

SEISMICALLY RATED ISOLATION CURBS

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FEA ensures designs will work.

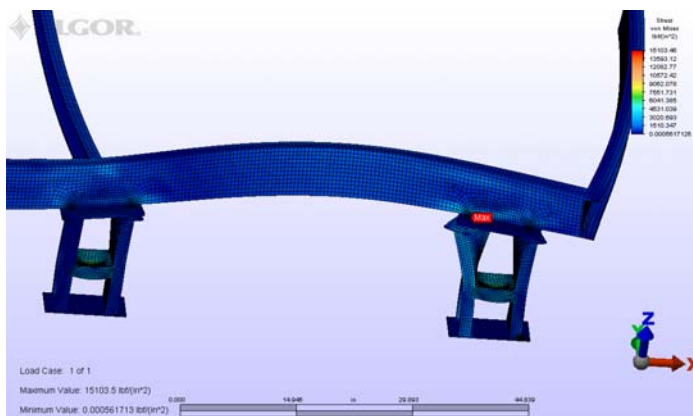
Vibro-Acoustics has a long tradition of engineering solutions for challenges encountered in Heating, Ventilating and Air-conditioning systems. Since 1960, the company has provided noise and vibration control system solutions to meet the most stringent of criteria. Its line of products for vibration isolation has included elastomeric floor mounts and pads, spring floor mounts, spring and elastomeric hangers, spring isolation rails and full-perimeter curbs, and steel and concrete inertia bases. Many of the projects supplied by Vibro-Acoustics have used customized solutions, including snubbers and restraints to maintain equipment position. Vibro-Acoustics has also enhanced its vibration isolation product line with seismically-rated devices that can provide both mitigation of structure-borne noise and adequate restraint from wind and seismic activity.

Rooftop air handling units present a multitude of noise transmission paths which can create excessive noise levels in the spaces below. Packaged rooftop vibration isolation curbs are common solutions to address these significant problems. These curbs not only provide structure-borne noise control of the entire unit but also adequate support, height and waterproofing for the rooftop equipment.



Current building codes (such as the National Building Code of Canada 2005 or International Building Code 2006) require adequate anchorage and support to resist seismic motions. Per these model codes, design forces for roof-mounted equipment are three times what they are for equipment mounted on the ground floor. Equipment supports must be designed to withstand these forces and be attached to the structure in an effective manner.

Due to the complexity of the forces that may be seen by a large, full-perimeter support structure on a roof, Vibro-Acoustics employs 3-dimensional (3D) modeling and Finite Element Analysis (FEA) to ensure that the designs are structurally sufficient. The components and sub-assemblies have been modeled to prove the design concepts and ensure they would be able to safely transfer the loads – their load limits are established. Using these proven components, full, complete models are created to investigate the overall performance of the assemblies.



As an example, the model on the left was created using SolidWorks® and as close to actual construction as possible, including fillet welds and standard dimensions for structural steel members. The model was then imported into ALGOR® for meshing and analysis. Areas of higher anticipated stress were given higher mesh densities to provide better resolution. Processing was done using a parallel processor CPU.

Initial design loads for proof-of-concept testing were selected to coincide with the upper limit of the existing spring capacities in the Vibro-Acoustics family of spring isolators. A lateral force

