



Weaver

CONSTRUCTION MANAGEMENT

3679 S Huron Street, Suite 404 Englewood, Colorado 80110

Phone: (303) 789-4111 FAX: (303) 789-4310

SUBMITTAL TRANSMITTAL

February 22, 2012

Submittal No: 15060-001

PROJECT: **Harold Thompson Regional WRF**
Birdsall Rd.
Fountain, CO 80817
Job No. 2908

ENGINEER: **GMS, Inc.**
611 No. Weber St., #300
Colorado Springs, CO 80903
719-475-2935 Roger Sams

OWNER: **Lower Fountain Metropolitan
Sewage Disposal District**
901 S. Santa Fe Ave.
Fountain, CO 80817
719-382-5303 James Heckman

CONTRACTOR: **Contract Mechanical Services, Inc.**
P.O.Box 63323
Colorado Springs, CO 80962
719-596-7717 Jeff Payne

SUBJECT: Black Steel Pipe @ EM Building

SPEC SECTION: 15060

PREVIOUS SUBMISSION DATES:

DEVIATIONS FROM SPEC: ___ YES X NO

CONTRACTOR'S STAMP: This submittal has been reviewed by Weaver Construction Management and, unless indicated otherwise, has been found to be in conformance with the intent of the contract documents.

Contractor's Stamp:

Engineer's Stamp:

Date: 2/22/12

Reviewed by: H.C. Myers

() Reviewed Without Comments

(X) Reviewed With Comments

ENGINEER'S
COMMENTS:



Project: Harold D. Thompson WRF / Equipment, Maintenance and Storage Bldg.

Location: Fountain, CO

Supplier/Contractor: Contract Mechanical

Date: 22 February 2012

Submittal No/Spec. Section: 15060

WCM Submittal Review Comments:

- 1. The information for black steel pipe being submitted is intended for use as interior gas piping.**

ASTM A120-84

Withdrawn Standard: ASTM A120-84 Specification for Pipe, Steel, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless for Ordinary Uses (Withdrawn 1987)

Developed by Subcommittee: A01.09

WITHDRAWN, REPLACED BY A53/A53M



SUBMITTAL DATA

Rev. 01/28/11

ASTM A53 TYPE E GRADE A PIPE

SCOPE

Covers black and hot-dipped galvanized electric-resistance welded Grade A pipe. Pipe is intended for mechanical and pressure applications and is acceptable for ordinary uses in steam, water, gas and air lines. Pipe is suitable for welding and threading. Produced to the latest revision of ASTM A53A/53M, Federal Specification WW-P404 and ASME B36.10M.

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 not a requirement on lengths of ERW pipe NPS 1-1/2 and smaller.

CHEMICAL REQUIREMENTS

Composition, max. %

Carbon	Manganese	Phosphorus	Sulfur	
.25	.95	.05	.045	
*Copper	*Nickel	*Chromium	*Molybdenum	*Vanadium
.50	.40	.40	.15	.08

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

TENSILE REQUIREMENTS

Tensile Strength, min.	48 000 psi
Yield Strength, min.	30 000 psi
Elongation in 2"	Refer to A53 Table x 4.1

BENDING TEST (COLD)

Degree of Bend	For NPS 2 and under 90°
Diameter of Mandrel	12 x outside pipe diameter

FREQUENCY OF TESTS

Tensile tests are required on one length of pipe from each lot of 500 lengths or fraction thereof for each size.

END FINISH

Plain End: End finish shall be at the option of the manufacturer.

Threaded:	To ANSI Standard B 1.20.1
Couplings:	To ASTM Standard A865

DIMENSIONS AND WEIGHTS

BLACK PLAIN END					
NPS	OD Inches	Sch 40		Sch 80	
		Nominal Wall	Weight/ Lb. Ft	Nominal Wall	Weight/ Lb. Ft
GRADE A					
1/4	.540	.088	.43	.119	.54
3/8	.675	.091	.57	.126	.74

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 shall not vary more than +/- 0.016" from the standard specified.

PERMISSIBLE VARIATIONS IN WEIGHT PER FOOT.

Pipe shall not vary more than +/- 10% from the standard specified.

PRODUCT MARKING

Each bundle tag securely attached to the bundle shall show the manufacturer, the grade of pipe (ASTM A53), the kind of pipe E for Electric Resistance Welded, A for Grade A, the size, XS for extra strong, and length. Bar coding is acceptable as a supplementary identification method.

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.

WHEATLAND TUBE COMPANY – 700 SOUTH DOCK STREET, SHARON, PA 16146

Phone: 800-257-8182 ▶ Fax: 724-346-7260 ▶ EMAIL: info@wheatland.com Made in USA



Wheatland Tube Company

1 Council Avenue P.O. Box 608
Wheatland, PA 16161-0608
800.257.8182

www.wheatland.com

Wheatland ASTM A 53

Schedule 40 and Schedule 80 Pipe

Wheatland Steel Pipe is made by specialists who understand that it's the small details that make the difference between average products and superior products. At the Wheatland Plant, most department heads and foremen have been employed in some phase of pipe manufacturing for 25 or more years.

This kind of specialization, experience and knowledge pays off...in workable, threadable, uniform pipe. Delivered clean. Delivered promptly.

Wheatland specializes in manufacturing welded steel pipe in 1/2 through 4 nominal sizes. Available inventory in 1/8 to 12 pipe sizes produced to various ASTM standards is maintained to meet your pipe requirements.

Care, pride and personal concern are bonus features that go into every inch of Wheatland Pipe. Don't settle for less.

Make sure it's quality. Make sure it's Wheatland.

Standard Pipe Schedule 40 ASTM A 53 Grades A and B

NPS Designator	DN Designator	Outside Diameter		Inside Diameter		Wall Thickness		Nominal Weight (Mass) per unit Length			
		(Inches)	(mm)	(Inches)	(mm)	(Inches)	(mm)	Plain End (lb/ft)	Plain End (kg/m)	Threads & Couplings (lb/ft)	Threads & Couplings (kg/m)
1/8	6	0.405	10.3	0.289	6.8	0.068	1.73	0.24	0.37	0.25	0.37
1/4	8	0.540	13.7	0.364	9.2	0.088	2.24	0.43	0.63	0.43	0.63
3/8	10	0.675	17.1	0.493	12.5	0.091	2.31	0.57	0.84	0.57	0.84
1/2	15	0.840	21.3	0.622	15.8	0.109	2.77	0.85	1.27	0.86	1.27
3/4	20	1.050	26.7	0.824	20.9	0.113	2.87	1.13	1.69	1.14	1.69
1	25	1.315	33.4	1.049	26.6	0.133	3.38	1.68	2.50	1.69	2.50
1-1/4	32	1.660	42.2	1.380	35.1	0.140	3.56	2.27	3.39	2.28	3.40
1-1/2	40	1.900	48.3	1.610	40.9	0.145	3.68	2.72	4.05	2.74	4.04
2	50	2.375	60.3	2.067	52.5	0.154	3.91	3.66	5.44	3.68	5.46
2-1/2	65	2.875	73.0	2.469	62.7	0.203	5.16	5.80	8.63	5.85	8.67
3	80	3.500	88.9	3.068	77.9	0.216	5.49	7.58	11.29	7.68	11.35
3-1/2	90	4.000	101.6	3.548	90.1	0.226	5.74	9.12	13.57	9.27	13.71
4	100	4.500	114.3	4.026	102.3	0.237	6.02	10.80	16.07	10.92	16.23
5	125	5.563	141.3	5.047	158.2	0.258	6.55	14.63	21.77	14.90	22.07
6	150	6.625	168.3	6.065	154.1	0.280	7.11	18.99	28.26	19.34	28.58
8	200	8.625	219.1	7.981	202.7	0.322	8.18	28.58	42.55	29.35	43.73
10	250	10.750	273.0	10.020	254.5	0.365	9.27	40.52	60.29	41.49	63.36
Standard Pipe											
12'	300	12.750	323.8	12.000	304.8	0.375	9.52	49.61	73.78	51.28	76.21

Note! NPS 12 dimensions are for standard wall pipe, not schedule 40.

Product Type and Specification:

Standard welded pipe is produced in 1/2 to 6 trade sizes. Wheatland pipe is produced to ASTM A 53 Grades A and B, A 501, and A 589 Type II, API 5L and Federal Specification WW-P404. All pipe threads conform to ANSI B1.20.1. Merchant couplings comply with ASTM A 865.

Specifications and descriptions are accurate as known at time of publication and subject to change without notice.

Wheatland ASTM A 53 Grades A & B Schedule 40 Pipe

Approvals / Specifications



WARD FITTINGS
117 Gullick St., Blossburg, PA 16912

MALLEABLE IRON THREADED FITTINGS

Standard Class 150 Specifications:

ANSI B1.20.1, Threads, B 16.3, Dimensions, Pressure Rating

ASTM A197, Material. A153, Galvanizing

Federal Spec: WWP 521

MSDS Malleable 



NSF Listing 

NSF 61 Annex G Cert 

Pressure Ratings:

150 psig - Saturated Steam

300 psig - At 150 Degrees W. O. G.

U.L.C.  and U.L.  listed where applicable, FM approved.

Extra Heavy Class 300 Specifications:

ANSI B1.20.1, Threads, B16.3, Dimensions, Pressure Rating

ASTM A197, Material A153, Galvanizing

MSDS Malleable 

NSF Listing 

NSF 61 Annex G Cert 



Pressure Ratings:

300 psig - Saturated Steam

¼ - 1 - 2000 psig - At 150 Degrees W.O.G.

1-¼ - 2 - 1500 psig - At 150 Degrees W.O.G.

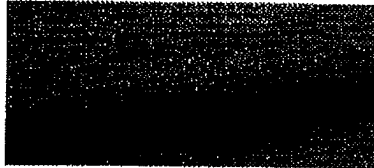
2-½ - 3 - 1000 psig - At 150 Degrees W.O.G.

U.L.C.  and U.L.  listed where applicable, FM approved

CHARLOTTE
PIPE AND FOUNDRY COMPANY



Made With FlowGuard Gold®



Non-Potable Water Distribution System
Product Specification

All pipe and fittings shall be manufactured from CPVC compound with a cell class of 24448 for pipe and 23447 for fittings as per ASTM D 1784 and conform with NSF International Standard 14. The pipe shall be listed by NSF International for reclaimed water and bear the mark "NSF-rw."

½" through 2" sizes: ReUze® made with FlowGuard Gold® CPVC Copper Tube Size manufactured to standard dimension ratio (SDR) 11 and shall conform to ASTM D 2846. Pipe shall be purple pigmented and have two rows of marking 180° apart to include "WARNING: NON-POTABLE WATER DO NOT DRINK." Fittings shall be either tan or purple in color. Transition fittings shall have brass male or female connections with integral CPVC socket connections as manufactured by Charlotte Pipe and Foundry Company.

All pipe and fittings shall be produced by a single manufacturer and be installed in accordance with manufacturer's recommendations and applicable code requirements. System shall be joined using approved one-step solvent cement conforming to ASTM F 493. Pipe and fittings shall be manufactured by Charlotte Pipe and Foundry Company and are intended for hot and cold non-potable water distribution systems.

ReUze is a registered trademark of Charlotte Pipe and Foundry Company.
FlowGuard Gold is a registered trademark of the Lubrizol Corp.

SPEC-SF-RU (611)

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



Suggested Specification

System: ReUze® CPVC Copper-Tube-Size (CTS) Non-Potable Water Distribution System

Scope: This specification covers Copper Tube Size (CTS) CPVC manufactured to standard dimensional ratio (SDR) 11 for non-potable water distribution. This system is intended for pressure applications where the operating temperature will not exceed 180°F at 100 psi.

Specification: Pipe and fittings shall be manufactured from virgin rigid CPVC (chlorinated polyvinyl chloride) vinyl compounds with a Cell Class of 24448 as identified in ASTM D 1784.

ReUze CTS CPVC pipe and fittings shall conform to ASTM D 2846. Pipe and fittings shall be manufactured as a system and be the product of one manufacturer. All pipe and fittings shall be manufactured in the United States. Pipe and fittings shall conform to NSF International Standard 14. The pipe shall be listed by NSF International for reclaimed water and bear the mark "NSF-rw." Installation shall comply with latest installation instructions published by Charlotte Pipe and Foundry and shall conform to all applicable plumbing, building and fire code requirements. Buried pipe shall be installed in accordance with ASTM F 1668. Solvent weld joints shall be made using CPVC cement conforming to ASTM F 493. Yellow one-step cement may be used without primer. If a primer is required by local plumbing or building codes, then a primer conforming to ASTM F 656 should be used. The system shall be protected from chemical agents, fire stopping materials, thread sealant, plasticized vinyl products or other aggressive chemical agents not compatible with CPVC compounds. Systems shall be hydrostatically tested after installation. **WARNING!** Never test with or transport/store compressed air or gas in CPVC pipe or fittings.

Referenced Standards*:

ASTM D 1784	Rigid Vinyl Compounds
ASTM D 2846	CPVC Plastic Hot and Cold Water Distribution System
ASTM F 493	Solvent Cements for CPVC Pipe and Fittings
ASTM F 1668	Procedures for Buried Plastic Pipe
NSF Standard 14	Plastic Piping Components and Related Materials

* Note: Latest revision of each standard applies.

SPEC-LF-RU (611)

ReUze is a registered trademark of Charlotte Pipe and Foundry Company.

15060 2.1 D

CRESLINE[®]

CRESLINE PLASTIC PIPE CO., INC.

FLOWGUARD GOLD[®]
PIPE & FITTINGS

CPVC PIPE


FORM NO. 861 CPVC SPECIFICATIONS

JANUARY, 2004


PRICES ARE LISTED ON FORM MLP-2.

CPVC CEMENT AND PRIMER ON FORM NO. 466.

PLEASE ORDER BY PART NUMBER.

HC-CTS TUBING RIGID 100 PSI @ 180° F. ASTM D-2846  POTABLE WATER	SIZE	O.D.	MIN. WALL	WEIGHT PER 100'	FEET PER BAG	FEET PER PALLET	LGTH.	PART NO.
	1/2"	.625	.068	8.22	500	9000	10'	44905
1000					18000	20	44907	
3/4"	.875	.080	13.87	250	4500	10	44910	
				500	9000	20	44912	
1"	1.125	.102	22.68	160	2880	10	44915	
				320	5760	20	44917	
1 1/4"	1.375	.125	34.00	90	1620	10	44920	
				180	3240	20	44922	
1 1/2"	1.625	.148	47.60	60	1080	10	44925	
				120	2160	20	44927	
2"	2.125	.193	81.11	40	720	10	44930	
				80	1440	20	44932	

AVAILABLE IN BAG QUANTITY ONLY.

HC-CTS TUBING COILED 100 PSI @ 180° F. ASTM D-2846  POTABLE WATER	SIZE	O.D.	MIN. WALL	WEIGHT PER 100'	FEET PER SKID	COIL LGTH.	PART NO.
	1/2"	.625	.068	8.22	1500	150'	44510
3/4"					.875	.080	13.87
1"	1.125	.102	22.68	500	100	44540	

AVAILABLE IN SKID QUANTITY ONLY.

PPFA MEMBER
PLASTIC PIPE
AND FITTINGS
ASSOCIATION

CRESLINE PLASTIC PIPE CO., INC.

600 Cross Pointe Blvd.
264 Silver Spring Rd.
2100 South 35th St.
3801 East Hwy. 31

Evansville, IN 47715
Mechanicsburg, PA 17050
Council Bluffs, IA 51501
Corsicana, TX 75109

812-428-9350
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903-872-8475

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Fax 812-428-9353
Fax 717-697-2371
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CRESLINE®

CRESLINE PLASTIC PIPE CO., INC.

FLOWGUARD GOLD® PIPE & FITTINGS

CPVC FITTINGS

FORM NO. 866

MEETS ASTM D-2846 STANDARDS


PLEASE ORDER BY PART NUMBER.

SUGGESTED LIST PRICES

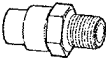
EFFECTIVE: MAY 9, 2011

SUPERSEDES: AUGUST 9, 2010


HC5 MALE IRON PIPE ADAPTER

	SIZE	PART NO.	CTN. QTY.	LIST PRICE
	1/2	92005	20/700	\$.59
	3/4	92010	10/300	1.00
	1	92014	10/100	4.47
	1 1/4	92407	10/100	7.32
	1 1/2	92409	10/100	9.02
	2	92411	10/50	14.88
	SLIP X MPT			


HC5B MALE ADAPTER - BRASS THREADS

	1/2	92282	10/100	6.83
	3/4	92284	5/50	9.29
	1	92285	5/25	17.64
	1 1/4	92286	5/25	54.03
	1 1/2	92287	5/25	68.77
	2	92288	5/20	103.16
	SLIP X BRASS MPT			


HC10 FEMALE ADAPTER

	1/2	92011	25/400	1.97
	3/4	92013	25/200	2.78
	1	92016	10/100	3.19
	NOT NSF LISTED SLIP X FPT (INCLUDES WASHER)			


HC10B FEMALE ADAPTER - BRASS THREADS

	1/2	92290	10/100	6.83
	3/4	92292	5/50	9.29
	1	92294	5/25	17.64
	1 1/4	92295	5/25	54.03
	1 1/2	92296	5/25	68.77
	2	92297	5/20	103.16
SLIP X BRASS FPT				


HC20 COUPLING

	1/2	92015	20/700	.47
	3/4	92020	20/300	.58
	3/4 x 1/2	92025	10/250	1.08
	1	92021	10/100	2.61
	1 x 3/4	92026	10/100	3.26
	1 1/4	92447	10/100	3.57
	1 1/2	92449	10/100	5.04
	2	92451	10/50	9.08
	3/4 IPS x 3/4 CTS	92260	25/500	1.46
	1 IPS x 1 CTS	92262	10/100	2.90
	2 IPS x 2 CTS	92268	5/25	9.73
SLIP X SLIP				

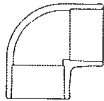
HC21 COMPRESSION COUPLING

	1/2	92027	15	4.37
	3/4	92028	30	5.96
	1	92029	24	8.33
COMP. X COMP.				


HC24 TRANSITION FITTING

	SIZE	PART NO.	CTN. QTY.	LIST PRICE
	1/2	92150	25/500	\$1.90
	3/4	92155	10/100	2.51
	SPIGOT X COMP.			

HC30 90° ELL

	1/2	92035	20/600	.53
	3/4	92040	20/200	.88
	3/4 x 1/2	92042	10/250	2.03
	1	92041	10/100	2.57
	1 1/4	92507	10/100	5.12
	1 1/2	92509	10/100	9.23
	2	92511	5/50	17.70
SLIP X SLIP				

HC30A 90° STREET ELL

	1/2	92160	10/500	.67
	3/4	92165	10/300	1.04
	1	92167	10/100	4.77
	SPIGOT X SLIP			

HC30E DROP EAR ELL

1/2	92044	25/500	1.68	
SLIP X SLIP				

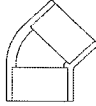
HC32E DROP EAR ELL

1/2	92220	25/200	2.34	
SLIP X FPT (INCLUDES WASHER)				


HC32B BRASS DROP EAR ELBOW


1/2	92370	10/50	17.05	
BRASS FPT X CPVC SLIP				

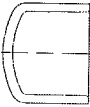
HC36 45° ELL

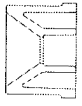
	1/2	92045	20/700	.71
	3/4	92050	20/300	1.24
	1	92051	10/100	2.98
	1 1/4	92587	10/100	6.67
	1 1/2	92589	10/100	9.66
	2	92591	5/25	19.13
SLIP X SLIP				


HC36A 45° STREET ELL


	1/2	92175	25/500	1.43
	3/4	92180	25/500	2.03
	1	92185	10/100	5.84
SPIGOT X SLIP				

HC50 TEE					
	SIZE	PART NO.	CTN. QTY.	LIST PRICE	
	1/2	92055	20/400	\$.72	
	3/4	92060	10/150	1.28	
	3/4 x 3/4 x 1/2	92061	10/150	1.40	
	3/4 x 1/2 x 3/4	92062	10/150	1.82	
	3/4 x 1/2 x 1/2	92063	10/200	1.33	
	1	92064	10/100	6.73	
	1 x 1 x 3/4	92066	10/100	7.30	
	1 1/4	92627	10/100	10.33	
	1 1/2	92629	5/50	13.45	
	1 1/2 x 1 1/2 x 1	92652	5/50	15.33	
	2	92631	5/25	21.75	
	2 x 2 x 1	92672	5/25	21.82	
	SLIP X SLIP X SLIP				


HC70 CAP				
	1/2	92065	20/1200	.48
	3/4	92070	10/600	.65
	1	92071	10/100	2.36
	1 1/4	92707	10/100	3.35
	1 1/2	92709	10/100	5.16
	2	92711	10/50	10.41
SLIP				

HC90 REDUCER BUSHING				
	3/4 x 1/2	92030	10/800	.70
	1 x 1/2	92031	10/100	2.30
	1 x 3/4	92032	10/100	2.30
	1 1/4 x 1/2	92727	10/100	3.30
	1 1/4 x 3/4	92729	10/100	2.98
	1 1/4 x 1	92731	10/100	2.61
	1 1/2 x 1/2	92733	10/100	3.88
	1 1/2 x 3/4	92735	10/100	3.88
	1 1/2 x 1	92737	10/100	3.68
	1 1/2 x 1 1/4	92739	10/100	3.68
	2 x 1/2	92741	10/50	9.22
	2 x 3/4	92743	10/50	8.61
	2 x 1	92745	10/50	8.31
	2 x 1 1/4	92747	10/50	9.80
2 x 1 1/2	92749	10/50	8.31	
SPIGOT X SLIP				

HC90T TRANSITION BUSHING				
	1/2 IPS x 1/2 CTS	92270	10/100	3.08
	3/4 IPS x 3/4 CTS	92272	10/100	3.11
	1 IPS x 1 CTS	92274	10/100	3.43
	1 1/4 IPS x 1 1/4 CTS	92276	10/100	4.40
	1 1/2 IPS x 1 1/2 CTS	92278	10/100	5.54
	2 IPS x 2 CTS	92280	10/100	5.84
SPIGOT(IPS) X SLIP(CTS)				

HC100 PLASTIC STRAPS				
	1/2	92075	100/1500	.26
	3/4	92080	100/1200	.36

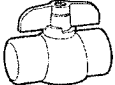
HC101 TALON STRAPS				
	SIZE	PART NO.	CTN. QTY.	LIST PRICE
	1/2	92105	100/1000	\$.15
	3/4	92110	100/1000	.20
	1	92115	50/500	.39


HC110-M TRANSITION UNION				
	1/2	92305	10/100	7.78
	3/4	92310	10/50	14.70
MPT (COPPER) X SLIP (CPVC)				


HC110-F TRANSITION UNION				
	1/2	92320	10/100	11.37
	3/4	92325	10/50	13.98
	1	92330	10/50	43.98
FPT (BRASS) X SLIP (CPVC)				

HC110-S TRANSITION UNION				
	1/2	92335	10/100	8.44
	3/4	92340	10/100	16.32
SOLDER (BRASS) X SLIP (CPVC)				

HC110-C TRANSITION UNION				
	1/2	92350	10/50	17.97
	3/4	92355	10/50	36.33
COMP (BRASS) X SLIP (CPVC)				

HC125 CPVC BALL VALVE				
	1/2	92190	36	8.12
	3/4	92195	24	9.51
	1	92197	18	11.78
	1 1/4	92198	8	26.72
	1 1/2	92199	6	34.92
	2	92201	4	50.07
SLIP X SLIP				

HC133 GLOBE STOP VALVE				
	1/2	92230	36	4.47
	3/4	92235	36	6.63
SLIP X SLIP				

HC135 BOILER DRAIN VALVE				
	1/2	92250	36	4.47
	3/4	92255	36	5.53
SLIP X MHT				

CPVC CEMENT AND PRIMER IS LISTED ON FORM NO. 466.



CRESLINE PLASTIC PIPE CO., INC.

600 Cross Pointe Blvd.
264 Silver Spring Rd.
2100 South 35th St.
3801 East Hwy. 31

Evansville, IN 47715
Mechanicsburg, PA 17050
Council Bluffs, IA 51501
Corsicana, TX 75109



www.cresline.com

812-428-9350
717-766-2566
712-322-2294
903-872-8475

Fax 812-428-9353
Fax 717-697-2371
Fax 712-322-6673
Fax 903-872-7732



No-Hub Submittal

510010 - 02/11rev

15060-2.1 F

Cast Iron No-Hub Pipe & Fittings System

Date _____

Project _____

Architect _____

Engineer _____

Contractor _____

Suggested Spec

All duct, waste, vent, sewer and storm lines shall be of cast iron vit pipe, fittings and couplings, and shall be NSF Certified to conform to the CISPI 301 standard, and shall comply with ASTM A 888, latest edition. Pipe and fittings shall be marked with the following trademarks of the Cast Iron Pipe Institute and CISPI: *cast iron brand*, indicate the manufacturer's name, country of origin, and date of manufacture, or receive prior approval of the engineer.

NO-HUB PIPE, 10' LAYING LENGTH

Size	Wt/Piece (lbs)	Pieces/Bundle	Lbs/Bundle
1-1/2"	30	54	1620
2	36	64	2340
3	54	48	2592
4	74	30	2220
5	85	24	2040
6	115	21	2415
8	165	10	1740
10	265	8	2280
12	325	6	2130
15	435	3	1425

DIMENSIONS AND TOLERANCES

Size	B Inside Diam	J Outside Diam	T Norm	T Min
1-1/2"	1.50±.06	1.90±.06	.16	.13
2	1.96±.09	2.35±.09	.16	.13
3	2.96±.09	3.35±.09	.16	.13
4	3.94±.09	4.38±.09/-05	.19	.15
5	4.94±.09	5.30±.09/-05	.19	.15
6	5.94±.09	6.30±.09/-05	.19	.15
8	7.94±.13	8.38±.13/-09	.23	.17
10	10.00±.13	10.56±.09	.28	.22
12	11.94±.13	12.50±.13	.28	.22
15	15.11±.13	15.83±.13	.35	.30

Weights are approximate for shipping



Pipe diagram for illustration only, not to scale

For more detailed specifications of cast iron pipe and fittings, see the Cast Iron Soil Pipe Institute Pipe and Fittings Handbook, available online at www.abifoundry.com, or contact AB&I at 800-GOT-IRON (468-4766).

AB&I is a founding member of CISPI.

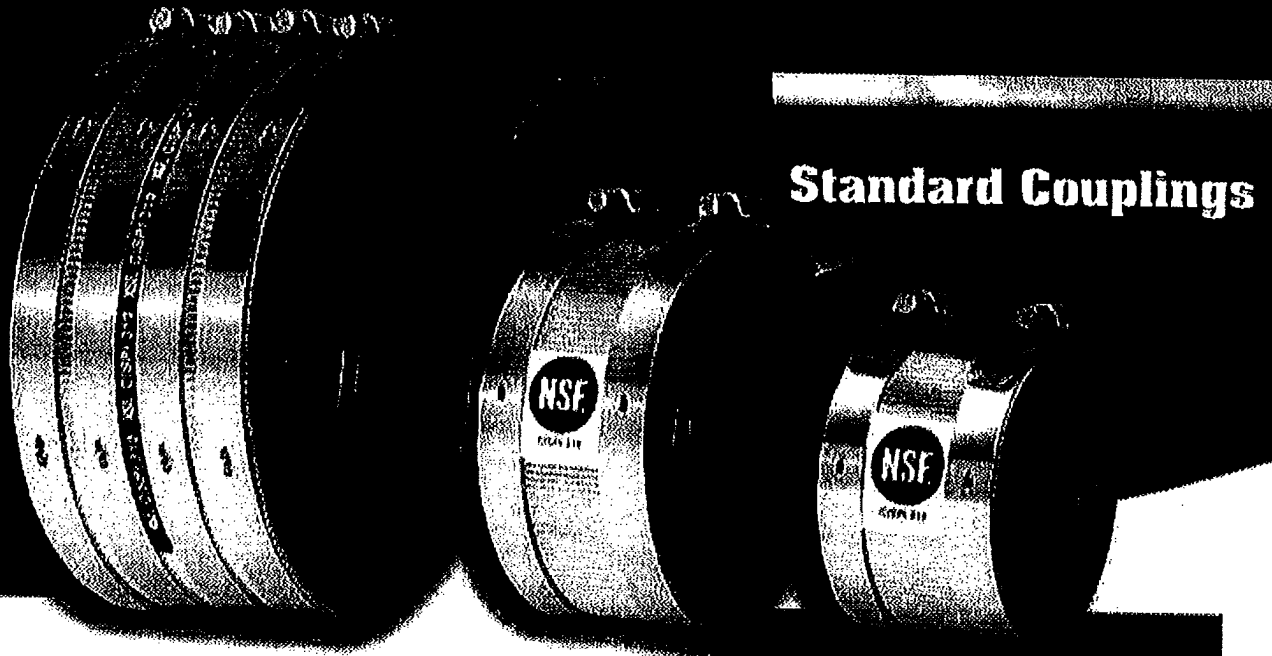


anaco®

Standing the test of time

No-Hub Coupling
Submittal

07/11rev



Standard Couplings

Project

Architect

Engineer

Contractor

Date

No-Hub Couplings

Anaco No-Hub Couplings meet CISPI 310 and are certified by NSF to the CISPI 310 standard. Couplings consist of a stainless steel shield, clamp assembly and a elastomeric gasket with the primary elastomer as neoprene.

The coupling is used to join hubless cast iron soil pipe and fittings made to conform to the CISPI 301 and/or the ASTM A 888 standard. Coupling sizes range from 1-1/2" through 15" diameters. The stainless steel shield and clamp assemblies are made from Series 300 stainless steel and are corrosion resistant.

IAPMO listed.

Material Specifications

- Clamps: Type 301 AISI stainless steel for 1-1/2" - 10", Type 304 for 12" and 15"
- Screws: Type 305 AISI stainless steel 5/16" hex head for 1-1/2" - 10", 3/8" for 12" and 15"
- Shield: Type 301 AISI stainless steel corrugated, Shield thickness 0.0075"
- Housing: Type 301 AISI stainless steel
- Gasket: Genuine neoprens as the primary elastomer

Suggested Specification

Hubless or N-Hub couplings used to join cast iron soil pipe and fittings for drain, waste, vent, and stormwater shall be manufactured to CISPI 310 and be certified by NSF. Couplings shall be installed in conformance with the manufacturer's installation instructions and local code requirements.

NSF Certified
Made in USA



Marketed by AB&I Foundry
7825 San Leandro Street
Oakland, CA 94621
800/GOT.IRON (468-4766)



Standard No-Hub Couplings

> Meets CISPI 310, ASTM C 1277,
 and ASTM C 564 Standards

> Made in USA



Gasket Test

Performance Test	Physical Tests Min. or Max. Requirements	ASTM Method
Tensile Strength	1500psi min.	D412
Elongation	250 min.	D412
Durometer (Shore A)	70 +/- 5 @ 76° +/- 5° F	D2240
Accelerated Aging	15% maximum tensile and 20% maximum elongation deterioration, 10 points maximum increase in hardness, all determinations after oven aging for 96hrs at 158°F.	D573
Compression Set	25% maximum after 22 hrs at 158°F	D395 Method B
Oil Immersion	80% maximum volume change after immersion in IRM 903 for 70hrs at 212°F.	D471
Ozone Cracking	No visible cracking at 2x magnification of the gasket after 100hrs exposure in 1.5ppm ozone concentration at 100°F. Testing and inspection to be on gasket which is loop mounted to give approximately 25% elongation of outer surface.	D1149
Tear Resistance	150lbs. minimum per inch of thickness	D624



Marketed by AB&I Foundry
 7825 San Leandro Street
 Oakland, CA 94621
 800/GOT.IRON (468-4766)

Earthwool™ Redi-Klad® 1000° Pipe Insulation

Submittal Date _____

Description

Knauf Insulation Earthwool™ Redi-Klad® 1000° Pipe Insulation is a multi-purpose, molded, heavy-density, one-piece fiber glass insulation bonded with ECOSE® Technology. Redi-Klad comes with a factory applied 5-ply weather and abuse resistant jacketing with self-sealing lap. Redi-Klad is designed for indoor or outdoor installation on mechanical piping systems with operating temperatures ranging from 0°F to 1000°F (-18°C to 538°C). Properly installed, Redi-Klad jacket provides a zero permeability rating. Earthwool Redi-Klad is produced in convenient 3' lengths with a matching 4" butt strip furnished for each 3' section. The installed product offers a finished appearance comparable to embossed aluminum.

Earthwool

Earthwool is the new benchmark that stands apart for its genuine sustainability, unsurpassed performance and consistently high product quality.

ECOSE Technology

ECOSE Technology is a revolutionary, more sustainable binder made from rapidly renewable bio-based materials, rather than non-renewable petroleum-based chemicals traditionally used in fiber glass insulation products. ECOSE Technology reduces Knauf Insulation's binder embodied energy and does not contain phenol, formaldehyde, acrylics or artificial colors.

Application

Knauf Insulation Earthwool Redi-Klad 1000° Pipe Insulation is designed for indoor and outdoor installation on industrial and commercial mechanical systems piping. Typical applications include, but are not limited to steam, condensate, process, chilled, and domestic water piping for new or retro-fit power generation, petro-chemical, pulp and paper, institutional, and educational construction projects, operating at temperatures from 0°F (-18°C) to 1000°F (538°C).

Features & Benefits

Energy Conservation

- Offers excellent resistance to heat loss or gain, which saves energy and lowers operating costs.
- A low thermal conductivity of .23 at 75°F (24°C).

Low-Cost Installation

- Available with a self-closure tape, which eliminates need for banding, screws and caulk.
- Lightweight and easy to handle.
- Low maintenance costs.
- No off-site fabrication required.
- Safe installation.
- Fast, easy installation reduces installed costs versus standard aluminum jacketing systems.

Zero Permeability

- Properly installed, Redi-Klad jacket provides a zero perm vapor barrier.

Easy Size Identification

- Pipe size, wall thickness and Proto PVC fitting cover size are printed along the longitudinal seam.
- Easy identification at job site.
- Simplifies restocking.
- During application, print is covered by the closure tape for a neat finished appearance.

Specification Compliance Fiber Glass Pipe Insulation

In U.S.:

- ASTM C 547; Type I, Type IV
- ASTM C 585
- ASTM C 795
- HH-I-558C; Form D, Type III, Class 12; Class 13 (to 1000°F, 538°C) Replaced by ASTM C 592
- MIL-I-PRF-22344E (except pH requirements)
- MIL-I-24244D
- NFPA 90A and 90B
- NRC Reg. Guide 1.36 (certification needs to be specified at time of order)

Venture Clad Jacket and Tape

In U.S.:

- MEA 447-06-M (City of New York Department of Buildings)

Technical Data—Fiber Glass Pipe Insulation

Surface Burning Characteristics

- UL Classified.
- Does not exceed 25 Flame Spread, 50 Smoke Developed when tested in accordance with ASTM E 84, CAN/ULC S102-M88, NFPA 255 and UL 723.

Temperature Range

- Pipe operating temperatures from 0°F to 1000°F (-18°C to 538°C).

Corrosiveness (ASTM C 665)

- No greater than sterile cotton.

Stress Corrosion

- Complies with ASTM C 795, MIL-I-24244D and NRC 1.36. (certification needs to be specified at time of order)

Microbial Growth (ASTM C 1338)

- Does not promote microbial growth.

Water Vapor Sorption (ASTM C 1104)

- Less than 0.2% by volume.

Linear Shrinkage (ASTM C 356)

- Negligible.

Technical Data—Venture Clad Jacket and Tape

Surface Burning Characteristics

- UL/ULC listed.
- Does not exceed 25 Flame Spread, 50 Smoke Developed when tested in accordance with UL 723.

Surface Temperature Range

- Maximum temperature continuous use 300°F (149°C).
- Application temperature -10°F to 300°F (-23°C to 149°C).

Water Vapor Permeability (ASTM E 96-05)

- Zero-perm.

Puncture Resistance (ASTM D 1000)

- 35.4 kg, 189.3 N.

Tear Strength (ASTM D 624)

- 4.3 lb., 19.4 N.

Thickness

- 14.5 mils (0.0145")

Tensile (PSTC-31)

- 68 lb./inch width, 306 N (31 kg)/25 mm

KNAUF INSULATION

its time to save energy

15082-2 F

Redi-Klad Product Forms and Sizes

Produced in 3' (914 mm) sections:

- For iron pipe from 2" to 24" nominal pipe size (51 mm to 610 mm).
- For copper tube from 2¼" to 6¼" (54 mm to 156 mm).
- Wall thicknesses from 1" to 6" (39 mm to 152 mm) in single layer (for most sizes).
- All insulation inner and outer diameters comply with ASTM C 585.

Packaging

- Four convenient carton sizes for easy ordering, inventory tracking and storage.
- Reinforced carton handles for strength and easy lifting.
- Bar-coded cartons for accurate shipments and tracking.

Precautions

Hot Pipe

- May be installed while the system is in operation, at all temperatures up to 1000°F (538°C).
- Knauf recommends, for insulation thicknesses greater than 6" (152 mm), the temperature must be increased from 500°F (260°C) to maximum temperature at a rate not exceeding 100°F (56°C) per hour.
- During initial heat-up to operating temperatures above 350°F (177°C), a slight odor and some smoke may be given off as a portion of the bonding material used in the insulation begins to undergo a controlled decomposition.
- If natural convection is not adequate in confined areas, forced ventilation should be provided in order to protect against any harmful fumes and vapors that might be generated during initial start-up.
- Care must also be taken when using sealants, solvents or flammable adhesive during installation.
- A maximum of 6" (152 mm) wall thickness is recommended.

Cold Pipe

- Redi-Klad jacket acts as a continuous vapor retarder on piping operating below ambient temperatures.
- Seal all joints, surfaces, seams and fittings to prevent condensation.
- Exposed ends of insulation shall be sealed with vapor barrier mastic installed per the mastic manufacturer's instructions. Vapor seals at the butt joint shall be applied at every fourth pipe section joint and at each fitting to isolate any water incursion.
- On chilled water systems operating in high humidity conditions, it is recommended that the same guidelines be followed as listed above for below freezing applications.
- Exterior hanger supports are recommended.

Redi-Klad

- Keep adhesive and contact surfaces free from dirt and water, and seal immediately once adhesive is exposed. Redi-Klad Pipe Insulation should be installed in dry conditions with no moisture present.
- Apply when ambient and insulation surface temperatures are between 0°F and 130°F (-18°C and 54°C).
- If stored below 0°F or above 130°F, allow insulation cartons to stand within recommended temperature range for 24 hours prior to application.

Earthwool™ Redi-Klad® 1000° Pipe Insulation

Submittal Date _____



- Do not store product below -20°F (-29°C) or above 150°F (66°C).
- When using Knauf Insulation's Redi-Klad closure system, make sure the longitudinal and circumferential joints are properly sealed by rubbing the closure firmly with a squeegee.
- When using Redi-Klad Pipe Insulation, the surface temperature of the insulation should be between -20°F and 150°F (-29°C and 66°C) during the life of the insulation.

Fittings and Hangers

- Use metal or PVC fitting covers. For below ambient piping systems, caution should be taken to prevent punctures, tears, or rips in Redi-Klad vapor barrier. Additionally, all fitting insulation surfaces must have independent, field applied vapor barriers. Prior to installing fitting insulation, all exposed ends of pipe insulation sections must be vapor sealed.
- Fittings should be insulated to same thickness as the adjoining insulation.
- Apply fittings per manufacturer's instructions.
- When required by specification, a hard insert of sufficient length should be used to avoid compression of the insulation.

Additional Precautions

- Fiber glass may cause temporary skin irritation. Wear long-sleeved, loose-fitting clothing, head covering, gloves and eye protection when handling and applying material.
- Wash with soap and warm water after handling.
- Wash work clothes separately and rinse washer.

- Use a disposable mask/respirator designed for nuisance-type dusts where sensitivity to dust and airborne particles may cause irritation to the nose or throat.

Application Guidelines

Storage

- Protect insulation from water damage or other abuse, welding sparks and open flame.
- Cartons are not designed for outside storage.

Preparation

- Apply only on clean, dry surfaces.
- Pipe or vessel should be tested and released before insulation is applied.

General Guidelines

- All sections should be firmly butted.
- Seal circumferential joint with a minimum 4" (102 mm) wide butt strip.
- All piping should have continuous insulation.
- Position longitudinal lap at top to minimize dirt and moisture accumulation.
- Do not expose pipe insulation to excessive vibration or physical abuse.
- Insulation thickness must be adequate to assure 300°F (149°C) exterior surface temperature maximum.

Recommended Thicknesses

ASHRAE 90.1-2007

The minimum thicknesses are based on ASHRAE 90.1-2007 standards and do not necessarily represent the Economic Thickness of insulation or the thickness

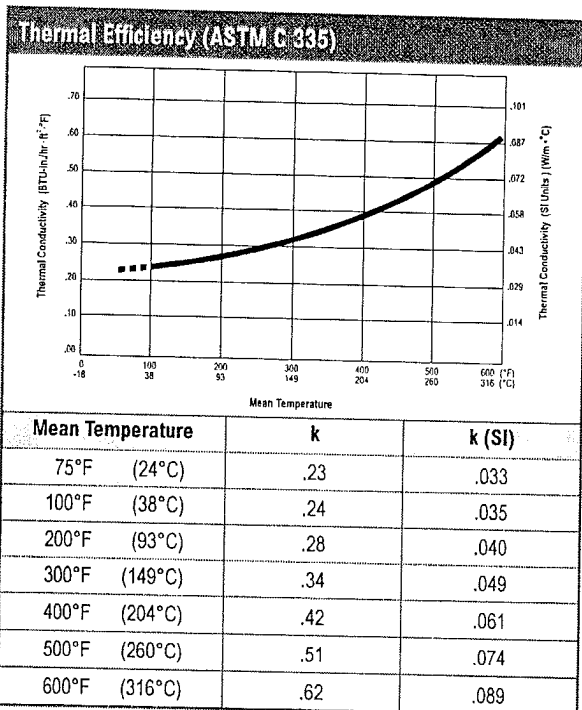
required for proper condensation control. Rather, they serve as minimum recommendations for commercial applications. For recommended Economic Thickness, install according to Knauf Insulation or NAIMA 3E Plus programs or as specified.

Fiber Glass and Mold

Fiber glass insulation will not sustain mold growth. However, mold can grow on almost any material when it becomes wet and contaminated with organic materials. Carefully inspect any insulation that has been exposed to water. If it shows any sign of mold it must be discarded. If the material is wet but shows no evidence of mold, it should be dried rapidly and thoroughly. If it shows signs of facing degradation from wetting, it should be replaced.

Notes

The chemical and physical properties of Knauf Insulation Earthwool Redi-Klad 1000° Pipe Insulation represent typical average values determined in accordance with accepted test methods. The data is subject to normal manufacturing variations. The data is supplied as a technical service and is subject to change without notice. References to numerical flame spread ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions. Check with your Knauf Insulation sales representative to assure information is current.



Childers®

Mastics, Coatings, Adhesives, Sealants

VI-CRYL®

CP-10 (Trowel Grade)

CP-11 (Spray/Brush)

Weather Barrier Coatings

DURABLE WATER BASED VINYL-ACRYLIC MASTIC COATING FOR THERMAL INSULATIONS

DESCRIPTION

VI-CRYL® CP-10/11 weather barrier coating is a tough, durable, and fire-resistive water based mastic for most types of thermal insulation and finishing and insulating cements. It is very thixotropic - it looks heavy but spreads easily. It is available in a variety of standard and special fade-resistant colors. It is outdoor rated and U.V. resistant.

USES

VI-CRYL CP-10/11 weather barrier coating is unsurpassed for the mechanical protection and weatherproofing of thermal insulations both outdoors and indoors, in hot, cold, and dual-temperature service. However, since it is a 'breathing' coating (vapors under pressure will pass through it) it should only be used over insulations in low-temperature, or dual-temperature service when the insulations themselves are vapor barriers. VI-CRYL CP-10/11 has also found use throughout the thermal insulation industry as a coating used over closed cell polyethylene and polyurethane foam insulations. Industry experience has demonstrated that all weather barrier coatings may blister when applied over polystyrene board. This effect may be limited by the use of white colored coatings. VI-CRYL CP-10/11 weather barrier coating in its Metallic Gray color is the ideal companion product to Aluminum and Stainless Steel Jacketing.

APPLICATION

VI-CRYL CP-10/11 weather barrier coating is easy to apply by Trowel, Brush or Heavy-Duty Airless Spray. Its thixotropic consistency yields a smooth, attractive finish even over rough substrates; it readily fills gaps and imperfections. VI-CRYL CP-10/11 coating should be applied with glass fiber reinforcing mesh.

ADVANTAGES

- In the wet state, VI-CRYL CP-10/11 weather barrier coatings is non-flammable. It contains no solvents that will attack insulations or facings.
- The cured film is tough, flexible, and resists most common chemicals and many solvents.
- It is fire-resistive: its flame spread index being within the range of acceptance of government and industrial agencies.

CERTIFIED

- Meets NFPA Standard 90-A and 90-B 25/50 requirements.
- Qualifies under Coast Guard Specification 164.012.
- This product has been tested according to ASTM E-84 (Surface Burning Characteristics of Building Materials).
- Meets requirements for LEED IEQ 4.1 Low-Emitting Materials, Paints and Coatings. VOC: 45 g/l, less water and exempt solvents.

CP-10/11 contains no asbestos, lead, mercury, or mercury compounds. See other side for specification and application information. Visit us on the web at www.fosterproducts.com

COLORS

	TROWEL	SPRAY/BRUSH
White	10	11
Metallic Gray	10-1	11-1
Black	10-2	11-2

(Other colors are available on special order)

WET WEIGHT

11.4 lbs./U.S. gal. (1.37 kg/liter)

AVERAGE NON-VOLATILE

60% to 64% by volume (64% by weight)

SERVICE TEMPERATURE RANGE

(Temperature to which dry coating is subjected.)
-40°F to 180°F
(-40°C to 83°C)

APPLICATION TEMPERATURE RANGE

40°F to 100°F
(4°C to 38°C)

DRYING TIME

Touch - 2-4 hours
Through - 24-36 hours
(Drying time will vary depending upon film thickness, temperature and humidity.)

COVERAGE

6 U.S. gal./100 sq. ft. (2.4 l/sq.m)
(Varies with substrate and membrane.)

CLEAN-UP

Warm, soapy water (wet) xylol (dry)

WATER VAPOR PERMEANCE ASTM E-96

Greater than 1.0 perm for 1/16 inch (0.16cm) dry film. (Procedure B)



GENERAL PURPOSE COATING SURFACE BURNING CHARACTERISTICS

Applied to 1/4" Inorganic Reinforced Cement Board

Flame Spread:	10
Smoke Developed:	40
Rate per Coat (Sq.ft/gallon):	16.7
Number of Coats	1
Flash point of liquid coating (closed cup):	No flash to boiling
	282U



Specialty Construction Brands, Inc.

Customer Service
800-231-9541

1105 South Frontenac Street
Aurora, IL 60504

Fax
800-942-6856

Suggested Specifications

VI-CRYL® CP-10 CP-11

MASTIC FINISH over insulation shall be VI-CRYL CP-10/11 weather barrier coating. It shall be applied in two coats. A tack coat is to be applied at a rate of two gallons per 100 sq. ft. (.81 l/sq. m.). While the tack coat is still wet, a layer of CHIL-GLAS #10 open weave glass fiber reinforcing mesh shall be embedded with all fabric seams overlapped a minimum of 2" (5.08cm). A finish coat at a coverage of four gallons per 100 sq. ft. (1.6 l/sq. m) shall be applied, fully covering the glass fiber reinforcing mesh, so that the minimum dry film thickness is 1/16" (.063") (.16 cm). There shall be no voids or holidays and the mastic shall be trowelled, sprayed or wet-brushed to a smooth even finish.

All adjoining insulated or un-insulated surfaces must be completely waterproofed and flashed. To effectively seal those locations where the VI-CRYL CP-10/11 coating meets adjoining insulated or uninsulated surfaces, or dissimilar weather proofing materials, CP-76 sealant shall be applied as the sealing/flashing material. CP-76 shall be trowelled at 1/8" thickness a minimum of 1" in both directions back onto and over the complete joint interface of the VI-CRYL CP-10/11 coating and the adjoining surface. CHIL-GLAS #10 glass fiber reinforcing mesh is recommended to provide thickness control and strength at the joint interface.

NOTES TO SPECIFYING ENGINEER

1. Synthetic fabrics may be substituted for #10 open weave glass cloth without affecting the application.
2. If Chicken Wire, Hardware Cloth, or other metal reinforcements are to be used in lieu of fabric membranes, contact your representative for suggested procedures.
3. The above specification is for weather proofing and protection of insulation in HOT SERVICE: or for COLD or DUAL TEMPERATURE SERVICE where the insulation and/or the insulation system forms an adequate vapor barrier prior to the application of the VI-CRYL CP-10/11 coating.

Application Guide and Suggested Procedures

1. USE OF MATERIAL

VI-CRYL CP-10/11 weather barrier coating looks much heavier than it is. It is thixotropic. DO NOT THIN. Protect from freezing until dry. Keep stored over long periods of time in a heated area. For spray application VI-CRYL CP-10/11 coating must be kept at a minimum of 50°F (10°C) just prior to spraying to achieve optimum results.

2. THE CONDITION OF THE INSULATION TO BE COATED

VI-CRYL CP-10/11 is a "breathing coating", which means that it will allow reasonable amounts of water (in the form of vapor - a gas) to pass through it in a reasonable period of time. However, excessively wet insulation on equipment operating at elevated temperatures will cause excessive water vapor pressure, and therefore blistering of the finish. Make certain the insulation is dry prior to the application of any coating. **To obtain proper bonding, dusty surfaces shall first be primed with Chil-Seal CP-50A MV1 diluted 50% with water.**

When applying VI-CRYL CP-10/11 coating over hygroscopic alkaline cements, first prime the surface of the cement with Chil-Seal CP-50A MV1 diluted 50% with water and allow to dry completely before applying the finish coat.

The presence of moisture in systems operating in Cold Service can completely destroy the effectiveness of not only the finish, but the entire insulation system. They **MUST BE DRY.**

All exterior horizontal surfaces must be sloped at least 1/2 inch per foot (4cm/m) to prevent ponding water.

3. HAND APPLICATION

Large flat areas are best covered by application with trowel or stiff brush. Smaller, irregular surfaces such as fittings are more readily covered by brushing. Airless spray may also be used.

4. SPRAY APPLICATION

VI-CRYL CP-11 coating may be sprayed with many types of equipment, including airless spray. It may also be sprayed with conventional Mastic spray equipment using an external atomizing spray gun. Many manufacturers of spray equipment can make detailed recommendations for any number of types of equipment. The spray equipment and techniques would be similar to those used for applying block fillers. For best results, we suggest the following airless spray equipment.

PUMP	Graco Bulldog Hydramastic, 40:1 ratio (model 204-925) air regulator with inductor plate (207-039).
COMPRESSOR	Capable of 75 CFM and maintaining 100 PSIG.
FLUID HOSE	High pressure capable of 4,000 PSI One inch up to 150 feet. 3/4 inch after the first 150 feet. Use 8' (2.4 m) 1/2" I.D. hose for coupling to the gun.
GUN	Graco Hydra-Mastic #207-300 with Reverse-A-Clean 205-614.
TIP SIZES	635 to 655.

5. DRYING AND RECOATING

A finish coat of VI-CRYL CP-10/11 weather barrier coating should be applied immediately after the tack coat and membrane application for maximum bond.

CUSTOMER SERVICE: 800-231-9541

IMPORTANT: Specialty Construction Brands, Inc. warrants that each of its products will be manufactured in accordance with the specifications in effect on the date of manufacture. WE MAKE NO OTHER WARRANTIES AND EXPRESSLY DISCLAIM ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. If a product fails to meet this limited warranty, purchaser's sole and exclusive remedy is replacement of the product or, at our option, refund of the purchase price. OUR ACCEPTANCE OF ANY ORDERS FOR THE PRODUCT IS EXPRESSLY CONDITIONAL UPON PURCHASER'S ASSENT TO THE TERMS ON THE APPLICABLE INVOICE.

ADEQUATE TESTS: The information contained herein we believe is correct to the best of our knowledge and tests. The recommendations and suggestions herein are made without guarantee or representation as to results. We recommend that adequate tests be performed by you to determine if this product meets all of your requirements. The warranted shelf life of our products is six months from date of shipment to the original purchaser.

**For professional use only. Keep out of reach of children.
Consult Material Safety Data Sheet and container label for further information.**

PROTO FITTING COVERS

25/50 RATED
PER ASTM E-84 — LoSMOKE® PVC

SUBMITTAL SHEET

Effective: 05/01/07

Submitted Date: _____

PVC FITTING COVERS, PRE-MOLDED, INSULATED
WHITE GLOSS FINISH — INDOOR OUTDOOR GRADE

DESCRIPTION

The Proto Fitting Cover System consists of one piece and two piece pre-molded high impact LoSMOKE® PVC fitting covers with fiberglass inserts and accessories, which include elbows, tee/valves, end caps, mechanical line couplings, specialty fittings, white and indoor color jacketing, Protop® Tank End Panels, tack fasteners, tapes and specialty items.

APPLICATIONS

The Proto Fitting Cover System is used to insulate mechanical piping systems at fitting locations and provide a PVC jacketing for straight run piping. Both give a quality appearance and have excellent durability.

FEATURES AND BENEFITS

25/50 Rated. All Proto PVC Fittings are made of LoSMOKE® grade PVC. Roll Jacketing is available in either 25/50 rated or regular PVC Grade (not 25/50 rated). The 25/50 products meet fire and smoke safety requirements of federal, state and local building codes.

Excellent Appearance. Bright high-gloss white coloring adds a distinct quality appearance to the system. The standard line of Proto Fitting Covers are made in LoSMOKE® PVC designed for indoor and outdoor use. Virtually all sizes pass 25/50 when made of LoSMOKE® PVC. Colored PVC is manufactured from a LoSMOKE® formula that is suitable for indoor use only.

Easy To Clean. Due to the smooth, high gloss finish on Proto PVC Fittings, the product cleans easily with soap and water. This makes the system ideal for food and drug facilities.

Low Cost Installation. Significant cost savings vs. conventional cement, molded sections, and mitered sections.

Fast and Easy. At fitting locations, wrap the fiberglass insert around the pipe fitting, apply the Proto PVC Fitting over the insert and tack or tape in place. Do not use tacks where a vapor retarder is applied.

Wide Temperature Range. May be used for mechanical piping systems operating from -20°F to +140°F surface temperature of insulation. Variety: LoSMOKE®, Indoor/Outdoor, Exod®, Exotuff®. Proto products are also available in LoSMOKE® Indoor colors. Exod® is CPVC, GOOD TO 225° F.

Long Lasting. Can be used more than once on retrofit projects, general maintenance.

Excellent Thermal Value. K value of .26 at 75°F (.037 W/m °C at 24°C) of fiberglass insert, mean temperature assures better thermal efficiency than conventional cement fittings.

Resistance To Fungi and Bacteria. (ASTM G 21, ASTM G 22) Does not promote growth of fungi or bacteria.

U.V. Resistant. Can be used on indoor or outdoor applications, for both (White) LoSMOKE® PVC and Regular PVC. Extra thick fitting covers should be used outdoors. (All Std. Proto Fitting covers are made of LoSMOKE® PVC.)

TECHNICAL PHYSICAL PROPERTIES OF PVC LoSMOKE® MATERIALS

Specific Gravity (ASTM D-792)1.41
Tensile Modulus, PSI (ASTM D-638)361,000 (25,380 kg/cm²)
Tensile Strength, PSI (ASTM D-638)6,011

PROTO REGULAR PVC LoSMOKE® PVC JACKETING

PROTO CORP.

10500 47th Street North
Clearwater, FL 33762-5017
Tel: (727) 573-4665
Fax: (727) 572-6823
Toll Free (800) 875-7768

SUBMITTAL SHEET DOES NOT SUPERCEDE WRITTEN
SPECIFICATIONS OR OWNER AGREEMENT.

Flexural Strength, PSI (ASTM D-790)9,396
Izod Impact (1/4") ft. lb./in (ASTM D-256)3.7
Heat Deflection Temp. (ASTM D-648)157°F (70°C)
at 264 PSI (8.95 kg/cm²), °F
VICAT Softening Temp. (ASTM D-1525)198°F (92°C)

Water Vapor Transmission
ASTM E 96-95

70°F & 50% Relative Humidity

.015" thick = .058

.020" thick = .047

.030" thick = .027

Surface Burning Characteristics of All Fitting Covers and Jacketing
LoSMOKE® PVCpasses 25/50 ASTM-E 84
Up to .035" Thk.

Puncture Resistance (ASTM D 781) .. .006" thick = 178 Beach Units
.015" thick = 221 Beach Units

FEDERAL SPECIFICATIONS COMPLIANCE— POLY VINYL CHLORIDE — ASTM 1784-92

LP-1035A Type II Grade GU and Type III

LP-535E Type II Grade GU and Type III

United States Department of Agriculture Authorized
Agriculture Canada Authorized

New York City MEA 243-84-M, Chicago, Los Angeles ASTM
C-585-76 (sizes)

Canada CAN/CGSB - 51.53-95

TECHNICAL PROPERTIES OF FIBERGLASS INSERT MATERIAL

Thermal Conductivity (ASTM C 177)

Mean Temperature — °F	"k" — BTU in./hr. Ft.2 °F
HH-I-558 Form B 75° 1(24°C)	.26 (.037 W/m. °C)
Type 1 Class B 150° 1(66°C)	.33 (.048 W/m. °C)
250° (121°C)	.44 (.063 W/m. °C)

APPLICATION AND SPECIFICATION GUIDELINES

A. STORAGE

Protect cartons from water damage or other abuse. Proto Fitting Cover cartons are not designed for outside storage.

B. PREPARATION

Proto Fitting Covers should be applied on clean, dry surfaces.

C. APPLICATION

1. **General:** The matching fiberglass insert shall be wrapped completely around the metal fitting leaving no voids. Loose wrappings of twine is helpful in shaping difficult surfaces. The Proto Fitting Cover shall then be applied over the fitting and insert, and the throat secured by either tack fastening or taping.

2. **Cold Pipe:** Fitting systems below ambient temperature must have a continuous vapor retarder or vapor retardant mastic as specified by the engineer. When using Proto PVC Tape, a 2" (51mm) minimum downward overlap is recommended for optimum performance. Care should be taken not to stretch the last 2" (51mm) of Proto PVC Tape, to avoid stretching or creeping.

3. **Hot Pipe:** Insulate as per General Instructions given above. Due to PVC softening point at approximately 159°F (70.6°C), care should be taken to ensure sufficient insulation thicknesses are applied.

For hot piping which requires Pipe Insulation over 1 1/2" (38 mm) wall thickness, an extra fiberglass insert shall be applied for each additional inch of pipe insulation wall thickness. Proto recommends the surface temperature of the Pipe Insulation and PVC to be no higher than 125°F (52°C). To complete application of Proto PVC Fittings on hot piping, the throat seam shall be tack fastened or taped. Seal all laps outdoors and in wash down areas.

CAUTION: During initial heat-up to operating temperatures above 350°F (177°C) an acrid odor and some smoke may be given off as a portion of the bonding material used in the insulation begins to undergo a controlled decomposition. If natural convection is not adequate in confined areas, forced ventilation should be provided in order to protect against any harmful fumes and vapors that might be generated.

4. **Outdoor Pipe:** Insulate as per above instructions.

Minimum Proto PVC Jacketing thickness for outdoor applications should be .030" (.7 mm). Over 15" O.D., .040 is recommended. Under 3 1/8" O.D., .020 is permitted. The PVC Jacketing shall be overlapped a minimum of 2" (51 mm) on the down side so as to shed water. All long and round joints shall be completely weather sealed with caulk adhesive.

On all piping, insulation shall be of sufficient thickness to keep the surface temperature below 125°F (52°C). Additionally, a slip type expansion joint of 8" (202 mm) minimum width shall be applied at least every 25 lineal feet (6.1 lineal meters) and between fittings.

Painting: Painting must be done only after priming the PVC surface with a suitable primer, such as X-1-M 400W Primer, or a similar, approved product.

Outdoor Painting: Only over White Exotuff® 195°F deflection temp. (modified PVC) or EXOD™ 225°F deflection temp. CPVC after X-1-M primer, or a similar, approved product. Use PVC compatible paints without strong solvents. Test paint a section before proceeding.

5. **CAUTION:** Fiberglass may cause temporary skin irritation. Wear long-sleeved, loose-fitting clothing, head covering, gloves and eye protection when handling and applying material. Wash with soap and warm water after handling. Wash work clothes separately and rinse washer. A disposable mask designed for nuisance type dusts should be used where sensitivity to dust and airborne particles may cause irritation to the nose or throat.

D. HEAVY INDUSTRIAL APPLICATIONS OUTDOORS

Use .030" or higher PVC Jacketing. Use "heavy duty" two piece fitting covers made from minimum .030" thick to .050" thick PVC sheet depending on size of fitting cover. Jacketing to be cut and oven precured

E. FIRE TEST RESULTS: PROTO LoSMOKE® — PVC

USA: E-84 25/50 Rated up to .035" thick (The Best Rated PVC)

CANADA: Conforms to CAN 4-S102.2

LoSMOKE® fitting covers conform to virtually all city, state and federal codes, for use in hotel, commercial and industrial buildings.

LoSMOKE® fitting covers will be labeled on the box "Passes ASTM E-84." Flame spread 25; smoke developed 50".

All E-84 ratings shown here were tested on flat sheets from which fitting covers are made.

Virtually all Proto LoSMOKE® fitting covers will pass E-84 25/50 flame spread and smoke development rating requirements.

SUGGESTIONS

Slide Joints: Do not apply PVC Jacketing too tightly. Slide joints plus PVC thickness must work together to prevent cracks and puckering.

Caulk/Adhesives:

Use: Celulon® (Red Devil Inc.) water base "Ultra Clear".
Service temp. -25°F to +175°F

PVC Cement: Avoid use if possible. Heavy application can cause puckering and cracks. Learn how to use it sparingly.

Vapor Retarder: A vapor retarder is required under all fitting covers for systems operating below ambient temperatures, such as chilled water lines, and is recommended for all outdoor applications. The fitting vapor retarder should provide a continuous seal with the adjacent pipe vapor retarder.

Outdoor Fitting Covers: Use extra thick, plastic heavy duty covers.

Outdoor and Indoor Washdown Areas: Use EXOD™ (CPVC) by Proto, for its higher deflection temperature (225°F). It is light grey.

PVC Outdoor Thickness (Reg. PVC Jacketing): Use .030" thick cut and oven precured jacketing. Use "heavy duty" plastic fitting covers formed from minimum .030" to .050" thick PVC sheet depending on size of fitting cover. On pipe insulation larger than 15" O.D. use .040" thick PVC.

PVC Indoor Thickness: Use white or indoor color LoSMOKE® on piping. Use .020" thick with standard one piece fitting cover, .030" jacketing can also be used.

Vessels and Tank Tops: Use .050" or .060" thick tank panels for outdoor applications and .030" or .040" for indoor tanks. Use .050" thick Prototop® segments for tank heads. (Only Proto Corp. has them.) Made of LoSMOKE® PVC.

Pipe Insulation End Caps: Use on all outdoor, indoor washdown areas, and all vapor sealed systems. End caps will be PVC, metal, or gasket materials appropriate for the metal pipe temperatures. Silicone rubber (500°F) can be applied (min. 1/16" thick) as an end cap outdoors.

Indoor hot piping need not be sealed to the end cap. Cap will be sealed or taped to the jacket.

Two-Ply Waterproofing System: Use .010" thick PVC with self-sealing long lap tape, as the first waterproof layer. Overlap ends 3" and PVC tape over. Caulk all openings with Celulon® or similar, approved product. The finished jacketing material should employ staggered joints with at least a .010 mil thick first layer. Recaulk again over last layer. Install slide joints every 25'; caulk shut all other seams, openings, or end overlaps with PVC tape or caulk. Use vapor seal jacketing (instead of .010" thick PVC first layer) where a vapor seal system is required.

CPVC-High Chemical Resistance and High Deflection Temperature:

Use "Exod™" CPVC jacketing and fitting covers for 225°F deflection temperature and maximum chemical resistance. Offered only by Proto Corp. as a substitute for stainless steel.

Regular PVC Jacketing Outdoors: Use regular PVC jacketing outdoors. It is less expensive, does the same job as LoSMOKE® PVC. Regular PVC has very good fire (self-extinguishing) properties — not as good as the LoSMOKE® PVC used in confined people areas (buildings), however much better than common plastics used outdoors.

Vessels with ends 24" O.D. or larger: Use .040" thick jacketing up to 48" O.D. On sides of vessels larger than 48" O.D. See Prototop® brochure for instructions requiring a suspended band system, to hang panels from, (Gerrard & Company or equal). Use thick PVC panels on Outdoor Tanks not PVC Roll Jacketing. See Tank Tops above for end segments.

PROTO **PVC**
CORP™

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The physical and chemical properties of Proto Corp. PVC represent typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Numerical flame spread rating is not intended to reflect hazards presented by this or any other materials under actual fire conditions. Check with Proto Corp. office to assure current information. Purchaser will be responsible to determine suitability of this product for purchaser's use. Proto Corp. liability will be limited to the purchase price of the material. No person is authorized to alter this without a Proto Corp. officer's written approval.