



ICC Evaluation Service, Inc.
www.icc-es.org

Business/Regional Office ■ 5360 Workman Mill Road, Whittier, California 90601 ■ (562) 699-0543
Regional Office ■ 900 Montclair Road, Suite A, Birmingham, Alabama 35213 ■ (205) 599-9800
Regional Office ■ 4051 West Flossmoor Road, Country Club Hills, Illinois 60478 ■ (708) 799-2305

The Subcommittee on Evaluation has reviewed the data submitted for compliance with the Standard Building Code®, the Standard Mechanical Code®, the Standard Plumbing Code®, the Standard Fire Prevention Code®, the International Plumbing Code®, and the International Mechanical Code® and submits to the Building Official or other authority having jurisdiction the following report. The Subcommittee on Evaluation, and ICC-ES and its staff are not responsible for any errors or omissions to any documents, calculations, drawings, specifications, tests or summaries prepared and submitted by the design professional or preparer of record that are listed in the Substantiating Data Section of this report. Portions of this report were previously included in Evaluation Reports #94111, #94112, #9555A, #9709, and #2037.

REPORT NO.: 2037A

EXPIRES: See the current EVALUATION REPORT INDEX

CATEGORY: PLUMBING MATERIALS AND SYSTEMS

SUBMITTED BY:

MUELLER GROUP R&D
20 THURBER BLVD.
SMITHFIELD, RHODE ISLAND 02917
401-349-3020
www.anvilintl.com

1. PRODUCT TRADE NAME

- 1.1 Gruvlok® Systems:
1.1.1 Gruvlok Grooved End Couplings
1.1.2 Grooved End Fittings
1.1.3 Branch Outlet System
1.1.4 Plain End Fittings
1.1.5 Butterfly Valves
1.2 Gruvlok® Copper Method:
1.2.1 Gruvlok Figure 7400 Rigidlite Couplings
1.2.2 Gruvlok Figure 7012 Flange
1.2.3 Gruvlok Grooved End Copper Fittings

LICENSEE

Anvil International, Inc.
110 Corporate Drive
Suite 10
Portsmouth, New Hampshire 03801

2. SCOPE OF EVALUATION

Joint and sealer system for piping systems

3. USES

Gruvlok Systems and Gruvlok® Copper Method are used to join pipes in fire protection, plumbing, and mechanical piping systems.

4. DESCRIPTION

4.1 General - Gruvlok® Systems for Steel Pipe consists of couplings, fittings, branch outlets, plain end fittings, and butterfly valves used with the following grooved end steel piping systems:

- Fire protection systems, automatic sprinklers, and standpipe systems.
• Plumbing systems of drain, waste, and vent (DWV), and storm water piping systems.
• Mechanical systems of chilled water, hot water, condenser water, and liquid fuel piping systems.

4.2 General - Gruvlok® Copper Method consists of grooved end tube couplings, flanges, and fittings in 2 through 6 inch sizes. The products are used on copper tubing grooved in accordance with Gruvlok® Copper-Prep grooving specifications. The specification is a method of increasing the outside diameter of copper tube to the same dimension of equivalent steel pipe and at the same time forming a groove in the tube end.

The components are used in the following grooved end piping systems:

- Fire protection systems wet and dry, automatic sprinkler, and standpipe systems.
• Plumbing systems of drain, waste and vent (DWV), building sewer, and storm water piping systems.
• Mechanical systems of chilled water, hot water, condenser water, compressed air, vacuum and liquid fuel piping systems.
• Plumbing systems of potable (domestic) water supply and distribution piping systems.

4.3 Gruvlok Grooved End Couplings - Gruvlok® Systems for Steel Pipe

Gruvlok Couplings for grooved end pipe are available in various nominal pipe sizes and designs providing a means of connection for pipe, pipe fittings, and other pipe system components. The housing of the coupling is ductile iron conforming to ASTM A 536, Grade 65-45-12. Bolts are heat treated, zinc electroplated, carbon steel oval-neck track bolts conforming to ASTM A 183, and the nuts are zinc electroplated carbon steel heavy hex nuts conforming to ASTM A 563 (standard).

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These couplings are malleable and ductile iron housings with rubber gaskets and steel track bolts. They are used in fire protection piping systems, and plumbing and mechanical systems consisting of ASTM A 53, A 135, A 795, or ANSI/ASME B 36.10M steel pipe. The gasket types must be compatible with the fluid being transported.

Figure 7000 Light Weight Coupling: Flexible rubber gasketed couplings are intended for joining cut-groove and roll-groove Schedule 40 steel pipe, roll-groove lightweight steel pipe, and roll-groove Super 40, XL, SuperFlo, Dyna-Flow, and Schedule 5 pipe.

Fig.	Intended Pipe	Sizes (in.)	PSIG
7000	Sch. 40, Cut Groove	1 thru 4	500
7000	Sch. 40, Cut Groove	5 thru 8	450
7000	Sch. 40, Roll Groove	1 thru 4	500
7000	Sch. 40, Roll Groove	5 thru 8	450
7000	Sch. 10, Roll Groove	1 thru 4	500
7000	Sch. 10, Roll Groove	5 thru 6	450
7000	0.188 Wall, Roll Groove	8	450
7000	Super 40, Roll	1 thru 2	300
7000	XL, Roll Groove	1 thru 3	300
7000	SF, DF, Roll Groove*	1 thru 2	175
7000	SF, DF, Roll Groove*	2-1/2, 3, 4	300
7000	Sch. 5, Roll Groove	1 thru 1-1/2	175

Figure 7001 Standard Weight Coupling: Flexible rubber gasketed couplings are intended for joining cut-groove and roll-groove Schedule 40 steel pipe, roll-groove lightweight steel pipe, and roll-groove Super 40, XL.

Fig.	Intended Pipe	Sizes (in.)	PSIG
7001	Sch. 40, Cut Groove	1 thru 12	500
7001	Sch. 30, Cut Groove	14 thru 24	500
7001	Sch. 40, Roll Groove	1 thru 12	500
7001	Sch. 10, Roll Groove	1 thru 6	500
7001	0.188 Wall, Roll Groove	8	400
7001	0.188 Wall, Roll Groove	10	450
7001	0.250 Wall, Roll Groove	12	500
7001	Super 40 & XL, Roll	1 Thru 3	300

Figure 7003 Hinglok Coupling: Hinged rubber-gasketed fittings are intended for quick connections and/or disconnections of cut-groove and roll-groove Schedule 40 steel pipe and roll-groove lightweight steel pipe. The two coupling halves are hinged for ease of handling.

Fig.	Intended Pipe	Sizes (in.)	PSIG
7003	Sch. 40, Cut Groove	1-1/2 thru 4	300
7003	Sch. 40, Roll Groove	1-1/2 thru 4	300
7003	Sch. 10, Roll Groove	1-1/2 thru 4	300

Figure 7004 HPR Rigid Coupling: Designed to provide a more rigid joint than lightweight couplings. These couplings shall not be used to provide flex joints in systems subjected to earthquake forces.

Fig.	Intended Pipe	Sizes (in.)	PSIG
7004	Sch. 40, Cut Groove	2 thru 8	750
7004	Sch. 40, Roll Groove	2 thru 8	750
7004	Sch. 10, Roll Groove	2 thru 6	300
7004	0.188 Wall, Roll Groove	8	300
7004	Super 40 & XL, Roll	2 thru 3	300

Figure 7005 Roughneck Coupling: Rubber-gasketed fittings are intended for joining plain end or beveled end Schedule 40 and lightweight steel pipe.

Fig.	Intended Pipe	Sizes (in.)	PSIG
7005	Sch. 40	2 thru 5	500
7005	Sch. 40	6,8	400
7005	Sch. 10	2 thru 3	500
7005	Sch. 10	4,5	400
7005	Sch. 10	6	300
7005	0.188 Wall	8	300

Figure 7010 Reducing Coupling: Flexible coupling used to connect two different pipe sizes.

Fig.	Intended Pipe	Sizes (in.)	PSIG
7010	Sch. 40, Cut Groove	2x1-1/2	400
7010	Sch. 40, Cut Groove	2-1/2x2	400
7010	Sch. 40, Cut Groove	3x2,2-1/2	400
7010	Sch. 40, Cut Groove	4x2,2-1/2,3	400
7010	Sch. 40, Cut Groove	5x4	400
7010	Sch. 40, Cut Groove	6x4,5	400
7010	Sch. 30, Cut Groove	8x6	400
7010	Sch. 40, Roll Groove	2x1-1/2	400
7010	Sch. 40, Roll Groove	2-1/2x2	400
7010	Sch. 40, Roll Groove	3x2,2-1/2	400
7010	Sch. 40, Roll Groove	4x2,3	400
7010	Sch. 40, Roll Groove	5x4	400
7010	Sch. 40, Roll Groove	6x4,5	400
7010	Sch. 30, Roll Groove	8x6	400
7010	Sch. 10, Roll Groove	2x1-1/2	350
7010	Sch. 10, Roll Groove	2-1/2x1	350
7010	Sch. 10, Roll Groove	3x2,2-1/2	350
7010	Sch. 10, Roll Groove	4x2,2-1/2,3	350
7010	Sch. 10, Roll Groove	5x4	350
7010	Sch. 10, Roll Groove	6x4,5	350
7010	0.188 Wall, Roll Groove	8x6	350
7010	Super 40 & XL, Roll	2x1-1/2	300
7010	Super 40 & XL, Roll	2-1/2x2	300
7010	Super 40 & XL, Roll	3x2,2-1/2	300

Figure 7012 Flange: Allows direct connection of Class 125 or Class 150 flange components to a grooved piping systems.

Fig.	Intended Pipe	Sizes (in.)	PSIG
7012	Sch. 40, Cut Groove	2 thru 10	300
7012	Sch. 30, Cut Groove	12	300
7012	Sch. 40, Roll Groove	2 thru 10	300
7012	Sch. 30, Roll Groove	12	300
7012	Sch. 10, Roll Groove	2 thru 6	300
7012	0.188 Wall, Roll Groove	8,10	300
7012	0.219 Wall, Roll Groove	12	300
7012	Super 40 & XL, Roll	2,2-1/2,3	300
7012	SuperFlo, Roll Groove	2 thru 4	300
7012	Dyna-Flow, Roll Groove	2	175
7012	Dyna-Flow, Roll Groove	2-1/2,3,4	300
7012	Sch. 5, Roll Groove	2	175

Figure 7400 Rigidlite Coupling: Coupling designed to provide a lightweight, rigid, lock-in pipe connection where rigidity is designed-in. The designed-in actions prevent movement and produce a secure, lightweight rigid pipe joint connection. These couplings shall not be used for flex joints subjected to earthquake forces.

Fig.	Intended Pipe	Sizes (in.)	PSIG				
7400	Sch. 40, Cut Groove	1,1-1/4,1-1/2, 2,2-1/2,3,4,5,6,8	175			8x8x2,3,4,5,6 10x10x2,3,4,5,6,8 12x12x3,4,5,6,8,10	
7400	Sch. 40, Roll Groove	1,1-1/4,1-1/2, 2,2-1/2,3,4,5,6,8	175	7062	Bull Head Tee	5x5x8 6x6x8	500
7400	Sch. 10, Cut Groove	1,1-1/4,1-1/2, 2,2-1/2,3,4,5,6	175	7063	Tee w/Threaded Branch	1 thru 12	500
7400	Super 40, XL, Roll Groove	1,1-1/4,1-1/2,2 2-1/2,3	175	7064	Reducing Tee with Threaded Branch	2x2x1,1-1/2 2-1/2x2-1/2x2 3x3x1,1-1/2,2,2-1/2 4x4x1,2,2-1/2,3 5x5x2,3,4 6x6x2,2-1/2,3,4,5 8x8x2,3,4,5,6 10x10x2,3,4,5,6,8 12x12x4,6,8,10	500
7400	SF, Roll Groove	1,1-1/4,1-1/2,2 2-1/2,3,4	175				
7400	DF, Roll Groove	1,1-1/4,1-1/2, 2,2-1/2,3	175				
7400	Sch. 5, Roll Groove	1,1-1/4,1-1/2,2	175				

Figure 7401 Rigidlok Coupling: Designed to provide a positive, locked-in pipe connection where rigidity is designed-in. The designed-in action prevents movement and produces a secure rigid pipe joint connection. These couplings shall not be used for flex joints subjected to earthquake forces.

Fig.	Intended Pipe	Sizes (in.)	PSIG				
7401	Sch. 40, Cut Groove	1-1/2,2,2-1/2,3,4	750	7065	Standpipe Tee	4x4x2-1/2 6x6x2-1/2	500
7401	Sch. 40, Cut Groove	5,6	500	7066	Tee Wyes	2x2x2 2-1/2x2-1/2x2-1/2 3x3x3 3-1/2x3-1/2x3-1/2 4x4x3,4 5x5x3,4,5 6x6x3,4,5,6 8x8x3,4,5,6,8 10x10x3,4,5,6,8,10 12x12x3,4,6,8,10,12	500
7401	Sch. 40, Cut Groove	8	450				
7401	Sch. 40, Cut Groove	10	400				
7401	Sch. 30, Cut Groove	12	400				
7401	Sch. 40, Roll Groove	1-1/2,2,2-1/2,3,4	750				
7401	Sch. 40, Roll Groove	5,6	500				
7401	Sch. 40, Roll Groove	8	450				
7401	Sch. 40, Roll Groove	10	400				
7401	Sch. 30, Roll Groove	12	400				
7401	Sch. 10, Roll Groove	1-1/2,2,2-1/2,3	750	7067	Reducing Tee Wyes	4x3x3,4 5x3x3,5 5x4x3,4 6x4x6 6x5x3,4 8x6x4,8	500
7401	Sch. 10, Roll Groove	4,5	500				
7401	Sch. 10, Roll Groove	6	400				
7401	0.188 Inch, Roll Groove	8,10,12	300				
7401	Super 40, XL, Roll	1-1/2,2,2-1/2,3	300				
7401	SF, DF, Roll Groove	1-1/2,2	175				
7401	SF, DF, Roll Groove	2-1/2,3,4	300				
7401	Sch. 5, Roll Groove	1-1/2,2	175				

SF=SuperFlo DF=Dyna-Flow

4.4 Grooved end Fittings - Gruvlok® Systems for Steel Pipe

Gruvlok Grooved Fittings are available through 12 inch nominal pipes sizes. The fittings are cast (malleable or ductile iron), steel forged, or segmental welded (carbon steel, ASTM A 53).

Fig.	Item Description	Sizes	PSIG				
7050	90° Elbow	1 thru 12	500				
7050LR	90° Long Radius Elbow	1 thru 12	500	7071	True Wye	1 thru 12	500
7051	45° Elbow	1 thru 12	500				
7051LR	45° Long Radius Elbow	1 thru 12	500	7072	Concentric Reducer	1-1/2x1 2x1,1-1/4,1-1/2 2-1/2x2 3x2,2-1/2 3-1/2x3 4x1,2,2-1/2,3,3-1/2 5x4 6x2,3,4,5 8x4,5,6 10x4,6,8 12x6,8,10	500
7052	22-1/2 inch Elbow	1 thru 12	500				
7053	11-1/4" Elbow	1 thru 12	500				
7055	90° Adapter Elbow	1 thru 12	500				
7056	45° Adapter Elbow	1 thru 12	500				
7060	Tee	1 thru 12	500				
7061	Reducing Tee	2x2x1,1-1/2, 2-1/2x2-1/2x2 3x3x1,1-1/2,2,2-1/2 4x4x1,2,2-1/2,3 5x5x2,3,4 6x6x2,2-1/2,3,4,5	500				

7073	Eccentric Reducer	1-1/2x1 2x1,1-1/4,1-1/2 2-1/2x2 3x2,2-1/2 3-1/2x3 4x1,2,2-1/2,3,3-1/2 5x4 6x2,3,4,5 8x4,5,6 10x4,6,8 12x6,8,10	500
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7074	Cap	1 thru 12	500
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7076	Concentric Reducer, Threaded Small End	1-1/2x1 2x1,1-1/4,1-1/2 2-1/2x2 3x2,2-1/2 3-1/2x3 4x1,2,2-1/2,3,3-1/2 5x4 6x2,3,4,5 8x4,5,6 10x4,6,8 12x6,8,10	500
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7077	Swaged Nipple, Grv.xGrv.	2x1,1-1/4, 1-1/2 2-1/2x1,1-1/4,1-1/2,2 3x1,1-1/4,1-1/2,2,2-1/2 3-1/2x3 4x1,1-1/4,1-1/2,2,2-1/2,3, 3-1/2 5x2,2-1/2,3,4 6x1,1-1/4,1-1/2,2,2-1/2,3,4,5	500
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7078	Swaged Nipple, Grv.xThrd.	2x1,1-1/4, 1-1/2 2-1/2x1,1-1/4,1-1/2,2 3x1,1-1/4,1-1/2,2,2-1/2 3-1/2x3 4x1,1-1/4,1-1/2,2,2-1/2,3-1/2 5x2,2-1/2,3,4 6x1,1-1/4,1-1/2,2,2-1/2,3,4,5	500
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7079	Swaged Nipple, Grv.xBev.	2x1,1-1/4, 1-1/2 2-1/2x1,1-1/4,1-1/2,2 3x1,1-1/4,1-1/2,2,2-1/2 3-1/2x3 4x1,1-1/4,1-1/2,2-1/2,3,3-1/2 5x2,2-1/2,3,4 6x1,1-1/4,1-1/2,2,2-1/2,3,4,5	500
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7080	Adapter Nipple, Grv.xGrv.	1 thru 12	500
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7081	Adapter Nipple, Grv.xThd.	1 thru 12	500
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7082	Adapter Nipple, Grv.xBev.	1 thru 12	500
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7097	Eccentric Reducer Thread Small End	1-1/2x1 2x1,1-1/4,1-1/2 2-1/2x2 3x2,2-1/2 3-1/2x3 4x1,2,2-1/2,3,3-1/2 5x4 6x2,3,4,5 8x4,5,6 10x4,6,8 12x6,8,10	500
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4.5 Branch Outlet Systems - Gruvlok® Systems for Steel Pipe

Gruvlok Branch Outlet Systems provide an outlet at any location along the pipe. A hole is drilled or cut into the pipe, the Clamp-T is located and installed to produce a branch connection outlet. These fittings have specially engineered gaskets designed to conform to the pipe O.D. forming a leak tight seal.

Figure 7045 Clamp-T: Has a female threaded branch outlet and provides an immediate branch and cross connection in either standard, lightweight, SuperFlo, or Dyna-Flow pipe systems.

Fig.	Intended Pipe	Sizes (in.)	PSIG
7045	Sch. 40	2x1/2,3/4,1,1-1/4,1-1/2	400
7045	Sch. 40	2-1/2x1/2,3/4,1,1-1/4,1-1/2	400
7045	Sch. 40	3x1/2,3/4,1	300
7045	Sch. 40	3x1-1/4,1-1/2,2	350
7045	Sch. 40	4x1/2,3/4,1	300
7045	Sch. 40	4x1-1/4,1-1/2,2,2-1/2	400
7045	Sch. 40	4x3	350
7045	Sch. 40	5x1-1/4,1-1/2,2,2-1/2,3	350
7045	Sch. 40	6x1-1/4,1-1/2,2,2-1/2,3	350
7045	Sch. 40	6x4	300
7045	Sch. 30	8x2-1/2,3	400
7045	Sch. 30	8x4	300
7045	Sch. 10	2x1/2,3/4,1,1-1/4,1-1/2	400
7045	Sch. 10	2-1/2x1/2,3/4,1,1-1/4,1-1/2	400
7045	Sch. 10	3x1/2,3/4,1	300
7045	Sch. 10	3x1-1/4,1-1/2,2	350
7045	Sch. 10	4x1/2,3/4,1	300
7045	Sch. 10	4x1-1/4,1-1/2,2,2-1/2	400
7045	Sch. 10	4x3	350
7045	Sch. 10	5x1-1/4,1-1/2,2,2-1/2,3	350
7045	Sch. 10	6x1-1/4,1-1/2,2,2-1/2,3	350
7045	Sch. 10	6x4	300
7045	0.188 wall	8x2-1/2,3	400
7045	0.188 wall	8x4	300
7045	SF, DF	2x1/2,3/4,1,1-1/4,1-1/2	175
7045	SF, DF	2-1/2x1/2,3/4,1,1-1/4,1-1/2	175
7045	SF, DF	3x1/2,3/4,1,1-1/4,1-1/2,2	175
7045	SF, DF	4x1/2,3,4,1,1-1/4,1-1/2,2, 2-1/2,3	175

SF=SuperFlo DF=Dyna-Flow

Figure 7046 Clamp-T: Has a grooved branch outlet and provides an immediate branch and cross connection in either standard, lightweight, SuperFlo, or Dyna-Flow pipe systems.

Fig.	Intended Pipe	Size	PSIG
7046	Sch. 40	2-1/2x1-1/4,1-1/2	400
7046	Sch. 40	3x1-1/4,1-1/2,2	350

7046	Sch. 40	4x1-1/4,1-1/2,2,2-1/2	400
7046	Sch. 40	4x3	350
7046	Sch. 40	5x1-1/4,1-1/2,2,2-1/2,3	350
7046	Sch. 40	6x1-1/4,1-1/2,2,2-1/2,3	350
7046	Sch. 40	6x4	300
7046	Sch. 30	8x2-1/2,3	400
7046	Sch. 30	8x4	300
7046	Sch. 10	2-1/2x1-1/4,1-1/2	400
7046	Sch. 10	3x1-1/4,1-1/2,2	350
7046	Sch. 10	4x1-1/4,1-1/2,2,2-1/2	400
7046	Sch. 10	4x3	350
7046	Sch. 10	5x1-1/4,1-1/2,2,2-1/2,3	350
7046	Sch. 10	6x1-1/4,1-1/2,2,2-1/2,3	350
7046	Sch. 10	6x4	300
7046	0.188 wall	8x2-1/2,3	400
7046	0.188 wall	8x4	300
7046	SF, DF	2-1/2x1-1/4,1-1/2	175
7046	SF, DF	3x1-1/4,1-1/2,2	175
7046	SF, DF	4x1-1/4,1-1/2,2,2-1/2,3	175

SF=Super Flo DF=Dyna-Flow

4.6 Plain End Fittings - Gruvlok® Systems for Steel Pipe - Sock-It Piping System

Gruvlok Sock-It Piping System provides a quick, secure, and reliable method of joining plain end steel pipe. Several Sock-It configurations are available; tees with NPT outlets, reducing run tees with NPT outlets, straight couplings, 90° elbows, straight tees, and reducing elbows. Pressure responsive elastomeric gaskets provide the Sock-It fittings with a leak-tight seal. Specially designed locking bolts secure the pipe in the Sock-It, providing a fast way of joining a small diameter plain end pipe. Sock-It fittings are cast iron ASTM A-126 Class A, and are intended for use with Standard, Lightweight, Super 40, XL, Super-Flo, and Dyna-Flow piping systems.

Figure 7100 90° Elbow(Sock-It x Sock-It)

Fig.	Intended Pipe	Sizes (in.)	PSIG
7100	Sch. 40	1,1-1/4,1-1/2	300
7100	Sch. 40	2	250
7100	Sch. 10	1,1-1/4,1-1/2	300
7100	Sch. 10	2	250
7100	Super 40, XL, Super Flo, Dyna-Flo	1,1-1/4,1-1/2,2	175

Figure 7101 90° Reducing Elbow (Sock-It x NPT)

Fig.	Intended Pipe	Sizes (in.)	PSIG
7101	Sch. 40	1x1/2,3/4,1	300
7101	Sch. 40	1-1/4x1/2,3/4,1	300
7101	Sch. 40	1-1/2x1/2,3/4,1	300
7101	Sch. 10	1x1/2,3/4,1	300
7101	Sch. 10	1-1/4x1/2,3/4,1	300
7101	Sch. 10	1-1/2x1/2,3/4,1	300
7101	Super 40,XL,SF,DF	1x1/2,3/4,1	175
7101	Super 40,XL,SF,DF	1-1/4x1/2,3/4,1	175
7101	Super 40,XL,SF,DF	1-1/2x1/2,3/4,1	175

Figure 7103 Straight Tee (Sock-It x Sock-It x Sock-It)

Fig.	Intended Pipe	Sizes (in.)	PSIG
7103	Sch. 40	1,1-1/4,1-1/2	300
7103	Sch. 40	2	250
7103	Sch. 10	1,1-1/4,1-1/2	300

7103	Sch. 10	2	250
7103	Super 40,XL,SF,DF	1,1-1/4,1-1/2,2	175

Figure 7105 Sock-It Tee (Sock-It x Sock-It x NPT)

Fig.	Intended Pipe	Sizes (in.)	PSIG
7105	Sch. 40	1x1x1/2,3/4,1	300
7105	Sch. 40	1-1/4x1-1/4x1/2,3/4,1	300
7105	Sch. 40	1-1/2x1-1/2x1/2,3/4,1	300
7105	Sch. 40	2x2x1/2,3/4,1	250
7105	Sch. 10	1x1x1/2,3/4,1	300
7105	Sch. 10	1-1/4x1-1/4x1/2,3/4,1	300
7105	Sch. 10	1-1/2x1-1/2x1/2,3/4,1	300
7105	Sch. 10	2x2x1/2,3/4,1	250
7105	Super 40,XL,SF,DF	1x1x1/2,3/4,1	175
7105	Super 40,XL,SF,DF	1-1/4x1-1/4x1/2,3/4,1	175
7105	Super 40,XL,SF,DF	1-1/2x1-1/2x1/2,3/4,1	175
7105	Super 40,XL,SF,DF	2x2x1/2,3/4,1	175
7105	SF, XL, Sch. 10, 40	2-1/2x2-1/2x3/4	175

Figure 7106 Reducing Tee (Sock-It x Sock-It x NPT)

Fig.	Intended Pipe	Sizes (in.)	PSIG
7106	Sch. 40	1-1/4x1x1/2,3/4,1	300
7106	Sch. 40	1-1/2x1-1/4x1/2,3/4,1	300
7106	Sch. 40	2x1-1/2x1/2,3/4,1	250
7106	Sch. 10	1-1/4x1x1/2,3/4,1	300
7106	Sch. 10	1-1/2x1-1/4x1/2,3/4,1	300
7106	Sch. 10	2x1-1/2x1/2,3/4,1	250
7106	Super 40,XL,SF,DF	1-1/4x1x1/2,3/4,1	175
7106	Super 40,XL,SF,DF	1-1/2x1-1/4x1/2,3/4,1	175
7106	Super 40,XL,SF,DF	2x1-1/2x1/2,3/4,1	175

Figure 7107 Coupling (Sock-It x Sock-It)

Fig.	Intended Pipe	Sizes (in.)	PSIG
7107	Sch. 40	1,1-1/4,1-1/2	300
7107	Sch. 40	2	250
7107	Sch. 10	1,1-1/4,1-1/2	300
7107	Sch. 10	2	250
7107	Super 40,XL,SF,DF	1,1-1/4,1-1/2,2	175

SF=SuperFlo, DF=Dyna-Flow

4.7 Butterfly Valves - Gruvlok® Systems for Steel Pipe

The flanged or wafer body valves have a cast gray or ductile iron bodies with either nickel plated ductile iron or aluminum bronze discs. The grooved end body valves have ductile iron bodies and the disc is rubber encapsulated ductile iron.

Series	Sizes(in.)	PSIG
7700FP	2 thru 10	300

4.8 Gruvlok Figure 7400 Rigidlite Couplings - Gruvlok® Copper Method

The Gruvlok Figure 7400 Rigidlite Coupling for grooved end copper tubing is available in 2 through 6 inch sizes and provides a means for connecting copper tubing, copper fittings, and other grooved end system components. The housing of the couplings is made of ductile iron conforming to ASTM A 536 Grade 65-45-12. The bolts are heat treated, zinc electroplated, carbon steel oval neck track bolts conforming to ASTM A 183 Grade 2, and the nuts are zinc electroplated carbon steel heavy hex nuts conforming to ASTM A 563 (Standard). The gasket materials are made of EPDM or Nitrile and must be compatible with the fluid being transported.

The couplings are used in fire protection, plumbing, and mechanical systems consisting of Type K, L, M, and DWV copper tube per ASTM B 88 and B 306.

Fig.	Intended Tube	Size (inches)	PSIG
7400	Type K and L	2,2-1/2,3,4,5,6	300
7400	Type M	2,2-1/2,3,4	250
7400	Type M	5,6	200
7400	Type DWV	2,2-1/2,3,4,5,6	100

4.9 Gruvlok Figure 7012 Flange - Gruvlok® Copper Method

The Gruvlok Figure 7012 Flanges for grooved end copper tubing are available in 2 through 6 inch sizes and provide a means for connecting ANSI Class 125 and 150 flanges to copper tubing, copper fittings, and other system components. The housing of the flange is made of ductile iron conforming to ASTM A 536 Grade 65-45-12. The bolts are heat treated, zinc electroplated, carbon steel oval neck track bolts conforming to ASTM A 183 Grade 2, and the nuts are zinc electroplated carbon steel heavy hex nuts conforming to ASTM A 563 (Standard). The gasket materials are made of EPDM or Nitrile and must be compatible with the fluid being transported.

The couplings are used in fire protection, plumbing, and mechanical systems consisting of Type K, L, M, and DWV copper tube per ASTM B 88 and B 306.

Fig.	Intended Tube	Size (inches)	PSIG
7012	Type K and L	2,2-1/2,3,4,5,6	300
7012	Type M	2,2-1/2,3,4	250
7012	Type M	5,6	200
7012	Type DWV	2,2-1/2,3,4,5,6	100

4.10 Gruvlok Grooved End Copper Fittings - Gruvlok® Copper Method

The Gruvlok Copper Fittings consist of the 2 through 6 inch Figure 7550 90° Elbows, Figure 7551 45° Elbows, Figure 7560 Tees, Figure 7572 Concentric Reducers Groove by Groove, and Figure 7575 Concentric Reducers Groove by Cup. The fittings are all manufactured in copper per ASTM B 75 and ANSI B 16.22 Alloy C12200.

Fig.	Item Description	Size (inches)	PSIG
7550	90° Elbow	2,2-1/2,3,4,5,6	300
7551	45° Elbow	2,2-1/2,3,4,5,6	300
7560	Tee	2,2-1/2,3,4,5,6	300
7572	Concentric Reducer Groove by Groove	2-1/2x2,3x2,3x2-1/2,4x2,4x2-1/2,4x3,5x3,5x4,6x3,6x4,6x5	300

7575	Concentric Reducers Groove by Cup	2x1,2x1-1/4,2x1-1/2,2-1/2x1,2-1/2x1-1/4,2-1/2x1-1/2,2-1/2x2,3x1-1/2,3x2,4x2	300
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5. INSTALLATION

The manufacturer's catalog shall be used to determine pipe size and type, groove type, gasket type, and maximum working pressure allowed for the Grooved End Couplings, Grooved End Fittings, Branch Outlets, Plain End Fittings, Butterfly Valves, and Grooved End Flanges listed in this report.

The manufacturer's published installation instructions and this report shall be strictly adhered to and a copy of these instructions shall be available at all times on the job site during installation.

The instructions within this report govern if there are any conflicts between the manufacturer's instructions and this report.

6. SUBSTANTIATING DATA

- 6.1 Manufacturer's descriptive literature:
- 6.2 Engineering drawings, prepared by Grinnell Corporation:
- Gruvlok Copper Method, signed and sealed by Matthew D. Curley, P.E.
 - Gruvlok Systems for Steel Pipe, signed and sealed by Henry R. Sonderegger, P.E.
- 6.3 Test reports on leakage and hydrostatic testing of couplings under UL 213, Underwriters Laboratories Inc., File Ex3202, signed by Kent H. Williams and Emil W. Misichko.

Figure 7000 Coupling

- Project 78NK424, July 20, 1978.
- Project 89NK13213 and 92NK4747, Issued October 13, 1989, Revised June 8, 1992.
- Project 91NK5890, July 26, 1991.
- Project 91NK5770, August 9, 1991.
- Letter dated October 22, 1992.

Figure 7001 Coupling

- Project 78NK424, July 20, 1978.
- Project 89NK24800 and 92NK4747, Issued March 8, 1990, Revised June 8, 1992.
- Letter dated October 22, 1992.
- Letter dated October 20, 1988.

Figure 7004, 7010, 7012 Coupling

- Project 84NK13895, December 17, 1985, Revised January 20, 1995.
- Project 84NK13894, January 9, 1986.
- Project 88NK20074, October 20, 1988.
- Letter dated October 22, 1992.

Figure 7045 and 7046 Coupling

- Project 83NK13512, August 31, 1984.
- Project 84NK13894, January 9, 1986.

Figure 7400 Coupling

- Project 91NK24431, February 19, 1992, Revised January 20, 1995.
- Project 91NK24587, February 18, 1992.
- Letter dated October 22, 1992.

- Figure 7401 Coupling**
- Project 90NK10646, August 23, 1990.
 - Letter dated October 22, 1992.
- 6.4 Test reports on hydrostatic, bending, and rotational torque, vibration resistance, and cycling pressure tests for couplings, Factory Mutual Research:
- **Figures 7000, 7001, and 7010 Couplings**, J.I.1A7A6.AH, December 27, 1979, signed by A.V. Brandao, P.E. and K.R. Zenker.
 - **Figures 7004 and 7012 Couplings**, J.I. 0K7A5.AH, October 17, 1984, signed by V. Cirigliano and K.R. Zenker.
 - **Figures 7010 and 7012 Couplings**, J.I. 0M8A1.AH, February 20, 1986, signed by Vincent Cirigliano and K.R. Zenker.
 - **Figures 7000, 7001, 7010, and 7012**, J.I. 1Q0A9.AH, January 3, 1989, signed by M.C. Farrington and A.V. Brandao, P.E.
 - **Figures 7000, 7001, and 7010 Couplings**, J.I. 0R9A9.AH, August 22, 1989, signed by A.V. Brandao, P.E. and R. L. Allard.
 - **Figures 7012, 7000, 7010, and 7401 Couplings**, J.I. 0V2A6.AH, June 7, 1991, signed by M.C. Farrington and R. L. Allard.
 - **Figure 7401 Rigidlok Coupling**, J.I. 0T9A4.AH, July 2, 1990, signed by M.C. Farrington and J.S. Matrisciano.
- 6.5 Test report on leakage and body strength of **Grooved End Fittings**, Underwriters Laboratories Inc., File Ex3201, Project 89NK24799, Issued June 8, 1990, Revised November 13, 1992, signed by Kent H. Williams and Emil W. Misichko.
- 6.6 Test reports on hydrostatic, bending, and rotational torque, vibration resistance, and cycling pressure tests for clamp tee branch outlet systems, Factory Mutual Research:
- **Figures 7045 and 7046 Clamp Tees**, J.I.1A7A6.AH, December 27, 1979, signed by A.V. Brandao, P.E. and K.R. Zenker.
 - **Figures 7045 and 7046 Clamp Tees**, J.I. 0K7A5.AH, October 17, 1984, signed by V. Cirigliano and K.R. Zenker.
 - **Figures 7045 and 7046 Clamp Tees**, J.I. 2H0A3.AH, July 2, 1984, signed by V. Cirigliano and K.R. Zenker.
 - **Figures 7045 and 7046 Clamp Tees**, J.I. 0R9A9.AH, August 22, 1989, signed by A.V. Brandao, P.E. and R. L. Allard.
 - **Figures 7045 and 7046 Clamp Tees**, J.I. 0V2A6.AH, June 7, 1991, signed by M.C. Farrington and R. L. Allard.
- 6.7 Test reports on leakage and hydrostatic testing of couplings under UL 213, Underwriters Laboratories Inc., signed by David G. Harrington and George E. Laverick.
- Figure 7003 Hinglok Coupling**
- File Ex3202, Project 84NK13895, December 17, 1985.
- Figure 7005 Roughneck Coupling**
- File EX3201, Project 84NK13894, January 9, 1986.
 - File Ex3202, Project 83NK13512, August 31, 1984.
- 6.8 Test report on leakage and body strength of fittings, Underwriters Laboratories Inc., File EX3201, Project 89NK24799, issued June 8, 1990, Revised November 13, 1992, signed by Kent H. Williams and Emil W. Misichko.
- 6.9 Test report on hydrostatic tests of **Grooved End Fittings Figures 7052, 7063, and 7064**, Factory Mutual Research Corporation, J.I. 0T6A3.AH, June 22, 1990, signed by M.C. Farrington and R.L. Allard.
- 6.10 Test report on leakage and hydrostatic testing of couplings under UL 213, on **Plain End Fittings - Sock-It Fittings**, Underwriters Laboratories Inc., File 3202, signed by Keht H. Williams and Emil W. Misichko.
- Project 91NK5890, July 26, 1991, Project 96NK12548, Revised August 28, 1996. .
 - Project 91NK5770, August 9, 1991.
 - Letter dated October 22, 1992, Revised Listing.
 - Project 96NK12548, August 28, 1996.
- 6.11 Test report on hydrostatic, bending, rotational, vibration resistance, and cycling pressure tests on Plain End Fittings and Couplings, Factory Mutual Research Corporation.
- J.I. 0V2A6.AH, June 7, 1991, signed by M. C. Farrington and R. L. Allard.
 - J.I. 1R6A2.AH, October 23, 1989, signed by M. C. Farrington and R. L. Allard.
 - J.I. 0P6A78.AH, August 4, 1987, signed by V. Cirigliano and R. L. Allard.
 - J.I. 1G5A5.AH, April 28, 1982, signed by A.V. Brandao, P.E. and R. L. Allard, P.E.
- 6.12 Test reports on leakage, hydrostatic pressure, hydraulic friction loss under UL 1091, Underwriters Laboratories Inc., File Ex2949:
- **Series 8000FP**, Project 86NK26126, February 17, 1987, signed by Michael Millard and Kerry M. Bell.
 - **Series 7700FP and 7700HFP Butterfly Valves**, Project 91NK24455, December 23, 1992, signed by Kevin Kort and Kenneth W. Zastrow.
- 6.13 Test report on leakage, hydrostatic pressure, hydraulic friction loss of **Series 7700FP and 7700HFP Butterfly Valves**, Factory Mutual Research, J.I. 2V1A3.AH, Class 1112, April 3, 1992, signed by Stanley M. Ziobro and R. L. Allard.
- 6.14 Test report on physical properties testing of EPDM gasket material, Akron Rubber Development Laboratory, Inc., PO# PBD-32839, May 19, 1993, signed by Cynthia J. Miller and Jim Drummond.
- 6.15 Engineering analysis, evaluation of UL Standard 213 and FM 1920 for thrust and shear, Grinnell Corporation, Research and Development Center, May 14, 1993, and March 3, 1995, signed by Michael W. Horgan, Senior Project Engineer.
- 6.16 Test report on leakage and hydrostatic strength of Gruvlok Copper Grooved End Fittings under UL Standard 213 for installation under NFPA 13, Underwriters Laboratories Inc., File Ex3201, Project 94NK25770, January 20, 1995, signed by Kent H. Williams and Emil W. Misichko.
- 6.17 Test report on physical properties testing of Buna-N gasket material, Beebe Rubber Company Testing Laboratory, March 2, 1995, signed by Richard G. Peterson.
- 6.18 Test report on ANSI/NSF Standard 61, Drinking Water System Components-health Effects, NSF International, Customer 18910, Plant 18913, Lab Number: S51025638, Report for Job 953339, Sampled July 12, 1995, Received August 9, 1995.

7. CODE REFERENCES

Standard Building Code® - 1999 Edition

Section 103.7 Alternate Materials and Methods
Chapter 9 Fire Protection Systems

Standard Mechanical Code® - 1997 Edition

Section 103.7 Alternate Materials and Methods
Chapter 12 Hydronic Piping

Standard Plumbing Code® - 1994 Edition with 1995/1996/1997 Revisions

Section 103.7 Alternate Materials and Methods
Section 303.6 Water Piping Quality
Section 308 Types of Joints
Section 309 Use of Joints
Section 311 Tests
Chapter 6 Water Supply and Distribution
Section 604 Quality of Water Supply
Chapter 7 Sanitary Drainage
Chapter 9 Vents
Chapter 11 Storm Drainage

Standard Fire Prevention Code® - 1999 Edition

Section 102.7 Alternate Materials and Alternate
Methods of Construction
Section 603 Automatic Sprinkler Systems
Section 604 Standpipes

International Plumbing Code® - 2000 Edition

Section 105.2 Alternative Materials, Methods and
Equipment
Section 303 Materials
Section 308 Piping Support
Section 312 Tests and Inspections
Chapter 6 Water Supply and Distribution
Section 605 Materials, Joints and Connections
Chapter 7 Sanitary Drainage
Chapter 9 Vents
Chapter 11 Storm Drainage

International Mechanical Code® - 2000 Edition

Section 105.2 Alternative Materials, Methods
Equipment and Appliances
Chapter 12 Hydronic Piping

8. COMMITTEE FINDINGS

The Subcommittee on Evaluation in review of the data submitted finds that, in their opinion, the Gruvlok® Systems for Steel Pipe and the Gruvlok® Copper Method as described in this report conform with or are suitable alternates to that specified in the *Standard Building Code*®, the *Standard Plumbing Code*®, the *Standard Mechanical Code*®, the *Standard Fire Prevention Code*®, the *International Plumbing Code*®, and the *International Mechanical Code*® or Supplements thereto.

9. LIMITATIONS

9.1 This Evaluation Report and the installation instructions, when required by the code official, shall be submitted at

the time of permit application.

- 9.2 Rubber-gasketed fittings shall not be used in places where the maximum ambient temperatures exceed 230° F or temperature range of the fluid being transported is outside the range of that recommended by the manufacturer for the gasket material specified.
- 9.3 Groove type rubber fittings are to be used only with pipe, miscellaneous fittings, and valves which have been grooved in accordance with the Gruvlok specifications for use with that type fitting.
- 9.4 All bolts are to be tightened as specified in the manufacturer's installation instructions.
- 9.5 Fittings shall not be installed where the working pressure exceeds those given in this report.
- 9.6 Piping systems shall be supported as required by the *Code*. Hanger spacing, location, and end loads on fittings shall not be greater than those recommended by the manufacturer.
- 9.7 Rubber gasket fittings used in mechanical piping systems transporting liquid fuels shall not be used within buildings or above ground outside of buildings.
- 9.8 Steel Pipe and Copper Tubing shall be of the minimum schedule and type as required by the *Code* for the particular service.
- 9.9 The Gruvlok® Copper Method shall not be used as flexible joints in locations subject to earthquake.
- 9.10 Figure 7004 HPR Rigid, Figure 7400 Rigidlite, and Figure 7401 Rigidlok couplings shall not be used as flexible joints in locations subject to earthquake.
- 9.11 Gasket material for potable water is limited to EPDM.

10. IDENTIFICATION

Each package of Gruvlok® Systems for Steel Pipe and Gruvlok® Copper Method components covered by this report shall be labeled with the manufacturer's name and/or trademark, the SBCCI Public Safety Testing and Evaluation Services Inc. Seal or initials (SBCCI ES), and the number of this report for field identification

11. PERIOD OF ISSUANCE

SEE THE CURRENT EVALUATION REPORT INDEX FOR STATUS OF THIS EVALUATION REPORT.

For information on this report contact:

Michael P. O'Reardon
205/599-9800
moreardon@icc-es.org