GENERAL NOTES PER NFPA 13, 2016 EDITION

- THIS PROJECT CONSISTS OF EXISTING BUILDING HAVING A REMODEL
- BUILDING OCCUPANCY IS B
- SYSTEM #1 (FIRST LEVEL) IS A WET SYSTEM DESIGNED TO THE 2016 EDITION OF NFPA 13 EDITION.
- ALL BRANCH LINE PIPING TO BE SCHED 40 PIPING.
- ALL FITTINGS TO BE CAST
- ALL HANGERS TO BE IN ACCORDANCE WITH 2016 NFPA 13 EDITION.
- ALL MATERIAL TO MEET 2016 NFPA 13 EDITION.
- MAXIMUM SQUARE FOOTAGE PER STANDARD COVERAGE HEAD IS 225 SQ FT
- THE AUTHORITY HAVING JURISDICTION IS THE AURORA BUILDING CODES DIVISION / LIFE SAFETY
- SCOPE OF WORK IS IN ACCORDANCE WITH 2016 NFPA 13
- THE CITY OF AURORA BUILDING DIVISION DOES NOT GRANT APPROVAL FOR ANY VIOLATIONS OF ADOPTED FIRE CODE. CODE VIOLATIONS UNCOVERED DURING FIELD INSPECTIONS MUST BE CORRECTED.
- OBSTRUCTIONS WHETHER CONTINUOUS OR NON-CONTINUOUS THAT AFFECT SPRINKLER WATER FLOW OR DISCHARGE ABILITIES AS DESCRIBED IN NFPA 13, 2015 SEC 8.5.5, THAT ARE DISCOVERED IN THE FIELD MUST BE RECTIFIED PRIOR TO FINAL SIGN-OFF BY CITY INSPECTORS.
- OWNER IS RESPONSIBLE FOR PROVIDING HEAT - ABOVE 40 DEGREE F ADEQUATE ENOUGH TO PREVENT FREEZING OF THE SPRINKLER PIPING
- ALL VALVES CONTROLLING THE WATER SUPPLY TO 20 OR MORE HEADS MUST BE SUPERVISED AT THE TIME OF FINAL INSPECTION. FIRE SAFETY SYSTEMS MUST BE SUPERVISED BY AN APPROVED UL LISTED MONITORING AGENCY
- THE CONTRACTOR MUST PROVIDE ALL NECESSARY TESTING EQUIPMENT AND PERFORM ALL TESTING REQUIRED BY THE LIFE SAFETY INSPECTOR
- ALL NEW OR EXISTING FIRE ALARM SYSTEMS MUST BE INTERCONNECTED WITH THE FLOW SWITCH OF THE FIRE SPRINKLER SYSTEM OUTSIDE HORN AND STROBE
- INSTALLATION OF INTERIOR ALARMS ACTIVATED BY THE FIRE SPRINKLER WATER FLOW WILL BE REQUIRED PER 2015 IFC 903.4.2 APPROVED AUDIBLE DEVICES SHALL BE CONNECTED TO EVERY AUTOMATIC FIRE SPRINKLER SYSTEM
- IMPORTANT: IN THE EVENT THAT A CONCEALED SPACE IS NOT SHOWN ON THE PLAN SUBMITTAL AND IS DISCOVERED IN THE FIELD, THE INSTALLING CONTRACTOR MUST COMPLY WITH 2016 NFPA 13, SECTION 8.14.1
- ALL WATER SUPPLY VALVES AND WATER FLOW SWITCHES SHALL BE ELECTRONICALLY SUPERVISED PER IFC SECTION 903.4
- ELECTRICAL EXTERIOR HORN AND STROVE SHALL BE LISTED FOR OUTDOOR USE, IFC 904.3.2 OUTSIDE HORN AND STROBE WILL ACTIVATE UPON BOTH GENERAL ALARM AND FLOW SWITCH ACTIVATION WHEN FIRE ALARM PANEL IS SILENCED, THE INTERIOR AND EXTERIOR STROBES WILL CONTINUE UNTIL FIRE ALARM PANEL IS RESET
- ALL CONTROL VALVES WITHIN THE RISER ROOM MUST BE ACCESSIBLE
- PRESSURE GAUGES ARE REQUIRED ON THE SYSTEM SIDE OF THE MAIN VALVE
- BOTH NEW AND EXISTING FIRE SPRINKLER SYSTEMS MUST BE EQUIPPED WITH AN APPROVED KNOX CAPS
- THE FIRE DEPARTMENT CONNECTION MUST BE LOCATED ON THE FRONT MAIN ENTRY SIDE OF THE BUILDING AND WITHIN 100 FEET OF A FIRE HYDRANT. PRIOR TO INSTALLING THE FIRE DEPARTMENT CONNECTION PLEASE REQUEST A CONSULTATION WITH A LIFE SAFETY FIELD INSPECTOR TO VERIFY LOCATION.
- THE FIRE DEPARTMENT CONNECTION MUST BE LOCATED NOT LESS THAN 18 INCH AND NOT MORE THEN 4 FEET ABOVE THE LEVEL OF THE ADJACENT GRADE OR ACCESS LEVEL
- FIELD INSPECTIONS CONSULTATIONS IS AVAILABLE UPON REQUEST. CALL 303-739-7420 TO REQUEST A CONSULTATION.

GENERAL NOTES PER NFPA 13, 2016 EDITION

ALL FIRE SPRINKLER MAIN PIPING ARE TO BE SCH 10 OR EQUIVALENT. BRANCH LINES ARE TO BE SCH 10 AND SCH 40 OR EQUIVALENT. ARMOVERS AND DROPS/SPRIGS ARE TO BE SCH 40 OR EQUIVALENT. OUTLETS TO BE WELD-O-LETS FOR THE FIRE SPRINKLER HEADS AND PIPE OUTLETS

HANGERS TO CONFORM TO NFPA 13 FOR SPACING AND PIPE TO BE SUPPORTED BY RING HANGER AND (3/8" FOR 1 ~ 4 INCH) AND (1/2" FOR 6 ~8 INCH) ALL THREAD ROD WITH ATTACHING DEVICE (BEAM CLAMP, SAMMY SCREW OR HILTI DROP-IN)

START POINT OF WORK TO BE FROM THE EXISTING FIRE SPRINKLER SYSTEM

ALL FIRE SPRINKLER HEAD RELOCATED WILL BE REPLACED WITH NEW HEADS TO MATCH THE EXISTING HEADS IN THE AREA OF WORK

DASHED PIPING IS EXISTINGS
SOLID PIPING IS NEW

THIS OFFICE AREA IS ALL LIGHT HAZARD AREA

Referenced Codes
2015 International Fire Code (IFC)
2015 National Electrical Code (NEC)
2015 International Building Code (IBC)
2015 International Mechanical Code (IMC)
2013 National Fire Protection Association (NFPA) Standard 72

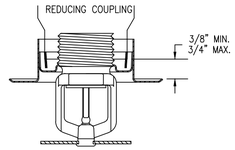
Occupancy Group: B
Numbers of Stories: 2 floors
The building is fire sprinkled: Yes
This is new or existing construction: EXISTING
Construction type: TYPE II
Square footage project area and total square footage of structure:

FIRST 950 Sq. Ft.
Total 5,000+ Sq. Ft. APPROX

Sprinkler Contractor
SEE TITLE BLOCK

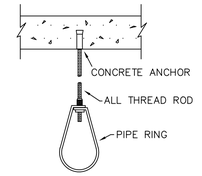
Authority Having Jurisdiction
Aurora Building Division
15151 E. Alameda Parkway,
2nd Floor Permit Center
Aurora, CO 80012
(P) 303-739-7420
(F) 303-739-7551

HEAD DETAILS

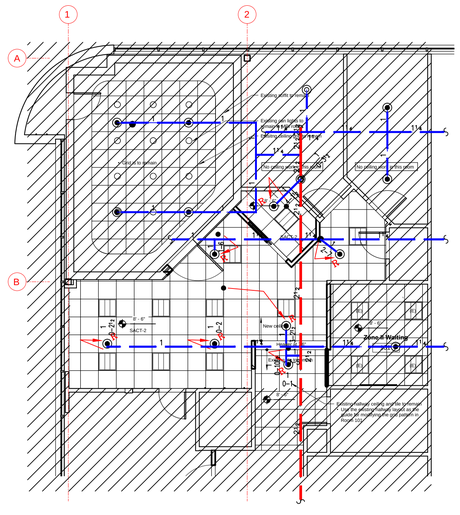


'RELIABLE'
G STD RESPONSE
RECESSED PENDENT SPRINKLER

HANGER DETAIL



DRILLED CONC. ANCHOR
HANGER



FIRE SPRINKLER PLANS
SCALE: 1/8" = 1'-0"

PLAN NORTH

R 7 RELOCATED HEADS = "R"
A 0 ADDED HEADS = "A"
P 0 PLUGGED HEADS = "P"

ACCEPTING THIS COPY IS DEEMED AS AGREEING TO THE FOLLOWING: THIS DRAWING COPY, ITS CONTENTS, INFORMATION AND PRINCIPALS OF DESIGN ARE THE EXCLUSIVE PROPERTY OF THE FIRE PROTECTION CONTRACTOR LISTED AND MILE HIGH DESIGN GROUP, LLC AND IS BEING SUBMITTED TO YOU WITH THE UNDERSTANDING THAT IT IS NOT TO BE REPRODUCED, COPIED OR MODIFIED IN ANY MANNER; NEITHER SHALL IT BE RELAYED IN WHOLE OR IN PART TO ANY OTHER INDIVIDUAL OR FIRM FOR ANY OTHER PROJECT OR EXTENSION OF THIS PROJECT EXCEPT THRU WRITTEN AGREEMENT WITH THE FIRE PROTECTION CONTRACTOR AND MILE HIGH DESIGN GROUP, LLC. ERRORS AS A RESULT OF THIS FILE BEING ELECTRONICALLY TRANSMITTED ARE BEYOND THE CONTROL OF AND ARE NOT THE RESPONSIBILITY OF THE FIRE PROTECTION CONTRACTOR OR MILE HIGH DESIGN GROUP. MILE HIGH DESIGN GROUP IS NOT RESPONSIBLE FOR INSTALLATION OR INSPECTION OF WORK INSTALLED. THESE PLANS ARE DIAGRAMMATICAL ONLY. ON SITE COORDINATION MUST BE ARRANGED WITH ALL OBSTRUCTIONS, i.e.: MECHANICAL, ELECTRICAL, AND STRUCTURAL. ANY ALTERATIONS FROM ENGINEERED DRAWINGS MUST BE APPROVED BY MILE HIGH DESIGN GROUP. MILE HIGH DESIGN GROUP IS NOT RESPONSIBLE FOR LAYOUT DESIGN ISSUES OR CONFLICTS WITH ANY OBSTRUCTIONS. IF ADDITIONAL FIRE SPRINKLER PIPING AND/OR FIRE SPRINKLER HEADS ARE REQUIRED THIS WILL BE THE RESPONSIBILITY OF THE FIRE SPRINKLER CONTRACTOR. ALL CHANGES MUST ME APPROVED BY MILE HIGH DESIGN GROUP, LLC

THE OWNER IS RESPONSIBLE TO PROVIDE SUFFICIENT HEAT THROUGHOUT THIS BUILDING TO PREVENT FREEZING OF WATER IN THE FIRE SPRINKLER SYSTEM -

City of Aurora Building Division
Counter Permit intake by: JVE
Date: *Aug 17, 2018*
RSN: *1312601*
Permit: *2018-1509422-CT*
2015 INTERNATIONAL CODES & 2014 NEC Scope of permit to be field verified.

THIS SET OF FIRE SPRINKLER SHOP DRAWINGS HAVE BEEN REVIEWED AND FOUND TO BE ACCEPTABLE BY TIMOTHY N. TROSTEL, JR - M.I.C.E.T. IV # 102055. SR. ENGINEERING TECHNICIAN - FIRE PROTECTION
NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINNERING TECHNOLOGIES

07/23/18
TIMOTHY N. TROSTEL, JR.; SET

MILE HIGH DESIGN GROUP
5151 Balmoral St.
Denver, CO 80216
303-291-1011
303-383-5022 FAX
firesprinkler@milehigh.com
A FIRE SPRINKLER DESIGN COMPANY

TENANT FINISH
INVISION SALLY JOBE - SUITE 180
1400 SOUTH POTOMAC STREET
AURORA, COLORADO 80109

Fire Alarm SERVICE INC.
4800 W. 60TH AVENUE
ARVADA, CO 80003
www.fasonline.cc email: contactus@fasonline.cc
phone: 303-466-8800
fax: 303-466-8820
STATE LICENSE 18-5-06383

N W E S

REVISIONS

DATE	DESCRIPTION	BY

P.O #
PERMIT NO.
APPROVAL
DRAWN BY
SCALE 1/8" = 1'-0"
DATE 07.13.2018
REVISED
PLOTTED

FP 1

RSN: *1312601*
Permit #: *2018-1509422-CT*

INVISION SALLY JOBE

TENANT FINISH
SUITE 180
1400 SOUTH POTOMAC STREET
AURORA, COLORADO 80109

PRODUCT SPECIFICATIONS

THIS SET OF FIRE SPRINKLER SHOP SPECIFICATIONS AND HYDRAULIC CALCULATIONS HAVE BEEN REVIEWED AND FOUND TO BE ACCEPTABLE – N.I.C.E.T. IV #102055 SR. ENGINEERING TECHNICIAN – FIRE PROTECTION, NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNICIANS

_____ _____/_____/_____
TIMOTHY N TROSTEL, JR – SET **DATE**

FIRE ALARM SERVICES
4800 WEST 60TH AVE
ARVADA, COLORADO
STATE LICENSE 18-B-06383
303-466-8800 PHONE
303-466-8820 FAX

RSN: 1312601
Permit #: 2018-1509422-CT

Reliable®

Model G Automatic Sprinklers Spray Upright, Spray Pendent And Conventional

Bulletin 110 Rev.R

Product Description

The Reliable Model G Automatic Sprinkler utilizes the center strut solder in compression principle of construction. The fusible alloy is captured in the cylinder of the solder capsule by a stainless steel ball. When the fusible alloy melts, the ball moves into the cylinder allowing the cylinder to fall away from the sprinkler. When this happens, the lever is released to spring free from the sprinkler so that all of the operating parts clear from the waterway allowing the deflector to distribute the discharging water.

Except for the parts in the cylinder as mentioned above, the sprinkler components are made from copper based alloys for maximum corrosion protection. Lead plated, wax coated or wax over lead plated sprinklers are available for specially severe environments. Chrome plated sprinklers are available for decorative purposes.

All sprinklers are individually hydrostatically tested.

All sprinklers are identified as to their fusing point by markings that appear on several of the operating parts and by an identifying color that appears on the frame.

Sprinkler Types

Standard Upright – This deflector configuration is normally used with exposed piping installations. Water is distributed laterally and downward in a wide pattern approximating a hemisphere which is completely and uniformly filled with water in the form of small drops or spray. At a sprinkler height of 10 feet (3m), a circular area of approximately 20 feet (6.1m) in diameter is covered by the water discharged at the minimum pressure.

Standard Pendent – This deflector configuration is normally used where the space above the piping is not adequate or where a concealed piping installation is employed. The discharge characteristics of the standard pendent are virtually identical to the standard upright as described above.

Large and Small Orifice—By varying the orifice size, a large or small orifice sprinkler is created that will distribute as much as 40% more water or 65% less water than the normal ½″ (15mm) orifice sprinkler. These sprinklers are identified by the orifice size that is stamped in the base of the sprinkler and by the pintle that extends from the deflector–the exception is the large orifice sprinkler with the ¾″ NPT (R¾) inlet thread where the size of the inlet is sufficient to classify this sprinkler as one having a larger than standard orifice.



Upright


Pendent



Small Orifice Upright



Conventional

Conventional—This deflector configuration is used primarily in those countries where the LPC installation rules have precedence. The sprinkler is designed to distribute a portion of its water discharge upward against the ceiling with the balance downward. It may be installed in either the upright or the pendent position. Sprinklers with conventional deflectors are available with orifice sizes corresponding to light, ordinary and extra–high hazard installations.

Application and Installation

Standard sprinklers are used in fixed fire protection systems: Wet, Dry, Deluge or Preaction. Care must be exercised that the orifice sizes, temperature ratings, deflector styles and sprinkler spacings are in accordance with the latest published standards of the National Fire Protection Association or the approving authority having jurisdiction.

The sprinklers must be installed with the Reliable Model D Sprinkler Wrench. Any other type of wrench may damage the sprinkler.

The approvals or listings of Reliable Automatic Sprinklers by major approving organizations are shown in the tabulated list provided on the back of this bulletin.

*Patent No. 4,440,234

Technical Data

Sprinkler Type	"K" Factor US	"K" Factor Metric	Sprinkler Height	Approvals	Sprinkler Identification Number (SIN) SSU	Sprinkler Identification Number (SIN) SSP
Standard–Upright (SSU) and Pendent (SSP) Deflectors Marked to Indicate Position						
½″ (15 mm) Standard Orifice with ½″ NPT (R½) Thread	5.62	81.0	2 7/8″ (73 mm)	1, 2, 3, 4, 5, 6, 7	R1025	R1015
7/16″ (11 mm) Small Orifice with ½″ NPT (R½) Thread	4.24	61.0	2 7/8″ (73 mm)	1, 3, 7	R1023	R1013
⅜″ (10 mm) Small Orifice with ½″ NPT (R½) Thread	2.82	40.6	2 7/8″ (73 mm)	1, 2, 3, 7	R1021	R1011
5/16″ (8 mm) Small Orifice with ½″ NPT (R½) Thread	1.98	28.5	2 7/8″ (73 mm)	1, 3, 7	R1022	R1012
17/32″ (20 mm) Large Orifice with ½″ NPT (R½) Thread	7.96	114.7	2 7/8″ (73 mm)	1, 2, 3, 7	R1026	R1016
17/32″ (20 mm) Large Orifice with ¾″ NPT (R¾)Thread	8.20	118.2	2 15/16″ (75 mm)	1, 2, 3, 7	R1027	R1017
20 mm XHH with 20 mm Thread	8.20	118.2	75.4 mm	4, 5, 6	R1027	R1017
10 mm XLH with 10 mm Thread	4.10	59.1	73 mm	4, 5, 6	R1024	R1014
Conventional—Installed in Upright or Pendent Position						
10mm XLH with 10mm Thread	4.10	59.1	73 mm	5	R1074	
15mm Standard Orifice with (R½) Thread	5.62	81.0	73 mm	4, 5, 6	R1075	
20mm XHH with (R¾) Thread	8.20	118.2	75.4 mm	4, 5	R1077	

Temperature Ratings

Classification	Sprinkler Rating °F	Sprinkler Rating °C	Maximum Ambient Temperature °F	Maximum Ambient Temperature °C	Frame (1) Color
Ordinary	135	57	100	38	Black
Ordinary	165	74	100	38	Uncolored
Intermediate	212	100	150	66	White
High	286	141	225	107	Blue

(1) Frame color does not apply to painted or plated sprinklers–Use sprinkler rating as identified on operating parts.

Maintenance

Model G Sprinklers should be inspected quarterly and the sprinkler system maintained in accordance with NFPA 25. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluids. Remove any sprinkler that has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging until used to minimize the potential for damage to sprinklers that would cause improper operation or non-operation. Use only the Model D Sprinkler Wrench for sprinkler removal and installation. Any other type of wrench may damage the sprinkler.

Finishes(1)

Standard Finishes	
Bronze	—All Temperature Ratings
Chrome	—All Temperature Ratings
White (2)	—All Temperature Ratings Only Frame and Deflector are Painted
Special Application Finishes	
Bright Brass Plated	—Only frame, deflector and cap are plated. 135°F (57°C), 165°F (74°C), 212°F (100°C) Temp. Rating.
Black Plated	—Only frame, deflector and cap are plated. All Temp. Ratings.
Polyester Coated (2)	—Only frame and deflector are coated.
Lead Plated	—165°F (74°C), 212°F (100°C) and 286°F (141°C) Temp. Ratings.
Wax-Coated (3)	—165°F (74°C) Clear Wax, 212°F (100°C) Brown Wax.
Wax-Coated Over Lead Plated (3)	—165°F (74°C) Clear Wax, 212°F (100°C) Brown Wax.

(1) Other colors and finishes are available. Consult factory for details.
(2) UL listed and NYC MEA Approved only.
(3) 212°F (100°C) brown wax may be used on 286°F (141°C) sprinklers when maximum ambient temperatures do not exceed 150°F (66°C). UL Listed, FM Approved, NYC MEA 258-93-E.

Approval Organizations

1. Underwriters Laboratories, Inc.
2. Factory Mutual Research Corporation
3. Underwriters' Laboratories of Canada
4. Loss Prevention Council
5. Pleniere Assemblee
6. Verband der Schadenversicherer eV
7. N.Y.C. BS&A No. 587–75–SA
8. N.Y.C. MEA 258-93-E

Ordering Information Specify

1. Model G
2. Deflector
   - Upright
   - Pendent
   - Conventional
3. Nominal Orifice
4. Inlet Thread
5. Temperature Rating
6. Finish

The equipment presented in this bulletin is to be installed in accordance with the latest pertinent Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Products manufactured and distributed by Reliable have been protecting life and property for over 80 years, and are installed and serviced by the most highly qualified and reputable sprinkler contractors located throughout the United States, Canada and foreign countries.

Manufactured by

Reliable®

The Reliable Automatic Sprinkler Co., Inc.

(800) 431-1588 Sales Offices
(800) 848-6051 Sales Fax
(914) 668-3470 Corporate Offices
www.reliablesprinkler.com Internet Address

Recycled Paper

Revision lines indicate updated or new data.

EG. Printed in U.S.A. 4/03 P/N 9999970005

RSN: 1312601
Permit #: 2018-1509422-CT

Submittal Data Sheet
Schedule-10®/Schedule-40®
Fully Listed and FM Approved Sprinkler Pipe

When you specify Schedule-10/Schedule-40 sprinkler pipe you get UL listed and FM approved product. Although these products do not require separate approvals, Schedule-10/Schedule-40 gives you the extra quality assurance you demand. Our Sch-10 (1¼" – 8") pipe and Sch-40 (1" – 2½") pipe have passed the same thorough lab testing as our other listed pipe products, and receive periodic mill inspections from both UL and FM agents to ensure consistent quality.

Galvanized Pipe Schedule-10/Schedule-40 product can be "hot-dip" galvanized to meet FM.

Superior Coating Our advanced formula mill coating offers a clean, durable surface. It is also paint-ready for custom color applications without special preparation.

The internal surface of all black Fire Sprinkler pipe up to 4.5000" in diameter shall be coated with Allied Tube & Conduit Antibacterial Formula "ABF".

American Made Meets "Buy American" requirement and is available through distributors in the USA, Canada and Mexico.

Specifications & Approvals Schedule-10/Schedule-40 pipe are in compliance with the following: ASTM A135 and NFPA 13. Both pipe products have a working pressure rating of 300 psi maximum and also meet the stringent requirement for the following tests: Welded Outlets, Hydrostatic Pressure, Side Wall Rupture, Vibration Test.

Stamp Here



Sch-40 Specications

NPS	Nominal I.D.	Wt.	Wt. (H2O Filled)	Pcs/	Wt/Lift (21')	Wt/Lift (24')	Wt/Lift (25')
In; mm	*In; mm*	*Lbs/Ft; Kg/m*	*Lbs/Ft; Kg/m*	*Lift*	*Lbs; Kg*	*Lbs; Kg*	*Lbs; Kg*
1"	1.049	1.680	2.05	70	2,470	2,822	2,940
25	*26.6*	*2.5*	*3.05*	*70*	*1,120*	*1,280*	*1,334*
1¼"	1.380	2.270	2.93	51	2,431	2,778	2,894
32	*35.1*	*4.36*	*4.36*	*51*	*1,103*	*1,260*	*1,313*
1½"	1.610	2.720	3.61	44	2,513	2,872	2,992
40	*40.9*	*4.0*	*5.37*	*44*	*1,140*	*1,303*	*1,357*
2"	2.067	3.650	5.13	30	2,300	2,628	2,738
50	*52.5*	*5.4*	*7.63*	*30*	*1,043*	*1,192*	*1,242*
2½"	2.469	5.790	7.86	19	2,310	2,640	2,750
65	*62.7*	*8.6*	*11.73*	*19*	*1,048*	*1,197*	*1,247*

Sch-10 Specications

NPS	Nominal I.D.	Wt.	Wt. (H2O Filled)	Pcs/	Wt/Lift (21')	Wt/Lift (24')	Wt/Lift (25')
In; mm	*In; mm*	*Lbs/Ft; Kg/m*	*Lbs/Ft; Kg/m*	*Lift*	*Lbs; Kg*	*Lbs; Kg*	*Lbs; Kg*
1"	1.097	1.400	1.81	91	2,675	3,053	3,185
25	*27.9*	*2.1*	*2.70*	*91*	*1,213*	*1,385*	*1,445*
1¼"	1.442	1.810	2.52	61	2,319	2,664	2,760
32	*36.6*	*2.7*	*3.75*	*61*	*1,052*	*1,208*	*1,252*
1½"	1.682	2.080	3.04	61	2,664	3,045	3,172
40	*42.7*	*3.1*	*4.52*	*61*	*1,208*	*1,381*	*1,439*
2"	2.157	2.640	4.22	37	2,051	2,344	2,442
50	*54.8*	*3.9*	*6.28*	*37*	*930*	*1,063*	*1,108*
2½"	2.635	3.530	5.89	30	2,224	2,542	2,648
65	*66.9*	*5.3*	*8.77*	*30*	*1,009*	*1,153*	*1,201*
3"	3.260	4.330	7.94	19	1,728	1,975	2,057
80	*82.8*	*6.4*	*11.82*	*19*	*784*	*896*	*933*
4"	4.260	5.610	11.78	19	2,238	2,558	2,665
90	*108.2*	*8.3*	*17.53*	*19*	*1,015*	*1,160*	*1,209*
5"	5.295	7.77	17.33	10	1,632	1,865	1,943
125	*134.5*	*11.56*	*25.80*	*10*	*740*	*846*	*881*
6"	6.357	9.290	23.03	10	1,951	2,230	2,322
150	*161.5*	*13.8*	*34.27*	*10*	*885*	*1,012*	*1,053*
8"	8.249	16.490	40.15	7	2,424	2,770	2,885
200	*209.5*	*24.5*	*59.75*	*7*	*1,100*	*1,256*	*1,309*

American Tube and Pipe was acquired by Allied Tube and Conduit on February 1, 1997. The engineered lightwall and standard wall family of products although they have different names are the same in all respects with regard to strength, weight, bundle count, listings and approvals. For example, Dyna-Flow and Super Flo are the same product as are Dyna Thread and Super 40. XL is manufactured with Exterior galvanized coating. BLT is manufactured with Black lacquer coating.

UL Listed FM Approved ULC Listed

Project: Sprinkler Contractor: Date:

Engineer: Specification Reference: System Type:

Locations: Comments:

Close

Threaded Fittings

RSN: *1312601*
Permit #: *2018-1509422-CT*

Tyco Fire Products --- www.tyco-grooved.com
451 North Cannon Avenue, Lansdale, Pennsylvania 19446 --- USA
Customer Service/Sales: Tel: (215) 362-0700 / Fax: (215) 362-5385
Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500

CENTRAL
Grooved Piping Products

General Description

See Fire Protection Submittal Sheet for pressure rating and Listing and Approval information

Ductile Iron threaded fittings (with the exception of California Tees and Street Elbows) conform to ANSI B16.3. They are higher in strength and more corrosion resistant than cast iron fittings. The additional strength is provided by the ductile properties making up the fitting. This is accomplished by adding magnesium while the iron is being poured into it final cast shape. This provides an advantage as the fittings are not as susceptible to leaks or cracking and they are also lighter than standard cast iron.

Caution: Installers who have not used ductile iron threaded fittings before should be instructed that the fittings are stronger than the pipe and over-tightening the fitting can create leaks and cause damage to pipe threads. In general, there is about one-half turn difference between cast iron and ductile iron fittings. Apply Teflon tape or high quality pipe joint compound on the male pipe threads and tighten two to three turns beyond hand tight. If you are using an automatic make-on machine, please exercise caution in setting your machine to the proper parameters prior to tightening fittings onto the male pipe threads.

Technical Data

Figures: 811, 812, 813, 814, 815, 816, 817, 818, 820, 825, 827, 830, 719, California Tees, and Street Elbows
Sizes: $^1/_2$" - 2$^1/_2$"
Maximum Working Pressure:
800 Series, California Tees, and Street Elbows: 300 psi
Figure 719: 250 psi
Approvals: UL, and FM
Note: See Fire Protection Submittal Sheet for exact Listing/Approval information.
Manufacture Source:
Imported
Material:
Ductile Iron, conforming to ANSI B16.3 (Note: Figure 719 Plugs are constructed of Cast Iron)
Thread: N.P.T.

Installation

Apply Teflon Tape or high quality pipe joint compound on the male pipe threads and tighten two to three turns beyond hand tight. (See caution in first column)

Ordering Procedure

Ordering information: When placing an order, indicate the full product name. Please specify the quantity, figure number and size.

Availability and Service: Grooved Piping Products, valves, accessories and other products are available throughout the U.S., Canada, and internationally, though a network of distribution centers. You may write directly or call 215-362-0700 for the distributor nearest you.

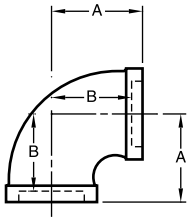
Care and Maintenance

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in accordance with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any authority having jurisdiction. The installing contractor or product manufacturer should be contacted relative to any questions. Any impairment must be immediately corrected.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service.

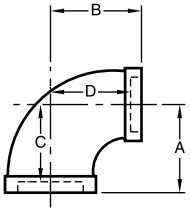
RSN: *1312601*
Permit #: *2018-1509422-CT*

Figure 811
90° Elbow



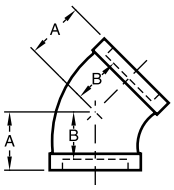
Size Inches	A Inches	B Inches	Part Number	Weight Lbs.	Box Qty.
1/2	1 1/8	9/16	86206	0.24	240
3/4	1 5/16	3/4	86205	0.40	120
1	1 1/2	13/16	86200	0.64	70
1 1/4	1 3/4	1 1/16	86201	0.95	40
1 1/2	1 15/16	1 3/16	86202	1.24	30
2	2 1/4	1 1/2	86203	1.74	20
2 1/2	2 11/16	1 9/16	86204	3.28	10

Figure 812
90° Reducing Elbow



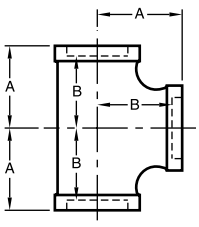
Size Inches	A Inches	B Inches	C Inches	D Inches	Part Number	Weight Lbs.	Box Qty.
3/4 x 1/2	1 3/16	1 3/16	5/8	5/8	86342	0.33	160
1 x 1/2	1 1/4	1 3/8	9/16	13/16	86210	0.44	110
1 x 3/4	1 3/8	1 7/16	11/16	7/8	86211	0.53	90
1 1/4 x 1/2	1 5/16	1 1/2	5/8	15/16	86212	0.64	75
1 1/4 x 3/4	1 7/16	1 5/8	3/4	1 1/16	86213	0.75	60
1 1/4 x 1	1 9/16	1 11/16	7/8	1	86214	0.77	55
1 1/2 x 3/4	1 1/2	1 3/4	3/4	1 3/16	86221	0.95	45
1 1/2 x 1	1 5/8	1 13/16	7/8	1 1/8	86215	0.99	40
1 1/2 x 1 1/4	1 13/16	1 7/8	1 1/8	1 3/16	86216	1.14	35
2 x 3/4	1 5/8	1 15/16	7/8	1 3/8	86217	1.39	30
2 x 1	1 3/4	2 1/16	2	1 5/16	86218	1.58	25
2 x 1 1/2	2	2 3/16	1 1/4	1 7/16	86220	1.67	20
2 1/2 x 2	2 3/8	2 5/8	1 1/4	1 7/8	86262	3.01	15

Figure 813
45° Elbow



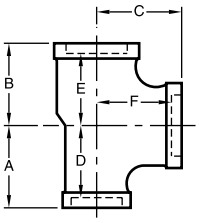
Size Inches	A Inches	B Inches	Part Number	Weight Lbs.	Box Qty.
1/2	7/8	3/8	86780	0.22	250
3/4	1	7/16	86781	0.33	150
1	1 1/8	13/16	86280	0.48	90
1 1/4	1 5/16	5/8	86281	0.73	50
1 1/2	1 7/16	11/16	86282	0.93	35
2	1 11/16	15/16	86283	1.55	18
2 1/2	1 15/16	1	86782	2.70	12

Figure 814
Tee



Size Inches	A Inches	B Inches	Part Number	Weight Lbs.	Box Qty.
1/2	1 1/8	9/16	86340	0.33	150
3/4	1 5/16	3/4	86341	0.50	90
1	1 1/2	13/16	86230	0.85	60
1 1/4	1 3/4	1 1/16	86231	1.30	35
1 1/2	1 15/16	1 3/16	86232	1.63	24
2	2 1/4	1 1/2	86233	2.63	12
2 1/2	2 11/16	1 9/16	86234	4.55	8

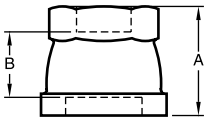
Figure 815
Reducing Tee



Size Inches	A Inches	B Inches	C Inches	D Inches	E Inches	F Inches	Part Number	Wt. Lbs.	Box Qty.
3/4 x 3/4 x 1/2	1 3/16	1 3/16	1 1/4	5/8	5/8	11/16	86235	0.46	95
3/4 x 3/4 x 1	1 7/16	1 7/16	1 3/8	7/8	7/8	11/16	86755	0.68	65
1 x 1/2 x 1	1 1/2	1 3/8	1 1/2	13/16	13/16	13/16	86236	0.70	55
1 x 3/4 x 1/2	1 1/4	1 3/16	1 3/8	9/16	5/8	13/16	86756	0.63	80
1 x 3/4 x 3/4	1 3/8	1 5/16	1 7/16	11/16	3/4	7/8	86757	0.68	65
1 x 3/4 x 1	1 1/2	1 7/16	1 1/2	13/16	7/8	13/16	86237	0.77	55
1 x 1 x 1/2	1 1/4	1 1/4	1 3/8	9/16	9/16	13/16	86238	0.66	65
1 x 1 x 3/4	1 3/8	1 3/8	1 7/16	11/16	11/16	7/8	86239	0.73	60
1 x 1 x 1 1/4	1 11/16	1 11/16	1 9/16	1	1	7/8	86240	0.97	45
1 x 1 x 1 1/2	1 13/16	1 13/16	1 5/8	1 1/8	1 1/8	7/8	86241	1.14	35
1 1/4 x 1 x 1/2	1 15/16	1 1/4	1 9/16	5/8	9/16	1	86242	0.81	50
1 1/4 x 1 x 3/4	1 7/16	1 3/8	1 5/8	3/4	11/16	1 1/16	86243	0.90	50
1 1/4 x 1 x 1	1 9/16	1 1/2	1 11/16	7/8	13/16	1	86244	1.03	45
1 1/4 x 1 x 1 1/4	1 3/4	1 11/16	1 3/4	1 1/16	1	1 1/16	86245	1.10	40
1 1/4 x 1 x 1 1/2	1 7/8	1 13/16	1 13/16	1 3/16	1 1/8	1 1/16	86246	1.43	30
1 1/4 x 1 1/4 x 1/2	1 3/8	1 3/8	1 9/16	11/16	11/16	1	86247	0.87	45
1 1/4 x 1 1/4 x 3/4	1 7/16	1 7/16	1 5/8	3/4	3/4	1 1/16	86248	0.96	45
1 1/4 x 1 1/4 x 1	1 9/16	1 9/16	1 11/16	7/8	7/8	1	86249	1.10	40
1 1/4 x 1 1/4 x 1 1/2	1 7/8	1 7/8	1 13/16	1 13/16	1 13/16	1 1/16	86250	1.50	30
1 1/4 x 1 1/4 x 2	2 1/8	2 1/8	2	1 7/16	1 7/16	1 1/8	86251	2.00	24
1 1/2 x 1 x 1/2	1 7/16	1 5/16	1 11/16	11/16	5/8	1 1/8	86252	0.97	40
1 1/2 x 1 x 3/4	1 1/2	1 3/8	1 3/4	3/4	11/16	1 3/16	86253	1.14	40
1 1/2 x 1 x 1	1 5/8	1 1/2	1 13/16	7/8	13/16	1 1/8	86254	1.14	30
1 1/2 x 1 x 1 1/2	1 15/16	1 13/16	1 15/16	1 3/16	1 1/8	1 3/16	86255	1.52	30
1 1/2 x 1 1/4 x 1/2	1 7/16	1 5/16	1 11/16	11/16	5/8	1 1/8	86257	1.03	40
1 1/2 x 1 1/4 x 3/4	1 1/2	1 7/16	1 3/4	3/4	3/4	1 3/16	86258	1.10	40
1 1/2 x 1 1/4 x 1	1 5/8	1 9/16	1 13/16	7/8	7/8	1 1/8	86259	1.31	30
1 1/2 x 1 1/4 x 2	2 3/16	2 1/8	2	1 7/16	1 7/16	1 1/4	86260	1.94	20
1 1/2 x 1 1/2 x 1/2	1 7/16	1 7/16	1 11/16	11/16	11/16	1 1/8	86261	1.14	35
1 1/2 x 1 1/2 x 3/4	1 1/2	1 1/2	1 3/4	3/4	3/4	1 3/16	86262	1.23	35
1 1/2 x 1 1/2 x 1	1 5/8	1 5/8	1 13/16	7/8	7/8	1 1/8	86263	1.38	30
1 1/2 x 1 1/2 x 1 1/4	1 13/16	1 13/16	1 7/8	1 1/16	1 1/16	1 3/16	86264	1.50	30
1 1/2 x 1 1/2 x 2	2 3/16	2 3/16	2	1 7/16	1 7/16	1 1/4	86265	2.00	20
2 x 1 x 2	2 1/4	2	2 1/4	1 1/2	1 5/16	1 1/2	86266	2.18	15
2 x 1 1/4 x 2	2 1/4	2 1/8	2 1/4	1 1/2	1 7/16	1 1/2	86267	2.31	15
2 x 1 1/2 x 1/2	1 1/2	1 7/16	1 7/8	3/4	11/16	1 5/16	86268	1.50	30
2 x 1 1/2 x 3/4	1 5/8	1 1/2	1 15/16	7/8	3/4	1 3/8	86269	1.61	25
2 x 1 1/2 x 1	1 3/4	1 5/8	2	1	7/8	1 5/16	86270	1.65	20
2 x 1 1/2 x 1 1/2	2 1/16	1 15/16	2 3/16	1 5/16	1 3/16	1 7/16	86272	2.03	20
2 x 1 1/2 x 2	2 1/4	2 3/16	2 1/4	1 1/2	1 7/16	1 1/2	86273	2.37	15
2 x 2 x 1/2	1 1/2	1 1/2	1 7/8	3/4	3/4	1 5/16	86222	1.50	30
2 x 2 x 3/4	1 5/8	1 5/8	1 15/16	7/8	7/8	1 3/8	86223	1.67	20
2 x 2 x 1	1 3/4	1 3/4	2	1	1	1 5/16	86224	1.91	20
2 x 2 x 1 1/4	1 7/8	1 7/8	2 1/8	1 1/8	1 1/8	1 7/16	86225	2.05	20
2 x 2 x 1 1/2	2	2	2 3/16	1 1/4	1 1/4	1 1/2	86226	2.11	15
2 x 2 x 2 1/2	2 5/8	2 5/8	2 3/8	1 3/4	1 7/8	1 7/16	86227	3.67	10
2 1/2 x 2 x 3/4	1 3/4	1 5/8	2 5/16	5/8	7/8	1 3/4	86274	2.22	15

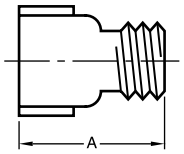
RSN: *1312601*
Permit #: *2018-1509422-CT*

Figure 816
Reducing Coupling



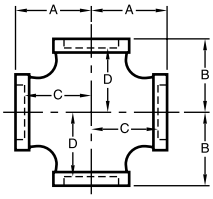
Size Inches	A Inches	B Inches	Part Number	Weight Lbs.	Box Qty.
3/4 x 1/2	1 3/4	11/16	86772	0.38	240
1 x 1/2	1 11/16	1/2	86228	0.38	200
1 x 3/4	1 3/4	1/2	86229	0.53	110

Figure 825
Extension Piece



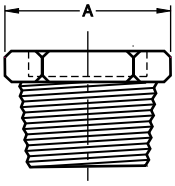
Size Inches	A Inches	Part Number	Weight Lbs.	Box Qty.
1/2 x 1 1/2	1 1/2	72751	0.20	300
1/2 x 2	2	72980	0.27	250
3/4 x 1 1/2	1 1/2	72981	0.22	250
3/4 x 2	2	72982	0.31	200

Figure 817
Cross



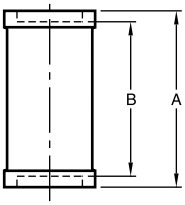
Size Inches	A Inches	B Inches	C Inches	D Inches	Part Number	Weight Lbs.	Box Qty.
1	1 1/2	1 1/2	13/16	13/16	86284	0.97	45
1 1/4	1 3/4	1 3/4	1 1/16	1 1/16	86285	1.59	25
1 1/2	1 15/16	1 15/16	1 3/16	1 3/16	86286	1.89	20
2	2 1/4	2 1/4	1 1/2	1 1/2	86287	2.93	10
1 1/4 x 1 1/4 x 1 x 1	1 11/16	1 9/16	1	7/8	86289	1.25	30
1 1/2 x 1 1/2 x 1 x 1	1 13/16	1 5/8	1 1/16	1 15/16	86322	1.48	24
2 x 2 x 1 x 1	2	1 3/4	1 1/4	1 1/16	86291	2.64	10

Figure 827
Hex Bushing



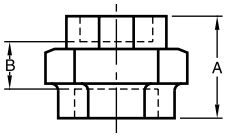
Size Inches	A Inches	Part Number	Weight Lbs.	Box Qty.
1 x 1/2	1 1/16	72726	0.22	280
1 x 3/4	1 1/16	72762	0.18	280
1 1/4 x 1	1 3/16	72763	0.31	150
1 1/2 x 1	1 1/4	72757	0.53	100
1 1/2 x 1 1/4	1 1/4	72764	0.35	100
2 x 1	1 3/8	72759	0.75	80
2 x 1 1/4	1 3/8	72761	0.69	80
2 x 1 1/2	1 3/8	72775	0.62	80

Figure 818
Straight Coupling



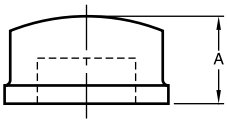
Size Inches	A Inches	B Inches	Part Number	Wrench	Weight Lbs.	Box Qty.
1/2	1 3/8	5/16	72779	1 1/8	0.18	360
3/4	1 5/8	9/16	72778	1 3/8	0.26	200
1	1 3/4	3/8	72755	1 11/16	0.44	110
1 1/4	2	9/16	72754	2	0.54	75
1 1/2	2 3/16	3/4	72753	2 1/4	0.71	60
2	2 5/8	1 1/8	72752	2 3/4	1.15	30
2 1/2	3	3/4	72758	3 3/8	2.29	18

Figure 830
Brass Seat Union



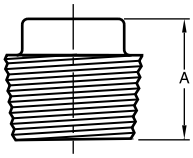
Size Inches	A Inches	B Inches	Part Number	Weight Lbs.	Box Qty.
1/2	1 7/8	13/16	86207	0.47	110
3/4	2	15/16	86275	0.66	80
1	2 3/16	13/16	86276	1.08	50
1 1/4	2 1/2	1 1/16	86277	1.54	35
1 1/2	2 5/8	1 3/16	86278	2.03	25
2	3 1/8	1 5/8	86279	3.15	18

Figure 820
Cap



Size Inches	A Inches	Part Number	Weight Lbs.	Box Qty.
1/2	7/8	72776	0.15	500
3/4	1	72777	0.22	300
1	1 3/16	72824	0.33	180
1 1/4	1 5/16	72756	0.54	110
1 1/2	1 3/8	72822	0.68	80
2	1 1/2	72823	0.96	45
2 1/2	1 3/4	72825	1.80	25

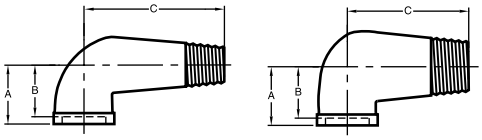
Figure 719
Cast Iron Plug



Size Inches	A Inches	Part Number	Weight Lbs.	Box Qty.
1/2	15/16	86292	0.10	500
3/4	1 1/8	86293	0.18	300
1	1 1/4	86294	0.28	200
1 1/4	1 3/8	86295	0.50	110
1 1/2	1 7/16	86296	0.70	80
2	1 1/2	86297	0.90	45

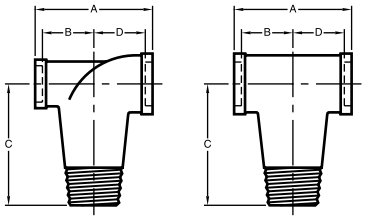
Close

Street Elbows



Size Inches	A Inches	B Inches	C Inches	Part Number	Weight lbs.	Box Qty.
1 x 1/2	1 1/2	3/4	3	42003	0.70	80
1 x 1	1 1/2	3/4	3	42002	0.90	60

California Tees



Size Inches	A Inches	B Inches	C Inches	D Inches	Part Number	Weight lbs.	Box Qty.
1 x 1/2 x 1	1 1/2	7/8	3	3/4	42000	0.95	50
1 x 1 x 1	1 1/2	3/4	3	3/4	42001	0.95	45

Limited Warranty

Products manufactured by Tyco Fire Products are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by Tyco Fire Products. No warranty is given for products or components manufactured by companies not affiliated by ownership with Tyco Fire Products or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association (NFPA), and/or the standards of any other Authorities Having Jurisdiction. Materials found by Tyco Fire Products to be defective shall be either repaired or replaced, at Tyco Fire Products' sole option. Tyco Fire Products neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. Tyco Fire Products shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

IN NO EVENT SHALL TYCO FIRE PRODUCTS BE LIABLE, IN CONTRACT, TORT, STRICT LIABILITY OR UNDER ANY OTHER LEGAL THEORY, FOR INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LABOR CHARGES, REGARDLESS OF WHETHER TYCO FIRE PRODUCTS WAS INFORMED ABOUT THE POSSIBILITY OF SUCH DAMAGES, AND IN NO EVENT SHALL TYCO FIRE PRODUCTS' LIABILITY EXCEED AN AMOUNT EQUAL TO THE SALES PRICE.

THE FOREGOING WARRANTY IS MADE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

General Notes: It is the Designer's responsibility to select products suitable for the intended service and to ensure that pressure ratings and performance data is not exceeded. Never remove any piping component nor correct or modify any piping deficiencies without first depressurizing and draining the system. Material and gasket selection should be verified to be compatible for the specific application.

ISO 9001 CERTIFIED COMPANY

RSN: *1312601*
Permit #: *2018-1509422-CT*

Fig. Rod Stiffener

Size Range — Secures 3/8" thru 7/8" hanger rod
Material — Carbon Steel
Function — Secures channel to hanger rod for vertical seismic bracing.
Finish — Electro Galvanized
Note — Available in HDG finish or Stainless Steel materials.
Order y — Figure number

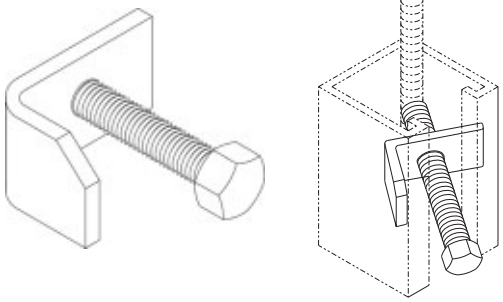
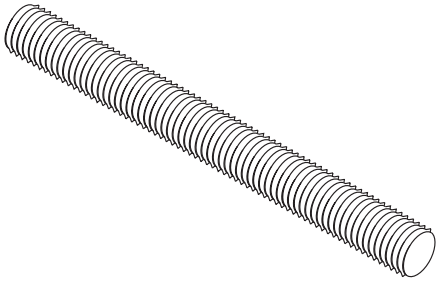


Fig. All Thread Rod Cut to Length

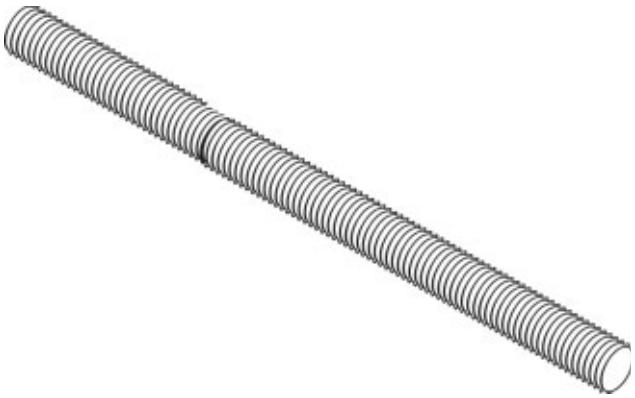
Size Range — Secures 3/8" thru 7/8" rod in 1" increments
Material — Carbon Steel
Maximum Temperature — 750°F
Finish — Plain
Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.
Order y — Figure number, rod diameter, rod length and finish



Dimensions eights		
Rod Size	Max. Rec. Load Lbs. For Service Temps °F	°F
3/8	610	540
1/2	1130	1010
5/8	1810	1610
3/4	2710	2420
7/8	3770	3360

Fig. 1 All Thread Rod Full Lengths

Size Range — Secures 3/8" thru 7/8" rod in 10' lengths
Material — Carbon Steel
Maximum Temperature — 750°F
Finish — Plain
Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.
Order y — Figure number, rod diameter and finish



Dimensions eights			
Rod Size	Max Rec. Load Lbs. For Service Temps °F	°F	Approx. t. 1
1/4	240	215	12
3/8	610	540	29
1/2	1130	1010	53
5/8	1810	1610	84
3/4	2710	2420	123
7/8	3770	3360	169
1	4960	4420	222
$1^1/_4$	8000	7140	360
$1^1/_2$	11630	10370	510

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Permit #: *2018-1509422-CT*

Fig. 200 - "Trimline" Adjustable Band Hanger

Size Range — 1/2" thru 8" pipe

Material — Carbon Steel, Mil. Galvanized to G90 specifications

Function — For fire sprinkler and other general piping purposes. Knurled swivel nut design permits hanger adjustment after installation.

Features —

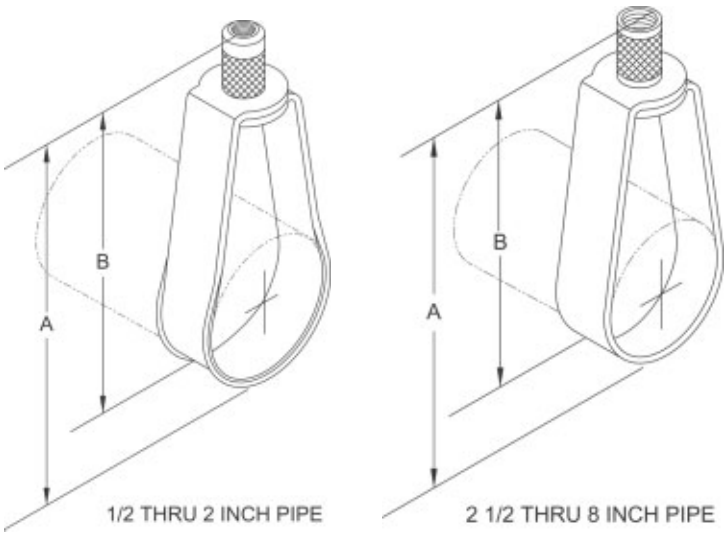
- (1/2" thru 2") Flared edges ease installation for all pipe types and protect CPVC plastic pipe from abrasion. Captured design keeps adjusting nut from separating with hanger. Hanger is easily installed around pipe.
- ($2^1/_2$" thru 8" Spring tension on nut holds it securely in hanger before installation. Adjusting nut is easily removed.

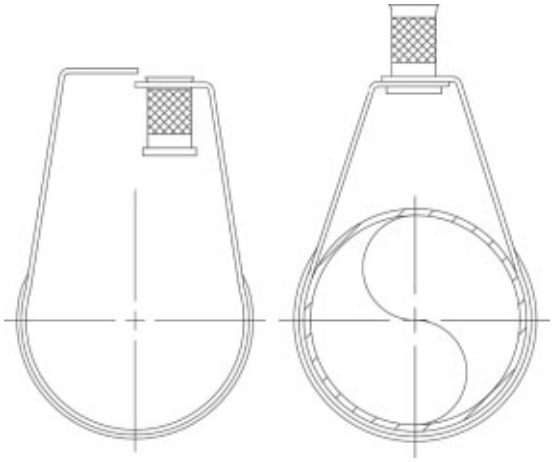
Approvals — Underwriters' Laboratories listed (1/2" thru 8") in the USA **(UL)** and Canada **(cUL)** for steel and CPVC plastic pipe and Factory Mutual Engineering Approved (3/4" thru 8"). Conforms to Federal Specifications WW-H-171E, Type 10 and Manufacturers Standardization Society SP-69, Type 10.

Maximum Temperature — 650°F

Finish — Mil. Galvanized. For Stainless Steel materials, order TOLCO™ Fig. 200WON.

Order By — Figure number and pipe size





Dimensions • Weights

Pipe Size	Rod Size Inch	Rod Size Metric	A	B	Max. Rec. Load Lbs.	Approx. Length
1/2	3/8	8mm or 10mm	$3^1/_8$	$2^5/_8$	400	11
3/4	3/8	8mm or 10mm	$3^1/_8$	$2^1/_2$	400	11
1	3/8	8mm or 10mm	$3^3/_8$	$2^5/_8$	400	12
$1^1/_4$	3/8	8mm or 10mm	$3^3/_4$	$2^7/_8$	400	13
$1^1/_2$	3/8	8mm or 10mm	$3^7/_8$	$2^7/_8$	400	14
2	3/8	8mm or 10mm	$4^1/_2$	3	400	15
$2^1/_2$	3/8	10mm	$5^5/_8$	$4^1/_8$	600	27
3	3/8	10mm	$5^7/_8$	4	600	29
$3^1/_2$	3/8	10mm	$7^3/_8$	$5^1/_4$	600	34
4	3/8	10mm	$7^3/_8$	5	1000	35
5	1/2	12mm	$9^1/_8$	$6^1/_4$	1250	66
6	1/2	12mm	$10^1/_8$	$6^3/_4$	1250	73
8	1/2	12mm	$13^1/_8$	$8^3/_4$	1250	136

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