TODD COMPANIES
P.O. Box 6820
(1701 N. Clancy Ct.)
Visalia, CA 93290
Ph. (559) 651-5820
Fax (559) 651-5830

LETTER OF TRANSMITTAL

Date: 07/17/2025

Emailed

TO: Bakersfield City School District
1300 Baker St,
Bakersfield, CA 93305

ATTN: Grant Southwell

JOB: Bakersfield Franklin E.S. 9-Classroom & 1-Restroom

JOB#: 25-078

We are sending you:

- ☐ Change Order
- ☐ Copy of Letter
- ☒ Enclosed
- ☐ Releases
- ☐ Specifications
- ☒ Other: **SUBMITTALS**

Copies	***Date***	***No.***	***Description***
1	***07/17/2025***	***1.0***	***Site Utilities Submittal***

These are transmitted as checked below:

- ☐ Approved as Noted
- ☐ Approved as Submitted
- ☒ As Requested
- ☐ Copies for Distribution
- ☐ Copies for Approval
- ☐ Corrected Prints
- ☒ For approval
- ☐ For your use
- ☐ For Bids Due
- ☐ Prints Returned on Loan
- ☐ Resubmit
- ☐ Return
- ☐ Returned or corrections
- ☒ Submittal

REMARKS:

SIGNED BY: *Florencio Torres* **DATE: 07/17/2025**

TODD COMPANIES

C.S.L.N. 788798, C36,A

2.0 SITE UTILITES SUBMITTAL
JOB# 25-078

JULY 17, 2025

FRANKLIN E.S. 9-CLASSROOM & 1-RESTROOM

BAKERSFIELD, CA

****

BAKERSFIELD CITY SCHOOL DISTRICT
1300 BAKER ST.
BAKERSFIELD, CA 93305
PHONE # (661) 631-5883

****

TODD COMPANIES
P.O. BOX 6820
1701 N. CLANCY CT.
VISALIA, CA 93290-6820
PHONE # (559) 651-5820
FAX # (559) 651-5830

FOR PURPOSES OF AVAILABILITY, MULTIPLE MANUFACTURERS ARE SUBMITTED FOR APPROVAL FOR THE SAME PRODUCT. ONCE ORDERED ONLY ONE MANUFACTURER WILL BE PROVIDED.

INDEX
SITE UTILITIES SUBMITTAL – #1.0
JOB# 25-078

FRANKLIN E.S. 9-CLASSROOM & 1-RESTROOM
BAKERSFIELD, CA

INDEX
SITE UTILITIES SUBMITTAL – #1.0
JOB# 25-078

FRANKLIN E.S. 9-CLASSROOM & 1-RESTROOM
BAKERSFIELD, CA

CONCRETE MIX DESIGN – 6 SACK
DETECTOR TAPE
NIBCO T113 GATE VAVLE – 2" & SMALLER
QUANTUM COUPLINGS
CHRISTY G5 BOX – WATER

MATERIAL

SEWER

CHARLOTTE
PIPE AND FOUNDRY COMPANY

Plastic Pipe and Fittings Drainage Systems
Suggested Short Form Specifications

ABS Schedule 40 Cellular Core (Foam Core) Pipe and DWV Fitting System:

Pipe and fittings shall be manufactured from ABS compound with a cell class of 42222 for pipe and 32222 for fittings as per ASTM D 3965 and conform with National Sanitation Foundation (NSF) standard 14. Pipe shall be iron pipe size (IPS) conforming to ASTM F 628. Fittings shall conform to ASTM D 2661.

All pipe and fittings to be produced by a single manufacturer and to be installed in accordance with manufacturer's recommendations and local code requirements. **WARNING!** Never test with or transport/store compressed air or gas in ABS pipe or fittings. Solvent cement shall conform to ASTM D 2235. The system to be manufactured by Charlotte Pipe and Foundry Co. and is intended for non-pressure drainage applications where the temperature will not exceed 140°F.

PVC Schedule 40 Cellular Core (Foam Core) Pipe and DWV Fitting System:

Pipe and fittings shall be manufactured from PVC compound with a cell class of 11432 per ASTM D 4396 for pipe and 12454 per ASTM D 1784 for fittings and conform with National Sanitation Foundation (NSF) standard 14. Pipe shall be iron pipe size (IPS) conforming to ASTM F 891. Injection molded fittings shall conform to ASTM D 2665. Fabricated fittings shall conform to ASTM F 1866.

All pipe and fittings to be produced by a single manufacturer and to be installed in accordance with manufacturer's recommendations and local code requirements. **WARNING!** Never test with or transport/store compressed air or gas in PVC pipe or fittings. Solvent cements shall conform to ASTM D 2564. Primer shall conform to ASTM F 656. The system to be manufactured by Charlotte Pipe and Foundry Co. and is intended for non-pressure drainage applications where the temperature will not exceed 140°F.

PVC Schedule 40 Solid Wall Pipe and DWV Fitting System:

Pipe and fittings shall be manufactured from PVC compound with a cell class of 12454 per ASTM D 1784 and conform with National Sanitation Foundation (NSF) standard 14. Pipe shall be iron pipe size (IPS) conforming to ASTM D 1785 and ASTM D 2665. Injection molded fittings shall conform to ASTM D 2665. Fabricated fittings shall conform to ASTM F 1866.

All pipe and fittings to be produced by a single manufacturer and to be installed in accordance with manufacturer's recommendations and local code requirements. **WARNING!** Never test with or transport/store compressed air or gas in PVC pipe or fittings. Solvent cements shall conform to ASTM D 2564. Primer shall conform to ASTM F 656. The system to be manufactured by Charlotte Pipe and Foundry Co. and is intended for non-pressure drainage applications where the temperature will not exceed 140°F.

PO Box 35430 Charlotte, NC 28235 USA 704/372-5030 800/438-6091 FAX 800/553-1605
www.charlottepipe.com

WELD-ON®
IPS CORPORATION

PRODUCT BULLETIN

P-68™

LOW VOC PRIMER FOR PVC AND CPVC PIPES

GENERAL DESCRIPTION:

WELD-ON® P-68™ is a low VOC emission, non-bodied, fast acting, primer. The strong action of P-68 primer rapidly softens and dissolves the joining surfaces of PVC and CPVC pipe and fittings. Available in clear and purple; the latter allows easy identification when used on the joining surfaces.

APPLICATION:

WELD-ON P-68 primer, when used in conjunction with appropriate WELD-ON solvent cements, will make consistently strong, well-fused joints. It is essential that the joining surfaces of pipe and fittings be softened and remains softened prior to assembly. The main function of the primer is to expedite the penetration and softening of the surfaces. Its rate of penetration into the joining surfaces is more rapid than that of solvent cement alone. P-68 primer is suitable for use with all types, classes and schedules of PVC and CPVC pipe and fittings.

Detailed directions on making solvent cemented joints are printed on the container label. An installation DVD/CD covering solvent cementing is available. It not only describes the basic principles of solvent cementing, but also covers the handling, storage and use of our products. It is highly recommended that the installer review the instructions supplied by the pipe and fitting manufacturer. **NOTE:** WELD-ON solvent cements must never be used in a CPVC system using or being tested by compressed air or gases; including air-over-water booster.

AVAILABILITY:

WELD-ON Both WELD-ON P-68 clear and purple primers are available in ¼ pint (118 ml), ½ pint (237 ml), pint (473 ml), quart (946 ml) and gallon (3.785 l) metal cans. For detailed information on containers and applicators, see our current Price List.

STANDARDS AND CERTIFICATION LISTINGS:

NSF® PW/DWV/SW

UPC® Purple Only

- Meets ASTM F 656 Standard
- Meets SCAQMD Rule 1168/316A
- Compliant with LEED® (Leadership in Energy and Environmental Design). When using this WELD-ON low VOC product, credit can be claimed for LEED Green Building Rating System – Indoor Environmental Quality.
- Listed by NSF International for compliance with ASTM F 656, NSF/ANSI Standard 14, and NSF/ANSI Standard 61 for use on potable water, drain, waste, vent and sewer applications.
- ***WELD-ON P-68 Purple Only*** - Listed by IAPMO for compliance with ASTM F 656 and applicable sections of the latest edition of the Uniform Plumbing Code®.

SPECIFICATIONS:

COLOR:	Clear or Purple
SPECIFIC GRAVITY:	0.841 ± 0.040
BROOKFIELD VISCOSITY:	Water Thin

SHELF LIFE:

3 years in tightly sealed containers. The date code of manufacture is stamped on the bottom of the container. Stability of the product is limited by the evaporation of the solvent when the container is opened. Adding of solvents is not recommended and may significantly change the properties of the primer.

QUALITY ASSURANCE:

WELD-ON P-68 primer is carefully evaluated to assure that consistent high quality is maintained. Fourier transform infrared spectroscopy, gas chromatography, and additional in depth testing ensures each batch is manufactured to exacting standards. A batch identification code is stamped on each can and assures traceability of all materials and processes used in manufacturing this product.

SHIPPING:

For One Liter and Above

Proper Shipping Name:	Flammable Liquid n.o.s. (Acetone, Methyl Ethyl Ketone)
Hazard Class:	3
Identification Number:	UN 1993
Packing Group:	II
Label Required:	Flammable Liquid

For Less than One Liter

Proper Shipping Name: Consumer Commodity
Hazard Class: ORM-D

SAFETY AND ENVIRONMENTAL PRECAUTIONS:

This product is flammable and considered a hazardous material. In conformance with the Federal Hazardous Substances Labeling Act, the following hazards and precautions are given. Purchasers who repackage this product must also conform to all local, state and federal labeling, safety and other regulations. VOC emissions do not exceed 550 grams per liter.

DANGER: EXTREMELY FLAMMABLE. VAPOR HARMFUL.
MAY BE HARMFUL IF SWALLOWED. MAY IRRITATE SKIN OR EYES.

Keep out of reach of children. Do not take internally. Keep away from heat, spark, open flame and other sources of ignition. Vapors may ignite explosively. Solvent cement vapors are heavier than air and may travel to source(s) of ignition at or near ground or lower level(s) and flash back. Keep container closed when not in use. Store between 40°F (5°C) and 110°F (44°C). Avoid breathing of vapors. Use only in well-ventilated area. If confined or partially enclosed, use forced ventilation. When necessary, use local exhaust ventilation to remove harmful airborne contaminants from employee breathing zone and to keep contaminates below 25 ppm TWA. Atmospheric levels must be maintained below established exposure limits contained in Section II of the Material Safety Data Sheet (MSDS). If airborne concentrations exceed those limits, use of a NIOSH approved organic vapor cartridge respirator with full face-piece is recommended. The effectiveness of an air-purifying respirator is limited. Use it only for a single short-term exposure. For emergency and other conditions where short-term exposure guidelines may be exceeded, use an approved positive pressure self-contained breathing apparatus. Do not smoke, eat or drink while working with this product. Avoid contact with skin, eyes and clothing. May cause eye injury. Protective equipment such as gloves, goggles and impervious apron should be used. Carefully read Material Safety Data Sheet and follow all precautions. Do not use this product for other than intended use.

"SARA Title III Section 313 Supplier Notification": This product contains toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 and of 40CFR372. This information must be included in all MSDS that are copied and distributed for this material.

FIRST AID:

Inhalation:	If overcome with vapors, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call physician.
Eye Contact:	Flush with plenty of water for 15 minutes and call a physician.
Skin Contact:	Wash skin with plenty of soap and water for at least 15 minutes. If irritation develops, get medical attention.
Ingestion:	If swallowed, give 1 or 2 glasses of water or milk. Do not induce vomiting. Contact physician or poison control center immediately.

SPECIAL PRECAUTION:

Do not use a dry granular calcium hypochlorite as a disinfecting material for water purification in potable water piping systems. The introduction of granules or pellets of calcium hypochlorite with PVC and CPVC solvent cements and primers (including their vapors) may result in a violent chemical reaction if a water solution is not used. It is advisable to purify lines by pumping chlorinated water into the piping system – this solution will be nonvolatile. Furthermore, dry granular calcium hypochlorite should not be stored or used near solvent cements and primers.

IMPORTANT NOTE:

This product is intended for use by skilled individuals at their own risk. These suggestions and data are based on information we believe to be reliable. Installers should verify for themselves that they can make satisfactory joints under varying conditions. Toward this end, it is highly desirable that they receive personal instruction from trained instructors or competent, experienced installers. Contact IPS® Corporation or your supplier for additional information or instructions.

WARRANTY:

IPS® Corporation ("IPS Corp.") warrants that all new IPS Corp. products shall be of good quality and free from defects in material and workmanship for the shelf life as indicated on the product. If any IPS Corp. product becomes defective, or fails to conform to our written limited warranty under normal use and storage conditions, then IPS Corp. will, without charge, replace the nonconforming product. However, this limited warranty shall not extend to, nor shall IPS Corp. be responsible for, damages or loss resulting from accident, misuse, negligent use, improper application, or incorporation of IPS Corp. products into other products. In addition, any repackaging of IPS Corp. products also shall void the limited warranty. IPS Corp. shall not be responsible for, nor does this limited warranty extend to, consequential damage, or incidental damage or expense, including without limitation, injury to persons or property or loss of use. Please refer to our standard IPS Corp. Limited Warranty for additional provisions.

IPS® CORPORATION

455 W. Victoria Street
Compton, CA 90220 U.S.A.
Tel: 310.898.3300
Fax: 310.898.3392

500 Distribution Parkway
Collierville, TN 38017 U.S.A.
Tel: 901.853.5001
Fax: 901.853.5008

Customer Service: 800.888.8312
www.ipscorp.com

WELD-ON®
IPS CORPORATION

PRODUCT BULLETIN

705™

INDUSTRIAL GRADE

LOW VOC PVC SOLVENT CEMENT

GENERAL DESCRIPTION:

WELD-ON® 705™ is an industrial grade, clear or gray, low VOC emission, medium bodied, fast setting, high strength PVC solvent cement for all classes and schedules of pipe and fittings with interference fit through 6 inch (160 mm) diameter, Schedule 80 through 4 inch (110 mm) diameter. Can be used without primer on non-pressure systems if local codes permit.

APPLICATION:

WELD-ON 705 is for use on all types of PVC plastic pipe applications, Type I and Type II. It is suitable for use with potable water pressure systems, irrigation, turf, foam core, conduit, sewer, drain, waste and vent systems.

Detailed directions on making solvent cemented joints are printed on the container label. An installation DVD/CD covering solvent cementing is available. It not only describes the basic principles of solvent cementing, but also covers the handling, storage and use of our products. It is highly recommended that the installer review the instructions supplied by the pipe and fitting manufacturer. **NOTE:** WELD-ON solvent cements must never be used in a PVC system using or being tested by compressed air or gases; including air-over-water booster.

AVAILABILITY:

This product is available in ¼ pint (118 ml), ½ pint (237 ml), pint (473 ml), quart (946 ml) and gallon (3.785 l) metal cans. For detailed information on containers and applicators, see our current Price List.

STANDARDS AND CERTIFICATION LISTINGS:

NSF PW/DWV/SW

UPC

NSF c US PW/DWV/SW Gray Only

CSA Gray Only

- Meets ASTM D 2564 Standard.
- Meets SCAQMD Rule 1168/316A.
- Compliant with LEED® (Leadership in Energy and Environmental Design). When using this WELD-ON Low VOC product, credit can be claimed for LEED Green Building Rating System - Indoor Environmental Quality.
- Listed by NSF International for compliance with ASTM D 2564, NSF/ANSI Standard 14 and NSF/ANSI Standard 61 for use in potable water, drain, waste, vent and sewer applications.
- **Gray Cement Only** - Meets CSA standards B137.3 and B181.2 for use in pressure and non-pressure potable water, drain, waste, and vent applications.
- Listed by IAPMO for compliance with ASTM D 2564 and applicable sections of the latest edition of the Uniform Plumbing Code®.

SPECIFICATIONS:

COLOR:	Clear or Gray
RESIN:	PVC
SPECIFIC GRAVITY:	0.960 ± 0.04
BROOKFIELD VISCOSITY:	Minimum 500 cP @ 73° ± 2°F (23° ± 1°C)

SHELF LIFE:

3 years in tightly sealed containers. The date code of manufacture is stamped on the bottom of the container. Stability of the product is limited by the evaporation of the solvent when the container is opened. Evaporation of solvent will cause the cement to thicken and reduce its effectiveness. Adding of thinners to change viscosity is not recommended and may significantly change the properties of the cement.

QUALITY ASSURANCE:

WELD-ON 705 is carefully evaluated to assure that consistent high quality is maintained. Fourier transform infrared spectroscopy, gas chromatography, and additional in depth testing ensures each batch is manufactured to exacting standards. A batch identification code is stamped on each can and assures traceability of all materials and processes used in manufacturing this solvent cement.

SHIPPING:

For One Liter and Above
Proper Shipping Name: Adhesive
Hazard Class: 3
Identification Number: UN 1133
Packing Group: II
Label Required: Flammable Liquid

For Less than One Liter
Proper Shipping Name: Consumer Commodity
Hazard Class: ORM-D

SAFETY AND ENVIRONMENTAL PRECAUTIONS:

This product is flammable and considered a hazardous material. In conformance with the Federal Hazardous Substances Labeling Act, the following hazards and precautions are given. Purchasers who repackage this product must also conform to all local, state and federal labeling, safety and other regulations. VOC emissions do not exceed 510 grams per liter.

DANGER: EXTREMELY FLAMMABLE. VAPOR HARMFUL.
MAY BE HARMFUL IF SWALLOWED. MAY IRRITATE SKIN OR EYES.

Keep out of reach of children. Do not take internally. Keep away from heat, spark, open flame and other sources of ignition. Vapors may ignite explosively. Solvent cement vapors are heavier than air and may travel to source(s) of ignition at or near ground or lower level(s) and flash back. Keep container closed when not in use. Store between 40°F (5°C) and 110°F (44°C). Avoid breathing of vapors. Use only in well-ventilated area. If confined or partially enclosed, use forced ventilation. When necessary, use local exhaust ventilation to remove harmful airborne contaminants from employee breathing zone and to keep contaminates below 25 ppm TWA. Atmospheric levels must be maintained below established exposure limits contained in Section II of the Material Safety Data Sheet (MSDS). If airborne concentrations exceed those limits, use of a NIOSH approved organic vapor cartridge respirator with full face-piece is recommended. The effectiveness of an air-purifying respirator is limited. Use it only for a single short-term exposure. For emergency and other conditions where short-term exposure guidelines may be exceeded, use an approved positive pressure self-contained breathing apparatus. Do not smoke, eat or drink while working with this product. Avoid contact with skin, eyes and clothing. May cause eye injury. Protective equipment such as gloves, goggles and impervious apron should be used. Carefully read Material Safety Data Sheet and follow all precautions. Do not use this product for other than intended use.

"SARA Title III Section 313 Supplier Notification": This product contains toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 and of 40CFR372. This information must be included in all MSDS that are copied and distributed for this material.

FIRST AID:

Inhalation:	If overcome with vapors, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call physician.
Eye Contact:	Flush with plenty of water for 15 minutes and call a physician.
Skin Contact:	Wash skin with plenty of soap and water for at least 15 minutes. If irritation develops, get medical attention.
Ingestion:	If swallowed, give 1 or 2 glasses of water or milk. Do not induce vomiting. Contact physician or poison control center immediately.

SPECIAL PRECAUTION:

Do not use a dry granular calcium hypochlorite as a disinfecting material for water purification in potable water piping systems. The introduction of granules or pellets of calcium hypochlorite with PVC and CPVC solvent cements and primers (including their vapors) may result in a violent chemical reaction if a water solution is not used. It is advisable to purify lines by pumping chlorinated water into the piping system – this solution will be nonvolatile. Furthermore, dry granular calcium hypochlorite should not be stored or used near solvent cements and primers.

IMPORTANT NOTE:

This product is intended for use by skilled individuals at their own risk. These suggestions and data are based on information we believe to be reliable. Installers should verify for themselves that they can make satisfactory joints under varying conditions. Toward this end, it is highly desirable that they receive personal instruction from trained instructors or competent, experienced installers. Contact IPS® Corporation or your supplier for additional information or instructions.

WARRANTY:

IPS® Corporation ("IPS Corp.") warrants that all new IPS Corp. products shall be of good quality and free from defects in material and workmanship for the shelf life as indicated on the product. If any IPS Corp. product becomes defective, or fails to conform to our written limited warranty under normal use and storage conditions, then IPS Corp. will, without charge, replace the nonconforming product. However, this limited warranty shall not extend to, nor shall IPS Corp. be responsible for, damages or loss resulting from accident, misuse, negligent use, improper application, or incorporation of IPS Corp. products into other products. In addition, any repackaging of IPS Corp. products also shall void the limited warranty. IPS Corp. shall not be responsible for, nor does this limited warranty extend to, consequential damage, or incidental damage or expense, including without limitation, injury to persons or property or loss of use. Please refer to our standard IPS Corp. Limited Warranty for additional provisions.

IPS® CORPORATION

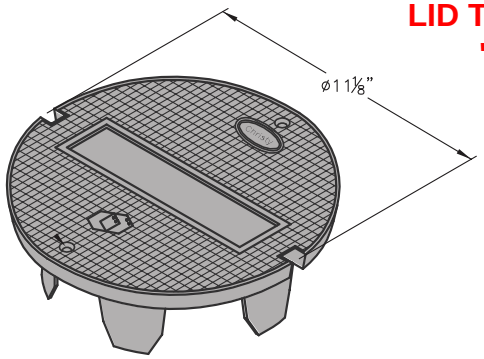
455 W. Victoria Street
Compton, CA 90220 U.S.A.
Tel: 310.898.3300
Fax: 310.898.3392

500 Distribution Parkway
Collierville, TN 38017 U.S.A.
Tel: 901.853.5001
Fax: 901.853.5008

Customer Service: 800.888.8312
www.ipscorp.com

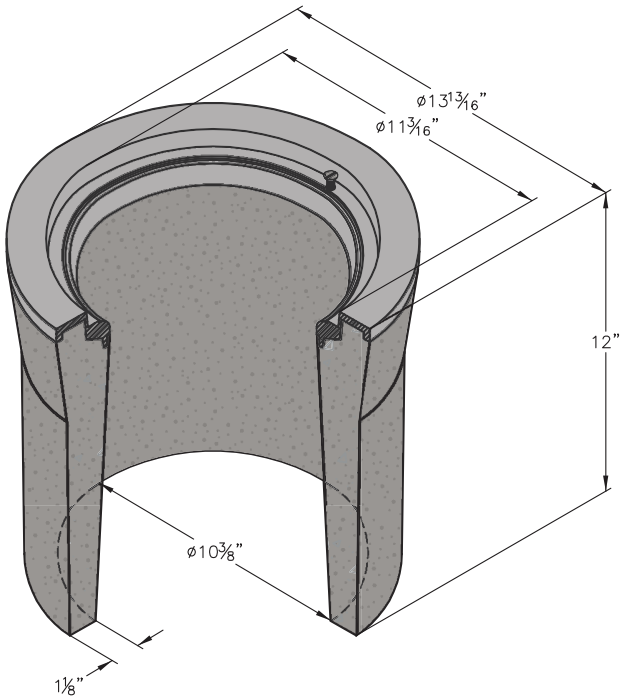
G05

LID TO BE MARKED "SEWER"



COVER:

Style:	Flush
Material:	Cast Iron
Model:	11" Dia.
Weight:	14 lbs
Options:	Special Markings
Surface:	Skid Resistant & Marked*
Coefficient of Friction:	>0.6 ASTM 1028
Performance:	H20, AASHTO M309



BODY:

Material:	Reinforced Concrete with Steel Frame
Model:	14" Dia.
Weight:	58 lbs
Wall Type:	Straight
Mouseholes:	0
Performance:	H20, AASHTO M309

GRADE RING:

Material:	Cast Iron
Grade Options:	1" Height 1-1/2" Height 2" Height

Traffic Rated: Continuous Roadway Traffic

Actual load rating is determined by the box and cover combination.
Weights and dimensions may vary slightly

All information contained on this sheet is current at the time of printing. Oldcastle Precast, Inc. reserves the right to discontinue or update product information without notice.

*Cover comes standard with permanent markings for manufacturer, load rating, model size and manufacturing location.

Contact your Oldcastle Enclosure Solutions Distribution Center for specific information and additional options.

Est. 1958

NEWBY RUBBER INC

WATER WORKS GASKETS

This is our new Water Works Catalog. All prices are each, F.O.B. Bakersfield, CA. Our terms are net 30 days. We are continually adding to our product line so please check with us on any item not shown that you may require.

Newby Rubber, Inc. has been manufacturing since 1958. We are proud of our past record, and will continue to provide our customers with the service and quality they expect and deserve. Please feel free to contact us on any requirement you might have.

Our CL-150 gaskets, Transition gaskets and Mechanical joint gaskets are manufactured to meet ASTM-D-1869-66 Specifications for Rubber Rings for Asbestos Cement Pipe, ASTM C564-68 Specifications for Rubber Rings for Cast Iron Soil Pipe, AWWA Standard C111/ A21.11 and ASTM F477-76 Elastomeric Seals for Joining Plastic Pipe. ASTM C-923 Table 1, Manhole Stop Rings.

SPECIAL ELASTOMERS:	**RESISTANT TO MOST**
NITRILE (BUNA-N)	OIL
NEOPRENE	LIGHT OIL RESISTANCE
VITON (FLUOROELASTOMER)	OIL & TERMPERATURE TO 350° F,
EPDM	GASOLINE OZONE, HOT WATER & STEAM TO 500° F

STORAGE: Recommended storage would be in a plastic bag and or a cardboard box, in a cool dry area. Do not store close to electric motors.

STORAGE LIFE:
NITRILE - Several years.
NEOPRENE - Indefinite - Long Life.
VITON (fluorelastomer) - Several years.
EPDM - Indefinite - Long Life.

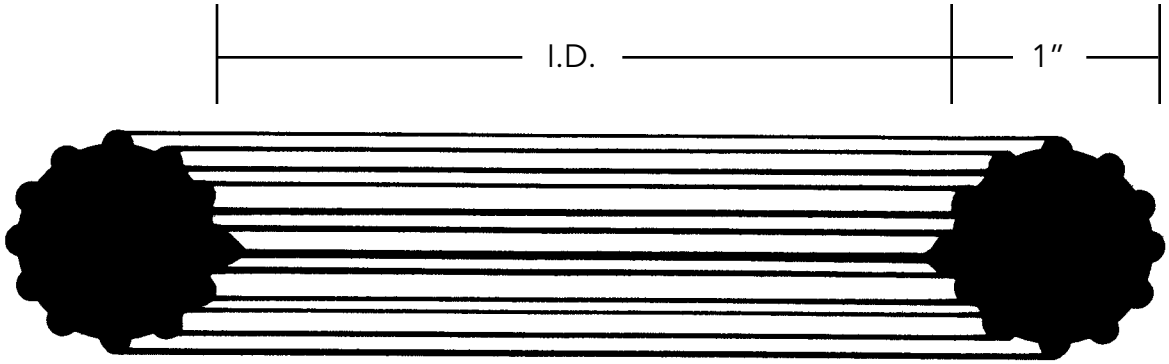
Est. 1958

NEWBY RUBBER INC

MANHOLE STOP RINGS

TO BE USED WITH PVC THAT GOES INTO A MANHOLE AND IS CEMENTED IN PLACE. OUR MANHOLE STOP RINGS ARE MOLDED, NOT EXTRUDED.

ILLUSTRATION



SIZE & TYPE	PART NO.	PCS/BOX	I.D.
4″ MANHOLE STOP RING	102675	125	4
6″ MANHOLE STOP RING	102700	75	5-7/8
8″ MANHOLE STOP RING	102725	50	8-3/4
10″ MANHOLE STOP RING	102750	25	10-1/4
12″ MANHOLE STOP RING	102775	25	12-1/4
14″ MANHOLE STOP RING		—	13-3/8
15″ MANHOLE STOP RING	102800	25	13-3/8
18″ MANHOLE STOP RING	102830	25	16-3/4
20″ MANHOLE STOP RING	102832	Spliced	20-5/8
21″ MANHOLE STOP RING	102833	25	21
24″ MANHOLE STOP RING	102836	20	23-3/4
27″ MANHOLE STOP RING	102840	Spliced	26-1/2
30″ MANHOLE STOP RING	102844	Spliced	30
36″ MANHOLE STOP RING	102846	Spliced	38

Other sizes quoted on request.

Christy's™

— PRODUCT INFORMATION & SPECIFICATIONS —

Detectable Marking Tape

Christy's™ Detectable Marking Tape provides for easy buried pipeline detection and below ground identification and warning. The tape can be located below ground with a non-ferrous metal detector, when buried at the proper depths. Christy's™ Detectable Tape Must Be Buried Flat For Maximum Detectability and Line Protection. We recommend bury depths of:

TAPE WIDTH	2”	3”	6”	12” or wider
TAPE BURY DEPTH	6” - 18”	6” - 28”	6” - 36”	6” - 36”

Detectable Marking Tape

SPECIFICATIONS

Tape consists of Minimum 4.5 MIL overall thickness, with 0.0035 MIL solid aluminium foil core. The warning message is “Buried, or Encased” to prevent ink rub-off and is impervious to acid, alkalis and other destructive elements found in soil. All Christy’s tape meets or exceeds the industry standards including the America Public Works Association (APWA) color code.

TEST DATA		VALUE
MATERIAL IDENTIFICATION	3” & 6” WIDE	4.5 MIL
OVERALL FOIL THICKNESS		0035 MIL
TEST PROCEDURE	ASTM-D-8820, METHOD A	90%
SPECIMEN CONDITIONS		73ºF / 50% R.H
TEST TEMPERATURE		73ºF
ELONGATION		90%
TENSILE STRENGTH	TRANSVERSE	5530 PSI
TENSILE STRENGTH	LONGITUDINAL	4544 PSI
ROLL WEIGHT	3” X 1000’	+/- 7.5 LBS
ROLL WEIGHT	6” X 1000’	+/- 15 LBS
MINIMUM WEIGHT		10 LBS PER 1000’ UNIT
MAXIMUM IMPRINT LENGTH		36”

COLOR CODE	DESCRIPTION
BLUE	WATER & ASSOCIATED LINES
BROWN	FORCE MAINS & ASSOCIATED LINES
GREEN	SANITARY & ASSOCIATED LINES
ORANGE	TELECOMMUNICATIONS & TELEPHONE LINES
PURPLE	RECLAIMED WATER LINES
RED	ELECTRIC & ASSOCIATED LINES
YELLOW	GAS & ASSOCIATED LINES

The tape is manufactured by T. Christy Enterprises, Inc. (800) 258-4583.

The model number is _____ (TA-DT-XX-XXX). See model number designations on the following page.

Christy's™

— PRODUCT INFORMATION & SPECIFICATIONS —

STANDARD COLOR/LEGEND COMBINATIONS

How to Order Underground Marking Tapes

TA.XX.XX.XXXXX

Example: TA.DT.2.PRW is 2" Detectable Purple Reclaimed Water.

Type of Tape	Width of Tape	Colors	Legend	
DT - Detectable	2 - 2"	B - Blue	CP - Cathodic Protection	RAW - Raw Water
	3 - 3"	P - Purple	E - Electric	RJ - Restrained Joint
	6 - 6"	Y - Yellow	F- Fire	RW - Reclaimed Water
	12 - 12"	G - Green	FM - Force main	STDR - Storm Drain
		R - Red	FO - Fiber Optic	T - Telephone
		W - White	G - Gas	W - Water
		O - Orange	I - Irrigation	
		BR - Brown	NPW - Non-Potable Water	

STANDARD COLOR/LEGEND COMBINATIONS

Color	Legend	Text
Blue	BI	"Caution Irrigation Line Buried Below"
Blue	BNPW	"Caution Non-Potable Water Line Buried Below"
Blue	BPW	"Caution Potable Water Line Buried Below"
Blue	BW	"Caution Water Line Buried Below"
Blue	RJ	"Caution Restrained Joint Buried Below"
Brown	BFM	"Caution Force Main Buried Below"
Green	GFM	"Caution Force Main Buried Below"
Green	GI	"Caution Irrigation Line Buried Below"
Green	GNPW	"Caution Non-Potable Line Buried Below"
Green	GPW	"Caution Potable Line Buried Below"
Green	GRAW	"Caution Raw Water Line Buried Below"
Green	GS	"Caution Sewer Line Buried Below "
Green	GSTDR	"Caution Storm Drain Buried Below"
Orange	OFO	"Caution Fiber Optic Line Buried Below"
Orange	OT	"Caution Telephone Line Buried Below"
Orange	OCP	"Caution Cathodic Protection Cable Buried Below"
Purple	PRW	"Caution Recycled/Reclaimed Water Line Buried Below"
Purple	PNPW	"Caution Non-Potable Line Buried Below"
Red	RE	"Caution Electric Line Buried Below"
Red	RF	"Caution Fire Line Buried Below"
Yellow	YG	"Caution Gas Line Buried Below"

NOTE: Not all widths are available as standard for the stock color/legend combinations shown. Contact Christy's™ for stock availability of specific products. **Non-stock combinations are subject to minimum requirements and plate charges.**

SPECIAL AND CUSTOM LEGENDS

Christy's™ offers a full range of non-standard legend/color combinations in addition to the combinations listed below, including specialty applications such as Telemetry, Irrigation and additional water line wording. All standard combinations listed are available in at least one color/width combination. We offer specific agency legends, designations or color combinations. Custom legends can include the use of specific wording, insignias and phone numbers. Call for special pricing.

GOLDEN EMPIRE CONCRETE SALES

1830 South Milliken Ave, Ontario CA 91761

Date Issued: 7/17/2025

Submittal No. 2202

Contractor: TODD COMPANIES

Project: FRANKLIN ELEMENTARY SCHOOL

Location:

Dear Sir/Madam:

We are submitting the following concrete mix design(s) for approval of use for the above referenced project:

Mix Code Number	Description	Intended Use
NC40000	4000 6.00SK 1AGG WR SCI	SITE / MISCEILLANEOUS WORK

LIMITATIONS:

1. The concrete mix designs submitted are in conformance with ACI 301 and ASTM standards and other generally accepted engineering practices. Purchaser agrees to abide by the operational and acceptance standards set forth by those organizations.

2. Prior to delivery it is the responsibility of the purchaser to obtain approval of these mix designs from the necessary authorities. Supplier assumes no responsibility for obtaining or verifying approvals. By ordering, the purchaser receipt of all approvals for this or any other mix the purchaser orders for this project.

3. This concrete mixture will produce concrete meeting the design criteria when sampled in accordance with C-94 and ASTM C172. The minimum 28 day compressive strength may not meet project requirements if the slump is not within specificied refernces stated in the approved project speifications.

4. The concrete must be placed, protected, and cured in strict accordance with ACI 318, and the specified references stated in the approved project specifications.

5. Prior to placement, it is the responsibility of the purchases to verify the air content of those mixes requiring entrained air. We as ready mix concrete supplier do not accept liability for concrete that does not meet air entrainment specifications after it has been placed in the forms.

6. We as the ready mix concrete supplier take no responsibilty for concrete performance when the workmanship deviates from the standards and practices stated therein.

7. Finishing of Concrete should be finished per CI 302 recommendations. Hard trowel finishing of air entrained concrete may result in adverse effects up to and including delamination of concrete slabs.

8. Mixes containing SRA maybe prone to delamination when subject to hard trowel finishing techniques.

9. Mix designs containing smaller nominal maximum sizes aggregate are susceptible to shrinkage cracks - i.e., 3/8" as well as 5/50 concrete mix designs.

We appreciate the opportunity to be of service to you. Should you have any questions regarding the information provided, please contact our office.

Respectfully,

Prepared by:
LANCE MATTOS

GOLDEN EMPIRE CONCRETE SALES

1830 South Milliken Ave, Ontario CA 91761

PROJECT INFORMATION

4000 6.00SK 1AGG WR SCE4001

Customer:	TODD COMPANIES	**Concrete Mix No.:**	**NC40000**
Project:	FRANKLIN ELEMENTARY SCHOOL	**Date:**	July 17, 2025
Address:		**Use:**	SITE / MISCEILLANEOUS WORK
Concrete Supplier:	Golden Empire Concrete		
Design Compressive Strength:	4000 psi @ 28 days	**Plant:**	WESTSIDE
W/C + P Ratio:	0.50 5.65 gal/sack	**Slump Range:**	4.00 +/- 1.00
Equivalent Cement Factor:	6.00 sacks/CY	**General Contractor:**	

CONCRETE MIX PROPORTIONS

Note: All aggregate weights are saturated surface dry (SSD) weights and the moisture content of the aggregates at the time of batching must be considered when determining the total water in the mix.

Material		Source	Batch Wts (lb)	Abs. Vol. (cu.ft.)	Spec Grav.
ASTM C-595 1L		NATIONAL	564	2.90	3.08
WATER LBS	34.0 gal	WATER	283.0	4.50	1.00
1 INCH AGGREGATE	46 %	VULCAN / SAN EMIDI	1468	8.90	2.65
3/8 INCH AGGREGATE	12 %	VULCAN / SAN EMIDI	364	2.20	2.63
CONCRETE SAND	42 %	VULCAN / SAN EMIDI	1326	8.00	2.64
EUCON NW WATER REDUCER	4.5 oz/cwt C+P	EUCLID	25.4 oz/cy		
Air Content	1.5 %			0.41	
Plastic Unit Wt:	148.3 pcf	**Material Totals:**	4004.4 lbs.	27.00	cu.ft.

PROPOSED AGGREGATE GRADATIONS

	1 1/2 in. (37.5 mm)	1 in. (25 mm)	3/4 in. (19 mm)	1/2 in. (12.5 mm)	3/8 in. (9.5 mm)	No. 4 (4.75 mm)	No. 8 (2.36 mm)	No. 16 (1.18 mm)	No. 30 (0.6 mm)	No. 50 (0.3 mm)	No. 100 (0.15 mm)	No. 200 (0.075 mm)	FM
INVAGG1	100	99	84	31	10	3	2	0	0	0	0	0	7.01
INVAGG3/8				100	89	18	3	1	0	0	0	0	5.89
INVSAND					100	99	88	65	42	20	7	4	2.79
Comb. Grad.	100	100	93	68	57	45	38	27	18	8	3	2	5.11

Mix Notes:

Lance Mattos

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Tristan Fox	Report Date:	4/14/2023
Project Name:	Chick-Fil-A No. 4799	Project Number:	2-622-1363
Structure Placed:	Slab on Grade	Sample Set ID:	22245
Area of Placement:	Trash Enclosure Apron		

Date Sampled:	3/17/2023	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	9:45 AM	Slump:	4½"	Ticket Number:	207292305
Date Sample Received:	3/20/2023	Concrete Temperature:	65°F	Mix Number:	NC40000
Sampled By:	Y. Saleh	Ambient Temperature:	60°F	Air Content:	
Delivered By:	D. Perera	Environmental Conditions:	Cloudy	Unit Weight (pcf):	

Date Tested	Sample Age in Days	Diameter (in.)	Area (in.^{2})	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
3/24/2023	7	4.00	12.57	37,420	**2,980**		5	D. Perera
4/14/2023	28	4.00	12.57	54,570	**4,340**	4,000	3	D. Perera
4/14/2023	28	4.00	12.57	53,460	**4,250**		5	D. Perera
4/14/2023	28	4.00	12.57	53,760	**4,280**		3	D. Perera
	HOLD							

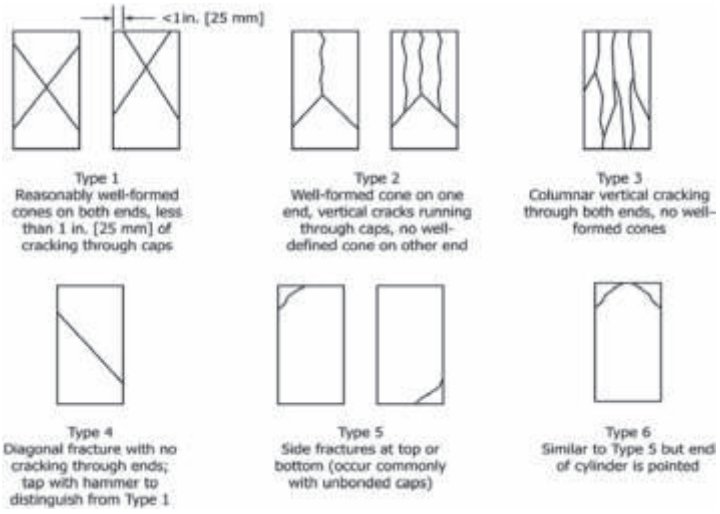
Average 28 Day Compressive Strength, psi: **4,290**

Condition of Sample: Undisturbed

Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

- Bonded Cap (ASTM C617) ☐
- Unbonded Cap (ASTM C1231) ☑
- Air Content, Volumetric Method (ASTM C173) ☐
- Air Content, Pressure Method (ASTM C231) ☐
- Density, Yield and Air Content of Concrete (ASTM C138) ☐
- Sampling Freshly Mixed Concrete (ASTM C172)
- Slump of Hydraulic-Cement Concrete (ASTM C143)
- Temperature of Freshly Mixed Concrete (ASTM C1064)
- Making and Curing Test Specimens (ASTM C31)
- Compressive Strength of Concrete Specimens (ASTM C39)



Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Makkawi Builders	Report Date:	1/19/2023
Project Name:	ARCO Gas Station & Convenience Store	Project Number:	2-622-1042
Structure Placed:	SOG/Footings	Sample Set ID:	22224
Area of Placement:	South West Side		

Date Sampled:	12/22/2022	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	6:30 AM	Slump:	5 ½"	Ticket Number:	208153591
Date Sample Received:	12/23/2022	Concrete Temperature:	55°F	Mix Number:	NC40000
Sampled By:	D. Perera	Ambient Temperature:	35°F	Air Content:	N/A
Delivered By:	D. Perera	Environmental Conditions:	Cold, Gloomy	Unit Weight (pcf):	N/A

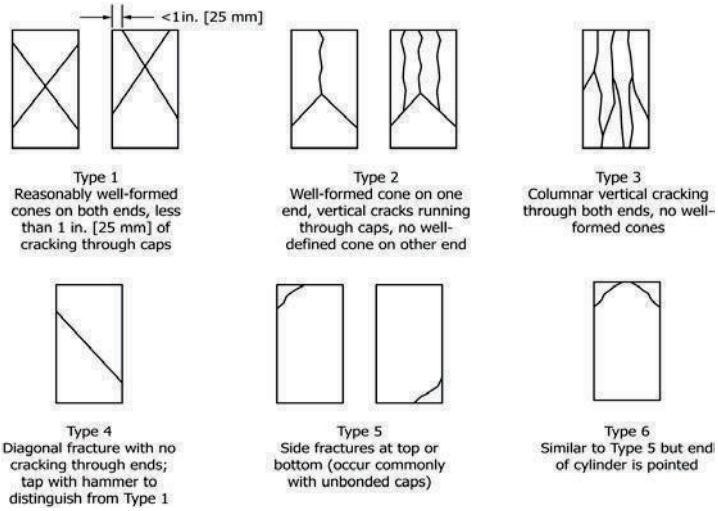
Date Tested	Sample Age in Days	Diameter (in.)	Area ($in.^2$)	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
12/29/2022	7	4.00	12.57	38,310	**3,050**		1	A. Dalqamouni
1/19/2023	28	4.00	12.57	60,200	**4,790**	4,000	5	D. Perera
1/19/2023	28	4.00	12.57	60,750	**4,830**		3	D. Perera
1/19/2023	28	4.00	12.57	63,550	**5,060**		2	D. Perera
	HOLD							
				Average 28 Day Compressive Strength, psi:	**4,890**			

Condition of Sample: Undisturbed

Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

Bonded Cap (ASTM C617) ☐
Unbonded Cap (ASTM C1231) ☑
Air Content, Volumetric Method (ASTM C173) ☐
Air Content, Pressure Method (ASTM C231) ☐
Density, Yield and Air Content of Concrete (ASTM C138) ☐
Sampling Freshly Mixed Concrete (ASTM C172)
Slump of Hydraulic-Cement Concrete (ASTM C143)
Temperature of Freshly Mixed Concrete (ASTM C1064)
Making and Curing Test Specimens (ASTM C31)
Compressive Strength of Concrete Specimens (ASTM C39)



Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Tristan Fox	Report Date:	4/11/2023
Project Name:	Chick-Fil-A No. 4799	Project Number:	2-622-1363
Structure Placed:	Slab on Grade / Footings	Sample Set ID:	22244
Area of Placement:	Trash Enclosure - North East half		

Date Sampled:	3/14/2023	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	8:00 AM	Slump:	4"	Ticket Number:	207292219
Date Sample Received:	3/15/2023	Concrete Temperature:	66°F	Mix Number:	NC40000
Sampled By:	D. Perera	Ambient Temperature:	60°F	Air Content:	
Delivered By:	D. Perera	Environmental Conditions:	Drizzle	Unit Weight (pcf):	

Date Tested	Sample Age in Days	Diameter (in.)	Area ($in.^2$)	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
3/21/2023	7	4.00	12.57	39,380	**3,130**		5	D. Perera
4/11/2023	28	4.00	12.57	54,200	**4,310**	4,000	5	D. Perera
4/11/2023	28	4.00	12.57	53,260	**4,240**		3	D. Perera
4/11/2023	28	4.00	12.57	54,280	**4,320**		5	D. Perera
	HOLD							

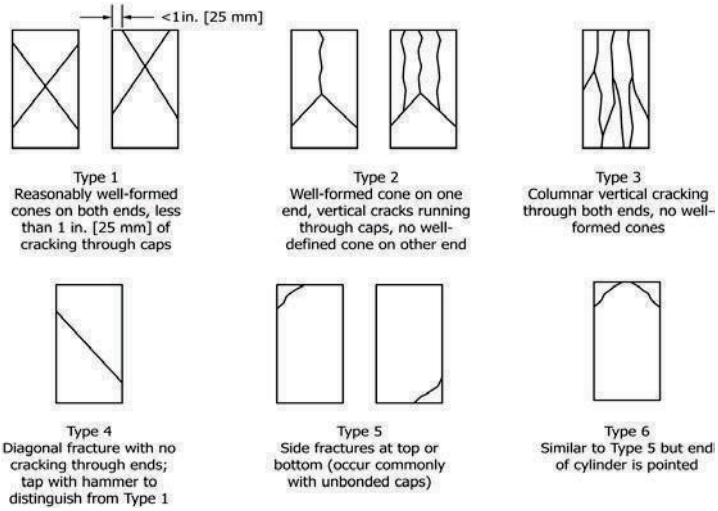
Average 28 Day Compressive Strength, psi: **4,290**

Condition of Sample: Undisturbed

Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

- Bonded Cap (ASTM C617) ☐
- Unbonded Cap (ASTM C1231) ☑
- Air Content, Volumetric Method (ASTM C173) ☐
- Air Content, Pressure Method (ASTM C231) ☐
- Density, Yield and Air Content of Concrete (ASTM C138) ☐
- Sampling Freshly Mixed Concrete (ASTM C172)
- Slump of Hydraulic-Cement Concrete (ASTM C143)
- Temperature of Freshly Mixed Concrete (ASTM C1064)
- Making and Curing Test Specimens (ASTM C31)
- Compressive Strength of Concrete Specimens (ASTM C39)



Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Tristan Fox	Report Date:	3/10/2023
Project Name:	Chick-Fil-A No. 4799	Project Number:	2-622-1363
Structure Placed:	SOG / Footings	Sample Set ID:	22235
Area of Placement:	Footings -East Side		

Date Sampled:	2/10/2023	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	5:30 AM	Slump:	4"	Ticket Number:	207290729
Date Sample Received:	2/13/2023	Concrete Temperature:	62°F	Mix Number:	NC40000
Sampled By:	D. Perera	Ambient Temperature:	39°F	Air Content:	
Delivered By:	D. Perera	Environmental Conditions:	Foggy	Unit Weight (pcf):	

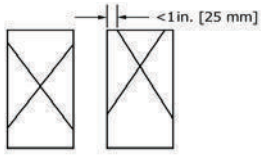
Date Tested	Sample Age in Days	Diameter (in.)	Area ($in.^2$)	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
2/17/2023	7	4.00	12.57	45,610	**3,630**		2	D. Perera
3/10/2023	28	4.00	12.57	60,760	**4,840**	4,000	2	D. Perera
3/10/2023	28	4.00	12.57	64,000	**5,090**		2	D. Perera
3/10/2023	28	4.00	12.57	60,700	**4,830**		5	D. Perera
	HOLD							
				Average 28 Day Compressive Strength, psi:	**4,920**			

Condition of Sample: Undisturbed

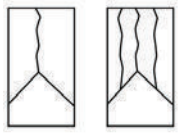
Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

Bonded Cap (ASTM C617) ☐
Unbonded Cap (ASTM C1231) ☑
Air Content, Volumetric Method (ASTM C173) ☐
Air Content, Pressure Method (ASTM C231) ☐
Density, Yield and Air Content of Concrete (ASTM C138) ☐
Sampling Freshly Mixed Concrete (ASTM C172)
Slump of Hydraulic-Cement Concrete (ASTM C143)
Temperature of Freshly Mixed Concrete (ASTM C1064)
Making and Curing Test Specimens (ASTM C31)
Compressive Strength of Concrete Specimens (ASTM C39)

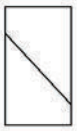


Type 1
Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps

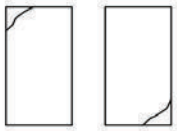


Type 2
Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end

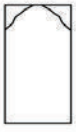
Type 3
Columnar vertical cracking through both ends, no well-formed cones



Type 4
Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1



Type 5
Side fractures at top or bottom (occur commonly with unbonded caps)



Type 6
Similar to Type 5 but end of cylinder is pointed

Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Tristan Fox	Report Date:	3/10/2023
Project Name:	Chick-Fil-A No. 4799	Project Number:	2-622-1363
Structure Placed:	SOG / Footings	Sample Set ID:	22236
Area of Placement:	Slab -South Side		

Date Sampled:	2/10/2023	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	6:50 AM	Slump:	4½"	Ticket Number:	207290739
Date Sample Received:	2/13/2023	Concrete Temperature:	66°F	Mix Number:	NC40000
Sampled By:	D. Perera	Ambient Temperature:	40°F	Air Content:	
Delivered By:	D. Perera	Environmental Conditions:	Foggy	Unit Weight (pcf):	

Date Tested	Sample Age in Days	Diameter (in.)	Area ($in.^2$)	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
2/17/2023	7	4.00	12.57	43,460	**3,460**		3	D. Perera
3/10/2023	28	4.00	12.57	54,370	**4,330**	4,000	5	D. Perera
3/10/2023	28	4.00	12.57	55,720	**4,430**		2	D. Perera
3/10/2023	28	4.00	12.57	55,060	**4,380**		5	D. Perera
	HOLD							

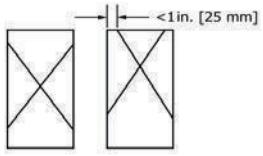
Average 28 Day Compressive Strength, psi: **4,380**

Condition of Sample: Undisturbed

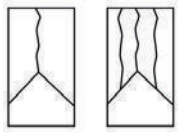
Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

Bonded Cap (ASTM C617) ☐
Unbonded Cap (ASTM C1231) ☑
Air Content, Volumetric Method (ASTM C173) ☐
Air Content, Pressure Method (ASTM C231) ☐
Density, Yield and Air Content of Concrete (ASTM C138) ☐
Sampling Freshly Mixed Concrete (ASTM C172)
Slump of Hydraulic-Cement Concrete (ASTM C143)
Temperature of Freshly Mixed Concrete (ASTM C1064)
Making and Curing Test Specimens (ASTM C31)
Compressive Strength of Concrete Specimens (ASTM C39)

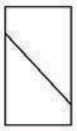


Type 1
Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps

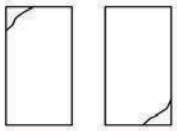


Type 2
Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end

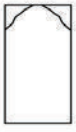
Type 3
Columnar vertical cracking through both ends, no well-formed cones



Type 4
Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1



Type 5
Side fractures at top or bottom (occur commonly with unbonded caps)



Type 6
Similar to Type 5 but end of cylinder is pointed

Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Tristan Fox	Report Date:	3/14/2023
Project Name:	Chick-Fil-A No. 4799	Project Number:	2-622-1363
Structure Placed:	Canopy & Trash Enclosure Footings	Sample Set ID:	22237
Area of Placement:	Canopy Footings		

Date Sampled:	2/14/2023	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	7:15 AM	Slump:	5½"	Ticket Number:	207290876
Date Sample Received:	2/15/2023	Concrete Temperature:	60°F	Mix Number:	NC40000
Sampled By:	D. Perera	Ambient Temperature:	48°F	Air Content:	
Delivered By:	D. Perera	Environmental Conditions:	Clear	Unit Weight (pcf):	

Date Tested	Sample Age in Days	Diameter (in.)	Area ($in.^2$)	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
2/21/2023	7	4.00	12.57	41,130	**3,270**		3	D. Perera
3/14/2023	28	4.00	12.57	56,220	**4,470**	4,000	5	D. Perera
3/14/2023	28	4.00	12.57	55,420	**4,410**		5	D. Perera
3/14/2023	28	4.00	12.57	59,020	**4,700**		2	D. Perera
	HOLD							

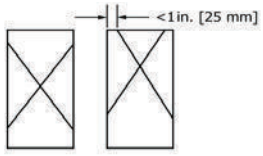
Average 28 Day Compressive Strength, psi: **4,530**

Condition of Sample: Undisturbed

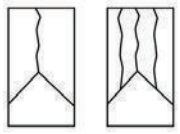
Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

Bonded Cap (ASTM C617) ☐
Unbonded Cap (ASTM C1231) ☑
Air Content, Volumetric Method (ASTM C173) ☐
Air Content, Pressure Method (ASTM C231) ☐
Density, Yield and Air Content of Concrete (ASTM C138) ☐
Sampling Freshly Mixed Concrete (ASTM C172)
Slump of Hydraulic-Cement Concrete (ASTM C143)
Temperature of Freshly Mixed Concrete (ASTM C1064)
Making and Curing Test Specimens (ASTM C31)
Compressive Strength of Concrete Specimens (ASTM C39)

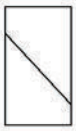


Type 1
Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps

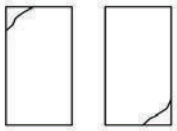


Type 2
Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end

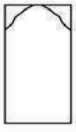
Type 3
Columnar vertical cracking through both ends, no well-formed cones



Type 4
Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1



Type 5
Side fractures at top or bottom (occur commonly with unbonded caps)



Type 6
Similar to Type 5 but end of cylinder is pointed

Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

NATIONAL CEMENT

National Cement Company of California, Inc.

LEBEC Plant

MILL TEST REPORT

We certify that the below described Hydraulic Blended Cement, at the time of shipment and Manufactured Production of December 2024 meets the Chemical and Physical requirements of Blended Hydraulic Cements as per ASTM C595/C595M and AASTHO M240.

Chemical Specifications and Analysis

ASTM (C114)	ASTM C595/C595M TYPE IL	Actual Analysis	
SiO2	NA	20.40	%
Al2O3	NA	4.06	%
Fe2O3	NA	3.76	%
CaO	NA	63.37	%
MgO	NA	1.94	%
SO3	3.0 max *	3.1	% *
Loss	10.0 max	5.0	%
Insoluble	NA	1.09	%
Na2O	NA	0.05	%
K2O	NA	0.08	%
Eq.Alkalies	NA	0.55	%
Free CaO	NA	1.10	%
Cl	NA	0.006	%
%CO2	NA	3.8	%
% Limestone	15.0% max	9.5	%
%CaCO3 in LS	70% min	98.1	%

* Meets ASTM C595, Table 1, Option B

* It is permissible to exceed the values in the table for SO3 content, provided it has been demonstrated by Test Method C1038 that the cement with the increased SO3 will not develop expansion exceeding 0.020 % at 14 days.

Physical Specifications and Analysis

	ASTM C595/C595M TYPE IL	Actual Analysis
Air content of mortar (%volume) (C185)	12 max	7
Blaine, Sq.cm/gm (C204)	NR	4840
Fineness (M-325) (C430)	NR	98.6
Autoclave Exp. % (C215)	NR	0.002
Time of Setting:		
Vicat (A),Initial (C191)	45 min	165
Vicat (A),Final (C191)	NR	288
Gilmore, Initial (C266)	NR	160
Gilmore, Final (C266)	NR	288
C-1038 Mortar bar exp.(%)	0.02 max	0.005
(1) Sulfate Resistance (C1012/C1012M)	0.05 max	0.02
Per ASTM C595, Table 3, Special Properties HS-High Sulfate Resistance		
Compressive Strength: (C109/C109M)		
1 day (Psi)	NR	2270
3 days (Psi)	1890 min	3870
7 days (Psi)	2900 min	4770
28 days (Psi)	3620 min	6000

NA = Not Applicable

NR = No Requirement

(1) Sulfate Resistance Historical Data

This Cement Meets Or Exceeds The Following Described Specifications

ASTM: C595/C595M-24, TYPE IL(10) - HS Blended Portland

AASTHO: 240M Standard Specifications for Blended Hydraulic Cement

Main Office:

15821 Ventura Blvd.
Suite 475
Encino, Ca. 91436-2935
(818) 788-4228

NATIONAL CEMENT COMPANY OF CALIFORNIA

By: 

QUALITY CONTROL MANAGER

1/9/25

WATER REDUCERS

Master Format #: 03 30 00 03 40 00 03 70 00

EUCON™ NW

WATER REDUCING ADMIXTURE

EUCLID CHEMICAL

PRODUCT INFORMATION

PACKAGING

Packaged in bulk, 275 gal (1041 L) totes, 55 gal (208 L) drums and 5 gal (18.9 L) pails

SHELF LIFE

1 year in original, unopened container

SPECIFICATIONS/COMPLIANCES

ASTM C494, Type A & D

AASHTO M194

DESCRIPTION

EUCON NW is a water reducing, normal set admixture made from a concentrated solution of refined lignosulfonate, polymer and other water reducing and plasticizing chemicals. EUCON NW provides a more plastic and cohesive mix in fresh concrete and better durability, reduced shrinkage and less permeability in the hardened concrete. EUCON NW contains no added chlorides or chemicals known to promote the corrosion of steel.

PRODUCT CHARACTERISTICS

FEATURES & BENEFITS

- Improves finishability and workability
- Reduces segregation
- Improves setting times
- Increases durability
- Increases strength
- Reduces permeability
- Improves finished appearance
- Reduces cracking

PRIMARY APPLICATIONS

- Flatwork concrete
- Ready mix concrete
- Lightweight concrete
- Hot weather concrete
- Precast / Prestressed concrete

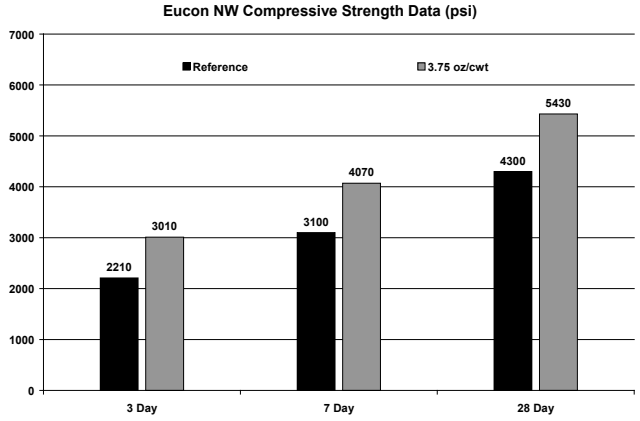
PRECAUTIONS/LIMITATIONS

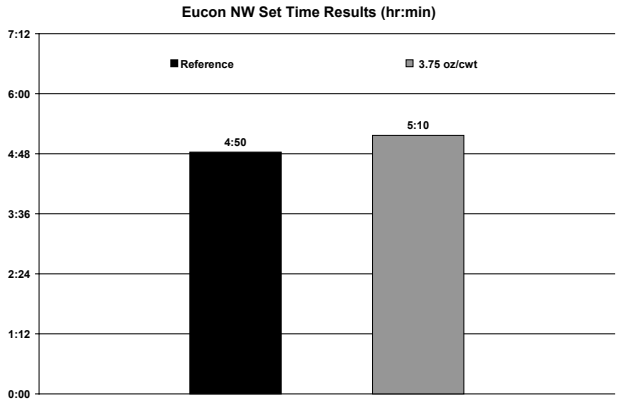
- Care should be taken to maintain EUCON NW above freezing; however, freezing and subsequent thawing will not harm the material if thoroughly agitated. Do not agitate with air or an air lance.
- Add to mix independent of other admixtures.
- In all cases, consult the Safety Data Sheet before use.

TECHNICAL INFORMATION

PERFORMANCE DATA

The following test results were achieved using typical ASTM C494 mix design requirements, 517 lb/yd^3 (307 kg/m^3) cement content and similar (± 0.5)% air content. These results were obtained under laboratory conditions with materials and mix designs meeting the specifications of ASTM C494. Changes in materials and mix designs can affect the dosage response.





DIRECTIONS FOR USE

EUCON NW is typically used at dosages of 2-6 oz/100 lbs (130-390 mL/100 kg) of cementitious material. Higher dosages are acceptable with prior testing and confirmation of the desired performance with specific materials being used.

EUCON NW has been tested per ASTM C494 at a Type A dosage of 3.5 oz/100 lbs (230mL/100 kg) of cementitious materials and at 6 oz/100 lbs (390 mL/100 kg) of cementious materials for Type B and D requirements.

EUCON NW should be added to the initial batch water of the concrete mixture. Do not dispense onto dry cement. Because of variations in job conditions and concrete materials, dosages other than the recommended amounts may be required. In such cases, contact your local Euclid sales representative.

National Ready Mixed Concrete Association

Certificate of Conformance for Concrete Production Facilities

THIS IS TO CERTIFY THAT

Gosford Plant 5207, Bakersfield, CA

Golden Empire

has been inspected by the undersigned licensed professional engineer for conformance with the requirements of the Checklist for Ready Mixed Concrete Production Facilities. As of the inspection date, the facility meets the requirements for production by

Truck Mixing with Automatic Batching and Recordings of Cementitious Materials, Aggregate, Water, and Chemical Admixtures

(Seal)

Signature of Licensed Professional Engineer

November 15, 2024	*November 29, 2026*
Inspection Date	Expiration Date

This company will maintain this facility in compliance with the checklist requirements and promptly correct any deficiencies that develop.

Justin Cook Vice President Operations

Signature of Company Official & Title

NOTICE: The checklist verifies that the plant facilities are deemed satisfactory for concrete production when operated correctly. However, compliance of the concrete with specification requirements must be confirmed through standard inspection methods and sales agreements.

This certificate is issued by the National Ready Mixed Concrete Association (NRMCA) to confirm that the production facility complies with the requirements outlined in Section 3 of the NRMCA Quality Control Manual for Ready Mixed Concrete Production Facilities. *Unauthorized reproduction or misuse of this certificate may result in legal action.*

Plant ID #: 802773

Certification ID #: 33123

12/10/2024 1:21:09 PM

Vulcan Materials Company

October 1, 2024

Subject: Annual Testing of Concrete Aggregates (ASTM C33)
Vulcan Materials Company
16101 Hwy 166
Bakersfield, Ca 93311
SMARA # 91-15-0041

To Whom it may concern,

Submitted herewith are the laboratory test results for the San Emidio Concrete Aggregates. The various test were performed in accordance with the listed ASTM and Caltrans test methods. The samples tested conform to the requirements listed in ASTM C33 and Caltrans Standard Specification for concrete aggregates.

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

Respectfully
Vulcan Materials Company

Aaron Godfrey
Technical Services Manager
Central California

San Emidio Aggregates
October 1, 2024
SMARA No. 91-15-0041

Scope of Services

Designation		
ASTM	**Caltrans**	
C 136	CTM 202	Test Method for Sieve Analysis of Coarse and Fine Aggregate
C 127	CTM 206	Test Method for Specific Gravity and Absorption of Coarse Aggregate
C 128	CTM 207	Test Method for Specific Gravity and Absorption of Fine Aggregate
C 131	CTM 211	Test Method for Los Angles Abrasion of Coarse Aggregate
D 2419	CTM 217	Test Method for Sand Equivalent Value of Fine Aggregate
D 3744	CTM 229	Test Method for Coarse and Fine Durability Index
C 40	CTM 213	Test Method for Organic Impurities in Fine Aggregate
	CTM 227	Test Method for Cleanness Value of Coarse Aggregate
C 117	CTM 202	Test Method for Material Finer Than No. 200 Sieve in Mineral
C 142		Test Method for Clay Lumps and Friable Particles in Aggregates
C 123		Test Method for Lightweight Particles in Aggregate
C 88		Test Method for Soundness of Aggregates by Use of Magnesium Sulfate
	CTM 214	Test Method for Potential Alkali Silica Reactivity of Aggregate
	CTM 212	Test Method for Density (Unit Weight)
C 136		Test Method for Fineness Modulus of Fine Aggregate

San Emidio Aggregate
October 1, 2024
SMARA No. 91-15-0041

San Emidio 1-1/2" Concrete Aggregate

The 1-1/2" Con Aggregate supplied by Vulcan Materials Company conforms to the requirements of CalTrans Standards Specification Section 90 and ASTM Specification C 33. The Aggregate is produced at the San Emidio Quarry, Bakersfield, California, SMARA No. 91-15-0041. Concrete aggregate from this location has been used in concrete around Bakersfield by a multitude of suppliers, with no known incidence of alkali reactivity or cement incompatibility. The typical physical properties of this aggregate are as follows:

Gradation:		Percent Passing		
		Operating	CalTrans	ASTM
Sieve Size	**1" x No.4**	**Range**	**Sect. 90**	**C33**
50.0 mm (2")	100	100	100	100
37.5 mm (1-1/2")	98	88 - 100	85 - 100	90 - 100
25.0 mm (1")	67 (41)	23 - 59	X ± 25	20 - 55
19.0 mm (3/4")	43	0 - 17	0 - 20	0 - 15
12.5 mm (1/2")	16		-	-
9.50 mm (3/8")	6	0 - 7	0 - 9	0 - 5
75 µm (#200), C117	0.1 (X-value)		-	0 - 1
Specific Gravity				
Specific Gravity, Dry	2.639	-	-	
Specific Gravity, S.S.D	2.662	-	-	
Specific Gravity, Apparent	2.7	-	-	
Density, Unit Weight, C 29	91	-	-	
Absorption, %, C 127	0.85	-	-	
Cleanness Value, CT 227	89	75 min.		
Durability, Di , CT 229	85			
Clay & Friables, C 142	0		2.0% max	
Lt. Wt. Particles, %, C 123	0		0.5% max	
Abrasion Loss, A-500, C 131	33	45% max	50% max	
Sodium Soundness, %, C 88	1.8	10% max	12% max	
Organic Impurities, %, CT 213	Clear	< No.11	Free of Injurious	
Alkali Reactivity				
ASTM C1260	Innocuous			
Days of Exposure to NaOH Solution	14 Days			
Average Expansion	0.1	0.15% max		

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

San Emidio Quarry

Aaron Godfrey
Quality Control Manager, Central Cal
Vulcan Materials Company

These data have been developed on the basis of information and test of materials submitted to this laboratory which are assumed to be representative of the materials to be used. All test have been made in compliance with the current ASTM or applicable methods of testing.

San Emidio Aggregate
October 1, 2024
SMARA No. 91-15-0041

San Emidio 1"xNo.4 Concrete Aggregate

The 1"x No.4 Con Aggregate supplied by Vulcan Materials Company conforms to the requirements of CalTrans Standards Specification Section 90 and ASTM Specification C 33. The Aggregate is produced at the San Emidio Quarry, Bakersfield, California, SMARA No. 91-15-0041. Concrete aggregate from this location has been used in concrete around Bakersfield by a multitude of suppliers, with no known incidence of alkali reactivity or cement incompatibility. The typical physical properties of this aggregate are as follows:

Gradation:		Percent Passing		
		Operating	CalTrans	ASTM
Sieve Size	**1" x No.4**	**Range**	**Sect. 90**	**C33**
37.5 mm (1-1/2")	100	100	100	100
25.0 mm (1")	99	88 - 100	86 - 100	95 - 100
19.0 mm (3/4")	84 (85)	70 - 100	X ± 22	-
12.5 mm (1/2")	31		-	25 - 60
9.50 mm (3/8")	10 (18)	3 - 33	X ± 22	-
4.75 mm (#4)	3	0 - 16	0 - 16	0 - 10
2.36 mm (#8)	2	0 - 6	0 - 6	0 - 5
75 µm (#200), C117	0.1		-	0 - 1
	(X-value)			
Specific Gravity				
Specific Gravity, Dry	2.616	-	-	
Specific Gravity, S.S.D	2.646	-	-	
Specific Gravity, Apparent	2.698	-	-	
Density, Unit Weight, C 29	90	-	-	
Absorption, %, C 127	1.2	-	-	
Cleanness Value, CT 227	89	75 min.		
Durability, Dc , CT 229	74			
Clay & Friables, C 142	0		2.0% max	
Lt. Wt. Particles, %, C 123	0.01		0.5% max	
Abrasion Loss, B-500, C 131	29	45% max	50% max	
Sodium Soundness, %, C 88	1.2	10% max	12% max	
Alkali Reactivity				
ASTM C1260	Innocuous			
Days of Exposure to NaOH Solution	14 Days			
Average Expansion	0.09	0.15% max		

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

San Emidio Quarry

Aaron Godfrey
Quality Control Manager, Central Cal
Vulcan Materials Company

These data have been developed on the basis of information and test of materials submitted to this laboratory which are assumed to be representative of the materials to be used. All test have been made in compliance with the current ASTM or applicable methods of testing.

San Emidio Aggregate
October 1, 2024
SMARA No. 91-15-0041

San Emidio 1/2" Concerte Aggregate

The 1/2" Con Aggregate supplied by Vulcan Materials Company conforms to the requirements of CalTrans Standards Specification Section 90 and ASTM Specification C 33. The Aggregate is produced at the San Emidio Quarry, Bakersfield, California, SMARA No. 91-15-0041. Concrete aggregate from this location has been used in concrete around Bakersfield by a multitude of suppliers, with no known incidence of alkali reactivity or cement incompatibility. The typical physical properties of this aggregate are as follows:

Gradation:		Percent Passing	
		VMC	CalTrans
Sieve Size	**1" x No.4**	**Spec**	**Sect. 90**
19.0 mm (3/4")	100	100	100
12.5 mm (1/2")	70	61 - 71	80 - 100
9.50 mm (3/8")	19	12 - 22	X ± 22
4.75 mm (#4)	5	0 - 8	0 - 18
2.36 mm (#8)	3	0 - 5	0 - 7
75 µm (#200), C117	1	-	-
	(X-value)		
Specific Gravity			
Specific Gravity, Dry	2.617	-	-
Specific Gravity, S.S.D	2.652	-	-
Specific Gravity, Apparent	2.71	-	-
Density, Unit Weight, C 29	96	-	-
Absorption, %, C 127	1.3	-	-
Cleanness Value, CT 227	81	75 min.	
Durability, Dc , CT 229	85		
Clay & Friables, C 142	0		2.0% max
Lt. Wt. Particles, %, C 123	0.1		0.5% max
Abrasion Loss, C-500, C 131	30	45% max	50% max
Sodium Soundness, %, C 88	4.5	10% max	12% max
Alkali Reactivity			
ASTM C1260	Innocuous		
Days of Exposure to NaOH Solution	14 Days		
Average Expansion	0.1	0.15% max	

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

San Emidio Quarry

Aaron Godfrey
Quality Control Manager, Central Cal
Vulcan Materials Company

These data have been developed on the basis of information and test of materials submitted to this laboratory which are assumed to be representative of the materials to be used. All test have been made in compliance with the current ASTM or applicable methods of testing.

San Emidio Aggregate
October 1, 2024
SMARA No. 91-15-0041

San Emidio 3/8" Concrete Aggregate

The 3/8" Con Aggregate supplied by Vulcan Materials Company conforms to the requirements of CalTrans Standards Specification Section 90 and ASTM Specification C 33. The Aggregate is produced at the San Emidio Quarry, Bakersfield, California, SMARA No. 91-15-0041. Concrete aggregate from this location has been used in concrete around Bakersfield by a multitude of suppliers, with no known incidence of alkali reactivity or cement incompatibility. The typical physical properties of this aggregate are as follows:

Gradation:		Percent Passing		
		Operating	CalTrans	ASTM
Sieve Size	**1" x No.4**	**Range**	**Sect. 90**	**C33**
12.5 mm (1/2")	100	100	-	100
9.50 mm (3/8")	89 (85)	70 - 100	X ± 20	85 - 100
4.75 mm (#4)	18	0 - 25	0 - 28	10 - 30
2.36 mm (#8)	3	0 - 6	0 - 7	0 - 10
1.18 mm (#16)	1	-	-	0 - 5
75 µm (#200), C117	0.5	-	-	-
	(X-value)			
Specific Gravity				
Specific Gravity, Dry	2.617	-		-
Specific Gravity, S.S.D	2.652	-		-
Specific Gravity, Apparent	2.712	-		-
Density, Unit Weight, C 29	92	-		-
Absorption, %, C 127	1.4	-		-
Cleanness Value, CT 227	85	75 min.		
Durability, Dc , CT 229	76			
Clay & Friables, C 142	0.1			2.0% max
Lt. Wt. Particles, %, C 123	0			0.5% max
Abrasion Loss, C-500, C 131	29	45% max		50% max
Sodium Soundness, %, C 88	6.5	10% max		12% max
Alkali Reactivity				
ASTM C1260	Innocuous			
Days of Exposure to NaOH Solution	14 Days			
Average Expansion	0.11	0.15% max		

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

San Emidio Quarry

Aaron Godfrey
Quality Control Manager, Central Cal
Vulcan Materials Company

These data have been developed on the basis of information and test of materials submitted to this laboratory which are assumed to be representative of the materials to be used. All test have been made in compliance with the current ASTM or applicable methods of testing.

San Emidio Aggregate
October 1, 2024
SMARA No. 91-15-0041

San Emidio Washed Concrete Sand Aggregate

The Washed Con Sand Aggregate supplied by Vulcan Materials Company conforms to the requirements of CalTrans Standards Specification Section 90 and ASTM Specification C 33. The Aggregate is produced at the San Emidio Quarry, Bakersfield, California, SMARA No. 91-15-0041. Concrete aggregate from this location has been used in concrete around Bakersfield by a multitude of suppliers, with no known incidence of alkali reactivity or cement incompatibility. The typical physical properties of this aggregate are as follows:

Gradation:			Percent Passing		
			Operating	CalTrans	ASTM
Sieve Size	**1" x No.4**		**Range**	**Sect. 90**	**C33**
9.5 mm (3/8")	100		100		100
4.75 mm (#4)	99		95 - 100		95 - 100
2.36 mm (#8)	88		65 - 95		80 - 100
1.18 mm (#16)	65	(64)	54 - 74	54 - 74	50 - 85
0.6 mm (#30)	42	(42)	33 - 51	33 - 51	25 - 60
0.3 mm (#50)	20	(22)	16 - 28	16 - 28	5 - 30
0.15 mm (#100)	7		2 - 12		0 - 10
75 µm (#200)	3.53		0 - 8		
	(X-value)				
Specific Gravity					
Specific Gravity, Dry	2.616		-	-	
Specific Gravity, S.S.D	2.647		-	-	
Specific Gravity, Apparent	2.698		-	-	
Density, Unit Weight, C 29	102		-	-	
Absorption, %, C 127	1.1		-	-	
Fineness Modulus	2.79		-	2.3 - 3.1	
Sand Equivalent, CT 217	83		75 min.		
Durability, Dc , CT 229	76				
Clay & Friables, C 142	0			3% max	
Lt. Wt. Particles, %, C 123	0.01			0.5% max	
Abrasion Loss, D-500, C 131	39		45% max	50% max	
Sodium Soundness, %, C 88	7.6		10% max	12% max	
Alkali Reactivity					
ASTM C1260	Innocuous				
Days of Exposure to NaOH Solution	14 Days				
Average Expansion	0.09		0.15% max		

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

San Emidio Quarry

Aaron Godfrey
Quality Control Manager, Central Cal
Vulcan Materials Company

These data have been developed on the basis of information and test of materials submitted to this laboratory which are assumed to be representative of the materials to be used. All test have been made in compliance with the current ASTM or applicable methods of testing.

STORM

VINYLTECH SEWER PIPE
TECHNICAL DATA SUBMITTAL

VINYLTECH VT PVC • PIPE

CONFORMANCE
These specifications designate the requirements for manufacturing and installing Vinyltech PVC sewer pipe.
ASTM D3034 - Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM F679 - Standard Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
ASTM D3212 - Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
ASTM D2152 - Standard Test Method for Extruded Poly (Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion
ASTM D2444 - Standard Test Method for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of Tup (Falling Weight)
ASTM D2321 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and other Gravity-Flow Applications
ASTM D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
IAPMO (File No. 2128) - Uniform Plumbing Code (UPC) - Vinyltech sewer pipe is IAPMO listed for ASTM D3034 SDR 35 4-15 inch and SDR 26 4-12 inch.

PIPE COMPOUND
The pipe shall be extruded from compounds meeting the requirements of Cell Classification 12454, as defined in ASTM D1784, Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.

PIPE
Vinyltech pipe shall be manufactured in accordance with ASTM D3034 and ASTM F679.

GASKET JOINT
The gasket shall be reinforced with a steel ring and meet the requirements of ASTM F477. Vinyltech pipe shall have an integral bell end with a locked-in factory installed gasket and shall meet the requirements of ASTM D3212.

MARKING
The pipe shall be marked in accordance with ASTM D3034 and F679.

QUALITY CONTROL
Requirements for manufacturing and testing are conducted in strict accordance with ASTM specifications and are outlined in ASTM D3034 and F679.

INSTALLATION
Recommended installation procedures of Vinyltech Corporation are outlined in ASTM D2321, Underground Installation of Flexible Thermoplastic Sewer Pipe.

ASSEMBLING THE PIPE
Assembling of PVC Sewer Pipe is easily accomplished by hand or by using a bar and block. A depth of entry mark serves as a visual check for rapid, accurate joint inspection. **Do not over insert.**

1) Remove any mud, sand, or other foreign matter from the belled and spigot ends of the pipe. Carefully clean the gasket area.
2) With a clean applicator (a brush or hand) lubricate the entire surface of the pipe from the spigot end to the depth of entry mark and the contact surface of the gasket with **Vinyltech Brand Lubricant.**
3) Brace the bell to avoid disturbing the already installed joints. Align the pipe, insert the spigot into the bell and push.
4) **Do not insert past the entry mark line.**

ASTM INTERNATIONAL

IAPMO

SEWER PIPE

VINYLTECH VT PVC • PIPE
201 S. 61st Avenue • Phoenix, AZ 85043
602 233-0071 • 602 272-4847 Fax • www.vtpipe.com
a varistar company

Effective 03/14

VINYLTECH VT PVC • PIPE

GRAVITY SEWER MAIN

TECHNICAL DATA SUBMITTAL

SEWER PIPE

ASTM D3034 SDR 35/PS 46 PVC SEWER PIPE

NOMINAL SIZE (IN)	(mm)	OUTER DIAMETER (IN)	MINIMUM WALL	14' LENGTH WEIGHT (LB/100')	20' LENGTH WEIGHT (LB/100')
4	(100)	4.215	0.120	105.7	104.2
6	(150)	6.275	0.180	232.6	229.0
8	(200)	8.400	0.240	417.8	410.3
10	(250)	10.500	0.300	657.4	643.9
12	(300)	12.500	0.360	944.1	922.7
15	(375)	15.300	0.437	1390.0	1361.0

ASTM D3034 SDR 26/PS 115 PVC SEWER PIPE

NOMINAL SIZE (IN)	(mm)	OUTER DIAMETER (IN)	MINIMUM WALL	14' LENGTH WEIGHT (LB/100')
4	(100)	4.215	0.162	150.0
6	(150)	6.275	0.241	320.0
8	(200)	8.400	0.323	580.0
10	(250)	10.500	0.404	900.0
12	(300)	12.500	0.481	1300.0
15	(375)	15.300	0.588	2000.0

ASTM F679 PS 46 PVC SEWER PIPE

NOMINAL SIZE (IN)	(mm)	OUTER DIAMETER (IN)	MINIMUM WALL	14' LENGTH LB/100'
18	(475)	18.701	0.499	2115.0
* 21	(560)	22.047	0.588	2962.0
* 24	(630)	24.803	0.661	3740.0

ASTM F679 PS 115 PVC SEWER PIPE

NOMINAL SIZE (IN)	(mm)	OUTER DIAMETER (IN)	MINIMUM WALL	14' LENGTH LB/100'
18	(475)	18.701	0.671	2790.0
* 21	(560)	22.047	0.791	3940.0
* 24	(630)	24.803	0.889	4980.0

* Northern Pipe Products

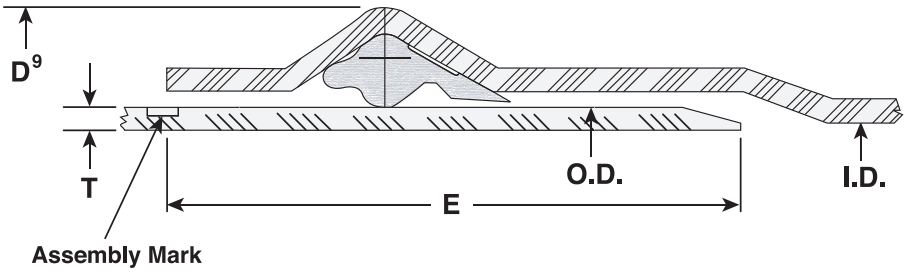
VINYLTECH VT PVC • PIPE
201 S. 61st Avenue • Phoenix, AZ 85043
602 233-0071 • 602 272-4847 Fax • www.vtpipe.com
a varistar company

JM Eagle *Building essentials for a better tomorrow™*

GRAVITY SEWER

SUBMITTAL AND DATA SHEET

PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	MIN. E (IN)	APPROX. D (IN)	APPROX. WEIGHT (LBS/FT)
SDR 35 (PS46) ASTM D3034						
4	4.215	3.975	0.120	3.50	4.695	1.05
6	6.275	5.915	0.180	4.25	6.995	2.36
8	8.400	7.920	0.240	4.75	9.360	4.24
10	10.500	9.900	0.300	6.00	11.700	6.64
12	12.500	11.780	0.360	6.25	13.940	9.50
15	15.300	14.426	0.437	7.25	17.048	14.19
SDR 26 (PS115) ASTM D3034						
4	4.215	3.891	0.162	3.50	4.863	1.40
6	6.275	5.793	0.241	4.25	7.239	3.11
8	8.400	7.754	0.323	4.75	9.692	5.63
10	10.500	9.692	0.404	6.00	12.116	8.84
12	12.500	11.538	0.481	6.25	14.424	12.56
15	15.300	14.124	0.588	7.25	17.652	18.90
PS46, ASTM F679						
18	18.701	17.629	0.499	8.00	20.845	21.43
21	22.047	20.783	0.588	9.50	24.575	29.88
24	24.803	23.381	0.661	9.60	27.647	38.96
27	27.953	26.351	0.745	10.10	31.157	49.47
30 CIOD	32.000	30.194	0.853	16.75	35.612	64.18
36 CIOD	38.300	36.042	1.021	19.02	42.816	93.00
42 CIOD	44.500	41.948	1.187	22.43	49.604	—
48 CIOD	50.800	47.888	1.355	24.78	56.624	—
PS115, ASTM F679						
18	18.701	17.261	0.671	8.00	21.581	28.49
21	22.047	20.349	0.791	9.50	25.443	—
24	24.803	22.891	0.889	9.60	28.627	—
27	27.953	25.799	1.002	10.10	32.261	—
30 CIOD	32.000	29.070	1.148	16.75	36.348	—
36 CIOD	38.300	35.464	1.373	19.02	45.438	—
42 CIOD	44.500	41.072	1.596	22.43	51.356	—
48 CIOD	50.800	46.886	1.822	24.78	58.628	—



I.D. : Inside Dameter
O.D. : Outside Diameter
T. : Wall Thickness
D^9 : Bell Outside Diameter
E : Distance between Assembly Mark to the end of spigot.

Product Standard:	ASTM 3034 (4”–15”)
	ASTM F679 (18”–48”)
Pipe Compound:	ASTM D1784 Cells Class 12454 or 12364
Gasket:	ASTM F477
Integral Bell Joint:	ASTM D3212
Pipe Stiffness:	ASTM D2412 F/ΔY = 46 PSI or 115 PSI
Pipe Length:	14 or 20 feet laying length
Installation:	ASTM D 2321
	JM Eagle™ Installation Guide

Sani-21™: PVC Sewer Pipe
SPECIFICATION DATA

Sani-21™
SANITARY SEWER PIPE FOR THE 21st CENTURY

D3034 & F679
SEWER SPECIFICATION DATA

Diamond gravity sewer pipe 4 inches through 60 inches shall be made of compounds conforming to material requirements of ASTM D3034 and ASTM F679 in accordance with ASTM D1784. Diamond PVC Sewer Pipe meets all the dimensional, chemical, and physical requirements as outlined in ASTM D3034 and ASTM F679. A listing to CSA B182.2 is available for most of these sizes. A complete listing by manufacturing plant is available upon request.

The pipe sizes 4 inches through 60 inches are made with an integral bell "water-tight" joint that meets the requirements of ASTM D3212 and that utilizes a Rieber gasket system for sealing that meets the requirements of ASTM F477.

Each male end shall be beveled to facilitate joining and referencing marked for proper insertion depth. Diamond furnished lubricant is to be used in the joining process.

Physical Properties of ASTM D3034 & F679

Pipe Materials:
Pipe shall be made of PVC plastic having a minimum cell classification of 12454 or 12364 as defined in Specification D1784.

Property	**ASTM Test**	**Minimum** 12454/12364
Specific Gravity	D792	1.40/1.40
Tensile Strength, psi	D638	7,000/6,000
Tensile Modulus, psi	D638	400,000/500,000
IZOD Impact Strength,	D256	.65ft., lb./in.

SHORT FORM **Specification for Diamond PVC Solid-Wall Sewer Pipe SDR 26 or SDR 35 or PS 46 or PS 115**
All PVC Solid-Wall Sewer PIpe shall be made of compounds conforming to ASTM D1784 manufactured in accordance with the material requirements of ASTM D3034 or ASTM F679. All PVC Sewer Pipe must meet dimensional, chemical, and physical requirements as outlined in ASTM D3034 orASTM F679. Joints shall meet the requirements of ASTM D3212 and shall be formed using Rieber Technology.
PVC Sewer Pipe shall be installed according to the requirements of ASTM D2321, Uni-Bell's Uni-Pub 6 and the manufacturer's recommendations.

DIAMOND PLASTICS® CORPORATION

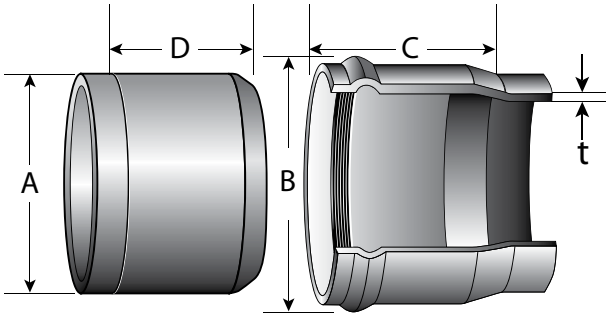
Corporate Headquarters • 1212 Johnstown Road • P.O. Box 1608 • Grand Island, NE 68802-1608

Sani-21™: PVC Sewer Pipe

SPECIFICATION DATA

Sani 21™
SANITARY SEWER PIPE FOR THE 21st CENTURY

Rieber Joint Illustration



Sani-21 is supplied in 14 foot and 22 foot laying lengths.

Sani-21™ D3034 & F679 SEWER SPECIFICATION DATA

Nominal Pipe Size in. (mm)	Outside Diameter A Inches	Bell Socket Diameter B Inches	Socket Depth C Inches	Insert Mark D Inches #	Wall Thickness SDR26/PS115 (t) Inches	Wall Thickness SDR35/PS46 (t) Inches
D-3034 Pipe Dimensions						
4″ (100)	4.215	5-1/4	4-5/8″	4″	0.162	0.120
6″ (150)	6.275	7-1/2	4-3/4″	4-1/8″	0.241	0.180
8″ (200)	8.400	9-7/8	6-1/8″	4-7/8″	0.323	0.240
10″ (250)	10.500	12-3/8	6-3/4″	5-1/4″	0.404	0.300
12″ (300)	12.500	14-5/8	7-1/4″	5-1/2″	0.481	0.360
15″ (375)	15.300	18	7-1/4″	4-5/8″	0.588	0.437
F-679 Pipe Dimensions						
18″ (450)	18.701	21-3/4″	9-1/2″	7-3/4″	0.671	0.499
21″ (525)	22.047	25-1/2″	10″	8-1/2″	0.795	0.588
24″ (600)	24.803	28-3/4″	11″	10″	0.889	0.661
27″ (675)	27.953	32-1/2″	13-1/4″	11-1/8″	1.002	0.745
30″ ciod (750)	32.000	37-1/4″	14″	13-5/8″	1.148	0.853
36″ ciod (900)	38.300	43-1/4″	15″	13-7/8″	1.373	1.021
42″ ciod (1050)	44.500	53″	18″	16-3/4″	1.596	1.187
48″ ciod (1200)	50.800	60″	18″	16-7/8″		1.355
54″ ciod (1350)	57.560	67″	*	*	2.227	1.641
60″ ciod (1500)	61.610	72″	*	*	2.384	1.756

*Contact manufacturer for specific information.

#Tolerance of +/- 1/4" allowed

Prices are subject to a firm policy of "Price in effect at time of shipment on regular purchases"

DIAMOND PLASTICS® CORPORATION

Rev 12/2013

Corporate Headquarters • 1212 Johnstown Road • P.O. Box 1608 • Grand Island, NE 68802-1608

North American Pipe Corporation™

ASTM D3034: *Gasketed Integral Bell PVC Pipe*

Municipal

Gravity Sewer & Storm Water

North American Pipe Corporation's ASTM D3034 Gasketed Integral Bell PVC Pipe product line is manufactured to meet the needs of modern municipal waste water systems, storm water drainage systems, and other non-pressure applications. With top quality raw materials and modern processing technology, our ASTM D3034 pipe meets all industry standards in addition to our own rigorous quality control requirements.

Our D3034 pipe utilizes Rieber style gaskets throughout the entire product offering to create a leak-free joint.

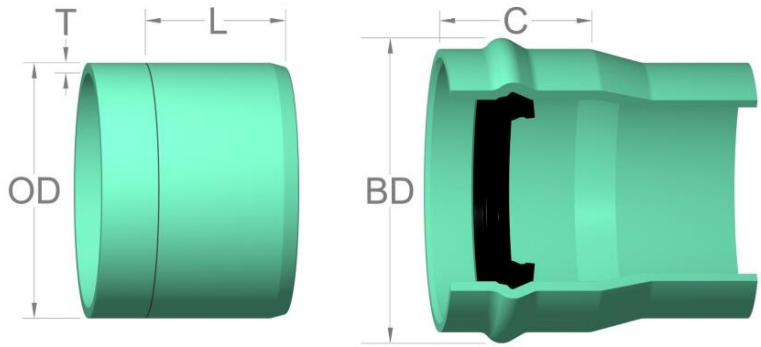
Whether specifying or installing our pipe, you can be assured that North American Pipe will provide the pipe "Right, On Time, All the Time".

Pipe Standard:	ASTM D3034
Diameter Standard:	PSM
Nominal Sizes:	4", 6", 8", 10", 12", 15"
Dimension Ratios & Pipe Stiffness:	SDR 35 – 46 psi ~~SDR 26 – 115 psi~~ ~~SDR 23.5 – 153 psi~~
Lay Length:	14' or 20'
Color:	Green
Pipe Compound:	ASTM D1784 Cell Class 12454
Pipe Joint Std.:	ASTM D3212
Gasket Standard:	ASTM F477
Gasket Material Offerings:	Styrene-Butadiene Rubber
Certifications:	IAPMO Uniform Plumbing Code*
Installation Std.:	ASTM D2321

** IAPMO Uniform Plumbing Code listed products must be requested at time of order.*

North American Pipe Corporation™

ASTM D3034: *Gasketed Integral Bell PVC Pipe*



NOMINAL PIPE SIZE	OUTSIDE DIAMETER (OD)	*APPROX. BELL DIAMETER (BD)	APPROX. BELL DEPTH (C)	INSERTION MARK (L)
4”	4.215	5.000	3.750	3.125
6”	6.275	7.375	4.625	4.000
8”	8.400	9.625	5.250	4.125
10”	10.500	12.250	5.875	5.125
12”	12.500	14.375	6.500	5.375
15”	15.300	17.500	7.750	7.375

NOMINAL PIPE SIZE	MINIMUM WALL THICKNESS (T)		
	PS 46 SDR 35	PS 115 SDR 26	PS 153 SDR 23.5
4”	.120	.162	**
6”	.180	.241	.265
8”	.240	.323	---
10”	.300	.404	---
12”	.360	.481	---
15”	.437	.588	---

Notes:

1. These dimensions are for estimating purposes only. All dimension are in inches.
2. SDR = Standard Dimension Ratio
3. PS = Pipe Stiffness (psi). This is a property that defines the pipe’s ability to resist external loading.
4. * Dimension given for Approx. Bell Diameter (BD) is for highest pipe stiffness.
5. ** Consult our Customer Service or Sales Department for availability.

SDR35 D 3034 / PS46 F 679 FITTING SPECIFICATIONS

1.0 **GPK PVC Sewer Fittings** shall be manufactured in accordance with either ASTM D 3034, F1336 or F 679. The PVC material shall have a minimum cell classification of 12454, 13343 or 12364 as defined in ASTM D 1784.

2.0 The **purpose** of GPK in-line fittings is to convey municipal sanitary and industrial wastes, storm water runoff and many other related applications. They are designed to be used in gravity flow and low pressure applications not to exceed 10.8 psi. (74.5 kPa).

3.0 **Injection Molded Fittings** are produced in sizes 4" (100mm) through 12" (300mm) diameter. **Fabricated Fittings** are produced in sizes 4" (100mm) through 36" (973mm) diameter. A fabricated fitting is considered any fitting made from pipe or a combination of pipe and molded components.

4.0 **Chemical Resistance** GPK fittings resist attack from certain alcohols, alkalies, salt solutions, acids and other types of chemicals. Refer to chemical resistant chart for suitability.

5.0 **Marking.** GPK fittings shall be marked with applicable size, "PVC", company name or logo, PSM and the ASTM specification number (D 3034, F 1336 or F679). The fittings and/or packaging shall include the manufacturer's date and shIft code.

6.0 **Testing.** A test after installation of either low pressure air (Uni-B-6) or a water infiltration-exfiltration test is recommended.

7.0 **Deflection Test.** The maximum allowable pipe fitting deflection should be 7 ½% of base ID as shown in table X1.1 of D 3034, and X2.1 of F 679.

8.0 **Backfilling and Tamping.** Backfilling should follow closely after assembly of pipe and fittings.

8.1 **Backfilling.** with proper material is important to achieve desired density in haunching area which enables pipe, fitting and soil to work together to meet designed load requirements. This eliminates excess deflection and shear breaks due to heavy loads. Approved material shall be used properly, compacted continuously above and around the pipe and fittings as well as between fitting and trench wall. A cushion of approved material up to a minimum of 12" (305mm) over the fittings and between the trench walls shall be applied in accordance with the engineers' specifications.

8.2 **Tamping.** This shall be done by hand tamping of the embedment material between the trench wall of the service line fitting and riser connection. Tamping can also be done by mechanical tampers or by using water to consolidate the embedment material. **Extreme unstable ground conditions** may require wider trenches to enable you to compact a larger area around the pipe and fittings to the density consistent of the original ground surface conditions.

9.0 **Service Lines.** Normally, service lines from the property line to the collection sewer should be a minimum depth of 3 feet (1 meter) at the property line and should be laid in straight alignment and uniform slope of not less than ¼" per foot (20.8mm/meter) for 4" (100mm) nominal pipe and 1/8" (10.4mm/meter) per foot for 6" (150mm) pipe. Where collection sewers are deeper than 7 feet (2 meters) a vertical standpipe or stack is permitted but not recommended, consult the project engineer for proper installation details. Deep sewer chimney and risers necessitate extreme care during backfilling. Where surface loading is anticipated the final backfill must be compacted to a density compatible with those surface loads to be encountered.

9.1 **Backfilling around pipe service laterals on slope.** Extra attention should be given on slopes to prevent the newly backfilled trench from becoming a "French Drain". Before backfilling completely there is a tendency for ground and surface water to follow the direction of the looser soil. This flow may wash out soil from under or around pipe and branch line fittings, reducing or eliminating the support needed. To avoid this problem the backfilling should be of greater compaction. Tamping should be done in 4" (100mm) layers and continued in this manner all the way up to the ground or surface line of the trench. Concrete collars or other concrete poured around the fitting to stabilize unwanted movement is recommended to prevent water from undercutting the underside of the pipe and fittings.

Summary: Due to various ground conditions and different situations, installation techniques vary widely. We warranty our products to be free of manufacturer's defects. We will not replace the products that are installed or used incorrectly. The design of the systems that our product is used in is a factor that cannot be overlooked.

GPK FITTING SUBMITTAL SHEET

Intro: GPK manufactures PVC sewer fittings in accordance with either ASTM D 3034, F 1336 or F 679 to be used in gravity flow or low pressure applications. Injection molded fittings are produced in sizes 4" (100mm) through 12" (300mm) diameter. Fabricated fittings are produced in sizes 4" (100mm) through 36" (973mm) diameter.

Material: Fabricated fittings are manufactured from PVC pipe and molded components meeting the requirements of either ASTM D 3034, F 1336 or F 679 for workmanship, extrusion quality, stiffness, impact resistance, dimensions and structural performance.

Extruded pipe components are made from PVC material with a minimum cell classification of 12454, 13343 or 12364 as defined in ASTM D1784.

Injection molded fittings are made from PVC material with a minimum cell classification of 12454 or 13343 as defined in ASTM D 1784.

Extrusion Quality: Extruded components are tested in accordance with and meet the requirements of ASTM D 2152 for properly fused PVC.

Impact Resistance: Extruded Components are tested in accordance with ASTM D 2444 using a 20 lb (9.07kg). Tup A and a Flat Plate Holder B. The strength shall equal or exceed the values shown below:

4" – 5" 150 Ft-Lbs (100mm – 125mm 203 J)	6" – 8" 210 Ft-Lbs (150mm – 200mm 284 J)	10" – 36" 220 Ft-Lbs (250mm – 973mm 299 J)

Impact Resistance: Injection molded fittings are tested in accordance with ASTM D 2444 using a 20 lb (9.07kg). Tup A and a Flat Plate Holder B. The strength shall equal or exceed the values shown below:

4" 50 Ft-Lbs (100mm 68 J)	6" – 8" 75 Ft-Lbs (150mm – 200mm 102 J)	10" – 12" 90 Ft-Lbs (250mm – 300mm 122 J)

Pipe Stiffness: Extruded Components are tested in accordance with ASTM D 2412. The stiffness equals or exceeds the requirements of ASTM D 3034 and F 679.

Pipe Flattening: Extruded components are flattened as described in ASTM D 3034 and F 679 until the distance between the plates is 40% of the outside diameter of the pipe. There shall be no splitting, cracking or breaking.

Pressure/Pressure Deflection: Gasketed joints are tested in accordance with ASTM D 3212.
Pressure: 10 minutes @ 10.8 psi (74.5 kPa) + 10 minutes deflected @ 10.8 psi (74.5 kPa).
Vacuum: 10 minutes @ 22 in. Hg (74 kPa) + 10 minutes deflected @ 22 in. Hg (74kPa).

Branch Bending: The chemically fused areas around the fabricated branches of tee, wye and tee-wye fittings are tested to ASTM F 1336 to verify their strength and integrity.

Pipe Stop Support: Tee and tee-wye fittings are tested to requirements of ASTM F 1336 for pipe stop load support. No cracking or splitting shall occur and pipe spigot shall not protrude into waterway of the fitting.

Joining Methods: Chemically Fused Solvent Weld Joints
Solvent cement is handled and tested in accordance with ASTM D 2564 and D 2855. The Lap Shear Strength shall equal or exceed 900 psi (6205 kPa) @ 72 hours.

Heat Fusion Welded Joints (Butt Fusion Welds)

Elastomeric Seals (Gaskets)
Must meet all requirements of ASTM F 477 and D 3212.

Saddles: Injection Molded saddle tees and saddle wyes shall have skirts with a minimum of 80 square inches (516 square cm) surface area which can be bonded to pipe.

Fabricated saddle tees and saddle wyes shall have skirts with a minimum of 160 square inches (1032 square cm) surface area which can be bonded to pipe.

The worm drive saddle straps used to fasten the saddles are manufactured with corrosion resistant 300 series AISI stainless steel.

GPK does not recommend gasket skirts where air tests are required.

Epoxy Reinforced Welds.

G-Series Gasketed SDR 35 Sewer Fittings

The G series fitting line is a fully-integrated SDR 35 fitting design using reinforced branches and intersections to enhance the structural integrity of the installation and provide long- lasting performance.

Short Form Specifications

G-Series 4" through 12" injection molded gasketed SDR 35 sewer fittings shall be manufactured in accordance with ASTM D3034, ASTM F1336, and CSA B182.2. They shall be injection molded from virgin PVC compound having a cell classification of 12454 or 13343 in accordance with, and certified by the National Sanitation Foundation (NSF), to meet ASTM D1784. Gaskets shall be manufactured in accordance with ASTM F477 or ASTM F913. Gaskets shall be firmly seated in fitting in order to ensure proper installation and to prevent dislocation or misalignment during system assembly. Gasket joints must comply with ASTM D3212 Internal Pressure Test (ex-filtration) and Vacuum Test (infiltration) at 5 degrees of gasket joint deflection and top load deflection.

Where available, reducing branches on injection molded 8", 10", and 12" tees, wyes, and tee-wyes shall be minimum SDR 18 wall thickness in the reducing branch body and reducing branch hub area below the gasket race.

Certification

Our Gasketed SDR 35 Sewer fittings are third party tested and listed by NSF, UPC and CSA to meet specifications defined in ASTM D3034, ASTM F1336 and CSA B182.2, where applicable.

ROYAL® Building Products
An Axiall Company

ConSeal™ CS-102

Butyl Rubber Sealant

Butyl Rubber Sealant for All Precast Concrete Structures - Meets ASTM C-990

Applications

For concrete joints in: Manholes, Concrete Pipe, Vaults, Box Culverts, Septic Tanks, and Vertical Panel Structures. **Not intended for use in expansion joints or joints that move.**

Sealing Properties

- Provides permanently flexible watertight joints.
- Low to high temperature workability: 30°F to 120°F (-1°C to +48°C)
- Rugged service temperature: -30°F to +200°F (-34°C to +93°C)
- Excellent chemical and mechanical adhesion to clean dry surfaces.
- Greater cohesive and adhesive strengths.
- Sealed joints will not shrink, harden or oxidize upon aging.
- Controlled flow resistance for application ease.
- No priming normally necessary. When confronted with difficult installation conditions, such as wet concrete or temperatures below 40°F (4°C), priming the concrete will improve the bonding action. Consult Concrete Sealants for the proper primer to meet your application.

Hydrostatic Strength

ConSeal CS-102 meets the hydrostatic performance requirement as set forth in ASTM C-990 section 10.1 (Performance requirement: 10psi for 10 minutes in straight alignment – in plant, quality control test for joint materials.)

Specifications

ConSeal CS-102 meets or exceeds all of the requirements of Federal Specification SS-S-210 (210-A), AASHTO M-198B, and ASTM C-990-91.

Physical Properties

Description

	Spec	Required	CS-102
Color			Black
Specific Gravity, 77°F	ASTM D71	1.15-1.50	1.25
Ductility, 77°F	ASTM D113	5.0 min.	10
Penetration, cone 77°F (25°C), 150 gm, 5 sec.	ASTM D217	50-100 mm	55-60 mm
Penetration, cone 32°F (0°C), 150 gm, 5 sec.	ASTM D217	40 mm min.	40-65 mm
Flash Point, C.O.C., °F	ASTM D92	350°F min.	450°F
Fire Point, C.O.C., °F	ASTM D92	375°F min.	475°F

Don't Just Seal It, ConSeal It!

Concrete Sealants, Inc. 9325 State Route 201 ■ Tipp City, OH 45371 ■ P.O. Box 176 ■ New Carlisle, OH 45344
P. 937.845.8776 **F.** 937.845.3587 **Toll Free** 800.332.7325 ■ **www.conseal.com**

ISO 9001 Registered

ConSeal™ CS-102

Butyl Rubber Sealant

Butyl Rubber Sealant for All Precast Concrete Structures - Meets ASTM C-990

Chemical Composition

Description

	Spec	Required	CS-102
Hydrocarbon plastic content % by weight	ASTM D297	50% min.	51%
Inert mineral filler % by weight	AASHTO T111	30% min.	35%
Volatile Mater % by weight	ASTM D6	2% max.	1.2%
Non-extractable, carbon-based material			12.8%
Recycled Content, % by weight			
Post Consumer:			8.41%
Post Industrial:			10.85%

Immersion Testing

30-Day Immersion Testing: No visible deterioration when tested in 5% Caustic Potash, 5% Hydrochloric Acid, 5% Sulfuric Acid, and 5% saturated Hydrogen Sulfide.

One Year Immersion Testing: No visible deterioration when tested in 5% Formaldehyde, 5% Formic Acid, 5% Sulfuric Acid, 5% Hydrochloric Acid, 5% Sodium Hydroxide, 5% Hydrogen Sulfide, and 5% Potassium Hydroxide.

Limited Warranty

This information is presented in good faith, but we cannot anticipate all conditions under which this information and our products, or the products of other manufactures in combination with our products, may be used. We accept no responsibility for results obtained by the application of this information or the safety and suitability of our products, either alone or in combination with other products. Users are advised to make their own tests to determine the safety and suitability of each such product or product combinations for their own purposes. It is the **users' responsibility** to satisfy himself as to the suitability and completeness of such information for this own particular use. We sell this product without warranty, and buyers and users assume all responsibility and liability for loss or damage arising from the handling and use of this product, whether used alone or in combination with other products.

Don't Just Seal It, ConSeal It!

Concrete Sealants, Inc. 9325 State Route 201 ■ Tipp City, OH 45371 ■ P.O. Box 176 ■ New Carlisle, OH 45344
P. 937.845.8776 **F.** 937.845.3587 **Toll Free** 800.332.7325 ■ **www.conseal.com**

ISO 9001 Registered

GOLDEN EMPIRE CONCRETE SALES

1830 South Milliken Ave, Ontario CA 91761

Date Issued: 7/17/2025

Submittal No. 2202

Contractor: TODD COMPANIES

Project: FRANKLIN ELEMENTARY SCHOOL

Location:

Dear Sir/Madam:

We are submitting the following concrete mix design(s) for approval of use for the above referenced project:

Mix Code Number	Description	Intended Use
NC40000	4000 6.00SK 1AGG WR SCI	SITE / MISCEILLANEOUS WORK

LIMITATIONS:

1. The concrete mix designs submitted are in conformance with ACI 301 and ASTM standards and other generally accepted engineering practices. Purchaser agrees to abide by the operational and acceptance standards set forth by those organizations.

2. Prior to delivery it is the responsibility of the purchaser to obtain approval of these mix designs from the necessary authorities. Supplier assumes no responsibility for obtaining or verifying approvals. By ordering, the purchaser receipt of all approvals for this or any other mix the purchaser orders for this project.

3. This concrete mixture will produce concrete meeting the design criteria when sampled in accordance with C-94 and ASTM C172. The minimum 28 day compressive strength may not meet project requirements if the slump is not within specificied refernces stated in the approved project speifications.

4. The concrete must be placed, protected, and cured in strict accordance with ACI 318, and the specified references stated in the approved project specifications.

5. Prior to placement, it is the responsibility of the purchases to verify the air content of those mixes requiring entrained air. We as ready mix concrete supplier do not accept liability for concrete that does not meet air entrainment specifications after it has been placed in the forms.

6. We as the ready mix concrete supplier take no responsibilty for concrete performance when the workmanship deviates from the standards and practices stated therein.

7. Finishing of Concrete should be finished per CI 302 recommendations. Hard trowel finishing of air entrained concrete may result in adverse effects up to and including delamination of concrete slabs.

8. Mixes containing SRA maybe prone to delamination when subject to hard trowel finishing techniques.

9. Mix designs containing smaller nominal maximum sizes aggregate are susceptible to shrinkage cracks - i.e., 3/8" as well as 5/50 concrete mix designs.

We appreciate the opportunity to be of service to you. Should you have any questions regarding the information provided, please contact our office.

Respectfully,

Prepared by:
LANCE MATTOS

GOLDEN EMPIRE CONCRETE SALES

1830 South Milliken Ave, Ontario CA 91761

PROJECT INFORMATION

4000 6.00SK 1AGG WR SCE4001

Customer:	TODD COMPANIES	**Concrete Mix No.:**	**NC40000**
Project:	FRANKLIN ELEMENTARY SCHOOL	**Date:**	July 17, 2025
Address:		**Use:**	SITE / MISCEILLANEOUS WORK
Concrete Supplier:	Golden Empire Concrete		
Design Compressive Strength:	4000 psi @ 28 days	**Plant:**	WESTSIDE
W/C + P Ratio:	0.50 5.65 gal/sack	**Slump Range:**	4.00 +/- 1.00
Equivalent Cement Factor:	6.00 sacks/CY	**General Contractor:**	

CONCRETE MIX PROPORTIONS

Note: All aggregate weights are saturated surface dry (SSD) weights and the moisture content of the aggregates at the time of batching must be considered when determining the total water in the mix.

Material		Source	Batch Wts (lb)	Abs. Vol. (cu.ft.)	Spec Grav.
ASTM C-595 1L		NATIONAL	564	2.90	3.08
WATER LBS	34.0 gal	WATER	283.0	4.50	1.00
1 INCH AGGREGATE	46 %	VULCAN / SAN EMIDI	1468	8.90	2.65
3/8 INCH AGGREGATE	12 %	VULCAN / SAN EMIDI	364	2.20	2.63
CONCRETE SAND	42 %	VULCAN / SAN EMIDI	1326	8.00	2.64
EUCON NW WATER REDUCER	4.5 oz/cwt C+P	EUCLID	25.4 oz/cy		
Air Content	1.5 %			0.41	
Plastic Unit Wt:	148.3 pcf	**Material Totals:**	4004.4 lbs.	27.00	cu.ft.

PROPOSED AGGREGATE GRADATIONS

	1 1/2 in. (37.5 mm)	1 in. (25 mm)	3/4 in. (19 mm)	1/2 in. (12.5 mm)	3/8 in. (9.5 mm)	No. 4 (4.75 mm)	No. 8 (2.36 mm)	No. 16 (1.18 mm)	No. 30 (0.6 mm)	No. 50 (0.3 mm)	No. 100 (0.15 mm)	No. 200 (0.075 mm)	FM
INVAGG1	100	99	84	31	10	3	2	0	0	0	0	0	7.01
INVAGG3/8				100	89	18	3	1	0	0	0	0	5.89
INVSAND					100	99	88	65	42	20	7	4	2.79
Comb. Grad.	100	100	93	68	57	45	38	27	18	8	3	2	5.11

Mix Notes:

Lance Mattos

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Tristan Fox	Report Date:	4/14/2023
Project Name:	Chick-Fil-A No. 4799	Project Number:	2-622-1363
Structure Placed:	Slab on Grade	Sample Set ID:	22245
Area of Placement:	Trash Enclosure Apron		

Date Sampled:	3/17/2023	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	9:45 AM	Slump:	4½"	Ticket Number:	207292305
Date Sample Received:	3/20/2023	Concrete Temperature:	65°F	Mix Number:	NC40000
Sampled By:	Y. Saleh	Ambient Temperature:	60°F	Air Content:	
Delivered By:	D. Perera	Environmental Conditions:	Cloudy	Unit Weight (pcf):	

Date Tested	Sample Age in Days	Diameter (in.)	Area (in.^{2})	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
3/24/2023	7	4.00	12.57	37,420	**2,980**		5	D. Perera
4/14/2023	28	4.00	12.57	54,570	**4,340**	4,000	3	D. Perera
4/14/2023	28	4.00	12.57	53,460	**4,250**		5	D. Perera
4/14/2023	28	4.00	12.57	53,760	**4,280**		3	D. Perera
	HOLD							

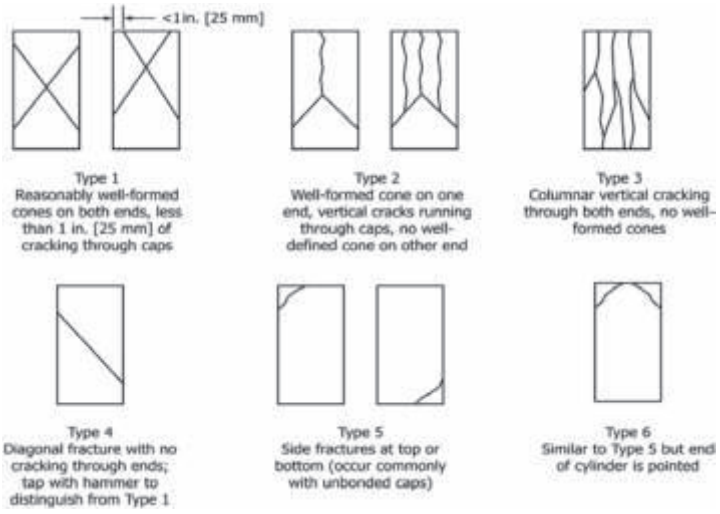
Average 28 Day Compressive Strength, psi: **4,290**

Condition of Sample: Undisturbed

Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

- Bonded Cap (ASTM C617) ☐
- Unbonded Cap (ASTM C1231) ☑
- Air Content, Volumetric Method (ASTM C173) ☐
- Air Content, Pressure Method (ASTM C231) ☐
- Density, Yield and Air Content of Concrete (ASTM C138) ☐
- Sampling Freshly Mixed Concrete (ASTM C172)
- Slump of Hydraulic-Cement Concrete (ASTM C143)
- Temperature of Freshly Mixed Concrete (ASTM C1064)
- Making and Curing Test Specimens (ASTM C31)
- Compressive Strength of Concrete Specimens (ASTM C39)



Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Makkawi Builders	Report Date:	1/19/2023
Project Name:	ARCO Gas Station & Convenience Store	Project Number:	2-622-1042
Structure Placed:	SOG/Footings	Sample Set ID:	22224
Area of Placement:	South West Side		

Date Sampled:	12/22/2022	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	6:30 AM	Slump:	5 ½"	Ticket Number:	208153591
Date Sample Received:	12/23/2022	Concrete Temperature:	55°F	Mix Number:	NC40000
Sampled By:	D. Perera	Ambient Temperature:	35°F	Air Content:	N/A
Delivered By:	D. Perera	Environmental Conditions:	Cold, Gloomy	Unit Weight (pcf):	N/A

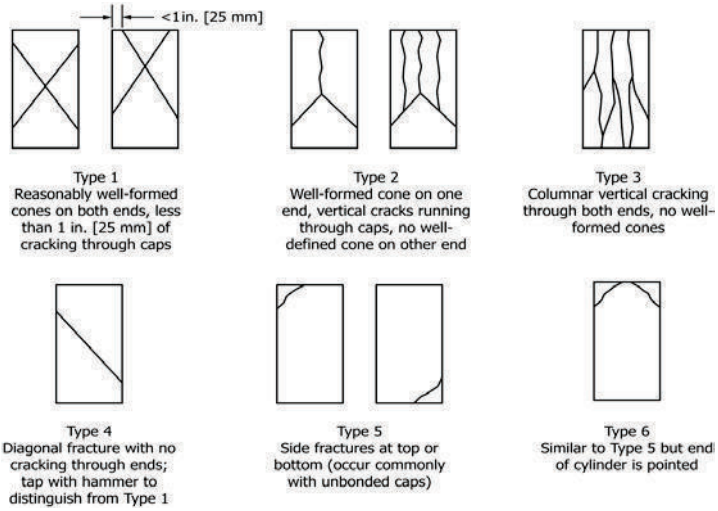
Date Tested	Sample Age in Days	Diameter (in.)	Area ($in.^2$)	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
12/29/2022	7	4.00	12.57	38,310	**3,050**		1	A. Dalqamouni
1/19/2023	28	4.00	12.57	60,200	**4,790**	4,000	5	D. Perera
1/19/2023	28	4.00	12.57	60,750	**4,830**		3	D. Perera
1/19/2023	28	4.00	12.57	63,550	**5,060**		2	D. Perera
	HOLD							
				Average 28 Day Compressive Strength, psi:	**4,890**			

Condition of Sample: Undisturbed

Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

Bonded Cap (ASTM C617) ☐
Unbonded Cap (ASTM C1231) ☑
Air Content, Volumetric Method (ASTM C173) ☐
Air Content, Pressure Method (ASTM C231) ☐
Density, Yield and Air Content of Concrete (ASTM C138) ☐
Sampling Freshly Mixed Concrete (ASTM C172)
Slump of Hydraulic-Cement Concrete (ASTM C143)
Temperature of Freshly Mixed Concrete (ASTM C1064)
Making and Curing Test Specimens (ASTM C31)
Compressive Strength of Concrete Specimens (ASTM C39)



Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Tristan Fox	Report Date:	4/11/2023
Project Name:	Chick-Fil-A No. 4799	Project Number:	2-622-1363
Structure Placed:	Slab on Grade / Footings	Sample Set ID:	22244
Area of Placement:	Trash Enclosure - North East half		

Date Sampled:	3/14/2023	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	8:00 AM	Slump:	4"	Ticket Number:	207292219
Date Sample Received:	3/15/2023	Concrete Temperature:	66°F	Mix Number:	NC40000
Sampled By:	D. Perera	Ambient Temperature:	60°F	Air Content:	
Delivered By:	D. Perera	Environmental Conditions:	Drizzle	Unit Weight (pcf):	

Date Tested	Sample Age in Days	Diameter (in.)	Area ($in.^2$)	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
3/21/2023	7	4.00	12.57	39,380	**3,130**		5	D. Perera
4/11/2023	28	4.00	12.57	54,200	**4,310**	4,000	5	D. Perera
4/11/2023	28	4.00	12.57	53,260	**4,240**		3	D. Perera
4/11/2023	28	4.00	12.57	54,280	**4,320**		5	D. Perera
	HOLD							

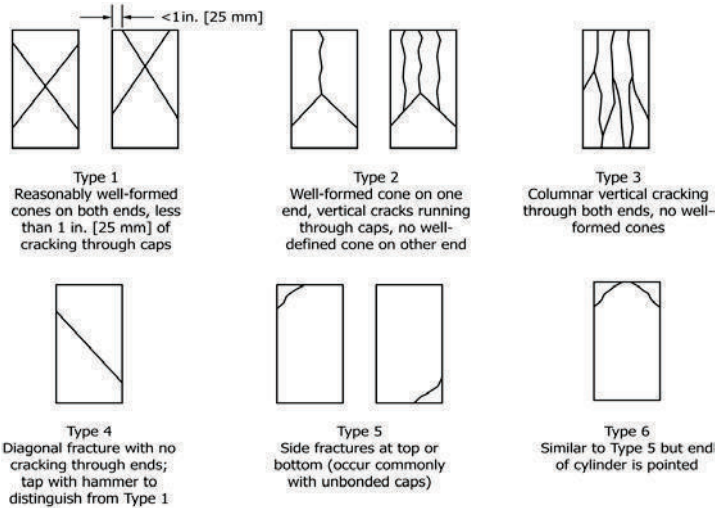
Average 28 Day Compressive Strength, psi: **4,290**

Condition of Sample: Undisturbed

Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

- Bonded Cap (ASTM C617) ☐
- Unbonded Cap (ASTM C1231) ☑
- Air Content, Volumetric Method (ASTM C173) ☐
- Air Content, Pressure Method (ASTM C231) ☐
- Density, Yield and Air Content of Concrete (ASTM C138) ☐
- Sampling Freshly Mixed Concrete (ASTM C172)
- Slump of Hydraulic-Cement Concrete (ASTM C143)
- Temperature of Freshly Mixed Concrete (ASTM C1064)
- Making and Curing Test Specimens (ASTM C31)
- Compressive Strength of Concrete Specimens (ASTM C39)



Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Tristan Fox	Report Date:	3/10/2023
Project Name:	Chick-Fil-A No. 4799	Project Number:	2-622-1363
Structure Placed:	SOG / Footings	Sample Set ID:	22235
Area of Placement:	Footings -East Side		

Date Sampled:	2/10/2023	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	5:30 AM	Slump:	4"	Ticket Number:	207290729
Date Sample Received:	2/13/2023	Concrete Temperature:	62°F	Mix Number:	NC40000
Sampled By:	D. Perera	Ambient Temperature:	39°F	Air Content:	
Delivered By:	D. Perera	Environmental Conditions:	Foggy	Unit Weight (pcf):	

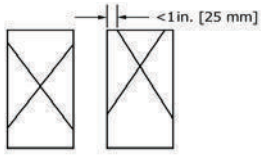
Date Tested	Sample Age in Days	Diameter (in.)	Area ($in.^2$)	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
2/17/2023	7	4.00	12.57	45,610	**3,630**		2	D. Perera
3/10/2023	28	4.00	12.57	60,760	**4,840**	4,000	2	D. Perera
3/10/2023	28	4.00	12.57	64,000	**5,090**		2	D. Perera
3/10/2023	28	4.00	12.57	60,700	**4,830**		5	D. Perera
	HOLD							
				Average 28 Day Compressive Strength, psi:	**4,920**			

Condition of Sample: Undisturbed

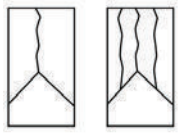
Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

Bonded Cap (ASTM C617) ☐
Unbonded Cap (ASTM C1231) ☑
Air Content, Volumetric Method (ASTM C173) ☐
Air Content, Pressure Method (ASTM C231) ☐
Density, Yield and Air Content of Concrete (ASTM C138) ☐
Sampling Freshly Mixed Concrete (ASTM C172)
Slump of Hydraulic-Cement Concrete (ASTM C143)
Temperature of Freshly Mixed Concrete (ASTM C1064)
Making and Curing Test Specimens (ASTM C31)
Compressive Strength of Concrete Specimens (ASTM C39)

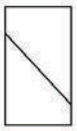


Type 1
Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps

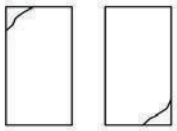


Type 2
Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end

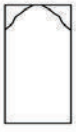
Type 3
Columnar vertical cracking through both ends, no well-formed cones



Type 4
Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1



Type 5
Side fractures at top or bottom (occur commonly with unbonded caps)



Type 6
Similar to Type 5 but end of cylinder is pointed

Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Tristan Fox	Report Date:	3/10/2023
Project Name:	Chick-Fil-A No. 4799	Project Number:	2-622-1363
Structure Placed:	SOG / Footings	Sample Set ID:	22236
Area of Placement:	Slab -South Side		

Date Sampled:	2/10/2023	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	6:50 AM	Slump:	4½"	Ticket Number:	207290739
Date Sample Received:	2/13/2023	Concrete Temperature:	66°F	Mix Number:	NC40000
Sampled By:	D. Perera	Ambient Temperature:	40°F	Air Content:	
Delivered By:	D. Perera	Environmental Conditions:	Foggy	Unit Weight (pcf):	

Date Tested	Sample Age in Days	Diameter (in.)	Area ($in.^2$)	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
2/17/2023	7	4.00	12.57	43,460	**3,460**		3	D. Perera
3/10/2023	28	4.00	12.57	54,370	**4,330**	4,000	5	D. Perera
3/10/2023	28	4.00	12.57	55,720	**4,430**		2	D. Perera
3/10/2023	28	4.00	12.57	55,060	**4,380**		5	D. Perera
	HOLD							

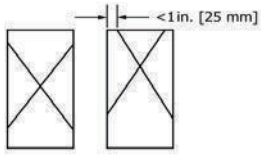
Average 28 Day Compressive Strength, psi: **4,380**

Condition of Sample: Undisturbed

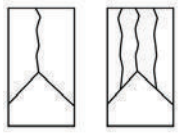
Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

Bonded Cap (ASTM C617) ☐
Unbonded Cap (ASTM C1231) ☑
Air Content, Volumetric Method (ASTM C173) ☐
Air Content, Pressure Method (ASTM C231) ☐
Density, Yield and Air Content of Concrete (ASTM C138) ☐
Sampling Freshly Mixed Concrete (ASTM C172)
Slump of Hydraulic-Cement Concrete (ASTM C143)
Temperature of Freshly Mixed Concrete (ASTM C1064)
Making and Curing Test Specimens (ASTM C31)
Compressive Strength of Concrete Specimens (ASTM C39)

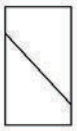


Type 1
Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps

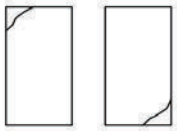


Type 2
Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end

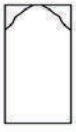
Type 3
Columnar vertical cracking through both ends, no well-formed cones



Type 4
Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1



Type 5
Side fractures at top or bottom (occur commonly with unbonded caps)



Type 6
Similar to Type 5 but end of cylinder is pointed

Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Tristan Fox	Report Date:	3/14/2023
Project Name:	Chick-Fil-A No. 4799	Project Number:	2-622-1363
Structure Placed:	Canopy & Trash Enclosure Footings	Sample Set ID:	22237
Area of Placement:	Canopy Footings		

Date Sampled:	2/14/2023	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	7:15 AM	Slump:	5½"	Ticket Number:	207290876
Date Sample Received:	2/15/2023	Concrete Temperature:	60°F	Mix Number:	NC40000
Sampled By:	D. Perera	Ambient Temperature:	48°F	Air Content:	
Delivered By:	D. Perera	Environmental Conditions:	Clear	Unit Weight (pcf):	

Date Tested	Sample Age in Days	Diameter (in.)	Area ($in.^2$)	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
2/21/2023	7	4.00	12.57	41,130	**3,270**		3	D. Perera
3/14/2023	28	4.00	12.57	56,220	**4,470**	4,000	5	D. Perera
3/14/2023	28	4.00	12.57	55,420	**4,410**		5	D. Perera
3/14/2023	28	4.00	12.57	59,020	**4,700**		2	D. Perera
	HOLD							

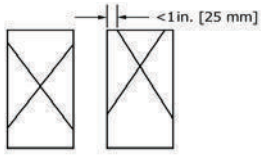
Average 28 Day Compressive Strength, psi: **4,530**

Condition of Sample: Undisturbed

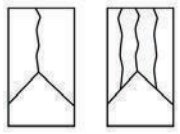
Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

Bonded Cap (ASTM C617) ☐
Unbonded Cap (ASTM C1231) ☑
Air Content, Volumetric Method (ASTM C173) ☐
Air Content, Pressure Method (ASTM C231) ☐
Density, Yield and Air Content of Concrete (ASTM C138) ☐
Sampling Freshly Mixed Concrete (ASTM C172)
Slump of Hydraulic-Cement Concrete (ASTM C143)
Temperature of Freshly Mixed Concrete (ASTM C1064)
Making and Curing Test Specimens (ASTM C31)
Compressive Strength of Concrete Specimens (ASTM C39)

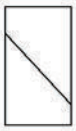


Type 1
Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps

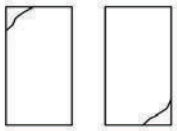


Type 2
Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end

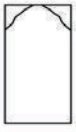
Type 3
Columnar vertical cracking through both ends, no well-formed cones



Type 4
Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1



Type 5
Side fractures at top or bottom (occur commonly with unbonded caps)



Type 6
Similar to Type 5 but end of cylinder is pointed

Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

NATIONAL CEMENT

National Cement Company of California, Inc.

LEBEC Plant

MILL TEST REPORT

We certify that the below described Hydraulic Blended Cement, at the time of shipment and Manufactured Production of December 2024 meets the Chemical and Physical requirements of Blended Hydraulic Cements as per ASTM C595/C595M and AASTHO M240.

Chemical Specifications and Analysis

ASTM (C114)	ASTM C595/C595M TYPE IL	Actual Analysis	
SiO2	NA	20.40	%
Al2O3	NA	4.06	%
Fe2O3	NA	3.76	%
CaO	NA	63.37	%
MgO	NA	1.94	%
SO3	3.0 max *	3.1	% *
Loss	10.0 max	5.0	%
Insoluble	NA	1.09	%
Na2O	NA	0.05	%
K2O	NA	0.08	%
Eq.Alkalies	NA	0.55	%
Free CaO	NA	1.10	%
Cl	NA	0.006	%
%CO2	NA	3.8	%
% Limestone	15.0% max	9.5	%
%CaCO3 in LS	70% min	98.1	%

* Meets ASTM C595, Table 1, Option B

* It is permissible to exceed the values in the table for SO3 content, provided it has been demonstrated by Test Method C1038 that the cement with the increased SO3 will not develop expansion exceeding 0.020 % at 14 days.

Physical Specifications and Analysis

	ASTM C595/C595M TYPE IL	Actual Analysis
Air content of mortar (%volume) (C185)	12 max	7
Blaine, Sq.cm/gm (C204)	NR	4840
Fineness (M-325) (C430)	NR	98.6
Autoclave Exp. % (C215)	NR	0.002
Time of Setting:		
Vicat (A),Initial (C191)	45 min	165
Vicat (A),Final (C191)	NR	288
Gilmore, Initial (C266)	NR	160
Gilmore, Final (C266)	NR	288
C-1038 Mortar bar exp.(%)	0.02 max	0.005
(1) Sulfate Resistance (C1012/C1012M)	0.05 max	0.02
Per ASTM C595, Table 3, Special Properties HS-High Sulfate Resistance		
Compressive Strength: (C109/C109M)		
1 day (Psi)	NR	2270
3 days (Psi)	1890 min	3870
7 days (Psi)	2900 min	4770
28 days (Psi)	3620 min	6000

NA = Not Applicable

NR = No Requirement

(1) Sulfate Resistance Historical Data

This Cement Meets Or Exceeds The Following Described Specifications

ASTM: C595/C595M-24, TYPE IL(10) - HS Blended Portland

AASTHO: 240M Standard Specifications for Blended Hydraulic Cement

Main Office:

15821 Ventura Blvd.
Suite 475
Encino, Ca. 91436-2935
(818) 788-4228

NATIONAL CEMENT COMPANY OF CALIFORNIA

By: 

QUALITY CONTROL MANAGER

1/9/25

WATER REDUCERS

Master Format #: 03 30 00 03 40 00 03 70 00

EUCON™ NW

WATER REDUCING ADMIXTURE

EUCLID CHEMICAL

PRODUCT INFORMATION

PACKAGING

Packaged in bulk, 275 gal (1041 L) totes, 55 gal (208 L) drums and 5 gal (18.9 L) pails

SHELF LIFE

1 year in original, unopened container

SPECIFICATIONS/COMPLIANCES

ASTM C494, Type A & D

AASHTO M194

DESCRIPTION

EUCON NW is a water reducing, normal set admixture made from a concentrated solution of refined lignosulfonate, polymer and other water reducing and plasticizing chemicals. EUCON NW provides a more plastic and cohesive mix in fresh concrete and better durability, reduced shrinkage and less permeability in the hardened concrete. EUCON NW contains no added chlorides or chemicals known to promote the corrosion of steel.

PRODUCT CHARACTERISTICS

FEATURES & BENEFITS

- Improves finishability and workability
- Reduces segregation
- Improves setting times
- Increases durability
- Increases strength
- Reduces permeability
- Improves finished appearance
- Reduces cracking

PRIMARY APPLICATIONS

- Flatwork concrete
- Ready mix concrete
- Lightweight concrete
- Hot weather concrete
- Precast / Prestressed concrete

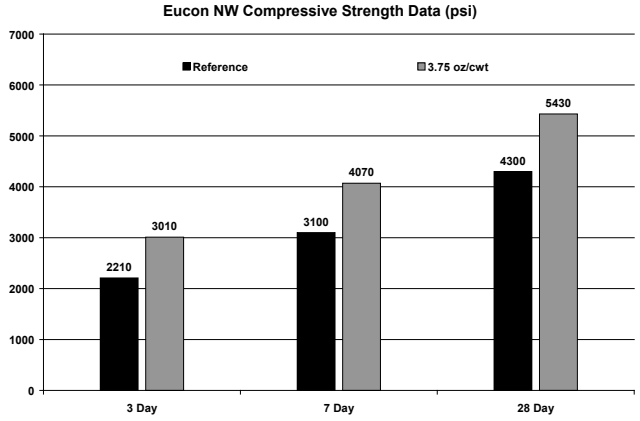
PRECAUTIONS/LIMITATIONS

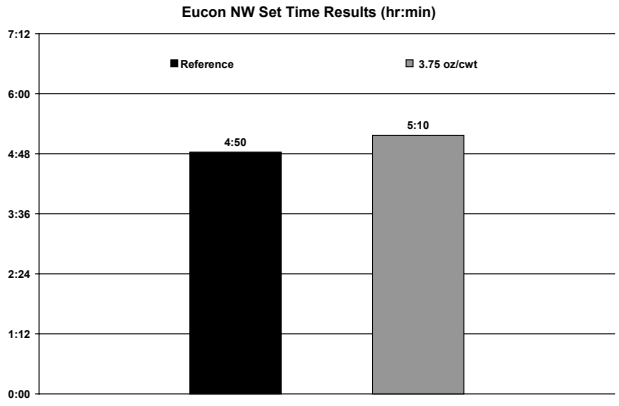
- Care should be taken to maintain EUCON NW above freezing; however, freezing and subsequent thawing will not harm the material if thoroughly agitated. Do not agitate with air or an air lance.
- Add to mix independent of other admixtures.
- In all cases, consult the Safety Data Sheet before use.

TECHNICAL INFORMATION

PERFORMANCE DATA

The following test results were achieved using typical ASTM C494 mix design requirements, 517 lb/yd^3 (307 kg/m^3) cement content and similar (± 0.5)% air content. These results were obtained under laboratory conditions with materials and mix designs meeting the specifications of ASTM C494. Changes in materials and mix designs can affect the dosage response.





DIRECTIONS FOR USE

EUCON NW is typically used at dosages of 2-6 oz/100 lbs (130-390 mL/100 kg) of cementitious material. Higher dosages are acceptable with prior testing and confirmation of the desired performance with specific materials being used.

EUCON NW has been tested per ASTM C494 at a Type A dosage of 3.5 oz/100 lbs (230mL/100 kg) of cementitious materials and at 6 oz/100 lbs (390 mL/100 kg) of cementious materials for Type B and D requirements.

EUCON NW should be added to the initial batch water of the concrete mixture. Do not dispense onto dry cement. Because of variations in job conditions and concrete materials, dosages other than the recommended amounts may be required. In such cases, contact your local Euclid sales representative.

National Ready Mixed Concrete Association

Certificate of Conformance for Concrete Production Facilities

THIS IS TO CERTIFY THAT

Gosford Plant 5207, Bakersfield, CA

Golden Empire

has been inspected by the undersigned licensed professional engineer for conformance with the requirements of the Checklist for Ready Mixed Concrete Production Facilities. As of the inspection date, the facility meets the requirements for production by

Truck Mixing with Automatic Batching and Recordings of Cementitious Materials, Aggregate, Water, and Chemical Admixtures

(Seal)

Signature of Licensed Professional Engineer

November 15, 2024	*November 29, 2026*
Inspection Date	Expiration Date

This company will maintain this facility in compliance with the checklist requirements and promptly correct any deficiencies that develop.

Justin Cook Vice President Operations

Signature of Company Official & Title

NOTICE: The checklist verifies that the plant facilities are deemed satisfactory for concrete production when operated correctly. However, compliance of the concrete with specification requirements must be confirmed through standard inspection methods and sales agreements.

This certificate is issued by the National Ready Mixed Concrete Association (NRMCA) to confirm that the production facility complies with the requirements outlined in Section 3 of the NRMCA Quality Control Manual for Ready Mixed Concrete Production Facilities. *Unauthorized reproduction or misuse of this certificate may result in legal action.*

Plant ID #: 802773

Certification ID #: 33123

12/10/2024 1:21:09 PM

Vulcan Materials Company

October 1, 2024

Subject: Annual Testing of Concrete Aggregates (ASTM C33)
Vulcan Materials Company
16101 Hwy 166
Bakersfield, Ca 93311
SMARA # 91-15-0041

To Whom it may concern,

Submitted herewith are the laboratory test results for the San Emidio Concrete Aggregates. The various test were performed in accordance with the listed ASTM and Caltrans test methods. The samples tested conform to the requirements listed in ASTM C33 and Caltrans Standard Specification for concrete aggregates.

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

Respectfully
Vulcan Materials Company

Aaron Godfrey
Technical Services Manager
Central California

San Emidio Aggregates
October 1, 2024
SMARA No. 91-15-0041

Scope of Services

Designation		
ASTM	**Caltrans**	
C 136	CTM 202	Test Method for Sieve Analysis of Coarse and Fine Aggregate
C 127	CTM 206	Test Method for Specific Gravity and Absorption of Coarse Aggregate
C 128	CTM 207	Test Method for Specific Gravity and Absorption of Fine Aggregate
C 131	CTM 211	Test Method for Los Angles Abrasion of Coarse Aggregate
D 2419	CTM 217	Test Method for Sand Equivalent Value of Fine Aggregate
D 3744	CTM 229	Test Method for Coarse and Fine Durability Index
C 40	CTM 213	Test Method for Organic Impurities in Fine Aggregate
	CTM 227	Test Method for Cleanness Value of Coarse Aggregate
C 117	CTM 202	Test Method for Material Finer Than No. 200 Sieve in Mineral
C 142		Test Method for Clay Lumps and Friable Particles in Aggregates
C 123		Test Method for Lightweight Particles in Aggregate
C 88		Test Method for Soundness of Aggregates by Use of Magnesium Sulfate
	CTM 214	Test Method for Potential Alkali Silica Reactivity of Aggregate
	CTM 212	Test Method for Density (Unit Weight)
C 136		Test Method for Fineness Modulus of Fine Aggregate

San Emidio Aggregate
October 1, 2024
SMARA No. 91-15-0041

San Emidio 1-1/2" Concrete Aggregate

The 1-1/2" Con Aggregate supplied by Vulcan Materials Company conforms to the requirements of CalTrans Standards Specification Section 90 and ASTM Specification C 33. The Aggregate is produced at the San Emidio Quarry, Bakersfield, California, SMARA No. 91-15-0041. Concrete aggregate from this location has been used in concrete around Bakersfield by a multitude of suppliers, with no known incidence of alkali reactivity or cement incompatibility. The typical physical properties of this aggregate are as follows:

Gradation:		Percent Passing		
		Operating	CalTrans	ASTM
Sieve Size	**1" x No.4**	**Range**	**Sect. 90**	**C33**
50.0 mm (2")	100	100	100	100
37.5 mm (1-1/2")	98	88 - 100	85 - 100	90 - 100
25.0 mm (1")	67 (41)	23 - 59	X ± 25	20 - 55
19.0 mm (3/4")	43	0 - 17	0 - 20	0 - 15
12.5 mm (1/2")	16		-	-
9.50 mm (3/8")	6	0 - 7	0 - 9	0 - 5
75 µm (#200), C117	0.1 (X-value)		-	0 - 1
Specific Gravity				
Specific Gravity, Dry	2.639	-	-	
Specific Gravity, S.S.D	2.662	-	-	
Specific Gravity, Apparent	2.7	-	-	
Density, Unit Weight, C 29	91	-	-	
Absorption, %, C 127	0.85	-	-	
Cleanness Value, CT 227	89	75 min.		
Durability, Di , CT 229	85			
Clay & Friables, C 142	0		2.0% max	
Lt. Wt. Particles, %, C 123	0		0.5% max	
Abrasion Loss, A-500, C 131	33	45% max	50% max	
Sodium Soundness, %, C 88	1.8	10% max	12% max	
Organic Impurities, %, CT 213	Clear	< No.11	Free of Injurious	
Alkali Reactivity				
ASTM C1260	Innocuous			
Days of Exposure to NaOH Solution	14 Days			
Average Expansion	0.1	0.15% max		

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

San Emidio Quarry

Aaron Godfrey
Quality Control Manager, Central Cal
Vulcan Materials Company

These data have been developed on the basis of information and test of materials submitted to this laboratory which are assumed to be representative of the materials to be used. All test have been made in compliance with the current ASTM or applicable methods of testing.

San Emidio Aggregate
October 1, 2024
SMARA No. 91-15-0041

San Emidio 1"xNo.4 Concrete Aggregate

The 1"x No.4 Con Aggregate supplied by Vulcan Materials Company conforms to the requirements of CalTrans Standards Specification Section 90 and ASTM Specification C 33. The Aggregate is produced at the San Emidio Quarry, Bakersfield, California, SMARA No. 91-15-0041. Concrete aggregate from this location has been used in concrete around Bakersfield by a multitude of suppliers, with no known incidence of alkali reactivity or cement incompatibility. The typical physical properties of this aggregate are as follows:

Gradation:		Percent Passing		
		Operating	CalTrans	ASTM
Sieve Size	**1" x No.4**	**Range**	**Sect. 90**	**C33**
37.5 mm (1-1/2")	100	100	100	100
25.0 mm (1")	99	88 - 100	86 - 100	95 - 100
19.0 mm (3/4")	84 (85)	70 - 100	X ± 22	-
12.5 mm (1/2")	31		-	25 - 60
9.50 mm (3/8")	10 (18)	3 - 33	X ± 22	-
4.75 mm (#4)	3	0 - 16	0 - 16	0 - 10
2.36 mm (#8)	2	0 - 6	0 - 6	0 - 5
75 µm (#200), C117	0.1		-	0 - 1
	(X-value)			
Specific Gravity				
Specific Gravity, Dry	2.616	-	-	
Specific Gravity, S.S.D	2.646	-	-	
Specific Gravity, Apparent	2.698	-	-	
Density, Unit Weight, C 29	90	-	-	
Absorption, %, C 127	1.2	-	-	
Cleanness Value, CT 227	89	75 min.		
Durability, Dc , CT 229	74			
Clay & Friables, C 142	0		2.0% max	
Lt. Wt. Particles, %, C 123	0.01		0.5% max	
Abrasion Loss, B-500, C 131	29	45% max	50% max	
Sodium Soundness, %, C 88	1.2	10% max	12% max	
Alkali Reactivity				
ASTM C1260	Innocuous			
Days of Exposure to NaOH Solution	14 Days			
Average Expansion	0.09	0.15% max		

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

San Emidio Quarry

Aaron Godfrey
Quality Control Manager, Central Cal
Vulcan Materials Company

These data have been developed on the basis of information and test of materials submitted to this laboratory which are assumed to be representative of the materials to be used. All test have been made in compliance with the current ASTM or applicable methods of testing.

San Emidio Aggregate
October 1, 2024
SMARA No. 91-15-0041

San Emidio 1/2" Concerte Aggregate

The 1/2" Con Aggregate supplied by Vulcan Materials Company conforms to the requirements of CalTrans Standards Specification Section 90 and ASTM Specification C 33. The Aggregate is produced at the San Emidio Quarry, Bakersfield, California, SMARA No. 91-15-0041. Concrete aggregate from this location has been used in concrete around Bakersfield by a multitude of suppliers, with no known incidence of alkali reactivity or cement incompatibility. The typical physical properties of this aggregate are as follows:

Gradation:		Percent Passing	
		VMC	CalTrans
Sieve Size	**1" x No.4**	**Spec**	**Sect. 90**
19.0 mm (3/4")	100	100	100
12.5 mm (1/2")	70	61 - 71	80 - 100
9.50 mm (3/8")	19	12 - 22	X ± 22
4.75 mm (#4)	5	0 - 8	0 - 18
2.36 mm (#8)	3	0 - 5	0 - 7
75 µm (#200), C117	1	-	-
	(X-value)		
Specific Gravity			
Specific Gravity, Dry	2.617	-	-
Specific Gravity, S.S.D	2.652	-	-
Specific Gravity, Apparent	2.71	-	-
Density, Unit Weight, C 29	96	-	-
Absorption, %, C 127	1.3	-	-
Cleanness Value, CT 227	81	75 min.	
Durability, Dc , CT 229	85		
Clay & Friables, C 142	0		2.0% max
Lt. Wt. Particles, %, C 123	0.1		0.5% max
Abrasion Loss, C-500, C 131	30	45% max	50% max
Sodium Soundness, %, C 88	4.5	10% max	12% max
Alkali Reactivity			
ASTM C1260	Innocuous		
Days of Exposure to NaOH Solution	14 Days		
Average Expansion	0.1	0.15% max	

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

San Emidio Quarry

Aaron Godfrey
Quality Control Manager, Central Cal
Vulcan Materials Company

These data have been developed on the basis of information and test of materials submitted to this laboratory which are assumed to be representative of the materials to be used. All test have been made in compliance with the current ASTM or applicable methods of testing.

San Emidio Aggregate
October 1, 2024
SMARA No. 91-15-0041

San Emidio 3/8" Concrete Aggregate

The 3/8" Con Aggregate supplied by Vulcan Materials Company conforms to the requirements of CalTrans Standards Specification Section 90 and ASTM Specification C 33. The Aggregate is produced at the San Emidio Quarry, Bakersfield, California, SMARA No. 91-15-0041. Concrete aggregate from this location has been used in concrete around Bakersfield by a multitude of suppliers, with no known incidence of alkali reactivity or cement incompatibility. The typical physical properties of this aggregate are as follows:

Gradation:		Percent Passing		
		Operating	CalTrans	ASTM
Sieve Size	**1" x No.4**	**Range**	**Sect. 90**	**C33**
12.5 mm (1/2")	100	100	-	100
9.50 mm (3/8")	89 (85)	70 - 100	X ± 20	85 - 100
4.75 mm (#4)	18	0 - 25	0 - 28	10 - 30
2.36 mm (#8)	3	0 - 6	0 - 7	0 - 10
1.18 mm (#16)	1	-	-	0 - 5
75 µm (#200), C117	0.5	-	-	-
	(X-value)			
Specific Gravity				
Specific Gravity, Dry	2.617	-		-
Specific Gravity, S.S.D	2.652	-		-
Specific Gravity, Apparent	2.712	-		-
Density, Unit Weight, C 29	92	-		-
Absorption, %, C 127	1.4	-		-
Cleanness Value, CT 227	85	75 min.		
Durability, Dc , CT 229	76			
Clay & Friables, C 142	0.1			2.0% max
Lt. Wt. Particles, %, C 123	0			0.5% max
Abrasion Loss, C-500, C 131	29	45% max		50% max
Sodium Soundness, %, C 88	6.5	10% max		12% max
Alkali Reactivity				
ASTM C1260	Innocuous			
Days of Exposure to NaOH Solution	14 Days			
Average Expansion	0.11	0.15% max		

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

San Emidio Quarry

Aaron Godfrey
Quality Control Manager, Central Cal
Vulcan Materials Company

These data have been developed on the basis of information and test of materials submitted to this laboratory which are assumed to be representative of the materials to be used. All test have been made in compliance with the current ASTM or applicable methods of testing.

San Emidio Aggregate
October 1, 2024
SMARA No. 91-15-0041

San Emidio Washed Concrete Sand Aggregate

The Washed Con Sand Aggregate supplied by Vulcan Materials Company conforms to the requirements of CalTrans Standards Specification Section 90 and ASTM Specification C 33. The Aggregate is produced at the San Emidio Quarry, Bakersfield, California, SMARA No. 91-15-0041. Concrete aggregate from this location has been used in concrete around Bakersfield by a multitude of suppliers, with no known incidence of alkali reactivity or cement incompatibility. The typical physical properties of this aggregate are as follows:

Gradation:			Percent Passing		
			Operating	CalTrans	ASTM
Sieve Size	**1" x No.4**		**Range**	**Sect. 90**	**C33**
9.5 mm (3/8")	100		100		100
4.75 mm (#4)	99		95 - 100		95 - 100
2.36 mm (#8)	88		65 - 95		80 - 100
1.18 mm (#16)	65	(64)	54 - 74	54 - 74	50 - 85
0.6 mm (#30)	42	(42)	33 - 51	33 - 51	25 - 60
0.3 mm (#50)	20	(22)	16 - 28	16 - 28	5 - 30
0.15 mm (#100)	7		2 - 12		0 - 10
75 µm (#200)	3.53		0 - 8		
	(X-value)				
Specific Gravity					
Specific Gravity, Dry	2.616		-	-	
Specific Gravity, S.S.D	2.647		-	-	
Specific Gravity, Apparent	2.698		-	-	
Density, Unit Weight, C 29	102		-	-	
Absorption, %, C 127	1.1		-	-	
Fineness Modulus	2.79		-	2.3 - 3.1	
Sand Equivalent, CT 217	83		75 min.		
Durability, Dc , CT 229	76				
Clay & Friables, C 142	0			3% max	
Lt. Wt. Particles, %, C 123	0.01			0.5% max	
Abrasion Loss, D-500, C 131	39		45% max	50% max	
Sodium Soundness, %, C 88	7.6		10% max	12% max	
Alkali Reactivity					
ASTM C1260	Innocuous				
Days of Exposure to NaOH Solution	14 Days				
Average Expansion	0.09		0.15% max		

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

San Emidio Quarry

Aaron Godfrey
Quality Control Manager, Central Cal
Vulcan Materials Company

These data have been developed on the basis of information and test of materials submitted to this laboratory which are assumed to be representative of the materials to be used. All test have been made in compliance with the current ASTM or applicable methods of testing.

The Pro's Choice Since 1936

SAKRETE® Type S Mortar/Stucco Mix

SAKRETE® Type-S Mortar is a mixture of sand and masonry cement or sand, lime and portland cement. For laying brick, block and stone. For building or repairing chimneys, walls, planters and outdoor grills. For tuck pointing mortar joints and stuccoing walls. Meets or exceeds ASTM Specification C 1714 when used as directed. Complies with ASTM C 270 for Type-S Mortar. Not to be used as a grout on traffic bearing surfaces.

SAFETY:
READ and UNDERSTAND the Material Safety Data Sheet (MSDS) before using this product. WARNING: Wear protective clothing and equipment. See HMIS block. For emergency information, call CHEMTREC at 800-424-9300 or 703-527-3887 (outside USA). KEEP OUT OF REACH OF CHILDREN.

PREPARATION:
When laying new brick or block walls first construct a sound footing below the frost line. When repairing mortar joints or stucco, remove all loose and foreign material. Dampen areas to be repaired just prior to application.

MIXING:
Empty contents into a mortar box, wheelbarrow or mechanical mixer. When mixing by hand, form a crater for adding water. Add clean water according to the table below or enough to achieve a workable mix. If too stiff, add more water a little at a time. AVOID A SOUPY MIX. Excess water reduces strength and durability and can cause cracking. In cold weather use warm water to accelerate the set. Use cold water to slow the set in hot weather. Re-tempering impairs performance.

40 lb. (18.1 kg)	2.6 qts. (2.5 L)
60 lb. (27.2 kg)	4 qts. (3.8 L)
80 lb. (36.2 kg)	5.3 qts. (5 L)

PLACEMENT:
When laying brick or block, butter the end with mortar before placing into a full bed of mortar. Tap into place while leveling. When tuck pointing mortar joints, place material in the joint with a pointing trowel and compact. Allow the newly placed material to set about 1 hour until the surface is thumb print hard before striking with a jointer tool. When repairing stucco apply the material using a plasterer's hawk and trowel using enough pressure to completely fill and compact the material.

FINISHING:
Dress mortar joints with a joint tool. Texture stucco to match the surrounding area using a plasterer's trowel.

CURING:
In hot weather lightly dampen the material as needed to promote adequate curing. In cold weather adequately cover and keep from freezing for a minimum of 24 hours.

CAN BE PAINTED
Using an alkali resistant lime proof paint usually within 7 days provided the masonry is dry.

STORAGE:
Store material in a tightly closed container off the floor in a dry place.

TECHNICAL DATA:
Exceeds ASTM C 1714 when used as directed.
Complies with ASTM C 270

Compressive Strength	Water Retention
28 day 1800 psi (12 MPa)	75%

For Cultured Stone:
One 40 lb. (18.1 kg) bag will install approximately 5 sq. ft. (0.5 sq. m) of cultured stone. This does not allow for waste.
One 60 lb. (27.2 kg) bag will install approximately 7.5 sq. ft. (0.7 sq. m) of cultured stone. This does not allow for waste.
One 80 lb. (36.2 kg) bag will install approximately 10 sq. ft. (0.9 sq. m) of cultured stone. This does not allow for waste.

For laying brick, block or stone:
One 40 lb. (18.1 kg) bag will lay approximately 8 – 8 inch (200 mm) concrete blocks or 20 standard bricks. This does not allow for waste.

One 60 lb. (27.2 kg) bag will lay approximately 11 – 8 inch (200 mm) concrete block or 30 standard brick. This does not allow for waste.

One 80 lb. (36.2 kg) bag will lay approximately 15 – 8 inch (200 mm) concrete block or 40 standard brick. This does not allow for waste.

As a Stucco:
One 40 lb. (18.1 kg) will cover approximately 35 sq. ft. (3.3 sq. m) at 1/8 inch (3.2 mm) thick. Remember to allow for waste and spillage.

One 60 lb. (27.2 kg) will cover approximately 50 sq. ft. (4.3 sq.m) at 1/8 inch (3.2 mm) thick. Remember to allow for waste and spillage.

One 80 lb. (36.2 kg) will cover approximately 70 sq. ft. (6.4 sq. m.) at 1/8 inch (3.2 mm) thick. Remember to allow for waste and spillage.

REV 7-10

The Pro's Choice Since 1936

SAKRETE® Type S Mortar/Stucco Mix

COVERAGE:
For Cultured Stone:

One 40 lb. (18.1 kg) bag will install approximately 5 sq. ft. (0.5 sq. m) of cultured stone. This does not allow for waste.

One 60 lb. (27.2 kg) bag will install approximately 7.5 sq. ft. (0.7 sq. m) of cultured stone. This does not allow for waste.

PACKAGING:
40 lb. bag (18.1 kg) - UPC: 7-64661-13240-0
60 lb. bag (27.2 kg) - UPC: 7-64661-13160-1
80 lb. bag (36.2 kg) - UPC: 7-64661-13080-2

COLORS:
White and Gray
*Ask about availablitity of additional colors.
Availability varies by region.

ENVIRONMENTAL ADVISORY:
Uncured or crushed cured cement is an environmental hazard, which may adversely affect fish and wildlife. Dispose of construction debris containing cement, including empty bags, at a permitted municipal disposal firm. Do not use crushed concrete as a fill near an aquatic habitat.

WARNING! CAUSES IRRITATION – Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Exposure may result in irritation of the skin, eyes or nasal passages from alkali in portland cement. When wet, contact with the skin or eyes may result in irritation or burns. FIRST AID: In case of eye contact, flush immediately with plenty of water for at least 15 minutes and get prompt medical attention; for skin, wash thoroughly with plenty of soap and water. If irritation persists, get medical attention. WARNING! HARMFUL IF INHALED – Avoid breathing dust. Keep container closed. Use with adequate ventilation. Excessive exposure by inhalation over an extended period of time may result in the development of pulmonary diseases including pneumoconiosis and silicosis. Crystalline Silica has been classified by IARC and NTP as a carcinogen.

The SAKRETE Companies
866-SAKRETE
866-725-7383

REV 7-10

QUIKRETE®
CEMENT & CONCRETE PRODUCTS™

MORTAR MIX

PRODUCT NO. 1102

DIVISION 4

Masonry Mortaring
04 05 13

PRODUCT DESCRIPTION

QUIKRETE® Mortar Mix is a construction grade mortar mix designed for laying brick, concrete masonry units and stone.

PRODUCT USE

QUIKRETE® Mortar Mix is a construction grade mortar mix designed for laying brick, concrete masonry units and stone. QUIKRETE® Mortar Mix is a pre-blended, sanded product. The standard formulation meets ASTM C 270 and C 1714 for Type N mortar.

COLORS

QUIKRETE® Mortar Mix is available in gray and additional colors by special order. Color can also be added to the product as it is mixed by adding QUIKRETE® Stucco and Mortar Color (#1319) to the mixing water. Twenty standard colors are available.

SIZES

- QUIKRETE® Mortar Mix -
  - 60 lb (27.2 kg) bags
  - 80 lb (36.3 kg) bags

YIELD

- Each 80 lb (36.3 kg) bag of QUIKRETE® Mortar Mix will lay up to 37 standard bricks or 13 standard (8" x 8" x 16" [200 x 200 x 400 mm]) blocks.

TECHNICAL DATA

APPLICABLE STANDARDS

ASTM International

- ASTM C 270 Specification for Mortar for Unit Masonry
- ASTM C 387 Specification for Packaged, Dry, Combined Materials for Mortar and Concrete
- ASTM C 1714 Specification for Preblended Dry Mortar Mix for Unit Masonry

PHYSICAL/CHEMICAL PROPERTIES

QUIKRETE® Mortar Mix meets or exceeds the property requirements of ASTM C 270, ASTM C 387 and ASTM C 1714 for the type selected. Refer to Appendix XI of ASTM C270 for guidance in selecting the proper mortar type. See Table 1.

INSTALLATION

SURFACE PREPARATION

Surfaces to receive Mortar Mix should be clean and free of dirt, loose debris, grease, oil, etc., for the best possible bond.

MIXING

- For each 80 lb (36.3 kg) bag, add 9 pt (4.3 L) of fresh water to mixer
- Turn the mixer on and begin adding bags of Mortar Mix
- If the material becomes too difficult to mix, add additional water until a workable mix of trowelable consistency is obtained

Note - Final water content should be 9 - 14 pt (4.3 - 6.6 L) for each 80 lb (36.3 kg) bag and 7 - 10 pt (3.3 - 4.7 L) for each 60 lb (27.2 kg) bag.

INSTALLATION

- Apply a full bed of mortar onto the base, approximately 1/2" - 3/4" (12.7 - 19.1 mm) thick
- Push downward into the mortar bed and sideways against the previously laid block with a slight twisting motion
- Tool the mortar joints when they become thumbprint hard. This will make the mortar joint watertight and provide a neat appearance

Table 1

Hydraulic Cement- Lime Mortars or Cement Mortars			
Type	Minimum Compressive Strength, psi (MPa)	Water Retention Minimum %	Air content Maximum %
M	2500 (17.2)	75	12
S	1800 (12.4)	75	12
N	750 (5.2)	75	14[1]
O	350 (2.4)	75	14[1]
Masonry Cement Mortars			
Type	Minimum Compressive Strength, psi (MPa)	Water Retention Minimum %	Air content Maximum %
M	2500 (17.2)	75	18
S	1800 (12.4)	75	18
N	750 (5.2)	75	20[2]
O	350 (2.4)	75	20[2]

[1] When structural reinforcement is included, the maximum air content shall be 12%
[2] When structural reinforcement is included, the maximum air content shall be 18%

CURING

Curing of masonry mortars is required only if conditions are very hot, dry or windy. In such cases, a gentle mist of water applied to the surface will prevent premature drying and improve the strength of the mortar.

PRECAUTIONS

Variations in mix water amount, mix time, curing conditions and finishing will cause color variations.

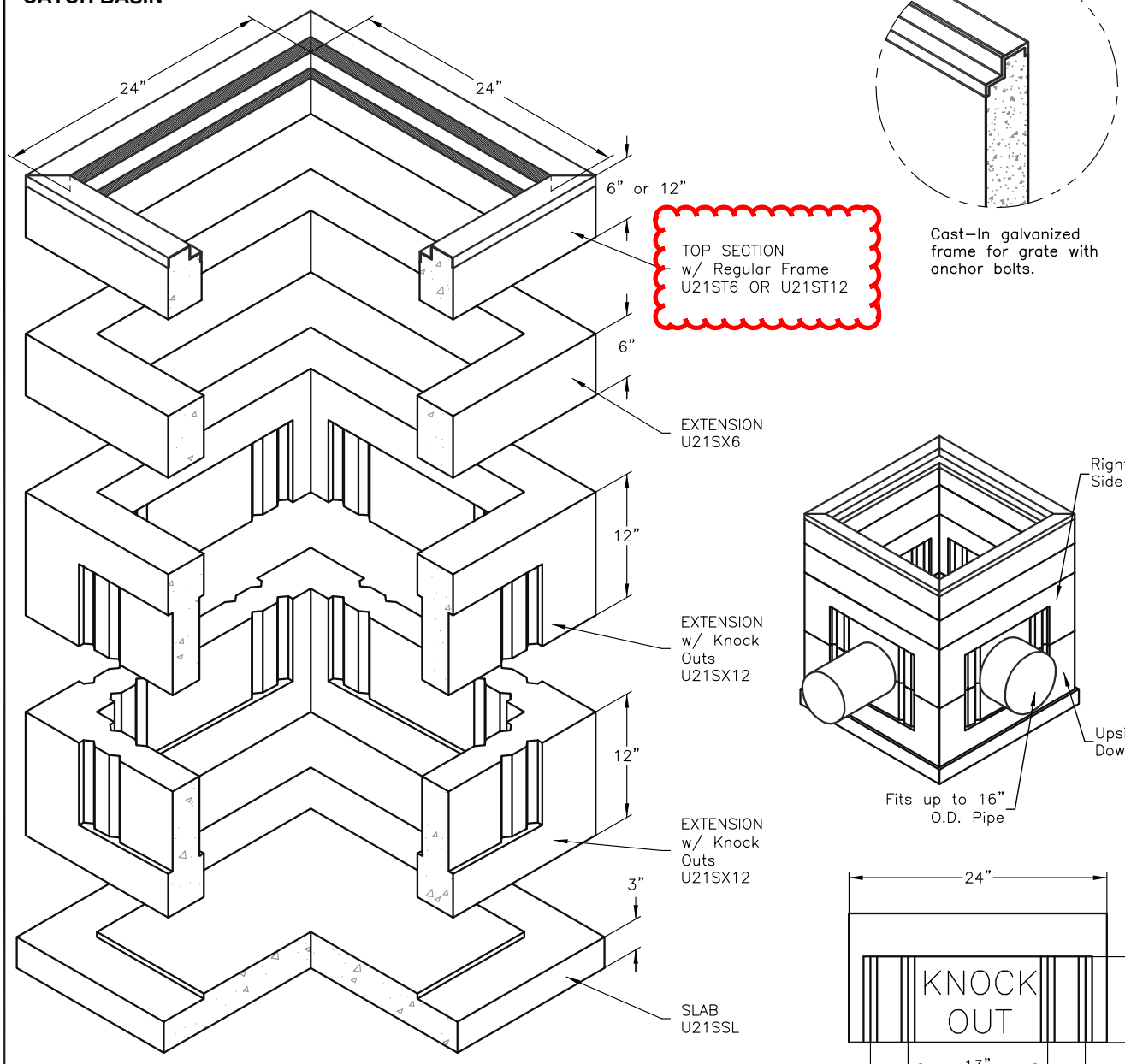
WARRANTY

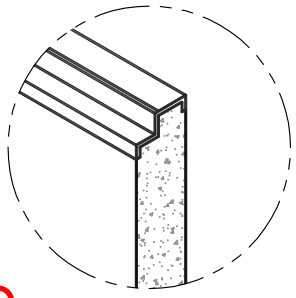
The QUIKRETE® Companies warrant this product to be of merchantable quality when used or applied in accordance with the instructions herein. The product is not warranted as suitable for any purpose or use other than the general purpose for which it is intended. Liability under this warranty is limited to the replacement of its product (as purchased) found to be defective, or at the shipping companies' option, to refund the purchase price. In the event of a claim under this warranty, notice must be given to The QUIKRETE® Companies in writing. This limited warranty is issued and accepted in lieu of all other express warranties and expressly excludes liability for consequential damages.

The QUIKRETE® Companies
One Securities Centre
3490 Piedmont Rd., NE, Suite 1300, Atlanta, GA 30305
(404) 634-9100 • Fax: (404) 842-1425

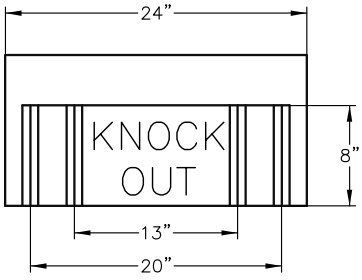
** Refer to www.quikrete.com for the most current technical data, MSDS, and guide specifications*

U21 SECTIONAL CATCH BASIN





Cast–In galvanized frame for grate with anchor bolts.



Oldcastle Ordering Code	Item	Approx. Shipping Weight	Description
U21S	DRAIN BOX		U21S Sectional drain Box (24" x 24" I.D.)
U21ST12RF	TOP SECTION	403 lbs.	12" Reinforced concrete with regular frame
U21ST6RF	TOP SECTION	190 lbs.	6" Reinforced concrete with regular frame
U21SX12NF	EXTENSION	337 lbs.	12" Reinforced concrete with knock outs, no frame
U21SSL	SLAB	164 lbs.	3" Reinforced concrete (33" x 33")

Oldcastle® Enclosure Solutions

Phone: (800) 486–7070 Fax: (800) 486–6804

U21S SECTIONAL

FILE NAME: U21S_ISO

ISSUE DATE: January, 2011

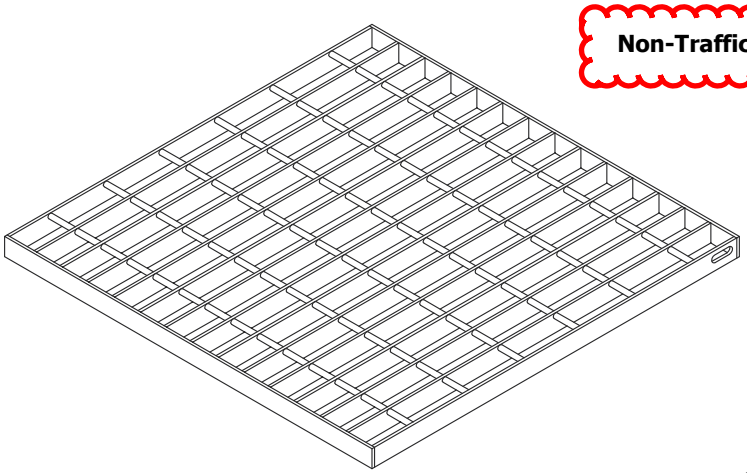
www.oldcastleprecast.com

U21S SECTIONAL CATCH BASIN

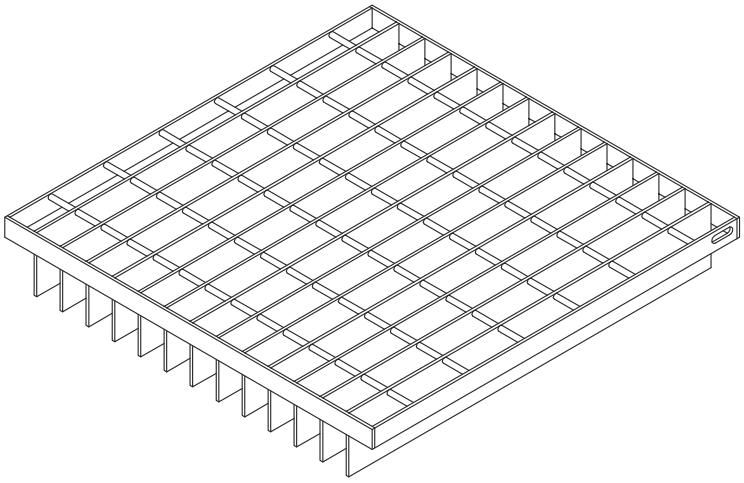
CHRISTY Concrete

Welded Steel Grates with Cross Bars
77% Open Flow Area

Non-Traffic Loading



H/20 Traffic Loading



- Welded steel grates for "U" series catch basins to meet job specifications.
- Individual city, county, district or state requirement information available on request.
- See catch basin page for frame detail.
- ADA availability for all sizes.

Oldcastle Ordering Code	Item	Approx. Shipping Weight	Description
U21–NT	GRATE	35 lbs.	26½" x 26½" Welded, Galvanized, Non–Traffic. Fits U23 Catch Basin
U21–HT	GRATE	75 lbs.	26½" x 26½" Welded, Galvanized, H/20 Traffic. Fits U23 Catch Basin
U32–NT	GRATE	46 lbs.	26½" x 38" Welded, Galvanized, Non–Traffic
U32–HT	GRATE	112 lbs.	26½" x 38" Welded, Galvanized, H/20 Traffic
U36–NT	GRATE	67 lbs.	26½" x 50" Welded, Galvanized, Non–Traffic
U36–HT	GRATE	155 lbs.	26½" x 50" Welded, Galvanized, H/20 Traffic
U43–NT	GRATE	70 lbs.	35½" x 40" Welded, Galvanized, Non–Traffic
U43–HT	GRATE	232 lbs.	35½" x 40" Welded, Galvanized, H/20 Traffic
U52–NT	GRATE	94 lbs.	40" x 47¼" Welded, Galvanized, Non–Traffic
U52–HT	GRATE	280 lbs.	40" x 47¼" Welded, Galvanized, H/20 Traffic
All grates are galvanized, bicycle proof, and bolt down.			

Oldcastle® Enclosure Solutions

Phone: (800) 486–7070 Fax: (800) 486–6804

STEEL GRATES

FILE NAME: WELDED–STEEL–GRATES_ISO

ISSUE DATE: January, 2011

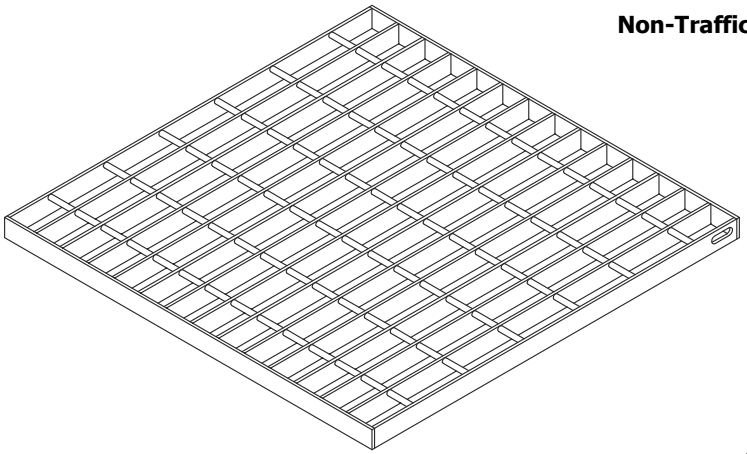
www.oldcastleprecast.com

WELDED STEEL GRATES

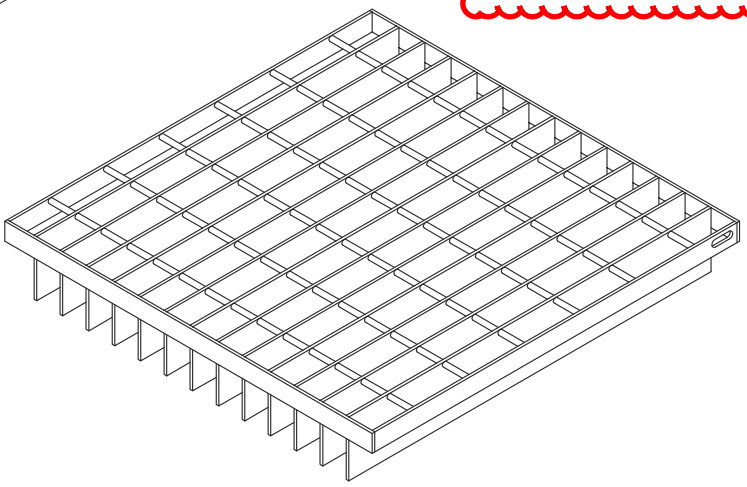
CHRISTY Concrete

Welded Steel Grates with Cross Bars
77% Open Flow Area

Non-Traffic Loading



H/20 Traffic Loading



- Welded steel grates for "U" series catch basins to meet job specifications.
- Individual city, county, district or state requirement information available on request.
- See catch basin page for frame detail.
- ADA availability for all sizes.

Oldcastle Ordering Code	Item	Approx. Shipping Weight	Description
U21–NT	GRATE	35 lbs.	26½" x 26½" Welded, Galvanized, Non–Traffic. Fits U23 Catch Basin
U21–HT	GRATE	75 lbs.	26½" x 26½" Welded, Galvanized, H/20 Traffic. Fits U23 Catch Basin
U32–NT	GRATE	46 lbs.	26½" x 38" Welded, Galvanized, Non–Traffic
U32–HT	GRATE	112 lbs.	26½" x 38" Welded, Galvanized, H/20 Traffic
U36–NT	GRATE	67 lbs.	26½" x 50" Welded, Galvanized, Non–Traffic
U36–HT	GRATE	155 lbs.	26½" x 50" Welded, Galvanized, H/20 Traffic
U43–NT	GRATE	70 lbs.	35½" x 40" Welded, Galvanized, Non–Traffic
U43–HT	GRATE	232 lbs.	35½" x 40" Welded, Galvanized, H/20 Traffic
U52–NT	GRATE	94 lbs.	40" x 47¼" Welded, Galvanized, Non–Traffic
U52–HT	GRATE	280 lbs.	40" x 47¼" Welded, Galvanized, H/20 Traffic
All grates are galvanized, bicycle proof, and bolt down.			

Oldcastle® Enclosure Solutions
Phone: (800) 486–7070 Fax: (800) 486–6804

STEEL GRATES

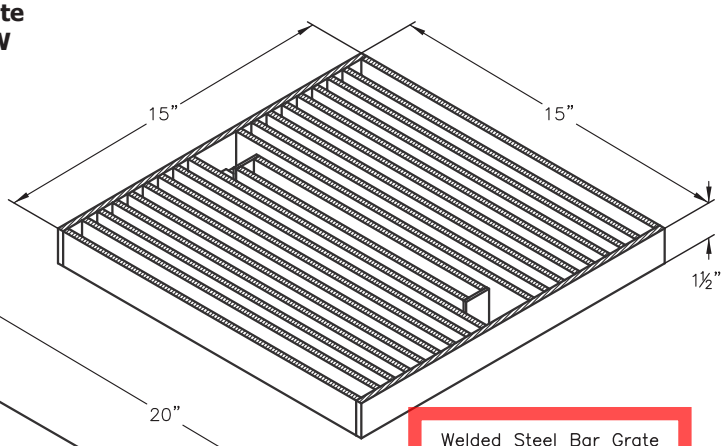
FILE NAME: WELDED–STEEL–GRATES_ISO
ISSUE DATE: January, 2011
www.oldcastleprecast.com

WELDED STEEL GRATES

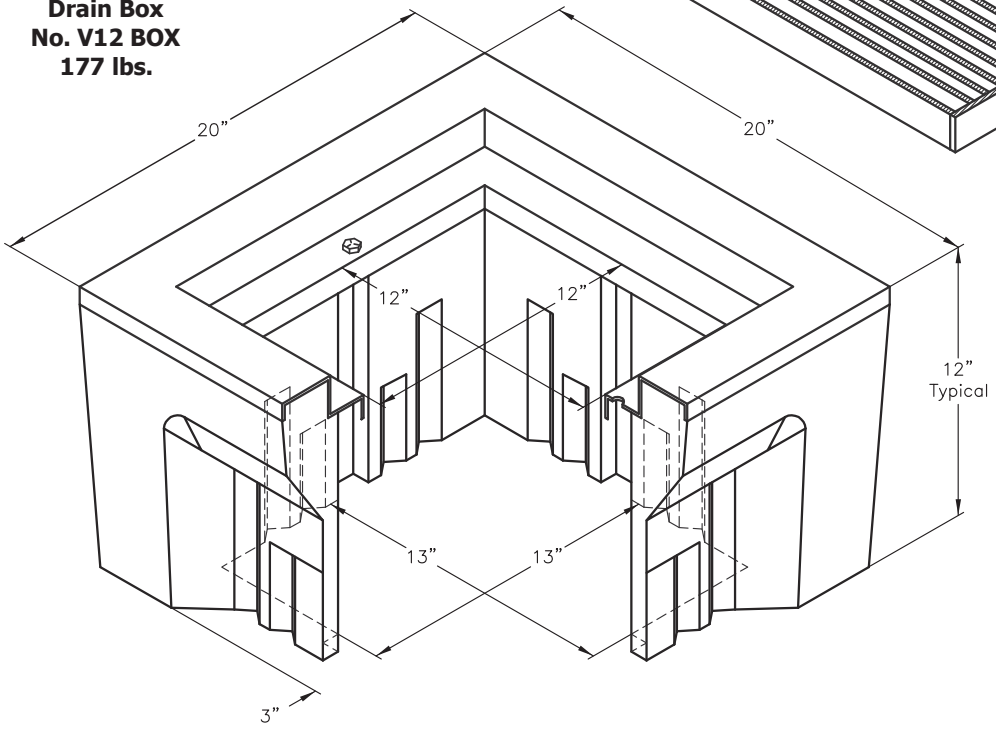
CHRISTY Concrete

- Drainage Box is H/20 rated

Cast Iron Grate
No. V12-71W
34 lbs.



Drain Box
No. V12 BOX
177 lbs.



Welded Steel Bar Grate is ADA Approved.

A high density reinforced concrete box with cast in galvanized frame, specifically engineered for heavy traffic areas. Approximate dimensions and weight shown.

Oldcastle Ordering Code	Item	Approx. Shipping Weight	Description
V12BOX	BOX	177 lbs.	V12 Drain Box (12" x 12") – H/20 Loading, Bolt Down, Interchangeable with Brooks #1212 Box– 12 per pallet
V12–71W	LID	34 lbs.	Welded, Steel Cross Bars, H/20 Loading, Galvanized; ADA Approved
V12X12	EXTENSION	120 lbs.	12" Reinforced Concrete – 12 per pallet

Oldcastle Precast®
Enclosure Solutions
Phone: (800) 486–7070 Fax: (800) 486–6804

V12 BOX

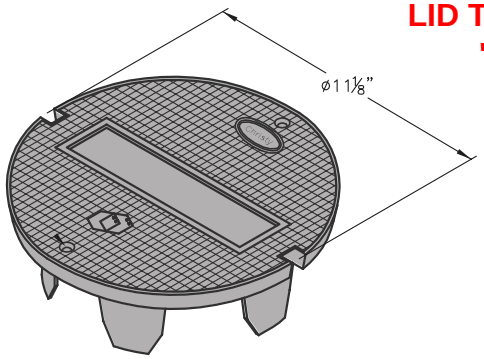
FILE NAME: V12_ISO
ISSUE DATE: January, 2011
www.oldcastleprecast.com

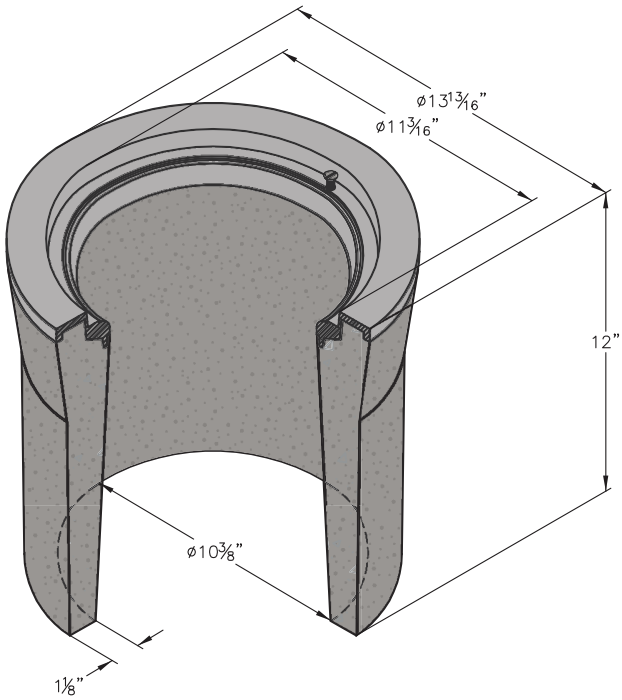
V12 DRAIN BOX
12" x 12"

Christy®

G05

LID TO BE MARKED "STORM"





COVER:

Style:	Flush
Material:	Cast Iron
Model:	11" Dia.
Weight:	14 lbs
Options:	Special Markings
Surface:	Skid Resistant & Marked*
Coefficient of Friction:	>0.6 ASTM 1028
Performance:	H20, AASHTO M309

BODY:

Material:	Reinforced Concrete with Steel Frame
Model:	14" Dia.
Weight:	58 lbs
Wall Type:	Straight
Mouseholes:	0
Performance:	H20, AASHTO M309

GRADE RING:

Material:	Cast Iron
Grade Options:	1" Height 1-1/2" Height 2" Height

Traffic Rated: Continuous Roadway Traffic

Actual load rating is determined by the box and cover combination.
Weights and dimensions may vary slightly

All information contained on this sheet is current at the time of printing. Oldcastle Precast, Inc. reserves the right to discontinue or update product information without notice.

*Cover comes standard with permanent markings for manufacturer, load rating, model size and manufacturing location.

Contact your Oldcastle Enclosure Solutions Distribution Center for specific information and additional options.

Revision 8/2013

Est. 1958

NEWBY RUBBER INC

WATER WORKS GASKETS

This is our new Water Works Catalog. All prices are each, F.O.B. Bakersfield, CA. Our terms are net 30 days. We are continually adding to our product line so please check with us on any item not shown that you may require.

Newby Rubber, Inc. has been manufacturing since 1958. We are proud of our past record, and will continue to provide our customers with the service and quality they expect and deserve. Please feel free to contact us on any requirement you might have.

Our CL-150 gaskets, Transition gaskets and Mechanical joint gaskets are manufactured to meet ASTM-D-1869-66 Specifications for Rubber Rings for Asbestos Cement Pipe, ASTM C564-68 Specifications for Rubber Rings for Cast Iron Soil Pipe, AWWA Standard C111/ A21.11 and ASTM F477-76 Elastomeric Seals for Joining Plastic Pipe. ASTM C-923 Table 1, Manhole Stop Rings.

SPECIAL ELASTOMERS:	**RESISTANT TO MOST**
NITRILE (BUNA-N)	OIL
NEOPRENE	LIGHT OIL RESISTANCE
VITON (FLUOROELASTOMER)	OIL & TERMPERATURE TO 350° F,
EPDM	GASOLINE OZONE, HOT WATER & STEAM TO 500° F

STORAGE: Recommended storage would be in a plastic bag and or a cardboard box, in a cool dry area. Do not store close to electric motors.

STORAGE LIFE:
NITRILE - Several years.
NEOPRENE - Indefinite - Long Life.
VITON (fluorelastomer) - Several years.
EPDM - Indefinite - Long Life.

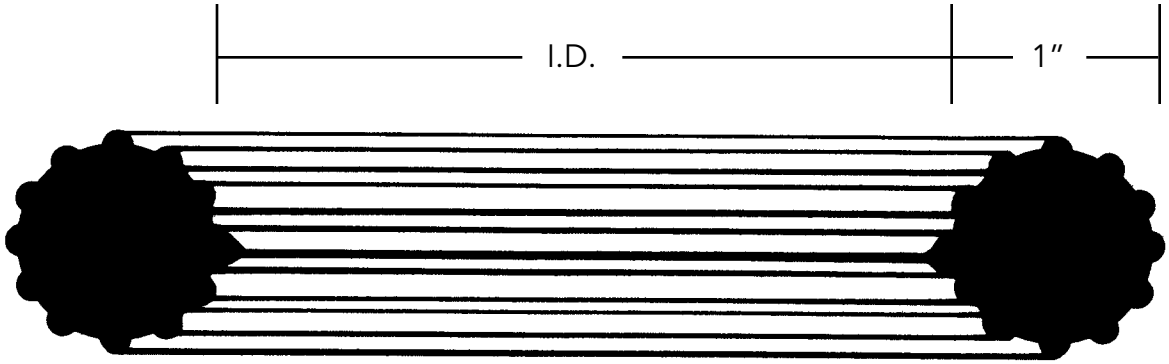
Est. 1958

NEWBY RUBBER INC

MANHOLE STOP RINGS

TO BE USED WITH PVC THAT GOES INTO A MANHOLE AND IS CEMENTED IN PLACE. OUR MANHOLE STOP RINGS ARE MOLDED, NOT EXTRUDED.

ILLUSTRATION



SIZE & TYPE	PART NO.	PCS/BOX	I.D.
4″ MANHOLE STOP RING	102675	125	4
6″ MANHOLE STOP RING	102700	75	5-7/8
8″ MANHOLE STOP RING	102725	50	8-3/4
10″ MANHOLE STOP RING	102750	25	10-1/4
12″ MANHOLE STOP RING	102775	25	12-1/4
14″ MANHOLE STOP RING		—	13-3/8
15″ MANHOLE STOP RING	102800	25	13-3/8
18″ MANHOLE STOP RING	102830	25	16-3/4
20″ MANHOLE STOP RING	102832	Spliced	20-5/8
21″ MANHOLE STOP RING	102833	25	21
24″ MANHOLE STOP RING	102836	20	23-3/4
27″ MANHOLE STOP RING	102840	Spliced	26-1/2
30″ MANHOLE STOP RING	102844	Spliced	30
36″ MANHOLE STOP RING	102846	Spliced	38

Other sizes quoted on request.

Christy's™

— PRODUCT INFORMATION & SPECIFICATIONS —

Detectable Marking Tape

Christy's™ Detectable Marking Tape provides for easy buried pipeline detection and below ground identification and warning. The tape can be located below ground with a non-ferrous metal detector, when buried at the proper depths. Christy's™ Detectable Tape Must Be Buried Flat For Maximum Detectability and Line Protection. We recommend bury depths of:

TAPE WIDTH	2”	3”	6”	12” or wider
TAPE BURY DEPTH	6” - 18”	6” - 28”	6” - 36”	6” - 36”

Detectable Marking Tape

SPECIFICATIONS

Tape consists of Minimum 4.5 MIL overall thickness, with 0.0035 MIL solid aluminium foil core. The warning message is “Buried, or Encased” to prevent ink rub-off and is impervious to acid, alkalis and other destructive elements found in soil. All Christy’s tape meets or exceeds the industry standards including the America Public Works Association (APWA) color code.

TEST DATA		VALUE
MATERIAL IDENTIFICATION	3” & 6” WIDE	4.5 MIL
OVERALL FOIL THICKNESS		0035 MIL
TEST PROCEDURE	ASTM-D-8820, METHOD A	90%
SPECIMEN CONDITIONS		73ºF / 50% R.H
TEST TEMPERATURE		73ºF
ELONGATION		90%
TENSILE STRENGTH	TRANSVERSE	5530 PSI
TENSILE STRENGTH	LONGITUDINAL	4544 PSI
ROLL WEIGHT	3” X 1000’	+/- 7.5 LBS
ROLL WEIGHT	6” X 1000’	+/- 15 LBS
MINIMUM WEIGHT		10 LBS PER 1000’ UNIT
MAXIMUM IMPRINT LENGTH		36”

COLOR CODE	DESCRIPTION
BLUE	WATER & ASSOCIATED LINES
BROWN	FORCE MAINS & ASSOCIATED LINES
GREEN	SANITARY & ASSOCIATED LINES
ORANGE	TELECOMMUNICATIONS & TELEPHONE LINES
PURPLE	RECLAIMED WATER LINES
RED	ELECTRIC & ASSOCIATED LINES
YELLOW	GAS & ASSOCIATED LINES

The tape is manufactured by T. Christy Enterprises, Inc. (800) 258-4583.

The model number is _____ (TA-DT-XX-XXX). See model number designations on the following page.

Christy's™

— PRODUCT INFORMATION & SPECIFICATIONS —

STANDARD COLOR/LEGEND COMBINATIONS

How to Order Underground Marking Tapes

TA.XX.XX.XXXXX

Example: TA.DT.2.PRW is 2" Detectable Purple Reclaimed Water.

Type of Tape	Width of Tape	Colors	Legend	
DT - Detectable	2 - 2"	B - Blue	CP - Cathodic Protection	RAW - Raw Water
	3 - 3"	P - Purple	E - Electric	RJ - Restrained Joint
	6 - 6"	Y - Yellow	F- Fire	RW - Reclaimed Water
	12 - 12"	G - Green	FM - Force main	STDR - Storm Drain
		R - Red	FO - Fiber Optic	T - Telephone
		W - White	G - Gas	W - Water
		O - Orange	I - Irrigation	
		BR - Brown	NPW - Non-Potable Water	

STANDARD COLOR/LEGEND COMBINATIONS

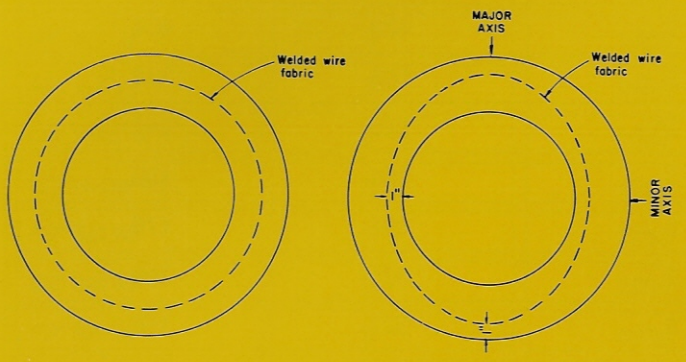
Color	Legend	Text
Blue	BI	"Caution Irrigation Line Buried Below"
Blue	BNPW	"Caution Non-Potable Water Line Buried Below"
Blue	BPW	"Caution Potable Water Line Buried Below"
Blue	BW	"Caution Water Line Buried Below"
Blue	RJ	"Caution Restrained Joint Buried Below"
Brown	BFM	"Caution Force Main Buried Below"
Green	GFM	"Caution Force Main Buried Below"
Green	GI	"Caution Irrigation Line Buried Below"
Green	GNPW	"Caution Non-Potable Line Buried Below"
Green	GPW	"Caution Potable Line Buried Below"
Green	GRAW	"Caution Raw Water Line Buried Below"
Green	GS	"Caution Sewer Line Buried Below "
Green	GSTDR	"Caution Storm Drain Buried Below"
Orange	OFO	"Caution Fiber Optic Line Buried Below"
Orange	OT	"Caution Telephone Line Buried Below"
Orange	OCP	"Caution Cathodic Protection Cable Buried Below"
Purple	PRW	"Caution Recycled/Reclaimed Water Line Buried Below"
Purple	PNPW	"Caution Non-Potable Line Buried Below"
Red	RE	"Caution Electric Line Buried Below"
Red	RF	"Caution Fire Line Buried Below"
Yellow	YG	"Caution Gas Line Buried Below"

NOTE: Not all widths are available as standard for the stock color/legend combinations shown. Contact Christy's™ for stock availability of specific products. **Non-stock combinations are subject to minimum requirements and plate charges.**

SPECIAL AND CUSTOM LEGENDS

Christy's™ offers a full range of non-standard legend/color combinations in addition to the combinations listed below, including specialty applications such as Telemetry, Irrigation and additional water line wording. All standard combinations listed are available in at least one color/width combination. We offer specific agency legends, designations or color combinations. Custom legends can include the use of specific wording, insignias and phone numbers. Call for special pricing.

Typical Dimensions & Steel Reinforcement of Pipe Manufactured by Van Cleve Construction Co.



Notes:

1. Pipe conforms to the requirements of ASTM C76 or AASHTO M170.
2. All pipe 36" diameter and larger have a ring of reinforcement in the tongue end as per Sec 63.1 and Sec. 105.1 of ASTM C76.
3. D-Loads not listed shall be interpolated between loads shown as to amount of reinforcement required.
4. Holding pegs for elliptical reinforcement shall extend through the tongue forming ring at the minor axis on all sizes (except 48"). 48" holding pegs are placed at the major axis.
5. Reinforcement used is cold drawn welded wire fabric 2" x 8" style.

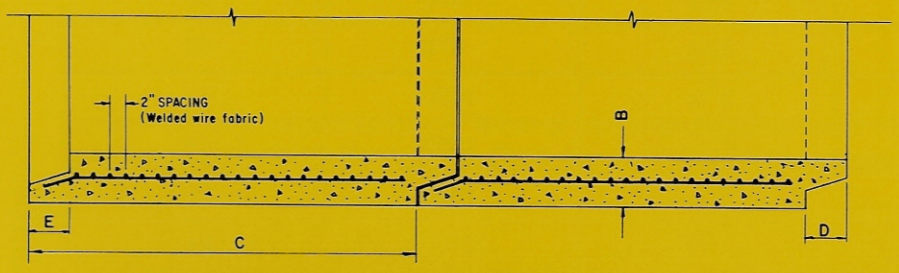


TABLE OF DIMENSIONS

INSIDE DIAMETER A	WALL THICKNESS B	LAYING LENGTH C	DEPTH OF GROOVE D	TONGUE LENGTH E	OUTSIDE DIAMETER F	REINFORCEMENT IN. ²/ LINEAR FT. OF PIPE WALL — CIRCULAR REINFORCEMENT — INNER CAGE						ELLIPTICAL REINFORCEMENT — INNER CAGE					
						D-LOAD 1000		D-LOAD 1350		D-LOAD 2000		D-LOAD 1000		D-LOAD 1350		D-LOAD 2000	
						REQ'D.	USED	REQ'D.	USED	REQ'D.	USED	REQ'D.	USED	REQ'D.	USED	REQ'D.	USED
12"	2"	48"	1¾"	1½"	16"	.07	.124	.07	.124	.07	.124	...	...	...	...	...	...
15"	2¼"	48"	1½"	1½"	19½"	.07	.124	.07	.124	.10	.124	...	...	...	...	...	...
18"	2½"	48"	1¾"	1¾"	23"	.07	.124	.07	.124	.14	.149	...	...	...	...	...	...
21"	2¾"	48"	2¼"	2"	26½"	.07	.124	.07	.124	.20	.202	...	...	...	...	...	...
24"	3"	48"	2½"	2½"	30"	.07	.124	.07	.124	...	...	...	...	...	...	...	...
24"	3¼"	48"	2½"	2½"	30½"	.07	.124	.07	.124	.27	.280	...	...	...	...	...	...
27"	3¼"	48"	2¾"	2¾"	33½"	.13	.149	.16	.174	.31	.325	...	...	...	...	...	...
30"	3"	48"	3"	3"	36"	.147	.149	.187	.202	...	...	...	...	...	...	...	...
30"	3½"	48"	3"	3"	37"	.14	.149	.18	.202	.35	.351	...	...	...	...	...	...
33"	3¾"	48"	3"	3"	40½"	.15	.149	.20	.202	...	...	...	...	...	...	.30	.303
36"	4"	48"	3"	3"	44"	...	...	...	...	...	...	.13	.149	.19	.202	.33	.348
39"	4¼"	48"	3¼"	3¼"	47½"	...	...	...	...	...	...	.15	.149	.21	.239	.36	.377
42"	4½"	48"	3¼"	3¼"	51	...	...	...	...	...	...	.17	.174	.23	.239	.39	.404
48"	5"	48"	2½"	2¾"	58"	...	...	...	...	...	...	.20	.202	.27	.302	.47	.478
54"	5½"	72"	4½"	4½"	65"	...	...	...	...	...	...	.24	.239	.32	.325	...	...
60"	6"	72"	5"	5"	72"	...	...	...	...	...	...	.28	.302	.38	.377	...	...

NOTE: ALL MATERIAL MANUFACTURED TO CONFORM WITH A.S.T.M. SPECIFICATION C-76

TENCATE Mirafi®

Mirafi® 140N

Mirafi® 140N is a needlepunched nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. Mirafi® 140N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids. Mirafi® 140N meets Aashto M288-06 Class 3 for elongation > 50%.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Grab Tensile Strength	ASTM D4632	lbs (N)	120 (534)	120 (534)
Grab Tensile Elongation	ASTM D4632	%	50	50
Trapezoid Tear Strength	ASTM D4533	lbs (N)	50 (223)	50 (223)
CBR Puncture Strength	ASTM D6241	lbs (N)	310 (1380)	
Apparent Opening Size (AOS)[1]	ASTM D4751	U.S. Sieve (mm)	70 (0.212)	
Permittivity	ASTM D4491	sec^{-1}	1.7	
Flow Rate	ASTM D4491	$gal/min/ft^2$ ($l/min/m^2$)	135 (5500)	
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	70	

[1] ASTM D4751: AOS is a Maximum Opening Diameter Value

Physical Properties	Unit	Typical Value	
Roll Dimensions (width x length)	ft (m)	12.5 x 360 (3.8 x 110)	15 x 360 (4.5 x 110)
Roll Area	yd^2 (m^2)	500 (418)	600 (502)
Estimated Roll Weight	lb (kg)	133 (60)	160 (72)

Made in USA

TENCATE™ materials that make a difference

FGS000385
ETQR54

Arvin Aggregate Plant
20541 East Bear Mtn. Blvd.
Arvin, CA 93203
661-854-3051

September 24, 2019

Edison Sand

3/4" AGGCRUSH-1816

Sieve/Test	Average	Unit	Granite
1"	100	%	100-100
3/4"	86	%	80-95
1/2"	10	%	0-20
3/8"	3	%	0-10
#4	2	%	0-5
#8	1	%	0-5
#16	1	%	0-5
#30	1	%	
#50	1	%	
#100	1	%	
#200	0.4	%	

If we can be of further assistance, please do not hesitate to contact us.

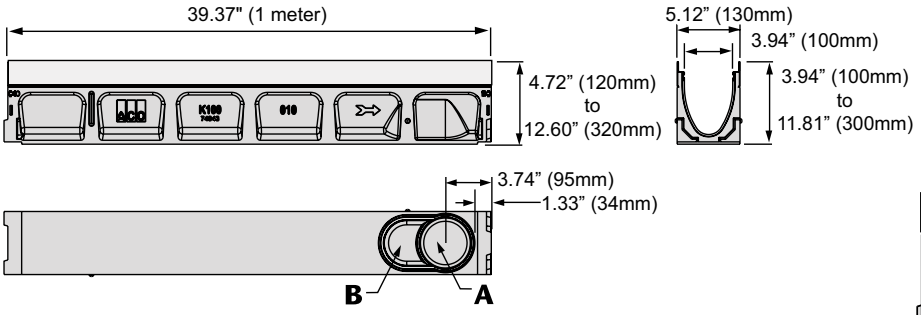
Respectfully,
GRANITE CONSTRUCTION COMPANY

Expires 3 months from date of issue

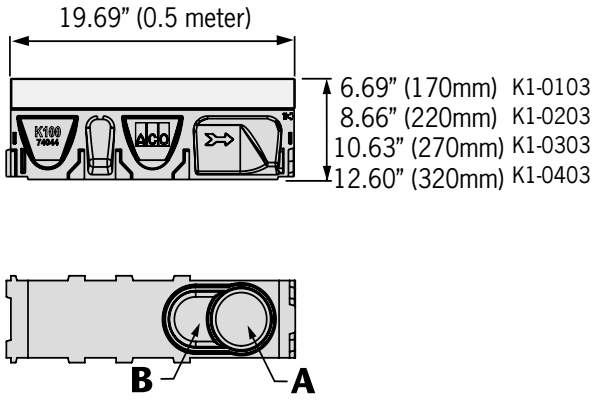
ACO DRAIN

KlassikDrain - K100 Galvanized steel edge rail channel system

One meter channel

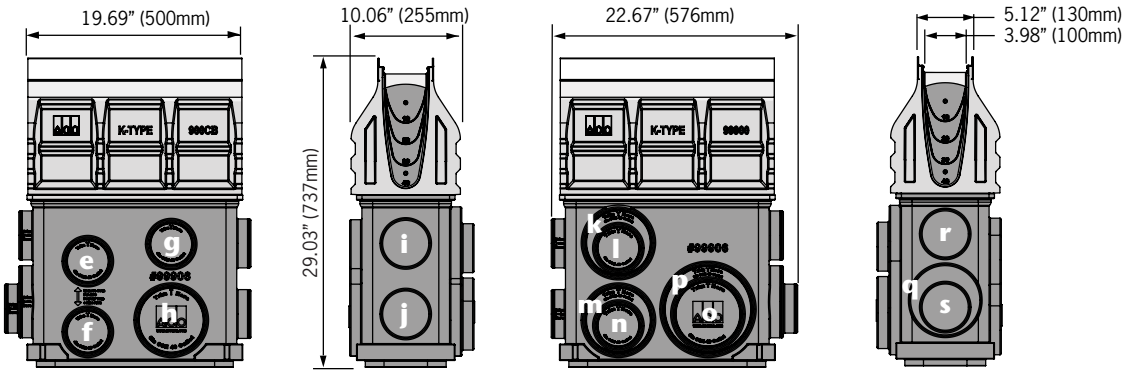


Half meter channel



Knock-outs included on every 5th channel

Type K901G In-line catch basin

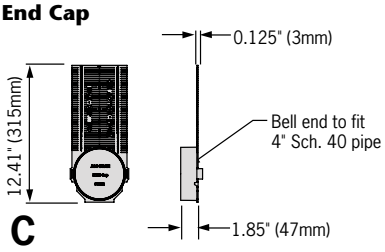


Total capacity = 10.49 gallons

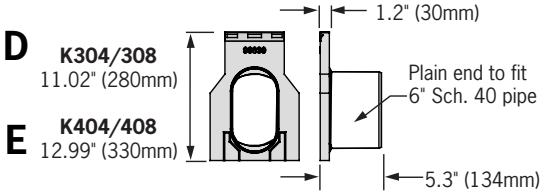
Outlet flow rates

Outlet	Product	Outlet size (Sch. 40)	Invert Depth	GPM	CFS
a	Bottom outlet - K00	4" round	3.94"	108	0.24
a	Bottom outlet - K40	4" round	11.81"	187	0.42
b	Bottom outlet - K00	6" oval	3.94"	177	0.39
b	Bottom outlet - K40	6" oval	11.81"	306	0.68
c	End outlet - K20	4" round	7.87"	132	0.29
c	End outlet - K40	4" round	11.81"	171	0.38
d	K1-308-6 6" outlet cap	6" oval	9.84"	233	0.52
d	K1-408-6 6" outlet cap	6" oval	11.81"	264	0.59
e	Type K1-901G	4" round	20.68"	235	0.52
f	Type K1-901G	4" round	27.17"	226	0.50
g	Type K1-901G	4" round	18.99"	265	0.59
h	Type K1-901G	6" round	27.17"	263	0.59
i	Type K1-901G	4" round	19.30"	222	0.49
j	Type K1-901G	4" round	25.67"	586	1.30
k	Type K1-901G	6" round	19.99"	269	0.60
l	Type K1-901G	4" round	19.36"	227	0.51
m	Type K1-901G	6" round	27.30"	604	1.35
n	Type K1-901G	4" round	26.43"	505	1.12
o	Type K1-901G	6" round	26.43"	593	1.32
p	Type K1-901G	8" round	27.30"	1051	2.34
q	Type K1-901G	6" round	25.85"	273	0.61
r	Type K1-901G	4" round	18.56"	235	0.52
s	Type K1-901G	4" round	25.30"	224	0.50

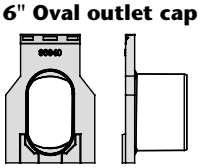
End Cap



6" Oval inlet cap



6" Oval outlet cap



Note: These are the pipe flow rates at the specified outlet, **NOT** channel flow rates. Catch basin flow rates are without trash bucket - using trash bucket reduces flow.

ACO Specification Information

KlassikDrain - K100 Galvanized steel edge rail channel system

Description	Part No.	Invert Inches[2]	Invert mm[2]	Weight Lbs.
K1-00 Neutral channel - 39.37" (1m)[1]	**74041**	**3.94**	**100**	**28.1**
K1-1 Sloped channel - 39.37" (1m)	**74001**	4.13	105	28.1
K1-2 Sloped channel - 39.37" (1m)	**74002**	4.33	110	28.9
K1-3 Sloped channel - 39.37" (1m)	**74003**	4.53	115	29.7
K1-4 Sloped channel - 39.37" (1m)	**74004**	4.72	120	30.5
K1-5 Sloped channel - 39.37" (1m)[1]	**74005**	4.92	125	31.3
K1-6 Sloped channel - 39.37" (1m)	**74006**	5.12	130	32.1
K1-7 Sloped channel - 39.37" (1m)	**74007**	5.31	135	32.9
K1-8 Sloped channel - 39.37" (1m)	**74008**	5.51	140	33.7
K1-9 Sloped channel - 39.37" (1m)	**74009**	5.71	145	34.5
K1-10 Sloped channel - 39.37" (1m)[1]	**74010**	5.91	150	35.3
K1-010 Neutral channel - 39.37" (1m)[1]	**74043**	**5.91**	**150**	**35.3**
K1-0103 Neutral channel - 19.69" (0.5m)[1]	**74044**	**5.91**	**150**	**17.0**
K1-11 Sloped channel - 39.37" (1m)	**74011**	6.10	155	36.1
K1-12 Sloped channel - 39.37" (1m)	**74012**	6.30	160	36.9
K1-13 Sloped channel - 39.37" (1m)	**74013**	6.50	165	37.7
K1-14 Sloped channel - 39.37" (1m)	**74014**	6.69	170	38.5
K1-15 Sloped channel - 39.37" (1m)[1]	**74015**	6.89	175	39.3
K1-16 Sloped channel - 39.37" (1m)	**74016**	7.09	180	40.1
K1-17 Sloped channel - 39.37" (1m)	**74017**	7.28	185	40.9
K1-18 Sloped channel - 39.37" (1m)	**74018**	7.48	190	41.7
K1-19 Sloped channel - 39.37" (1m)	**74019**	7.68	195	42.5
K1-20 Sloped channel - 39.37" (1m)[1]	**74020**	7.87	200	43.4
K1-020 Neutral channel - 39.37" (1m)[1]	**74045**	**7.87**	**200**	**43.4**
K1-0203 Neutral channel - 19.69" (0.5m)[1]	**74046**	**7.87**	**200**	**20.5**
K1-21 Sloped channel - 39.37" (1m)	**74021**	8.07	205	44.2
K1-22 Sloped channel - 39.37" (1m)	**74022**	8.27	210	45.0
K1-23 Sloped channel - 39.37" (1m)	**74023**	8.46	215	45.8
K1-24 Sloped channel - 39.37" (1m)	**74024**	8.66	220	46.6
K1-25 Sloped channel - 39.37" (1m)[1]	**74025**	8.86	225	47.4
K1-26 Sloped channel - 39.37" (1m)	**74026**	9.06	230	48.2
K1-27 Sloped channel - 39.37" (1m)	**74027**	9.25	235	49.0

Description	Part No.	Invert Inches[2]	Invert mm[2]	Weight Lbs.
K1-28 Sloped channel - 39.37" (1m)	**74028**	9.45	240	49.8
K1-29 Sloped channel - 39.37" (1m)	**74029**	9.65	245	50.6
K1-30 Sloped channel - 39.37" (1m)[1]	**74030**	9.84	250	51.4
K1-030 Neutral channel - 39.37" (1m)[1]	**74047**	**9.84**	**250**	**51.4**
K1-0303 Neutral channel - 19.69" (0.5m)[1]	**74048**	**9.84**	**250**	**24.0**
K1-31 Sloped channel - 39.37" (1m)	**74031**	10.04	255	52.2
K1-32 Sloped channel - 39.37" (1m)	**74032**	10.24	260	53.0
K1-33 Sloped channel - 39.37" (1m)	**74033**	10.43	265	53.8
K1-34 Sloped channel - 39.37" (1m)	**74034**	10.63	270	54.6
K1-35 Sloped channel - 39.37" (1m)[1]	**74035**	10.83	275	55.4
K1-36 Sloped channel - 39.37" (1m)	**74036**	11.02	280	56.2
K1-37 Sloped channel - 39.37" (1m)	**74037**	11.22	285	57.0
K1-38 Sloped channel - 39.37" (1m)	**74038**	11.42	290	57.9
K1-39 Sloped channel - 39.37" (1m)	**74039**	11.61	295	58.7
K1-40 Sloped channel - 39.37" (1m)[1]	**74040**	11.81	300	59.5
K1-040 Neutral channel - 39.37" (1m)[1]	**74049**	**11.81**	**300**	**59.5**
K1-0403 Neutral channel - 19.69" (0.5m)[1]	**74050**	**11.81**	**300**	**27.5**
K1-901G In-line catch basin - 19.69" (0.5m)[3]	**94608**	28.81	701.9	52.6
K1-621G catch basin - 19.69" (0.5m)[3]	**94617**	28.84	732.5	55.8
K1-631G catch basin - 19.69" (0.5m)[4]	**94631**	40.84	1037.4	65.8
K1-Series 600 Optional plastic riser	**99902**	-	-	10.0
Foul air trap - fits both 900 & 600 series basins	**90854**	-	-	1.2
K1-304-6 6" Inlet Cap	**96839**	9.84	250	5.2
K1-308-6 6" Outlet Cap	**96840**	9.84	250	5.0
K1-404-6 6" Inlet Cap	**96834**	11.81	300	6.0
K1-408-6 6" Outlet Cap	**96836**	11.81	300	5.8
Universal end cap	**96822**	11.81	300	0.4
Debris strainer for 4" bottom knockout	**93488**	-	-	0.2
4" Oval to 6" round outlet adapter	**95140**	-	-	1.1
K1-Installation device	**97477**	-	-	2.8
Grate removal tool	**01318**	-	-	0.3
K1-QuickLok locking bar	**02899**	-	-	0.1

Notes:
1. This channel offers a bottom knockout feature; 4" round/6" oval.
2. Inverts shown are for the male end; for female invert depth subtract 5mm (≈0.2") from the male invert (except for neutral channels, where it will be same as male invert). To calculate the overall channel depth add 20mm (≈0.8") to invert depth.
3. This catch basin kit includes a polymer concrete top, removable Quicklok locking bar, trash bucket and plastic base. Select an appropriate grate.
4. This catch basin kit includes a polymer concrete top, removable Quicklok locking bar, deep trash bucket, plastic riser and plastic base. Select an appropriate grate.

Specifications

General
The surface drainage system shall be ACO Drain K100 complete with gratings secured with 'QuickLok' locking as manufactured by ACO, Inc. or approved equal.

Materials
The trench system bodies shall be manufactured from polyester polymer concrete with the minimum properties as follows:

Compressive strength:	14,000 psi
Flexural strength:	4,000 psi
Water absorption	0.07%
Frost proof	YES
Salt proof	YES
Dilute acid and alkali resistant	YES

The nominal clear opening shall be 4" (100mm) with overall width of 5.12" (130mm). Pre-cast units shall be manufactured with either an invert slope of 0.5% or with neutral invert and have a wall thickness of at least 0.50" (13mm). Each unit will feature a partial radius in the trench bottom and a male to female interconnecting end profile. Units shall have horizontal cast in anchoring keys on the outside wall to ensure maximum mechanical bond to the surrounding bedding material and pavement surface. The galvanized steel edge rail will be integrally cast in by the manufacturer to ensure maximum homogeneity between polymer concrete body and edge rail. Each edge rail shall be at least 3/32" (2.5mm) thick.

Grates
Grates shall be specified. See separate ACO Spec Info grate sheets for details. After removal of grates and 'QuickLok' bar there shall be uninterrupted access to the trench to aid maintenance.

Installation
The trench drain system shall be installed in accordance with the manufacturer's installation instructions and recommendations.

ACO, Inc.
Northeast Sales Office
9470 Pinecone Drive
Mentor, OH 44060
Tel: (440) 639-7230
Toll free: (800) 543-4764
Fax: (440) 639-7235

West Sales Office
825 W. Beechcraft St.
Casa Grande, AZ 85122
Tel: (520) 421-9988
Toll Free: (888) 490-9552
Fax: (520) 421-9899

Southeast Sales Office
4211 Pleasant Road
Fort Mill, SC 29708
Toll free: (800) 543-4764
Fax: (803) 802-1063

Electronic Contact:
info@acousa.com
www.acousa.com

Type 410D/412D Perforated galvanized steel grate (ADA)

Product Features

- Certified to EN 1433 Load Class A - 3,500 lbs - 70 psi
- Uses 'DrainLok' boltless locking system
- Suitable for use with K100, KS100, and H100K-8 channels
- Manufactured from 16 gauge galvanized steel
- Patented reinforcement underneath designed to prevent bowing and collapse
- Complies with ADA - American Disabilities Act of 1990 Section 4.5.4

Specifications

General

The surface drainage system shall be ACO Drain K100, KS100, and H100K-8 channels*, complete with ACO Type 410D/412D Perforated galvanized steel grate with 'DrainLok' locking as manufactured by ACO, Inc. or similar approved.

Materials

The covers shall be manufactured from galvanized steel and have ***minimum*** properties as follows:-

- ***Independently certified to meet Load Class A to EN 1433 - 3,500 lbs - 70 psi***
- ***16 gauge galvanized steel***
- ***Intake area of 14.1 sq. in. (91.0 cm²) per half meter of grate***

The overall width of 4.84" (123mm) and overall length of 39.37" (1000mm) (Type 410D) and 19.69" (500mm)(Type 412D). Perforations measure 0.25" (6.35mm) in diameter.

Installation

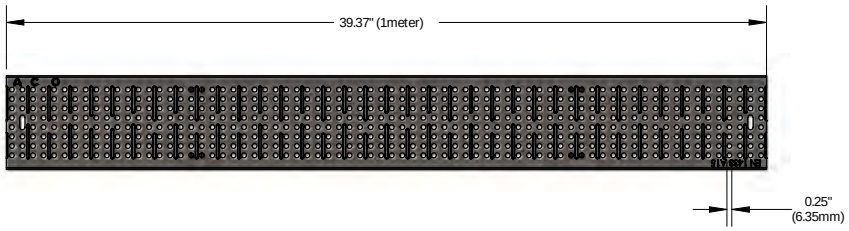
The trench drain system and grates shall be installed in accordance with the manufacturer's installation instructions and recommendations.

* delete as appropriate

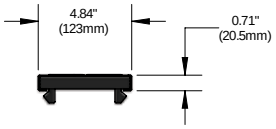
ACO Specification Information

Type 410D/412D Perforated galvanized steel grate (ADA)

Plan view

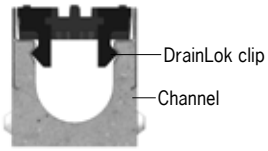


Side elevation



Description	Part No.	Length inches *(mm)*	Width inches *(mm)*	Weight lbs.
DrainLok grates				
Type 410D perforated galvanized grate	**12666**	39.37 *(1000)*	4.84 *(123)*	6.3
Type 412D perforated galvanized grate	**12667**	19.69 *(500)*	4.84 *(123)*	3.2

'DrainLok' locking mechanism



ACO DrainLok™ is a patented, boltless locking system that removes the need for bolts and bars and improves the hydraulic capacity of the channel. The DrainLok™ mechanism simply clips into the channel edge rail for rapid installation. ACO DrainLok™ grates are fitted with an anti-shunt mechanism that restricts unwanted grate movement when installed, improving durability and longevity of the system.

ACO, Inc.
Northeast Sales Office
9470 Pinecone Drive
Mentor, OH 44060
Tel: (440) 639-7230
Toll free: (800) 543-4764
Fax: (440) 639-7235

West Sales Office
825 W. Beechcraft St.
Casa Grande, AZ 85122
Tel: (520) 421-9988
Toll Free: (888) 490-9552
Fax: (520) 421-9899

Southeast Sales Office
4211 Pleasant Road
Fort Mill, SC 29708
Toll free: (800) 543-4764
Fax: (803) 802-1063

Follow us on

Electronic Contact:
info@ACODrain.us
www.ACODrain.us

WATER

BLUE BRUTE™

MEETS AWWA C900

JM Eagle™

Building essentials for a better tomorrow™

BLUE BRUTE™

PVC C.I.O.D. Distribution Pipe
DR 25 / DR18 / DR14

Pressure Class 165, 235 and 305 psi
Ring-Tite™ Joints 4"-12"

01

PRODUCT DESCRIPTION

AWWA C900 BLUE BRUTE™

FOR USE IN DISTRIBUTION, MUNICIPAL WATER SYSTEMS AND OTHER SERVICES

DESCRIPTION

JM Eagle's Blue Brute™ pipe, produced in blue or white, conforms to the AWWA C900 specification, with gaskets meeting ASTM F477 and joints in compliance with ASTM D3139. Blue Brute™ water pipe has the long-term hydrostatic strength to meet the high safety requirements commonly needed by municipal water systems. This pipe conforms to AWWA C900-07 Pressure Class 165 psi (DR 25), 235 psi (DR 18), 305 psi (DR 14); for sizes 4"-12" in diameter.

Note: Please contact JM Eagle™ Sales Department for availability and locations.

LONG LAYING LENGTHS

The standard laying length of Blue Brute™ PVC pipe is 20 feet. This means that more ground can be covered during installation while eliminating the cost of unnecessary joints.

LISTING STANDARDS ANSI/NSF STANDARD 61, UL 1285, FM APPROVAL

See Short Form Specification.

APPLICATIONS

These products are typically used for distribution pipelines of potable water. However, this pipe may be used for gravity sewer, force main, and water reclamation projects.

PURPLE RECLAIM AND GREEN SEWER FORCE MAIN

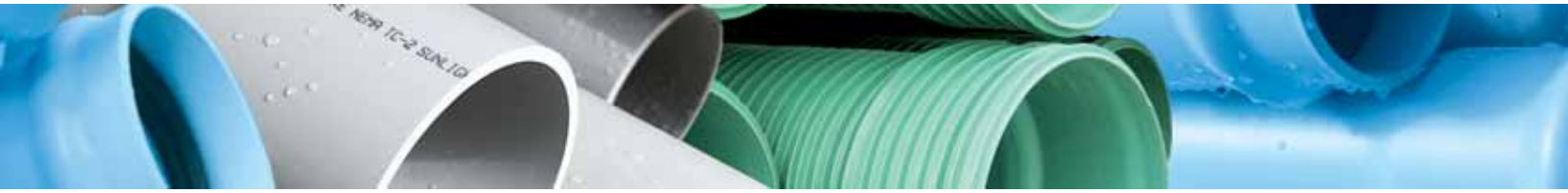
JM Eagle™ also manufactures this pipe in purple, specifically for reclaimed water systems and green for sewer force main applications. This pipe is made to the same requirements as our standard products. The only difference is that the pigment used is purple or green. These products will not be marked with UL or NSF listing marks. Additionally, the purple pipe will be marked: "Reclaimed Water... Do Not Drink" and the green pipe will be marked "Forced Sewer."

* For lengths of 14 feet, Non-Hydrotested DR 18 Sewer Pipe is available upon request.

QUALITY CONTROL

Without exception, each length of pipe is hydrostatically tested and subject to inspection by our quality control inspectors throughout every step of the manufacturing process. JM Eagle's Quality Management System is ISO 9001:2000 registered.* Copies of the registration certificates are available on our website at *www.jmeagle.com.*

* JM Eagle™ is in the process of obtaining the ISO 9001-2000 registration of Quality Management System for all locations.



CORROSION RESISTANCE

Blue Brute™ PVC pipe is unaffected by electrolytic or galvanic corrosion, or any known corrosive soil or water conditions. You don't have to worry about tuberculation, or the need for costly lining, wrapping, coating, or cathodic protection.

FLOW CAPACITY

This PVC water pipe has a smooth interior that stays smooth over long years of service with virtually no loss in carrying capacity. Its coefficient of flow is C = 150 (Hazen & Williams) the best available in common use water systems. This capacity often allows savings in pumping costs as well as savings on the size of pipe required.

SAVE IN HANDLING COSTS

Blue Brute™ PVC pipe is designed for installed-cost savings. Most sizes can be handled manually, so there is no need for costly installation equipment. Use the backhoe for excavating and backfilling only. Dig more trench, lay pipe faster, and save more in cost per foot installed.

FIELD CUTTING AND BEVELING

Blue Brute™ pipe can be field cut with a power saw or ordinary handsaw. This eliminates the need to invest in costly cutting equipment. The pipe can also be beveled without the use of any expensive or complicated machinery.

LIGHT WEIGHT

A 20 foot length of 8" DR 18 Blue Brute™ water pipe weighs approximately 184 pounds. Installers prefer it because it goes into the ground quickly—thus saving on installation costs.

SERVICE LIFE

Because it is nonmetallic, the pipe does not lose strength due to either potable water corrosion or external galvanic soil conditions.

INSTALLATION

This product should be installed in accordance with JM Eagle™ Publication JME-03B, "Blue Brute™, Big Blue™ and Ultra Blue™ (C900/C905/C909) Installation Guide" and "Pressure Pipe Tapping Guide."

PRODUCT DESCRIPTION

AWWA C900 BLUE BRUTE™

(CONTINUED)

CAST IRON O.D.

Available in 4", 6", 8", 10", and 12" trade sizes, this pipe can be connected directly into cast/ductile iron fittings and pipe. Connections to products with other O.D. regimens can be done using commonly available adapters or transition gaskets. Dimensions should be checked for use with butterfly valves.

RING-TITE™ JOINTS WITH LOCKED-IN GASKETS

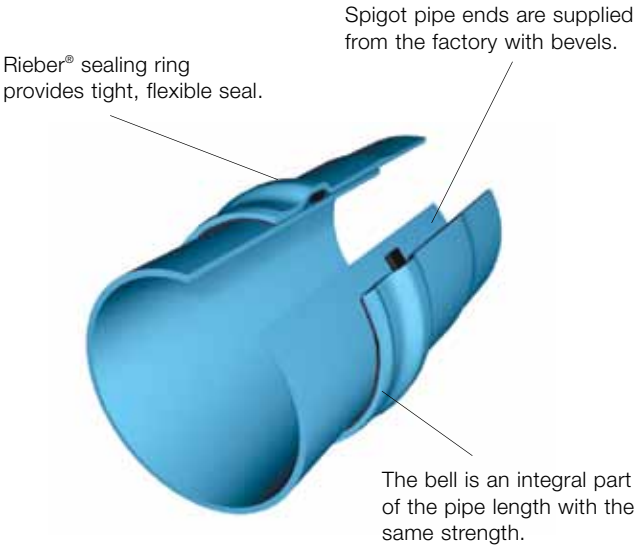
JM Eagle's Ring-Tite™ joint can be assembled quickly. Seated in a deep groove, the flexible elastomeric Rieber®* gasket provides a tight seal that protects the line from shock, vibration, earth movement and compensates for expansion and contraction of pipe lengths. There's no field mixing or application of cement. It's a simple push-together joint that remains tight under normal operating conditions.

The factory installed Rieber® gaskets provide a tight, flexible seal that resists rolling during installation. Special gasket types are available for use with certain chemical and petroleum products. Spigot pipe ends are supplied from the factory with bevels. The bell is an integral part of the pipe length with the same strength. Joints meet or exceed ASTM D3139 for joint tightness, including a 22 in. Hg vacuum for one hour, under deflection with no leakage.

Note: Other types of gaskets may be provided. JM Eagle™ is in the process of converting all gasketed products to the Rieber® ring gasket.

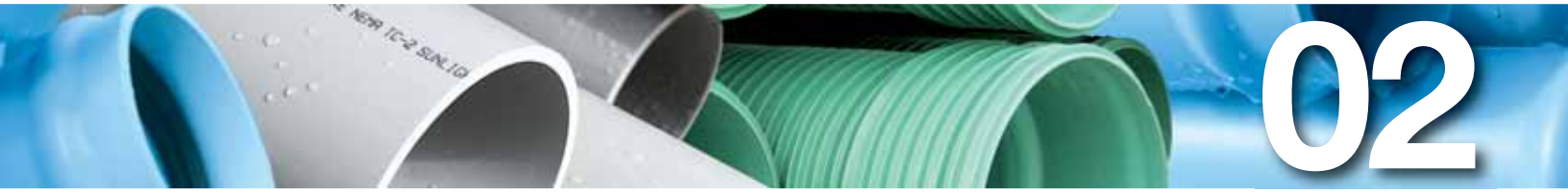
* Rieber® is a registered trademark of TI Specialty Polymer Products Inc.

RING-TITE™ JOINT



ACCESSORIES

JM Eagle's Blue Brute™ PVC pipe is compatible with all the items required for smooth installation of distribution pipelines.



02

SURGE DESIGN

It is important to note that for the same conditions of interrupted flow, the surge pressures generated in pipe with high tensile moduli will be greater than the surges in low moduli (PVC) pipe of similar dimensions.

As the modulus of tensile elasticity for a piping material increases, the resultant pressure surge, or “water hammer”, caused by a change in flow velocity also increases. For example, an instantaneous 2 fps (0.6 mps) flow velocity change in an 8" water main will create surge pressures as shown in **Table 1** for different pipe materials. For all system designs, surge pressures should be examined with the pipe material in use.

TABLE 1

PRESSURE SURGES IN 8 IN. WATER MAIN

In Response to 2 fps (0.6 mps) Instantaneous Flow Velocity Change.

PIPE PRODUCT	PRESSURE SURGE	
	psi	kPa
Class 50 DI Pipe	100.0	689
Class 150 AC Pipe	88.7	611
165 psi (DR 25) PVC Pipe	29.4	202

Pressure surges in PVC pipe of different dimension ratios in response to a 1 fps (0.3 mps) instantaneous flow velocity change are shown in **Table 2**.

TABLE 2

DESIGN TABLE FOR PVC PIPE-PRESSURE SURGE VS. DIMENSION RATIO

In Response to 1 fps (0.3 mps) Instantaneous Flow Velocity Change.

DIMENSION RATIO	PRESSURE SURGE	
	psi	kPa
14	19.8	137
18	17.4	120
25	14.7	101

03

SHORT FORM SPECIFICATION

AWWA C900 BLUE BRUTE™

SCOPE

This specification designates general requirements for 4" through 12" C.I.O.D.'s pipe produced in blue or white unplasticized polyvinyl chloride (PVC) plastic pressure pipe with integral bell and spigot joints for the conveyance of water and other fluids. This pipe shall meet the requirements of AWWA Standard C900, "Polyvinyl Chloride (PVC) Water Distribution Pipe."

MATERIALS

All pipe shall be made from quality PVC resin, compounded to provide physical and mechanical properties that equal or exceed cell class 12454 as defined in ASTM D1784.

HYDROSTATIC PROOF TESTING

Each standard length of pipe is tested up to 400 psi for Pressure Class 165; 600 psi for Pressure Class 235; 800 psi for Pressure Class 305 for a minimum of 5 seconds. The integral bell shall be tested with the pipe.

STANDARD LAYING LENGTHS

Standard laying lengths are 20 feet for all sizes. Other lengths of 14 feet, Non-Hydrotested pipe is available upon request.

PIPE

Where specified as such, all pipe shall be suitable for use as pressure conduit. Provisions must be made for expansion and contraction at each joint with an elastomeric gasket. The bell shall consist of an integral wall section with a factory installed, solid cross section Rieber® or other elastomeric gasket, which meets the requirements of ASTM F477. The bell section shall be designed to be at least as hydrostatically strong as the pipe barrel and meet the requirements of AWWA C900. The joint design shall meet the requirements of ASTM D3139 under both pressure and 22 in. Hg vacuum. Sizes and dimensions shall be as shown in this specification.

Pipe installation and usage shall be in compliance with JM Eagle™ Publication JME-03B, "Blue Brute™, Big Blue™ and Ultra Blue™ C900/C905/C909 Installation Guide" and Uni-Bell® Publication UNI-PUB-08-07, "Tapping Guide for PVC Pressure Pipe."

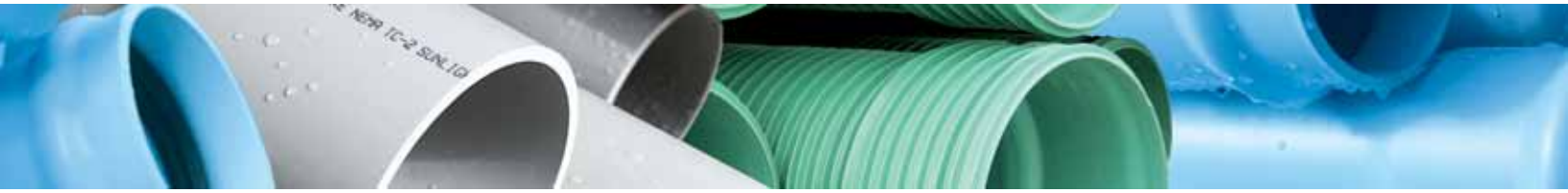
QUICK BURST TEST

Randomly selected samples tested in accordance with AWWA C900 and UL 1285 shall withstand, without failure, the pressures listed below when applied for 60-70 seconds.

DR	PRESSURE CLASS (psi)		MINIMUM BURST PRESSURE AT 73°F (psi)
	AWWA C900-97/FM 1612	AWWA C900-07	
25	100	165	535
18	150	235	755
14	200	305	985

DROP IMPACT TEST

Pipe shall withstand, without failure using Tup "B" and Flat Rate Holder "B", at 73°F, a tup impact energy of 100 ft-lbf for all Pressure Class of 4"-12" trade sizes. There shall be no visible evidence of shattering or splitting when the energy is imposed.



TESTING REQUIREMENTS PER AWWA C900

TEST	PRESSURE CLASS C900-07		
	165 psi	235 psi	305 psi
LONG TERM PRESSURE TEST 1000 hours (psi)	350	500	650
EXTRUSION QUALITY OF PVC PIPE BY ACETONE IMMERSION TEST METHOD ASTM D2152	20 min	20 min	20 min
FLATTENING TEST Tests extrusion quality and ductility under slow loading conditions. (Flattening Capability)	40% of OD between the plates within 2 - 5 min	40% of OD between the plates within 2 - 5 min	40% of OD between the plates within 2 - 5 min
HYDROSTATIC PROOF TEST (each piece) (psi)	330	470	610

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

PROPERTY	AWWA C900 BLUE BRUTE™ PVC PIPE	ASTM TEST METHOD
Fiber Hoop Stress at 73° F Minimum Short Term Bursting Strength (psi) 1,000 Hour Strength (psi) min	 6400 4200	 D1599 D1598
Working Pressure Rating 73° F (% of rating at 73° F) 80° F (% of rating at 73° F) 100° F (% of rating at 73° F)	 100% 88% 62%	
Chemical Resistance at 73° F Acids Salts - Bases	 Excellent Excellent	
Physical Properties of Compound Std. Test Specimens Minimum Tensile Strength (psi) at 73° F	7000	D638
Thermal Expansion (in / 100 ft / 50° F Change)	2"	
Fire Resistance	Self Extinguishing	
Flame Spread	10	E162
Smoke Development	330	E84
Coefficient of Flow Hazen & Williams	C = 150	
Mannings N Value	N = 0.009	

* For data, sizes, or classes not reflected in these charts, please contact JM Eagle™ for assistance.

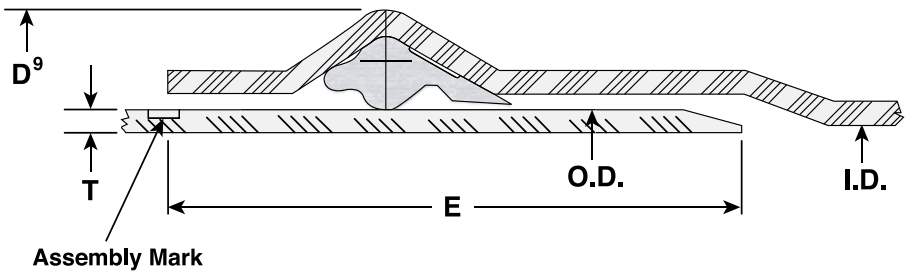
04

DIMENSIONS AND WEIGHTS

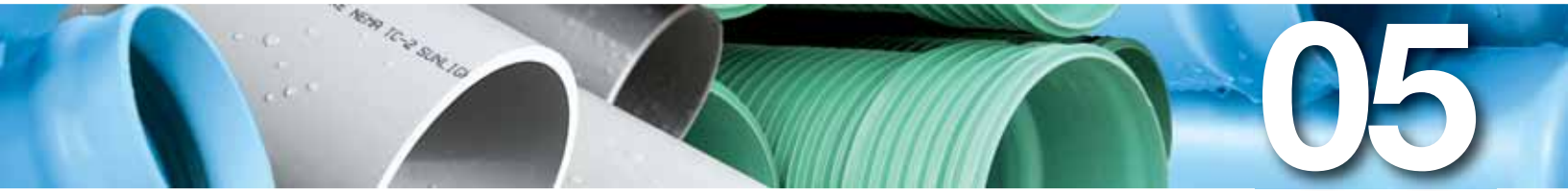
SUBMITTAL AND DATA SHEET

PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	MIN. E (IN)	APPROX. D[9] (IN)	APPROX. WEIGHT (LBS/FT)
PRESSURE CLASS 165 psi (DR 25)						
4	4.80	4.39	0.192	5.25	5.57	1.9
6	6.90	6.31	0.276	6.40	8.00	3.9
8	9.05	8.28	0.362	7.05	10.50	6.7
10	11.10	10.16	0.444	8.20	12.88	10.1
12	13.20	12.08	0.528	8.80	15.31	14.4
PRESSURE CLASS 235 psi (DR 18)*						
4	4.80	4.23	0.267	5.25	5.87	2.6
6	6.90	6.09	0.383	6.40	8.43	5.3
8	9.05	7.98	0.503	7.05	11.06	9.2
10	11.10	9.79	0.617	8.20	13.57	13.9
12	13.20	11.65	0.733	8.80	16.13	19.7
PRESSURE CLASS 305 psi (DR 14)*						
4	4.80	4.07	0.343	5.25	6.17	3.2
6	6.90	5.86	0.493	6.40	8.87	6.7
8	9.05	7.68	0.646	7.05	11.63	11.6
10	11.10	9.42	0.793	8.20	14.27	17.6
12	13.20	11.20	0.943	8.80	16.97	25.1

Consult JM Eagle™ for CSA and other listing availability prior to shipment.
Note: *FM Approvals Pressure Class 150 psi for DR 18 and 200 psi for DR 14.
* Contact your JM Eagle™ sales representative for location availability.



I.D. : Inside Dameter
O.D. : Outside Diameter
T. : Wall Thickness
D[9] : Bell Outside Diameter
E : Distance between Assembly Mark to the end of spigot.



FLOW/FRICTION CHARTS

FLOW/FRICTION LOSS, BLUE BRUTE™ PVC PIPE

4" C.I.O.D. (AWWA C900) ACTUAL O.D. 4.80 INCH

FLOW (GAL/MIN)	DR 25 (165 psi)		DR 18 (235 psi)		DR 14 (305 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
20	0.424	0.008	0.456	0.010	0.493	0.012
25	0.530	0.012	0.570	0.015	0.616	0.018
30	0.636	0.017	0.684	0.021	0.739	0.025
35	0.742	0.023	0.798	0.028	0.863	0.033
40	0.847	0.029	0.912	0.035	0.986	0.043
45	0.953	0.037	1.026	0.044	1.109	0.053
50	1.059	0.045	1.140	0.053	1.232	0.064
60	1.271	0.062	1.368	0.075	1.479	0.090
70	1.483	0.083	1.597	0.099	1.725	0.120
75	1.589	0.094	1.711	0.113	1.849	0.136
80	1.695	0.106	1.825	0.127	1.972	0.154
90	1.907	0.132	2.053	0.158	2.218	0.191
100	2.119	0.161	2.281	0.192	2.465	0.232
125	2.648	0.243	2.851	0.291	3.081	0.351
150	3.178	0.341	3.421	0.408	3.697	0.492
175	3.708	0.453	3.991	0.542	4.313	0.655
200	4.237	0.580	4.562	0.694	4.930	0.839
250	5.297	0.877	5.702	1.050	6.162	1.268
300	6.356	1.230	6.842	1.471	7.394	1.777
350	7.415	1.636	7.983	1.957	8.627	2.364
400	8.475	2.095	9.123	2.506	9.859	3.027
450	9.534	2.606	10.264	3.117	11.092	3.765
500	10.593	3.167	11.404	3.789	12.324	4.576
600	12.712	4.439	13.685	5.311	14.789	6.415
700	14.831	5.906	15.965	7.066	17.254	8.534

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, “Handbook of PVC Pipe Design and Construction.”

FLOW/FRICTION CHARTS

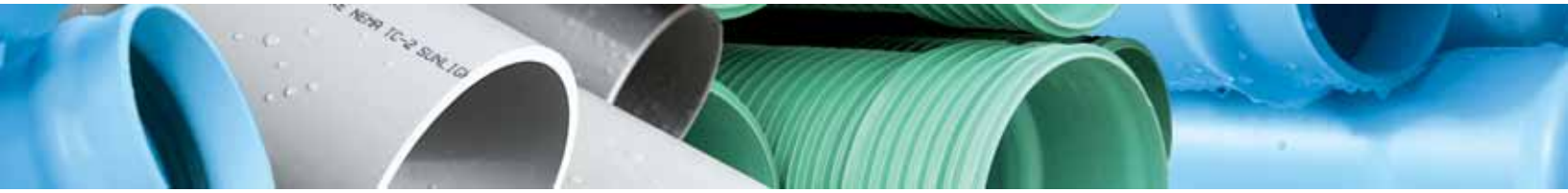
(CONTINUED)

FLOW/FRICTION LOSS, BLUE BRUTE™ PVC PIPE

6" C.I.O.D. (AWWA C900) ACTUAL O.D. 6.90 INCH

FLOW (GAL/MIN)	DR 25 (165 psi)		DR 18 (235psi)		DR 14 (305 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
50	0.513	0.008	0.552	0.009	0.596	0.011
60	0.615	0.011	0.662	0.013	0.716	0.015
70	0.718	0.014	0.772	0.017	0.835	0.021
75	0.769	0.016	0.827	0.019	0.895	0.023
80	0.820	0.018	0.882	0.022	0.954	0.026
90	0.923	0.023	0.993	0.027	1.073	0.033
100	1.025	0.027	1.103	0.033	1.193	0.040
125	1.282	0.042	1.379	0.050	1.491	0.060
150	1.538	0.058	1.655	0.070	1.789	0.084
175	1.794	0.078	1.930	0.093	2.087	0.112
200	2.051	0.099	2.206	0.119	2.385	0.143
250	2.563	0.150	2.758	0.179	2.982	0.217
300	3.076	0.210	3.309	0.251	3.578	0.304
350	3.589	0.280	3.861	0.334	4.175	0.404
400	4.101	0.358	4.412	0.428	4.771	0.518
450	4.614	0.446	4.964	0.533	5.367	0.644
500	5.126	0.542	5.516	0.647	5.964	0.783
600	6.152	0.759	6.619	0.907	7.156	1.097
700	7.177	1.010	7.722	1.207	8.349	1.460
800	8.202	1.294	8.825	1.546	9.542	1.869
1000	10.253	1.956	11.031	2.337	11.927	2.826

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, "Handbook of PVC Pipe Design and Construction."



FLOW/FRICTION LOSS, BLUE BRUTE™ PVC PIPE

8" C.I.O.D. (AWWA C900) ACTUAL O.D. 9.05 INCH

FLOW (GAL/MIN)	DR 25 (165 psi)		DR 18 (235 psi)		DR 14 (305 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
100	0.596	0.007	0.641	0.009	0.693	0.011
125	0.745	0.011	0.802	0.013	0.866	0.016
150	0.894	0.016	0.962	0.019	1.040	0.022
200	1.192	0.027	1.283	0.032	1.386	0.038
250	1.490	0.040	1.604	0.048	1.733	0.058
300	1.788	0.056	1.924	0.067	2.079	0.081
350	2.086	0.075	2.245	0.089	2.426	0.108
400	2.384	0.096	2.566	0.115	2.772	0.138
450	2.682	0.119	2.887	0.142	3.119	0.172
500	2.980	0.145	3.207	0.173	3.466	0.209
600	3.576	0.203	3.849	0.243	4.159	0.293
700	4.172	0.270	4.490	0.323	4.852	0.390
800	4.768	0.346	5.132	0.413	5.545	0.499
1000	5.960	0.523	6.415	0.625	6.931	0.754
1200	7.152	0.732	7.698	0.876	8.317	1.057
1400	8.344	0.975	8.981	1.165	9.704	1.407
1600	9.536	1.248	10.264	1.492	11.090	1.802
2000	11.920	1.887	12.829	2.256	13.862	2.724

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, "Handbook of PVC Pipe Design and Construction."

FLOW/FRICTION CHARTS

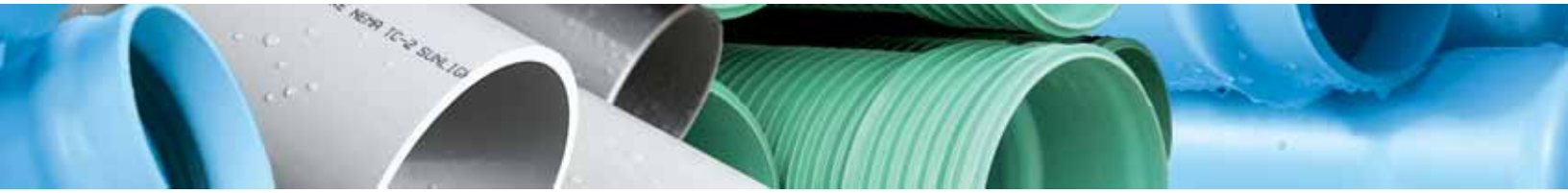
(CONTINUED)

FLOW/FRICTION LOSS, BLUE BRUTE™ PVC PIPE

10" C.I.O.D. (AWWA C900) ACTUAL O.D. 11.10 INCH

FLOW (GAL/MIN)	DR 25 (165 psi)		DR 18 (235 psi)		DR 14 (305 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
175	0.693	0.008	0.746	0.009	0.807	0.011
200	0.792	0.010	0.853	0.012	0.922	0.014
250	0.990	0.015	1.066	0.018	1.152	0.021
300	1.189	0.021	1.279	0.025	1.383	0.030
350	1.387	0.028	1.492	0.033	1.613	0.040
400	1.585	0.035	1.706	0.042	1.843	0.051
450	1.783	0.044	1.919	0.053	2.074	0.064
500	1.981	0.054	2.132	0.064	2.304	0.077
600	2.377	0.075	2.559	0.090	2.765	0.109
700	2.773	0.100	2.985	0.120	3.226	0.144
800	3.169	0.128	3.411	0.153	3.687	0.185
1000	3.962	0.194	4.264	0.231	4.609	0.280
1200	4.754	0.271	5.117	0.324	5.530	0.392
1400	5.547	0.361	5.970	0.432	6.452	0.521
1600	6.339	0.462	6.823	0.553	7.374	0.668
2000	7.924	0.699	8.528	0.835	9.217	1.009
2500	9.905	1.056	10.661	1.263	11.522	1.526
3000	11.886	1.480	12.793	1.770	13.826	2.139

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, “Handbook of PVC Pipe Design and Construction.”



FLOW/FRICTION LOSS, BLUE BRUTE™ PVC PIPE

12" C.I.O.D. (AWWA C900) ACTUAL O.D. 13.20 INCH

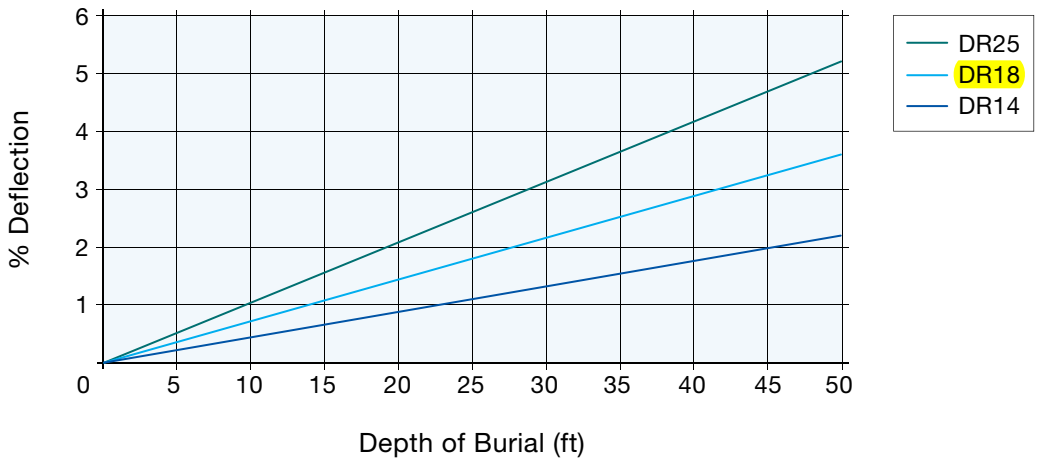
FLOW (GAL/MIN)	DR 25 (165 psi)		DR 18 (235 psi)		DR 14 (305 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
300	0.840	0.009	0.904	0.011	0.978	0.013
350	0.981	0.012	1.055	0.014	1.141	0.017
400	1.121	0.015	1.206	0.018	1.304	0.022
450	1.261	0.019	1.357	0.023	1.467	0.027
500	1.401	0.023	1.507	0.028	1.629	0.033
600	1.681	0.032	1.809	0.039	1.955	0.047
700	1.961	0.043	2.110	0.051	2.281	0.062
800	2.241	0.055	2.412	0.066	2.607	0.080
1000	2.802	0.083	3.015	0.100	3.259	0.120
1200	3.362	0.117	3.617	0.140	3.911	0.169
1400	3.922	0.155	4.220	0.186	4.563	0.224
1600	4.482	0.199	4.823	0.238	5.214	0.287
2000	5.603	0.301	6.029	0.359	6.518	0.434
2500	7.004	0.455	7.536	0.543	8.147	0.657
3000	8.405	0.637	9.044	0.761	9.777	0.920
3500	9.805	0.848	10.551	1.013	11.406	1.225
4000	11.206	1.085	12.058	1.297	13.036	1.568
4500	12.607	1.350	13.565	1.613	14.665	1.950

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, "Handbook of PVC Pipe Design and Construction."

06

DEFLECTION CHART

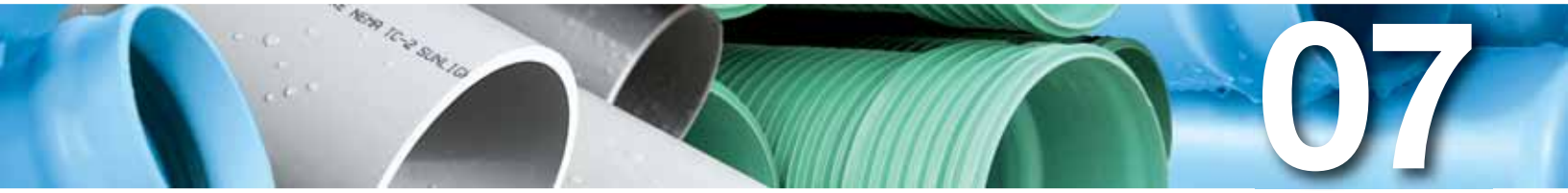
Blue Brute™ Deflection By Depth of Burial : : †



: : Deflections computed using a unit weight of backfill at 120 lbs/cft and assume no internal pressure or live load.

: : Pipe embedment used in calculations is Class 1, 2, 3, or 4, as defined in ASTM D2321 with appropriate compaction to achieve an E'=1000 psi.

† Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, “Handbook of PVC Pipe Design and Construction.”



07

SHORT FORM INSTALLATION GUIDE/ WARNING

This information is furnished in order to provide a brief review of the installation requirements for JM Eagle™ Blue Brute™ PVC pipe. It is not intended to serve as or replace the function of the FULL VERSION product installation guide available upon request.

1. Check to see that the gasket is properly seated in the bell groove, and that the bell and spigot are clean before assembly.
2. Apply the approved lubricant supplied with the pipe to the spigot end of the pipe, paying particular attention to the bevel. The coating should be equivalent to a brush coat of enamel paint.
3. Assemble the joint only to and not over the stop mark provided on the spigot end.
4. If undue resistance to insertion of the spigot is encountered, or the assembly mark does not reach the flush position, disassemble the joint and check the position of the rubber gasket, and remove any debris.
5. Curvature of the pipe shall be accomplished through longitudinal bending of the pipe barrel in accordance with the following table. Deflection of the joint is not allowed and may cause leakage.

PIPE SIZE (IN)	RADIUS (FT)
4	100
6	150
8	200
10	250
12	300

6. Prior to backfilling, check to see that the assembly mark is flush with the end of the bell.
7. All taps performed on JM Eagle's pressure products, shall be in accordance with Uni-Bell® Publication UNI-PUB-08-07, "Tapping Guide for PVC Pressure Pipe."

WARNING: RUPTURE HAZARD

IMPROPER INSTALLATION OR MISUSE OF TAPPING TOOLS MAY CAUSE PIPES UNDER HIGH PRESSURE TO RUPTURE AND RESULT IN HIGH VELOCITY AIRBORNE FRAGMENTATION LEADING TO SERIOUS INJURIES AND/OR DEATH.

BEFORE AND DURING INSTALLATION, ALWAYS:

- Consult and follow the FULL VERSION of the product installation guide
- Closely follow job specifications
- Use protective gear and equipment

BEFORE AND DURING TAPPING, ALWAYS:

- Consult and follow Uni-Bell® Publication UNI-PUB-08-07, "Tapping Guide for PVC Pressure Pipe."
- Use the correct tapping tools
- Bleed air from pipes at high spot before tapping
- Use protective gear and equipment

Please contact JM Eagle™ Product Assurance at (800) 621-4404 to obtain FULL VERSION of the appropriate installation guide or for further assistance.

08 WARRANTY

JM EAGLE™ PRODUCTS LIMITED WARRANTY

J-M Manufacturing Co., Inc. (JM Eagle™) warrants that its standard polyvinyl chloride (PVC), polyethylene (PE), conduit/plumbing/solvent weld and Acrylonitrile-Butadiene-Styrene (ABS) pipe Products ("Products") are manufactured in accordance with applicable industry specifications referenced on the Product and are free from defects in workmanship and materials. Every claim under this warranty shall be void unless in writing and received by JM Eagle™ within thirty (30) days of the date the defect was discovered, and within one (1) year of the date of shipment from the JM Eagle™ plant. Claims for Product appearance defects, such as sun-bleached pipe etc., however, must be made within thirty (30) days of the date of the shipment from the JM Eagle™ plant. This warranty specifically excludes any Products allowed to become sun-bleached after shipment from the JM Eagle™ plant. Proof of purchase with the date thereof must be presented to the satisfaction of JM Eagle™, with any claim made pursuant to this warranty. JM Eagle™ must first be given an opportunity to inspect the alleged defective Products in order to determine if it meets applicable industry standards, if the handling and installation have been satisfactorily performed in accordance with JM Eagle™ recommended practices and if operating conditions are within standards. Written permission and/or a Return Goods Authorization (RGA) must be obtained along with instructions for return shipment to JM Eagle™ of any Products claimed to be defective.

The limited and exclusive remedy for breach of this Limited Warranty shall be, at JM Eagle's sole discretion, the replacement of the same type, size and like quantity of non-defective Product, or credits, offsets, or combination of thereof, for the wholesale purchase price of the defective unit.

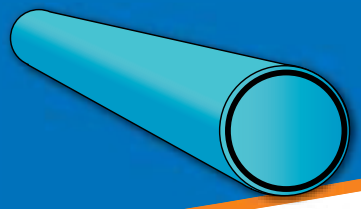
This Limited Warranty does not apply for any Product failures caused by user's flawed designs or specifications, unsatisfactory applications, improper installations, use in conjunction with incompatible materials, contact with aggressive chemical agents, freezing or overheating of liquids in the product and any other misuse causes not listed here. This Limited Warranty also excludes failure or damage caused by fire stopping materials, thread sealants, plasticized vinyl Products or damage caused by the fault or negligence of anyone other than JM Eagle™, or any other act or event beyond the control of JM Eagle™.

JM Eagle's liability shall not, at any time, exceed the actual wholesale purchase price of the Product. The warranties in this document are the only warranties applicable to the Product and there are no other warranties, expressed or implied. This Limited Warranty specifically excludes any liability for general damages, consequential or incidental damages, including without limitation, costs incurred from removal, reinstallation, or other expenses resulting from any defect. IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE SPECIFICALLY DISCLAIMED AND JM EAGLE™ SHALL NOT BE LIABLE IN THIS RESPECT NOTWITHSTANDING JM EAGLE'S ACTUAL KNOWLEDGE THE PRODUCT'S INTENDED USE.

JM Eagle's Products should be used in accordance with standards set forth by local plumbing and building laws, codes, or regulations and the applicable standards. Failure to adhere to these standards shall void this Limited Warranty. Products sold by JM Eagle™ that are manufactured by others are warranted only to the extent and limits of the warranty of the manufacturer. No statement, conduct or description by JM Eagle™ or its representative, in addition to or beyond this Limited Warranty, shall constitute a warranty. This Limited Warranty may only be modified in writing signed by an officer of JM Eagle™.

C900 : PVC Pressure Pipe

SPECIFICATION DATA



Diamond (C900) PVC Pipe (4" through 12") is made of 12454 compound per ASTM D1784, in accordance with the dimensional, chemical, and physical requirements of AWWA C900.

Diamond (C900) PVC Pipe bears the mark of NSF, International (NSF), the listing of Underwriters Laboratory, Inc. (UL), and (DR14 & DR18) bears the listing of Factory Mutual(FM). Some factory locations produce C900 bearing the mark of the Canadian Standards Association (CSA).

Diamond (C900) PVC Pipe utilizes a gasket, per ASTM F477, to seal the integral bell socket to the spigot of the next joint (which conforms to the requirements of ASTM D3139.) Each male end is beveled to facilitate joint assembly, and the spigot is referenced marked to ensure proper insertion depth. Diamond furnished lubricant is to be used in the joining process. Specialty gaskets may be available upon request.

Diamond C900 is supplied in 20 foot laying lengths.

Physical Properties of PVC 12454:

Property	ASTM Test	Minimum
Specific Gravity	D792	1.40
Tensile Strength, psi	D638	7,000
Tensile Modulus, psi	D638	400,000
IZOD Impact Strength	D256	.65ft., lb./in.

Underwriters Laboratories Inc.©

FM APPROVED

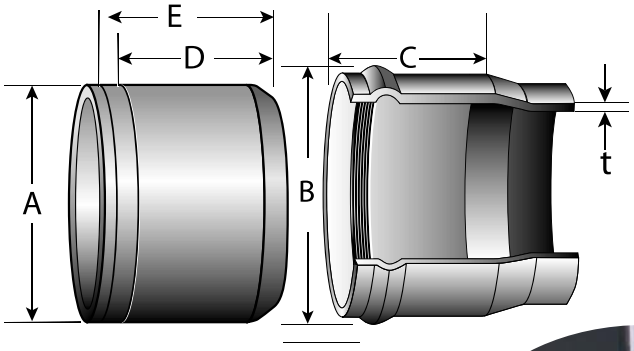
SHORT FORM **Specification for Diamond C900 PVC Water Pipe**

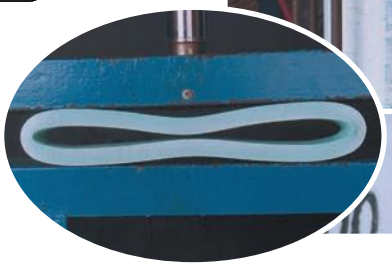
Diamond C900 PVC Water Pipe shall be made of compounds conforming to ASTM D1784 with a cell classification of 12454. Diamond C900 shall meet all the dimensional, chemical, and physical requirements as outlined in AWWA C900 and will be supplied in 20 foot laying lengths. Joints shall meet the requirements of ASTM D3139 and shall be formed using Rieber Technology. Gaskets shall meet the requirements of ASTM F477.
Potable water pipe shall be manufactured from National Sanitation Foundation (NSF) approved compounds.

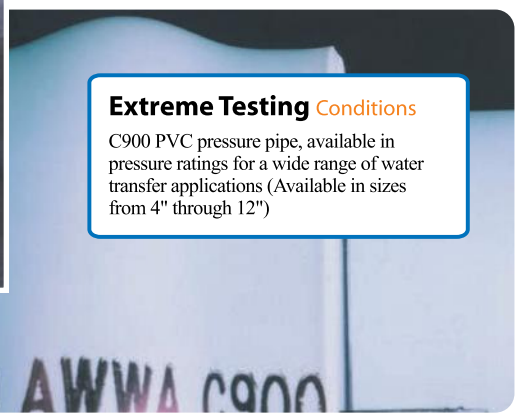
DIAMOND PLASTICS® CORPORATION

Corporate Headquarters • 1212 Johnstown Road • P.O. Box 1608 • Grand Island, NE 68802-1608

Rieber Joint Illustration







Extreme Testing Conditions

C900 PVC pressure pipe, available in pressure ratings for a wide range of water transfer applications (Available in sizes from 4" through 12")

C900™ AWWA C900 SPECIFICATION DATA

Nominal Pipe Size in. (mm)	Outside Dia. A Inches	Bell Dia. B Inches	Approximate Bell Depth C Inches	Assembly Mark 1 (D) Inches #	Assembly Mark 2 (E) Inches #	C900 DR-14 305 psi Min Wall (t) Inches	C900 DR-18 235 psi Min Wall (t) Inches	C900 DR-25 165 psi Min Wall (t) Inches
4″ (100)	4.800	6-1/2″	6	4-1/4″	5-1/4″	0.343	0.267	0.192
6″ (150)	6.900	9-1/4″	6.5	4-5/8″	5-5/8″	0.493	0.383	0.276
8″ (200)	9.050	11-3/4″	7	5-1/8″	6-1/8″	0.646	0.503	0.362
10″ (250)	11.100	14-1/4″	7.5	5-3/4″	6-3/4″	0.793	0.617	0.444
12″ (300)	13.200	16-3/4″	8	6-1/8″	7-1/8″	0.943	0.733	0.528

#Tolerance of +/- 1/4" allowed

DIAMOND PLASTICS® CORPORATION

Corporate Headquarters • 1212 Johnstown Road • P.O. Box 1608 • Grand Island, NE 68802-1608

AWWA C900/IB PVC Pressure Pipe | Gasketed Integral Bell

NAPCO's AWWA C900 Gasketed Integral Bell PVC Pipe product line is manufactured to meet the needs of modern municipal water, wastewater, and reclaimed water systems. With top quality raw materials and modern processing technology, our C900 pipe meets all industry standards in addition to our own rigorous quality control requirements.

Our C900 pipe utilizes Rieber style gaskets throughout the entire product offering to create a leak-free joint.

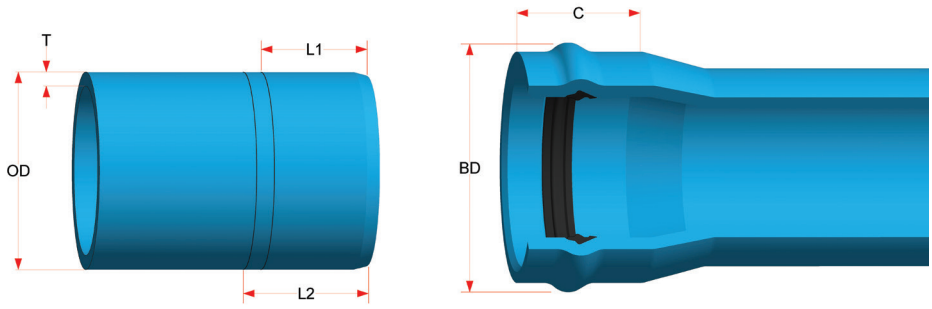
Short Form Specification		
Pipe Standard:	AWWA C900-16	
Diameter Std.:	Cast Iron Outside Diameter (CIOD)	
Nominal Sizes:	4", 6", 8", 10", 12", 14", 16", 18", 20", 24", 30", 36"	
Dimension Ratios & Pressure Ratings"	DR 51 – 80 psi DR 41 – 100 psi DR 32.5 – 125 psi DR 25 – 165 psi DR 21 – 200 psi	DR 18 – 235 psi (185 psi)** DR 14 – 305 psi (250 psi)**
Lay Length:	20' [6.1m]	
Pipe Compound:	ASTM D1784 Cell Class 12454	
Pipe Joint Std.:	ASTM D3139	
Max. Angular Joint Deflection:‡	1°	
Gasket Standard:	ASTM F477, UL 157	
Gasket Material Offerings:	Standard – SBR Optional – NBR or EPDM	
Installation Std.:	AWWA C605	

Applications	Potable Water	Waste-water	Reclaimed Water
Color:	Blue	Green	Purple
Certifications:*	NSF 14, NSF 61 CSA B137.3* UL 1285 FM 1612** BNQ 3624-250 (24in)*, BNQ 3660-950 (24in)	CSA B137.3*	CSA B137.3*

**See Certification Letter for full explanation and list of exceptions.*
***FM 1612 calculates pressure ratings differently than AWWA for 4"-12" only with DR 18 as 185 psi and DR 14 as 250 psi.*
‡See Installation Guide for more information.

Only products bearing the NSF Mark are Certified

AWWA C900/IB PVC Pressure Pipe | Gasketed Integral Bell



C900/IB PIPE DIMENSIONS & PERFORMANCE									
Nom. Size	Outside Diameter (OD)	DR	Pressure Class psi [kPa]	Min. Wall Thickness (T)	Internal Diameter (ID)	Approx. Bell Diameter (BD)	Bell Depth (C)	1st Insertion Mark (L1)	2nd Insertion Mark (L2)
4" [100mm]	4.800 [121.9]	25	165 [1150]	0.192 [4.88]	4.416 [112.1]	6.250 [158.8]	5.000 [127]	3.375 [85.7]	4.375 [111.1]
		18	235 [1620]	0.267 [6.78]	4.266 [108.3]				
		14	305 [2130]	0.343 [8.70]	4.114 [104.5]				
6" [150mm]	6.900 [175.3]	25	165 [1150]	0.276 [7.00]	6.348 [161.3]	8.625 [219.1]	5.750 [146.1]	4.625 [117.5]	5.625 [135.3]
		18	235 [1620]	0.383 [9.72]	6.134 [155.9]				
		14	305 [2130]	0.493 [12.50]	5.914 [150.3]				
8" [200mm]	9.050 [229.9]	25	165 [1150]	0.362 [9.20]	8.326 [211.5]	11.500 [292.1]	7.000 [177.8]	5.625 [135.3]	6.625 [168.3]
		18	235 [1620]	0.503 [12.80]	8.044 [204.3]				
		14	305 [2130]	0.646 [16.40]	7.758 [197.1]				
10" [250mm]	11.100 [281.9]	25	165 [1150]	0.444 [11.30]	10.212 [259.3]	14.000 [355.6]	7.250 [184.2]	6.125 [155.6]	7.125 [181.0]
		18	235 [1620]	0.617 [15.70]	9.866 [250.3]				
		14	305 [2130]	0.793 [20.10]	9.514 [241.7]				
12" [300mm]	13.200 [335.3]	25	165 [1150]	0.528 [13.40]	12.144 [308.5]	16.563 [420.7]	8.000 [203.2]	6.875 [174.6]	7.875 [200]
		18	235 [1620]	0.733 [18.60]	11.734 [298.1]				
		14	305 [2130]	0.943 [23.90]	11.314 [287.5]				
14" [350mm]	15.300 [388.6]	32.5	125 [860]	0.471 [12.0]	14.358 [364.7]	19.063 [484.2]	9.000 [228.6]	7.500 [190.5]	8.500 [215.9]
		25	165 [1150]	0.612 [15.6]	14.076 [357.5]				
		21	200	0.729	13.842				
		18	235 [1620]	0.850 [21.6]	13.600 [345.4]				
		14	305	1.093	13.114				
16" [400mm]	17.400 [442.0]	41	100	0.424	16.552	21.750 [552.5]	10.000 [254.0]	8.500 [215.9]	9.500 [241.3]
		32.5	125 [860]	0.535 [13.6]	16.330 [414.8]				
		25	165 [1150]	0.696 [17.7]	16.008 [406.6]				
		21	200	0.829	15.742				
		18	235 [1620]	0.967 [24.6]	15.466 [392.8]				
		14	305	1.243	14.914				

AWWA C900/IB PVC Pressure Pipe | Gasketed Integral Bell

C900/IB PIPE DIMENSIONS & PERFORMANCE									
Nom. Size	Outside Diameter (OD)	DR	Pressure Class psi [kPa]	Min. Wall Thickness (T)	Internal Diameter (ID)	Approx. Bell Diameter (BD)	Bell Depth (C)	1st Insertion Mark (L1)	2nd Insertion Mark (L2)
18" [450mm]	19.500 [459.3]	41	100	0.476	18.548	23.563 [598.5]	10.375 [263.5]	8.875 [225.4]	9.875 [250.8]
		32.5	125 [860]	0.600 [15.2]	18.300 [464.8]				
		25	165 [1150]	0.780 [19.8]	17.940 [455.7]				
		21	200	0.929	17.642				
		18	235 [1620]	1.083 [27.5]	17.334 [440.3]				
20" [500mm]	21.600 [548.6]	32.5	125 [860]	0.665 [16.9]	20.270 [514.9]	26.063 [662.0]	11.000 [279.4]	9.500 [241.3]	10.500 [266.7]
		25	165 [1150]	0.864 [22.0]	19.872 [504.7]				
		21	200	1.029	19.542				
		18	235 [1620]	1.200 [30.5]	19.200 [487.7]				
24" [600mm]	25.800 [655.3]	41	100	0.629	24.542	31.063 [789.0]	13.000 [330.2]	11.500 [292.1]	12.500 [317.5]
		32.5	125 [860]	0.794 [20.2]	24.212 [615.0]				
		25	165 [1150]	1.032 [26.2]	23.736 [602.9]				
		21	200	1.229	23.342				
		18	235 [1620]	1.433 [36.4]	22.934 [582.5]				
30" [750mm]	32.000 [812.8]	51	80 [550]	0.627 [15.90]	30.746 [781]	37.500 [952.5]	15.125 [384.2]	13.625 [346.1]	14.625 [371.5]
		41	100 [650]	0.780 [19.80]	30.440 [741.4]				
		32.5	125 [860]	0.985 [25.00]	30.030 [762.8]				
		25	165 [1150]	1.280 [32.50]	29.440 [747.8]				
		21	200	1.524	28.952				
		18	235 [1620]	1.778 [45.20]	28.444 [722.4]				
36" [900mm]	38.300 [972.8]	51	80 [550]	0.751 [19.10]	36.798 [934.6]	44.500 [1130.3]	19.125 [485.8]	17.625 [447.7]	18.625 [473.1]
		41	100 [650]	0.934 [23.70]	36.432 [925.4]				
		32.5	125 [860]	1.178 [29.90]	35.944 [913.0]				
		25	165 [1150]	1.532 [38.90]	35.236 [895.0]				
		21	200	1.824	34.652				

Notes:
1. These dimensions are for estimating purposes only. All dimensions not in brackets are in inches unless otherwise specified.
2. Products certified to CSA B137.3 have dimensions in brackets in millimeters unless otherwise specified.
3. DR = Dimension Ratio
4. AWWA and CSA Pressure Class @ 73°F [23°C] which includes a 2:1 safety factor.
5. Internal diameter calculated using nominal outside diameter and minimum wall thickness.
6. Dimension given for Approx. Bell Diameter (BD) is for highest pressure class.

VINYLTECH AWWA C900-07

TECHNICAL DATA SUBMITTAL

VINYLTECH VT PVC • PIPE

AWWA C900-07

CONFORMANCE

These specifications designate the requirements for manufacturing and installing Vinyltech AWWA C900-07 water pipe.

AWWA C900-07 - Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. Through 12 In. (100mm Through 300mm), for Water Transmission and Distribution

AWWA C605 - Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water

ASTM D1784 - Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds

ASTM D3139 - Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals

ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

ASTM D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading

UNI-PUB-8 - Tapping Guide for AWWA C900 Pressure Pipe

UNI-B-8 - Recommended Practice for the Direct Tapping of PVC Pressure Water Pipe (Nominal Diameters 6-12 inch)

PIPE COMPOUND

The pipe shall be extruded from compounds meeting (PVC1120) the requirements of Cell Classification 12454, as defined in ASTM D1784, Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds. The PVC shall also be listed by the National Sanitation Foundation (NSF) for use in potable water.

PIPE

Vinyltech pipe shall be manufactured in accordance with AWWA C900-07.

GASKET JOINT

The gasket shall be reinforced with a steel band and meet the requirements of ASTM F477. Vinyltech pipe shall have an integral bell end with a locked-in factory installed gasket and shall meet the joint requirements of ASTM D3139.

MARKING

The pipe shall be marked in accordance with AWWA C900 as in the following example.

a) Manufacturer's name and production codes
b) Nominal size, dimension ratio number, and O.D. base (for example, 8" DR 18 CIS)
c) Materials cell classification (PVC1120)
d) AWWA pressure class (235 psi or 305 psi) and hydrostatic test pressure (T600, or T800)
e) AWWA designation number (AWWA C900-07)
f) National Sanitaion Foundation (NSF-61)
g) Underwriters Laboratories (UL) logo, third party certification.
h) Production date and time code (VABB15B 48.34)
i) FM Approvals (FM) logo, required FM pressure rating (150 or 200 psi), third party certification

QUALITY CONTROL

Each length of the pipe including the bell shall be hydrostatically tested. The pipe shall meet all additional test requirements as described in AWWA C900-07. Our full time quality assurance staff continually administers a rigid program of tests to maintain the production of the best pipe products available.

INSTALLATION

Recommended installation procedure of Vinyltech Corporation and the Uni-Bell PVC Pipe Association are outlined in AWWA C605, Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water. The Uni-Bell Handbook of PVC Pipe is also an invaluable resource guide for design and installation.

TAPPING

The consistent success of tapping PVC pressure pipe is contingent upon the use of proper procedures and equipment. Vinyltech recommends strict compliance with the requirements as specified in UNI-B-8, UNI-PUB-8, and AWWA C605.

ASSEMBLING THE PIPE

Assembly of Vinyltech PVC water pipe is easily accomplished. A depth of entry mark is on each spigot end to serve as a visual check for rapid, accurate joint inspection. **Do not over insert**.

1) Remove any mud, sand, or other foreign matter from the belled and spigot ends of the pipe. Carefully clean the gasket area.
2) With a clean applicator (a brush or hand) lubricate the entire surface of the pipe from the spigot end to the depth of entry mark and the contact surface of the gasket with **Vinyltech Brand Lubricant**.
3) Brace the bell to avoid disturbing the already installed joints. Align the pipe, insert the spigot into the bell and push.
4) **Do not insert past the entry mark line**.

FM APPROVED

NSF CERTIFIED TO NSF/ANSI 61

UL Underwriters Laboratories Inc.® LISTED

VINYLTECH VT PVC • PIPE
201 S. 61st Avenue • Phoenix, AZ 85043
602 233-0071 • 602 272-4847 Fax • www.vtpipe.com
a varistar company

Effective 02/12

VINYLTECH VT PVC•PIPE

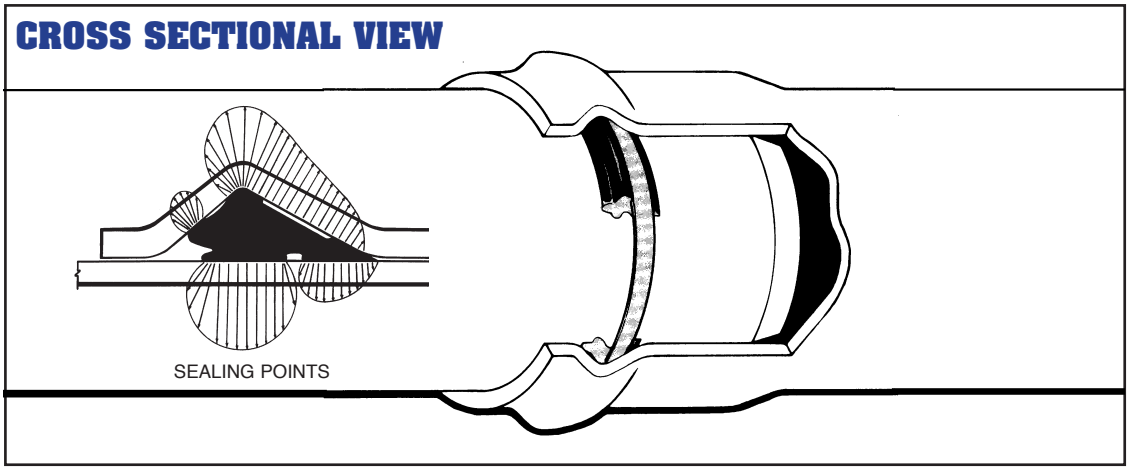
VINYLTECH AWWA C900-07

TECHNICAL DATA SUBMITTAL

C900 DR 18 PRESSURE CLASS 235						
NOMINAL SIZE (IN)	(mm)	OUTER DIAMETER (IN)	MINIMUM WALL (IN)	LIFTS PER TRUCK	FEET PER LIFT	APPROXIMATE WEIGHT (LB/100')
4	(100)	4.800	0.267	16	1020	251.6
6	(150)	6.900	0.383	16	440	521.2
8	(200)	9.050	0.503	20	200	903.0
10	(250)	11.100	0.617	12	240	1364.4
12	(300)	13.200	0.733	28	60-80	1935.8

C900 DR 14 PRESSURE CLASS 305						
NOMINAL SIZE (IN)	(mm)	OUTER DIAMETER (IN)	MINIMUM WALL (IN)	LIFTS PER TRUCK	FEET PER LIFT	APPROXIMATE WEIGHT (LB/100')
4	(100)	4.800	0.343	16	1020	317.5
6	(150)	6.900	0.493	16	440	658.7
8	(200)	9.050	0.646	20	200	1139.7
10	(250)	11.100	0.793	12	240	1722.3
12	(300)	13.200	0.943	28	60-80	2445.5

CROSS SECTIONAL VIEW



THE RIEBER SEALING SYSTEM

The Rieber system provides a proven pipe joint with an excellent track record in the field. It is the fastest growing system in the world because of its many advantages.

- Factory installed, locked-in gasket
- The pipe bell forms over the gasket, making a perfect fit
- Avoids the possibility of installing the wrong gasket
- Reduces installation problems
- The locked-in gasket eliminates gasket roll-out during joining
- The gasket is molded vs. extruded and spliced
- Works equally well under pressure or vacuum
- Three sealing points achieved vs. two
- **LEAK-PROOF JOINTS**
- **"THE WORLDS BEST JOINT"**

AWWA C900-07

VINYLTECH VT PVC•PIPE

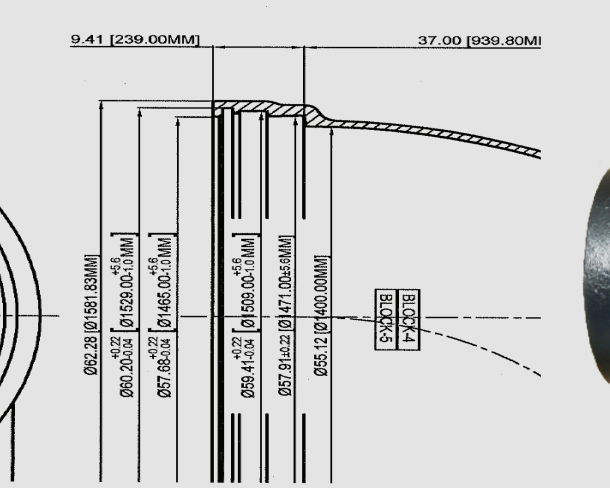
201 S. 61st Avenue • Phoenix, AZ 85043
602 233-0071 • 602 272-4847 Fax • www.vtpipe.com

a varistar company

SIGMA™

Quality – Service – Commitment – Delivered.

C153 Compact Push-On Fittings



3-24in C153 TYTON JOINT® COMPACT PUSH ON FITTINGS BASIC SPECIFICATIONS

MATERIAL	Ductile Iron ASTM A536, Grade 65-45-12, 60-42-10 or 70-50-05
PRESSURE	4” - 24” 350 psi WWP (2415 k Pa)
LAYING LENGTH	Short Body Design, straight section of body deleted to provide a compact and lighter fitting without reducing strength or flow characteristics, in accordance with ANSI/AWWA C153/A21.53.
CEMENT LINING	In accordance with ANSI / AWWA C104 / A21.4
COATING	Interior of fitting is seal coated (asphaltic material) in accordance with ANSI / AWWA C104 / A21.4 and NSF61 approved.
COATING	Exterior of fitting is seal coated (asphaltic material) in accordance with ANSI / AWWA C153/A21.53 and NSF approved.
GASKETS	SBR in accordance with AWWA C111 (ANSI A21.11)
STANDARDS	NSF 61 ANSI/AWWA C153/A21.53
JOINT	TYTON JOINT® push-on bell joint design, manufactured by SIGMA under license from the United States Pipe and Foundry Comapny.
DEFLECTION	up to 5 degrees, in accordance with TYTON JOINT bell design
APPROVALS	4-12”: Underwriters Laboratories listed and Factory Mutual approved

QUALITY MANAGEMENT SPECIFICATIONS

TESTING	All fittings tested in accordance with ANSI/AWWA C153/A21.53; additionally all fittings are hydrostatically tested in accordance with SIGMA Quality Management Standards.
TRACEABILITY	All fittings are HEAT coded to ensure traceability and verification of ductile iron metallurigcal properties in accordance with SIGMA Quality Management Standards.

FM APPROVED AWWA Member UL NSF Certified to ANSI/NSF 61

SIGMA Corporation

700 Goldman Drive
Cream Ridge, NJ 08514

800 999 2550 p
609 758 1163 f
crm-sales@sigmaco.com

www.sigmaco.com

Ductile Iron Push-On Fittings

ANSI/AWWA C153/A21.53

GENERAL SPECIFICATIONS

MATERIAL:	Ductile iron per ASTM A536
PRESSURE:	350 PSI rating for 4" - 24" sizes. Pressure rating applies to fittings only and does not apply to restraining lugs or external restrainers
TESTING:	In accordance with ANSI/AWWA C153/A21.53 and UL requirements
LAYING LENGTH:	In accordance with ANSI/AWWA C153/A21.53 (fittings not listed in ANSI/AWWA have dimensions per Star design as noted in the catalog)
WEIGHTS:	Are in pounds, unless noted otherwise and do not include accessories, cement lining and coating
FLANGES:	Flanged ends on fittings match ANSI/AWW C115/A21.15 and ANSI B16.1 class 125 flanges
CEMENT LINING:	In accordance with ANSI/AWWA C104/A21.4 -- sizes 4" - 24" double thickness
COATING:	Asphaltic seal coat inside and out in accordance with ANSI/AWWA C104/A21.4 and referenced in ANSI/AWWA C153/A21.53
GASKETS:	Dual hardness SBR in accordance with ANSI/AWWA C111/A21.11
APPROVALS:	4" - 12" Underwriters Laboratories Listed. Please consult factory for detail listing and approvals. 4" and greater are UL/NSF-61
DIMENSIONS:	All dimensions are in inches unless noted otherwise.
INSTALLATION:	Per ANSI/AWWA C600 and C111 using DIP conforming to C150/C151 and PVC pipe conforming to C900/C905

AWWA MEMBER

CLASSIFIED UL WATER QUALITY

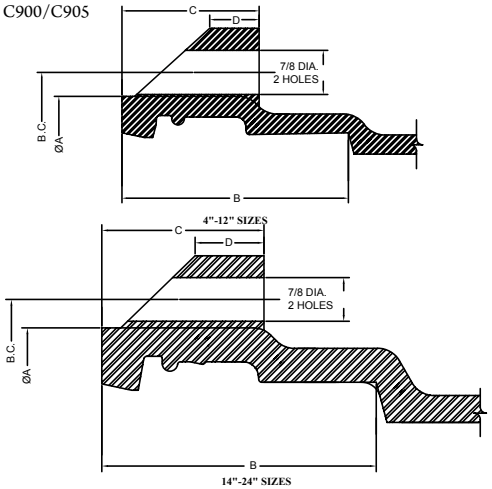
SUBMITTAL INFORMATION

PROJECT NAME:

ENGINEER:

CONTRACTOR:

SPEC. SECTION:



PUSH-ON JOINT DIMENSIONS

NOM. SIZE	ØA	B.C.	B	C	D
4	6.38	7.50	4.02	2.17	1.12
6	8.52	9.56	4.02	2.17	1.12
8	10.80	11.82	4.49	2.72	1.12
10	12.91	14.00	4.49	2.91	1.12
12	15.05	16.25	5.00	2.99	1.12
14	17.89	18.75	5.50	3.12	1.25
16	20.05	21.00	5.50	3.25	1.25
18	22.35	23.25	5.50	3.25	1.25
20	24.47	25.50	5.50	3.25	1.25
24	28.79	30.00	6.00	3.25	1.25

Please note: All fittings are standard with two (2) restraining lugs. Bends 45° & 90° in sizes 4" -12" are also available with four (4) restraining lugs.

SIZE RANGE (Please specify):

Size Range _____

LINING OPTIONS (Please check one):

- ☐ Standard: Cement-lined and asphalt seal coat per ANSI/AWWA C104/A21.4 and UL/NSF-61
- ☐ Optional: FBE (Fusion Bonded Epoxy) per ANSI/AWWA C116/A21.15 and UL/NSF-61
- ☐ Optional: P401 (Protecto 401) Ceramic Epoxy - sewer applications only. Not NSF-61
- ☐ Optional: Other (specify) _____

COATING OPTIONS (Please check one):

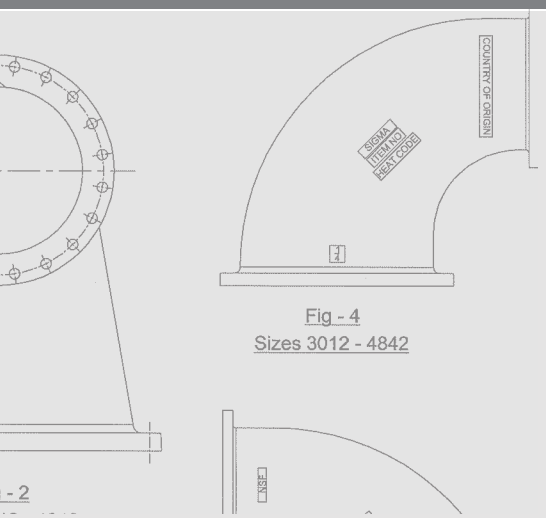
- ☐ Standard: Asphaltic seal coat per ANSI/AWWA C104/A21.4
- ☐ Optional: FBE (Fusion Bonded Epoxy) per ANSI/AWWA C116/A21.15 and UL/NSF-61
- ☐ Optional: Other (specify) _____

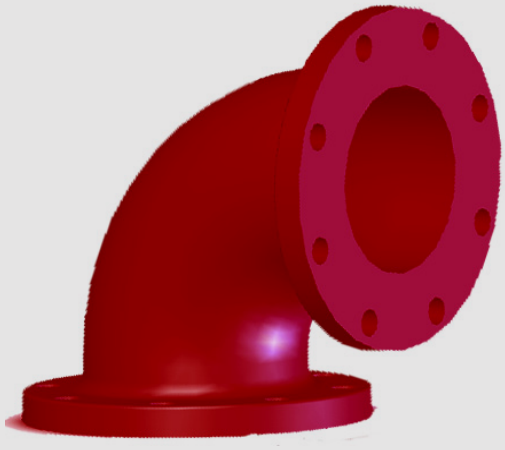
STAR PIPE PRODUCTS
HOUSTON **CORPORATE** TOLL FREE 1-800-999-3009 FAX 281-558-9000
www.starpipeproducts.com

SIGMA™

Quality – Service – Commitment – Delivered.

C110 Flanged Fittings





2-64in C110 CAST IRON/DUCTILE IRON FLANGED FITTINGS BASIC SPECIFICATIONS

MATERIAL:	Ductile Iron ASTM A536 Grade 60-42-10, 65-45-12 or 70-50-05.
PRESSURE:	250 PSI Water Working Pressure for Cast Iron sizes 2” - 12” 250 PSI Water Working Pressure for Ductile Iron sizes 2” - 48” 150 PSI Water Working Pressure for Ductile Iron sizes 54” - 64” 150 PSI Water Working Pressure for Cast Iron sizes 14” - 54”
TESTING:	In accordance with ANSI / AWWA C110 / A21.10 where applicable. Other items are in accordance with manufacturer’s standards. 54” and above Flanged Fittings are manufactured as per AWWA C153/A21.53
LAYING LENGTH:	In accordance with ANSI / AWWA C110 / A21.10 where applicable. Other items are in accordance with manufacturer’s standards. 54” and above Flanged Fittings are manufactured as per AWWA C153/A21.53
CEMENT LINING:	In accordance with ANSI / AWWA C104 / A21.4
COATING:	Tar coated (bituminous) inside in accordance with ANSI / AWWA C104 / A21.04 Red Primer Outside. For special conditions, other types of coatings and linings are available. Please specify when ordering.
APPROVALS:	2”-16” Underwriters Laboratories listed and Factory Mutual Approved.
STANDARDS:	ANSI / AWWA C110 / A21.10 Where applicable. Other items are in accordance with manufacturer’s standards. 54” and above Flanged Fittings are manufactured as per AWWA C153/A21.53

Note: call for Cast Iron Fittings

FM APPROVED · AWWA Member · UL · NSF Certified to ANSI/NSF 61

SIGMA Corporation
700 Goldman Drive
Cream Ridge, NJ 08514
800 999 2550 p
609 758 1163 f
crm-sales@sigmaco.com
www.sigmaco.com

Ductile Iron Flanged Fittings

ANSI/AWWA C110/A21.10

GENERAL SPECIFICATIONS

MATERIAL: Ductile iron per ASTM A536

PRESSURE: 250 PSI ratiing for 1" - 48" sizes and 150 PSI rating for 54" - 64"

TESTING: In accordance with ANSI/AWWA C110/A21.10, UL and FM requirements

LAYING LENGTH: 2" - 48" sizes in accordance with ANSI/AWWA C110/A21.10 and ANSI B16.1 and 54" - 64" sizes in accordance with ANSI/AWWA C153/A21.53 (fittings not listed in ANSI/AWWA have dimensions per Star design as noted in the catalog)

WEIGHTS: Are in pounds, unless noted otherwise and do not include accessories, cement lining and coatings

DRILLING: In accordance with ANSI/AWWA C110/A21.10, ANSI/AWWA C153/A21.53 and ANSI B16.1 Class 125 Flanges

CEMENT LINING: In accordance with ANSI/AWWA C104/A21.4 -- sizes 1"- 3" single thickness and sizes 4"- 64" double thickness

COATING: Asphaltic seal coat inside in accordance with ANSI/AWWA C104/A21.4 and prime coat outside

APPROVALS: 2" - 12" Underwriters Laboratories and ULC Listed and Factory Mutual approved for 300 PSI rating. Please consult factory for detail listing and approvals. 2" and greater are UL/NSF-61.

DIMENSIONS: All dimensions are in inches unless noted otherwise.

INSTALLATION: Per ANSI/AWWA C110 and C111

AWWA MEMBER

FM APPROVED

ULC

UL

CLASSIFIED UL WATER QUALITY

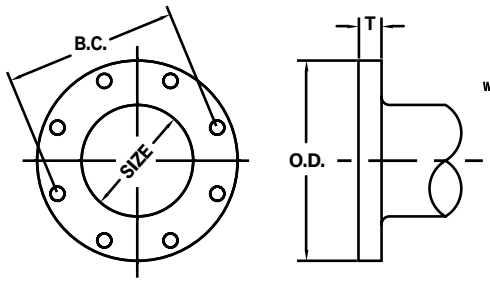
SUBMITTAL INFORMATION

PROJECT NAME: _____

ENGINEER: _____

CONTRACTOR: _____

SPEC. SECTION: _____



FLANGE DETAILS

NOM. SIZE	O.D.	B.C.	T	BOLT HOLE DIA.	BOLTS	
					SIZE	NO.
1	4.25	3.12	0.44	0.62	½ x 2	4
1 ½	5.00	3.88	0.56	0.62	½ x 2	4
2	6.00	4.75	0.62	0.75	⅝ x 2 ¼	4
2 ½	7.00	5.50	0.69	0.75	⅝ x 2 ½	4
3	7.50	6.00	0.75	0.75	⅝ x 2 ½	4
4	9.00	7.50	0.94	0.75	⅝ x 3	8
5	10.00	8.50	0.94	0.88	¾ x 3	8
6	11.00	9.50	1.00	0.88	¾ x 3 ½	8
8	13.50	11.75	1.12	0.88	¾ x 3 ½	8
10	16.00	14.25	1.19	1.00	⅞ x 4	12
12	19.00	17.00	1.25	1.00	⅞ x 4	12
14	21.00	18.75	1.38	1.13	1 x 4 ½	12
16	23.50	21.25	1.44	1.13	1 x 4 ½	16
18	25.00	22.75	1.56	1.25	1 ⅛ x 5	16
20	27.50	25.00	1.69	1.25	1 ⅛ x 5	20
24	32.00	29.50	1.88	1.38	1 ¼ x 5 ½	20
30	38.75	36.00	2.12	1.38	1 ¼ x 6 ½	28
36	46.00	42.75	2.38	1.63	1 ½ x 7	32
42	53.00	49.50	2.62	1.63	1 ½ x 7 ½	36
48	59.50	56.00	2.75	1.63	1 ½ x 8	44
54	66.25	62.75	3.00	2.00	1 ¾ x 8 ½	44
60	73.00	69.25	3.12	2.00	1 ¾ x 9	52
64	80.00	76.00	3.38	2.00	1 ¾ x 9	52

SIZE RANGE (Please specify):

Size Range _____

LINING OPTIONS (Please check one):

- [x] Standard: Cement-lined and asphalt seal coat per ANSI/AWWA C104/A21.4 and UL/NSF-61
- [ ] Optional: FBE (Fusion Bonded Epoxy) per ANSI/AWWA C116/A21.15 and UL/NSF-61
- [ ] Optional: P401 (Protecto 401) Ceramic Epoxy - sewer applications only. Not NSF-61
- [ ] Optional: Other (specify) _____

COATING OPTIONS (Please check one):

- [x] Standard: Red Prime Coat
- [ ] Optional: Asphaltic seal coat per ANSI/AWWA C104/A21.4
- [ ] Optional: FBE (Fusion Bonded Epoxy) per ANSI/AWWA C116/A21.15 and UL/NSF-61
- [ ] Optional: Other (specify) _____

STAR® PIPE PRODUCTS
HOUSTON **CORPORATE** TOLL FREE 1-800-999-3009 FAX 281-558-9000
www.starpipeproducts.com

QUALITY SYSTEM FM Approvals REGISTRATION

CARBON STEEL FLANGE NUT & BOLT SET
ASTM A307 GRADE A / SAE J995 GRADE 2

Features

- For 150# & 300# ANSI Flanges
- Lengths for Joining Two Flanges*
- Material: Carbon Steel
- Finish: Zinc Plated
- Sizes: 1/2" to 24" (150#), 1/2" to 12" (300#)

Standards

- Bolts:
  - Material - ASTM A307A Grade A
  - Dimensions - ASME B18.2.1
  - Thread - Class 2A
- Nuts:
  - Material - SAE J995 Grade 2
  - Dimensions - ASME B18.2.2
  - Thread - Class 2B

Bolt Properties

- Tensile: 60 KSI Minimum
- Elongation: 18% Minimum
- Hardness: 69 - 100 Rb

* Based on 1/16" raised face and 1/8" gasket

Figure Number Matrix

FNW NBS Z 1 Size

FINISH	FLANGE	SIZE CODE	
Zinc = Z	150# = 1	1/2 = D	6 = U
	300# = 3	3/4 = F	8 = X
		1 = G	10 = 10
		1-1/4 = H	12 = 12
		1-1/2 = J	14 = 14
		2 = K	16 = 16
		2-1/2 = L	18 = 18
		3 = M	20 = 20
		4 = P	24 = 24
		5 = S	

Note: 300# sizes are up to 12" only.

Pack Quantities & Bolt Sizes (inches)

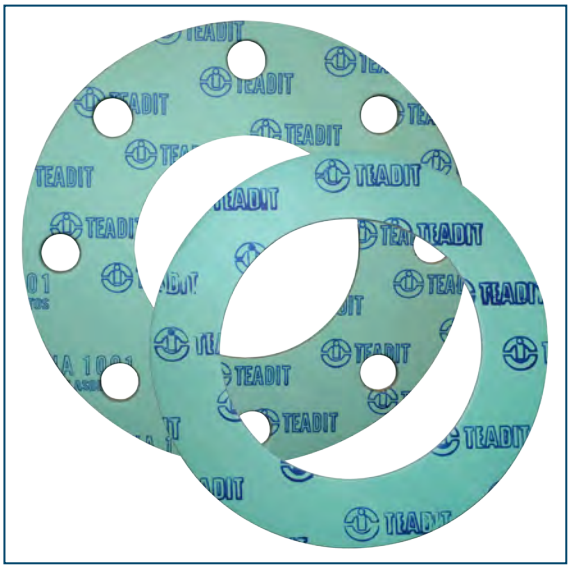
Size	Bolt Qty	Nut Qty	Diameter	Bolt Length
1/2	4	4	1/2-13	2
3/4	4	4	1/2-13	2
1	4	4	1/2-13	2-1/4
1-1/4	4	4	1/2-13	2-1/4
1-1/2	4	4	1/2-13	2-1/2
2	4	4	5/8-11	2-3/4
2-1/2	4	4	5/8-11	3
3	4	4	5/8-11	3
4	8	8	5/8-11	3
5	8	8	3/4-10	3-1/4
6	8	8	3/4-10	3-1/4
8	8	8	3/4-10	3-1/2
10	12	12	7/8-9	4
12	12	12	7/8-9	4
14	12	12	1-8	4-1/2
16	16	16	1-8	4-1/2
18	16	16	1-1/8-7	5
20	20	20	1-1/8-7	5-1/2
24	20	20	1-1/4-7	6

DOC: FNWNBSZ14 Ver. 4/2014

150# & 300# NON-ASBESTOS FULL FACE & RING GASKETS

Features

- Manufactured from compressed non-asbestos sheet gasket material
- Material is aramid and other synthetic fibers bonded with nitrile rubber (NBR)
- Manufactured through the hot calendar process under rigorous quality control standards that are registered under ISO-9001 certification



Standards

- Meets ASME B16.21 for 150# & 300# gaskets
- Dimensions: ASME B16.5

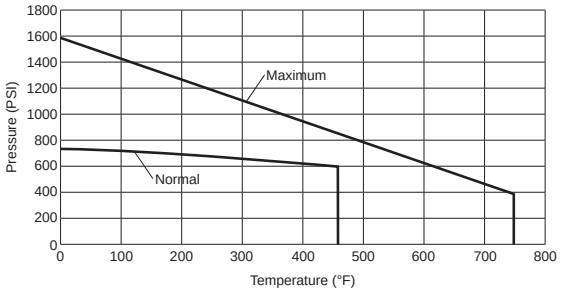
Service Limits

- Max. Temperature: 750°F (400°C)
- Max. Continuous Temperature: 460°F (240°C)
- Max. Pressure: 1595 PSI (110 Bar)
- Max. Continuos Pressure: 725 (50 Bar)
- Max. Pressure for Saturated Steam: 75 PSI
- ASTM F104 Line Call Out: F712120E22M5

Typical Physical Properties

ASTM Test Method	Property	Value
-	Density	109 lb/ft³ (1.75 gm/cc)
F36	Compressibility	7-17%
F36	Recovery	min 45%
F38	Tensile Strength Across Grain	1670 psi (11.5 N/mm²)
F495	Ignition Loss	max 34%
F146	Thickness Increase After 5 Hour Immersion ASTM IRM 903 @ 300°F (150°C) ASTM Fuel B @ 77°F (25°C)	 max 12% max 10%
F146	Weight Increase After 5 Hour Immersion ASTM IRM 903 @ 300°F (150°C) ASTM Fuel B @ 77°F (25°C)	 max 15% max 15%
F38	Creep Relaxation	25%
F37	Sealability at 1000 PSI	0.25 ml/h

Pressure / Temperature



The pressure/temperature chart shown indicates the service limits for the gaskets considering pressure and temperature simultaneously (Tests were performed with nitrogen on 1.6mm [1/16"] thick sheet). The normal curve represents the common usage area for the gaskets while the maximum curve indicates the maximum limits. For applications near or above the maximum curve, contact FNW.

Figure Number Matrix

FNW NA 1 FFG A Size

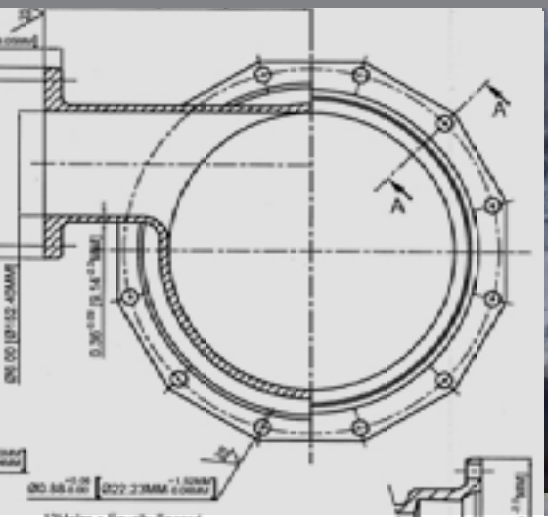
PRESSURE	TYPE	THICKNESS	SIZE CODE			
150# = 1	Ring Gasket = RG	1/16" = 116	1/2 = D	2 = K	6 = U	16 = 16
300# = 3	Full Face Gasket = FFG	1/8" = A	3/4 = F	2-1/2 = L	8 = X	18 = 18
			1 = G	3 = M	10 = 10	20 = 20
			1-1/4 = H	4 = P	12 = 12	24 = 24
			1-1/2 = J	5 = S	14 = 14	

DOC: FNWNA06 Ver. 7/2013

SIGMA™

Quality – Service – Commitment – Delivered.

C153 Mechanical Joint Ductile Iron Fittings



2-64in C153 Ductile Iron Mechanical Joint Class 350

MATERIAL:	Ductile Iron ASTM A536, Grade 65-45-12, 60-42-10 or 70-50-05.
PRESSURE:	350PSI WATER WORKING PRESSURE (CLASS 350) 3” - 24”: & 250 PSI 30” - 48”.
TESTING:	In accordance with ANSI / AWWA C153 / A21.53 & UL - FM requirements.
LAYING LENGTH:	Short body design - straight section of body deleted to provide a compact and lighter fitting without reducing strength or flow characterisitics, in accordance with ANSI / AWWA C153 / A21.53.
DEFLECTION:	2”- 4”=8°, 6”=7°, 8”-12”=5°, 14”-16”=3 ½°, 18”-24”=3°, 30”-48”=2°
CEMENT LINING:	In accordance with ANSI / AWWA C104 / A21.4.
COATING:	Interior of fitting is seal coated (asphaltic material) in accordance with ANSI / AWWA C104 / A21.4 and NSF61 approved.
COATING:	Exterior of fitting is seal coated (asphaltic material) in accordance with ANSI / AWWA C153/A21.53 and NSF approved.
GASKETS:	SBR in accordance with ANSI / AWWA C111 / A21.11. Also available in EDPM, NBR and CR.
T-BOLTS:	Low Alloy corrosion resistant high strength steel in accordance with ANSI / AWWA C111 / A21.11.
APPROVALS:	3”-16” Underwriters Laboratories listed and Factory Mutual Approved.
STANDARDS:	Certified to NSF61 Standard ANSI / AWWA C153 / A21.53 for Compact Ductile Iron Fittings 3”-48” for water and other liquids.

Note: 2” - 24” also available in Fusion Bonded Epoxy

FM APPROVED · AWWA Member · UL · NSF Certified to ANSI/NSF 61

SIGMA Corporation
700 Goldman Drive
Cream Ridge, NJ 08514
800 999 2550 p
609 758 1163 f
crm-sales@sigmaco.com
www.sigmaco.com

22U - ANSI/AWWA C110/A21.10
Mechanical Joint Full Body
Ductile Iron Fittings
Revised 6/2016

☐ **DOMESTIC** ☐ **NON-DOMESTIC**

SUBMITTAL: C110 MECHANICAL JOINT PRODUCT

(Current revisions for the noted Standards apply)

SIZES: 2" through 48"

STANDARDS: ANSI/AWWA C110/A21.10, NFPA 13/24, 3" - 12" UL listed and approved (File - Tyler Union)

MATERIAL: Cast of ASTM A536 qualified ductile iron. Date code is cast on and required for traceability.

PRESSURE RATING: *Flanged fittings rated at 250 psi. Mechanical joints 2" – 24" rated at 350 psi and 30" – 48" at 250 psi.
*Note: With rubber annular ring flange gasket, 2" – 24" Flanged fittings can be rated at 350 psi.

DEFLECTION: Max joint deflection 2"– 12", 5° and 14"– 48", 3°. Reduces by 50% at nominal pipe & fitting diameters

NSF-61 & NSF372: Meets all requirements including Annex G, Tyler Union's Underwriters Laboratory listing MH16439.

ASPHALT COATING: Per ANSI/AWWA C104/A21.4 and ANSI/AWWA C110/A21.10.

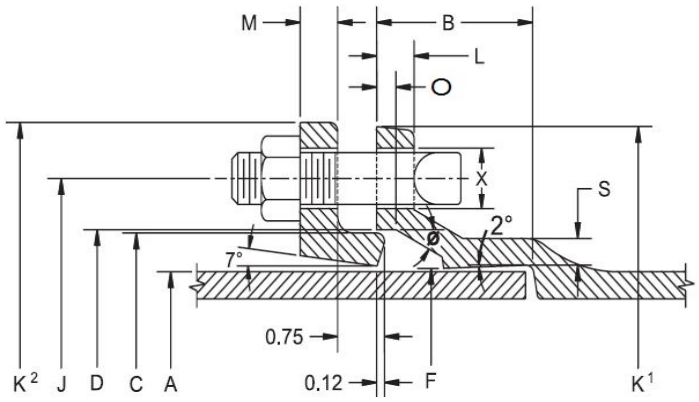
CEMENT LINING: Per ANSI/AWWA C104/A21.4, with double cement lining.

EPOXY COATING: Fusion bonded epoxy per ANSI/AWWA C116/A21.16. Additional coatings available upon request.

BARE FITTINGS: Available upon request.

FASTENERS: High strength low alloy weathering steel per ANSI/AWWA C111/A21.11 and ASTM A242

INSTALLATION: Install per AWWA C600/C651 using pipe conforming to ANSI/AWWA C151/A21.51 or AWWA C900/905.



NOMINAL JOINT DIMENSIONS IN INCHES

Size Inches	A Dia. DI Pipe	B Hub Depth	C Dia. GLAND	D Dia.	F Dia.	Ø	X	J Dia. GLAND	K¹ Dia.	K² Dia. GLAND	L	M GLAND	O	S	Qty. BOLTS
2	2.51	2.50	3.39	3.50	2.61	28°	3/4	4.75	6.25	6.25	0.73	0.62	0.31	0.44	2
3	3.96	2.50	4.84	4.94	4.06	28°	3/4	6.19	7.62	7.69	0.94	0.62	0.31	0.52	4
4	4.80	2.50	5.92	6.02	4.90	28°	7/8	7.50	9.06	9.12	1.00	0.75	0.31	0.65	4
6	6.90	2.50	8.02	8.12	7.00	28°	7/8	9.50	11.06	11.12	1.06	0.88	0.31	0.70	6
8	9.05	2.50	10.17	10.27	9.15	28°	7/8	11.75	13.37	13.37	1.12	1.00	0.31	0.75	6
10	11.10	2.50	12.22	12.34	11.20	28°	7/8	14.00	15.69	15.62	1.19	1.00	0.31	0.80	8
12	13.20	2.50	14.32	14.44	13.30	28°	7/8	16.25	17.94	17.88	1.25	1.00	0.31	0.85	8
14	15.30	3.50	16.40	16.54	15.44	28°	7/8	18.75	20.31	20.25	1.31	1.25	0.31	0.89	10
16	17.40	3.50	18.50	18.64	17.54	28°	7/8	21.00	22.56	22.50	1.38	1.31	0.31	0.97	12
18	19.50	3.50	20.60	20.74	19.64	28°	7/8	23.25	24.83	24.75	1.44	1.38	0.31	1.05	12
20	21.60	3.50	22.70	22.84	21.74	28°	7/8	25.50	27.08	27.00	1.56	1.44	0.31	1.12	14
24	25.80	3.50	26.90	27.04	25.94	28°	7/8	30.00	31.58	31.50	2.00	1.56	0.31	1.22	16
30	32.00	4.00	33.29	33.46	32.17	20°	1-1/8	36.88	39.12	39.12	2.00	2.00	0.38	1.50	20
36	38.30	4.00	39.59	39.76	38.47	20°	1-1/8	43.75	46.00	46.80	2.00	2.00	0.38	1.80	24
42	44.50	4.00	45.79	45.96	44.67	20°	1-3/8	50.62	53.12	53.12	2.00	2.00	0.38	1.95	28
48	50.80	4.00	52.09	52.26	50.97	20°	1-3/8	57.50	60.00	60.00	2.00	2.00	0.38	2.20	32

Anniston: 1501 W 17th St. ● Anniston, AL 36201 ● (800) 226-7601
Corona: 1001 El Camino Ave. ● Corona, CA 92879 ● (866) 527-8471
Tyler: 11910 CR 492 ● Tyler, Texas 75706 ● (800) 527-8478
Dallas: 1201 Ave. S. Suite100 ● Grande Prairie, TX 75050
Elmer: 701 Kenyon Ave. Elmer, New Jersey 03318
New Lenox: 2200 West Haven● New Lenox, IL 60451
Portland: 15670 N. Lombard St. ● Portland, OR 97203
Oxford: 1800 Greenbrier Dear Road ●Anniston, AL 36207

MJ ACCESSORY PACK WITH GLAND

Product Features

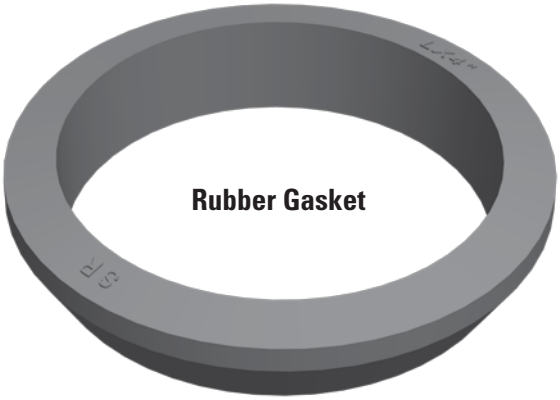
Rubber Gasket
- Material - SBR
- Standard - ANSI / AWWA C111 / A21.11
- ASTM Test Methods
  - Hardness - D2240-91
  - Tensile Strength & Elongation - D412-92
  - Minimum Aging - D572-88
  - Maximum Compression - D395-89

Ductile Iron Gland
- Material - ASTM A536, Grade 65-45-12
- Standard - ANSI / AWWA C153 / A21.53
- Coating - Asphaltic seal coat inside and out in accordance with ANSI / AWWA C104 / A24.1

Low Alloy Steel T-Head Bolts & Nuts
- Material & Dimension - ANSI / AWWA C111 / A21.11

Ductile Iron Gland

Low Alloy Steel T-Head Bolt & Nut



Rubber Gasket

Product Specifications

Includes Gland, MJ Gasket and standard T-Head Bolts

PART #	SIZE
IMJAPK	2"
IMJAPM	3"
IMJAPP	4"
IMJAPU	6"
IMJAPX	8"
IMJAP10	10"
IMJAP12	12"
IMJAP14	14"
IMJAP16	16"

PROSELECT Glands, Gaskets, T-head Bolts and Mechanical Joint Accessory Packs are sold exclusively through Ferguson Enterprises and its affiliates.

Ferguson Enterprises guarantees the quality and compliance to the listed specifications.

PROSELECT is a registered trademark of Ferguson Enterprises.

Warranty and Codes

This PROSELECT product carries a 1-year limited warranty.

MUELLER® 2300 SERIES
RESILIENT WEDGE GATE VALVES
PRODUCT SPECIFICATIONS

1. GENERAL CLASSIFICATION

1.1 MUELLER Resilient Wedge Gate Valves 2" thru 54" comply with either ANSI/AWWA C509 or C515 where applicable.

1.2 MUELLER Resilient Wedge Gate Valves 2-1/2" thru 16" are approved by Factory Mutual Research Corporation (FM).

1.3 Mueller Resilient Wedge Gate Valves 2-1/2" thru 24" are listed by Underwriters Laboratories, Inc. (UL). Valves with actuators are not listed.

1.4 MUELLER Resilient Wedge Gate Valves are tested and certified to ANSI/NSF Standard 61.

1.5 MUELLER Resilient Wedge Gate Valves are suitable for ordinary non-shock cold water service.

1.6 MUELLER Resilient Wedge Gate Valves are iron body, fully encapsulated resilient wedge type.

1.7 MUELLER Resilient Wedge Gate Valves are made in the U.S.A. at an ISO9001 Certified factory.

2. SIZE RANGE, WORKING PRESSURE AND WORKING TEMPERATURE

2.1 2" thru 54" Resilient Wedge Gate Valve

- 2.1.1 125°F maximum working temperature.
- 2.1.2 33°F minimum working temperature.

2.2 3" thru 48" AWWA Resilient Wedge Gate Valve

- 2.2.1 250 psi maximum working pressure.

2.3 2-1/2" thru 24" UL listed Resilient Wedge Gate Valve

- 2.3.1 2-1/2" thru 12" 200 psi maximum working pressure.
- 2.3.2 14" thru 16" 250 psi maximum working pressure.
- 2.3.3 18" thru 24" 175 psi maximum working pressure.

2.4 2-1/2 thru 16" FM approved Resilient Wedge Gate Valve

- 2.4.1 2-1/2" thru 12" 200 psi maximum working pressure.
- 2.4.2 14" thru 16" 250 psi maximum working pressure.

2.5 2" and 54" Resilient Wedge Gate Valve

- 2.5.1 250 psi maximum working pressure.

3. TYPE OF VALVE

3.1 MUELLER Resilient Wedge Gate Valves are non-rising stem (NRS – 2" thru 54"), rising stem (OS&Y – 2-1/2" thru 24") type or post indicator type (PIV – 3" thru 30").

3.2 MUELLER NRS Resilient Wedge Gate Valves are offered with O-ring stem seals.

3.3 MUELLER Resilient Wedge Gate Valves are offered to either open left or open right.

3.4 MUELLER Resilient Wedge Gate Valves with a 2" square wrench nut complying with AWWA C509/C515. Optional hand wheels are available.

3.5 MUELLER Resilient Wedge Gate Valves of the non-rising stem type and post indicator type are offered with the following end connections:

- 3.5.1 AguaGrip™ Ends (4" thru 12") with integral restraint and compression connection. DIPS style fits DI, C900 PVC and DIPS PE pipe, IPS style fits PVC and IPS PE pipe. A liner is required for PE pipe (DR9-DR17).
- 3.5.2 Flanged Ends (2" thru 54") with flange dimensions and drilling complying to ANSI B16.1 Class 125 (ISO PN10/PN16 drilling optional).
- 3.5.3 Standard Mechanical Joint Ends (2" thru 48") for cast iron pipe or ductile iron pipe with end dimensions complying with ANSI/AWWA C111/A21.11.
- 3.5.4 Slip-On Joint Ends* (4" thru 12") complete with Mueller Slip-On Gasket, complying with ANSI/AWWA C111/A21.11. Fits plain end of classes 150, 200 and 250 cast iron; ductile iron and classes 150 and 200 cast iron O.D. PVC**.
- 3.5.5 Radial Compression Joint Ends (2" thru 8") for I.P. size PVC pipe.

*Design and dimensions of the joint are manufactured under license of U.S. Pipe and Foundry Company.
**When using DI O.D. PVC pipe, the gaskets supplied by Mueller must be used with this valve connection.

(Continued)

3.5.6 Threaded Ends (2" thru 3") with end dimensions complying to ANSI B2.1.
3.5.7 D-150 Mechanical Joint ends (4" thru 8") with two specially designed gaskets to fit either of two diameters of Cast Iron or Ductile Iron Pipe: duck-tipped rubber gasket for Class 150 pipe or plain rubber gasket for Class D pit cast pipe.

3.6 MUELLER Resilient Wedge Gate Valves of the rising stem (OS&Y) type are offered with the following end connections:
3.6.1 AquaGrip™ Ends 4" thru 12" with integral restraint and compression connection. DIPS style fits DI, C900 PVC and DIPS PE pipe. IPS style fits PVC and IPS PE pipe. A liner is required for PE pipe (DR9-DR17).
3.6.2 Flanged ends 2-1/2" thru 24" with flange dimensions and drilling complying to ANSI 816.1Class 125
(ISO PN10/PN16 drilling optional).
3.6.3 Standard Mechanical Joint Ends 2-1/2" thru 24" for cast iron pipe or ductile iron pipe, with end dimensions complying with ANSI/AWWA C111/A21.11.

3.7 MUELLER Resilient Wedge Tapping valves (2" thru 48") have an inlet flange complying with ANSI B16.1 Class 125 (2" thru 12" also MSS SP-60), and are offered with a Standard Mechanical Joint outlet end with dimensions complying with ANSI/AWWA C111/A2.11.

3.8 MUELLER Resilient Wedge Cut-In valves 4" thru 8" have D-150 Mechanical Joint ends with two specially designed gaskets to fit either of two diameters of Cast Iron or Ductile Iron Pipe: duck-tipped rubber gasket for Class 150 pipe, or plain rubber gasket for Class D pit cast pipe.

4. MATERIAL SPECIFICATIONS

4.1 Cap screw
4.1.1 2" thru 12" sizes – Stainless Steel Type 304.
4.1.2 14" thru 54" sizes – Steel, SAE J429 Grade 2 Zinc Plated.

4.2 Wrench nut – Cast Iron, ASTM A-126, Class B.

4.3 Handwheel – Cast Iron, ASTM A-126, Class B.

4.4 Stuffing box
4.4.1 2" thru 12" sizes – Cast Iron, ASTM A-126, Class B.
4.4.2 14" thru 24" sizes – Ductile Iron, ASTM A-536, Grade 65-45-12.
4.4.3 30" thru 54" sizes - Hot Rolled Steel, ASTM A36.

4.5 Stem O-rings
4.5.1 2" thru 16" Nitrile, ASTM 2000.
4.5.2 18" thru 54" EPDM ASTM 2000

4.6 Anti-friction washers – Acetal Copolymer.

4.7 Stem
4.7.1 2" thru 16" sizes – Manganese Bronze, CDA Alloy C67600. OS&Y Valves 2-1/2" thru 8" 431 Stainless Steel.
4.7.2 18" thru 54" sizes – Bronze, ASTM B-584, Alloy C86400.

4.8 Bonnet
4.8.1 2" thru 12" sizes – Cast Iron, ASTM A-126, Class B.
4.8.2 14" thru 54" sizes – Ductile Iron, ASTM A-536, Grade 65-45-12.

4.9 Bonnet seal
4.9.1 2" thru 3" sizes – Flat gasket, Neoprene, ASTM D2000.
4.9.2 4" thru 16" sizes – O-ring, Nitrile, ASTM D2000.
4.9.3 18" thru 54" sizes - O-ring, EPDM, ASTM D2000.

4.10 Stuffing box bolts & nuts
4.10.1 2" thru 12" sizes – Stainless Steel Type 304.
4.10.2 14" thru 54" sizes – Steel - Bolts: SAE J429, Grade 2; Nuts: ASTM A-563 Grade A – Plated to ASTM F1941 Class Fe/Zn 12c.

(Continued)

4.11 Bonnet bolts & nuts
- 4.11.1 2" thru 12" sizes – Stainless Steel Type 304.
- 4.11.2 14" thru 54" sizes – Steel - Bolts: SAE J429 Grade 2; Nuts: ASTM A-563 Grade A – Plated to ASTM F1941 Class Fe/Zn 12c.

4.12 Disc nut – Bronze, ASTM B62 CDA 83600.

4.13 Guide cap bearings – Acetal Copolymer.

4.14 Disc
- 4.14.1 2" thru 12" sizes – Cast Iron, ASTM A-126, Class B.
- 4.14.2 14" thru 54" sizes – Ductile Iron, ASTM A-536, Grade 65-45-12.

4.15 Disc encapsulated
- 4.15.1 2" thru 16" sizes – SBR ASTM D2000.
- 4.15.2 18" thru 54" sizes – EPDM, ASTM D2000.

4.16 Body
- 4.16.1 2" thru 12" sizes – Cast Iron, ASTM A-126, Class B.
- 4.16.2 14" thru 54" sizes – Ductile Iron, ASTM A-536, Grade 65-45-12.

4.17 Inside and outside of valve fully coated - coating complies with ANSI/AWWA C550 and is certified to ANSI/NSF Standard 61.
- 4.17.1 2" thru 36" sizes - MUELLER PRO-GARD® Fusion Bonded Epoxy.
- 4.17.2 42" thru 54" sizes - MUELLER HP® Epoxy.

5. DESIGN FEATURES

5.1 2-1/2" thru 48" sizes - fully unobstructed, oversized (except 16" which is same size) flow way. The sealing mechanism is withdrawn from the flow way in a full open position. No pockets in bottom of flow way to trap sediment or debris. The flow way will permit passage of full-sized shell cutters (except 16" which requires undersized cutter). 54" valves will use a 48" full-sized shell cutter.

5.2 Bronze Disc Nut on all valves.

5.3 Anti-Friction Washers on non-rising stem valves – Are located above and below the thrust collar portion of the stem to reduce friction and provide more effective conversion of operating torques into seating loads.

5.4 Stem for non-rising stem valves, with O-ring Seals – One O-ring is located below the thrust collar of the stem and two are located above the thrust collar, the upper most serving as a dirt seal. The O-rings and thrust collar are factory lubricated. The two primary O-rings seal the thrust collar area from outside contaminants and water, and retain an ample amount of lubricant on the thrust collar and anti-friction washers to reduce operating torque and wear.

5.5 Stem – The threads on the bronze stem are Acme form threads for strength and efficiency. The stem thrust collar is made integral with the stem – and is formed by a heat upset operation for valves thru 16" in size; cast in place for 18" and larger valves.

5.6 Upper Stem O-ring Replacement – The two O-rings above the thrust collar of all MUELLER Resilient Wedge Gate Valves can be replaced with the valve in the fully open position, under pressure, with no leakage.

5.7 Corrosion Resistant – 2" thru 36" sizes - all inside and outside cast iron surfaces are coated with MUELLER PRO-GARD® Epoxy Coating, 10 mils nominal. MUELLER PRO-GARD® Epoxy Coating is non-toxic and imparts no taste to water. 42" thru 54" sizes - all inside and outside cast iron surfaces coated with MUELLER HP® Epoxy Coating. Both coatings comply with ANSI/AWWA C550 and are certified to ANSI/NSF Standard 61.

(Continued)

6. OPTIONAL FEATURES

6.1 MUELLER 2300 Series Resilient Wedge Gate Valves can be furnished with the following optional designs or features:

6.1.1 Gearing – Bevel and Spur gearing available on valves 4" and larger. Valves 30" and larger gearing is required. Bevel geared valves are for horizontal installations; spur geared for vertical. Geared valves provide an additional bearing to support the extreme end of the stem. Bevel and spur geared valves are furnished with a grease case. Any valve leakage past the stuffing box does not enter the grease case.

6.1.2 Bypass valve – Valves 18" or larger. The bypass valves are non-rising stem Mueller® Series 2360 Resilient Wedge Valves. The bypass size and location comply with Section 24 of AWWA C500. For 16" valves, bypasses are available on flanged ends, mechanical joint ends and flange x mechanical joint ends only.

6.1.3 Position indicator – Available for NRS valves 4" and larger.

6.1.4 Bolts and nuts – Stainless Steel, Type 316.

6.1.5 Stem – Silicon bronze - Valves 16" and smaller ASTM B98 C66100; 18" and larger ASTM B763 C99400 or C99500. 304 Stainless Steel or 316 Stainless Steel. 431 Stainless Steel is an option for OS&Y valves 10" thru 24".

6.1.6 Disc encapsulation – 2" thru 16" sizes - EPDM.

7. TEST PRESSURE

7.1 The pressure test on each MUELLER Resilient Wedge Gate Valve meets the requirements of AWWA Standard C509 and C515 for Resilient Seated Valves.

7.1.1 Each MUELLER Resilient Wedge Gate Valve is subjected to two pressure tests. The seat test is at the working pressure of AWWA valves and 1-1/2 times working pressure of UL Listed valves. Shell tests are at two times the working pressure.

7.1.2 Pressure tests at the working pressure shall show NO leakage past the seat from either side of the wedge or at the flange joints. Pressure tests at twice the working pressure shall show NO leakage through the metal or flange joints.

7.1.3 Test pressures are as follows: 2" thru 12" – 300 psi seat test, 500 psi shell test; 14" thru 16" – 375 psi seat test, 500 psi shell test; 18" thru 54" – 275 psi seat test, 500 psi shell test.

CLOW AWWA Resilient Wedge Gate Valves Meet or Exceed the Requirements of AWWA Standard C509

Size Range	Water Working Pressure psi	Bubble Tight Test psi	Hydrostatic Shell Test psi
AWWA 2"–12"	250	250	500
ULFM 2½"–12"	200	200	400

Available in either non-rising stem, outside screw & yoke.

Available End Connections & Size Range		Figure No.
FLG End (NRS)	2"–12"	F-6102
M.J.	2"–12" (except 2½")	F-6100
FLG & M.J.	3"–12"	F-6106
Push-on for PVC (SDR)	2"–12"	F-6110
FLG End (OS & Y)	2"–12"	F-6136
M.J. for Tapping	3"–12"	F-6114
Tyton for D.I. & C900 PVC	4"–12"	F-6112
M.J. Cutting-in	4"–12"	F-6111
Tyton for D.I. X FLG	4"–12"	F-6113
Threaded	2"–3"	F-6103

Accessories (Illustrated in the Gate Valve Section)

Indicator Posts
"T" Handles
Stem Guides
Electric Motor Actuators
2" Sq. Operating Nuts
Handwheels
Extension Stems
Floor Boxes
Chain Wheels

Floorstands (non-rising stem)

MODEL	2639	AWWA	C509	FULL BODY DUCTILE IRON
MODEL	2640	AWWA	C509	FULL BODY GRAY IRON

CLOW VALVE COMPANY

CAST IRON Specification ASTM A126 Class B

Physical Properties	
Minimum tensile strength	31,000 psi
Minimum transverse strength	3,300 lbs
Minimum deflection (12" Centers)	.12 in
Chemical Analysis (percent)	
Phosphorus (maximum)	.75
Sulfur (maximum)	.15

Ductile Iron ASTM A536

Minimum tensile strength	65,000 psi
Minimum Yield strength	45,000 psi
(EPDM)	10-12 %

Seat Rubber (EPDM)

Hardness	80+/-2
100% Modulus (PSI)	600
Tensile (PSI)	1,450
Elongation (%)	150
Compression Set, ASTM D395 Method B	18% max

R/W VALVE
Material Specifications

CLOW VALVE COMPANY

STANDARD

Copper Alloy - ASTM B584 CDA836 (Stem Nut)

Physical Properties

Minimum tensile strength	30,000 PSI
Minimum yield strength	14,000 PSI
Minimum elongation (in 2 inches)	20%

Chemical Analysis

Copper	84.0 - 86.0
Lead	4.0 - 6.0
Tin	4.0 - 6.0
Nickel (maximum)	1.0
Zinc	4.0 - 6.0

Copper Alloy - ASTM B584 CDA867 (Stem)

Physical Properties

Minimum tensile strength	80,000 PSI
Minimum yield strength	32,000 PSI
Minimum elongation (in 2 inches)	15%

Chemical Analysis

Copper	57.0 * - 60.0
Lead (maximum)	.50 - 1.5
Aluminum	1.0 - 3.0
Iron	1.0 - 3.0
Nickel (maximum)	1.0
Zinc	30.0 - 38.0
Manganese	1.0 - 3.5
Tin (maximum)	.2

ALTERNATE

CAST BRONZE - NDZ-S CA. NO. 995 (Stem)

Physical Properties

Minimum tensile strength	70,000 PSI
Minimum yield strength	40,000 PSI
Minimum elongation (in 2 inches)	12%

Chemical Analysis

Copper	82.8
Lead (maximum)	.25
Aluminum (maximum)	2.0
Iron (maximum)	5.5
Nickel (maximum)	5.5
Zinc (maximum)	2.0
Silicon (maximum)	2.0

* "Minimum Copper content as specified by AWWA standards."

4"–12" R/W VALVE UL/FM
Performance Information

CLOW VALVE COMPANY

MODEL 2639 & 2640

1. Valve complies with AWWA specs where applicable.

2. Valve complies with Underwriters Laboratory standard UL 262.

3. Valve is rated at 200 psi working pressure.

4. Valve is bubble-tight at all pressures up to full rated pressure (200 psi).

5. Valve is capable of bubble-tight seal at twice the rate pressure (400 psi) for short periods of time.

6. 2" thru 6" valve sizes have been hydrostatically shell tested at five (5) times the rated pressure (1000 psi).

7. 8", 10" and 12" valve sizes have been hydrostatically shell tested at four (4) times the rated pressure (800 psi).

8. Valve has been subjected to torques 150 percent of the designated minimum required torques.

9. Valve has been cycle tested 5,000 times without loss of bubble-tight seal.

10. Rubber to iron bond on wedge is inspected for strength as per ASTM D 429 specification.

For complete data on the tests
Underwriters Laboratories performed
reference UL File EX2697
Project 87NK7353

2"–12" R/W VALVE AWWA SERVICE

Performance Information

CLOW VALVE COMPANY

MODEL 2639 & 2640

1. Valve complies with AWWA C509 specs where applicable.

2. Valve is rated at 250 psi working pressure.

3. Valve is bubble-tight at all pressures up to full rated pressure (250 psi).

4. Valve is capable of bubble-tight seal at twice the rate pressure (500 psi) for short periods of time.

5. 2" thru 12" valve sizes have been hydrostatically shell tested at 2.5 times the rated pressure (625 psi).

6. Valve has been subjected to torques 150 percent of the designated minimum required torques.

7. Valve has been cycle tested 5,000 times without loss of bubble-tight seal.

8. Rubber to iron bond on wedge is inspected for strength as per ASTM D 429 specification.

R/W RESILIENT WEDGE GATE VALVE

Product Analysis

CLOW VALVE COMPANY

MODEL 2639 & 2640

Features	Benefits
Bubble Tight Closure at 250 psi (2"-12") (AWWA SERVICE)	• No leakage–no loss of water
Smooth, Unobstructed Waterway	• High flow characteristics • 100% smooth passage without turbulent flow • No sediment build-up • Will not impede travel of line cleaning tools
Only Three Internal Parts	• Virtually maintenance free
No Seat Rings	• Nothing to be damaged by scoring
Delrin* Anti-Friction Thrust Bearing	• Operating torque to close and open held to absolute minimum
Solid, Copper Alloy Stem Nut and High Strength Copper Alloy Stem	• No corrosion • Trouble-free service
Stem Nut is Self Centering	• Eliminates possible stress on stem and wedge
Two "O" Ring Seals Above Stem Thrust Collar	• Can be replaced with valve in service
High Strength Iron Wedge Fully Encapsulated with Rubber Permanently Bonded to Metal. Wedge Design Incorporates Two Seating Surfaces.	• Trouble-free service with minimum maintenance • No leaks–no wear

*DuPont Tradmark

CR (CORROSION RESISTANCE) COATING (INTERIOR & EXTERIOR)

CLOW VALVE COMPANY

Clow CR Coating is a high performance, one-part, heat-curable, thermoset coating which provides superior corrosion resistance protection for metal parts.

Clow CR Coating material is a stable, non-toxic resin consisting of 100% solids. It is impervious to and imparts no taste to potable water. Clow CR Coating is formulated from materials deemed acceptable in the Food and Drug Administrations Document Title 21 of the Federal Regulations on food additives, Section 175.300 entitled "Resinous and Polymeric Coatings".

Clow CR Coating is applied by a heat application, fusion—bonding process which secures the coating material to the metal valve components. This process provides a continuous coating 9 mils thick with excellent adhesion qualities.

The durable Clow CR Coating has a hard finish and exhibits excellent corrosion resistance in most aqueous solutions and good abrasion resistance. It will not sag or cold flow or become soft during long-term storage. In addition to excellent corrosion resistance to aqueous solutions, the coating has excellent stability and resistance to acidic soil conditions.

Clow CR Coating meets the requirements of the American Water Works Association Standard C-550 entitled "Protective Interior Coatings for Valves and Hydrants". This high performance coating has a ten year history of satisfactory service as a corrosion protection coating used in corrosive potable water applications and soil conditions.

CR (CORROSION RESISTANCE) COATING

CLOW VALVE COMPANY

CHEMICAL	EPOXY RATING 70°F	180°F
ACIDS:		
Acetic, 10%	F	N
Benzene Sulfonic, 10%	E	E
Benzoic	E	E
Boric	E	E
Chloracetic, 10%	E	E
Chromic, 5%	F	N
Citric, 10%	E	N
Fatty Acids	E	E
Fromic, 90%	E	F
Hydrobromic, 20%	G	G
Hydrochloric, 20%	E	G
Hydrocyanic	E	E
Hydrofluoric, 205	G	G
Hypochlorous, 5%	F	N
Lactic, 5%	F	N
Maleic, 25%	E	E
Nitric, 5%	E	G
Nitric, 30%	G	P
Oleic	E	E
Oxalic	E	E
Phosphoric	G	F
Picric	G	F
Steraric	E	E
Sulfuric, 50%	G	F
Tannic	E	E
Ketones	F	F
Ethers	F	F
Esters	F	F
Gasoline	E	E
Cargon Tetrachloride	E	E
Organics:		
Aniline	G	P

CHEMICAL	EPOXY RATING 70°F	180°F
ALKALIES:		
Ammonium Hydroxide	E	G
Calcium Hydroxide	E	E
Potassium Hydroxide	E	E
Sodium Hydroxide	E	E
ACID SALTS:		
Aluminum Sulfate	E	E
Ammonium Chloride*	E	E
Copper Chloride*	E	E
Iron Chloride*	E	E
Nickel Chloride*	E	E
Zinc Chloride*	E	E
ALKALINE SALTS:		
Barium Sulfide	E	E
Sodium Bicarbonate	E	E
Sodium Carbonate	E	E
Sodium Sulfide	E	E
Trisodium Phosphate	E	E
NEUTRAL SALTS:		
Calcium Chloride*	E	E
Magnesium Chloride*	E	E
Potassium Chloride*	E	E
Sodium Chloride*	E	E
SOLVENTS:		
Alcohols	E	E
Aliphatic Hydrocarbons	E	E
Aromatic Hydrocarbons	E	E
Benzene	E	E
Formaldehyde, 37%	E	G
Phenol, 5%	G	F
Mineral Oils	E	E
Vegetable Oils	E	E
Chlorobenzene		

KEY: E - no attack
G - appreciably no attack
F - some attack, but useable in some instances
P - attacked, not recommended for use
N - rapidly attacked
* - and nitrate and sulfate

2" THRU 12" R/W VALVE
Flow Coefficients

CLOW VALVE COMPANY

MODEL 2639 & 2640

VALVE SIZE	Cv (FULL OPEN)	K (FULL OPEN)
2	300	0.15
2½	500	0.130
3	800	0.115
4	1500	0.105
6	3600	0.090
8	6700	0.080
10	10,500	0.080
12	15,000	0.080

$$Cv = \sqrt{\frac{Q}{\Delta P}} \qquad K = f\,\frac{L}{D}$$

Values given are calculated, based on hydraulic lab tests on 6" R/W valve.

RESILIENT WEDGE GATE VALVES

Recommended Specifications

CLOW VALVE COMPANY

MODEL 2639 & 2640

Valves shall conform to the latest revision of AWWA Standard C-509 covering resilient wedge gate valves.

The valves shall be either, **non-rising stem or rising stem**, opening by turning stem **left or right** and provided with **2" square operating nut or handwheel** with the word **Open** and an **Arrow** cast in the metal to indicate direction to open.

The wedge shall be of cast iron completely encapsulated with rubber.

The sealing rubber shall be permanently bonded to the cast iron wedge to meet ASTM tests for rubber metal bond ASTM D429

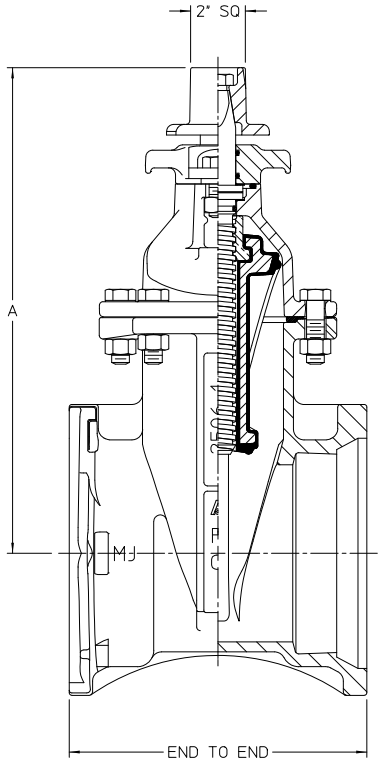
Stems for NRS assemblies shall be cast copper alloy with integral collars in full compliance with AWWA. OS & Y stems shall be copper alloy. The NRS stem stuffing box shall be the o-ring seal type with two o-rings located above thrust collar and one o-ring below. The two o-rings above the thrust collar shall be replaceable with valve fully open and subjected to full rated working pressure.

There shall be two low torque thrust bearings located above and below the stem collar. The stem nut shall be independent of wedge and shall be made of solid copper alloy. There shall be a smooth unobstructed waterway free of all pockets, cavities and depressions in the seat area.

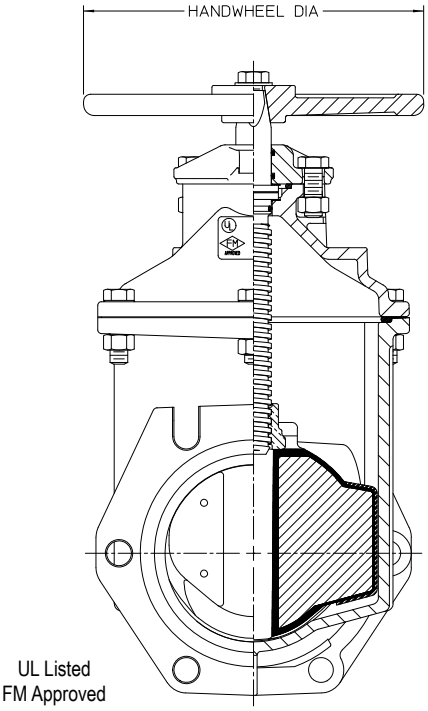
The body and bonnet shall be coated with fusion bonded epoxy both interior and exterior, complying with AWWA C550 and be NSF 61 certified. Each valve shall have maker's name, pressure rating and year in which manufactured cast on the body. Prior to shipment from factory, each valve shall be tested by hydrostatic pressure equal to requirement for both AWWA (twice the specified working pressure) and 400 PSI ULFM requirements.

AMERICAN Flow Control Submittal Information

4" - 12" SERIES 2500-1 RESILIENT WEDGE GATE VALVE, NRS



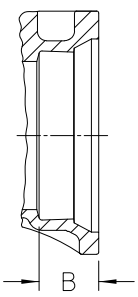
SHOWN WITH 2" OPERATING NUT



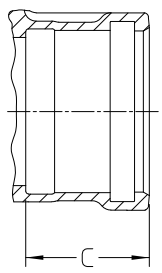
UL Listed
FM Approved
AWWA

SK20041101-1

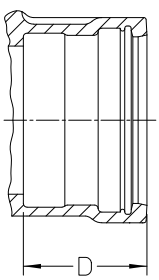
SHOWN WITH OPTIONAL HANDHWEEL

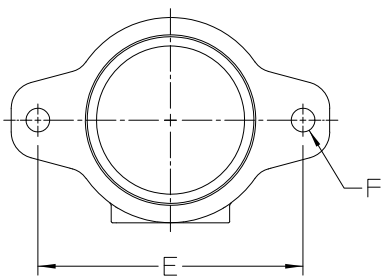


MECHANICAL JOINT (MJ)



PVC
(NOT AVAILABLE FOR UL/FM)





TYTON® (TY)

OPTIONAL END CONNECTIONS

DIMENSION	VALVE SIZE				
	4"	6"	8"	10"	12"
End to End - MJ/MJ	10.00	10.50	11.50	12.50	13.50
End to End - FL/FL	9.00	10.50	11.50	13.00	14.00
End to End - TY/TY	13.00	15.88	17.50	18.75	19.75
End to End - FL/MJ	9.50	10.50	12.38	13.62	14.38
End to End - FL/TY	11.00	13.19	14.50	15.88	16.88
End to End - PVC/ PVC	13.00	15.88	17.50	-	-
A	13.91	17.12	20.47	24.06	27.59
B	2.50	2.50	2.50	2.50	2.50
C	4.00	5.22	5.50	-	-
D	4.00	5.22	5.50	5.62	5.62
E	9.00	11.19	13.50	15.88	18.00
F DIA	1.00	1.00	1.00	1.31	1.31
Handwheel Diameter	10.00	12.00	14.00	15.50	15.50
No. of Turns to Open	14	20	26	32	38

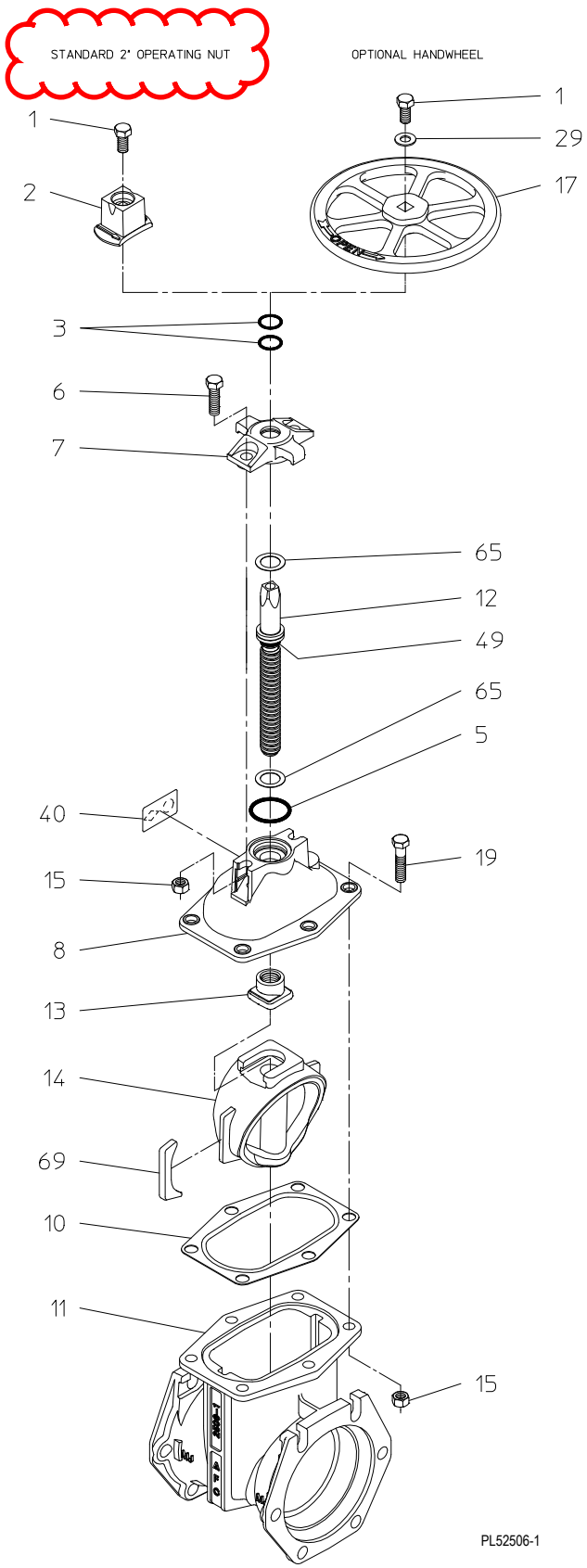
AMERICAN
FLOW CONTROL

THE RIGHT WAY

AMERICAN Flow Control
P.O. Box 2727
Birmingham, Al. 35202-2727
Phone: 1-800-326-8051
Fax: 1-800-610-3569
E-mail: afcsales@american-usa.com

Waterous Company
125 Hardman Avenue South
South St. Paul, Mn. 55075-1191
Phone: 1-888-266-3686
Fax: 1-800-601-2809
E-mail: afcsales@american-usa.com

WWW.AMERICAN-USA.COM



Construction shown is typical of the 6-inch size with mechanical joint end connections and is illustrative only. Construction of other sizes and end connection types vary slightly. See elsewhere on this submittal for specific details.

REF NO.	DESCRIPTION	MATERIAL
1	Hex Head Bolt, 5/8-11 x 1"	304 Stainless Steel
2	Operating Nut, 2" Square	Ductile Iron, ASTM A536
3	O-Ring	Rubber
5	Stuffing Box Gasket	Rubber O-ring
6	Hex Head Bolt, 5/8-11 x 1-3/4"	304 Stainless Steel
7	Stuffing Box	Ductile Iron, ASTM A536
8	Bonnet	Ductile Iron, ASTM A536
10	Bonnet Gasket	Rubber
11	Body	Ductile Iron, ASTM A536
12	Stem	Manganese Bronze, ASTM B763, UNS C86700
13	Wedge Nut	Manganese Bronze, ASTM B763, UNS C86700
14	Resilient Wedge	EPDM Rubber Encapsulated Ductile Iron ASTM A536
15	Hex Nut, 5/8-11	304 Stainless Steel
17	Handwheel	Ductile Iron, ASTM A536
19	Hex Head Bolt, 5/8-11 x 2-1/4"	304 Stainless Steel
29	Flat Washer, 5/8	304 Stainless Steel
40	UL/FM Label	Pressure Sensitive Acrylic Film
49	O-Ring	Rubber
65	Thrust Washer	304 Stainless Steel
69	Wedge Cover	Acetal Polymer

OPTIONAL MATERIALS ARE AS FOLLOWS

BOLTS and NUTS: 316 Stainless Steel
STEM: Cast NDZ-S Bronze, ASTM B763, UNS C99500
STEM: Stainless Steel
WEDGE NUT: Silicon Bronze, ASTM B584, UNS C87600

Open Direction: ☐ Left (C.C.W.) ☐ Right (C.W.)

NOTES:

1. Available in configurations that are UL Listed and FM Approved with 250 psig rated working pressure.
2. Meets requirements of ANSI/AWWA C515 with 250 psig rated working pressure.
3. Fusion-bonded epoxy-coated in accordance with ANSI/AWWA C550.
4. Certified to ANSI/NSF Standard 61.

AMERICAN FLOW CONTROL
THE RIGHT WAY

AMERICAN Flow Control
P.O. Box 2727
Birmingham, Al. 35202-2727
Phone: 1-800-326-8051
Fax: 1-800-610-3569
E-mail: afcsales@american-usa.com

Waterous Company
125 Hardman Avenue South
South St. Paul, Mn. 55075-1191
Phone: 1-888-266-3686
Fax: 1-800-601-2809
E-mail: afcsales@american-usa.com

WWW.AMERICAN-USA.COM

CRESLINE-WEST®

PVC PRESSURE PIPE
SCH-40 & SCH-80

CWPVC-3

JULY, 2013

PLEASE ORDER BY PART NUMBER.

20' BELLED END
SCH-40
PRESSURE PIPE
PVC1120
ASTM
D-1785
NSF pw

SIZE	O.D.	I.D.	MIN. WALL	WEIGHT PER 100'	FEET PER PALLET	PALLETS PER T.L.	PART NO.
½"	.840	6.22	.109	16.18	8400	44	42015
¾	1.050	8.24	.113	21.58	6600	40	42030
1	1.315	1.049	.133	32.00	5400	32	42046
1¼	1.660	1.380	.140	43.40	4000	32	42056
1½*	1.900	1.610	.145	51.83	3600	28	42070
2*	2.375	2.067	.154	69.71	2800	24	42085
2½	2.875	2.469	.203	110.57	2240	20	42102
3*	3.500	3.068	.216	144.82	1500	20	42111
4*	4.500	4.026	.237	206.19	580	28	42120
5	5.563	5.047	.258	296.52	460	24	47307
6*	6.625	6.065	.280	363.36	400	20	42130
8*	8.625	7.961	.322	549.21	280	16	45695
10*	10.750	10.020	.365	775.36	160	16	42155
12*	12.750	11.938	.406	1025.36	120	12	42165

*DUAL RATED ASTM D-1785 & D-2665

SCH-80
PRESSURE PIPE
PVC1120
ASTM
D-1785
NSF pw

½"	.840	.546	.147	20.63	5200	60	43010
¾	1.050	.742	.154	28.02	4400	48	43025
1	1.315	.957	.179	41.23	5200	32	43045
1¼	1.660	1.278	.191	57.06	4000	32	43065
1½	1.900	1.500	.200	69.19	2360	40	43080
2	2.375	1.939	.218	95.89	1860	32	43095
2½	2.875	2.323	.276	146.24	1160	36	43115
3	3.500	2.900	.300	195.88	1500	20	43120
4	4.500	3.826	.337	286.26	580	28	43135
6	6.625	5.761	.432	546.56	400	20	43150
8	8.625	7.625	.500	830.24	280	16	43165
10	10.750	9.564	.593	1230.78	160	16	43170
12	12.750	11.376	.687	1692.06	120	12	43175

SCH-80 PIPE IS RECOMMENDED FOR THREADING.
SCH-80 PIPE IS FURNISHED IN PLAIN END LENGTHS AND IS GRAY COLOR.
1/2" - 8" SCH-40 AND ALL SCH-80 PIPE IS CERTIFIED TO THE UNIFORM PLUMBING CODE BY NSF INTERNATIONAL.
ALL SCH-40 AND SCH-80 PIPE IS CERTIFIED TO NSF/ANSI 61, ANNEX G (CA AND VT LEAD FREE LAWS) BY NSF INTERNATIONAL.

PRESSURE RATINGS
FOR CRESLINE - PVC PIPE
AT 73.4°

SIZE	½	¾	1	1¼	1½	2	2½	3	4	5	6	8	10	12
SCH-40	600	480	450	370	330	280	300	260	220	190	180	160	140	130
SCH-80	850	690	630	520	470	400	420	370	320	-	280	250	230	230

CONVERSION CHART FOR PRESSURE RATINGS
AT VARIOUS TEMPERATURES FOR CRESLINE - PVC PIPE

TEMPERATURE °F	73.4°	80°	90°	100°	110°	120°	130°	140°
CONVERSION FACTOR	1.00	.88	.75	.62	.50	.40	.30	.22

PRESSURE RATING IS THE ESTIMATED MAXIMUM PRESSURE THAT WATER AS THE MEDIUM IN THE PIPE CAN EXERT CONTINOUSLY FOR A LONG TIME WITH A HIGH DEGREE OF CERTAINTY THAT FAILURE OF THE PIPE WILL NOT OCCUR.

DO NOT USE PLASTIC PIPE AND FITTINGS FOR COMPRESSED AIR.

PALLET QUANTITIES PVC PRESSURE PIPE

PIPE SIZE	FEET PER PALLET	WT. PER PALLET SCH-40
½	8400	1359
¾	6600	1424
1	5400	1728
1¼	4000	1736
1½	3600	1866
2	2800	1952
2½	2240	2477
3	1500	2172
4	580	1196
6	400	1453
5	460	1364
8	280	1538
10	160	1241
12	120	1230

PIPE SIZE	FEET PER PALLET	WT. PER PALLET SCH-80
½	5200	1073
¾	4400	1233
1	5200	2144
1¼	4000	2282
1½	2360	1633
2	1860	1784
2½	1160	1696
3	1500	2938
4	580	1660
6	400	2186
8	280	2325
10	160	1968
12	120	2030

NSF pw

NSF® pw-G U.P.Code

CRESLINE - WEST, INC.
CORPORATE HEADQUARTERS: 600 CROSS POINTE BOULEVARD · EVANSVILLE, IN 47715 · TELEPHONE (812) 428-9300
PLANT: 3747 W. BUCKEYE ROAD · PHOENIX, AZ 85009 · TELEPHONE (602) 269-5161
WAREHOUSE: 1930 W. WHITESBRIDGE ROAD · FRESNO, CA 93706 · TELEPHONE (559) 486-1840
www.cresline.com

Schedule 40 Pipe

Nom. Pipe Size (in)	O.D.	Average I.D.	Min. Wall	Nominal Wt./Ft.	Maximum W.P. PSI*
1/8	0.405	0.249	0.068	0.051	810
1/4	0.540	0.344	0.088	0.086	780
3/8	0.675	0.473	0.091	0.115	620
1/2	0.840	0.602	0.109	0.170	600
3/4	1.050	0.804	0.113	0.226	480
1	1.315	1.029	0.133	0.333	450
1-1/4	1.660	1.360	0.140	0.450	370
1-1/2	1.900	1.590	0.145	0.537	330
2	2.375	2.047	0.154	0.720	280
2-1/2	2.875	2.445	0.203	1.136	300
3	3.500	3.042	0.216	1.488	260
3-1/2	4.000	3.521	0.226	1.789	240
4	4.500	3.998	0.237	2.118	220
5	5.563	5.016	0.258	2.874	190
6	6.625	6.031	0.280	3.733	180
8	8.625	7.942	0.322	5.619	160
10	10.750	9.976	0.365	7.966	140
12	12.750	11.889	0.406	10.534	130
14	14.000	13.073	0.437	12.462	130
16	16.000	14.940	0.500	16.286	130
18	18.000	16.809	0.562	20.587	130
20	20.000	18.743	0.593	24.183	120
24	24.000	22.544	0.687	33.652	120

Maximum PVC Service Temperature 140 °F
Spears® does not recommend threading Schedule 40 Pipe.
Use Schedule 40 Male Adapters, Schedule 40 Female Adapters or Spears® Special Reinforced (SR) Female Adapters

Pressure De-rating at Elevated Temperatures

The pressure ratings given above are for water, non-shock, @ 73°F. The specified derating factors for PVC are suitable for pipe conveying water at elevated temperatures. To determine elevated temperature rating, multiply 73°F [23°C] pressure rating by appropriate factor shown in the table for desired operating temperature. When working near maximum specified temperature, solvent cement joints are recommended in place of threaded connections. Where disassembly is required at elevated temperatures use Spears® Special reinforced (SR) adapters, flanges, unions or grooved coupling connections. Spears® recommends that only Schedule 80 or heavier wall thickness pipe should be threaded.

PVC Pipe

Operating Temp (°F)	De-Rating Factor
73	1.00
80	0.88
90	0.75
100	0.62
110	0.51
120	0.40
130	0.31
140	0.22

See Plastic Pipe Engineering Guide for additional information

PVC Performance Engineered & Tested

SPEARS® Schedule 80 PVC product designs combine years of proven experience with computer generated stress analysis to yield the optimum physical structure and performance for each fitting. Material reinforcement is uniformly placed in stress concentration areas for substantially improved pressure handling capability. Resulting products are subjected to numerous verification tests to assure obtaining the very best PVC fittings available.

1/4" Through 14" Availability

Spears® comprehensive line of PVC injection molded fittings and extruded pipe offers a variety of configurations in sizes 1/4" through 14". Schedule 80 fittings are manufactured to ASTM D 2467 and pipe is produced to ASTM D 1785. Spears® exclusive CL150 Flanges are produced in sizes 1/2" - 18" with ANSI B16.5 bolt patterns, plus numerous Unions, Saddles, Transition and Specialty fittings in a variety of sizes.

Exceptional Chemical & Corrosion Resistance

Unlike metal, PVC fittings and pipe never rust, scale, or pit, and will provide many years of maintenance-free service and extended system life.

High Temperature Ratings

PVC thermoplastic can handle fluids at service temperatures up to 140°F (60°C), allowing a wide range of process applications, including corrosive fluids.

Lower Installation Costs

Substantially lower material costs than steel alloys or lined steel, combined with lighter weight and ease of installation, can reduce installation costs by as much as 60% over conventional metal systems.

Higher Flow Capacity

Smooth interior walls result in lower pressure loss and higher volume than conventional metal fittings.

Additional Fabricated Configurations through 36"

Extra large, hard-to-find, and custom configurations are fabricated from NSF® Certified pipe. Fittings are engineered and tested to provide full pressure handling capabilities according to Spears® specifications.

Advanced Design Specialty Fittings

Spears® wide range of innovative, improved products include numerous metal-to-plastic transition fittings and unions with Spears® patented special reinforced (SR) plastic threads.

PVC Valves

SPEARS® PVC Valve products are available for total system compatibility and uniformity.

PVC Sample Engineering Specifications

All PVC Schedule 80 pipe and fittings shall be produced by Spears® Manufacturing Company from PVC Type I, cell classification 12454, conforming to ASTM Standard D 1784. All PVC injection molded Schedule 80 fittings and extruded pipe shall be Certified for potable water service by NSF International. All Schedule 80 fittings shall be manufactured in strict compliance to ASTM D 2467 and Schedule 80 pipe shall be manufactured in strict compliance to ASTM D 1785. All fabricated fittings shall be produced in accordance with Spears® General Specifications for Fabricated Fittings. All PVC flanges shall be designed and manufactured to meet CL150 bolt pattern per ANSI Standard B16.5 and rated for a maximum internal pressure of 150 psi, non-shock at 73°F.

The information contained in this publication is based on current information and Product design at the time of publication and is subject to change without notification. Our ongoing commitment to product improvement may result in some variation. No representations, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications or results to be obtained therefrom. For verification of technical data or additional information not contained herein, please contact Spears® Technical Services Department [West Coast: (818) 364-1611 — East Coast: (678) 985-1263].

General Information

Recommendations For Installers And Users

Plastic piping systems should be ENGINEERED, INSTALLED and OPERATED in accordance with ESTABLISHED DESIGN AND ENGINEERING STANDARDS AND PROCEDURES for plastic piping systems. Suitability for the intended service application should be determined by the installer and/or user prior to installation of a plastic piping system. PRIOR TO ASSEMBLY, all piping system components should be inspected for damage or irregularities. Mating components should be checked to assure that tolerances and engagements are compatible. Do not use any components that appear irregular or do not fit properly. Contact the appropriate manufacturer of the component product in question to determine usability. Consult all applicable codes and regulations for compliance prior to installation.

Solvent Weld Connections — Use quality solvent cements and primers formulated for the intended service application, pipe size and type of joint. While the pipe and fitting materials may be compatible with the intended medium, the solvent cement may not be. Consult the manufacturers for suitability of use. Read and follow the cement and primer manufacturers' applications and cure time instructions thoroughly. Be sure to use the correct size applicator.

Threaded Connections — Use a quality grade thread sealant. WARNING: SOME PIPE JOINT COMPOUNDS OR PTFE PASTES MAY CONTAIN SUBSTANCES THAT COULD CAUSE STRESS CRACKING TO PLASTIC. Spears® Manufacturing company recommends the use of Spears® BLUE 75™ Thread Sealant which has been tested for compatibility with Spears® products. Please follow the sealant manufacturers' application/installation instructions. Choice of an appropriate thread sealant other than those listed above is at the discretion of the installer. 1 to 2 turns beyond FINGER TIGHT is generally all that is required to make a sound plastic threaded connection. Unnecessary OVERTIGHTENING will cause DAMAGE TO BOTH PIPE AND FITTING.

Standards and Specifications

Molded Schedule 80 PVC products are manufactured to ASTM D 2467 for use with pipe manufactured to ASTM D 1785. Certain products carry reduced pressure handling capability and have maximum internal pressure ratings at 73°F noted.

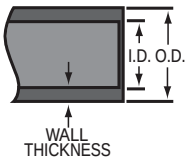
Fabricated Schedule 80 PVC pressure fittings (part numbers ending with "F") are manufactured to Spears® specifications for use with pipe manufactured to ASTM D 1785. General Specifications for Standard Fabricated Fittings for additional information.

All specified Schedule 80 PVC products are manufactured from materials certified by NSF® for use in potable water service.

"Lead Free" low lead certification – unless otherwise specified, all Spears® Schedule 80 fittings specified here-in are certified by NSF International to ANSI/NSF® Standard 61, Annex G and is in compliance with California's Health & Safety Code Section 116825 (commonly known as AB1953) and Vermont Act 193. Weighted average lead content <=0.25%. Spears® PVC Pipe, Fittings and Valves have always been lead-free and Certified by NSF International for use in potable water systems. Spears® offers a wide range of lead-free specialty fittings and transition adapters for plumbing applications. However, certain brass threaded adapter fittings for applications that are not intended to convey water for human consumption through drinking or cooking are still produced and available.

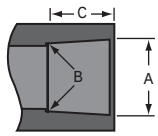
ASTM STANDARD DIMENSIONS

SCHEDULE 80 PIPE DIMENSIONS ASTM D 1785



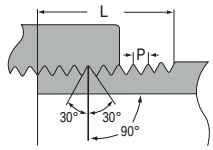
Nominal Pipe Size In.	Mean Outside Diameter In.	O. D. Tolerance In.	Minimum Wall Thickness In.
1/8	0.405	± 0.004	0.095
1/4	0.540	± 0.004	0.119
3/8	0.675	± 0.004	0.126
1/2	0.840	± 0.004	0.147
3/4	1.050	± 0.004	0.154
1	1.315	± 0.005	0.179
1-1/4	1.660	± 0.005	0.191
1-1/2	1.900	± 0.006	0.200
2	2.375	± 0.006	0.218
2-1/2	2.875	± 0.007	0.276
3	3.500	± 0.008	0.300
4	4.500	± 0.009	0.337
5	5.563	± 0.010	0.375
6	6.625	± 0.011	0.432
8	8.625	± 0.015	0.500
10	10.750	± 0.015	0.593
12	12.750	± 0.015	0.687

SCHEDULE 80 SOCKET DIMENSIONS ASTM D 2467



Nominal Size In.	Diameter			Socket Length Minimum C
	Entrance A	Bottom B	Tolerance A	
1/8	0.417	0.401	± 0.004	0.500
1/4	0.552	0.536	± 0.004	0.625
3/8	0.687	0.671	± 0.004	0.750
1/2	0.848	0.836	± 0.004	0.875
3/4	1.058	1.046	± 0.004	1.000
1	1.325	1.310	± 0.005	1.125
1-1/4	1.670	1.655	± 0.005	1.250
1-1/2	1.912	1.894	± 0.006	1.375
2	2.387	2.369	± 0.006	1.500
2-1/2	2.889	2.868	± 0.007	1.750
3	3.516	3.492	± 0.008	1.875
4	4.518	4.491	± 0.009	2.250
5	5.583	5.553	± 0.010	2.625
6	6.647	6.614	± 0.011	3.000
8	8.655	8.610	± 0.015	4.000
10	10.780	10.735	± 0.015	5.000
12	12.780	12.735	± 0.015	6.000
14	14.030	13.985	± 0.015	7.000

AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) ANSI B1 .20.1 ASTM F 1498



Nominal Size In.	Threads Per Inch	Effective Thread Length L	Pitch Of Thread P
1/8	27	0.2639	0.03704
1/4	18	0.4018	0.05556
3/8	18	0.4078	0.05556
1/2	14	0.5337	0.07143
3/4	14	0.5457	0.07143
1	11-1/2	0.6828	0.08696
1-1/4	11-1/2	0.7068	0.08696
1-1/2	11-1/2	0.7235	0.08696
2	11-1/2	0.7565	0.08696
2-1/2	8	1.1375	0.12500
3	8	1.2000	0.12500
4	8	1.3000	0.12500
5	8	1.4063	0.12500
6	8	1.5125	0.12500
8	8	1.7125	0.12500

STANDARD COMPARISONS

SPEARS® IPS-to-Metric transition unions are listed by nominal size. The chart below compares nominal and actual* pipe O.D. for each size according to the designated standard.

JIS K6741 (mm)		DIN 8062 (mm)		ASTM D1785 (in.)		NPT—ANSI B1.20.1** Tapered Thread		BSP—BS21,DIN 2999,ISO 7/1 Thread	
Nominal	Actual*	O.D.	Actual*	Nominal	Actual*	Designation	Threads/in.	Designation	Threads/25.4mm
16	22	15	20	1/2	.840	1/2	14	1/2	14
20	26	20	25	3/4	1.050	3/4	14	3/4	14
25	32	25	32	1	1.315	1	11.5	1	11
30	38	38	40	1-1/4	1.660	1-1/4	11.5	1-1/4	11
40	48	40	50	1-1/2	1.900	1-1/2	11.5	1-1/2	11
50	60	50	63	2	2.375	2	11.5	2	11
75	89	80	90	3	3.500	3	8	3	11
100	114	100	110	4	4.500	4	8	4	11

*Specified dimension, certain tolerances apply **NPT and BSP have different thread angles and not compatible.

WELD-ON®
IPS CORPORATION

PRODUCT BULLETIN

705™

INDUSTRIAL GRADE

LOW VOC PVC SOLVENT CEMENT

GENERAL DESCRIPTION:

WELD-ON® 705™ is an industrial grade, clear or gray, low VOC emission, medium bodied, fast setting, high strength PVC solvent cement for all classes and schedules of pipe and fittings with interference fit through 6 inch (160 mm) diameter, Schedule 80 through 4 inch (110 mm) diameter. Can be used without primer on non-pressure systems if local codes permit.

APPLICATION:

WELD-ON 705 is for use on all types of PVC plastic pipe applications, Type I and Type II. It is suitable for use with potable water pressure systems, irrigation, turf, foam core, conduit, sewer, drain, waste and vent systems.

Detailed directions on making solvent cemented joints are printed on the container label. An installation DVD/CD covering solvent cementing is available. It not only describes the basic principles of solvent cementing, but also covers the handling, storage and use of our products. It is highly recommended that the installer review the instructions supplied by the pipe and fitting manufacturer. **NOTE:** WELD-ON solvent cements must never be used in a PVC system using or being tested by compressed air or gases; including air-over-water booster.

AVAILABILITY:

This product is available in ¼ pint (118 ml), ½ pint (237 ml), pint (473 ml), quart (946 ml) and gallon (3.785 l) metal cans. For detailed information on containers and applicators, see our current Price List.

STANDARDS AND CERTIFICATION LISTINGS:

NSF PW/DWV/SW

UPC

NSF c US PW/DWV/SW Gray Only

CSA Gray Only

- Meets ASTM D 2564 Standard.
- Meets SCAQMD Rule 1168/316A.
- Compliant with LEED® (Leadership in Energy and Environmental Design). When using this WELD-ON Low VOC product, credit can be claimed for LEED Green Building Rating System - Indoor Environmental Quality.
- Listed by NSF International for compliance with ASTM D 2564, NSF/ANSI Standard 14 and NSF/ANSI Standard 61 for use in potable water, drain, waste, vent and sewer applications.
- **Gray Cement Only** - Meets CSA standards B137.3 and B181.2 for use in pressure and non-pressure potable water, drain, waste, and vent applications.
- Listed by IAPMO for compliance with ASTM D 2564 and applicable sections of the latest edition of the Uniform Plumbing Code®.

SPECIFICATIONS:

COLOR:	Clear or Gray
RESIN:	PVC
SPECIFIC GRAVITY:	0.960 ± 0.04
BROOKFIELD VISCOSITY:	Minimum 500 cP @ 73° ± 2°F (23° ± 1°C)

SHELF LIFE:

3 years in tightly sealed containers. The date code of manufacture is stamped on the bottom of the container. Stability of the product is limited by the evaporation of the solvent when the container is opened. Evaporation of solvent will cause the cement to thicken and reduce its effectiveness. Adding of thinners to change viscosity is not recommended and may significantly change the properties of the cement.

QUALITY ASSURANCE:

WELD-ON 705 is carefully evaluated to assure that consistent high quality is maintained. Fourier transform infrared spectroscopy, gas chromatography, and additional in depth testing ensures each batch is manufactured to exacting standards. A batch identification code is stamped on each can and assures traceability of all materials and processes used in manufacturing this solvent cement.

SHIPPING:

For One Liter and Above
Proper Shipping Name: Adhesive
Hazard Class: 3
Identification Number: UN 1133
Packing Group: II
Label Required: Flammable Liquid

For Less than One Liter
Proper Shipping Name: Consumer Commodity
Hazard Class: ORM-D

SAFETY AND ENVIRONMENTAL PRECAUTIONS:

This product is flammable and considered a hazardous material. In conformance with the Federal Hazardous Substances Labeling Act, the following hazards and precautions are given. Purchasers who repackage this product must also conform to all local, state and federal labeling, safety and other regulations. VOC emissions do not exceed 510 grams per liter.

DANGER: EXTREMELY FLAMMABLE. VAPOR HARMFUL.
MAY BE HARMFUL IF SWALLOWED. MAY IRRITATE SKIN OR EYES.

Keep out of reach of children. Do not take internally. Keep away from heat, spark, open flame and other sources of ignition. Vapors may ignite explosively. Solvent cement vapors are heavier than air and may travel to source(s) of ignition at or near ground or lower level(s) and flash back. Keep container closed when not in use. Store between 40°F (5°C) and 110°F (44°C). Avoid breathing of vapors. Use only in well-ventilated area. If confined or partially enclosed, use forced ventilation. When necessary, use local exhaust ventilation to remove harmful airborne contaminants from employee breathing zone and to keep contaminates below 25 ppm TWA. Atmospheric levels must be maintained below established exposure limits contained in Section II of the Material Safety Data Sheet (MSDS). If airborne concentrations exceed those limits, use of a NIOSH approved organic vapor cartridge respirator with full face-piece is recommended. The effectiveness of an air-purifying respirator is limited. Use it only for a single short-term exposure. For emergency and other conditions where short-term exposure guidelines may be exceeded, use an approved positive pressure self-contained breathing apparatus. Do not smoke, eat or drink while working with this product. Avoid contact with skin, eyes and clothing. May cause eye injury. Protective equipment such as gloves, goggles and impervious apron should be used. Carefully read Material Safety Data Sheet and follow all precautions. Do not use this product for other than intended use.

"SARA Title III Section 313 Supplier Notification": This product contains toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 and of 40CFR372. This information must be included in all MSDS that are copied and distributed for this material.

FIRST AID:

Inhalation:	If overcome with vapors, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call physician.
Eye Contact:	Flush with plenty of water for 15 minutes and call a physician.
Skin Contact:	Wash skin with plenty of soap and water for at least 15 minutes. If irritation develops, get medical attention.
Ingestion:	If swallowed, give 1 or 2 glasses of water or milk. Do not induce vomiting. Contact physician or poison control center immediately.

SPECIAL PRECAUTION:

Do not use a dry granular calcium hypochlorite as a disinfecting material for water purification in potable water piping systems. The introduction of granules or pellets of calcium hypochlorite with PVC and CPVC solvent cements and primers (including their vapors) may result in a violent chemical reaction if a water solution is not used. It is advisable to purify lines by pumping chlorinated water into the piping system – this solution will be nonvolatile. Furthermore, dry granular calcium hypochlorite should not be stored or used near solvent cements and primers.

IMPORTANT NOTE:

This product is intended for use by skilled individuals at their own risk. These suggestions and data are based on information we believe to be reliable. Installers should verify for themselves that they can make satisfactory joints under varying conditions. Toward this end, it is highly desirable that they receive personal instruction from trained instructors or competent, experienced installers. Contact IPS® Corporation or your supplier for additional information or instructions.

WARRANTY:

IPS® Corporation ("IPS Corp.") warrants that all new IPS Corp. products shall be of good quality and free from defects in material and workmanship for the shelf life as indicated on the product. If any IPS Corp. product becomes defective, or fails to conform to our written limited warranty under normal use and storage conditions, then IPS Corp. will, without charge, replace the nonconforming product. However, this limited warranty shall not extend to, nor shall IPS Corp. be responsible for, damages or loss resulting from accident, misuse, negligent use, improper application, or incorporation of IPS Corp. products into other products. In addition, any repackaging of IPS Corp. products also shall void the limited warranty. IPS Corp. shall not be responsible for, nor does this limited warranty extend to, consequential damage, or incidental damage or expense, including without limitation, injury to persons or property or loss of use. Please refer to our standard IPS Corp. Limited Warranty for additional provisions.

IPS® CORPORATION

455 W. Victoria Street
Compton, CA 90220 U.S.A.
Tel: 310.898.3300
Fax: 310.898.3392

500 Distribution Parkway
Collierville, TN 38017 U.S.A.
Tel: 901.853.5001
Fax: 901.853.5008

Customer Service: 800.888.8312
www.ipscorp.com

WELD-ON®
IPS CORPORATION

PRODUCT BULLETIN

P-68™

LOW VOC PRIMER FOR PVC AND CPVC PIPES

GENERAL DESCRIPTION:

WELD-ON® P-68™ is a low VOC emission, non-bodied, fast acting, primer. The strong action of P-68 primer rapidly softens and dissolves the joining surfaces of PVC and CPVC pipe and fittings. Available in clear and purple; the latter allows easy identification when used on the joining surfaces.

APPLICATION:

WELD-ON P-68 primer, when used in conjunction with appropriate WELD-ON solvent cements, will make consistently strong, well-fused joints. It is essential that the joining surfaces of pipe and fittings be softened and remains softened prior to assembly. The main function of the primer is to expedite the penetration and softening of the surfaces. Its rate of penetration into the joining surfaces is more rapid than that of solvent cement alone. P-68 primer is suitable for use with all types, classes and schedules of PVC and CPVC pipe and fittings.

Detailed directions on making solvent cemented joints are printed on the container label. An installation DVD/CD covering solvent cementing is available. It not only describes the basic principles of solvent cementing, but also covers the handling, storage and use of our products. It is highly recommended that the installer review the instructions supplied by the pipe and fitting manufacturer. **NOTE:** WELD-ON solvent cements must never be used in a CPVC system using or being tested by compressed air or gases; including air-over-water booster.

AVAILABILITY:

WELD-ON Both WELD-ON P-68 clear and purple primers are available in ¼ pint (118 ml), ½ pint (237 ml), pint (473 ml), quart (946 ml) and gallon (3.785 l) metal cans. For detailed information on containers and applicators, see our current Price List.

STANDARDS AND CERTIFICATION LISTINGS:

NSF® UPC® PW/DWV/SW Purple Only

- Meets ASTM F 656 Standard
- Meets SCAQMD Rule 1168/316A
- Compliant with LEED® (Leadership in Energy and Environmental Design). When using this WELD-ON low VOC product, credit can be claimed for LEED Green Building Rating System – Indoor Environmental Quality.
- Listed by NSF International for compliance with ASTM F 656, NSF/ANSI Standard 14, and NSF/ANSI Standard 61 for use on potable water, drain, waste, vent and sewer applications.
- ***WELD-ON P-68 Purple Only*** - Listed by IAPMO for compliance with ASTM F 656 and applicable sections of the latest edition of the Uniform Plumbing Code®.

SPECIFICATIONS:

COLOR:	Clear or Purple
SPECIFIC GRAVITY:	0.841 ± 0.040
BROOKFIELD VISCOSITY:	Water Thin

SHELF LIFE:

3 years in tightly sealed containers. The date code of manufacture is stamped on the bottom of the container. Stability of the product is limited by the evaporation of the solvent when the container is opened. Adding of solvents is not recommended and may significantly change the properties of the primer.

QUALITY ASSURANCE:

WELD-ON P-68 primer is carefully evaluated to assure that consistent high quality is maintained. Fourier transform infrared spectroscopy, gas chromatography, and additional in depth testing ensures each batch is manufactured to exacting standards. A batch identification code is stamped on each can and assures traceability of all materials and processes used in manufacturing this product.

SHIPPING:

For One Liter and Above

Proper Shipping Name:	Flammable Liquid n.o.s. (Acetone, Methyl Ethyl Ketone)
Hazard Class:	3
Identification Number:	UN 1993
Packing Group:	II
Label Required:	Flammable Liquid

For Less than One Liter

Proper Shipping Name: Consumer Commodity
Hazard Class: ORM-D

SAFETY AND ENVIRONMENTAL PRECAUTIONS:

This product is flammable and considered a hazardous material. In conformance with the Federal Hazardous Substances Labeling Act, the following hazards and precautions are given. Purchasers who repackage this product must also conform to all local, state and federal labeling, safety and other regulations. VOC emissions do not exceed 550 grams per liter.

DANGER: EXTREMELY FLAMMABLE. VAPOR HARMFUL.
MAY BE HARMFUL IF SWALLOWED. MAY IRRITATE SKIN OR EYES.

Keep out of reach of children. Do not take internally. Keep away from heat, spark, open flame and other sources of ignition. Vapors may ignite explosively. Solvent cement vapors are heavier than air and may travel to source(s) of ignition at or near ground or lower level(s) and flash back. Keep container closed when not in use. Store between 40°F (5°C) and 110°F (44°C). Avoid breathing of vapors. Use only in well-ventilated area. If confined or partially enclosed, use forced ventilation. When necessary, use local exhaust ventilation to remove harmful airborne contaminants from employee breathing zone and to keep contaminates below 25 ppm TWA. Atmospheric levels must be maintained below established exposure limits contained in Section II of the Material Safety Data Sheet (MSDS). If airborne concentrations exceed those limits, use of a NIOSH approved organic vapor cartridge respirator with full face-piece is recommended. The effectiveness of an air-purifying respirator is limited. Use it only for a single short-term exposure. For emergency and other conditions where short-term exposure guidelines may be exceeded, use an approved positive pressure self-contained breathing apparatus. Do not smoke, eat or drink while working with this product. Avoid contact with skin, eyes and clothing. May cause eye injury. Protective equipment such as gloves, goggles and impervious apron should be used. Carefully read Material Safety Data Sheet and follow all precautions. Do not use this product for other than intended use.

"SARA Title III Section 313 Supplier Notification": This product contains toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 and of 40CFR372. This information must be included in all MSDS that are copied and distributed for this material.

FIRST AID:

Inhalation:	If overcome with vapors, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call physician.
Eye Contact:	Flush with plenty of water for 15 minutes and call a physician.
Skin Contact:	Wash skin with plenty of soap and water for at least 15 minutes. If irritation develops, get medical attention.
Ingestion:	If swallowed, give 1 or 2 glasses of water or milk. Do not induce vomiting. Contact physician or poison control center immediately.

SPECIAL PRECAUTION:

Do not use a dry granular calcium hypochlorite as a disinfecting material for water purification in potable water piping systems. The introduction of granules or pellets of calcium hypochlorite with PVC and CPVC solvent cements and primers (including their vapors) may result in a violent chemical reaction if a water solution is not used. It is advisable to purify lines by pumping chlorinated water into the piping system – this solution will be nonvolatile. Furthermore, dry granular calcium hypochlorite should not be stored or used near solvent cements and primers.

IMPORTANT NOTE:

This product is intended for use by skilled individuals at their own risk. These suggestions and data are based on information we believe to be reliable. Installers should verify for themselves that they can make satisfactory joints under varying conditions. Toward this end, it is highly desirable that they receive personal instruction from trained instructors or competent, experienced installers. Contact IPS® Corporation or your supplier for additional information or instructions.

WARRANTY:

IPS® Corporation ("IPS Corp.") warrants that all new IPS Corp. products shall be of good quality and free from defects in material and workmanship for the shelf life as indicated on the product. If any IPS Corp. product becomes defective, or fails to conform to our written limited warranty under normal use and storage conditions, then IPS Corp. will, without charge, replace the nonconforming product. However, this limited warranty shall not extend to, nor shall IPS Corp. be responsible for, damages or loss resulting from accident, misuse, negligent use, improper application, or incorporation of IPS Corp. products into other products. In addition, any repackaging of IPS Corp. products also shall void the limited warranty. IPS Corp. shall not be responsible for, nor does this limited warranty extend to, consequential damage, or incidental damage or expense, including without limitation, injury to persons or property or loss of use. Please refer to our standard IPS Corp. Limited Warranty for additional provisions.

IPS® CORPORATION

455 W. Victoria Street
Compton, CA 90220 U.S.A.
Tel: 310.898.3300
Fax: 310.898.3392

500 Distribution Parkway
Collierville, TN 38017 U.S.A.
Tel: 901.853.5001
Fax: 901.853.5008

Customer Service: 800.888.8312
www.ipscorp.com

GOLDEN EMPIRE CONCRETE SALES

1830 South Milliken Ave, Ontario CA 91761

Date Issued: 7/17/2025

Submittal No. 2202

Contractor: TODD COMPANIES

Project: FRANKLIN ELEMENTARY SCHOOL

Location:

Dear Sir/Madam:

We are submitting the following concrete mix design(s) for approval of use for the above referenced project:

Mix Code Number	Description	Intended Use
NC40000	4000 6.00SK 1AGG WR SCI	SITE / MISCEILLANEOUS WORK

LIMITATIONS:

1. The concrete mix designs submitted are in conformance with ACI 301 and ASTM standards and other generally accepted engineering practices. Purchaser agrees to abide by the operational and acceptance standards set forth by those organizations.

2. Prior to delivery it is the responsibility of the purchaser to obtain approval of these mix designs from the necessary authorities. Supplier assumes no responsibility for obtaining or verifying approvals. By ordering, the purchaser receipt of all approvals for this or any other mix the purchaser orders for this project.

3. This concrete mixture will produce concrete meeting the design criteria when sampled in accordance with C-94 and ASTM C172. The minimum 28 day compressive strength may not meet project requirements if the slump is not within specificied refernces stated in the approved project speifications.

4. The concrete must be placed, protected, and cured in strict accordance with ACI 318, and the specified references stated in the approved project specifications.

5. Prior to placement, it is the responsibility of the purchases to verify the air content of those mixes requiring entrained air. We as ready mix concrete supplier do not accept liability for concrete that does not meet air entrainment specifications after it has been placed in the forms.

6. We as the ready mix concrete supplier take no responsibilty for concrete performance when the workmanship deviates from the standards and practices stated therein.

7. Finishing of Concrete should be finished per CI 302 recommendations. Hard trowel finishing of air entrained concrete may result in adverse effects up to and including delamination of concrete slabs.

8. Mixes containing SRA maybe prone to delamination when subject to hard trowel finishing techniques.

9. Mix designs containing smaller nominal maximum sizes aggregate are susceptible to shrinkage cracks - i.e., 3/8" as well as 5/50 concrete mix designs.

We appreciate the opportunity to be of service to you. Should you have any questions regarding the information provided, please contact our office.

Respectfully,

Prepared by:
LANCE MATTOS

GOLDEN EMPIRE CONCRETE SALES

1830 South Milliken Ave, Ontario CA 91761

PROJECT INFORMATION

4000 6.00SK 1AGG WR SCE4001

Customer:	TODD COMPANIES	**Concrete Mix No.:**	**NC40000**
Project:	FRANKLIN ELEMENTARY SCHOOL	**Date:**	July 17, 2025
Address:		**Use:**	SITE / MISCEILLANEOUS WORK
Concrete Supplier:	Golden Empire Concrete		
Design Compressive Strength:	4000 psi @ 28 days	**Plant:**	WESTSIDE
W/C + P Ratio:	0.50 5.65 gal/sack	**Slump Range:**	4.00 +/- 1.00
Equivalent Cement Factor:	6.00 sacks/CY	**General Contractor:**	

CONCRETE MIX PROPORTIONS

Note: All aggregate weights are saturated surface dry (SSD) weights and the moisture content of the aggregates at the time of batching must be considered when determining the total water in the mix.

Material		Source	Batch Wts (lb)	Abs. Vol. (cu.ft.)	Spec Grav.
ASTM C-595 1L		NATIONAL	564	2.90	3.08
WATER LBS	34.0 gal	WATER	283.0	4.50	1.00
1 INCH AGGREGATE	46 %	VULCAN / SAN EMIDI	1468	8.90	2.65
3/8 INCH AGGREGATE	12 %	VULCAN / SAN EMIDI	364	2.20	2.63
CONCRETE SAND	42 %	VULCAN / SAN EMIDI	1326	8.00	2.64
EUCON NW WATER REDUCER	4.5 oz/cwt C+P	EUCLID	25.4 oz/cy		
Air Content	1.5 %			0.41	
Plastic Unit Wt:	148.3 pcf	**Material Totals:**	4004.4 lbs.	27.00	cu.ft.

PROPOSED AGGREGATE GRADATIONS

	1 1/2 in. (37.5 mm)	1 in. (25 mm)	3/4 in. (19 mm)	1/2 in. (12.5 mm)	3/8 in. (9.5 mm)	No. 4 (4.75 mm)	No. 8 (2.36 mm)	No. 16 (1.18 mm)	No. 30 (0.6 mm)	No. 50 (0.3 mm)	No. 100 (0.15 mm)	No. 200 (0.075 mm)	FM
INVAGG1	100	99	84	31	10	3	2	0	0	0	0	0	7.01
INVAGG3/8				100	89	18	3	1	0	0	0	0	5.89
INVSAND					100	99	88	65	42	20	7	4	2.79
Comb. Grad.	100	100	93	68	57	45	38	27	18	8	3	2	5.11

Mix Notes:

Lance Mattos

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Tristan Fox	Report Date:	4/14/2023
Project Name:	Chick-Fil-A No. 4799	Project Number:	2-622-1363
Structure Placed:	Slab on Grade	Sample Set ID:	22245
Area of Placement:	Trash Enclosure Apron		

Date Sampled:	3/17/2023	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	9:45 AM	Slump:	4½"	Ticket Number:	207292305
Date Sample Received:	3/20/2023	Concrete Temperature:	65°F	Mix Number:	NC40000
Sampled By:	Y. Saleh	Ambient Temperature:	60°F	Air Content:	
Delivered By:	D. Perera	Environmental Conditions:	Cloudy	Unit Weight (pcf):	

Date Tested	Sample Age in Days	Diameter (in.)	Area (in.^{2})	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
3/24/2023	7	4.00	12.57	37,420	**2,980**		5	D. Perera
4/14/2023	28	4.00	12.57	54,570	**4,340**	4,000	3	D. Perera
4/14/2023	28	4.00	12.57	53,460	**4,250**		5	D. Perera
4/14/2023	28	4.00	12.57	53,760	**4,280**		3	D. Perera
	HOLD							

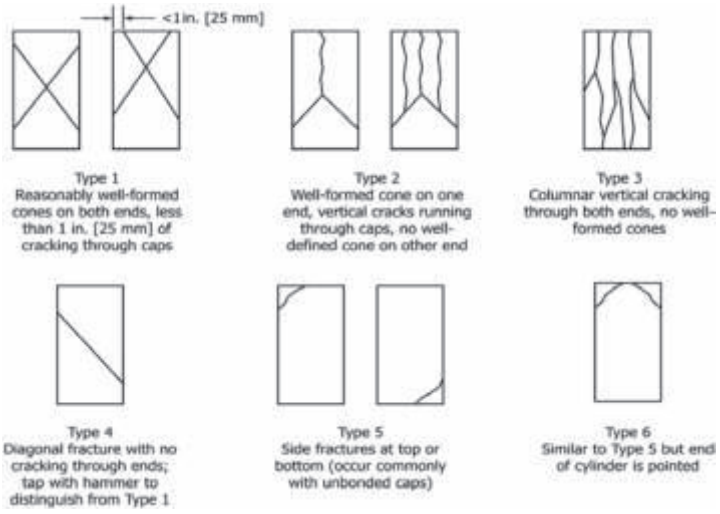
Average 28 Day Compressive Strength, psi: **4,290**

Condition of Sample: Undisturbed

Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

- Bonded Cap (ASTM C617) ☐
- Unbonded Cap (ASTM C1231) ☑
- Air Content, Volumetric Method (ASTM C173) ☐
- Air Content, Pressure Method (ASTM C231) ☐
- Density, Yield and Air Content of Concrete (ASTM C138) ☐
- Sampling Freshly Mixed Concrete (ASTM C172)
- Slump of Hydraulic-Cement Concrete (ASTM C143)
- Temperature of Freshly Mixed Concrete (ASTM C1064)
- Making and Curing Test Specimens (ASTM C31)
- Compressive Strength of Concrete Specimens (ASTM C39)



Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Makkawi Builders	Report Date:	1/19/2023
Project Name:	ARCO Gas Station & Convenience Store	Project Number:	2-622-1042
Structure Placed:	SOG/Footings	Sample Set ID:	22224
Area of Placement:	South West Side		

Date Sampled:	12/22/2022	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	6:30 AM	Slump:	5 ½"	Ticket Number:	208153591
Date Sample Received:	12/23/2022	Concrete Temperature:	55°F	Mix Number:	NC40000
Sampled By:	D. Perera	Ambient Temperature:	35°F	Air Content:	N/A
Delivered By:	D. Perera	Environmental Conditions:	Cold, Gloomy	Unit Weight (pcf):	N/A

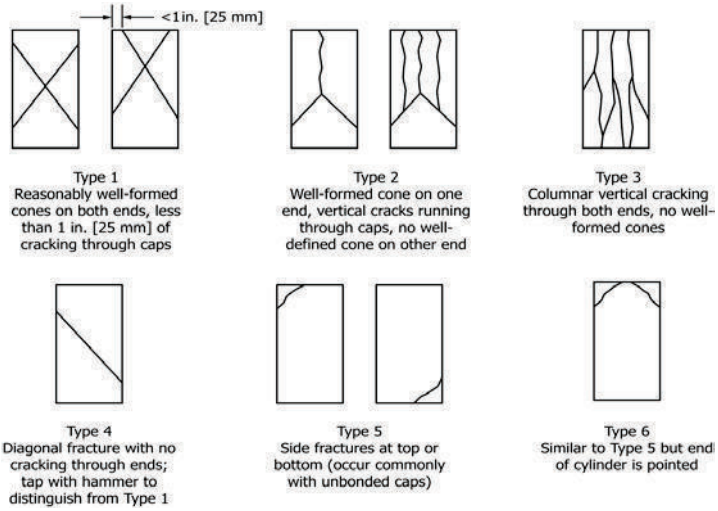
Date Tested	Sample Age in Days	Diameter (in.)	Area ($in.^2$)	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
12/29/2022	7	4.00	12.57	38,310	**3,050**		1	A. Dalqamouni
1/19/2023	28	4.00	12.57	60,200	**4,790**	4,000	5	D. Perera
1/19/2023	28	4.00	12.57	60,750	**4,830**		3	D. Perera
1/19/2023	28	4.00	12.57	63,550	**5,060**		2	D. Perera
	HOLD							
				Average 28 Day Compressive Strength, psi:	**4,890**			

Condition of Sample: Undisturbed

Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

Bonded Cap (ASTM C617) ☐
Unbonded Cap (ASTM C1231) ☑
Air Content, Volumetric Method (ASTM C173) ☐
Air Content, Pressure Method (ASTM C231) ☐
Density, Yield and Air Content of Concrete (ASTM C138) ☐
Sampling Freshly Mixed Concrete (ASTM C172)
Slump of Hydraulic-Cement Concrete (ASTM C143)
Temperature of Freshly Mixed Concrete (ASTM C1064)
Making and Curing Test Specimens (ASTM C31)
Compressive Strength of Concrete Specimens (ASTM C39)



Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Tristan Fox	Report Date:	4/11/2023
Project Name:	Chick-Fil-A No. 4799	Project Number:	2-622-1363
Structure Placed:	Slab on Grade / Footings	Sample Set ID:	22244
Area of Placement:	Trash Enclosure - North East half		

Date Sampled:	3/14/2023	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	8:00 AM	Slump:	4"	Ticket Number:	207292219
Date Sample Received:	3/15/2023	Concrete Temperature:	66°F	Mix Number:	NC40000
Sampled By:	D. Perera	Ambient Temperature:	60°F	Air Content:	
Delivered By:	D. Perera	Environmental Conditions:	Drizzle	Unit Weight (pcf):	

Date Tested	Sample Age in Days	Diameter (in.)	Area ($in.^2$)	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
3/21/2023	7	4.00	12.57	39,380	**3,130**		5	D. Perera
4/11/2023	28	4.00	12.57	54,200	**4,310**	4,000	5	D. Perera
4/11/2023	28	4.00	12.57	53,260	**4,240**		3	D. Perera
4/11/2023	28	4.00	12.57	54,280	**4,320**		5	D. Perera
	HOLD							

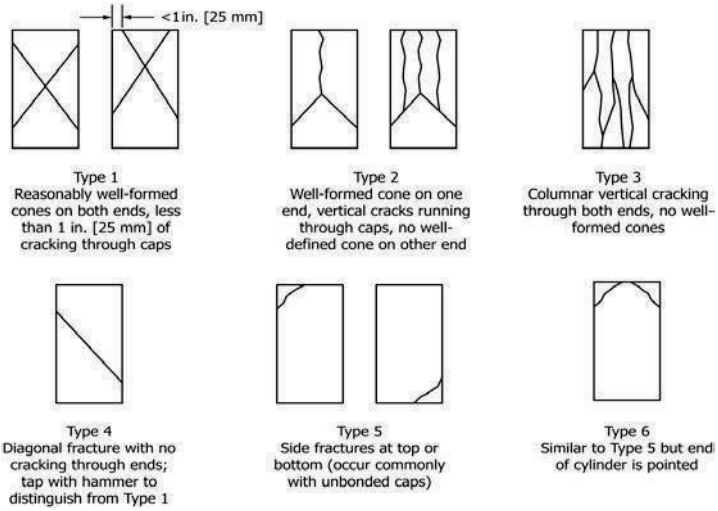
Average 28 Day Compressive Strength, psi: **4,290**

Condition of Sample: Undisturbed

Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

- Bonded Cap (ASTM C617) ☐
- Unbonded Cap (ASTM C1231) ☑
- Air Content, Volumetric Method (ASTM C173) ☐
- Air Content, Pressure Method (ASTM C231) ☐
- Density, Yield and Air Content of Concrete (ASTM C138) ☐
- Sampling Freshly Mixed Concrete (ASTM C172)
- Slump of Hydraulic-Cement Concrete (ASTM C143)
- Temperature of Freshly Mixed Concrete (ASTM C1064)
- Making and Curing Test Specimens (ASTM C31)
- Compressive Strength of Concrete Specimens (ASTM C39)



Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Tristan Fox	Report Date:	3/10/2023
Project Name:	Chick-Fil-A No. 4799	Project Number:	2-622-1363
Structure Placed:	SOG / Footings	Sample Set ID:	22235
Area of Placement:	Footings -East Side		

Date Sampled:	2/10/2023	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	5:30 AM	Slump:	4"	Ticket Number:	207290729
Date Sample Received:	2/13/2023	Concrete Temperature:	62°F	Mix Number:	NC40000
Sampled By:	D. Perera	Ambient Temperature:	39°F	Air Content:	
Delivered By:	D. Perera	Environmental Conditions:	Foggy	Unit Weight (pcf):	

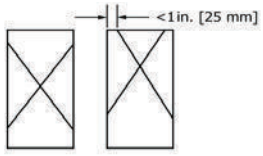
Date Tested	Sample Age in Days	Diameter (in.)	Area ($in.^2$)	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
2/17/2023	7	4.00	12.57	45,610	**3,630**		2	D. Perera
3/10/2023	28	4.00	12.57	60,760	**4,840**	4,000	2	D. Perera
3/10/2023	28	4.00	12.57	64,000	**5,090**		2	D. Perera
3/10/2023	28	4.00	12.57	60,700	**4,830**		5	D. Perera
	HOLD							
				Average 28 Day Compressive Strength, psi:	**4,920**			

Condition of Sample: Undisturbed

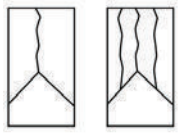
Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

Bonded Cap (ASTM C617) ☐
Unbonded Cap (ASTM C1231) ☑
Air Content, Volumetric Method (ASTM C173) ☐
Air Content, Pressure Method (ASTM C231) ☐
Density, Yield and Air Content of Concrete (ASTM C138) ☐
Sampling Freshly Mixed Concrete (ASTM C172)
Slump of Hydraulic-Cement Concrete (ASTM C143)
Temperature of Freshly Mixed Concrete (ASTM C1064)
Making and Curing Test Specimens (ASTM C31)
Compressive Strength of Concrete Specimens (ASTM C39)

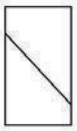


Type 1
Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps

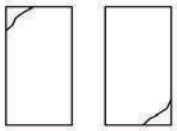


Type 2
Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end

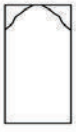
Type 3
Columnar vertical cracking through both ends, no well-formed cones



Type 4
Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1



Type 5
Side fractures at top or bottom (occur commonly with unbonded caps)



Type 6
Similar to Type 5 but end of cylinder is pointed

Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Tristan Fox	Report Date:	3/10/2023
Project Name:	Chick-Fil-A No. 4799	Project Number:	2-622-1363
Structure Placed:	SOG / Footings	Sample Set ID:	22236
Area of Placement:	Slab -South Side		

Date Sampled:	2/10/2023	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	6:50 AM	Slump:	4½"	Ticket Number:	207290739
Date Sample Received:	2/13/2023	Concrete Temperature:	66°F	Mix Number:	NC40000
Sampled By:	D. Perera	Ambient Temperature:	40°F	Air Content:	
Delivered By:	D. Perera	Environmental Conditions:	Foggy	Unit Weight (pcf):	

Date Tested	Sample Age in Days	Diameter (in.)	Area ($in.^2$)	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
2/17/2023	7	4.00	12.57	43,460	**3,460**		3	D. Perera
3/10/2023	28	4.00	12.57	54,370	**4,330**	4,000	5	D. Perera
3/10/2023	28	4.00	12.57	55,720	**4,430**		2	D. Perera
3/10/2023	28	4.00	12.57	55,060	**4,380**		5	D. Perera
	HOLD							

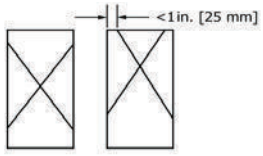
Average 28 Day Compressive Strength, psi: **4,380**

Condition of Sample: Undisturbed

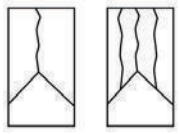
Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

Bonded Cap (ASTM C617) ☐
Unbonded Cap (ASTM C1231) ☑
Air Content, Volumetric Method (ASTM C173) ☐
Air Content, Pressure Method (ASTM C231) ☐
Density, Yield and Air Content of Concrete (ASTM C138) ☐
Sampling Freshly Mixed Concrete (ASTM C172)
Slump of Hydraulic-Cement Concrete (ASTM C143)
Temperature of Freshly Mixed Concrete (ASTM C1064)
Making and Curing Test Specimens (ASTM C31)
Compressive Strength of Concrete Specimens (ASTM C39)

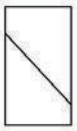


Type 1
Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps

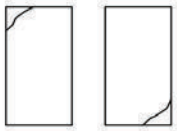


Type 2
Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end

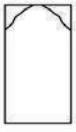
Type 3
Columnar vertical cracking through both ends, no well-formed cones



Type 4
Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1



Type 5
Side fractures at top or bottom (occur commonly with unbonded caps)



Type 6
Similar to Type 5 but end of cylinder is pointed

Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

SALEM
engineering group, inc.

4729 W. Jacquelyn Avenue
Fresno, CA 93722
Office: (559) 271-9700
Fax: (559) 275-0827

Report of Concrete Compression Results

Report to:	Tristan Fox	Report Date:	3/14/2023
Project Name:	Chick-Fil-A No. 4799	Project Number:	2-622-1363
Structure Placed:	Canopy & Trash Enclosure Footings	Sample Set ID:	22237
Area of Placement:	Canopy Footings		

Date Sampled:	2/14/2023	Number of Specimens:	5	Supplier:	Golden Empire
Time Sampled:	7:15 AM	Slump:	5½"	Ticket Number:	207290876
Date Sample Received:	2/15/2023	Concrete Temperature:	60°F	Mix Number:	NC40000
Sampled By:	D. Perera	Ambient Temperature:	48°F	Air Content:	
Delivered By:	D. Perera	Environmental Conditions:	Clear	Unit Weight (pcf):	

Date Tested	Sample Age in Days	Diameter (in.)	Area ($in.^2$)	Maximum Load (lbs.)	Compressive Strength (psi)	Specified Strength (psi)	Type of Fracture	Tested By
2/21/2023	7	4.00	12.57	41,130	**3,270**		3	D. Perera
3/14/2023	28	4.00	12.57	56,220	**4,470**	4,000	5	D. Perera
3/14/2023	28	4.00	12.57	55,420	**4,410**		5	D. Perera
3/14/2023	28	4.00	12.57	59,020	**4,700**		2	D. Perera
	HOLD							

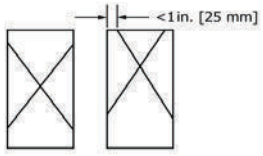
Average 28 Day Compressive Strength, psi: **4,530**

Condition of Sample: Undisturbed

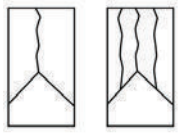
Notes:

The Material ☑ Was ☐ Was Not Sampled and Tested in Accordance with the Requirements of the Approved Plans and Specifications.

Bonded Cap (ASTM C617) ☐
Unbonded Cap (ASTM C1231) ☑
Air Content, Volumetric Method (ASTM C173) ☐
Air Content, Pressure Method (ASTM C231) ☐
Density, Yield and Air Content of Concrete (ASTM C138) ☐
Sampling Freshly Mixed Concrete (ASTM C172)
Slump of Hydraulic-Cement Concrete (ASTM C143)
Temperature of Freshly Mixed Concrete (ASTM C1064)
Making and Curing Test Specimens (ASTM C31)
Compressive Strength of Concrete Specimens (ASTM C39)

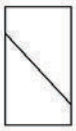


Type 1
Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps

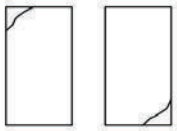


Type 2
Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end

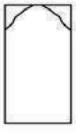
Type 3
Columnar vertical cracking through both ends, no well-formed cones



Type 4
Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1



Type 5
Side fractures at top or bottom (occur commonly with unbonded caps)



Type 6
Similar to Type 5 but end of cylinder is pointed

Signed,
Salem Engineering Group, Inc.

Neil McConnell

The results above relate only to the items inspected and/or tested.
This report shall not be reproduced, except in full, without the prior written approval of SALEM Engineering Group, Inc.

NATIONAL CEMENT

National Cement Company of California, Inc.

LEBEC Plant

MILL TEST REPORT

We certify that the below described Hydraulic Blended Cement, at the time of shipment and Manufactured Production of December 2024 meets the Chemical and Physical requirements of Blended Hydraulic Cements as per ASTM C595/C595M and AASTHO M240.

Chemical Specifications and Analysis

ASTM (C114)	ASTM C595/C595M TYPE IL	Actual Analysis	
SiO2	NA	20.40	%
Al2O3	NA	4.06	%
Fe2O3	NA	3.76	%
CaO	NA	63.37	%
MgO	NA	1.94	%
SO3	3.0 max *	3.1	% *
Loss	10.0 max	5.0	%
Insoluble	NA	1.09	%
Na2O	NA	0.05	%
K2O	NA	0.08	%
Eq.Alkalies	NA	0.55	%
Free CaO	NA	1.10	%
Cl	NA	0.006	%
%CO2	NA	3.8	%
% Limestone	15.0% max	9.5	%
%CaCO3 in LS	70% min	98.1	%

* Meets ASTM C595, Table 1, Option B

* It is permissible to exceed the values in the table for SO3 content, provided it has been demonstrated by Test Method C1038 that the cement with the increased SO3 will not develop expansion exceeding 0.020 % at 14 days.

Physical Specifications and Analysis

	ASTM C595/C595M TYPE IL	Actual Analysis
Air content of mortar (%volume) (C185)	12 max	7
Blaine, Sq.cm/gm (C204)	NR	4840
Fineness (M-325) (C430)	NR	98.6
Autoclave Exp. % (C215)	NR	0.002
Time of Setting:		
Vicat (A),Initial (C191)	45 min	165
Vicat (A),Final (C191)	NR	288
Gilmore, Initial (C266)	NR	160
Gilmore, Final (C266)	NR	288
C-1038 Mortar bar exp.(%)	0.02 max	0.005
(1) Sulfate Resistance (C1012/C1012M)	0.05 max	0.02
Per ASTM C595, Table 3, Special Properties HS-High Sulfate Resistance		
Compressive Strength: (C109/C109M)		
1 day (Psi)	NR	2270
3 days (Psi)	1890 min	3870
7 days (Psi)	2900 min	4770
28 days (Psi)	3620 min	6000

NA = Not Applicable

NR = No Requirement

(1) Sulfate Resistance Historical Data

This Cement Meets Or Exceeds The Following Described Specifications

ASTM: C595/C595M-24, TYPE IL(10) - HS Blended Portland

AASTHO: 240M Standard Specifications for Blended Hydraulic Cement

Main Office:

15821 Ventura Blvd.
Suite 475
Encino, Ca. 91436-2935
(818) 788-4228

NATIONAL CEMENT COMPANY OF CALIFORNIA

By: 

QUALITY CONTROL MANAGER

1/9/25

WATER REDUCERS

Master Format #: 03 30 00 03 40 00 03 70 00

EUCON™ NW

WATER REDUCING ADMIXTURE

EUCLID CHEMICAL

PRODUCT INFORMATION

PACKAGING

Packaged in bulk, 275 gal (1041 L) totes, 55 gal (208 L) drums and 5 gal (18.9 L) pails

SHELF LIFE

1 year in original, unopened container

SPECIFICATIONS/COMPLIANCES

ASTM C494, Type A & D

AASHTO M194

DESCRIPTION

EUCON NW is a water reducing, normal set admixture made from a concentrated solution of refined lignosulfonate, polymer and other water reducing and plasticizing chemicals. EUCON NW provides a more plastic and cohesive mix in fresh concrete and better durability, reduced shrinkage and less permeability in the hardened concrete. EUCON NW contains no added chlorides or chemicals known to promote the corrosion of steel.

PRODUCT CHARACTERISTICS

FEATURES & BENEFITS

- Improves finishability and workability
- Reduces segregation
- Improves setting times
- Increases durability
- Increases strength
- Reduces permeability
- Improves finished appearance
- Reduces cracking

PRIMARY APPLICATIONS

- Flatwork concrete
- Ready mix concrete
- Lightweight concrete
- Hot weather concrete
- Precast / Prestressed concrete

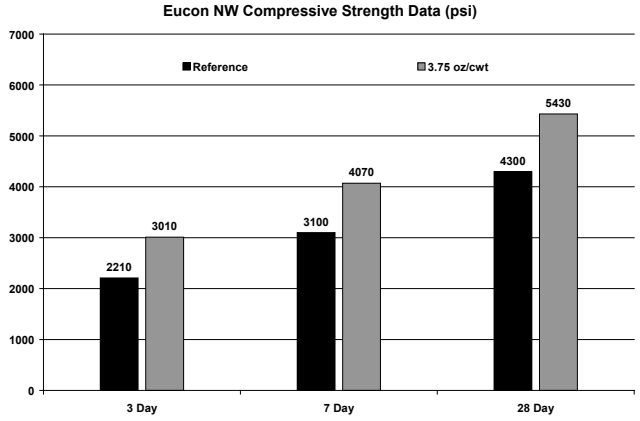
PRECAUTIONS/LIMITATIONS

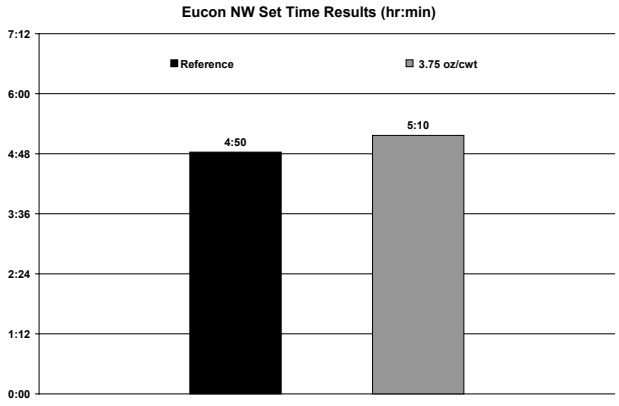
- Care should be taken to maintain EUCON NW above freezing; however, freezing and subsequent thawing will not harm the material if thoroughly agitated. Do not agitate with air or an air lance.
- Add to mix independent of other admixtures.
- In all cases, consult the Safety Data Sheet before use.

TECHNICAL INFORMATION

PERFORMANCE DATA

The following test results were achieved using typical ASTM C494 mix design requirements, 517 lb/yd^3 (307 kg/m^3) cement content and similar (± 0.5)% air content. These results were obtained under laboratory conditions with materials and mix designs meeting the specifications of ASTM C494. Changes in materials and mix designs can affect the dosage response.





DIRECTIONS FOR USE

EUCON NW is typically used at dosages of 2-6 oz/100 lbs (130-390 mL/100 kg) of cementitious material. Higher dosages are acceptable with prior testing and confirmation of the desired performance with specific materials being used.

EUCON NW has been tested per ASTM C494 at a Type A dosage of 3.5 oz/100 lbs (230mL/100 kg) of cementitious materials and at 6 oz/100 lbs (390 mL/100 kg) of cementious materials for Type B and D requirements.

EUCON NW should be added to the initial batch water of the concrete mixture. Do not dispense onto dry cement. Because of variations in job conditions and concrete materials, dosages other than the recommended amounts may be required. In such cases, contact your local Euclid sales representative.

National Ready Mixed Concrete Association

Certificate of Conformance for Concrete Production Facilities

THIS IS TO CERTIFY THAT

Gosford Plant 5207, Bakersfield, CA

Golden Empire

has been inspected by the undersigned licensed professional engineer for conformance with the requirements of the Checklist for Ready Mixed Concrete Production Facilities. As of the inspection date, the facility meets the requirements for production by

Truck Mixing with Automatic Batching and Recordings of Cementitious Materials, Aggregate, Water, and Chemical Admixtures

(Seal)

Signature of Licensed Professional Engineer

November 15, 2024	*November 29, 2026*
Inspection Date	Expiration Date

This company will maintain this facility in compliance with the checklist requirements and promptly correct any deficiencies that develop.

Justin Cook Vice President Operations

Signature of Company Official & Title

NOTICE: The checklist verifies that the plant facilities are deemed satisfactory for concrete production when operated correctly. However, compliance of the concrete with specification requirements must be confirmed through standard inspection methods and sales agreements.

This certificate is issued by the National Ready Mixed Concrete Association (NRMCA) to confirm that the production facility complies with the requirements outlined in Section 3 of the NRMCA Quality Control Manual for Ready Mixed Concrete Production Facilities. *Unauthorized reproduction or misuse of this certificate may result in legal action.*

Plant ID #: 802773

Certification ID #: 33123

12/10/2024 1:21:09 PM

Vulcan Materials Company

October 1, 2024

Subject: Annual Testing of Concrete Aggregates (ASTM C33)
Vulcan Materials Company
16101 Hwy 166
Bakersfield, Ca 93311
SMARA # 91-15-0041

To Whom it may concern,

Submitted herewith are the laboratory test results for the San Emidio Concrete Aggregates. The various test were performed in accordance with the listed ASTM and Caltrans test methods. The samples tested conform to the requirements listed in ASTM C33 and Caltrans Standard Specification for concrete aggregates.

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

Respectfully
Vulcan Materials Company

Aaron Godfrey
Technical Services Manager
Central California

San Emidio Aggregates
October 1, 2024
SMARA No. 91-15-0041

Scope of Services

Designation		
ASTM	**Caltrans**	
C 136	CTM 202	Test Method for Sieve Analysis of Coarse and Fine Aggregate
C 127	CTM 206	Test Method for Specific Gravity and Absorption of Coarse Aggregate
C 128	CTM 207	Test Method for Specific Gravity and Absorption of Fine Aggregate
C 131	CTM 211	Test Method for Los Angles Abrasion of Coarse Aggregate
D 2419	CTM 217	Test Method for Sand Equivalent Value of Fine Aggregate
D 3744	CTM 229	Test Method for Coarse and Fine Durability Index
C 40	CTM 213	Test Method for Organic Impurities in Fine Aggregate
	CTM 227	Test Method for Cleanness Value of Coarse Aggregate
C 117	CTM 202	Test Method for Material Finer Than No. 200 Sieve in Mineral
C 142		Test Method for Clay Lumps and Friable Particles in Aggregates
C 123		Test Method for Lightweight Particles in Aggregate
C 88		Test Method for Soundness of Aggregates by Use of Magnesium Sulfate
	CTM 214	Test Method for Potential Alkali Silica Reactivity of Aggregate
	CTM 212	Test Method for Density (Unit Weight)
C 136		Test Method for Fineness Modulus of Fine Aggregate

San Emidio Aggregate
October 1, 2024
SMARA No. 91-15-0041

San Emidio 1-1/2" Concrete Aggregate

The 1-1/2" Con Aggregate supplied by Vulcan Materials Company conforms to the requirements of CalTrans Standards Specification Section 90 and ASTM Specification C 33. The Aggregate is produced at the San Emidio Quarry, Bakersfield, California, SMARA No. 91-15-0041. Concrete aggregate from this location has been used in concrete around Bakersfield by a multitude of suppliers, with no known incidence of alkali reactivity or cement incompatibility. The typical physical properties of this aggregate are as follows:

Gradation:		Percent Passing		
		Operating	CalTrans	ASTM
Sieve Size	**1" x No.4**	**Range**	**Sect. 90**	**C33**
50.0 mm (2")	100	100	100	100
37.5 mm (1-1/2")	98	88 - 100	85 - 100	90 - 100
25.0 mm (1")	67 (41)	23 - 59	X ± 25	20 - 55
19.0 mm (3/4")	43	0 - 17	0 - 20	0 - 15
12.5 mm (1/2")	16		-	-
9.50 mm (3/8")	6	0 - 7	0 - 9	0 - 5
75 µm (#200), C117	0.1 (X-value)		-	0 - 1
Specific Gravity				
Specific Gravity, Dry	2.639	-	-	
Specific Gravity, S.S.D	2.662	-	-	
Specific Gravity, Apparent	2.7	-	-	
Density, Unit Weight, C 29	91	-	-	
Absorption, %, C 127	0.85	-	-	
Cleanness Value, CT 227	89	75 min.		
Durability, Di , CT 229	85			
Clay & Friables, C 142	0		2.0% max	
Lt. Wt. Particles, %, C 123	0		0.5% max	
Abrasion Loss, A-500, C 131	33	45% max	50% max	
Sodium Soundness, %, C 88	1.8	10% max	12% max	
Organic Impurities, %, CT 213	Clear	< No.11	Free of Injurious	
Alkali Reactivity				
ASTM C1260	Innocuous			
Days of Exposure to NaOH Solution	14 Days			
Average Expansion	0.1	0.15% max		

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

San Emidio Quarry

Aaron Godfrey
Quality Control Manager, Central Cal
Vulcan Materials Company

These data have been developed on the basis of information and test of materials submitted to this laboratory which are assumed to be representative of the materials to be used. All test have been made in compliance with the current ASTM or applicable methods of testing.

San Emidio Aggregate
October 1, 2024
SMARA No. 91-15-0041

San Emidio 1"xNo.4 Concrete Aggregate

The 1"x No.4 Con Aggregate supplied by Vulcan Materials Company conforms to the requirements of CalTrans Standards Specification Section 90 and ASTM Specification C 33. The Aggregate is produced at the San Emidio Quarry, Bakersfield, California, SMARA No. 91-15-0041. Concrete aggregate from this location has been used in concrete around Bakersfield by a multitude of suppliers, with no known incidence of alkali reactivity or cement incompatibility. The typical physical properties of this aggregate are as follows:

Gradation:		Percent Passing		
		Operating	CalTrans	ASTM
Sieve Size	**1" x No.4**	**Range**	**Sect. 90**	**C33**
37.5 mm (1-1/2")	100	100	100	100
25.0 mm (1")	99	88 - 100	86 - 100	95 - 100
19.0 mm (3/4")	84 (85)	70 - 100	X ± 22	-
12.5 mm (1/2")	31		-	25 - 60
9.50 mm (3/8")	10 (18)	3 - 33	X ± 22	-
4.75 mm (#4)	3	0 - 16	0 - 16	0 - 10
2.36 mm (#8)	2	0 - 6	0 - 6	0 - 5
75 µm (#200), C117	0.1		-	0 - 1
	(X-value)			
Specific Gravity				
Specific Gravity, Dry	2.616	-	-	
Specific Gravity, S.S.D	2.646	-	-	
Specific Gravity, Apparent	2.698	-	-	
Density, Unit Weight, C 29	90	-	-	
Absorption, %, C 127	1.2	-	-	
Cleanness Value, CT 227	89	75 min.		
Durability, Dc , CT 229	74			
Clay & Friables, C 142	0		2.0% max	
Lt. Wt. Particles, %, C 123	0.01		0.5% max	
Abrasion Loss, B-500, C 131	29	45% max	50% max	
Sodium Soundness, %, C 88	1.2	10% max	12% max	
Alkali Reactivity				
ASTM C1260	Innocuous			
Days of Exposure to NaOH Solution	14 Days			
Average Expansion	0.09	0.15% max		

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

San Emidio Quarry

Aaron Godfrey
Quality Control Manager, Central Cal
Vulcan Materials Company

These data have been developed on the basis of information and test of materials submitted to this laboratory which are assumed to be representative of the materials to be used. All test have been made in compliance with the current ASTM or applicable methods of testing.

San Emidio Aggregate
October 1, 2024
SMARA No. 91-15-0041

San Emidio 1/2" Concerte Aggregate

The 1/2" Con Aggregate supplied by Vulcan Materials Company conforms to the requirements of CalTrans Standards Specification Section 90 and ASTM Specification C 33. The Aggregate is produced at the San Emidio Quarry, Bakersfield, California, SMARA No. 91-15-0041. Concrete aggregate from this location has been used in concrete around Bakersfield by a multitude of suppliers, with no known incidence of alkali reactivity or cement incompatibility. The typical physical properties of this aggregate are as follows:

Gradation:		Percent Passing	
		VMC	CalTrans
Sieve Size	**1" x No.4**	**Spec**	**Sect. 90**
19.0 mm (3/4")	100	100	100
12.5 mm (1/2")	70	61 - 71	80 - 100
9.50 mm (3/8")	19	12 - 22	X ± 22
4.75 mm (#4)	5	0 - 8	0 - 18
2.36 mm (#8)	3	0 - 5	0 - 7
75 µm (#200), C117	1	-	-
	(X-value)		
Specific Gravity			
Specific Gravity, Dry	2.617	-	-
Specific Gravity, S.S.D	2.652	-	-
Specific Gravity, Apparent	2.71	-	-
Density, Unit Weight, C 29	96	-	-
Absorption, %, C 127	1.3	-	-
Cleanness Value, CT 227	81	75 min.	
Durability, Dc , CT 229	85		
Clay & Friables, C 142	0		2.0% max
Lt. Wt. Particles, %, C 123	0.1		0.5% max
Abrasion Loss, C-500, C 131	30	45% max	50% max
Sodium Soundness, %, C 88	4.5	10% max	12% max
Alkali Reactivity			
ASTM C1260	Innocuous		
Days of Exposure to NaOH Solution	14 Days		
Average Expansion	0.1	0.15% max	

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

San Emidio Quarry

Aaron Godfrey
Quality Control Manager, Central Cal
Vulcan Materials Company

These data have been developed on the basis of information and test of materials submitted to this laboratory which are assumed to be representative of the materials to be used. All test have been made in compliance with the current ASTM or applicable methods of testing.

San Emidio Aggregate
October 1, 2024
SMARA No. 91-15-0041

San Emidio 3/8" Concrete Aggregate

The 3/8" Con Aggregate supplied by Vulcan Materials Company conforms to the requirements of CalTrans Standards Specification Section 90 and ASTM Specification C 33. The Aggregate is produced at the San Emidio Quarry, Bakersfield, California, SMARA No. 91-15-0041. Concrete aggregate from this location has been used in concrete around Bakersfield by a multitude of suppliers, with no known incidence of alkali reactivity or cement incompatibility. The typical physical properties of this aggregate are as follows:

Gradation:		Percent Passing		
		Operating	CalTrans	ASTM
Sieve Size	**1" x No.4**	**Range**	**Sect. 90**	**C33**
12.5 mm (1/2")	100	100	-	100
9.50 mm (3/8")	89 (85)	70 - 100	X ± 20	85 - 100
4.75 mm (#4)	18	0 - 25	0 - 28	10 - 30
2.36 mm (#8)	3	0 - 6	0 - 7	0 - 10
1.18 mm (#16)	1	-	-	0 - 5
75 µm (#200), C117	0.5	-	-	-
	(X-value)			
Specific Gravity				
Specific Gravity, Dry	2.617	-		-
Specific Gravity, S.S.D	2.652	-		-
Specific Gravity, Apparent	2.712	-		-
Density, Unit Weight, C 29	92	-		-
Absorption, %, C 127	1.4	-		-
Cleanness Value, CT 227	85	75 min.		
Durability, Dc , CT 229	76			
Clay & Friables, C 142	0.1			2.0% max
Lt. Wt. Particles, %, C 123	0			0.5% max
Abrasion Loss, C-500, C 131	29	45% max		50% max
Sodium Soundness, %, C 88	6.5	10% max		12% max
Alkali Reactivity				
ASTM C1260	Innocuous			
Days of Exposure to NaOH Solution	14 Days			
Average Expansion	0.11	0.15% max		

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

San Emidio Quarry

Aaron Godfrey
Quality Control Manager, Central Cal
Vulcan Materials Company

These data have been developed on the basis of information and test of materials submitted to this laboratory which are assumed to be representative of the materials to be used. All test have been made in compliance with the current ASTM or applicable methods of testing.

San Emidio Aggregate
October 1, 2024
SMARA No. 91-15-0041

San Emidio Washed Concrete Sand Aggregate

The Washed Con Sand Aggregate supplied by Vulcan Materials Company conforms to the requirements of CalTrans Standards Specification Section 90 and ASTM Specification C 33. The Aggregate is produced at the San Emidio Quarry, Bakersfield, California, SMARA No. 91-15-0041. Concrete aggregate from this location has been used in concrete around Bakersfield by a multitude of suppliers, with no known incidence of alkali reactivity or cement incompatibility. The typical physical properties of this aggregate are as follows:

Gradation:			Percent Passing		
			Operating	CalTrans	ASTM
Sieve Size	**1" x No.4**		**Range**	**Sect. 90**	**C33**
9.5 mm (3/8")	100		100		100
4.75 mm (#4)	99		95 - 100		95 - 100
2.36 mm (#8)	88		65 - 95		80 - 100
1.18 mm (#16)	65	(64)	54 - 74	54 - 74	50 - 85
0.6 mm (#30)	42	(42)	33 - 51	33 - 51	25 - 60
0.3 mm (#50)	20	(22)	16 - 28	16 - 28	5 - 30
0.15 mm (#100)	7		2 - 12		0 - 10
75 µm (#200)	3.53		0 - 8		
	(X-value)				
Specific Gravity					
Specific Gravity, Dry	2.616		-	-	
Specific Gravity, S.S.D	2.647		-	-	
Specific Gravity, Apparent	2.698		-	-	
Density, Unit Weight, C 29	102		-	-	
Absorption, %, C 127	1.1		-	-	
Fineness Modulus	2.79		-	2.3 - 3.1	
Sand Equivalent, CT 217	83		75 min.		
Durability, Dc , CT 229	76				
Clay & Friables, C 142	0			3% max	
Lt. Wt. Particles, %, C 123	0.01			0.5% max	
Abrasion Loss, D-500, C 131	39		45% max	50% max	
Sodium Soundness, %, C 88	7.6		10% max	12% max	
Alkali Reactivity					
ASTM C1260	Innocuous				
Days of Exposure to NaOH Solution	14 Days				
Average Expansion	0.09		0.15% max		

Should you have questions regarding the aggregate material, please do not hesitate to call your Sales Representative.

San Emidio Quarry

Aaron Godfrey
Quality Control Manager, Central Cal
Vulcan Materials Company

These data have been developed on the basis of information and test of materials submitted to this laboratory which are assumed to be representative of the materials to be used. All test have been made in compliance with the current ASTM or applicable methods of testing.

Christy's™

— PRODUCT INFORMATION & SPECIFICATIONS —

Detectable Marking Tape

Christy's™ Detectable Marking Tape provides for easy buried pipeline detection and below ground identification and warning. The tape can be located below ground with a non-ferrous metal detector, when buried at the proper depths. Christy's™ Detectable Tape Must Be Buried Flat For Maximum Detectability and Line Protection. We recommend bury depths of:

TAPE WIDTH	2”	3”	6”	2” or wider
TAPE BURY DEPTH	6” - 18”	6” - 28”	6” - 36”	6” - 36”

Detectable Marking Tape

SPECIFICATIONS

Tape consists of Minimum 4.5 MIL overall thickness, with 0.0035 MIL solid aluminium foil core. The warning message is “Buried, or Encased” to prevent ink rub-off and is impervious to acid, alkalis and other destructive elements found in soil. All Christy’s tape meets or exceeds the industry standards including the America Public Works Association (APWA) color code.

TEST DATA		VALUE
MATERIAL IDENTIFICATION	3” & 6” WIDE	4.5 MIL
OVERALL FOIL THICKNESS		0035 MIL
TEST PROCEDURE	ASTM-D-8820, METHOD A	90%
SPECIMEN CONDITIONS		73ºF / 50% R.H
TEST TEMPERATURE		73ºF
ELONGATION		90%
TENSILE STRENGTH	TRANSVERSE	5530 PSI
TENSILE STRENGTH	LONGITUDINAL	4544 PSI
ROLL WEIGHT	3” X 1000’	+/- 7.5 LBS
ROLL WEIGHT	6” X 1000’	+/- 15 LBS
MINIMUM WEIGHT		10 LBS PER 1000’ UNIT
MAXIMUM IMPRINT LENGTH		36”

COLOR CODE	DESCRIPTION
BLUE	WATER & ASSOCIATED LINES
BROWN	FORCE MAINS & ASSOCIATED LINES
GREEN	SANITARY & ASSOCIATED LINES
ORANGE	TELECOMMUNICATIONS & TELEPHONE LINES
PURPLE	RECLAIMED WATER LINES
RED	ELECTRIC & ASSOCIATED LINES
YELLOW	GAS & ASSOCIATED LINES

The tape is manufactured by T. Christy Enterprises, Inc. (800) 258-4583.

The model number is _____ (TA-DT-XX-XXX). See model number designations on the following page.

Christy's™

— PRODUCT INFORMATION & SPECIFICATIONS —

STANDARD COLOR/LEGEND COMBINATIONS

How to Order Underground Marking Tapes

TA.XX.XX.XXXXX

Example: TA.DT.2.PRW is 2" Detectable Purple Reclaimed Water.

Type of Tape	Width of Tape	Colors	Legend	
DT - Detectable	2 - 2"	B - Blue	CP - Cathodic Protection	RAW - Raw Water
	3 - 3"	P - Purple	E - Electric	RJ - Restrained Joint
	6 - 6"	Y - Yellow	F- Fire	RW - Reclaimed Water
	12 - 12"	G - Green	FM - Force main	STDR - Storm Drain
		R - Red	FO - Fiber Optic	T - Telephone
		W - White	G - Gas	W - Water
		O - Orange	I - Irrigation	
		BR - Brown	NPW - Non-Potable Water	

STANDARD COLOR/LEGEND COMBINATIONS

Color	Legend	Text
Blue	BI	"Caution Irrigation Line Buried Below"
Blue	BNPW	"Caution Non-Potable Water Line Buried Below"
Blue	BPW	"Caution Potable Water Line Buried Below"
Blue	BW	"Caution Water Line Buried Below"
Blue	RJ	"Caution Restrained Joint Buried Below"
Brown	BFM	"Caution Force Main Buried Below"
Green	GFM	"Caution Force Main Buried Below"
Green	GI	"Caution Irrigation Line Buried Below"
Green	GNPW	"Caution Non-Potable Line Buried Below"
Green	GPW	"Caution Potable Line Buried Below"
Green	GRAW	"Caution Raw Water Line Buried Below"
Green	GS	"Caution Sewer Line Buried Below "
Green	GSTDR	"Caution Storm Drain Buried Below"
Orange	OFO	"Caution Fiber Optic Line Buried Below"
Orange	OT	"Caution Telephone Line Buried Below"
Orange	OCP	"Caution Cathodic Protection Cable Buried Below"
Purple	PRW	"Caution Recycled/Reclaimed Water Line Buried Below"
Purple	PNPW	"Caution Non-Potable Line Buried Below"
Red	RE	"Caution Electric Line Buried Below"
Red	RF	"Caution Fire Line Buried Below"
Yellow	YG	"Caution Gas Line Buried Below"

NOTE: Not all widths are available as standard for the stock color/legend combinations shown. Contact Christy's™ for stock availability of specific products. **Non-stock combinations are subject to minimum requirements and plate charges.**

SPECIAL AND CUSTOM LEGENDS

Christy's™ offers a full range of non-standard legend/color combinations in addition to the combinations listed below, including specialty applications such as Telemetry, Irrigation and additional water line wording. All standard combinations listed are available in at least one color/width combination. We offer specific agency legends, designations or color combinations. Custom legends can include the use of specific wording, insignias and phone numbers. Call for special pricing.

Lead-Free* Bronze Gate Valves

Silicon Performance Bronze™ Alloy • Screw-in Bonnet • Non-Rising Stem •
Conforms to MSS SP-139 • Solid Wedge •
NSF/ANSI-61-8 Commercial Hot 180°F (includes Annex F and G) and NSF/ANSI-372

NSF/ANSI 61
NSF/ANSI 372

Dezincification Resistant

5 year 125% warranty

Size Range: 1/4" - 3"
Pressure Rating: 300 PSI Non-Shock Cold Working Pressure
Maximum Pressure / Temperature: 100 PSI at 300° F

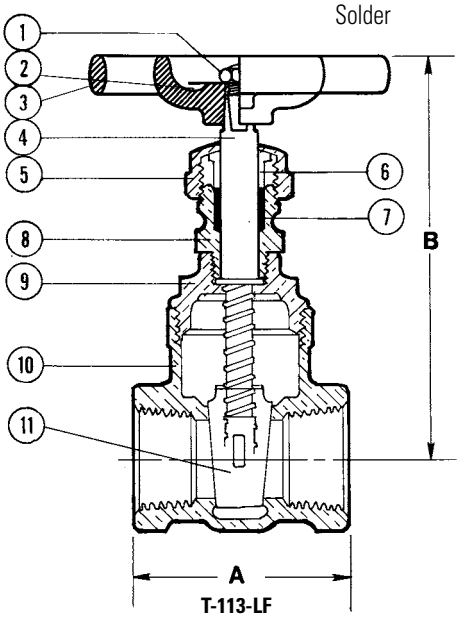
Lead-Free* markings:
Double oval in body casting, white handle and blue hang tag

T-113-LF
Threaded

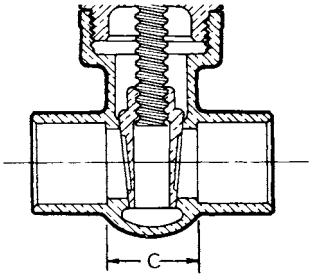
S-113-LF
Solder

MATERIAL LIST

	PART	SPECIFICATION
1.	Handwheel Nut	300 Series Stainless Steel
2.	Identification Plate	Aluminum
3.	Handwheel	Malleable Iron ASTM A47 (T-113)
4.	Stem	ASTM B99 Alloy C65100
5.	Packing Nut	Bronze ASTM B62 or ASTM B584 Alloy C84400 or Brass ASTM B16
6.	Packing Gland	Bronze ASTM B62 or ASTM B584 Alloy C84400 or Brass ASTM B16
7.	Packing	Aramid Fibers with Graphite
8.	Stuffing Box	Silicon Bronze ASTM B584 Alloy C87850
9.	Bonnet	Silicon Bronze ASTM B584 Alloy C87850
10.	Body	Silicon Bronze ASTM B584 Alloy C87850
11.	Wedge	Silicon Bronze ASTM B584 Alloy C87850



T-113-LF
NPT x NPT



S-113-LF
C x C

DIMENSIONS—WEIGHTS—QUANTITIES

SIZE		A		B		C		T-113-LF		S-113-LF		Master
In.	mm.	In.	mm.	In.	mm.	In.	mm.	Lbs.	Kg.	Lbs.	Kg.	Ctn Qty.
† ¼	8	1.69	43	3.38	86	—	—	0.70	0.31	—	—	50
† 3/8	10	1.69	43	3.38	86	0.69	18	0.67	0.30	0.62	0.28	50
† ½	15	1.94	49	3.63	92	0.75	19	0.78	0.35	0.69	0.29	50
¾	20	2.06	54	3.91	99	0.88	22	1.00	0.48	0.94	0.43	50
1	25	2.44	62	4.69	119	1.00	25	1.73	0.78	1.50	0.68	30
1-¼	32	2.63	67	5.22	133	1.19	32	2.28	1.04	2.14	0.97	20
1-½	40	2.88	72	6.25	159	1.25	33	3.33	1.51	3.01	1.37	10
2	50	3.06	78	7.06	179	1.31	34	4.68	2.13	4.40	1.99	10
2-½	65	4.13	105	8.41	224	1.81	46	9.46	4.29	8.34	3.78	5
3	80	4.5	114	10	254	1.94	49	13.70	6.20	12.20	5.50	4

†No packing gland, packing only in this size.

*Lead Free refers to the wetted surface of pipe, fittings and fixtures in potable water systems that have a weighted average lead content ≤ 0.25% per the Safe Drinking Water Act (Sec. 1417) amended 1-4-2011 and other equivalent state regulations.

ROMAC INDUSTRIES, INC.

STYLE XR501
EXTENDED RANGE COUPLING

SUBMITTAL INFORMATION

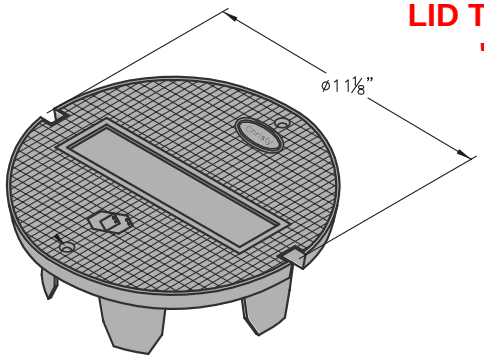
Use:	Provides an Extended Range Coupling for multi-purpose use. One gasket, center ring and end ring for SDR 35 PVC sewer through Class 200 A/C pipe sizes. **Note: for pipe ODs smaller than standard steel do not exceed 20 PSI.**
AWWA C219	Romac 501 couplings meet the specifications set forth in the AWWA Standard C219 coupling spec.
MATERIALS	
Castings	The end rings and center rings are cast from ductile (nodular) iron, meeting or exceeding ASTM A 536, Grade 65-45-12.
Gaskets	Gaskets are made from virgin Styrene Butadiene Rubber (SBR) compounded for water and sewer service in accordance with ASTM D2000 MBA 810. Other compounds available for petroleum, chemical, or high temperature service.
Bolts and Nuts	5/8 inch, High strength low alloy steel trackhead bolts. National coarse rolled thread and heavy hex nuts. Steel meets AWWA C-111 composition specifications. Stainless steel bolts and nuts available on request.
Coatings	Shop coat applied to cast parts for corrosion protection in transit. Fusion bonded epoxy, liquid epoxy and other coatings available on request.
PRESSURE	When properly installed on standard steel pipe and larger the Romac Style XR501 coupling can be used at working pressures up to 260 psi. Higher working pressures available for specific applications. **Note: for pipe ODs smaller than standard steel do not exceed 20 PSI.**
SIZES AND RANGES	See Catalog. 7/07

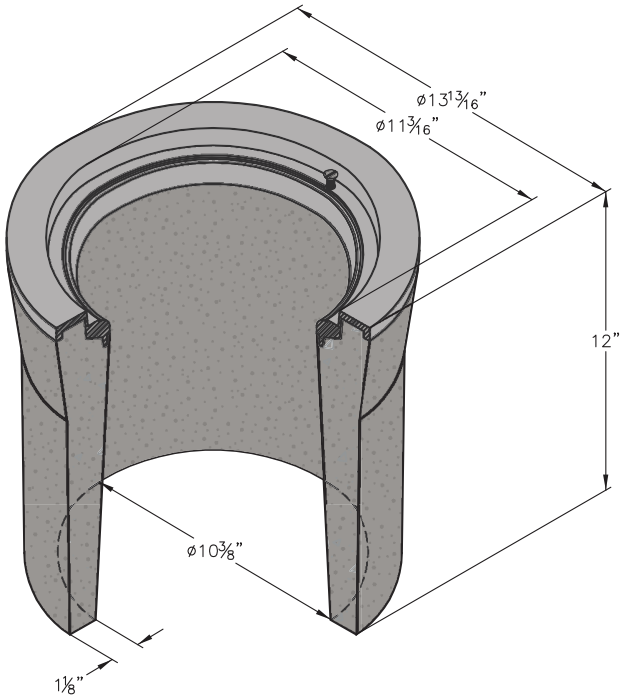
Romac Document Number 20-1-0022

This information is based on the best data available at the date printed above, please check with Romac Engineering Department for any updates or changes.

G05

LID TO BE MARKED "WATER"





COVER:

Style:	Flush
Material:	Cast Iron
Model:	11" Dia.
Weight:	14 lbs
Options:	Special Markings
Surface:	Skid Resistant & Marked*
Coefficient of Friction:	>0.6 ASTM 1028
Performance:	H20, AASHTO M309

BODY:

Material:	Reinforced Concrete with Steel Frame
Model:	14" Dia.
Weight:	58 lbs
Wall Type:	Straight
Mouseholes:	0
Performance:	H20, AASHTO M309

GRADE RING:

Material:	Cast Iron
Grade Options:	1" Height 1-1/2" Height 2" Height

Traffic Rated: Continuous Roadway Traffic

Actual load rating is determined by the box and cover combination.
Weights and dimensions may vary slightly

All information contained on this sheet is current at the time of printing. Oldcastle Precast, Inc. reserves the right to discontinue or update product information without notice.

*Cover comes standard with permanent markings for manufacturer, load rating, model size and manufacturing location.

Contact your Oldcastle Enclosure Solutions Distribution Center for specific information and additional options.

Revision 8/2013