



What about Vibration?

What causes vibration?

Vibration is caused by any force acting on a surface of a structure that causes it to move back and forth from its normal resting position. While some military noise seems to shake the ground, the vibration in citizen's homes is caused by airborne sound waves (impulse noise).

How can noise shake my home?

An airborne sound wave is a force that acts on the external surfaces of a home, causing it to vibrate. This vibration is transmitted through the structure of a home to shelves, dishes, and loose windows, which may cause annoyance and concern.

Will it damage my home?

It is very unlikely that vibration from normal military activities will result in structural damage to your home. Military installations set firing limits to prevent such damage from occurring.

Will repeated vibration weaken my home and cause damage in the future?

The strength of many materials can be reduced by repeated vibration. This reduction in strength is known as fatigue. However, fatigue from noise is negligible because

- Houses and other structures are overbuilt to compensate for weakening by fatigue;
- Brittle materials, such as glass, show little reduction in strength due to fatigue;
- Fatigue in flexible materials, including most metals and wood, show that approximately one million noise-producing events are required to reduce the strength of the material by 50%; and
- Normal preventive maintenance on your home will correct the effects of fatigue.

What is causing the damage to my home?

Structures can crack for a variety of reasons which have nothing to do with noise and vibration.

- Humidity and temperature are major sources of cracking of interior surfaces. The range of inside and outside humidity and the ratio of inside to outside surface and air temperatures (cold versus hot) can shrink and expand wood framing in homes.
- Intensity, duration, and direction of wind.
- Uneven settling of building foundation.
- Room volume wall and ceiling area—the larger the surface area of a wall or ceiling (high walls and cathedral ceilings), the more likely it is to crack from expansions or shrinkage.
- Orientation and partial shading of walls from sunlight—uneven heating causes uneven expansion of walls.
- Type of skin, frame, exterior materials, and interior finish.
- History of patching.
- Presence of water leaking into building structure from external sources or condensing on interior pipes.

What can be done to reduce vibration?

Vibration can be reduced by placing a soft material, such as felt, between the two hard surfaces (e.g., a shelf and a dish) and by tightening loose windows and doors.

For further information, contact

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