07 20 00 Thermal Protection

Revision 01/04/2019

Purpose:

The Architect and/or Engineer shall incorporate the Rice specific requirements indicated in this standard's section into their design. The Architect and/or Engineer shall further produce project specifications in line with industry standards that are updated to reflect these Rice specific requirements.

1. **General Requirements**
    a. When calculating the insulating requirements, use the weather data:
        i. Most recent edition of ASHRAE weather data for Hobby Airport with 99% heating and 1% cooling categories used. Indoor temperature shall be per 01 05 00 Environmental Standards.
    b. Architect shall be familiar with weather patterns of the Texas Gulf Coast area, or shall hire sub-consultant to advise on unique design considerations. Architect will need to prove familiarity to Rice Project Manager.
2. **Design Standard**
    a. Insulation systems must be in strict accordance with the latest version of the International Energy Code and/or ASHRAE Standard 90.1.
    b. Insulation for cold piping and equipment must have a water vapor permeability not to exceed 0.117 per inch and must not deteriorate in the presence of water.
    c. Insulation for hot piping systems must be rated for temperatures equal to 110% of the design rated temperature of the system.
    d. Insulation exposed to outside weather conditions, or in tunnels must have aluminum jackets.
    e. Interior duct-liner is not preferred and must be approved by Rice Construction Services prior to design. Typical exceptions for sound attenuation purposes include limited duct runs (less than 30') immediately exiting an AHU and thru-wall jumper ducts between offices/rooms and corridors in plenum returns above ceiling.
        i. Where internal liner is approved by Rice, fiberglass liner shall not be used.
3. **Product Standard**
    a. Acceptable products for cold piping and equipment: Koolphen K, Trymer, Pittsburg Corning (PC) Foam Glass. Fabricate with vapor barrier jacket applied.
    b. Acceptable products for heating water systems (180°F max design temperature) Glass fiber insulation, with All Service Jacket manufactured by Manville Knauf, Owens Corning and approved equals Koolphen K, Trymer and PC Foam glass and approved equal fabricated with ASJ.
    c. Acceptable products for steam piping and equipment: Calcium Silicate, PC Foam glass with ASJ Jacket

d. Acceptable products for ductwork and air handling systems: Glass fiber blanket insulation with vapor barrier jacket and adhesive manufactured by Manville, Knauf, Owens Corning or approved equals.
e. Acceptable products for grease exhaust duct: Calcium Silicate insulation and fire rated drywall barrier; Fire Master ceramic duct wrap (thickness and details as outlined in products U.L. listing for fire rated enclosure).

4. <u>Performance Standard</u>

a. Insulation systems must be applied to piping and ductwork only after piping/ductwork systems have been tested and approved by the Rice University's Project Manager or Rice Construction Services. (Both pressure testing and cleaning/flushing tests).
b. Piping systems must be clean, dry and free of dirt, oils and debris before insulation is applied.
c. Insulation that is damaged by construction activities must be replaced. Patching is only acceptable as determined by Rice Construction Services. It is the Contractor's responsibility to thoroughly document existing conditions (in this case, insulation) prior to start of construction.
d. Insulation systems that are not rigid by nature will require a "hard section" at each hanger. Sheet metal saddles should be applied at each hanger. For insulated piping run at ground level, a sheet metal saddle should be installed on the top of insulation where piping crosses walkways. Saddles should be attached with galvanized or stainless steel duct clamps with worm drive.
e. Joining of insulation sections and securing the insulation to the piping must be approved by the Rice University's Project Manager. In general, self-sealing lap joints and taped butt joints are not desirable. Mechanically jointed laps with sealant applied at laps and butts or floated fiber mesh joints are preferred.
f. The contract should include painting of all piping systems. Color coding of piping to the Rice University's Standard must be included.
g. Pipe marking and flow arrows should be applied after color coating is complete and approved by the Rice University's Project Manager.