No: MC-01

SUBMITTAL COVERSHEET
Nanuet UFSD –Phase 3 Projects

Architect:
KSQ Architects
215 W 40th Street,15th Floor
New York, NY 10018

Owner:
Nanuet Union Free School District
101 Church Street
Nanuet, NY 10954

Construction Manager:
Jacobs
One Penn Plaza, 54th floor
New York, NY 10019

Contractor: Joe Lombardo Plumbing & Heating of Rockland Inc

Contract: Ron Lombardo

Address: 321 Spook Rock Road Suite 109A
Suffern, New York 10901

Telephone: 845-357-6537

Fax: 845-357-8529

School Name: Nanuet Union Free School District Phase 3 Bond Projects @ Barr Middle School & Nanuet High School

Type of Submittal:

Re-submittal: [ ] No [ ] Yes

[ ] Shop Drawings **[ ]** Product Data **[ ]** Schedule **[ ]** Sample **[ ]** _____
[ ] Test Report **[ ]** Certificate **[ ]** Color Sample **[ ]** Warranty **[ ]** _____

Submittal Description:

Product Name: PLUMBING GAS PIPING

Manufacturer: VARIOUS

Subcontractor/ Supplier: FW WEBB

References:

Spec. Section No.: 221005

Drawing No(s): _____

Paragraph: _____

Rm. or Detail No(s): _____

Architect's/ Engineer's Review Stamp	Contractor Review Statement: These documents have been checked for accuracy and coordinated with job conditions and Contract requirements by this office and have been found to comply with the provisions of the Contract Documents. Ronald J. Lombardo 1-11-24 Name: Date: Company Name: Joe Lombardo Plumbing & Heating of Rockland Inc.

Remarks:

2.1 A - STEEL PIPE

Standard Steel Pipe

ASTM A53 TYPE E GRADE B

Submittal Data Sheet

Scope
Covers black and hot-dipped galvanized electric-resistance welded Grade B pipe. Pipe is intended for mechanical and pressure applications and is acceptable for ordinary uses in steam, water, gas and air lines. Wheatland ASTM A53 is UL® Listed, 2–6 NPS, and FM Approved, 2–8 NPS, for use in fire sprinkler pipe applications, and is suitable for welding, threading and grooving. Produced to the latest revision of ASTM A53/53M, Federal Specification WW-P404 and ASME B36.10M.

Manufacture
The weld seam shall be heat treated after welding to a minimum of 1400°F or be otherwise processed in such a manner that no untempered martensite remains.

Hot-dip Galvanized
The average weight of zinc coating shall be not less than 1.8 oz. per sq. ft. of surface (inside and outside). When galvanized pipe is bent or otherwise fabricated to a degree which causes zinc coating to stretch or compress beyond the limit of elasticity, some flaking of the coating may occur.

Hydrostatic and Nondestructive Electric Testing
Hydrostatic inspection test pressures for plain-end pipe are listed in Table X 2.2 of the A53/A53M specification. Test pressures shall be maintained for a minimum of five seconds. Nondestructive electric testing of the weld seam is required on each length of ERW pipe 2 NPS and larger.

Chemical Requirements
Composition, max. %

Carbon	Manganese	Phosphorus	Sulfur	
.30	1.20	.05	.045	
Copper*	Nickel*	Chromium*	Molybdenum*	Vanadium*
.40	.40	.40	.15	.08

*The combination of these five elements shall not exceed 1.00%.

Tensile Requirements

TENSILE STRENGTH, MIN.	YIELD STRENGTH, MIN.	ELONGATION IN 2"
60,000 psi	35,000 psi	Refer to A53 table x 4.1

Bending Test (Cold)

NPS	DEGREE OF BEND	DIAMETER OF MANDREL
2 and under	90°	12x pipe OD

Flattening Test
As a test for ductility of the weld for pipe 2½ NPS and larger, position the weld at 0° and alternately at 90° to the direction of force and flatten until the OD is ⅔ of the original outside diameter. No cracks shall occur along the inside or outside surface of the weld.

Frequency of Tests
Tensile tests are required on one length of pipe from each lot of 500 lengths or fraction thereof for each size. Refer to A53 specification for frequency of flattening tests.

End Finish
Plain End: 2 NPS and larger, STD and XS weights: ends beveled to angle of 30°, +5°, -0° with a root face of 1/16" ± 1/32"

Threaded: to ANSI® Standard B 1.20.1
Couplings: to ASTM Standard A 865

Weights and Dimensions

STANDARD (SCH. 40) BLACK PLAIN END

NPS	OD	NOMINAL WALL	WEIGHT
	in.	in.	lbs./ft.
2	2.375	0.154	3.66
2½	2.875	0.203	5.80
3	3.500	0.216	7.58
4	4.500	0.237	10.88
5	5.563	0.258	14.63
6	6.625	0.280	18.99
8	8.625	0.322	28.58

EXTRA STRONG (SCH. 80) BLACK PLAIN END

NPS	OD	NOMINAL WALL	WEIGHT
	in.	in.	lbs./ft.
2	2.375	0.218	5.03
2½	2.875	0.276	7.67
3	3.500	0.300	10.26
4	4.500	0.337	15.00

All information contained herein is accurate as known at the time of publication. Wheatland reserves the right to change product specifications without notice and without incurring obligations.

Permissible Variations in Wall Thickness
Minimum wall thickness at any point shall not be more than 12.5% under nominal wall thickness specified.

Permissible Variations in Outside Diameter
Pipe 2 NPS and larger shall not vary more than ± 1% from the standard specified.

Permissible Variations in Weight per Foot
Pipe shall not vary more than ± 10% from the standard specified.

Product Marking
Each length of pipe is continuously stenciled to show the manufacturer, the grade of pipe (ASTM A53), the kind of pipe (E for Electric Resistance Welded, B for Grade B), the size (XS for extra strong), and length. Stencil markings on standard Schedule 40 pipe indicate UL Listing for 2–6 NPS and FM Approval for 2–8 NPS for use in fire sprinkler pipe applications. Bar coding is acceptable as a supplementary identification method.

SUBMITTAL INFORMATION

PROJECT: _____ CONTRACTOR: _____ DATE: _____

ENGINEER: _____ SPECIFICATION REFERENCE: _____ SYSTEM TYPE: _____

LOCATIONS: _____ COMMENTS: _____

WST-070919

700 South Dock Street
Sharon, PA 16146
P 800.257.8182
F 724.346.7260

info@wheatland.com
wheatland.com
Follow us on Twitter:
@WheatlandTube

Wheatland Tube
A DIVISION OF ZEKELMAN INDUSTRIES

"Apollo" Valves

SUBMITTAL SHEET

80-100 Series

UL Listed Shut-Off **Bronze Ball Valve**

Job Name:	
Job Location:	
Engineer:	
Contractor:	
Tag:	
PO Number:	
Representative:	
Wholesale Distributor:	

DESCRIPTION

The Apollo® 80 Series Bronze Ball Valve is UL Listed and designed as a safe shut off valve for LP gas, natural gas, flammable liquids and heated oil.

FEATURES

- Adjustable Packing Gland
- Blow-Out Proof Stem Design
- RPTFE Seats and Seals
- Chromium Plated Ball

PERFORMANCE RATING

- Maximum Pressure: 600 psi CWP, 250 psi LP Gas, 150 psi SWP
- Vacuum Service to 29 in. Hg

OPTIONS & SIZES

- (-07) Tee Handle, Steel (1/4" to 3")
- (-27) SS Latch-Lock Lever & Nut (1/4" to 3")

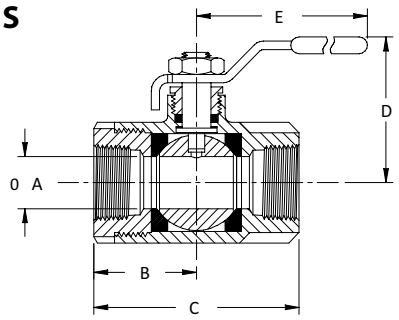
APPROVALS

- MSS SP-110; Ball Valves
- Federal Specification: WW-V-35C, Type: II, Composition: BZ, Style: 3
- CRN: OC10908.5C
- Guide YSDT: LP-Gas Shut-Off Valve
- Guide YRPV: Gas Shut-Off Valve for use with natural and manufactured gases
- Guide YRBX: Flammable liquid shutoff valve
- Guide MHKZ: No. 6 oil at 250°F

STANDARD MATERIALS LIST

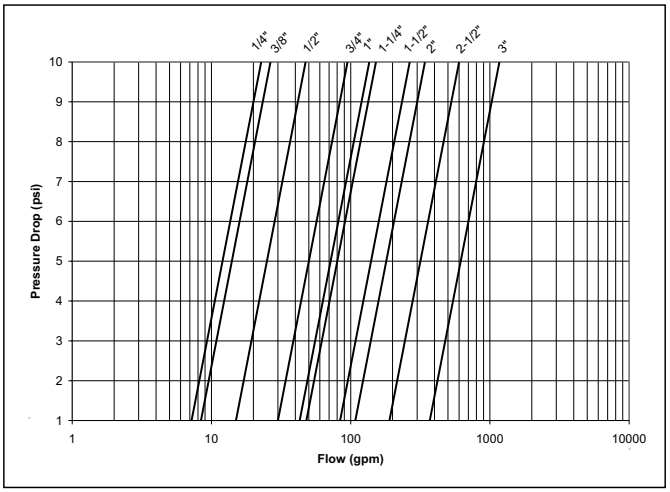
Part Name	Material
Lever and Grip	Steel, Zinc Plated w/ Vinyl
Stem Packing	RPTFE
Stem Bearing	RPTFE
Ball	B16, Chrome Plated or B283, C37700 Chrome Plated
Seat (2)	RPTFE
Retainer	B16 (1/4" to 1"), B584-C84400 (1-1/4" to 3") or B283, C37700
Gland Nut	B16
Stem	B16
Lever Nut	Steel, Zinc Plated
Body Seal (1-1/4" to 3")	PTFE
Body	B584-C84400

DIMENSIONS



Model Number	Size (in.)	Dimensions (in.)					Wt. (lbs.)
		A	B	C	D	E	
80-101	1/4"	0.37	1.03	2.06	1.75	3.87	0.60
80-102	3/8"	0.37	1.03	2.06	1.75	3.87	0.56
80-103	1/2"	0.50	1.12	2.25	1.81	3.87	0.63
80-104	3/4"	0.68	1.50	3.00	2.12	4.87	1.39
80-105	1"	0.87	1.68	3.37	2.25	4.87	1.72
80-106	1-1/4"	1.00	2.00	4.00	2.62	5.50	3.26
80-107	1-1/2"	1.25	2.18	4.37	2.87	5.50	4.57
80-108	2"	1.50	2.34	4.68	3.06	5.50	5.56
80-109	2-1/2"	2.50	3.25	6.50	4.12	8.00	17.25
80-100	3"	2.50	3.37	6.75	4.12	8.00	18.60

FLOW CHARACTERISTICS



Apollo Valves, Manufactured by **Conbraco Industries, Inc.**
701 Matthews Mint-Hill Road, Matthews, NC 28105 USA
www.**apollovalves**.com | (704) 841-6000

This specification is provided for reference only. Conbraco Industries Inc. reserves the right to change any portion of this specification without notice and without incurring obligation to make such changes to Conbraco products previously or subsequently sold. Please visit our website @ www.apollovalves.com for the most current information.

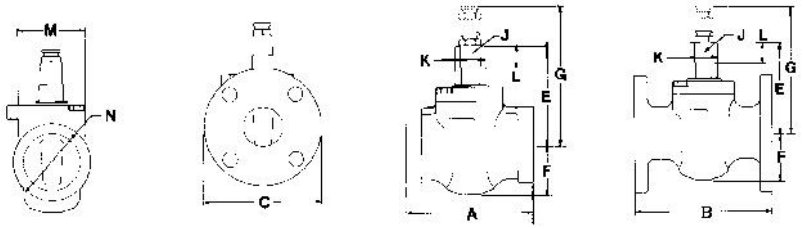
CAST IRON NON LUBRICATED PLUG VALVE

Super Nordstrom Two-Bolt Cover-Type Iron Plug Valves

Short Pattern (Gate Length)

200 CWP (13.8 bar)
400 psig (27.6 bar) Test

Figure 142 Threaded, Wrench Operated, Sizes ½ to 4
Figure 143 Flanged, Wrench Operated, Sizes 1 to 5



Size	NPS	½	¾	1	1¼	1½	2	2½	3	4	5
	DN	15	20	25	32	40	50	65	80	100	125
End-to-end, threaded, Figure 142	A	4.50 114	4.50 114	4.50 114	5.00 127	5.00 127	5.88 149	7.00 178	7.62 194	9.00 229	
End-to-end, flanged, Figure 143	B			5.50 140	6.50 165	6.50 165	7.00 178	7.50 191	8.00 203	9.00 229	10.00 254
Diameter of flange	C			4.3 109	4.6 117	5.0 127	6.0 152	7.0 178	7.5 191	9.0 229	10.0 254
Center to top of stem	E	3.8 97	3.8 97	3.8 97	4.1 104	4.1 104	4.7 119	4.7 119	5.6 142	6.3 160	6.3 160
Center to bottom of body	F	1.9 48	1.9 48	1.9 48	2.1 53	2.1 53	2.4 61	2.4 61	3.4 86	4.0 102	4.0 102
Clearance required to remove sealant fitting	G	5.5 140	5.5 140	5.5 140	5.8 147	5.8 147	6.4 163	6.4 163	7.2 183	8.0 203	8.0 203
Width of stem flats	J	.81 21	.81 21	.81 21	1.00 25	1.00 25	1.00 25	1.00 25	1.25 32	1.25 32	1.25 32
Diameter of stem	K	1.06 27	1.06 27	1.06 27	1.38 35	1.38 35	1.38 35	1.38 35	1.75 44	1.75 44	1.75 44
Height of stem flats	L	.9 23	.9 23	.9 23	1.0 25	1.0 25	1.0 25	1.0 25	1.3 33	1.3 33	1.3 33
Extreme width of body, Figure 142	M	2.6 66	2.6 66	2.6 66	3.2 81	3.2 81	3.2 81	3.2 81	4.0 102	4.8 122	
Diameter of hub, Figure 142	N	2.3 58	2.3 58	2.3 58	2.9 74	2.9 74	3.6 91	4.3 109	5.2 132	6.4 163	
Size of Sealant Stick	—	B	B	B	B	B	B	B	B	B	B
Size of wrench	—	SN-1	SN-1	SN-1	SN-2	SN-2	SN-2	SN-2	SN-4*	SN-4*	SN-4*
Length of wrench	—	7.0 178	7.0 178	7.0 178	10.5 267	10.5 267	10.5 267	10.5 267	17.5 445	15.0 381	15.0 381
Weight (approx.), Figure 142	—	6 3	6 3	6 3	9 4	9 4	13 6	17 8	29 13	48 22	
Weight (approx.), Figure 143	—			9 4	14 6	14 6	20 9	25 11	38 17	65 29	80 36

Flanges are drilled to ASME Class 125 Cast Iron Flange Standard Template. For drilling and bolting data, see page 45.

Figures 142 and 143 valves conform to the following standards where applicable: ASME B1.20.1; ASME B16.1; ASME B16.10; API 5B; ASTM A126, Class B; and MSS SP-78. See page 38.

Figure 143 face-to-face lengths are interchangeable with ASME Class 125 and API 175 CWP Cast Iron Gate Valves.

Figures 142 and 143 valves Size 5 (125 mm) and smaller are not recommended for temperatures above +200°F (+93°C).

** Use the longer SN-3 wrench for valves used in cold climates such as Canada.*

Engineering Specifications

Viega MegaPress®G Natural Fuel Gas Systems

This document is subject to updates. For the most current Viega technical literature, please visit www.viega.us.

Viega products are designed to be installed by licensed and trained plumbing and mechanical professionals who are familiar with Viega products and their installation. **Installation by non-professionals may void Viega LLC's warranty.**

Part 1: General

1.1 Summary

MegaPressG is a cold press mechanical joint fitting system made for use with ASTM A53 and A106 carbon steel pipe in natural gas applications.

1.2 Definitions

ANSI: American National Standards Institute
ASME: American Society of Mechanical Engineers
ASTM: American Society for Testing and Materials
CSA: Canadian Standards Association
FM: Factory Mutual
HNBR: Hydrogenated Nitrile Butadiene Rubber
IACS: International Association of Classification Societies
IAPMO: International Association of Plumbing and Mechanical Officials
ICC: International Code Council
MSS: Manufacturers Standardization Society
NACE International: National Association of Corrosion Engineers
NFPA: National Fire Protection Association
UL: Underwriters Laboratory

1.3 References

ANSI LC-4/CSA 6.32 Press-connect Metallic Fittings for use in Fuel Gas Distribution Systems
ASME A13.1 Scheme for the Identification of Piping Systems
ASME B1.20.1 Pipe Threads, General Purpose (inch)
ASME B16.3 Malleable Iron Threaded Fittings
ASME B16.9 Factory Made Wrought Steel Butt-welding Fittings
ASME B31.1 Power Piping
ASME B31.3 Process Piping

ASME B31.9 Building Piping Systems
ASME B36.10 Welded and Seamless Wrought Steel Pipe
ASTM A135 Specification for Electric-Resistance-Welded Steel Pipe
ASTM A420 Piping Fittings of Wrought Carbon Steel and Alloy Steel for Low Temperature Service
ASTM A53 Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless Pipe
ASTM D2000 Classification System for Rubber Products in Automotive Applications
ASTM F1476 Performance of Gasketed Mechanical Couplings for Use in Piping Applications
ASTM F3226 Standard Specification for Metallic Press-Connect Fittings for Piping and Tubing Systems
IAPMO: Uniform Mechanical Code (UMC)
IAPMO: Uniform Plumbing Code (UPC)
ICC: International Plumbing Code (IPC)
MSS-SP58 Pipe Hangers and Supports Materials, Design and Manufacturer
NACE RP 0169 control of External Corrosion on Underground or Submerged Metallic Piping Systems
NFPA 54 National Fuel Gas Code
UL 180: Standard for Combustible Liquid Tank Accessories

1.4 Quality Assurance

A. Installer shall be qualified, licensed within the jurisdiction, and familiar with the installation of cold press mechanical joint systems.
B. MegaPressG press fittings shall be installed using the proper tool, actuator, jaws and rings as instructed by the press fitting manufacturer.
C. The installation of carbon steel pipe in natural gas systems shall conform to the requirements of the IAPMO Uniform Plumbing Code or National Fuel Gas Code.
D. Compliance to ASME B31.9 for building services piping valves.

1.5 Delivery, Storage and Handling

A. Carbon steel pipe shall be shipped to the jobsite in such a manner to protect the pipe. The pipe and fittings shall not be roughly handled during shipment. Pipe and fittings shall be unloaded with reasonable care.
B. Protect the stored product from moisture and dirt. Elevate above grade. When stored inside, do not exceed the structural capacity of the floor.
C. Protect fittings and piping specialties from moisture and dirt.

1.6 Project Conditions

Verify length of pipe required by field measurements.

1.7 Warranty

A. Viega LLC (Viega) warrants to end users, installers and distribution houses that its Viega metal press products (MegaPressG) when properly installed shall be free from failure caused by manufacturing defects. Refer to Viega warranties for specific information.
B. Viega LLC (Viega) manufacturer of the fittings shall not be responsible for the improper use, handling or installation of the product.

Part 2: Products

2.1 Manufacturer

Viega LLC
585 Interlocken Blvd.
Broomfield CO, 80021
Phone: (800) 976-9819
www.viega.us

2.2 Pipe and Fittings

A. Approved Piping:
- Fuel gas applications shall conform to ASTM A53 and A106 Schedule 10 to 40 carbon steel pipe.
- Non-fuel gas application shall conform to ASTM A53, A106, A135, and A795 Schedule 5 to Schedule 40 carbon steel pipe. Schedule 80 pipe may be used but operating pressures are limited to the Viega Approved Applications guide.
- Carbon steel pipe shall conform to ASTM A53. Pipe schedule (pipe wall thickness) shall conform to the standard referenced dimensions for Schedule 10 or Schedule 40. Adopted code versions, standards compliance, and local approvals should be considered.

> Adopted code version, standards compliance, and local approvals should be considered for selecting pipe schedule and type.

B. Fittings:
- Cold Press Mechanical Joint Fitting shall conform to material requirements of ASTM A420 or ASME B16.3 and performance criteria ANSI LC-4/CSA 6.32.
- Sealing elements for press fittings shall be HNBR. Sealing elements shall be factory installed or an alternative supplied by fitting manufacturer.
- Press ends shall have SC (Smart Connect™) technology design (leakage path). MegaPressG fittings with Smart Connect technology assure leakage of liquids and/or gases from inside the system past the sealing element of an unpressed connection. The function of this feature is to provide the installer quick and easy identification of connections which have not been pressed prior to putting the system into operation.

C. Verify pipe and fittings with applicable codes.
D. Piping and fittings shall comply with ANSI LC-4/CSA 6.32 and the latest edition of NFPA-54.
E. Fittings shall comply to the requirements of ASTM F3226.

2.3 Valves

A. Valves shall conform to the performance criteria ANSI LC-4/CSA 6.32.
B. Metallic Valves, shall comply with ASME B16.33.

2.4 Gas Safety Shut-Off Valves

Gas safety shut-off valves shall be FM and UL listed, with a visual indicator to note the position of the valve whether “OPEN” or “SHUT”

2.5 Pressure Regulators

A. Pressure regulators shall be FM and UL listed for gas service and the gas system pressure rating.
B. Service Pressure Regulators shall comply with ANSI Z21.80.
C. Pressure regulators shall be equipped with an approved elevation compensator.

2.6 Cathodic Protection

Provide a complete electrically isolated, cathodic protection system for entire length of underground gas line, including all components, suitable for temperatures and pressures involved.

Part 3: Execution

3.1 Examination

A. Examine roughing-in for natural-gas piping system to verify actual locations of piping connections before equipment installation.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 Preparation
A. Close equipment shutoff valves before turning off natural gas to premises or piping section.
B. Inspect natural-gas piping according to NFPA 54 Fuel Gas Code to determine that natural-gas utilization devices are turned off in piping section affected.
C. Comply with NFPA 54 Fuel Gas Code requirements for prevention of accidental ignition.

3.3 Installation
A. Install piping free from traps and with drain pocket consisting of nipple and cap at low points for inside building and drip pot for underground piping.
B. Install shut-off valves at connection to each piece of equipment. Provide union of equipment side of individual shut-off valve.
C. Install gas meter in a well ventilated and accessible location. Gas meter room (3 hr. rated enclosure) with explosion-proof fixtures.

3.4 Outdoor Piping Installation
A. Comply with NFPA 54 Fuel Gas Code for installation and purging of natural-gas piping.
B. Install underground, natural-gas piping to comply with NFPA-54 and local codes.
C. Install fittings for changes in direction and branch connections.

3.5 Piping Installation
A. Comply with NFPA 54 Fuel Gas Code for installation and purging of natural-gas piping.
B. Locate valves for easy access.
C. Install piping free of sags and bends.
D. Install fittings for changes in direction and branch connections.

3.6 Fire-Barrier Penetrations:
Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with approved fire-stop materials.

3.7 Drips and Sediment Traps:
A. Install drips at points where condensate may collect, including service-meter outlets. Locate where accessible to permit cleaning and emptying. Do not install where condensate is subject to freezing.
B. Construct drips and sediment traps using tee fitting with bottom outlet plugged or capped.
C. Do not use natural-gas piping as grounding electrode.
D. Install strainer on inlet of each line-pressure regulator and automatic or electrically operated valve.

3.8 Service-Meter Assembly Installation
A. Install service-meter assemblies above ground.
B. Install metal shutoff valves upstream from service regulators.
C. Install strainer on inlet of service-pressure regulator and meter set.
D. Install service regulators mounted outside with vent outlet horizontal or facing down. Install screen in vent outlet if not integral with service regulator.
E. Install metal shutoff valves upstream from service meters. Install dielectric fittings downstream from service meters.
F. Install service meters downstream from pressure regulators.

3.9 Valve Installation
A. Install manual gas shutoff valve for each gas appliance as required by local codes.
B. Install underground valves with valve boxes.
C. Install regulators and overpressure protection devices with maintenance access space adequate for servicing and testing.
D. Install earthquake valves above ground outside buildings according to local codes.

3.10 Piping Joint Construction

A. Ream ends of pipes and tubes and remove burrs.
B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

3.11 Hanger and Support Installation

A. Hangers and hanger spacing shall conform to MSS-SP58: Pipe Hangers and Supports Materials, Design and Manufacturer
B. Install seismic restraints on piping as required by local codes.

3.12 Connections

A. Connect to utility's gas main according to utility's procedures and requirements.
B. Install natural-gas piping electrically continuous, and bonded to gas appliance equipment grounding conductor of the circuit powering the appliance according to NFPA 70.
C. Install piping adjacent to appliances to allow service and maintenance of appliances.
D. Connect piping to appliances using manual gas shutoff valves and unions. Install union between valve and appliances or equipment as required by local codes.
E. Sediment Traps: Install tee fitting with capped nipple in bottom to form drip, as close as practical to inlet of each appliance.

3.13 Labeling and Identifying

A. Comply with requirements of NFPA-54 and ASME A13.1 for piping and valve identification.
B. Underground piping shall have detectable warning tape directly above gas piping, including under pavements and slabs and protected from corrosion in accordance with NACE RP 0169.

3.14 Painting

A. Comply with requirements for painting interior and exterior natural-gas piping.
B. Paint exposed, exterior metal piping, valves, service regulators, service meters and meter bars, earthquake valves, and piping specialties, except components, with factory-applied paint or protective coating.

3.15 Field Quality Control

Tests and Inspections:
A. Test, inspect, and purge natural gas according to NFPA 54 and authorities having jurisdiction.
B. Purge all piping after pressure test and all appliances after piping has been purged.
C. Prepare test and inspection reports.

Viega LLC
585 Interlocken Blvd.
Broomfield, CO 80021

Phone (800) 976-9819
www.viega.us

2.1 -A-1, 3 & 4

WARD MANUFACTURING

P.O. Box 9
117 Gulick Street
Blossburg, PA 16912-0009

(570) 638-2131

January 11, 2013

To whom it may concern:

I hereby certify that our products listed below comply with the current specification. The products listed below are made with pride in Blossburg, Pennsylvania, USA.

1 >>>>>>>> CL 150 Malleable Iron Threaded Fittings

Fed. Spec. WW - P - 521

ASME	B16.3	(Dimensions)
ASTM	A-197	(Chemical & Physical Properties)
ASTM	A-153	(For Galvanized Product)
ANSI/ASME	B1.20.1	(Tapered Pipe Threads)

CL 300 Malleable Iron Threaded Fittings

ASME	B16.3	(Dimensions)
ASTM	A-197	(Chemical & Physical Properties)
ASTM	A-153	(For Galvanized Product)
ANSI/ASME	B1.20.1	(Tapered Pipe Threads)

3 >>>>>>>> Unions, Union Fittings, Flange Unions & Companion Flanges

CL 150 Malleable Iron to Brass Seat, Iron to Iron Unions
Fed. Spec. WW - U - 531 ASME B16.39

CL 250 Malleable Iron to Brass Seat,Unions
Fed. Spec. WW - U - 531 ASME B16.39

CL 300 Malleable Iron to Brass Seat, Iron to Iron Unions
MIL - U - 18250 ASME B16.39

CL 125 - CL 250 Cast Iron Flanges		ASME B16.1
ASTM	A-126	(Chemical & Physical Properties)
ASTM	A-153	(For Galvanized Product)
ANSI/ASME	B1.20.1	(Tapered Pipe Threads)

Bushings and Plugs

Fed. Spec. WW - P - 471

ASME	B16.14	(Dimensions)
ANSI/ASME	B1.20.1	(Tapered Pipe Threads) Supersedes B-2-1
ASTM	A-197 or A-126	(Chemical & Physical Properties)
ASTM	A-153	(For Galvanized Product)

4 >>>>>>> CL 125 Cast Iron Threaded Fittings

Fed. Spec. WW - P - 501

ASME	B16.4	(Dimensions)
ASTM	A-126	(Chemical & Physical Properties)
ASTM	A-153	(For Galvanized Product)
ANSI/ASME	B1.20.1	(Tapered Pipe Threads)

Top Beam & C-Clamps

ASTM	A-197	(Chemical & Physical Properties)
ASTM	A-153	(For Galvanized Product)
UL	203	(Test Parameters)

Drainage Fittings

ASME	B16.12	(Dimensions)
ASTM	A-126	(Chemical & Physical Properties)
ASTM	A-153	(For Galvanized Product)
ANSI/ASME	B1.20.1	(Tapered Pipe Threads)

Cast Iron Flanges

ASME	B16.1	(Dimensions)
ASTM	A-126	(Chemical & Physical Properties)
ASTM	A-153	(For Galvanized Product)
ANSI/ASME	B1.20.1	(Tapered Pipe Threads)

WARDLOX Plain-End Fittings

ASTM	A-126	(Chemical & Physical Properties, Housing)
ASTM	D2000	(Gaskets, Temperature Range)
ANSI/ASME	B1.20.1	(Tapered Pipe Threads)

TEE-LOX Mechanical Branch Connectors

ASTM	A-126	(Chemical & Physical Properties, Housing)
ASTM	D2000	(Gaskets, Temperature Range)
ANSI/ASME	B1.20.1	(Tapered Pipe Threads)

Full Standard Merchant Couplings

ASTM	A-865	(Dimensions)
ASTM	A-53	(Chemical & Physical Properties)
ANSI/ASME	B1.20.1	(Tapered Pipe Threads)

Half Standard Merchant Couplings

ASTM	A-865	(Dimensions)
ASTM	A-53	(Chemical & Physical Properties)
ANSI/ASME	B1.20.1	(Tapered Pipe Threads)

Welded Steel Pipe Nipples

ASTM	A-733	(Dimensions)
ASTM	A-53	(Chemical & Physical Properties)
ASNI/ASME	B1.20.1	(Pipe Threads)

Sincerely,

Jim Belawski
Manager of Quality Assurance

Garlock
SEALING TECHNOLOGIES®
an EnPro Industries company

Garlock BLUE-GARD® 3200

MATERIAL PROPERTIES*

Color:	Off-white
Composition:	Aramid fibers with a SBR binder
Fluid Services[1]:	Water, saturated steam[4], inert gases
Temperature[2], °F (°C)	
Minimum:	-100 (-73)
Continuous Max:	+400 (+205)
Maximum:	+700 (+371)
Pressure[2], Maximum, psig (bar):	1200 (83)
P x T (max.)[2], psig x °F (bar x °C)	
1/32 and 1/16":	350,000 (12,000)
1/8":	250,000 (8,600)
Meets Specification:	ABS (American Bureau of Shipping) and MIL-DTL-24696C[6]

TYPICAL PHYSICAL PROPERTIES*

ASTM F36	**Compressibility**, range, %:	7-17	
ASTM F36	**Recovery**, %:	50	
ASTM F38	**Creep Relaxation**, %:	18	
ASTM F152	**Tensile**, Across Grain, psi (N/mm^2):	2250 (15)	
ASTM F1315	**Density**, lbs./ft.^{3} (grams/cm^3):	100 (1.60)	
ASTM F433	**Thermal Conductivity (K)**, W/m°K (Btu.·in./hr.·ft.^{2}·°F):	0.29-0.38 (2.00-2.65)	
ASTM D149	**Dielectric Properties**, range, volts/mil.		
	Sample conditioning	1/16"	1/8"
	3 hours at 250°F:	508	285[(3)]
	96 hours at 100% Relative Humidity:	116	140
ASTM F586	**Design Factors**	1/16" & Under	1/8"
	"m" factor:	3.5	6.6
	"y" factor, psi (N/mm^2):	2100 (14.5)	3000 (20.7)
ASTM F104	**Line Call Out**:	F712902A9B4E45K5L102M9[(5)]	

SEALING CHARACTERISTICS*

	ASTM F37B Fuel A	ASTM F37B Nitrogen	DIN 3535- 4 Gas Permeability
Gasket Load, psi (N/mm2):	500 (3.5)	3000 (20.7)	4640 (32)
Internal Pressure, psig (bar):	9.8 (0.7)	30 (2)	580 (40)
Leakage	**0.1 ml/hr.**	**0.4 ml/hr.**	**0.03 cc/min**

IMMERSION PROPERTIES*- ASTM F146 Fluid Resistance after Five Hours

	ASTM #1 Oil 300°F (150°C)	ASTM IRM #903 300°F (150°C)	ASTM Fuel A 70-85°F (20-30°C)	ASTM Fuel B 70-85°F (20-30°C)
Thickness Increase, (%)	0-10	15-30	0-15	5-20
Weight Increase, (%)	<20	-	<25	<30
Tensile Loss, (%)	-	<70	-	-

Notes:

This is a general guide and should not be the sole means of selecting or rejecting this material. ASTM test results in accordance with ASTM F-104; properties based on 1/32" (0.8mm) sheet thickness unless otherwise mentioned.

* Values do not constitute specification Limits

[1] See Garlock chemical resistance guide.

[2] Based on ANSI RF flanges at our preferred torque. When approaching maximum pressure, continuous operating temperature, minimum temperature or 50% of maximum PxT, consult Garlock Applications Engineering. Minimum temperature rating is conservative.

[3] Indicates current arced around and not through gasket. Dielectric higher than indicated.

[4] These styles are not preferred choices for steam service, but are successful when adequately compressed. Minimum recommended assembly stress = 4,800psi. Preferred assembly stress = 6,000-10,000psi. Gasket thickness of 1/16" strongly preferred. Retorque the bolts/studs prior to pressurizing the assembly. For saturated steam above 150psig or superheated steam, consult Garlock Engineering.

[5] Fourth numeral 9: % Thickness Increase in IRM Oil #903 = 25-50% max. A9: Leakage in Fuel A (Isooctane), Gasket Load = 500psi (3.5N/mm2), Pressure = 9.8psig (0.7bar): Typical = 0.1ml/hr, Max = 1.0ml/hr. A9: Leakage in Nitrogen, Gasket Load = 3,000psi (20.7N/mm2), Pressure = 30psig (2bar): Typical = 0.4ml/hr, Max = 1.0ml/hr. M9: Tensile Strength = 2,250psi min. (15N/mm2 min.).

[6] To ensure receipt of product branded Mil-G-24696, certification will be required- - fees associated based on quantity. Refer to "Military Specifications" in the Gasketing Terms section of the Engineered Gasket Products catalog for order/inquiry requirements.

2.1 - A - 2 WELD FITTINGS

WELDBEND®

Even with all the advances in technology today, the wholly welded piping system has for decades remained the best choice for use in high pressure and high temperature application. Many piping jobs in schools, industrial plants, refineries and factories have benefited from the inherent advantages of a completely welded system. It becomes a closed container joining pipes, valves, fittings, and flanges. A welded joint actually becomes part of the pipe, minimizing leak potential. This provides greater margins of safety, especially under conditions of high internal pressures. Additionally, welding fittings form a continuous metal structure with the pipe, adding forged-in strength to any piping system. Furthermore, smooth forged fittings simplify insulation and take up less space.

ASTM A 234

Scope

This standard covers wrought carbon steel fittings of seamless and welded construction which are manufactured to the dimensional specifications of ASME B16.9 and B16.28. These fittings are primarily for use in pressure piping and in pressure vessel fabrication for service at moderate and elevated temperatures.

Materials

The starting material for fittings shall consist of killed steel, forgings, bars, plates, seamless or fusion-welded tubular products with filler metal added and shall conform to the the chemical requirements of ASTM A 234. Unless otherwise specified, carbon steel plates may be either coarse grain or fine grain practice.

Manufacture

Forging or shaping operations are performed by hammering, pressing, piercing, extruding, upsetting, rolling, bending, machining, or by a combination of two or more of these operations. The forming process shall be applied so that it will not produce injurious imperfections in the fittings.

Heat Treatment

Hot-formed WPB fittings, upon which the final forming operation is completed at a temperature above 1150ºF and below 1800ºF, need not be heat treated. Cold-Formed WPB fittings, upon which the final forming operation is completed at a temperature below 1150ºF, shall be normalized, or shall be stress relieved at 1100ºF to 1275ºF.

Fitting Summary Data Sheet

Chemical requirements (in %):

Carbon	Manganese	Phosphorus (max)	Sulfur (max)
.30 max	.29-1.06	.050	.058

Silicon	Chromium	Molybdenum	Nickel	Copper
.10 min	.40 max	.15 max	.40 max	.40 max

Vanadium	Columbium
.08 max	.02 max

Mechanical requirements:

Tensile Strength		60,000-85,000 psi
Yield Strength (min)		35,000 psi
Elongation	- Longitudinal:	22%
	- Transverse:	14%

Dimensions

Butt-welding fittings and butt-welding short radius elbows and returns purchased in accordance with this specification shall conform to the dimensions and tolerances given in the latest revision of ANSI B16.9 and B16.28, respectively.

Certification

When requested by the purchaser, the manufacturer shall provide a certificate of compliance to this specification. If requested to provide test reports, the manufacturer shall also provide the following where applicable:

* Chemical analysis results. When the amount of an element is less than .02%, the analysis for that element is reported as "<0.02%."
* Tensile property results, report the yield strength and ultimate strength in ksi [or MPa] and elongation in percent,
* Hardness acceptable in accordance with Section 10 of ASTM A-234,
* Seamless or Welded,
* Type of Heat Treatment, if any,
* Starting material, specifically pipe, plate, etc.,
* Statement regarding radiographic or ultrasonic examination.
* Any supplemental testing required by the purchase order.

Product Marking

All fittings shall have the prescribed information stamped or otherwise suitable marked on each fitting in accordance with ASTM A 234/MSS SP-25. A Weldbend fitting is marked as follows: Weldbend's Name, Nominal Pipe Size, Pipe Wall Thickness Designation, Material Grade (WPB/WPC) and Heat Identification Number.

Note: All information contained in this document, and for a complete description of all requirements, refer to ASTM A 105. Sheets are subject to change without notice.

2.1 - A - 4 - WELD FLANGED DATA

WELDBEND®

Flange Summary Data Sheet

Even with all the advances in technology today, the wholly welded piping system has for decades remained the best choice for use in high pressure and high temperature application. Many piping jobs in schools, industrial plants, refineries, and factories have benefited from the inherent advantages of a completely welded system. It becomes a closed container joining pipes, valves, fittings, and flanges. A welded joint actually becomes part of the pipe, minimizing leak potential. This provides greater margins of safety, especially under conditions of high internal pressures. Additionally, welding fittings form a continuous metal structure with the pipe, adding forged-in strength to any piping system. Furthermore, smooth forged flanges simplify insulation and take up less space.

Chemical requirements (in %):

Carbon	Manganese	Phosphorus (max)	Sulfur (max)
.35 max	.60-1.05	.035	.040

Silicon	Copper	Nickel	Chromium
.10-.35	.40 max	.40 max	.30 max

Molybdenum	Vanadium	Columbium
.12 max	.08 max	.02 max

Mechanical requirements:

Tensile Strength (min)	70,000 psi
Yield Strength (min)	36,000 psi
Basic minimum elongation for walls 5/16 in. and over in thickness, strip tests.	30%
Reduction of area (min)	30%
Hardness, HB (max)	187

ASTM A 105

Scope

This standard covers forged carbon steel piping components for ambient- and higher-temperature service in pressure systems. Flanges are ordered either to dimensions specified by the purchaser or to dimensional specifications such as ASME 16.5 and API 6A. Forgings made to ASTM A 105 are normally limited to a maximum weight of 10,000 lb.

Materials

Weldbend flanges are made by hammering, pressing, rolling and/or machining cast or forged bars, billets or slabs. These adhere to the extent described in the following sections.

Manufacture

ASTM A 105 covers the requirements for forged steel components as finished products only.
The requirements for raw materials are covered by the standards specified in Section 2: Referenced Documents of ASTM A 105.

Heat Treatment

Heat treatment is not a mandatory requirement of this specification except for the following piping components:
* Flanges above Class 300,
* Flanges of special design where the design pressure at the design temperature exceeds the pressure-temperature ratings of Class 300, Group 1.1,
* Flanges of special design where the design pressure or design temperature is not known.

Heat treatment, when required by the above, shall be annealing, normalizing, normalizing and tempering, or quenching and tempering in accordance with ASTM A 961.

Dimensions

Weldbend flanges are manufactured in accordance with ASME B 16.5 (24" NPS and smaller) and ASME B 16.47 (26" - 60" NPS).

Certification

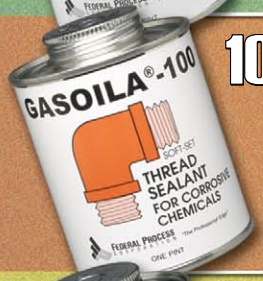
For forgings made to specified dimensions agreed upon by the purchaser, and for forgings made to dimensional standards, the application of identification marks, as required by ASTM A 961, shall be the certification that the forgings have been furnished in accordance with the requirements of this standard. The specification designation included on test reports shall include the year of issue and revision letter, if any.
Test Reports: When test reports are required, Weldbend will also provide the following, if applicable:
*Type of heat treatment,
*Tensile property results, i.e., yield strength and ultimate strength in ksi, elongation and reduction in area, in percent,
*Chemical analysis results,
*Hardness results, and,
*Any supplementary testing required by the purchase order.

Product Marking

All flanges shall have the prescribed information stamped or otherwise suitable marked on each flange in accordance with the Standard/MSS SP-25. A Weldbend flange is marked as follows:
Weldbend's Name, Nominal Pipe Size, A105/SA105, Bore Designation, Heat Identification Number and manufacture date.

Note: All information contained in this document, and for a complete description of all requirements, refer to ASTM A 105. Sheets are subject to change without notice.

Quick and Easy Sealant Reference Guide

	TYPE	APPLICATIONS	USED BY	USED ON	APPROVALS
 **Soft-Set** · General Purpose, Top-selling Sealant · Perfect for New Pipes · Stays Pliable in Cold Temperatures · Non-Hardening, · Non-Separating · Non-Toxic	Blue Gray Paste with PTFE	Water, Steam, Natural Gas, LPG, Propane, Gasoline, Butane *Not for Use with Oxygen systems	• Mechanical Contractors • Plumbers • Gas Utilities • Service Station Installers • Manufacturing Plants	All Metals and Most Plastics	CSA, UL NSF 16 NSF 14
 **E-Seal** · Specifically for E10 and E85 · Stays Pliable in Cold Temperatures · Non-Hardening, · Non-Separating · Non-Toxic	Green Paste with PTFE	Ethanol Blended Gasoline, including E10 and E85 (*NOT 100% Ethanol applications) *Not for Use with Oxygen systems	• Gas Station Installers	All Metals	UL
 **Hard-Set** · Hard Setting Sealant · Assembles Threaded Joints Permanently · Excellent for Coating Surfaces. · Impervious to Gasoline · Flammable	Red Varnish	Aliphatic, Aromatic and Chlorinated Solvents *Not for Use with Oxygen systems	• Auto Industry to Seal Drive Trains, Coat parts • Contractors Installing Underground Piping, Steam Systems • Marine Manufacturers	All Metals, Rubber, Porcelain, Wood	UL
 **PLS-2** · Ideal for Demanding Pneumatic and LPG Applications	Gray Paste with PTFE	Chlorine, Diesel, Jet Fuel, Steam, Dilute Acid *Not for Use with Oxygen systems	• Chemical Plants, • Gas Utilities • Refineries • Airlines, Hydraulics • Tank Trucks	All Metals and Most Plastics	CSA UL
 **100** · Ideal for use on Systems with 100% Methanol, Ethanol, Alcohol and Highly Corrosive Chemicals · Soft Setting	Black Paste	High Concentrations of Alcohol, Solvents, Caustic Chemicals 100% Ethanol 100% Methanol *Not for Use with Oxygen systems	• Pharmaceutical • Chemical Companies	All Metals and Fiberglass *Not for Use on Plastic Pipe *Threads must be Clean Prior to use	
 **JC-30** · For Damaged, Irregular, Mis-cut and Straight Threads · Vegetable Oil Base · Thick Consistency, 10-15% more Solids than Conventional Sealants	Oyster White Paste with PTFE	Water, Steam, Natural Gas, LPG, Propane, Gasoline, Freon 22 and Hydraulic Fluids *Not for Use with Oxygen systems	• Plumbers, • Gas Utilities • Manufacturing Plants	All Metals	UL
 **NT** · Soft Setting for Applications Requiring Grit-Free, Non-PTFE Compound · No Fillers to Contaminate Gas Lines · For use when Non-PTFE Sealant is Preferred	Dark Blue Paste without PTFE	Water, Steam, LPG, Propane, Gasoline *Not for Use with Oxygen systems	• Propane Companies • Petroleum Companies	All Metals and Most Plastics	NSF 16 NSF 14
 **FasSeal ATS** Anaerobic Thread Sealant that cures in Absence of Oxygen · Ideal for Refrigeration or other High Vibration Applications · High Speed Curing Time · Vibration Resistant.	Smooth White Paste with PTFE	Air Conditioning Lines, Hydraulic-Pneumatic Lines, Air Compressor Hoses, Sprinkler Installations *Not for Use with Oxygen systems	• HVAC • Refrigeration Companies	Metals *Not for Use on Plastic Pipe	

Phone: 800-846-7325 - Fax: 800-797-2085

FEDERAL PROCESS CORPORATION