# GENERAL

## SECTION INCLUDES

### Equipment insulation.

### Covering.

### Breeching insulation

## REFERENCE SECTION 23 05 00 FOR THE FOLLOWING:

### References

### Submittals

### LEED Submittal

### [Note to A/E: Edit to suit any LEED certification requirements]

### Quality Assurance

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

### Delivery, Storage and Handling

### 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, FLEXIBLE

### Insulation: ASTM C553; flexible, noncombustible.

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

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

#### Maximum service temperature: 250 degrees F.

#### Maximum moisture absorption: 0.2 percent by volume.

#### Density: 2.0 lb./cu ft.

### Vapor Barrier Jacket

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

#### Moisture vapor transmission: ASTM E96; 0.02 perm.

#### 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.

## GLASS FIBER, RIGID

### Insulation: ASTM C612; rigid, noncombustible.

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

#### Maximum service temperature: 450 degrees F.

#### Maximum moisture absorption: 0.1 percent by volume.

#### Density: 3.0 lb./cu ft.

### Vapor Barrier Jacket

#### Kraft paper reinforced with glass fiber yarn and bonded to aluminized film.

#### Moisture vapor transmission: ASTM E96; 0.02 perm.

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

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

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

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

## 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.

## CANVAS JACKET

### Fabric: ASTM C921, 6 oz./sq. yd., plain weave cotton treated with dilute fire retardant lagging adhesive.

### Lagging Adhesive: Compatible with insulation.

# EXECUTION

## EXAMINATION

### Verify that equipment 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.

### Do not insulate factory insulated equipment.

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

### Apply insulation close to equipment by grooving, scoring, and beveling insulation. Secure insulation to equipment with studs, pins, clips, adhesive, wires, or bands.

### Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor barrier cement.

### Insulated dual temperature equipment or cold equipment containing fluids below ambient temperature:

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

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

#### Insulate entire system.

### For insulated equipment containing fluids above ambient temperature:

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

#### Finish with glass cloth and adhesive.

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

### Inserts and Shields:

#### Application: equipment 1‑1/2 inches diameter or larger.

#### Shields: galvanized steel between hangers and inserts.

#### Insert location: between support shield and equipment 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.

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

### For equipment in mechanical equipment rooms or in finished spaces, finish with canvas jacket sized for finish covering.

### Do not insulate over nameplate or ASME stamps. Bevel and seal insulation around such labeling.

### Install insulation for equipment requiring access for maintenance, repair, or cleaning, in such a manner that it can be easily removed and replaced without damage.

## TOLERANCE

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

## [Note to A/E: Edit Equipment Insulation Schedules as necessary to suit project requirements]

## GLASS FIBER, FLEXIBLE INSULATION SCHEDULE

### Heating Systems

Equipment: Thickness (inches):

Heat exchangers/converters 2"

Air separators 1"

Steam pressure reducing valve 2”

## GLASS FIBER, RIGID INSULATION SCHEDULE

Equipment: Thickness (inches):

Air handling units air handling unit section

(if not factory insulated) 1-1/2"

## CELLULAR FOAM INSULATION SCHEDULE

Equipment: Thickness (inches):

Cooling system air separators 1-1/2”

Cooling systems pump bodies 1-1/2"

Cooling system suction diffusers and triple duty valves 1-1/2”

Cooling systems flanged strainer bodies. 1-1/2"

Cooling system expansion tanks 1-1/2”

Condensate drain pans 1-1/2”

END OF SECTION 23 07 16