# GENERAL

## SECTION INCLUDES

### Piping insulation.

### Jackets and accessories.

## REFERENCE SECTION 22 05 00 FOR THE FOLLOWING GUIDELINES

### References

### Submittals

### Delivery, Storage and Handling

## QUALITY ASSURANCE

### See Section 22 05 00.

### Materials: Flame spread/smoke developed rating of 25/50 or less in accordance with ASTM E84, NFPA 255, and UL 723.

## ENVIRONMENTAL REQUIREMENTS

### Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.

### Maintain temperature during and after installation for minimum period of 24 hours.

# PRODUCTS

## GLASS FIBER

### Insulation: ASTM C547; rigid molded, noncombustible.

#### 'K' ('ksi') value: ASTM C335, 0.24 at 75 degrees F.

#### Minimum Service Temperature: 0 degrees F.

#### Maximum Service Temperature: 300 degrees F

#### Maximum Moisture Absorption: 0.2 percent by volume.

### Vapor Barrier Jacket

#### ASTM C921, White kraft paper reinforced with glass fiber yarn and bonded to aluminized film.

#### Moisture Vapor Transmission: ASTM E96; 0.02 perm inches.

#### Secure with self sealing longitudinal laps and butt strips.

#### Secure with outward clinch expanding staples and vapor barrier mastic.

### Tie Wire: 18 gage stainless steel with twisted ends on maximum 12 inch centers.

### Vapor Barrier Lap Adhesive: compatible with insulation.

### Insulating Cement/Mastic: ASTM C195; hydraulic setting on mineral wool.

### Fibrous Glass Fabric: Cloth, untreated; 9 oz./sq. yd. weight with 1.0 lb./cu ft. density blanket.

### Indoor Vapor Barrier Finish: Vinyl emulsion type acrylic, compatible with insulation, white color.

## CELLULAR FOAM

### Insulation: ASTM C534; flexible, cellular elastomeric, molded or sheet.

#### 'K' ('ksi') Value: ASTM C177 or C518; 0.27 at 75 degrees F.

#### Minimum Service Temperature: ‑40 degrees F.

#### Maximum Service Temperature: 220 degrees F.

#### Maximum Moisture Absorption: ASTM D1056; 1.0 percent (pipe) by volume, 1.0 percent (sheet) by volume.

#### Moisture Vapor Transmission: ASTM E96; 0.20 perm inches.

#### Maximum Flame Spread: ASTM E84; 25.

#### Maximum Smoke Developed: ASTM E84; 50.

#### Connection: Waterproof vapor barrier adhesive.

### Elastomeric Foam Adhesive: Air dried, contact adhesive, compatible with insulation.

## “FIRE WRAP” INSULATION

### 3M Fire Barrier Plenum Wrap 5A system.

#### System shall include all manufacturer-recommended sealants and accessories to provide full protection of enclosed piping.

## JACKETS

### PVC Plastic

#### Jacket: ASTM C921, One piece molded type fitting covers and sheet material, white color.

##### Minimum Service Temperature: ‑40 degrees F.

##### Maximum Service Temperature: 150 degrees F.

##### Moisture Vapor Transmission: ASTM E96; 0.002 perm inches.

##### Maximum Flame Spread: ASTM E84; 25.

##### Maximum Smoke Developed: ASTM E84; 50.

##### Thickness: 20 mil.

##### Connections: Brush on welding adhesive or pressure sensitive color matching vinyl tape.

#### Covering Adhesive Mastic: Compatible with insulation.

### Aluminum Jacket: ASTM B209.

#### Thickness: 0.040 inch.

#### Finish: Smooth.

#### Joining: Longitudinal slip joints and 2 inch laps.

#### Fittings: PVC pre molded fittings.

#### Metal Jacket Bands: 3/8 inch wide; 0.010 inch thick stainless steel.

### Stainless Steel Jacket: Type 304 or 316 stainless steel.

#### Thickness: 0.018 inch.

#### Finish: Smooth.

#### Metal Jacket Bands: 3/8 inch wide; 0.010 inch thick stainless steel.

# EXECUTION

## EXAMINATION

### Verify that piping has been tested before applying insulation materials.

### Verify that surfaces are clean, foreign material removed, and dry.

## INSTALLATION

### Install materials in accordance with manufacturer's instructions.

### On exposed piping, locate insulation and cover seams in least visible locations.

### Insulated pipes conveying fluids below ambient temperature:

#### Provide vapor barrier jackets, factory applied or field applied.

#### Insulate fittings, joints, flanges, unions strainers, flexible connectors and valves with molded insulation of like material and thickness as adjacent pipe. PVC or aluminum covers are required in all exposed locations as in mechanical rooms.

#### Finish with glass cloth and vapor barrier adhesive.

#### Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations.

#### Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.

### For insulated pipes conveying fluids above ambient temperature:

#### Provide standard jackets, with or without vapor barrier, factory applied or field applied.

#### Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. PVC covers are required in all exposed locations as in mechanical rooms.

#### Finish with glass cloth and adhesive.

#### For hot piping conveying fluids, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.

#### For steam piping insulate flanges and unions at equipment.

### Inserts and Shields:

#### Refer to Section 22 05 29 for additional information.

#### Application: Piping 1 inch diameter or larger.

#### Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.

#### Insert Location: Between support shield and piping and under the finish jacket.

#### Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.

#### Insert Material: ASTM C640 cork, hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.

#### Provide inserts and/or shields per manufacturer recommendations for cellular foam insulation applications in order to maintain continuous insulation throughout the pipe system. The removal of sections of cellular foam insulation to accommodate pipe supports is not acceptable. Manufacturer products specifically designed for supporting insulation and maintaining the integrity of the insulation system at pipe hanger locations, such Armaflex Armafix Insulation Pipe Hangers, are acceptable.

### Finish insulation at supports, protrusions, and interruptions.

### For pipe exposed in finished spaces below 8 feet above finished floor, finish with PVC jacket and PVC fitting covers.

### For piping exposed in mechanical rooms below 8 feet above finished floor, finish with aluminum jacket and aluminum fitting covers.

### All valves in insulated systems shall have valve stem extensions. Insulation installer shall notify the contractor and Owner if valves without stem extensions are encountered. All valves without stem extensions in areas where stem extensions are required shall be replaced.

## TOLERANCE

### Substituted insulation materials, where allowed, shall provide thermal resistance within 10 percent at normal conditions, as materials indicated.

## GLASS FIBER INSULATION SCHEDULE

### Plumbing Systems

PIPING SYSTEM: PIPE SIZE: THICKNESS:

Cold Water 6” & smaller 1/2”

Domestic Hot Water and Recirc 1-1/4" & smaller 1"

Domestic Hot Water and Recirc 1-1/2" & larger 1-1/2"

Roof Drain Bodies All sizes 1"

Roof Drainage Above Grade All sizes 1"

Outside Air Plenum Drain Piping All sizes 1/2"

Plumbing Vents Within 20 Feet

of the Exterior All sizes 1"

Fire Sprinkler System Main Drain and

Inspector’s Test Valve Drain Within

20 Feet of Building Exterior All sizes 1”

## CELLULAR FOAM INSULATION SCHEDULE

### Plumbing Systems

PIPING SYSTEM: PIPE SIZE: THICKNESS:

Refrigerant Piping 1-1/2” & smaller 1”

Refrigerant Piping 2” & larger 1-1/2”

Cold Condensate Drain Piping 6” & smaller 1”

END OF SECTION 22 07 19