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**New York Blower**  
Company®

7660 QUINCY ST.—WILLOWBROOK, IL 60521-5596  
TEL: (630) 794-5700 • FAX: (630) 794-5776  
WEB: <http://www.nyb.com> • E-MAIL: [nyb@nyb.com](mailto:nyb@nyb.com)

## Fan Isolation

**SALES BULLETIN**

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Fans, like any other rotating or reciprocating machinery, create vibration or shock in varying degrees of intensity or amplitude during normal operation. Fan vibration is usually induced by unbalanced centrifugal or aerodynamic forces. Basic physics tells us that some of this net force will be transmitted to the equipment's supporting structure. This often leads to the question of what is the utility and need for vibration isolation and flexible connections on a particular fan installation.

Vibration isolation is most often requested and useful when a fan is mounted on a roof or common steel structure. In these situations, isolation is employed to limit the transfer of annoying or damaging vibration and noise to the supporting structure. But when a fan is mounted on vibration isolators it will inevitably exhibit some motion or movement because of the very nature of the isolators.

Because of the inherent movement associated with fans on isolators, sufficient flexibility must be built into the duct system to absorb this movement. The use of flexible connectors when a fan is mounted on isolators is always recommended for two reasons:

1. It permits the inherent movement associated with isolators without reducing or affecting the performance of the vibration isolators by imposing undue strain on the connections and equipment.
2. It reduces the transmission of vibration or noise to the connection duct system.

Additionally, even when a fan is not mounted on vibration isolation, it is a sound engineering practice to employ flexible connections. When a fan is rigidly mounted, the use of flexible connectors will provide the following advantages.

1. Allow any misalignment or tolerances in the duct system to be absorbed without putting the fan inlet or outlet into a bind.
2. Protect the fan and duct work from damage due to thermal expansion.
3. Isolate the duct work from any aerodynamically-generated vibrations or pulsations that could possibly cause cracking in the duct work.

Vibration isolation is not generally recommended when a fan is going to be mounted to a concrete pad or dedicated structure of sufficient mass. When a unit is directly mounted to grade through concrete, or a dedicated structure, the utility of vibration isolation is limited. In these cases, the rigidly mounted unit will transfer any damaging vibration to the earth, which tends to act as a good absorber of vibration.

Thus, the recommended use of vibration isolation on a fan depends on its particular mounting configuration, but the use of flexible connectors on the inlet and outlet of a fan is almost always recommended as a sound engineering practice.