

At Univ. of Chicago, Aerogel Insulation Upgrades Energy Efficiency of Steam Lines in Vaults Subjected to Repeated Flooding

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



CASE STUDY

DETAILS

Location: University of Chicago
Insulation Contractor: Falls Mechanical

CHALLENGES

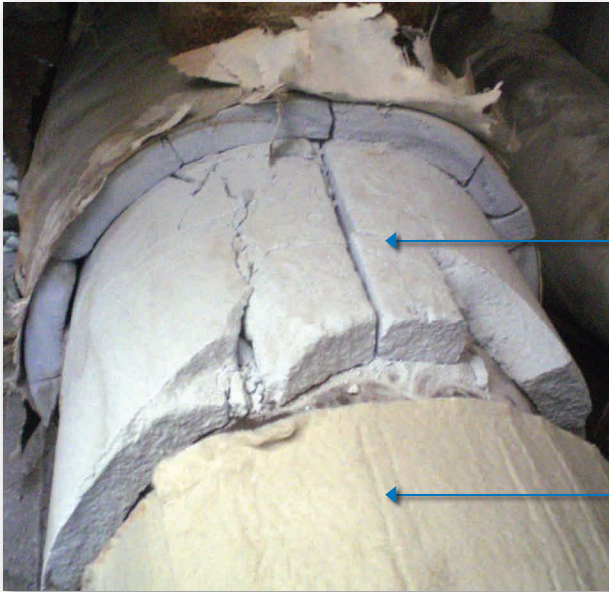
- 12" steam lines and 8" condensate lines located in a vault.
- Vault has been subjected to repeated flooding and existing insulation was severely degraded with sections completely washed off and missing.
- Many valves, fittings, flanges, and elbows in the vault created space limitations, hard to access piping.
- Existing insulation was 2" thick fiber insulation.
- Design criteria were to match thermal performance of "new" fiber insulation and create a durable insulation solution that could perform through flooding events without having to be replaced.

SOLUTIONS

- Two layers of **Pyrogel® XT** (20 mm, 0.8") used on all lines. Thickness met ASHRAE 90.1-2010 standard.
- Pre-cut "lobster tail" elbows were used to facilitate faster installation rates.
- Field cut flanges and valves were used to demonstrate flexibility of the material in maintenance situations.

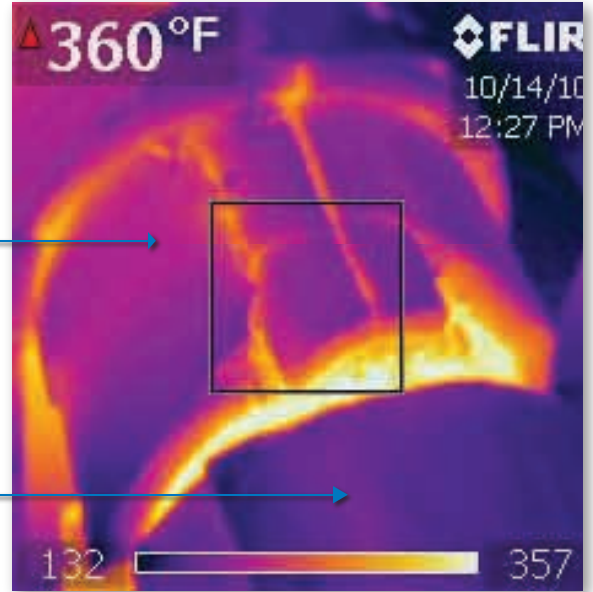
BENEFITS

- Touch temperature of the piping was reduced by more than 60°F.
- Superior water management provides assurance of long-term performance through flooding events.
- Reduced materials improved logistics to complete renovation work:
 - Truck deliveries reduced
 - Reduced job-site waste
 - Reduced storage and staging area requirements
 - Reduced local portage from staging to vault work site



Old two-layer insulation cracked and broken (360°F)

New Pyrogel aerogel insulation (132°F)



Pyrogel aerogel insulation on pipe



Old insulation in vault

COVER, BOTTOM PHOTO: Pyrogel aerogel insulation fits under the flange bolts, which makes a tighter insulation fit.