

# TYPICAL GENERAL & GUIDE SPECIFICATIONS

## TYPICAL GENERAL SPECIFICATION

(CSI - Div. 15, Section A Info., Methods, & Instructions)

### SECTION 1 - GROOVED PIPING METHOD

Grinnell® mechanical pipe couplings, grooved end fittings, grooved end butterfly and check valves, and other system components as manufactured or supplied by Tyco Fire & Building Products shall be used to install piping systems and make mechanical equipment connections in systems within specified operating conditions; and working pressures as shown in the coupling manufacturer's product specification. Grinnell mechanical pipe couplings shall be used for the following systems (subject to applicable local code approval).

#### PLUMBING

Domestic Hot Water  
Domestic Cold Water  
Roof Drains/Storm Drains

#### HEATING / AIR CONDITIONING

Chilled Water	Hot Water
Condenser Water	Heating
Cooling Tower	Dual Temperature
Machinery Room	Utility Water

#### OTHER

Vacuum	Lubrication
Air	Pneumatic Conveyor
Elevator Hydraulic	Low Temperature

## TYPICAL GUIDE SPECIFICATION

Basic Materials & Methods (CSI - Div. 15 Section 15050)

### SECTION 1 - MATERIALS - PIPE & PIPE FITTINGS

- 1.1 Pipe** - Pipe shall conform to Grinnell published tolerance specifications. Steel pipe shall be black or galvanized, conforming to ASTM A-135, A-795 or A-53.
- 1.2 Couplings** - Couplings shall be Grinnell Figures 705, 707, 772 and 716 cast in ductile iron as specified in ASTM A-536. Couplings shall have nuts and bolts. Couplings shall be coated with a lead free paint as standard, or hot-dipped galvanized in accordance with ASTM A-153 as an option.

Couplings shall be Grinnell Figures 405 and 472 cast in Stainless Steel as specified in ASTM A-743/A-743M. Couplings shall have nuts and bolts.

- 1.2.1 Gaskets** - Gaskets shall be a pressure responsive design, molded of synthetic elastomer as designated by ASTM D-2000, and shall conform to the coupling housing and pipe outside diameter. Reference shall be made to the latest published Grinnell gasket selection guide for proper gasket selection for the intended service.

- 1.2.1.1 Water Service** - Gasket shall be Grade "E" EPDM with green color code identification, for service temperatures from -30°F (-34°C) to 230°F (110°C). Recommended for hot water not to exceed 230°F (110°C), plus a variety of dilute acids, oil free air and many chemical services.

#### Not recommended for petroleum services or steam.

- 1.2.1.2 Oil Service** - Gasket shall be grade "T" Nitrile with orange color code identification, for service temperatures from -20°F (-29°C) to 180°F (82°C). Recommended for petroleum products, vegetable oils, mineral oils, and air with oil vapors.

- 1.2.1.3 Other Services** - Refer to the latest published Grinnell gasket selection guide for other service recommendations.

- 1.2.2 Bolts and Nuts** - Shall be heat treated carbon steel, oval-neck track head bolts and heavy hex nuts, conforming to the physical properties of ASTM A-183 with a minimum tensile strength of 110,000 psi. Bolts and nuts shall be zinc electroplated.

- 1.3 Flanges** - Shall be Grinnell Figure 71 Flange, casting in ductile iron in accordance with ASTM A-536. Flange shall conform to ANSI Class 125 and 150 bolt patterns and shall be coated with a lead-free paint as standard, or hot dipped galvanized in accordance to ASTM A-153.
- 1.4 Fittings** - Shall be ASTM A-536 ductile iron or fabricated from steel pipe, 1 1/4" (32mm) - 24" (600mm). All fittings shall be coated with a lead-free paint as standard, or hot-dipped galvanized as an option in accordance to ASTM A-153.
- 1.5 Branch Outlets** - Shall be Grinnell Figure 730 mechanical tees or crosses with integral gasket. Figure 730 shall be coated with a lead-free paint as standard, or hot-dipped galvanized as an option.
- 1.6 Butterfly Valves** - Shall be with grooved ends. Valves shall have encapsulated Grade "E" EPDM or Grade "T" Nitrile disc and rated at 300 psi bubble-tight-shut-off. Reference shall be made to the latest published Grinnell gasket selection guide for proper disc seal selection for the intended service. Valve bodies shall be ductile iron, and upper stems shall be stainless steel.
- 1.7 Check Valves** - Shall be with grooved ends. Valves shall have a resilient elastomer seal Grade "E" EPDM or Grade "T" Nitrile and rated at 300 psi. Reference shall be made to the latest published Grinnell gasket selection guide for proper seal selection for the intended service. Valve bodies shall be ductile iron with a nickel seat. The caps shall be ductile iron with an attached stainless steel clapper assembly for 2" (60.3mm) - 8" (219.1mm) and a ductile iron clapper assembly for 10" (273.0mm) - 12" (323.9mm). All bodies and caps shall be coated with a lead-free paint as standard.

### SECTION 2 - MATERIALS - PIPE PREPARATION

Pipe shall be prepared according to Grinnell® published specifications, ANSI/AWWA C-606, or other applicable standards.

- 2.1 Pipe Ends** - Shall be clean and free from indentations, projections, burrs, rust or roll marks in the area from pipe end to groove.
  - 2.1.1 Standard Weight Pipe** - Shall be roll grooved without removing metal, or cut grooved in accordance with Grinnell published standard roll groove or standard cut groove specifications.
  - 2.1.2 Lightwall Pipe** - Shall be roll grooved without metal removal in accordance with Grinnell published standard roll groove specifications.

# GUIDE & BUILDING SERVICE SYSTEM SPECIFICATIONS

## TYPICAL GUIDE SPECIFICATION

*Continued*

### SECTION 3 - ASSEMBLY

- 3.1 Grinnell couplings, fittings, flanges and valves shall be assembled in accordance with instructions published by Tyco Fire & Building Products.
- 3.1.1 **Pipe** - Ends shall be clean and free from indentations, projections, burrs, roll marks, etc., in the area from pipe end to groove. Pipe ends shall be square cut and prepared in accordance with standard Grinnell specifications.
- 3.1.2 **Gasket** - Shall be of pressure responsive design verified as proper style and grade suitable for the intended service as published in the latest Grinnell gasket recommendation technical literature.
- 3.1.3 **Lubrication** - A thin, uniform coat of Grinnell lubricant shall be applied to the entire exterior of the gasket, including the gasket lips. Complete lubrication is essential to prevent gasket pinching and to ease installation and alignment. Petroleum-free silicon gasket lubricant is recommended when gaskets are subject to low temperature conditions. Petroleum lubricants shall not be used for EPDM gaskets.

### SECTION 4 - SUPPORT

- 4.1 **Horizontal Piping:** (contact Tyco Fire & Building Products for support recommendations)
- 4.1.1 **Flexible Connections** - No pipe length shall be left unsupported between any two couplings, nor shall any pipe be left unsupported whenever a change in direction of line flow takes place. Supports shall meet the requirements stated above, but in no case shall the distance between supports exceed the following for systems where linear movement is not required:

Pipe Size Inches mm	Span Feet Meters	Pipe Size Inches mm	Span Feet Meters
1¼ - 1½ 42.4 - 48.3	12 3.7	14 - 16 355.6 - 406.4	18 5.5
2 - 8 60.3 - 219.1	15 4.6	18 - 24 457.2 - 609.6	20 6.1
10 - 12 273.0 - 323.9	16 4.9		

- 4.1.2 **Rigid Connections** - Pipe connections formed with the Figure 772 shall be supported in accordance with applicable ANSI B31.1, Power Piping Code; ANSI B31.9, Building Service Pipe Code.

## TYPICAL SPECIFICATIONS

### Building Service Systems - Plumbing

Plumbing Specifications (CSI - Div. 15 Section 15-E Plumbing)

#### SECTION 1 - DOMESTIC WATER SYSTEMS

(CSI - Div. 15, Section 15-E Water Supply Systems)

Grinnell Mechanical Grooved Pipe couplings, fittings and butterfly valves as manufactured or supplied by Tyco Fire & Building Products shall be used for all water supply systems under operating conditions not to exceed 230°F (110°C) temperature. The coupling gasket and encapsulated disc on butterfly valves shall be Grade "E" EPDM.

#### 1.1 **Materials:**

- 1.1.1 **Pipe** - Pipe shall be galvanized steel pipe, conforming to

ASTM A-135, A-795 or A-53. All pipe shall be prepared according to Grinnell published specifications, or to ANSI/AWWA C-606 grooved end pipe. Pipe ends shall be prepared as detailed in Basic Materials and Methods and to the latest Grinnell published specifications.

- 1.1.2 **Couplings** - All Grinnell grooved couplings and fittings shall be painted or galvanized Figure 705, 707, 772 or 716 with Grade "E" EPDM gaskets and zinc plated bolts and nuts.
- 1.1.3 **Branch Connections** - Shall be made with Figure 730 and/or Figure 40-5.
- 1.1.4 **Flange Connections** - Flange connections shall be Grinnell Figure 71 Flanges incorporating Grade "E" EPDM gasket.
- 1.1.5 **Fittings** - Fittings shall be painted or galvanized Grinnell standard ductile iron or segmentally welded steel fittings, with grooved ends.
- 1.1.6 **Butterfly Valves** - Shall be of grooved end design with a Grade "E" EPDM encapsulated disc. Upper stem shall be stainless steel. Valves shall have pressure assisted double seal and be capable of 300 psi, bubble-tight-shut-off. Butterfly valves shall be with gear actuator or hand lever. Operating conditions not to exceed -30°F (-34°C) to 230°F (110°C).
- 1.1.7 **Check Valves** - Shall be of grooved end design with a clapper seal of Grade "E" EPDM. Valves shall be capable of pressures of 300 psi. The valves shall have a spring-loaded clapper to ensure a leak tight seal and a non-sticking operation. The clapper seat in the valve body shall be nickel. Operating conditions not to exceed -30°F (-34°C) to 230°F (110°C).

### SECTION 2 - STORM DRAINS / ROOF DRAINS

Grinnell mechanical grooved pipe couplings and fittings as manufactured by Tyco Fire & Building Products shall be used for all storm and roof drainage systems.

#### 2.1 **Materials:**

- 2.1.1 **Pipe** - Pipe shall be galvanized steel pipe, conforming to ASTM A-135, A-795 or A-53. All pipe shall be prepared according to Grinnell published specifications, or to ANSI/AWWA grooved end pipe. Pipe ends shall be prepared as detailed in Basic Materials and Methods and to the latest Grinnell published specifications.
- 2.1.2 **Couplings** - Couplings shall be galvanized Figure 705, 707, 772 or 716 with Grade "E" EPDM gaskets and zinc plated bolts and nuts.
- 2.1.3 **Flange Connections** - Flange connections shall be galvanized Grinnell Figure 71 Flanges incorporating Grade "E" EPDM gasket.
- 2.1.4 **Fittings** - Fittings shall be galvanized Grinnell standard ductile iron or segmentally welded steel fittings, with grooved ends.

#### 2.2 **Plastic Pipe Systems**

- 2.2.1 **Pipe** - Pipe with material and dimensions conforming to ASTM D-1785 Type 1, Grade 1 with rolled or radius cut grooves and joint pressure ratings conforming to grooved manufacturer's specifications or recommendations; or Type 2, Grade 1 with rolled or radius cut grooves and joint ratings conforming to grooved manufacturer's specifications and recommendations.

# BUILDING SERVICE SYSTEM SPECIFICATIONS

## TYPICAL SPECIFICATIONS

### Building Service Systems - Plumbing

#### SECTION 2 - STORM DRAINS / ROOF DRAINS

*Continued*

- 2.2.2 Couplings - Flexible type couplings shall be used.
- 2.2.3 Flange Connections - Same as in 2.1.3
- 2.2.4 Fittings - Same as in 2.1.4

#### SECTION 3 - VENT PIPING

(Same as in Section 2 - Storm Drains / Roof Drains)

### Building Service Systems - Cooling

Cooling System Specifications (CSI - Div. 15 Section 15-N Refrigeration Systems)

#### SECTION 1 - CHILLED WATER - SUPPLY & RETURN

Grinnell® Mechanical Grooved Pipe couplings, fittings and butterfly and check valves as manufactured or supplied by Tyco Fire & Building Products shall be used for cooling system chilled water piping, including risers, mains, equipment connection, branches, supply and return lines under operating conditions not to exceed -30°F (-34°C) - 230°F (110°C) temperature. Calculations shall be made based on coupling manufacturers latest literature to determine expansion/contraction allowance available, enabling elimination of special movement compensators, swing joints, flexible connections and vibration isolators where possible.

##### 1.1 Materials:

- 1.1.1 Pipe - Shall be steel pipe, conforming to ASTM A-135, A-795 or A-53. All pipe shall be prepared according to Grinnell published specifications, or to ANSI/AWWA C-606 grooved end pipe. Pipe ends shall be prepared as detailed in Basic Materials and Methods.
- 1.1.2 Couplings - All flexible couplings shall be Grinnell Figure 705 and 707 with Grade "E" EPDM gaskets and zinc plated bolts and nuts. All rigid couplings shall be Grinnell Figure 772 with Grade "E" EPDM gaskets and zinc plated bolts and nuts.
- 1.1.3 Branch Connections - Branch stub-in connections shall be made with Figure 730 with Grade "E" EPDM gaskets and zinc plated bolts and nuts.
- 1.1.4 Flange Connections - Shall be Grinnell Figure 71 Flange incorporating Grade "E" EPDM gasket.
- 1.1.5 Fittings - Shall be Grinnell ductile iron or segmentally welded steel fittings, with grooved ends.
- 1.1.6 Butterfly Valves - Shall be of grooved end design with EPDM encapsulated disc. Neck design shall readily accommodate insulation. Valves shall have pressure assisted double seal and stainless steel upper stems, and be capable of 300 psi, bubble-tight-shut-off, with an actuator or hand lever.
- 1.1.7 Check Valves - Shall be of grooved end design with a clapper seal of EPDM. The valves shall have a spring-loaded clapper to ensure a leak tight seal and a non-sticking operation. The clapper seat in the valve body shall be nickel. Valves shall be capable of pressures of 300 psi.

#### SECTION 2 - COOLING TOWER PIPING

Same as Section 1, except pipe, couplings and fittings shall be galvanized.

#### SECTION 3 - DUAL TEMPERATURE SYSTEMS PIPING

Same as Section 1.

#### SECTION 4 - CONDENSER WATER PIPING

Same as Section 1.

### Building Service Systems - Heating

Heating System Specifications (CSI - Div. 15 Section 15-L Water Piping)

#### SECTION 1 - HOT WATER HEATING SYSTEMS - SUPPLY & RETURN

Grinnell Mechanical Grooved Pipe couplings, fittings and butterfly and check valves as manufactured or supplied by Tyco Fire & Building Products shall be used for hot water systems, including boiler manifolds, mains, risers, branches, supply and return lines, under operating conditions not to exceed 230°F (110°C). Calculations shall be based on coupling manufacturers latest literature to determine expansion allowance available, enabling elimination of special expansion compensators, swing joints, flexible connections and vibration isolators where possible.

##### 1.1 Materials:

- 1.1.1 Pipe - Shall be steel pipe, conforming to ASTM A-135, A-795 or A-53. All pipe shall be prepared according to Grinnell published specifications, or to ANSI/AWWA C-606 grooved end pipe. Pipe ends shall be prepared as detailed in Basic Materials and Methods.
- 1.1.2 Couplings - All flexible couplings shall be Grinnell Figure 705 and 707 with Grade "E" EPDM gaskets and zinc plated bolts and nuts. All rigid couplings shall be Grinnell Figure 772 with Grade "E" EPDM gaskets and zinc plated bolts and nuts. All reducing couplings shall be Grinnell Figure 716 with Grade "E" EPDM gaskets and zinc plated bolts and nuts.
- 1.1.3 Branch Connections - Branch stub-in connections shall be made with Grinnell Figure 730 with Grade "E" EPDM gaskets and zinc plated bolts and nuts.
- 1.1.4 Flange Connections - Flange connections shall be Grinnell Figure 71 Flange incorporating Grade "E" EPDM gasket.
- 1.1.5 Fittings - Fittings shall be Grinnell ductile iron or segmentally welded steel fittings, with grooved ends.
- 1.1.6 Butterfly Valves - Shall be of grooved end design with EPDM encapsulated disc. Neck design shall readily accommodate insulation. Valves shall have pressure assisted double seal and stainless steel upper stems, and be capable of 300 psi, bubble-tight-shut-off, with an actuator or hand lever.
- 1.1.7 Check Valves - Shall be of grooved end design with a clapper seal of EPDM. The valves shall have a spring-loaded clapper to ensure a leak tight seal and a non-sticking operation. Valves shall be capable of pressures of 300 psi.