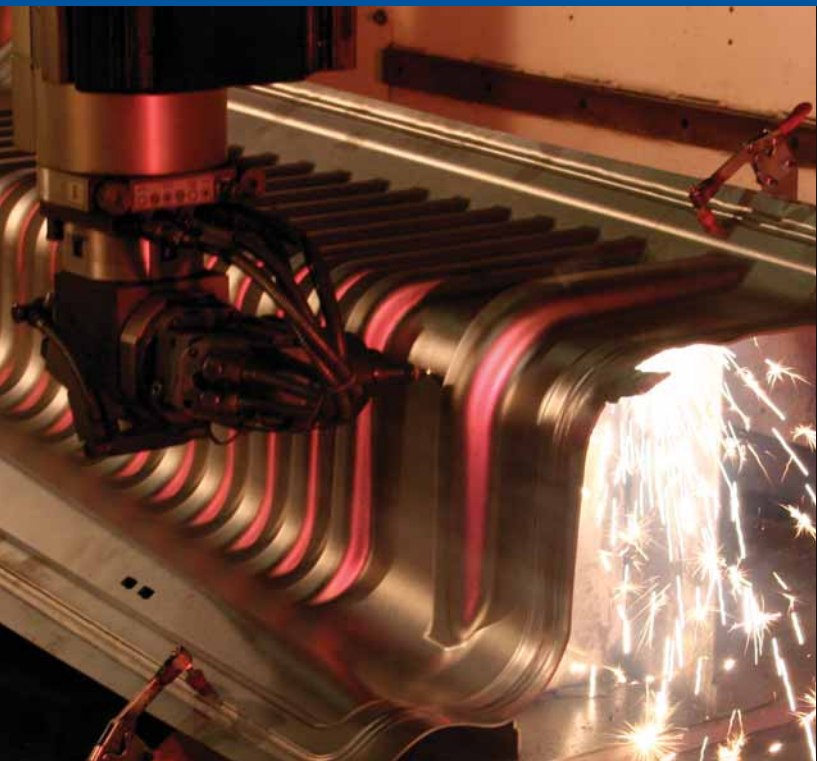


SUPERIOR SOLUTIONS

Barnes
Aerospace  BARNES[®]
GROUP INC

FOR MORE THAN 50 YEARS, BARNES AEROSPACE has been providing superior solutions by producing highly engineered machined and fabricated components and assemblies for aircraft engine and airframe manufacturers, and land-based industrial gas turbines, while providing comprehensive component overhaul and repair for the world's major turbine engine manufacturers, commercial airlines, and the military.



INVESTING IN TECHNOLOGY

Barnes Aerospace continues to invest in new technologies and specialized repairs to meet the global needs of the aerospace industry.

It's the Barnes Aerospace difference.



INSIDE BARNES AEROSPACE

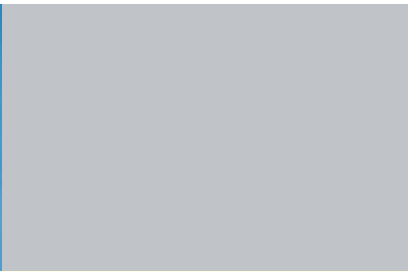
BARNES AEROSPACE is a business unit of Barnes Group Inc., a diversified international manufacturer of precision metal parts and distributor of industrial supplies, serving a wide range of markets and customers.

Founded in 1857 and head-quartered in Bristol, Conn., Barnes Group consists of three businesses:

- **Barnes Distribution** – an international, full-service distributor of maintenance, repair, operating, and production supplies
- **Barnes Industrial** – one of the world's largest manufacturers of precision mechanical and nitrogen gas products and a global supplier of retaining rings, reed valves, shock disks, and injection-molded plastic components
- **Barnes Aerospace** – a manufacturer and repairer of highly engineered assemblies and components for aircraft engines, airframes, and land-based industrial gas turbines

Over 6,600 dedicated employees at more than 65 locations worldwide contribute to Barnes Group's success. The legacy shared between Barnes Group Inc. and Barnes Aerospace is one of innovation, commitment, and expertise.





ALIGN WITH PRECISION

With in-house capabilities able to meet the most critical industry specifications, Barnes Aerospace delivers the highest quality and most cost-effective solutions to our customers.

We understand that customers in the Original Equipment Manufacturer (OEM), Maintenance, Repair & Overhaul (MRO) industries, and the military, rely on superior solutions, flawless integration, and seamless results. Barnes Aerospace has earned an international reputation in the aerospace industry by providing quality components, large sub-assemblies, and support for a variety of commercial and military platforms.

OEM Operations

Barnes Aerospace produces precision machined and fabricated components and assemblies for OEM turbine engine, airframe, and industrial gas turbine builders throughout the world. Our customers rely on these complex components and assemblies made of exotic and high temperature metals.

In addition, Barnes Aerospace provides concurrent engineering skills, integration capability, and kitting of complex assemblies, utilizing state-of-the-art Lean Manufacturing and Six Sigma capabilities.

MRO Operations

Barnes Aerospace Windsor Airmotive has FAA and EASA certified repair stations in the following locations:

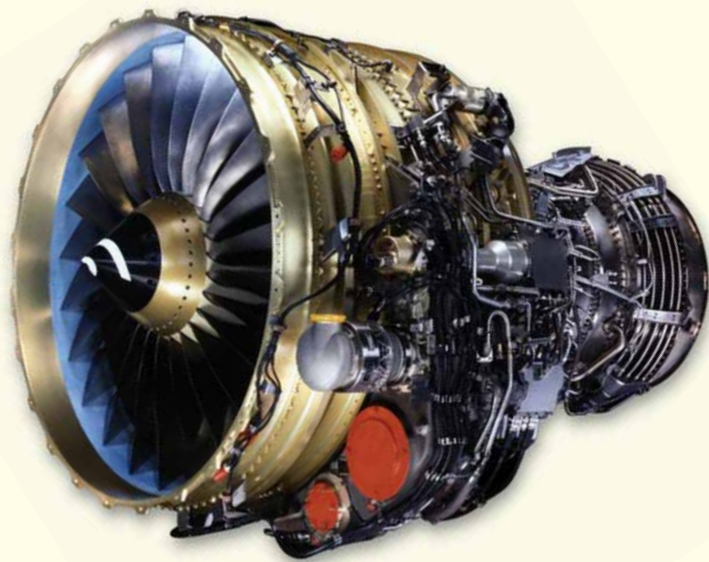
- East Granby, Connecticut
FAA Certified Repair Station #KC1R265K
- West Chester, Ohio
FAA Certified Repair Station #KKWR148K
- Singapore
FAA Certified Repair Station #ZWDY470L

Each location provides turbine engine component maintenance, repair, and overhaul services for many of the world's major commercial airlines and engine manufacturers.

By employing state-of-the-art processes, including electron beam welding (EBW) and plasma coating, Barnes Aerospace Windsor Airmotive delivers quality repairs and industry leading turn-times to support the demand of the aerospace industry.

Barnes Aerospace Windsor Airmotive provides MRO services primarily on rotating components, turbine shrouds, casings, and frames.

At Barnes Aerospace, we are committed to maintaining our position as one of the world's foremost repair sources, providing extensive and economical repair techniques worldwide.

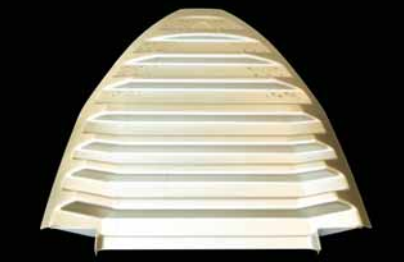




SET THE STANDARD

Barnes Aerospace has set the industry standard by offering a comprehensive range of in-house support and capabilities. By developing a culture where continuous improvement, lean thinking, and Six Sigma are practiced across all divisions and throughout the organization, Barnes Aerospace ensures superior customer service, reduction in turn-times, and competitive prices.

Through our long-standing and valued customer relationships, Barnes Aerospace is depended upon to provide manufacturing research, testing, and evaluation, as well as provide our customers with expert design capabilities of components and assemblies.



THE BARNES AEROSPACE DIFFERENCE

With Barnes Aerospace, the difference is in quality. Working to AS 9100 standards, Barnes Aerospace provides critical manufacturing services and maintenance, repair, and overhaul services in these primary areas:

- Kits and assemblies
- Precision machining
- Gear machining
- Fabrications
- Advanced weld processes
- Coatings
- Brazing

Barnes Aerospace offers customers the opportunity to simplify their supply chain by assuring accurate kit configuration, inventory control, and on-time delivery. Equipped to meet government specifications and requirements, Barnes Aerospace continues to invest in the latest technologies to exceed our customers' expectations.

Precision Machining

Barnes Aerospace machines complex critical components for turbine engines and is a leading supplier for high-thrust, lightweight aircraft turbine engine components. Barnes Aerospace has advanced manufacturing technologies and expertise in the following areas:

- Extensive grinding capability, including continuous dressing, rise and fall creep grinding, 4-axis rotary grinding, and 5-axis radial grooving
- Nonconventional machining, including electrical discharge and laser cutting
- 4- and 5-axis milling centers
- 5-axis lathe and vertical turret lathes
- On-site metallurgical lab

Known for tight tolerance gear machining, Barnes Aerospace is capable of hobbing and shaping a wide variety of internal and external gear features, such as splines, ratchets, spurs, helicals, and crowns. Barnes Aerospace gears are used in high precision applications, including aircraft starters, actuating systems, fuel controls, hydraulic and fuel pumps, and environmental control units.

Barnes Aerospace also specializes in complex assemblies, offering customers complete assembly, balancing, and testing services. In-house processes include:

- CNC turning
- 5-axis machining
- Inside Diameter/Outside Diameter (ID/OD) centerless and surface grinding
- Honing and lapping

Fabrications

Barnes Aerospace Fabrications Divisions, located in West Chester, Ohio; Lansing, Michigan; and Ogden, Utah are leading suppliers for both small and large fabricated airframe and engine components for the aerospace industry, specializing in:

- Hot and superplastic forming
- Sutton Core Process
- Diffusion bonding
- Cold forming
- Welding and brazing
- Honeycomb brazing and grinding
- Multi-axis machining
- Laser and water jet cutting technologies

These superior, cost-effective solutions are made from high temperature titanium, inconel, hastelloy, stainless steel, and nickel alloy materials. Barnes Aerospace's proficiency in technologies like superplastic and back-to-back forming result in increased design freedom, the elimination of costly multi-welded assemblies, reduced part count and material, and tooling savings – benefits and savings that are passed directly to our customers.

QUALITY –
ON TIME,
EVERY TIME



SUPERIOR SOLUTIONS

Engine Components & Airframe Products

Barnes Aerospace engine components can be found in most major aircraft worldwide. These components, located in the compressor, combustor, and turbine sections of the engine, include:

- Engine cases
- Panels and fairings
- Combustion liners
- Tail bearing housings
- Bearing housings
- Rotating air seals
- Shroud hanger segments
- Swirlers
- Spanner nuts
- Fuel shroud nozzles
- Shafts

Other components manufactured by Barnes Aerospace are found throughout the airframe, nacelle, and engine and include:

- Skins
- Ducts
- Firewalls
- Thresholds
- Doors
- Fairings
- Exhaust nozzles

Maintenance, Repair & Overhaul (MRO)

Working to ISO 9002 standards, Barnes Aerospace Windsor Airmotive's capabilities meet the most critical industry specifications, delivering high quality and cost-effective solutions to our customers. Having earned numerous Source Demonstration Repair Approvals, Barnes Aerospace Windsor Airmotive is well positioned among elite repair sources. Primary in-house capabilities include:

- Electron beam welding (EBW) and automatic TIG welding
- High pressure water jet stripping
- CNC milling, turning, and grinding
- Plasma and wire arc coating
- Heat treat and thermal processing
- Vacuum brazing
- X-ray and nondestructive testing
- Shot peening
- Corrosion resistant painting
- Advanced HF cleaning process
- 5-axis laser machining

Engine Components Overhauled

Barnes Aerospace Windsor Airmotive Divisions service numerous turbine engine components for both the commercial and military engine overhaul markets. These products, which are primarily found in the hot sections of the engine, include:

Rotating Components:

- Seals
- Drum rotors and spools
- HPC rotor hubs
- Stub shafts

Stationary Seals:

- Honeycomb segments
- Air seals
- Shroud segments
- Duct supports
- Hangers

Casings & Frames:

- Intermediate case
- Diffuser case/FIC case
- Turbine supports
- LPT case
- Turbine exhaust case



www.barnesaero.com



Barnes
Aerospace



BARNES[®]
GROUP INC

SUPERIOR SOLUTIONS

Barnes Aerospace
Group Headquarters
169 Kennedy Road
Windsor, CT 06095
USA

Phone: 860.298.7740
Fax: 860.298.7738