Engineering a Custom Vibration Isolation Solution for a Leading Aircraft Engine Manufacturer

Hutchinson developed a custom Met-L-Flex vibration isolator for a major aircraft engine manufacturer, overcoming complex performance and installation challenges to meet rigorous qualification requirements.



One of the largest commercial and military aircraft engine builders in the U.S. needed a specialized vibration isolator for the Active Clearance Control (ACC) system on a new engine design. The component had to maintain the performance of legacy systems while accommodating an installation configuration with severely restricted access.

The application called for a custom version of Hutchinson's Met-L-Flex mesh bushing, engineered to meet demanding performance requirements while addressing several interconnected design challenges. In addition to operating within tight mesh density parameters, the bushing required a specialized two-piece threaded core with features to support installation and maintain structural integrity during operation.

Working closely with the engine manufacturer, Hutchinson's engineering team developed and refined a solution through extensive testing and multiple design iterations. The resulting design met the application's requirements and successfully passed the customer's qualification testing.

Balancing Performance with Installation Constraints

One of the primary challenges involved achieving the necessary mesh density. The bushing needed to operate near the minimum density required to prevent the isolator from collapsing or compressing under load while maintaining the specified performance characteristics.

The installation configuration introduced additional complexity. With significantly reduced clearance for the installer, conventional assembly methods presented challenges. The customer required a two-piece threaded core incorporating anti-rotation features to simplify installation in the confined space.

The design also needed a reliable thread-locking mechanism to prevent the core from separating during flight. These requirements demanded an integrated engineering approach that considered performance, installation accessibility and mechanical security together rather than as independent design considerations.

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Refining the Design Through Collaboration and Testing

Hutchinson worked directly with the aircraft engine builder throughout the development process, evaluating design options and refining the custom Met-L-Flex bushing to address the application's specific requirements.

Over several months, extensive testing and iterative design adjustments helped the engineering team resolve the competing demands of mesh density, core configuration and installation constraints. Each refinement brought the design closer to meeting the required performance and qualification criteria.

The final solution successfully passed the customer's qualification testing and was developed for use in its advanced commercial aircraft engine.

For Hutchinson, the project demonstrates the value of combining established vibration isolation technology with application-specific engineering expertise. Through close customer collaboration, systematic testing and continued design refinement, we transformed a demanding set of technical requirements into a qualified solution tailored to the application.



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