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The 12 Inch Exemptions for Piping and Ductwork

This document will lay out The VMC Group's approach to the 12 inch Rule.

Since the advent of the International Building Code (IBC) in 2000, this exemption for piping and ductwork has been interpreted in a multitude of conflicting ways. As the IBC is based on the standard ASCE7-xx, all of those documents will be referenced within. This document will lay out The VMC Group's approach to this issue. It is important to note that SMACNA is not code, nor law. It is a guideline. ASCE 7 and IBC govern code compliance.

Piping

To date, there have been four versions in four separate documents written for piping. They state that for all piping, **regardless of importance factor** (Ip), seismic restraints are not required when:

IBC-2000: Section 1621.3.10.2.1; Para 2.1:

> *"Seismic supports are not required for piping supported by rod hangers provided that hangers in the pipe run are 12 inches (305 mm) or less in length from the top of the pipe to the supporting structure and the pipe can accommodate the expected deflections. Rod hangers shall not be constructed in a manner that would subject the rod to bending moments."*

ASCE 7-98: Section 9.6.3.11.4; Para c: & ASCE 7-02: Section 9.6.3.11.4; Para b:

> *"Rod hangers shall not be used as seismic supports unless the length of the hanger from the supporting structure is 12 in (305 mm) or less. Rod hangers shall not be constructed in a manner that subjects the rod to bending moments."*

ASCE 7-05: Section 13.6.8; Para 1:

> *"Piping is supported by rod hangers; hangers in the pipe run are 12 inches (305 mm) or less in length from the top of the pipe to the supporting structure; hangers are detailed to avoid bending of the hangers and their attachments; and provisions are made for piping to accommodate expected deflections."*

ASCE 7-10: Section 13.6.8.3; Para 2:

> *"The piping is supported by hangers and each hanger in the piping run is 12 inches (305 mm) or less in length from the top of the pipe to the supporting structure. Where pipes are supported on a trapeze, the trapeze shall be supported by hangers having a length of 12 in. (305 mm) or less. Where rod hangers are used, they shall be equipped with swivels, eye nuts, or other devices to prevent bending in the rod."*

Ductwork

Similarly, there are various forms of this statement for stating that seismic restraints are not required for ductwork when:

IBC-2000: Section 1621.3.9; Para 1:

> *"For ductwork where Ip = 1.0: HVAC ducts are suspended from hangers and hangers are 12 inches (305 mm) or less in length from the top of the duct to the supporting structure and the hangers are detailed to avoid significant bending of the hangers and their attachments."*

ASCE 7-98 & ASCE 7-02: Section 9.6.3.10; Para a:

> *"For ductwork where Ip = 1.0: HVAC ducts are suspended from hangers 12 inches (305 mm) or less in length from the top of the duct to the supporting structure. The hangers shall be detailed to avoid significant bending of the hangers and their attachments, …"*

ASCE 7-05: Section 13.6.7; Para a

> *"For ductwork where Ip = 1.0: HVAC ducts are suspended from hangers 12 inches (305 mm) or less in length. The hangers shall be detailed to avoid significant bending of the hangers and their attachments."*

ASCE 7-10: Section 13.6.7;

> *"**EXCEPTIONS**: The following exceptions pertain to ductwork not designed to carry toxic, highly toxic, or flammable gases or used for smoke control:"*
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> Para b:
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> *"The ductwork is supported by hangers and each hanger in the duct run is 12 inches. (305 mm) or less in length from the duct support point to the supporting structure. Where rod hangers are used, they shall be equipped with swivels to prevent inelastic bending in the rod."*

Note that for ASCE 7-10, the exception for ductwork that has an Ip of 1.5 has been relaxed slightly.

For ductwork, all codes allow for other referenced standards to be deemed acceptable if approved by the authority having jurisdiction. This is meant to allow seismic restraints installed per SMACNA to be acceptable, but only if the specific Authority Having Jurisdiction (AHJ) accepts it, which is not always the case.

SMACNA Seismic Restraint Manual, Second Edition (1998): Section 3.2:

> *"No bracing is required if the duct is suspended by hangers 12 inches or less in length, as measured from the top of the duct to the bottom of the support where the hanger is attached. Hangers must be positively attached to the duct within 2 inches of the top of the duct with a minimum of two #10 sheet metal screws."*

SMACNA Seismic Restraint Manual, Third Edition (2008): Section 3.3:

> "Seismic supports are not required for HVAC ductwork when the Ip = 1.0 if … the following condition(s) is met for the entire duct run:
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> a. Ducts are suspended from hangers 12 inches or less as measured from the top of the duct to the bottom of the support where the hanger is attached. Hangers must be positively attached to the duct within 2 inches of the top of the duct with a minimum of two #10 sheet metal screws. Lateral motion will not cause damaging impact with other systems. Lateral motion will not cause loss of vertical support"

Summary

For both piping and ductwork in ASCE7-10 the concept of swivels has come up. The VMC Group will use this latest version of the code as our standard going forward. We will utilize our isolation hangers as the "other devices to prevent bending in the rod." When installed properly, our rubber and/or spring hanger boxes will act as a moment release, and therefore, not allow the rod to bend.

One other noticeable change is the allowance, in ASCE7-10, of some ductwork with an Ip of 1.5 as being allowed to have the exemption. Alternatively, SMACNA now excludes all ductwork with an Ip of 1.5 from being exempt. The VMC Group will follow the ASCE7 code when allowing this exemption for certain ductwork where Ip = 1.5.

In all cases, the requirement needs to be met for the complete run. For installations where a significant portion of the run is within 12", bracing only will be required at those locations with rod lengths greater than 12", providing isolation hangers are used at the other locations.

If you have any questions regarding the 12 Inch Exemptions for Piping and Ductwork, or if you wish to receive additional copies of our Code Interpretation and Clarification by The VMC Group, please contact ***ibcinfo@thevmcgroup.com.***

About the Author...

Mr. John P. Giuliano, PE, incorporates his engineering and business management experience in his capacity as President of The VMC Group. His comprehensive experience and knowledge in vibration isolation, seismic design and code compliance has made him a pioneer in helping define requirements for certification methodologies of non-structural building components in the areas of HVAC, power generation and fire protection. John has an engineering degree and a specialty in economics from Polytechnic Institute of New York. He is a licensed Civil/Structural Professional Engineer in the state of NY. Prior to joining VMC, he spent 12 years in the aerospace industry working at Northrop-Grumman and Lockheed Martin in the design of military aircraft. Mr. Giuliano is also a founding member of VISCMA (Vibration Isolation and Seismic Controls Manufacturers Association) and has been actively involved with this organization since its inception. He is also a member of ASHRAE (American Society of Heating, Refrigeration and Air Conditioning Engineers), ICBO (International Conference of Building Officials), and BSSC (Building Seismic Safety Council).

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Aeroflex International Isolators has provided mission critical products and solutions to leading military, aerospace and defense companies for more than 35 years.

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Additionally, our engineering staff includes leading structural engineers with industry-recognized credentials in structural analysis, IBC seismic qualification and wind certification services, OSHPD pre-approval services, seismic project management, seismic and wind engineering design, bomb blast and shock modeling and system dynamics.

As a certified seismic qualification agency for IBC code compliance, The VMC Group can help you through the seemingly daunting task of equipment qualification and certification. With our turnkey solutions for IBC Certification and OSHPD Seismic Qualifications, we will manage all aspects of your project including: Development of product matrices; Management of shake table testing; Performance of structural analysis and mathematical modeling (FEA modeling), as well as Issuance of the certificates of compliance and product labeling required by the code

Our engineering services, manufacturing facilities and corporate offices are located in Bloomingdale, New Jersey with additional manufacturing and engineering offices located in Houston, Texas and Sacramento, California.

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