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Technical Data Sheet

Resonant Frequency
TDS-23

M/RAD has fabricated hundreds of fixtures over the years and offers over 40 years of engineering expertise in the manufacture of these fixtures. The anticipated natural frequency is based on the following criteria:

a. Analysis of a beam using a free-free mode using it's longest feasible length.
b. Experience with similar applications. (Please note that it is impossible to predict the precise performance of a fixture from one shaker to another since each shaker has its own peculiar performance characteristics, thereby, rendering the performance of each fixture to be slightly different).

Always, a resonant frequency is characterized by an amplification where the response of the fixture is greater than the input. In very general terms, every animate object has a fundamental resonant frequency. That is why glass shatters when exposed to high frequency and bridges twist when exposed to low frequency seismic vibration.

When a fixture is determined to have a resonant frequency at some point, that does not mean that the fixture is "flat" or "without dynamics" to that point. Because of the phenomenon of the transmissibility curve, the fixture begins to build up to the resonant point at a frequency approximately 30% below the fundamental resonance. That means a fixture whose resonant frequency is predicted at 2,000 Hz will demonstrate a gradual increase in amplification starting at 1,400 Hz, and will continue to increase until it reaches its apex at 2,000 Hz.

In order for a fixture to be flat to 2,000 Hz, the resonant frequency of the fixture must be in excess of 2,600 Hz. It probably will be necessary to use any one of several techniques to control the fixture:
1. Multi-point averaging
2. Notching
3. Strategic placement of the accelerometers, i.e. place the control accelerometer in the fixture's corner and the monitor accelerometer in the fixture's center.