Engineering Capabilities

ITT provides broad and complete engineering analysis, design and test capabilities to support our electric heaters, conveyance and noise control product lines. Our engineering staff is built on a heritage of innovation in order to deliver enduring custom solutions to the global aerospace industry.

Engineering Design and Analysis
- Complex CAD modeling (Catia V5 and Solidworks)
- Acoustic silencer analysis, design and development
- Thermal analysis
- Pressure drop and flow analysis
- Air and material heater design

Advanced Manufacturing Techniques
- Pattern making
- Heated circuit etching
- Complex shaped composite layup methods
- Honeycomb bonded structures
- Composite-elasticomeric-metal hybrid assemblies
- Innovative insulation operations
- Advanced sheet-metal assembly
- Welding (fusion and resistance)

Testing Capabilities
- Spectrum analysis and acoustics
- Acoustic attenuation and insertion loss
- Pressure drop
- Electrical and impedance
- Environmental
- Thermal
- Pneumatic and hydraulic pressure
- Radiologic inspection
- Ultrasonic inspection of composites
- Mechanical properties of materials
- CMM inspection

AS1900(c) and ISO9000:2008 registered and certified FAA and EASA approved repair stations EK8738K NADCAP welding approved

Materials
- Acoustic:
  - Acousti-Flo
  - Feltmetal
  - Perforated Metal
  - Absorptive Foams
- Elastomeric:
  - Silicone
  - Fluorosilicone
  - Neoprene
  - Nitrile
  - Viton
  - Buna
- Composite:
  - Epoxy
  - Phenolic
  - Polymer
  - Polyamide
  - Graphite
  - Bismaleimide
- Carrier:
  - Fiberglass
  - Nylon
  - Nomex
  - Dacron
  - Kevlar
  - Cotton
- Metals:
  - Superalloys
  - Aluminum
  - Stainless Steel
  - Titanium

Aerospace Environmental Control Systems
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Materials
Acoustic
• Acousti-Flo®
• Feltmetal
• Perforated Metal
• Absorptive Foams

Elastomeric
• Silicone
• Fluorosilicone
• Neoprene
• Nitrile
• Viton
• Buna

Composite
• Epoxy
• Phenolic
• Polyurethane
• Graphite
• Bismaleimide

Carrier
• Fiberglass
• Nylon
• Nomex
• Dacron
• Kevlar
• Cotton

Metals
• Superalloys
• Aluminum
• Stainless Steel
• Titanium
**Heaters**

**Freeze and Ice Protection**
- Waste and water freeze protection
- Valve heaters, in-line heaters
- Tank heaters, wrap heaters
- Ram air inlet ice protection
- Wing and tail ice protection
- Propeller de-icing
- Drain masts

**Applications**
- Waste and water freeze protection
- Valve heaters, in-line heaters
- Tank heaters, wrap heaters
- Ram air inlet ice protection
- Wing and tail ice protection
- Propeller de-icing
- Drain masts

**Air and Surface Heaters**
- Door heaters
- Crew rest heaters
- Galley heaters
- Space heaters
- Floor heaters
- Foot warmers

**Programs**
- Airbus A300
- Boeing 737, 747, 757, 767, 777, 787
- Bombardier Cseries
- Comac C919
- Embraer ERJ 135, 145, 170, 175, 190, 195
- Sukhoi Superjet 100
- De Havilland DHC-7/8
- Bombardier Lear 40, 45, 60, Challenger
- Dassault 7X, 900, 2000, 3500
- Gulfstream 280, 300, 400, 500, 550, 600, 650
- Military C5, C17, F-18, V-22

**Dielectrics**
- Silicone
- Neoprene
- EPDM
- Teflon

**Resistance Wire**
- Copper and Bronze
- Nickel
- Stainless Steel

**Etched Foil**
- Copper/Nickel
- Inconel
- Monel
- Stainless Steel

**Composites**
- Silicone
- Neoprene
- EPDM
- Teflon

**Product Capabilities**
- Flexible hoses
- SCAT, SCEET, CAT, CEET
- Flexible duct connectors
- Specialty shapes and transitions
- Coupling covers
- Insulation and insulation covers
- Rigid and flexible integrated parts

**Programs**
- Airbus A320, A330, A340, A350, A380
- Boeing 727, 737, 747, 757, 767, 777, 787
- Bombardier Cseries, Q400
- Embraer ERJ 135, 145, 170, 175, 190, 195, 175E2, 190E2, 195E2
- Mitsubishi MU

**Conveyance**

**ECS Elastomeric Hoses and Connectors**
- Flexible hoses
- SCAT, SCEET, CAT, CEET
- Flexible duct connectors
- Specialty shapes and transitions
- Coupling covers
- Insulation and insulation covers
- Rigid and flexible integrated parts

**Programs**
- Airbus A320, A330, A340, A350, A380
- Boeing 727, 737, 747, 757, 767, 777, 787
- Bombardier Cseries, Q400
- Embraer ERJ 135, 145, 170, 175, 190, 195, 175E2, 190E2, 195E2
- Mitsubishi MU

**Noise Control**

**Silencers and Acoustic Treatment**
- APU inlets with noise treatment
- APU exhausts with noise treatment
- ECS silencers
- Acoustic panels
- Acoustic enclosures
- Acoustic foil materials

**APU Programs**
- Boeing 787
- Bombardier Cseries, Q400-8, Lear 85
- Comac C919
- Embraer ERJ 135, 145, 170, 175, 190, 195, 175E2, 190E2, 195E2
- Mitsubishi MU

**ECS Programs**
- Boeing 787
- Bombardier Cseries, Q400-8, Lear 85
- Comac C919
- Embraer ERJ 135, 145, 170, 175, 190, 195, 175E2, 190E2, 195E2
- Mitsubishi MU

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- Embraer ERJ 135, 145, 170, 175, 190, 195, 175E2, 190E2, 195E2
- Mitsubishi MU

**We have the world’s broadest set of product choices for aircraft environmental control systems.**
Heaters

Freeze and Ice Protection
- Valve heaters, in-line heaters
- Tank heaters, wrap heaters
- Ram air inlet ice protection
- Wing and tail ice protection
- Propeller de-icing
- Drain masts

Air and Surface Heaters
- Door heaters
- Crew rest heaters
- Galley heaters
- Space heaters
- Floor heaters
- Foot warmers

Programs
- Airbus A320
- Boeing 737, 747, 757, 767, 777, 787
- Bombardier CSeries
- Comac C919
- Embraer ERJ 135, 145, 170, 175, 190, 195
- Sukhoi Superjet 100
- Dassault Falcon 50

Resistive Wire
- Copper and Bronze
- Inconel
- Monel
- Stainless Steel

Silicones
- Silicone
- Neoprene
- EPDM
- Teflon

Composites
- Kapton
- Polymides
- RTV
- Composites

ECS Elastomeric Hoses and Connectors
Product Capabilities
- Flexible hoses
- SCAT, SCEET, CAT, CEET
- A350, 1544
- Flexible duct connectors
- Specialty shapes and transitions
- Coupling covers
- Insulation and insulation covers
- Rigid and flexible integrated parts

Programs
- Airbus A320, A330, A340, A350, A380
- Boeing 737, 747, 757, 767, 777, 787
- Bombardier CSeries, Q400
- Comac ARJ 21
- Embraer ERJ 135, 145, 170, 175, 190, 195, 175E2, 190E2, 195E2
- Mitsubishi MU2

Noise Control

APU Programs
- Boeing 787
- Bombardier CSeries, Q400-8, Lear 85
- Comac A318
- Embraer ERJ 135, 145, 170, 175, 190, 195, 175E2, 190E2, 195E2
- Dassault Falcon 50

ECS Programs
- Airbus A320, A330, A340, A350, A380
- Boeing 737, 747, 757, 767, 777, 787
- Bombardier CSeries, Q400
- Embraer ERJ 135, 145, 170, 190, 195
- Honda HondaJet
- DeHavilland DHC-7/8
- Bombardier Lear 40, 45, 60, Challenger
- Dassault Falcon 50
- Gulfstream 280, 400, 500, 550, 600, 650
- Military C5, C17, F-18, V-22

ECS Elastomeric Hoses and Connectors
Product Capabilities
- APU inlets with noise treatment
- APU exhausts with noise treatment
- ECS silencers
- Acoustic enclosures
- Acoustic-felt materials

APU Programs
- Boeing 787
- Bombardier CSeries, Q400-8, Lear 85
- Comac A318
- Embraer ERJ 135, 145, 170, 175, 190, 195, 175E2, 190E2, 195E2
- Dassault Falcon 50

Space Station
- Hawker 800, 4000
- Cirrus Cirrus Jet
- Embraer Legacy 450, Legacy 500
- Bombardier Global 7000/8000
- Gulfstream G650, G600

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Heaters Conveyance Noise Control

Environmental Control Systems

Freeze and Ice Protection

Applications
- Waste and water freeze protection
- Valve heaters, in-line heaters
- Tank heaters, wrap heaters
- Ram air inlet ice protection
- Wing and tail ice protection
- Propeller de-icing
- Drain masts

ECS Elastomeric Hoses and Connectors

Product Capabilities
- Flexible hoses
  - S CAT, S CEE T, CAT, CEET
  - AS504, 1544
  - MIL-H-52079, MIL-H-62028,
  - MIL-H-62217
- Flexible duct connectors
- Specialty shapes and transitions
- Coupling covers
- Insulation and insulation covers
- Rigid and flexible integrated parts

Air and Surface Heaters

Applications
- Door heaters
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- Floor heaters
- Foot warmers

Conveyance

Dielectrics

- Silicone
- Neoprene
- EPDM
- Teflon

- Kapton
- Polymides
- RTV
- Composites

Resistance Wire Heater Elements

- Copper and Bronze
- Balco
- Esanohm
- Stainless Steel

Programs

- Airbus A300
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- Bombardier Cseries
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- Bombardier Lear 40, 45, 60, Challenger
- Dassault 7X, 900, 2000, SMS
- Gulfstream 280, 400, 500, 550, 600, 650
- Military CS, C17, F-18, V-22

Etched Foil Heater Elements

- Copper/Nickel
- Inconel
- Monel
- Stainless Steel

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Noise Control

Silencers and Acoustic Treatment

Product Capabilities
- APU inlets with noise treatment
- APU exhausts with noise treatment
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- Acoustic panels
- Acoustic enclosures
- Acoustic-Flo® materials

APU Programs

- Boeing 787
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- Honda HondaJet

Composites

Product Capabilities
- Rigid ducting
- APU inlets
- Flumes
- Structural components
- Hybrid composite and aluminum
- Hybrid composite and elastomeric

Programs

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- Embraer ERJ 170, 175, 190, 195
- Honda HondaJet
- Bombardier Challenger 605
- Beechcraft King Air, Baron, Bonanza
- Embraer Legacy 450, Legacy 500
- Gulfstream 500, 600
- Piper Malibu, Meridian
- Military Apache, B2, C-17, C-130,
  F-16, F-18, F-35, J-Plats, P-8

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  - Polyamide
  - Graphite
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  - fiberglass
  - Nylon
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  - Kevlar
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  - Titanium

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