

EXEMPTIONS FOR HVAC DUCTWORK

D2.1 – 6.1 Introduction:

The 2000/2003/2006 IBC has some general exemptions that apply to HVAC ductwork based on Component Importance Factor and the size of the duct. At present, there are not as many exemptions for ductwork as there are for piping. The number of exemptions for ductwork changed with SMACNA being dropped as a reference document in the 2003/2006 IBC. This will be discussed below in the appropriate section.

D2.1 – 6.2 The 12" Rule (Section 9.6.3.10-a) [Section 13.6.7-a]¹:

No seismic restraints will be required for ductwork with a Component Importance Factor equal to 1.0 that meets the requirements of the 12" Rule for the entire run of ductwork. The 12" Rule is said to apply to a run of ductwork if:

1. The HVAC ducts a suspended for hangers that are 12" (305 mm) or less in length for the entire run of ductwork. This is usually measured from the supporting structure to the top of the trapeze bar that is supporting the ductwork.
2. The hangers have been detailed and constructed in order to avoid significant bending of the hanger and its attachments. As with the 12" rule applied to piping, the industry generally interprets this to mean that the connection of the hanger to the structure must be "non-moment generating", or free swinging.

¹ References in brackets (Section 9.6.3.10-a) [Section 13.6.7-a] apply to sections, tables, and/or equations in ASCE 7-98/02 and ASCE 7-05 respectively which forms the basis for the seismic provisions in 2000/2003 IBC and 2006 IBC respectively.

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D2.1 – 6.0
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D2.1 – 6.3 Size Exemption (Section 9.6.3.10-b) [Section 13.6.7-b]:

No seismic restraints are required for ductwork with a Component Importance Factor equal to 1.0 if the cross-sectional area is less than 6 ft² (0.557 m²).

D2.1 – 6.4 Further Exemptions for Ductwork (Sections 9.6.1.1.2 and 9.6.3.10) [Section 13.6.7]:

There are no further exemptions for ductwork in 2006 IBC. The SMACNA Seismic Restraint Manual does have exemptions for ductwork that has been assigned a Component Importance Factor equal to 1.5. For 2000 IBC the SMACNA Seismic Design Manual was an accepted standard, and ductwork with a cross-sectional area of less than 6 ft² (0.557 m²) may be exempted from the need for seismic restraint. However for 2003 IBC and 2006 IBC, the SMACNA Seismic Design Manual was removed from the design portion of the code and was, instead, incorporated as an Accepted Standard in Section 9.6.1.1.2 of ASCE 7-02, which applies to 2003 IBC. The SMACNA Seismic Restraint Manual is not specifically identified in ASCE 7-05, 2006 IBC instead the following statement was inserted into the design portion of the code.

“HVAC duct systems fabricated and installed in accordance with standards approved by the authority having jurisdiction shall be deemed to meet the lateral bracing requirements of this section.”

In other words, it will be up to the local building authority to approve or disapprove SMACNA or any other reference documents. So, the HVAC design professional and contractor will need to petition the local building authority for permission to use the exemptions in the SMACNA Seismic Restraint Manual.

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D2.1 – 6.5 Restraint Allowance for In-Line Components (Section 9.6.3.10) [Section 13.6.7]:

This allowance deals with components, such as fans, heat exchangers, humidifiers, VAV boxes, and the like, that are installed in-line with the ductwork. Components that have an operating weight of 75 lbs (334 N) or less may be supported and laterally, seismically, braced as part of the duct system. Where the lateral braces, seismic restraints, have been designed and sized to meet the requirements of ASCE 7-98/02 Section 9.6.1.3 or ASCE 7-05 Section 13.3.1. The following requirements will also apply to these components.

1. At least one end of the component must be hard, rigidly, attached to the ductwork. The other end may have a flex connector or be open. The flex connected, or open end, of the component must be supported and laterally braced. This requirement is not mentioned as part of ASCE 7-98, -02, or -05, but is a requirement that is born out of common sense.
2. Devices such as diffusers, louvers, and dampers shall be positively attached with mechanical fasteners.
3. Unbraced piping and electrical power and control lines that are attached to in-line components must be attached with flex connections that allow adequate motion to accommodate the expected differential motions.

D2.1 – 6.6 Summary:

As with the piping exemptions these exemptions and allowances, with careful planning, can save the contractor and the building owner a great deal of effort and money. There is also a great advantage to petition the local building authority to allow the SMACNA Seismic Design Manual to become a reference document for the project. This will allow the exemptions spelled out in the SMACNA Seismic Design Manual to be utilized to best advantage

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