

## IBC 2000 Ductwork Restraint Rules

The following information is based on the 2000 IBC Code itself and does not take into account more stringent specifications or local requirements.

Prior to using this document, the appropriate ( $S_{DS}$ ) design spectral response for the project in question must be determined. This is a function of the mapped short period spectral response and the soil classification factor. If the soil type is unknown, type "D" should be assumed.

In addition, the project must be classified according to "seismic use group". Refer to the code or separate documentation for a detailed breakdown as to the definitions of various "seismic use groups."

Lastly, the ductwork system's importance factor must be determined. This factor is now tied more closely to the use of, or hazard generated by, the ductwork rather than the use of the structure. There are two levels of importance: 1.0 and 1.5. The importance factor of 1.5 is used under the following conditions:

- 1) The component is a life-safety component that must function after an earthquake.
- 2) The component contains hazardous or flammable material in excess of exempted limits.
- 3) Components needed for continued operation of Group III occupancy structures.
- 4) Components whose failure could result in damage to a system or space required for continued operation of Group III occupancy structures.
- 5) All other conditions use an importance factor of 1.0.

Using the seismic use group in conjunction with the design spectral response, the seismic design category can be determined from the table below:

Seismic Design Category based on .2 Second Response Accelerations			
$S_{DS}$ Value	Seismic Use Group		
	I	II	III
$S_{DS} < 0.167g$	A	A	A
$0.167g \leq S_{DS} < 0.33g$	B	B	C
$0.33 \leq S_{DS} < 0.50g$	C	C	D
$0.50g \leq S_{DS}$	D	D	D
$0.75g \leq S_1^a$	E	E	F

<sup>a</sup> $S_1$  is mapped max considered spectral response

### IBC 2000 DUCTWORK RESTRAINT RULES

PAGE 1 OF 2

RELEASE DATE: 11/7/03



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



## Ductwork Exempt from Restraint Requirement

### **Ductwork of all types that does not require seismic restraint per code:**

- 1) Any ductwork that is placed in a structure that falls into seismic design category A or B (1621.1.1).
- 2) Any ductwork that is placed in a structure that falls into seismic design category C and has an importance factor of 1.0 (1621.1.1).
- 3) Any ducting system in any seismic design category that has an importance factor of 1.0, weighs less than 400 lb, is mounted within 4 ft of the floor, is flexibly mounted to all interfacing equipment, and is not critical to the continued operation of the structure (1621.1.1).

### **High hazard ductwork systems that do not require seismic restraint per code:**

- 1) Restrain all ducts regardless of size (1621.3.9).

### **General ducting systems that do not require seismic restraint per code:**

- 1) Runs of ductwork with an importance factor of 1.0 that are supported by hangers where all rod hangers are a maximum of 12" long (from top anchor position to top of duct or from top anchor position to top of trapeze bar, whichever is longer). The rods must be detailed to avoid significant bending of the hanger rods or connections. Note that all hanger rods on the run must comply with the above to meet this criteria and the swinging of the ducts must not interfere with other ducts or systems (1621.3.9 item 1).
- 2) Ducts with an importance factor of 1.0 and with a cross-sectional area of 6 square feet or less. The ductwork must also be located such that impacts with other ductwork or equipment will not occur during a seismic event, and adequate flexes at the equipment interfaces must be provided (1621.3.9 item 2).

## **IBC 2000 DUCTWORK RESTRAINT RULES**

PAGE 2 OF 2

RELEASE DATE: 11/7/03



DUBLIN, OHIO, USA • MISSISSAUGA, ONTARIO, CANADA

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

DOCUMENT:

**D2.3**

