We Silence Your Critical Noise Applications

ITT Enidine, Inc. is a leader in noise and vibration isolation solutions for business jet programs. Our comprehensive knowledge and experience within this industry enables us to provide tailored solutions while respecting superior products, services and support. ITT’s innovative approach to partnerships with customers enables us to augment process efficiency in customer critical noise applications.

ITT Enidine Platforms/Products

Product Capabilities

• Elastomeric Rod Ends
• Elastomeric Panel Isolators
• APU Elastomeric Isolators
• Strut Integrated Isolation Systems
• Elastomeric Monument Mounts
• Wire Rope Isolators
• Compact Wire Rope Isolators

APU Inlet and Exhaust Programs

• Embraer Legacy 450/500

Noise Attenuation Programs

• Bombardier Global 7000/8000
• Dassault Falcon 7X
• Embraer Legacy 450/500
• Embraer Phenom 300
• Gulfstream G650/G280
• HondaJet

Capabilities

Innovative Products for Business Jet Applications

ITT is your partner for noise and vibration isolation systems, APU and APU exhaust, insulated ducting and main engine acoustic treatments for aircraft interior and exterior noise control. We offer a proven engineering approach to solving your noise control challenges. Contact ITT now about developing a superior solution to meet your critical noise control requirements.

Engineering Design and Analysis

• Acoustic analysis and design
• CAD modeling (Catia V5 and Solidworks)
• Structural and thermal analysis
• Pressure drop and flow analysis
• Selection of materials
• Prediction of in-situ attenuation of isolators
• Weight and cost optimization
• Design for ease of installation and removal

Advanced Manufacturing Techniques

• CNC cutting of prepreg patterns
• Porous, acoustic material processing
• Complex shaped composite layup methods
• Honeycomb sandwich structures
• Composite-elastomeric-metal hybrid assemblies
• Autoclave cure of composites
• Advanced sheet-metal assembly
• Welding (fusion and resistance)
• Elastomeric material processing

Testing Capabilities

• Reverberation room (in-process)
• Acoustic insertion loss and transmission loss
• Pressure drop
• Electrical and impedance
• Environmental (DO-160)
• Thermal
• Pneumatic and hydraulic pressure
• Radiologic inspection
• Ultrasonic inspection of composites
• Mechanical properties of materials
• CMM inspection
• Static load and pressure testing
• Performance dynamics testing
• Fatigue life requirements testing
• 4-Pole test method of isolators

AS9100 Rev C and ISO9000:2008 registered and certified FAA and EASA approved repair stations EFKR738K

NADCAP welding approved

Materials

Acoustic

• Acousti-Flo®
• Feltmetal
• Perforated metal
• Absorptive foams and fiberglass sound barrier materials

Elastomeric

• Silicone
• Fluorosilicone
• Neoprene
• Nitrile
• Viton
• Buna
• Natural rubber
• Enitemp IV™

Composite

• Epoxy
• Phenolic
• Polyester
• Polyimide
• Graphite
• Bismaleimide

Carrier

• Fiberglass
• Carbon fiber
• Nylon
• Nomex
• Dacron
• Kevlar

Metals

• Superalloys
• Aluminum
• Stainless Steel
• Titanium

ITT Aerospace Controls

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We Silence Your Critical Noise Applications

ITT aerospace product lines are continually expanding to provide our customers with unique solutions for applications on business jet programs. Our extensive knowledge and experience within this industry enables us to design and offer noise attenuation programs while supplying superior products, services and support. ITT’s innovative approach in partnership with customers needs, makes us a leader in noise critical engine exhaust solutions.

ITT Enidine Platforms/Products

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APU Inlet and Exhaust Programs
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• Gulfstream G650/G280
• HondaJet

We Silence Your Critical Noise Applications

ITT is your partner for noise and vibration isolation systems, APU and APU exhaust, fixed engine and main engine exhaust, loudspeaker and overall noise reduction for aircraft interior and exterior noise control. We offer a proven engineering approach in designing and developing noise attenuation programs and the unique solution to meet your critical noise control requirements.

ITT is your partner for noise and vibration isolation systems, APU and APU exhaust, fixed engine and main engine exhaust, loudspeaker and overall noise reduction for aircraft interior and exterior noise control. We offer a proven engineering approach in designing and developing noise attenuation programs and the unique solution to meet your critical noise control requirements.

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Advanced Manufacturing Techniques
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• Complex shaped composite layup methods
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Testing Capabilities
• Reverberation room (in-process)
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• Thermal
• Pneumatic and hydraulic pressure
• Radiologic inspection
• Ultrasonic inspection of composites
• Mechanical properties of materials
• CMM inspection
• Static load and pressure testing
• Performance dynamics testing
• Fatigue life requirements testing
• 4-Pole test method of isolators

Materials
• Acoustic
• Acousti-Flo®
• Feltmetal
• Perforated metal
• Absorptive foams and fiberglass sound barrier materials

• Elastomeric
• Silicone
• Fluorosilicone
• Neoprene
• Nitrile
• Viton
• Buna
• Natural rubber
• Enitemp IV™

• Composite
• Epoxy
• Phenolic
• Polyester
• Polyimide
• Graphite
• Bismaleimide

• Carrier
• Fiberglass
• Carbon fiber
• Nylon
• Nomex
• Dacron
• Kevlar

• Metals
• Superalloys
• Aluminum
• Stainless Steel
• Titanium

Innovative Products for Business Jet Applications

ITT Aerospace Platforms/Products

Product Capabilities
• APU inlet silencers
• APU exhaust silencers
• APU inlet plenums
• ECS silencers
• Main engine acoustic treatment
• Acoustic panels

APU Inlet and Exhaust Programs
• Boeing 787
• Bombardier CSeries, Q400, Lear 85
• Comac ARJ 21
• Embraer 135, 145, 170, 175, 190, 195
• Embraer 175 E2, 190 E2, 195 E2
• Mitsubishi MRJ

ECS Programs
• Bombardier Global 7000/8000
• Embraer Legacy 450/500
• Gulfstream G500/G600
• Hawker 800XP, 850XP, 950XP, 4000
• HondaJet

Capabilities
• Innovative Products for Business Jet Applications

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ITT Enidine Platforms/Products

Product Capabilities
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- Elastomeric Panel Isolators
- APU Elastomeric Isolators
- Strut Integrated Isolation Systems
- Elastomeric Monument Mounts
- Wire Rope Isolators
- Compact Wire Rope Isolators

APU Inlet and Exhaust Programs
- Embraer Legacy 450/500

Noise Attenuation Programs
- Bombardier Global 7000/8000
- Dassault Falcon 7X
- Embraer Legacy 450/500
- Embraer Phenom 300
- Gulfstream G650/G280
- HondaJet

We Silence Your Critical Noise Applications

ITT aerospace products and services are specifically designed to provide our customers with unique solutions for applications on business jet programs. Our extensive knowledge and experience within this industry enables us to provide cutting-edge noise isolators and systems while maintaining superior products, services, and support. ITT’s innovative approach to partnering with our customers’ needs, enables us to offer a complete portfolio of solutions for critical noise control challenges.

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ITT Aerospace Platforms/Products

Product Capabilities
- APU inlet silencers
- APU exhaust silencers
- APU inlet plenums
- ECS silencers
- Main engine acoustic treatment
- Acoustic panels

APU Inlet and Exhaust Programs
- Boeing 787
- Bombardier CSeries, Q400, Lear 85
- Comac ARJ 21
- Embraer 135, 145, 170, 175, 190, 195
- Embraer 175 E2, 190 E2, 195 E2
- Mitsubishi MRJ

ECS Programs
- Bombardier Global 7000/8000
- Embraer Legacy 450/500
- Gulfstream G500/G600
- Hawker 800XP, 850XP, 950XP, 4000
- HondaJet

Capabilities
- Innovative Products for Business Jet Applications
- We offer a complete portfolio of solutions for critical noise control challenges.

Innovative Products for Business Jet Applications

- Materials
  - Acoustic
    - Acousti-Flo®
    - Feltmetal
    - Perforated metal
    - Absorptive foams and fiberglass sound barrier materials
  - Elastomeric
    - Silicone
    - Fluorosilicone
    - Neoprene
    - Nitrile
    - Viton
    - Buna
    - Natural rubber
    - Enitemp IV™
  - Composite
    - Epoxy
    - Phenolic
    - Polyester
    - Polyimide
    - Graphite
    - Bismaleimide
  - Carrier
    - fiberglass
    - carbon fiber
    - nylon
    - Nomex
    - Dacron
    - Kevlar
  - Metals
    - Superalloys
    - aluminum
    - stainless steel
    - Titanium

Testing Capabilities
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ITT is your partner for noise and vibration isolation systems, APU and ECS silencers, fiberglass ducting and main-engine acoustic treatment for aircraft noise and interior noise control. ITT’s proven experience in noise control and our engineering team can provide unparalleled technological expertise and solutions to address your critical noise control requirements.
GROWING WITH ITT AEROSPACE PRODUCTS

Elastomeric & Wire Rope Technologies

Strut Isolated Integrator

ITT Enidine has developed a compact isolator designed for strut mounted equipment. The Strut Isolated Integrator is an excellent solution for jet and business aircraft where minimizing footprint and supporting structures is essential. This mounting system includes a low profile design, offering an installed height of less than 1.5 inches, a large load range of 25-100 lbs., and is capable of accommodating a range of mounting configurations and load conditions. The main component is an all-inclusive solution that allows the customer to select the best load range design, offering a fail-safe design.

- High performance, cost-effective
- Interchangeable with existing isolators
- Exceptional noise attenuation performance

Elastomeric Panel Isolators

ITT Enidine offers a line of isolators to provide optimized noise/vibration attenuation compared to industry “standard” mounts. For a variety of aircraft interior applications, these isolators provide significantly better noise attenuation compared to industry “standard” mounts.

- Monolithic design
- High reliability and durability
- High acoustic performance

Monument Noise Isolators

The ITT Enidine Monument Noise Isolator allows for noise free mounting of various fixtures and equipment. These isolators are designed to accommodate a range of mounting configurations and load conditions, allowing for a wide range of applications. The isolators are made of high-quality materials, providing high reliability and durability. The isolators are available in different sizes and configurations to meet the specific needs of each application.

- High reliability
- Interchangeable with existing isolators
- Exceptional noise attenuation performance

Noise Control Technologies

Silencers for ECS, APU and Main Engines

ITT has been designing and manufacturing a wide range of noise reduction products for over 40 years. We specialize in products that attenuate noise of Auxiliary Power Units (APU), Environmental Control Systems (ECS) and main engines. ITT Enidine Controls is uniquely positioned to provide noise attenuation and aerodynamic solutions for ECS and APU systems and offers a variety of solutions for optimizing noise quality and acoustic performance. These solutions can be customized to meet specific noise reduction requirements.

- Impedance matching
- Folded cavity
- ¼ wavelength cavity

APU Silencers

ITT typically provides an APU noise control system that minimizes noise, as well as acoustic and aerodynamic performance. The APU noise control system is typically an integrated APU sound isolator, usually in a horizontal orientation, consisting of an APU exhaust, acoustic liner and inlet acoustic panel. The noise control system includes a sound isolator that reduces noise outside of the aircraft.

- Pop-riveted panel construction
- Reduce noise at engine bleed and trim air
- APU/air interface
- Reduce noise outside of aircraft

Main Engine Noise Control

ITT has been providing and manufacturing a wide range of noise reduction products for over 40 years. We specialize in products that attenuate noise of Auxiliary Power Units (APU), Environmental Control Systems (ECS) and main engines. ITT Enidine Controls is uniquely positioned to provide noise attenuation and aerodynamic solutions for ECS and APU systems and offers a variety of solutions for optimizing noise quality and acoustic performance. These solutions can be customized to meet specific noise reduction requirements.

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- Pop-riveted panel construction
- Reduce noise at engine bleed and trim air
- APU/air interface
- Reduce noise outside of aircraft

ECS Silencers

ITT typically provides an ECS noise control system that minimizes noise, as well as acoustic and aerodynamic performance. The ECS noise control system is typically an integrated ECS sound isolator, usually in a horizontal orientation, consisting of an ECS exhaust, acoustic liner and inlet acoustic panel. The noise control system includes a sound isolator that reduces noise outside of the aircraft.

- Pop-riveted panel construction
- Reduce noise at engine bleed and trim air
- APU/air interface
- Reduce noise outside of aircraft

Design Features

- High reliability
- High durability
- High acoustic performance
- Ease of installation and removal
- Ease of installation and removal
- Ease of installation and removal
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- Reduce noise at engine bleed and trim air
- APU/air interface
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- Pop-riveted panel construction
- Reduce noise at engine bleed and trim air
- APU/air interface
- Reduce noise outside of aircraft

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- Pop-riveted panel construction
- Reduce noise at engine bleed and trim air
- APU/air interface
- Reduce noise outside of aircraft

Main Engine Noise Control

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- Pop-riveted panel construction
- Reduce noise at engine bleed and trim air
- APU/air interface
- Reduce noise outside of aircraft
GROWING WITH ITT AEROSPACE PRODUCTS

Elastomeric & Wire Rope Technologies

Strut Isolated Integrator

ITT has developed a compact isolator structure for a wider range of applications. The new design provides an improved solution for high performance, demanding applications, and is ideal for a variety of strut mounting applications. The compact design reduces the overall footprint, which makes it ideal for use in tight spaces. The isolator is designed to accommodate a range of mounting configurations and load conditions, and is available in the same envelope size as existing units.

- Available in the same envelope size
- Multiple elastomer stiffnesses
- Interchangeable with existing isolators
- Noise attenuation performance
- Improved composite frame
- Fail-safe low-profile design
- Exceptional noise attenuation performance
- Weight savings
- Improved performance
- Better integration with adjacent systems
- Ease of installation and removal
- High reliability and durability
- High acoustic performance

Elastomeric Panel Isolators

ITT offers a family of direct mount design features to provide improved acoustical control, weight, and design flexibility for a variety of applications. The isolators are designed to accommodate a range of mounting configurations and load conditions, and are available in the same envelope size as existing units.

- Low frequency elastomer
- Small footprint, adjustable mounting in two directions
- High load range of 25-100 lbs.
- Designed to accommodate a wide range of mounting configurations and load conditions
- Available in the same envelope size

Noise Control Technologies

Silencers for ECS, APU and Main Engines

ITT has been designing and manufacturing a wide range of noise control products for over 40 years. We specialize in products that attenuate noise of Auxiliary Power Units (APU), Environmental Control Systems (ECS) and main engines. ITT’s exclusive design capabilities and advanced composites provide structural reliability and improved performance over traditional isolator materials. ITT offers a variety of noise control solutions for ECS, APU and main engines, including:

- ECS Silencers
- APU Silencers
- Main Engine Noise Control

ECS Silencers

ITT’s silencers and trellis matrices are designed to provide maximum performance. These silencers are specifically designed to meet the needs of ECS applications and offer superior performance due to advanced composite design features, including:

- Reduce noise at engine field test and air test
- Reduce noise in the environment
- Reduce noise at aircraft entry

APU Silencers

ITT typically provides an APU noise control kit designed specifically for the APU being used. These kits can include bypass duct acoustic liners and inlet acoustic panels. ITT has the design and manufacturing capabilities to provide exhaust path for APU (exhaust silencer), provide intake air for APU (inlet silencer), and reduce noise in the air distribution system.

Main Engine Noise Control

ITT typically provides a Main Engine Noise Control kit designed specifically for the engine being used. These kits can include bypass duct acoustic liners and inlet acoustic panels. ITT has the design and manufacturing capabilities to provide exhaust path for APU (exhaust silencer), provide intake air for APU (inlet silencer), and reduce noise in the air distribution system.

- Helmholtz resonator chamber
- Impedance matching
- Folded cavity
- ¼ wavelength cavity

Noise attenuation techniques

- In-house FEA acoustic analysis software
- Proprietary acoustic treatment materials
- Low and high temperature solutions
- Rigid and flexible ECS silencers
- Acoustic analysis and custom designs

Design Features

- High acoustic performance
- High reliability and durability
- High weight savings
- High design flexibility
Elastomeric & Wire Rope Technologies

**Strut Integrated Isolator**

ITT has developed a complete family of strut isolators for airframe applications. The design provides a unique solution to the problem of noise and vibration transmission by offering a new level of performance and efficiency. The isolators are designed to be integrated into the structure of the aircraft, providing a simple and effective solution for noise and vibration control. The isolators are available in a variety of configurations to meet the specific needs of each application.

**Elastomeric Panel Isolators**

ITT offers a range of elastomeric panel isolators designed to provide optimized noise/vibration attenuation for a variety of aircraft interior applications. These isolators provide significantly better noise attenuation compared to industry "standard" mounts.

**Monument Noise Isolators**

ITT Enidine now offers a line of isolators to provide optimized noise/vibration attenuation for a variety of aircraft interior applications. These isolators provide significantly better noise attenuation compared to industry "standard" mounts.

ITT Enidine Panel Isolators can be used for sidewall and ceiling panels, as well as for mounting components in multiple configurations and locations. This new isolator boasts a small footprint, adjustable mounting in two directions, a high load range of 25 - 100 lbs. and an included color coded adjustment and mounting tool. Compared to other isolators on the market, this innovatively designed isolator offers significant advantages in terms of weight, cost and performance. This isolator is ideal for securing:

- Crew Rests
- Galley Systems
- Lavatories
- Cabinets
- Furniture
- Dividers
- Monuments

ITT Enidine Panel Isolators:

- **Silencers for ECS, APU and Main Engines**
  - **ECS Silencers**
    - **Design Capabilities**
      - Rigid and flexible ECS silencers
      - Proprietary acoustic treatment materials
      - Low and high temperature solutions
      - Acoustic analysis and custom designs
      - In-house FEA acoustic analysis software
    - **Design Features**
      - Low weight
      - Ease of installation and removal
      - Low cost
      - High reliability
      - High reliability and durability
      - High acoustic performance

- **APU Silencers**
  - **Design Capabilities**
    - Rigid and flexible ECS silencers
    - Proprietary acoustic treatment materials
    - Low and high temperature solutions
    - Acoustic analysis and custom designs
    - In-house FEA acoustic analysis software
  - **Design Features**
    - Reduce noise outside of aircraft
    - Reduce noise in cabin and cockpit
    - Reduce noise in air distribution system
    - Reduce noise of engine bleed and trim air

- **Main Engine Noise Control**
  - **Design Capabilities**
    - Rigid and flexible ECS silencers
    - Proprietary acoustic treatment materials
    - Low and high temperature solutions
    - Acoustic analysis and custom designs
    - In-house FEA acoustic analysis software
  - **Design Features**
    - Reduce noise outside of aircraft
    - Reduce noise in cabin
    - Enable aircraft compliance with ICAO noise level requirements
    - Provide exhaust path for APU (exhaust silencer)
    - Provide intake air for APU (inlet silencer)

- **APU Silencers**
  - **Design Capabilities**
    - Rigid and flexible ECS silencers
    - Proprietary acoustic treatment materials
    - Low and high temperature solutions
    - Acoustic analysis and custom designs
    - In-house FEA acoustic analysis software
  - **Design Features**
    - Reduce noise outside of aircraft
    - Reduce noise in cabin
    - Enable aircraft compliance with ICAO noise level requirements
    - Provide exhaust path for APU (exhaust silencer)
    - Provide intake air for APU (inlet silencer)

**ECS Silencers**

- **Silencers for ECS, APU and Main Engines**
  - **ECS Silencers**
    - **Design Capabilities**
      - Rigid and flexible ECS silencers
      - Proprietary acoustic treatment materials
      - Low and high temperature solutions
      - Acoustic analysis and custom designs
      - In-house FEA acoustic analysis software
    - **Design Features**
      - Low weight
      - Ease of installation and removal
      - Low cost
      - High reliability
      - High reliability and durability
      - High acoustic performance

- **APU Silencers**
  - **Design Capabilities**
    - Rigid and flexible ECS silencers
    - Proprietary acoustic treatment materials
    - Low and high temperature solutions
    - Acoustic analysis and custom designs
    - In-house FEA acoustic analysis software
  - **Design Features**
    - Reduce noise outside of aircraft
    - Reduce noise in cabin
    - Enable aircraft compliance with ICAO noise level requirements
    - Provide exhaust path for APU (exhaust silencer)
    - Provide intake air for APU (inlet silencer)

- **Main Engine Noise Control**
  - **Design Capabilities**
    - Rigid and flexible ECS silencers
    - Proprietary acoustic treatment materials
    - Low and high temperature solutions
    - Acoustic analysis and custom designs
    - In-house FEA acoustic analysis software
  - **Design Features**
    - Reduce noise outside of aircraft
    - Reduce noise in cabin
    - Enable aircraft compliance with ICAO noise level requirements
    - Provide exhaust path for APU (exhaust silencer)
    - Provide intake air for APU (inlet silencer)
ITT has been designing and manufacturing a wide range of noise reduction products for over 40 years. We specialize in products that attenuate noise of Auxiliary Power Units (APUs), environmental control systems (ECS), and main engines. ITT’s noise control technologies are engineered to provide the most advanced noise attenuation performance available today. Our proprietary acoustic treatment materials and advanced computer-aided design techniques are uniquely positioned to provide world-class acoustics and aerodynamics engineering to all aspects of aero engine design.

**Silencers for ECS, APU, and Main Engines**

- **ECS Silencers**
  - Silencers for jet engines and turboprop engines
  - Reduce noise levels in ECS ducts
  - Suitable for inlets and outlets of ECS systems
  - Improve Quiet Comfort and Performance
  - Low weight
  - Ease of installation and removal
  - Low cost
  - High reliability and durability

- **APU Silencers**
  - Suitable for APU inlet and exhaust silencers
  - Improve Quiet Comfort and Performance
  - Reduce noise levels in APU systems
  - Low weight
  - Ease of installation and removal
  - Low cost
  - High reliability and durability

- **Main Engine Noise Control**
  - Provide exhaust path for APU (exhaust silencer)
  - Provide intake air for APU (inlet silencer)
  - Improve passenger comfort
  - Reduce noise in cabin
  - Enable aircraft compliance with ICAO noise level requirements
  - Provide exhaust path for APU (exhaust silencer)
  - Provide intake air for APU (inlet silencer)
  - Improve passenger comfort
  - Reduce noise in cabin
  - Enable aircraft compliance with ICAO noise level requirements

**Elastic Strut Isolator**

ITT Tru-Trac® elastomeric isolators are designed for strut mounted equipment. The lightweight, adjustable, elastomeric isolator is spring loaded to provide an effective solution for the variety of mounts. A variety of mounting options are available for the installation in a variety of configurations. The Tru-Trac® elastomeric isolator is the most reliable and cost effective strut mounted equipment. It is available in a variety of elastomeric and designed to accommodate a range of mounting configurations and load conditions. ITT Enidine has developed a unique elastomeric compound that has been specifically designed to improve noise attenuation compared to industry “standard” mounts.

**Elastomeric Panel Isolators**

ITT Enidine Panel Isolators can be used for sidewall and ceiling panels, as well as for mounting IFE and other equipment. Designed to accommodate a range of mounting configurations and load conditions, ITT Enidine now offers a line of isolators to provide optimized noise/vibration attenuation for a variety of aircraft interior applications. These isolators provide significantly better noise attenuation compared to industry “standard” mounts.

**Monument Noise Isolators**

The ITT Enidine Monument Noise Isolator allows for noise free mounting of various components in multiple configurations and locations. This new isolator boasts a small footprint, adjustable mounting in two directions, a high load range of 25 - 100 lbs. and components in multiple configurations and locations. This solution offers performance, weight, and design flexibility advantages over traditional mounting systems. The Strut Integrated Isolator locates an elastomeric isolator directly into the strut, eliminating the need for a large multi-axis isolator. This solution offers performance, weight, and design flexibility advantages over traditional mounting systems. The Strut Integrated Isolator is an excellent choice for all strut mounted equipment.
We Silence Your Critical Noise Applications

ITT aerospace product lines and are specifically engineered to provide our customers with unique solutions for applications on business jet programs. Our extensive knowledge and experience within this industry enables us to solve our customers’ unique problems while supplying superior products, services and support.ITT is a customer approach and partnership with customers needs, makes us a supplier of choice for critical noise control applications.

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Noise Attenuation and Control for Business Aircraft

Capabilities

ITT is your partner for noise and vibration isolation systems, APU and APU exhaust, structural ducting and main-engine acoustics, isolated for overall noise and interior noise control. We offer a proven engineering approach and delivers solutions to help solve your critical noise control requirements.