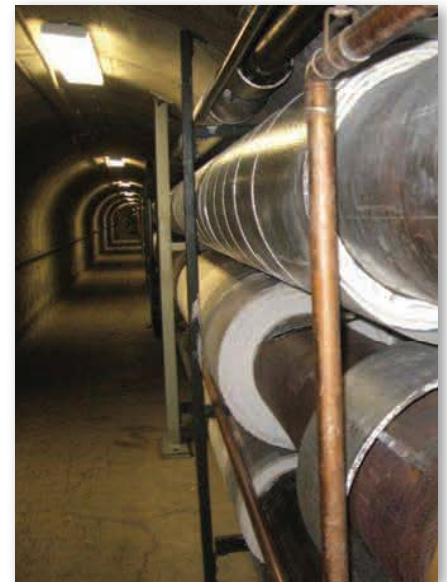


At Univ. of Minn., Aerogel Insulation Upgrades Energy Efficiency of Steam Lines in Space- Limited Tunnels

Thin, flexible, waterproof aerogel insulation a perfect fit for asbestos-remediated, confined-space steam and condensate pipes



CASE STUDY

DETAILS

Location: University of Minnesota, Minneapolis
Insulation Partner: Power Process Equipment Inc.

CHALLENGES

- System services 92 campus buildings.
- Insulate steam lines operating at 396°F service temperature.
- All piping was in tunnels with congestion and interference.
- Existing insulation was 4" thick fiber insulation.
- Design criteria was to meet ASHRAE 90.1-2010.
- Could not meet new standard with traditional insulation material in 4" space limitation.

SOLUTIONS

- Five layers of **Pyrogel® XT** (50 mm, 2") used on all lines. Thickness met ASHRAE 90.1-2010 standard.
- Re-insulation of 1,000 feet of 12" NPS existing piping.
- New insulation on 5,000 feet of 14" NPS new piping.
- Outward clenching staples used to attach insulation in tight spaces prior to jacketing.
- Pre-cutting of Pyrogel XT in staging area outside tunnels minimized clean-up.

BENEFITS

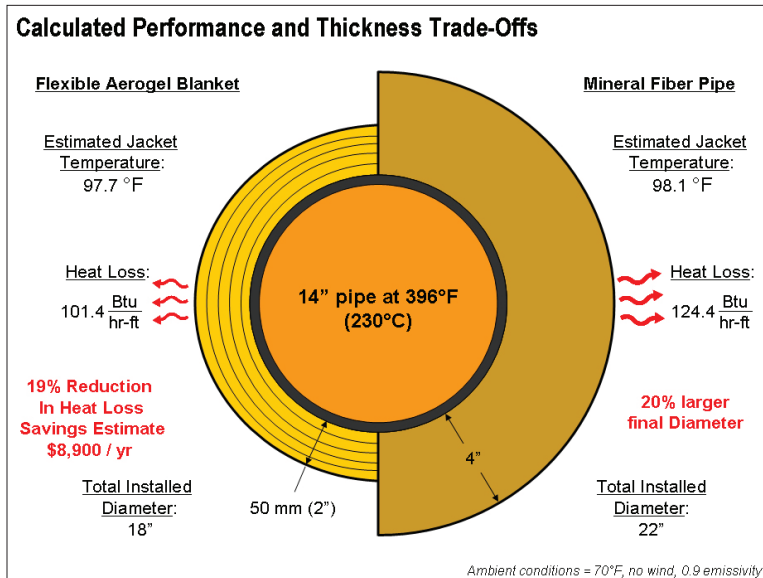
- Heat loss improvement of 19% over comparable design with traditional insulation materials.
- Estimated \$8,900/year savings in fuel costs.
- Superior water management provides assurance of long-term performance.
- Reduced materials improved logistics to complete renovation work:
 - Truck deliveries reduced nearly 50%
 - Reduced insulation packaging waste
 - Reduced storage and staging area requirements
 - Reduced local portage from staging to tunnel work site



Southeast Steam Plant, University of Minn. campus



Jacket notched around support, due to space limitations and interferences



Logistics Advantage - Reduced Trucking, SKUs, Waste, and Weight

	High-Temperature Aerogel Blanket	4" Mineral Fiber Pipe Cover	5" Fiberglass Pipe Cover (2-layer)
Cartons/Rolls Required	240 Rolls	3,500	7,000
Weight of Material (lbs.)	86,400	136,500	196,000
Delivery Trucks	3	7	12
Packaging Volume (ft³)	9,000	27,930	54,110
No. of 20-yd Dumpsters	1	8	14