

23 30 00 HVAC Air Distribution

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 Design Standards

- a. Low pressure duct systems are preferred.
 - i. If a high pressure system is warranted:
 1. Approval of the Rice Project Manager/Rice Mechanical Engineer is required prior to initiating design.
 2. Manufactured spiral re-enforced galvanized steel duct systems should be considered for higher pressure.
 3. At a minimum, duct system in excess of three (3) inches W.G. must be pressure tested.
 4. Sealed Class A SMACNA.
- b. Fiberglass duct systems and duct board systems are not acceptable.
- a. Use of internal duct liner is NOT permitted without Rice Project Manager approval. 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. Acoustically sensitive applications that require the use of internally lined duct must be approved by the Rice University Construction Services.
 1. "Fiber Free" acoustical lining using sheet rubber material should be considered as replacement for glass fiber lining.
 - ii. Where external insulation is not possible, internal may be allowed. Rice University Construction Services Approval is required prior to design.
- c. Water based sealants are preferred, except in exterior duct applications.
- d. Solvent based sealants should be used in exterior applications.
- e. All ductwork shall be constructed and installed according to latest SMACNA standards for required sheet metal thickness, internal and external structural duct support and sealing requirements.

2. Rigid Ductwork

- a. Welded joint, stainless steel duct systems should be used for the following:
 - i. Laboratory Exhaust systems. 16 gauge 316L SS.
 - ii. Shower Room Exhaust systems.
 - iii. Unprotected exterior mounted ductwork.
 - iv. Drainable sections at duct mounted humidifiers.
 - v. All welded systems must be fully pressure tested according to the latest SMACNA guidelines. Pressure tests to be witnessed by Rice Construction Services.

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- b. Welded joint, black or galvanized steel and stainless steel duct systems should be used for Kitchen Hood Exhaust systems.
- c. Teflon Lined ductwork
 - i. Certain laboratory exhaust ducts will require scrubbers and Teflon lined ducts from fume hoods, if “aqua regia” or other strong chemicals are in use.
 - ii. Architect and/or Engineer should request clarification from the Rice University Project Manager if Teflon coated ductwork design will be required. This should be completed prior to 100% Schematic Design.

3. **Flexible Ductwork**

- a. All flexible ducts must be insulated (R-8 minimum) and include an outer jacket (silver – “No Plastic”) for containment of the insulated covering.
- b. The maximum length of flexible duct should be 6 feet.
- c. Semi-rigid spiral locking flexible duct is preferred for connection to terminals.
- d. Flexible duct systems should be secured at both ends with removable fasteners.
- e. Semi-rigid flexible duct systems should be connected with sheet metal screws and stainless steel, or Tygon banding on the outer jacket.
- f. Spiral wound flexible duct should be attached using stainless steel banding, both at the duct collar and at the outer jacket.

4. **Duct Supports**

- a. Duct support should be made using structural steel and threaded rod or solid straps. Perforated strap suspension systems are not acceptable.
- b. Vibration Isolation on duct supports to be determined by Acoustical Consultant.

5. **Testing and Inspections**

- a. **All** duct work **medium pressure and higher** shall be tested using the latest SMACNA Standards.
- b. Testing shall be witnessed by the Rice University Construction Services.
- c. Duct systems must be tested before insulation is applied. If ductwork has been insulated and no documentation of testing can be produced with Rice witness, insulation shall be removed and pressure testing shall be performed in accordance to the project specifications.