

Wire Rope Isolators Quiet Aircraft Galley

Wire Rope Isolator Application

By: William Wilk

Situation Overview

Galley manufacturers (galley OEMs) for airplanes have tried many approaches to eliminate noise and vibration emitting from the galley into the interior of the plane. Noise and vibration disturb passengers and damage galley equipment. They are generated by electrical equipment used in the galley to keep food and drinks at the proper temperature during flight.

In the past, these OEMs used only rubber vibration mounts, but this solution was not providing sufficient service life for the aircraft. The mounts had to be replaced after several years, which reduced the productivity of the aircraft. These mounts often had difficulty withstanding certain environmental conditions, such as temperature and chemicals of the galley.

Application Opportunity

The galley contains convection ovens and chillers, which heat and cool food, drink and equipment. The compressors in these chillers vibrate at a frequency of approximately 60 to 70 Hertz. A leading worldwide galley OEM came to ITT Enidine Inc. for help in reducing the structure-borne noise and vibration from the galley, preventing them from radiating into the interior of a Boeing 777. The objective of the OEM was to design inherently quiet galley systems that would dampen approximately 80 percent of the vibration and handle a moderate shock load.

The ITT Enidine Inc. solution needed to dampen the vibration coming from the chillers, while supporting the structure that the chillers were mounted on. The weight of the structure and chillers was eighty pounds. The solution also needed to fit within a small sway space specification while supporting a specific static load. Additionally, the chillers would be crash tested at 9g load and were required to have a minimum service life of seven years. Finally, the galley OEM needed a solution that would not be effected by typical environmental conditions, such as condensation of water and cleaning solutions surrounding the chiller.

Project Solution

ITT Enidine Inc. recommended WR3 wire rope isolators to solve the noise problem. The wire ropes gave the OEM a single product solution to isolate the entire galley support structure, including the chiller. The wire ropes met each of the shock and vibration requirements, effectively dampening 80 percent of the vibration, and passing the 9g-shock test, which was validated during a crash test. The wire ropes passed the test without the galley structure tearing away from them.



Project Results

The galley OEMs are extremely pleased with their first experience using wire rope isolators. The ITT Enidine Inc. isolators will be incorporated into other aircraft galleys to reduce the effects of shock and vibration. Provided the wire ropes are sized correctly, they can be used throughout the life of the aircraft, without modification or replacement. Airlines are continually measured by their on-time performance. This makes reducing down time a critical factor in their competitiveness. The longevity of the ITT Enidine Inc. wire rope isolator when compared to elastomers helps the airline reduce down time of equipment and lower maintenance costs.