

## 230719S01- HVAC PIPING INSULATION (Interior) (Ameresco)

See [006290S01 to 006290S04](#) for ESCO Buildings List / Compliance Requirements.

See chart below for fiberglass \*\* insulation application & thickness (inches) for listed pipe diameters

PIPE SYSTEM	TEMP RANGE DEG F	1	Pipe Diameter Range (inches)				
			1.25-2	2.5-4	5-6	8-10	12 -
			Insulation Thickness (inches)				
HIGH PRESS STEAM ( - 76 PSIG)	320 - 500	2.5	2.5	3.0	3.5	3.5	4.0
MED PRESS STEAM (21 - 75 PSIG)	260 - 320	2.0	2.5	2.5	3.0	3.0	3.5
LOW PRESS STEAM (0 - 20 PSIG)	201 - 260	1.5	1.5	2.0	2.0	2.5	3.0
HOT WATER* /HEATING WATER*	120 - 200	1.0	1.0	1.5	2.0	2.0	2.0
CONDENSATE	180 - 250	1.5	1.5	2.0	2.0	2.5	2.5
DOMESTIC WATER*	55 - 70	0.5	1.0	1.0	1.0	1.0	1.0
CHILLED WATER*	40 - 55	1.0	1.5	1.5	2.0	2.0	2.0

### NOTES:

- \* Equivalent thickness of closed cell foam insulation may be used. Where possible, insulation tubes are to be slipped over the carrier pipe (not slit). Joints and seams are to be neat and sealed. Closed cell foam is also to be used for exposed drains and refrigerant piping.

Exposed piping in any room and all piping in boiler or mechanical rooms shall have an 8 ounce canvas jacket applied over the fiberglass factory ASJ/SSL jacketing to further protect the insulation from abuse. This jacketing must be properly applied with lagging adhesive, such that the outer surface is smooth and free of wrinkles. The canvas jacketing in all mechanical areas is to be prepared for painting, and then painted according to the University of Kentucky standard piping color coding. All chilled water piping insulation shall be completely sealed so that a perfect vapor barrier is achieved.

- \*\* Calcium Silicate insulation is preferred over fiberglass in mechanical and heating plant applications, where piping is more subject to abuse. Insulation in mechanical areas must be protected with an 8 oz. canvas jacket applied with lagging adhesive.

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CALCIUM SILICATE INSULATION APPLICATION & THICKNESS (inches)						
PIPE SYSTEM	TEMP RANGE DEG F	-1	Pipe Diameter (inches)			
			1.25-2	2.5 - 6	8	10 -
HIGH PRESS STEAM ( -76 PSIG)	320 - 500	3.0	3.5	4.0	4.0	4.0
MED PRESS STEAM (21-75 PSIG)	260 - 320	2.5	3.0	3.5	4.0	4.0

1. Insulate all surfaces not requiring constant access.
2. Provide removable insulation for surfaces requiring periodic access.
3. Insulate all surfaces creating a burn hazard.
4. Exposed piping in any room and all piping in boiler or mechanical rooms shall have an 8 ounce canvas jacket applied over the fiberglass factory ASJ/SSL jacketing to further protect the insulation from abuse. This jacketing must be properly applied with lagging adhesive, such that the outer surface is smooth and free of wrinkles. The canvas jacketing in all mechanical areas is to be prepared for painting, and then painted according to the University of Kentucky standard piping color coding. All chilled water piping insulation shall be completely sealed so that a perfect vapor barrier is achieved.

**NOTE:**

\*\* Calcium Silicate insulation is preferred over fiberglass in mechanical and heating plant applications, where piping is more subject to abuse. Insulation in mechanical areas must be protected with an 8 oz. canvas jacket applied with lagging adhesive.

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### [Ameresco Contract]

#### STEAM/STEAM CONDENSATE & HOT WATER PIPING REMOVABLE JACKETING INSULATION

All steam pressure reducing stations shall be installed with removable jacketing insulation to allow service to the station. This includes all fittings, valves, etc. on the steam pressure reducing stations. All steam condensate pumps shall be installed with removable jacketing insulation over reservoir. All steam traps 2 1/2" and larger shall have removable jacket insulation. All steam control valves shall be installed with removable jackets for maintenance. Designer shall coordinate with UK on removable jackets required for HVAC hot water components such as large control valves or strainers.

Insulation shall meet at minimum the following specification:

1. Non-Asbestos Glass mat, type E needled fiber.
2. Temperature maximum of 450°F, Maximum water vapor transmission of 0.00 perm, and maximum moisture absorption of 0.2 percent by volume.
3. Jacket Material: Silicon/fiberglass compressed as required to give maximum 130F surface temperature depending on fluid medium in piping.
4. Construction: One piece jacket body with three-ply braided pure Teflon or Kevlar thread and insulation sewn as part of jacket.
  1. Sewn lock stitch with a minimum 4 to 6 stitches per inch. The thread must be able to withstand the skin temperatures without degradation.
  2. Hog rings, staples and wire are not acceptable methods of closure. Velcro straps alone are not acceptable unless written permission from UK (hook & loop method required).
  3. No raw cut jacket edges shall be exposed.
  4. Jackets shall be fastened using hook and loop (Velcro) straps
  5. Provide a permanently attached Aluminum or stainless steel nameplate on each jacket to identify its location, size and tag number.
  6. The insulation shall be designed to minimize the convection current in the space between the hot metal surface and the inner layer of insulation. To this end, during jacket fabrication, the layers of insulating mat shall be placed in an overlapping pattern.
  7. Insulation must be sewn as integral part of the jacket to prevent shifting of the insulation.
  8. Insulation thickness: As required for Touch Temperature Exterior of all jacket < 130F.