

Requirements for Suspended Equipment Restraints Definitions and Locating Requirements

While SMACNA has developed a set of restraint placement criteria based on analytical review, practical experience, and historical analysis for piping and ductwork, their material does not address the restraint of equipment. The criterion presented in this manual is generally based on SMACNA concepts and criteria, except that it is modified to make it appropriate for use on equipment applications. The only exception to this is that the data has been extrapolated to higher seismic force levels and hardware capacity limited forces and is not limited by buckling issues as is the case with piping and ductwork.

With respect to the conceptual restraint arrangement illustrations, many of the SMACNA concepts are appropriate and are referenced here.

In general, equipment is restrained on a unit by unit basis and the concept of “runs” as defined in the piping and ductwork sections of the manual are not appropriate. In places where there are long lengths of pipe or duct integral to the equipment (like radiant heaters), that portion of the equipment should be restrained in the same manner as piping or ductwork. More information on this can be found in the piping/ductwork Chapters of the manual on this.

Also, in some cases, small pieces of equipment may be “hard” mounted into the ductwork. Under some conditions (see the code section of the manual), these can be treated as part of the duct and properly restraining the duct will result in acceptable restraint of the equipment. This is not true if the equipment is connected to the duct using a flexible material.

Definitions

Lateral A horizontal force acting on the equipment in any direction.

Restraint A device that limits the motion of the equipment in any horizontal direction.

Rod Stiffener A component added to a hanger rod to prevent it from buckling

Restraint Requirements

- 1) Equipment must be restrained against a lateral force that can act in any direction. Multiple restraint components may be required to accomplish this task.
- 2) For long modularized equipment (20 ft or longer), additional restraints should be installed so the span between the restraints does not exceed 20 ft.

DEFINITIONS AND LOCATING REQUIREMENTS

PAGE 1 OF 2

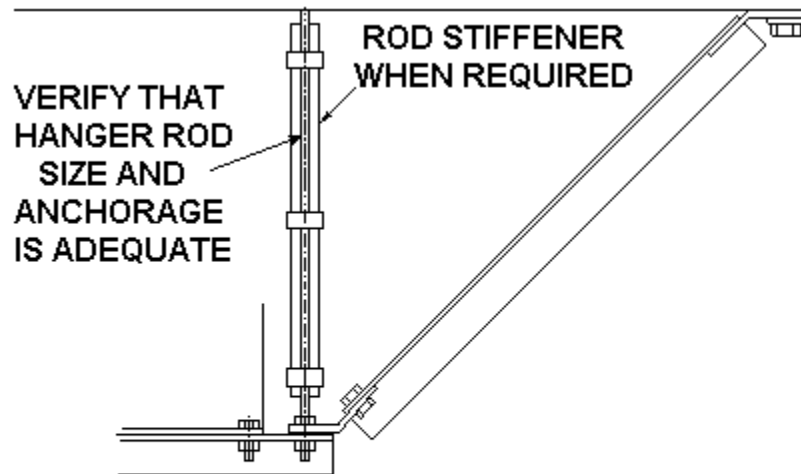
RELEASE DATE: 6/4/04



Toll Free (USA only): 800-959-1229
International: 614-889-0480
Fax: 614-889-0540
World Wide Web: www.kineticsnoise.com
Email: sales@kineticsnoise.com

DOCUMENT:
D10.4.1


- 3) Restraints must be connected to substantial attachment points on the equipment or to equipment support members that are in turn connected substantially to the equipment. Hardware in size equal to that identified for the restraint attachment (Chapter D4) should be used to attach the equipment.
- 4) All restraints for a given piece of equipment must be the same. (You cannot mix struts and cables.)
- 5) With longer hanger rods, rod stiffeners are likely to be required. Refer to the appropriate table in Chapter D4 to determine: (1) if needed, (2) what size stiffener material is appropriate, and (3) how frequently it needs to be clamped to the hanger rod.
- 6) In addition to possibly requiring rod stiffeners, when struts are used to restrain equipment, the size of the hanger rod and its anchorage also become critical. Again refer to the appropriate table in Chapter D4 to determine the minimum allowable size for the hanger rod and anchor.



- 7) There is no hanger rod length or component size based exclusion rules for equipment as there is for piping or ductwork with the following exception. If the equipment is hard connected to a duct, small enough to be considered part of the duct (see appropriate code section) and the duct is exempted by one of these rules, the equipment can also be considered to be exempted.

DEFINITIONS AND LOCATING REQUIREMENTS



Toll Free (USA only): 800-959-1229
 International: 614-889-0480
 Fax: 614-889-0540
 World Wide Web: www.kineticsnoise.com
 Email: sales@kineticsnoise.com

DOCUMENT:
D10.4.1
 VISCMA
 MEMBER