

**1 PART 1 GENERAL****2 DESCRIPTION**

3 The requirements of this section apply to the insulation of plumbing systems specified elsewhere in these  
4 specifications.

5  
6 The requirements of Section 22 05 00, Common Plumbing Materials and Methods, also apply to this section.  
7

**8 QUALITY ASSURANCE**

9 Minimum Insulation Thickness and Thermal Performance: Comply with Chapter 13 provisions of the State of  
10 Oregon Structural Specialty Code.

11  
12 Composite (Insulation, Jacket or Facing and Adhesives) Fire and Smoke Hazard Ratings: Not to exceed a  
13 flame spread of 25 or smoke development of 50 and containing less than 0.1% by weight deca-PDE fire  
14 retardant.

15  
16 Component Ratings of Accessories (Adhesives, Mastics, Cements, Tapes, Finishing Cloth for Fittings): Same  
17 as "B" requirements above and permanently treated. No water soluble treatments.  
18

**19 SUBMITTALS**

20 Submit catalog data and performance characteristics for each product specified.  
21

**22 PRODUCT DELIVERY, STORAGE AND HANDLING**

23 General: In addition to the requirements specified in Section 22 05 00, the following apply:  
24

25 Deliver insulation, coverings, cements, adhesives and coatings to the site in factory-fabricated  
26 containers with the manufacturer's stamp or label affixed showing fire hazard ratings of the products.

27 Store insulation in original wrappings and protect from weather and construction traffic.

28 Protect insulation against dirt, water, chemical and mechanical damage. Do not install damaged  
29 insulation. Remove such insulation from project site.

**30 PART 2 PRODUCTS****31 ACCEPTABLE MANUFACTURERS**

32 Insulation Manufacturers: Johns Manville, Owens-Corning, Knauf, Certain Teed, Armstrong, Pabco, Imcoa or  
33 Nomaco. Johns Manville products are listed unless indicated otherwise.  
34

35 Adhesive Manufacturers: Foster, 3M, Insul-Coustic, Borden, Kingco or Armstrong.  
36

**37 PIPING INSULATION**

38 Interior and Exterior Piping Systems 32 to 180 Deg. F: Glass fiber preformed pipe insulation with a minimum  
39 K-value of 0.23 at 75 deg. F, a minimum density of 3.5 pounds per cubic foot within all-service vapor barrier  
40 jacket, vinyl or pre-sized finish and pressure sensitive seal containing less than 0.1% by weight deca-PDE fire  
41 retardant.  
42

43 Pipe Temperatures Minus 30 to 180 Deg. F: Flexible, preformed, pre-slit, self-sealing elastomeric pipe  
44 insulation up to 2-1/8" ID, thermal conductivity of 0.27 BTU/hr. sq. ft./in. at 75 deg. F and vapor transmission  
45 rating of 0.2 perms/inch. On cold surfaces, apply in thickness necessary to prevent condensation on the  
46 surface at 85 deg. F and 70% RH. Armstrong "Armaflex 2000" or, in concealed locations, Imcoa or Nomaco  
47 also approved.  
48

**49 INSULATION ACCESSORIES**

50 Insulation Compounds and Materials: Provide rivets, staples, bands, tapes, adhesives, cements, coatings,  
51 sealers, welded studs, etc., as recommended by the manufacturer for the insulation and conditions specified.  
52 No staples allowed on cold water piping systems.  
53

54 PVC Protective Jacketing and Valve and Pipe Fitting Covers: Johns Manville Zeston 2000, Proto LoSmoke,  
55 or Ceel-Co Ceel-Tite 100 Series with precut fitting fiberglass insulation or approved.

- 1  
2 Jacket Lap Sealing Adhesives: Foster Drion 85-75 contact cement or approved substitute.  
3  
4 Saddles and Shields: Unless otherwise indicated and except as specified in piping system specification  
5 sections, install the following types:  
6 Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that  
7 matches adjoining insulation.  
8 Protection Shields (MSS Type 40): Of length recommended by manufacturer to prevent crushing  
9 insulation.  
10 Thermal-Hanger Shield Inserts: For supporting insulated pipe, 360-degree insert of high-density,  
11 100-psi (690-kPa) minimum compressive strength, water-repellent-treated calcium silicate or cellular-  
12 glass pipe insulation, same thickness as adjoining insulation with vapor barrier and encased in 360-  
13 degree sheet metal shield.

### 14 **PART 3 EXECUTION**

#### 15 **PIPING INSULATION**

16 General: Do not insulate underground piping except at joints and fittings on preinsulated piping unless  
17 indicated otherwise. At Contractor's option and in accordance with Part 2 of this section, elastomeric  
18 insulation may be installed on domestic water piping in thicknesses equivalent to the glass fiber insulation.  
19 Installation shall comply with the manufacturer's recommendation with joints and seams completely sealed.  
20

#### 21 Domestic Water Piping:

22 Insulate with glass fiber pipe covering, 1" thick for cold water piping and for 1" and smaller hot water  
23 piping; 1-1/2" for 1-1/4" and larger hot water piping.  
24 Insulate hot water return piping same as cold water piping.  
25 Insulate all water piping exposed to outside weather and freezing temperatures with 1" thickness of  
26 glass fiber pipe covering with weather-proof metal jacket. Apply insulation after heat cable is  
27 installed.  
28 For PEX pipe installations delete requirements for insulation on cold water lines and non-circulated  
29 hot water lines. Circulated hot water and hot water recirculation lines to be insulated.  
30

#### 31 Pipe Fittings:

32 Insulate and finish all fittings including valve bodies, bonnets, unions, flanges and expansion joints  
33 with precut fiberglass insulation and preformed PVC covers sealed to adjacent insulation jacket for  
34 continuous vapor barrier covering over all fittings.  
35 Provide removable/reusable insulation covers on 4" and larger valves, unions, flanges, pump casings,  
36 strainers and similar fittings or equipment requiring periodic service.  
37

38 Protective Covering: Install continuous protective PVC or metal covering on all piping and fittings in  
39 mechanical rooms, accessible tunnels, attic spaces, accessible ceilings, etc., where insulation may be subject  
40 to damage. Install with rivets or cement seams and joints.  
41

#### 42 Insulated Piping: Comply with the following.

43 Attach clamps and spacers to piping.  
44 Piping Operating above Ambient Air Temperature: Clamp may project through insulation.  
45 Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with  
46 clamp sized to match OD of insert.  
47 Do not exceed pipe stress limits according to ASME B31.9.  
48 Install MSS SP-58, Type 39 or Type 40 protection saddles, if insulation without vapor barrier is  
49 indicated. Fill interior voids with insulation that matches adjoining insulation.  
50 Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe  
51 NPS 4 (DN100) and larger if pipe is installed on rollers.  
52 Shield Dimensions for Pipe: Not less than the following.  
53 NPS 1/4 to NPS 3-1/2 (DN8 to DN90): 12 inches (305 mm) long and 0.048 inch (1.22 mm)  
54 thick.  
55 NPS 4 (DN100): 12 inches (305 mm) long and 0.06 inch (1.52 mm) thick.  
56 NPS 5 and NPS 6 (DN125 and DN150): 18 inches (457 mm) long and 0.06 inch (1.52 mm)  
57 thick.

- 1 NPS 8 and NPS 14 (DN200 and DN350): 24 inches (610 mm) long and 0.075 inch (1.91
- 2 mm) thick.
- 3 NPS 16 and NPS 24 (DN400 and DN600): 24 inches (610 mm) long and 0.105 inch (2.67
- 4 mm) thick.
- 5 Pipes NPS 8 (DN200) and Larger: Include wood inserts.
- 6 Insert Material: Length at least as long as protective shield.
- 7 Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.
- 8
- 9 Piping Insulation Lap Seams and Butt Joints: Install insulation jacket in accordance with manufacturer's
- 10 recommendation and without staples on cold water lines. Where jacket joint and lap seams have not
- 11 adhered, remove affected section of insulation and reinstall or apply lap sealing adhesive in accordance with
- 12 manufacturer's instructions.
- 13
- 14
- 15

END OF SECTION