

**TECHNICAL BULLETIN M/L- 681****VIBRO/DYNAMICS ISOLATORS PROVE MORE EFFECTIVE THAN THE COMPETITION IN REDUCING VIBRATION CAUSED BY A 400-TON PRESS****BACKGROUND**

VIBRO/DYNAMICS Corporation was contacted by a metalforming company in Michigan who was experiencing excessive building vibration from various presses in their plant. The vibration was affecting the operation of a coordinate measuring machine (CMM) in their quality control room. VIBRO/DYNAMICS Isolators were purchased for the CMM, which solved that problem.

A month later, VIBRO/DYNAMICS Corporation was contacted again concerning a severe vibration transmission problem the same company was having with a relatively new 400-ton press. This press was installed and running for about six months on press mounts supplied by a competitor of VIBRO/DYNAMICS Corporation. The Competitive Press Mounts had leveling capability and shock pad material selected by the competitor. The vibration transmitted from this press not only caused problems in the metalformer's quality control room, but also at a neighboring company. The neighbor also had a CMM that was being affected by this press, especially when a particular progressive die was used. This die requires approximately 260 - 280 tons to make a part for the automotive industry.

The metalformer gave the Competitive press mount supplier an opportunity to correct the situation. They took vibration measurements and told the metalformer that the excessive vibration was due to the press being in an out-of-level condition. The press was relevelled, but no change in the vibration problem occurred.

Since the Competitive press mount supplier did not solve the problem, VIBRO/DYNAMICS Corporation was called in to solve the vibration and neighbor problems. The metalformer removed the Competitive Press Mounts and installed VIBRO/DYNAMICS Model BFM2660 Micro/Level® Isolators for precision long-term leveling and alignment, as well as excellent vibration control. These isolators are physically larger than the Competitive Press Mounts, providing a greater degree of isolation efficiency and leveling stability. Usually, small mounts have very stiff pad material in order to support the load. As a result, the pads are subjected to high stress, causing creep, level instability, and too much vibration transmission. Further, a larger isolator selected for the same application can have greater elastomeric deflection, a lower stiffness without over-stressing the elastomer, and can provide better isolation efficiency.

The metalformer reported that since the press was reinstalled and precisely leveled and aligned using VIBRO/DYNAMICS Micro/Level Isolators, the neighbors have stopped complaining. In fact, the neighbor didn't even know the press was running!

The following report describes the results of the vibration tests comparing the press foundation vibration with the press installed on VIBRO/DYNAMICS Micro/Level Isolators versus the competition's smaller, stiffer press mounts.

Technical Bulletin M/L-681

OBJECTIVES OF COMPARATIVE VIBRATION REDUCTION TESTS

1. To help the metalformer effectively reduce vibration transmission from their press into the neighbor's plant and throughout their building.
2. To measure and compare press foundation vibration acceleration under identical operating conditions for the 400-ton press installed on VIBRO/DYNAMICS Micro/Level Isolators versus Competitive Press Mounts.

RESULTS

1. The vibration transmission problems were completely solved in both the metalformer's building and in their neighbor's plant.
2. VIBRO/DYNAMICS Model BFM 2660 Micro/Level Isolators were 80 - 85% more effective in reducing press foundation vibration than Competitive Press Mounts.

VIBRATION MEASUREMENTS

Vibration acceleration measurements were taken on the foundation near the left front and right front press feet. Recorded for both the Competitive Press Mounts and the VIBRO/DYNAMICS Isolators were transient foundation vibration response signals. These signals result from the stamping force created from the operation of the press running at 50 SPM with the progressive die using the specified material for the job.

The results are shown in Figures 1 - 4. The comparative time traces are shown in Figures 1 and 2, and the corresponding frequency spectra are shown in Figures 3 and 4.

In Figure 1, the measured peak reading was 2.43g for Competitive Press Mount compared with 0.45g

or the VIBRO/DYNAMICS Isolator at the left front foundation location. In Figure 2, the measured peak reading was 2.43g for the Competitive Press Mount compared with 0.48g for the VIBRO/DYNAMICS Isolator at the right front foundation location.

The measurements from Figures 1 and 2 show an "additional" foundation vibration reduction of 81.5% at the left front and 80.2% at the right front using VIBRO/DYNAMICS Micro/Level Isolators compared to Competitive Press Mounts. The word "additional" is used here because the press mounts, even with their high stiffness, were providing at least a small amount of vibration reduction even though no measurements were taken to compare them to a "hard mounted" case.

Illustrated in Figures 3 and 4 are the comparisons of frequency content and spectral magnitude of the data corresponding to Figures 1 and 2. The spectra show a significant reduction of vibration over the entire frequency range of 0 to 100 Hertz. At the maximum peak frequency from Figure 3, a reduction of 81.3% occurred at 65.0 Hertz. Figure 4 shows a reduction of 85.5% occurring at 67.5 Hertz.

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**Comparative Left Front Foundation Vibration
from a 400 Ton Press Installed on
VIBRO/DYNAMICS® Isolators vs. Competitive Mounts**

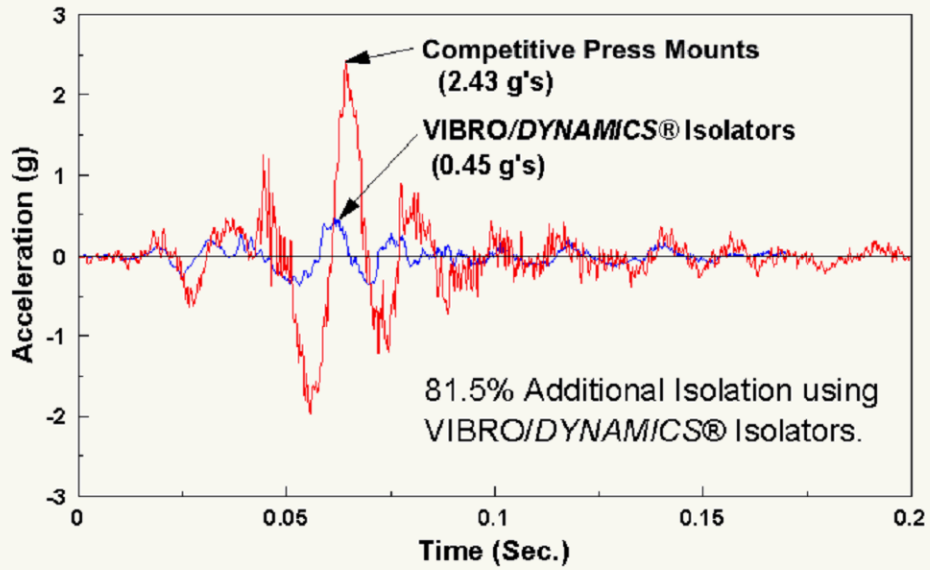


Figure 1

**Comparative Right Front Foundation Vibration
from a 400 Ton Press Installed on
VIBRO/DYNAMICS® Isolators vs. Competitive Mounts**

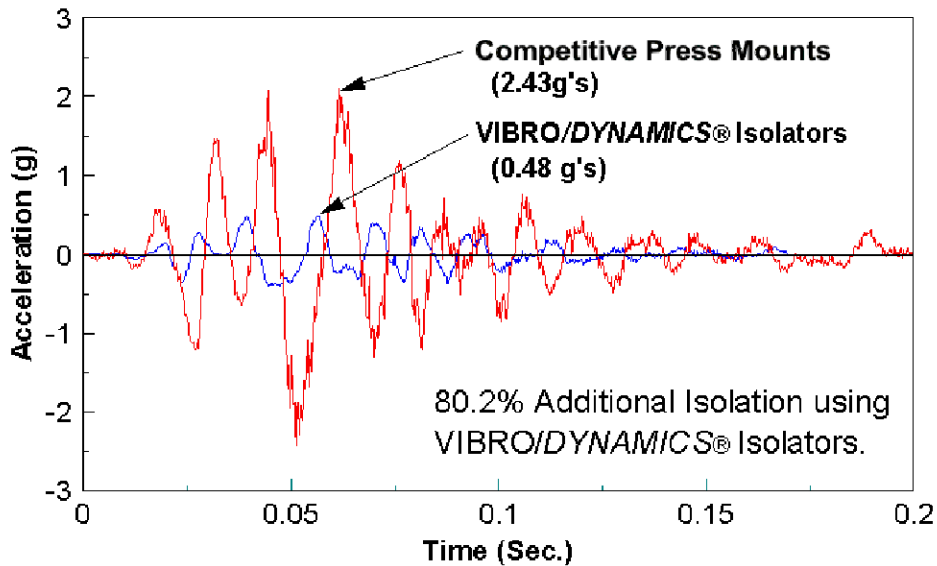


Figure 2

**At a Maximum Peak Frequency of 65 Hz,
VIBRO/DYNAMICS® Isolators Reduced Foundation Vibration
by 81.3% at the Left Front Foot of a 400 Ton Press**

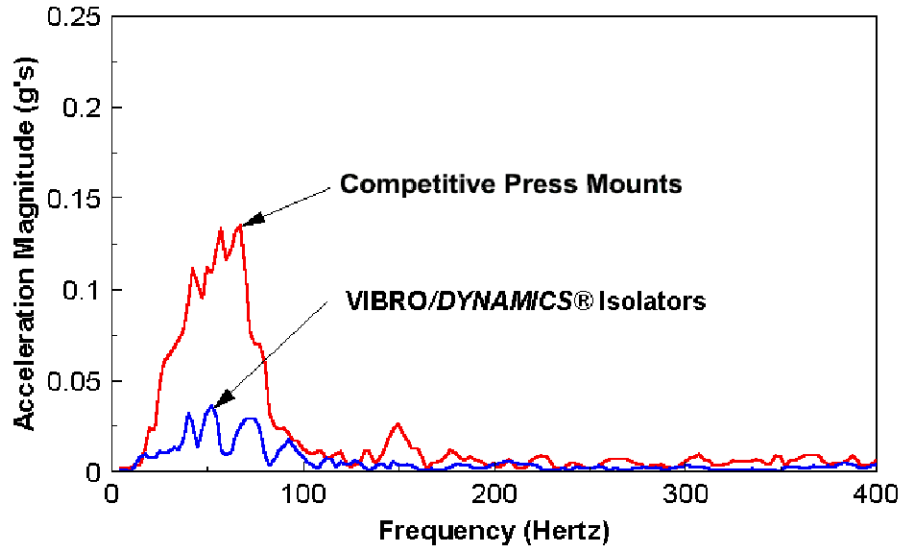


Figure 3

**At a Maximum Peak Frequency of 65 Hz,
VIBRO/DYNAMICS® Isolators Reduced Foundation Vibration
by 85.5% at the Right Front Foot of a 400 Ton Press**

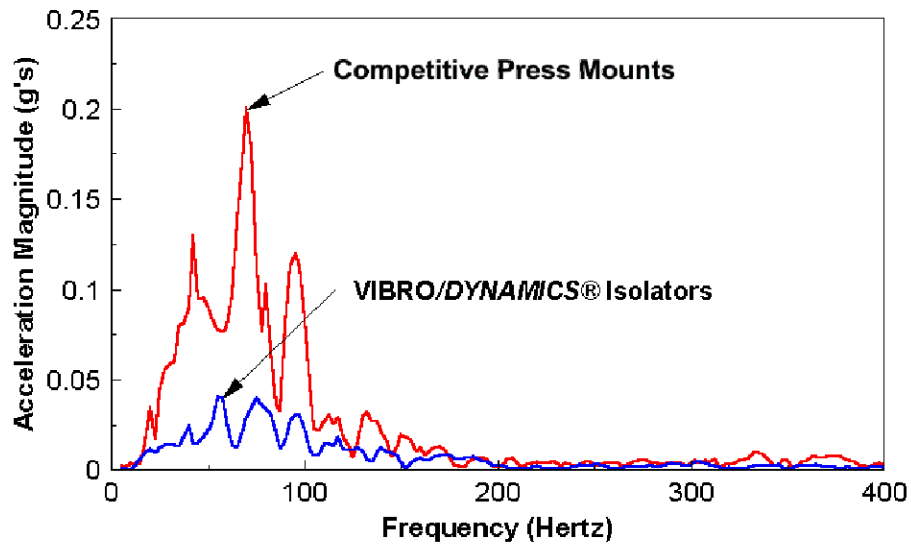


Figure 4