



200 YEAR HISTORY IN HIGH-QUALITY INDUSTRIAL AND ENGINEERING PRODUCTION



COMPANY PRESENTATION



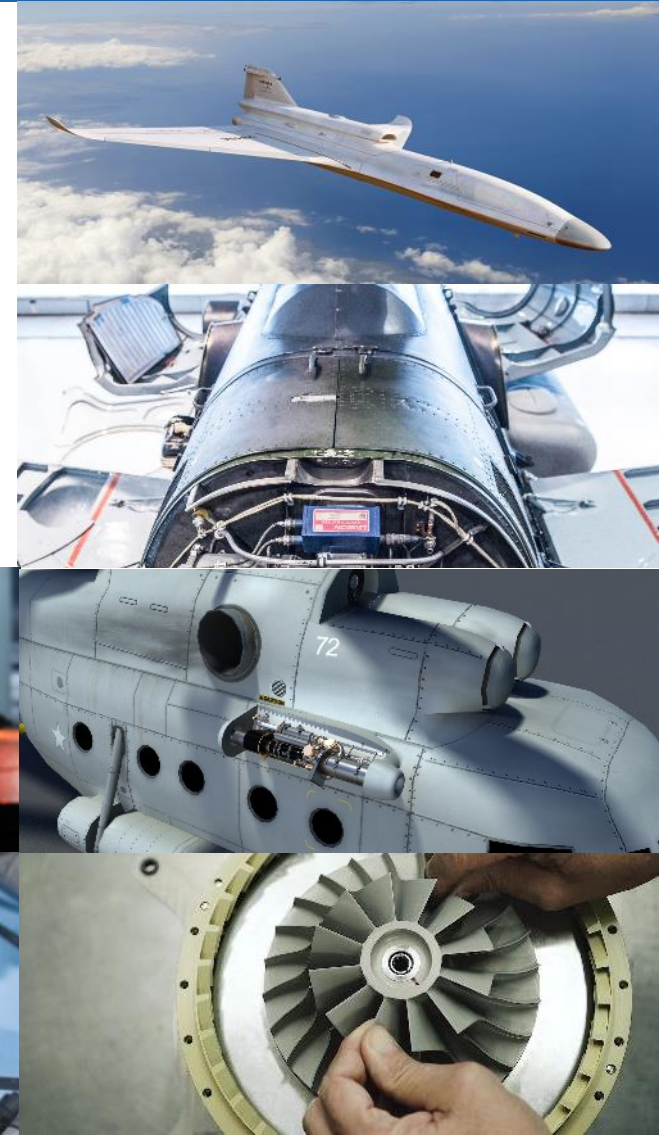
# ABOUT PBS INDIA

## PBS INDIA

is a part of PBS GROUP, a traditional engineering and manufacturing company of superior quality products for aerospace and defense with more than 200 years history.

## PBS PRODUCT PORTFOLIO

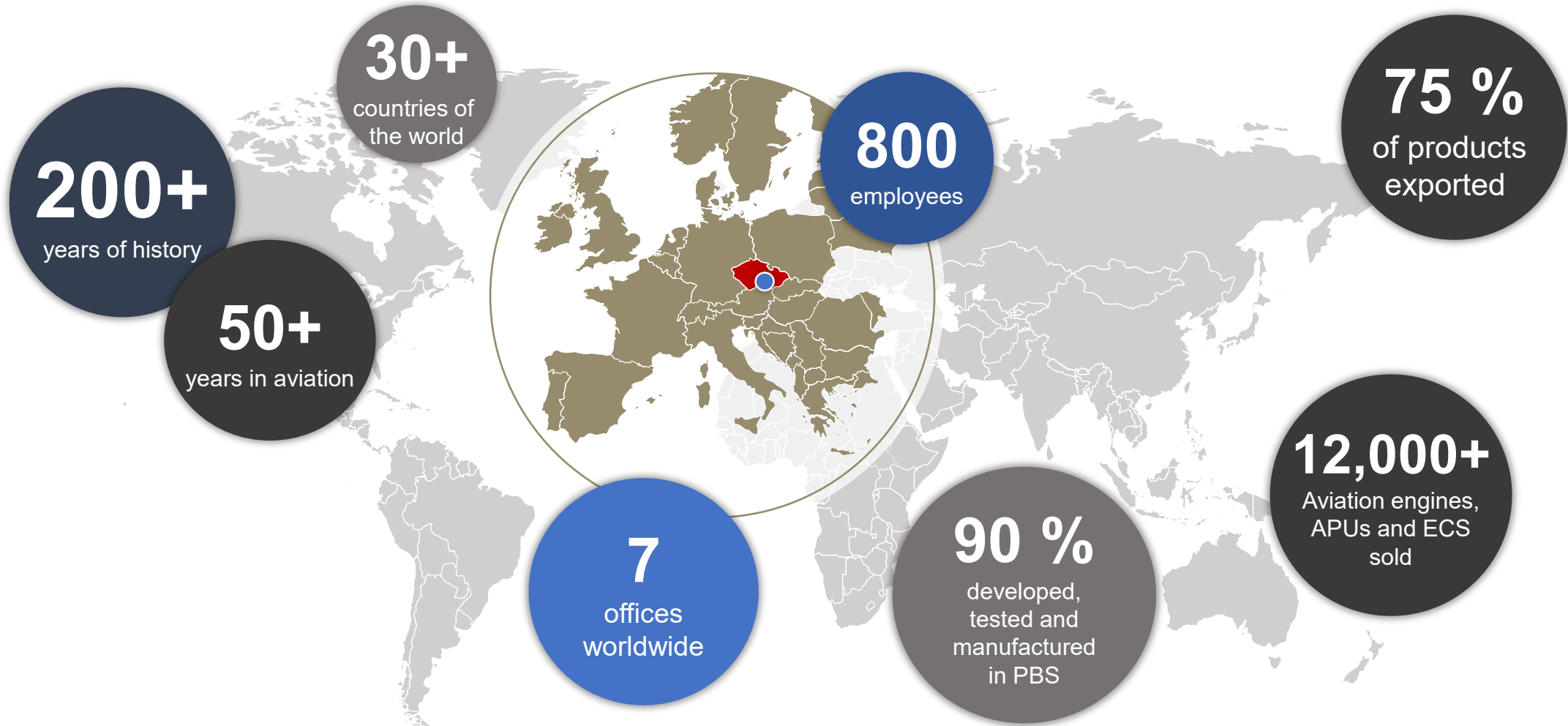
- turbine engines
- auxiliary power units
- environmental control systems
- investment casting
- cryogenic technology
- service & maintenance



# PBS GROUP STRUCTURE

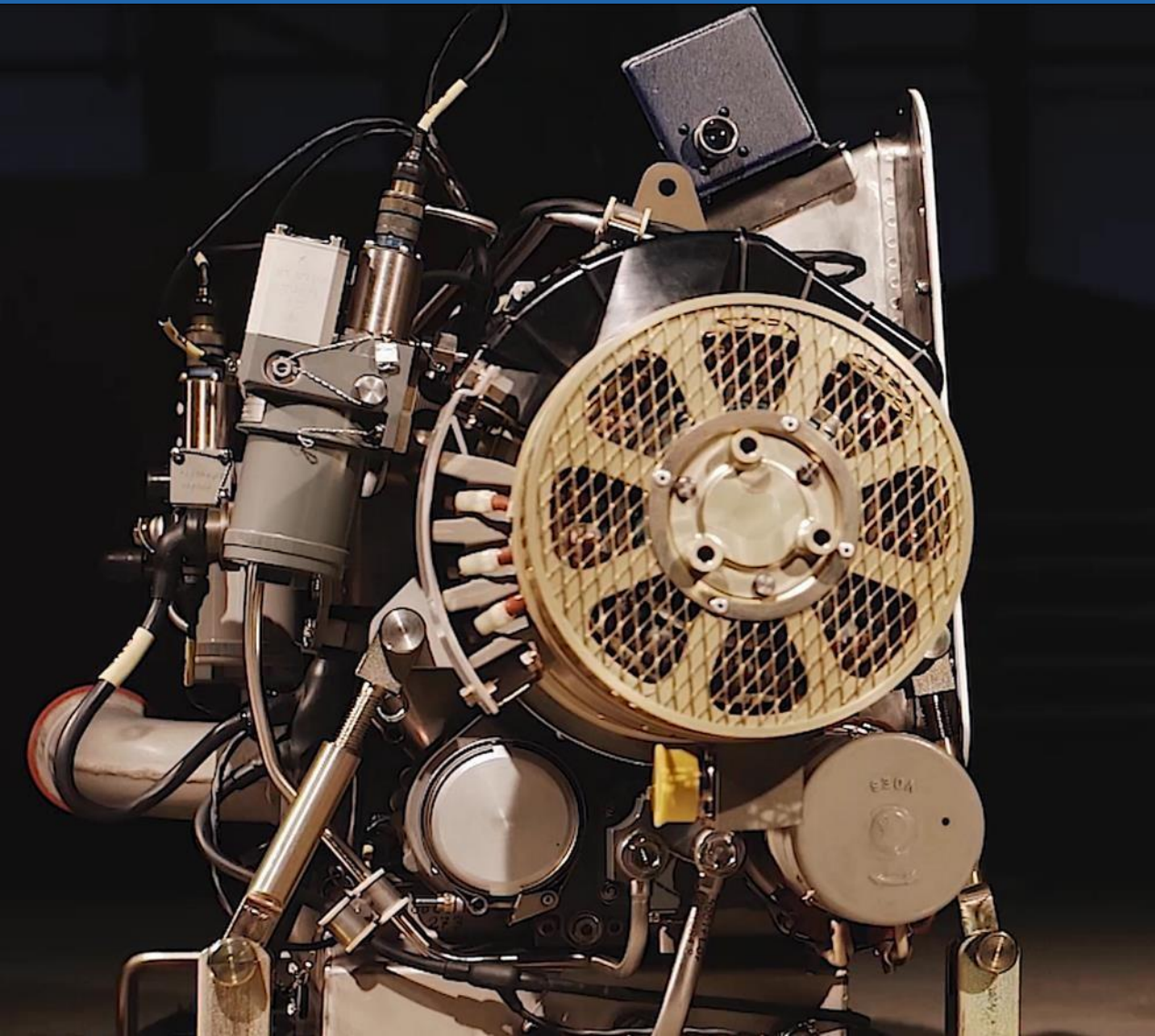
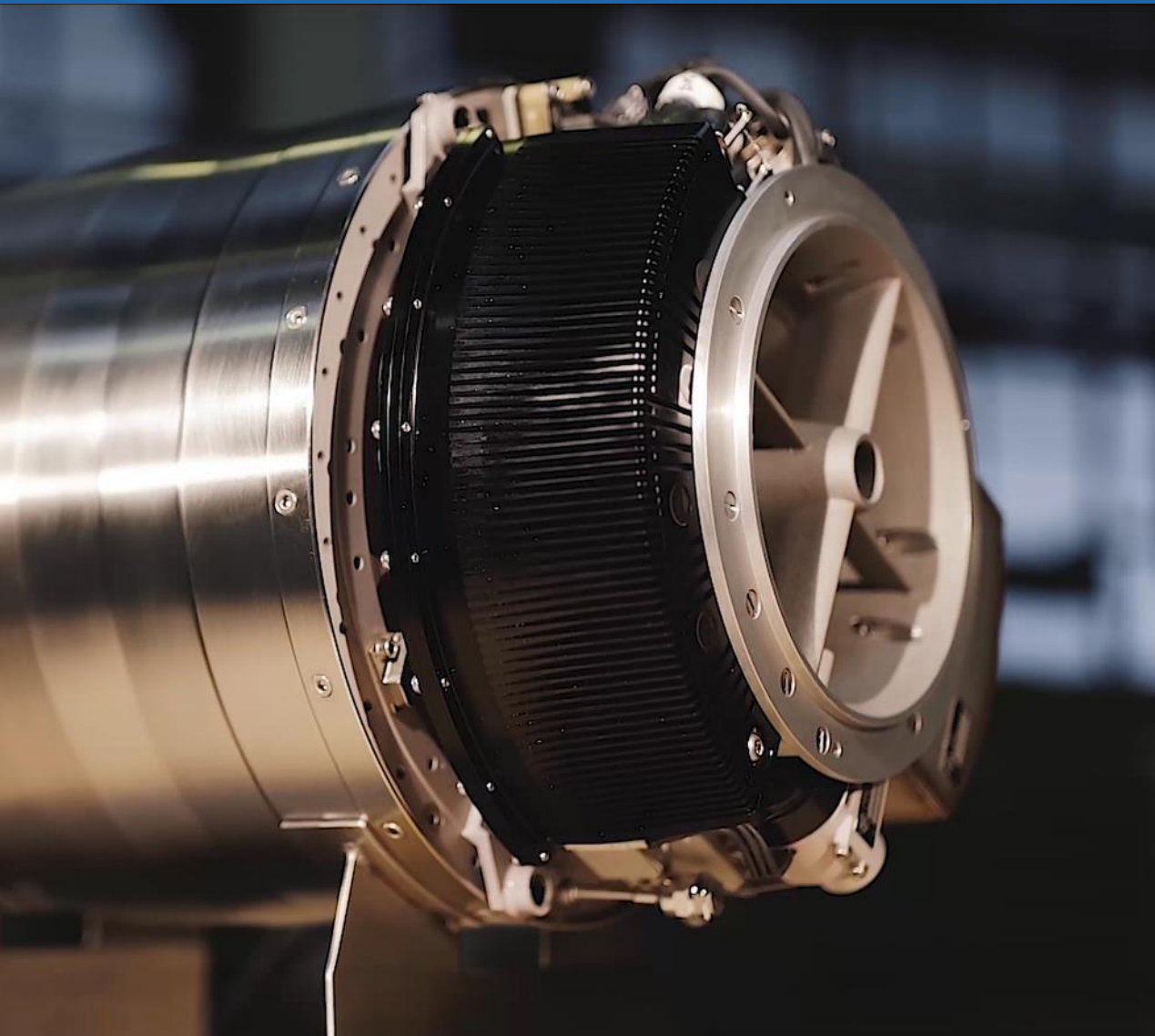


# PBS GROUP IN NUMBERS





# AEROSPACE PRODUCTS



# AEROSPACE PRODUCTS

## › Turbojet Engines



## › Auxiliary Power Units



## › Turboprop and Turboshaft Engines

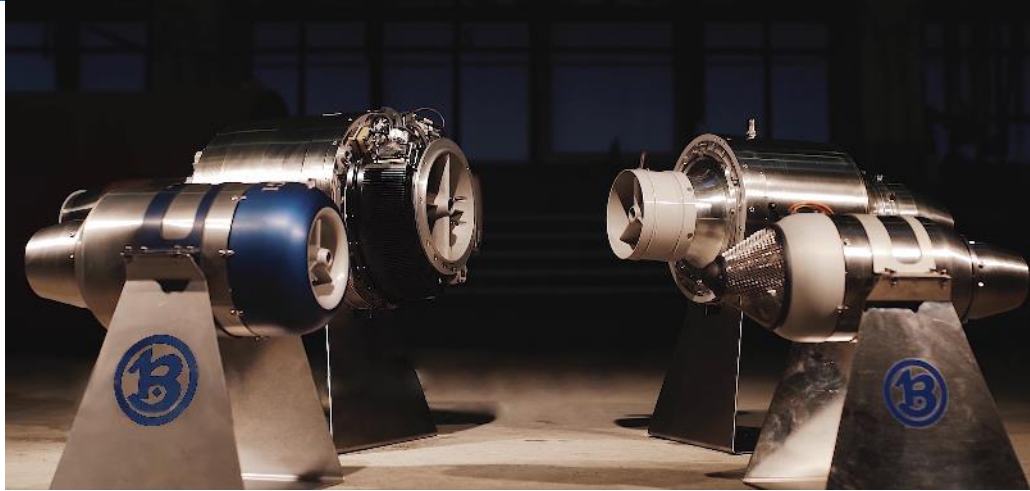


## › Environmental Control Systems



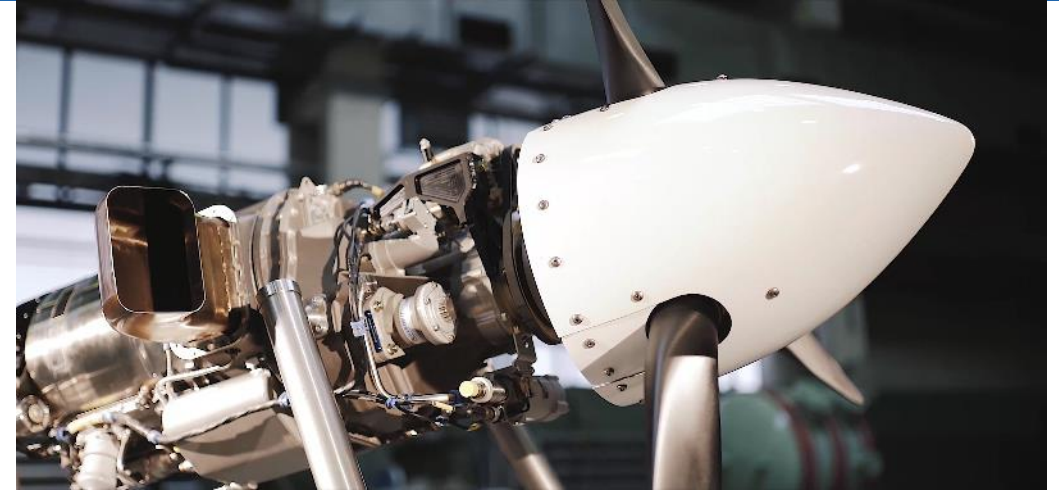


# PBS TURBINE ENGINES



## › Turbojet Engines

- Excellent weight/thrust ratio
- Compact design
- Low fuel consumption
- El. starting system, short starting sequence
- Ground and in-flight restart in any positions
- Salt water recovery versions



## › Turboprop & Turboshaft Engines

- TP100 – in both tractor and push configurations
- Stable operation in high altitudes and at high temperatures
- Ability to start in cold conditions as below as -30°C without preheating
- Low weight

# PBS TURBOJET ENGINES – MAIN PARAMETERS

## › PBS TJ150



## › PBS TJ100



## › PBS TJ80



## › PBS TJ40



## MAIN PARAMETERS:

- › Excellent weight / thrust ratio
- › Compact design
- › Low fuel consumption at its power category
- › Electric starting system
- › Possibility of ground and in-flight restart
- › Short starting sequence
- › High variability of engine positions during start
- › Variability according to customer requirements



# PBS TURBOJET ENGINES IN UNMANNED AIRCRAFT SYSTEMS





# PBS TURBOJET ENGINES IN MANNED AIRCRAFT



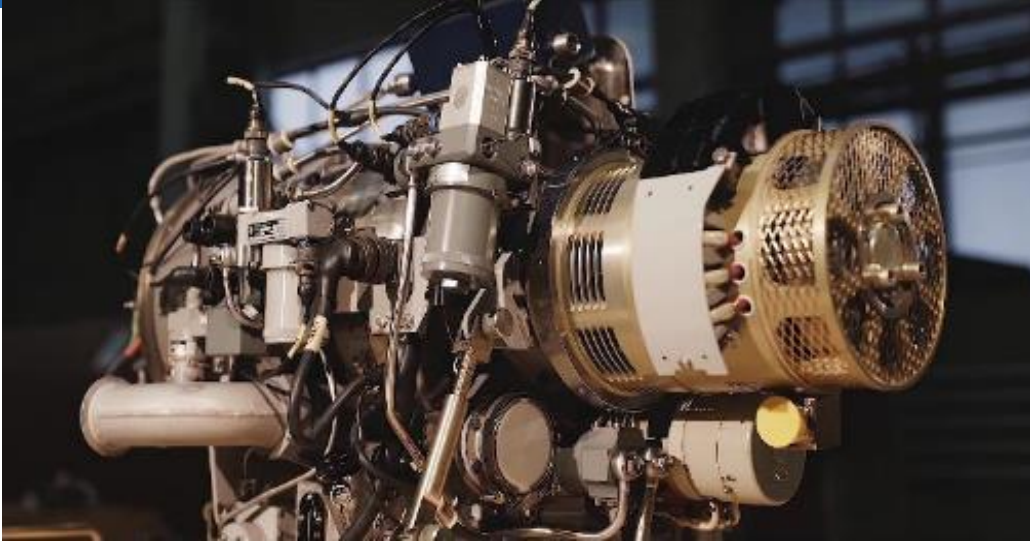


# PBS TURBOPROP AND TURBOSHAFT ENGINES APPLICATIONS



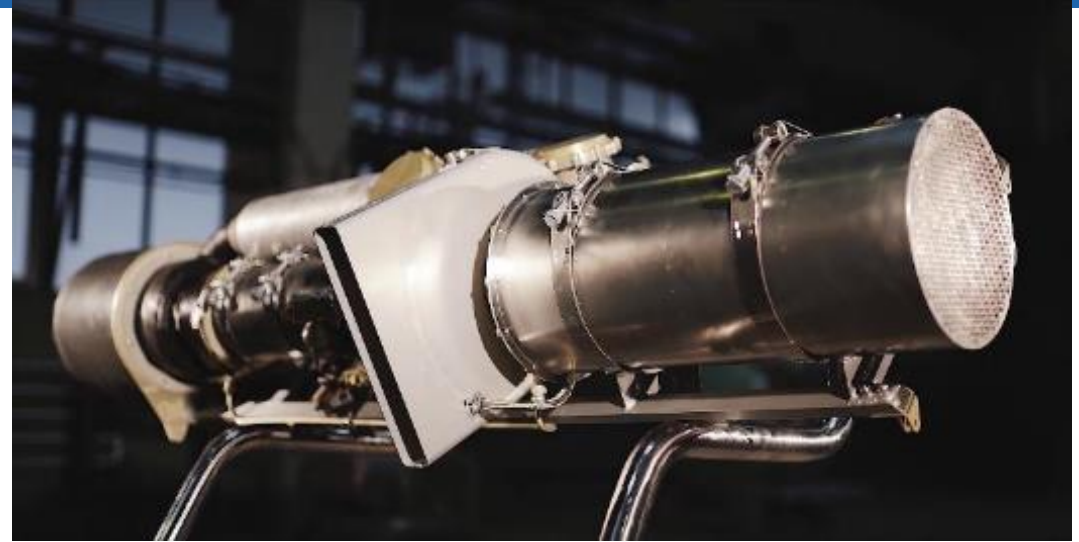


# PBS AUXILIARY POWER UNITS AND ENVIRONMENTAL CONTROL SYSTEMS



## › APU

- Simultaneous supply of electric power and compressed air
- Nominal power up to 100 kW
- Unlimited number of main engine starts
- Continuous operation for up to 6 hours
- Supply of bleed air of suitable cleanliness for ECS



## › ECS

- Combined cooling and heating system
- Minimum electricity consumption
- Compact design, Low weight
- Easy installation
- Ecological operation – no refrigerant
- Long service intervals

# PBS IN INDIA



**Bharat Dynamics Limited**





# CRYOGENICS PRODUCTS

- Rotary machines operating at low temperature of gas and liquid up to  $-265\text{ }^{\circ}\text{C}$
- Cryogenic compressors, cryogenic pumps are used in research, healthcare or industry as helium liquefier actuators
- Helium expansion turbines used in gas liquefaction processes in small helium liquefiers



**Institute for Plasma Research**  
प्लाज़्मा अनुसंधान संस्थान





# PRECISION CASTING PRODUCTS

- › **Reliable supplier** of castings for the power, transportation, aerospace and glass industries

Turbocharger wheels



Gas turbine blades



Circulation and distribution wheels



Spinner discs



# SERVICE & MAINTENANCE

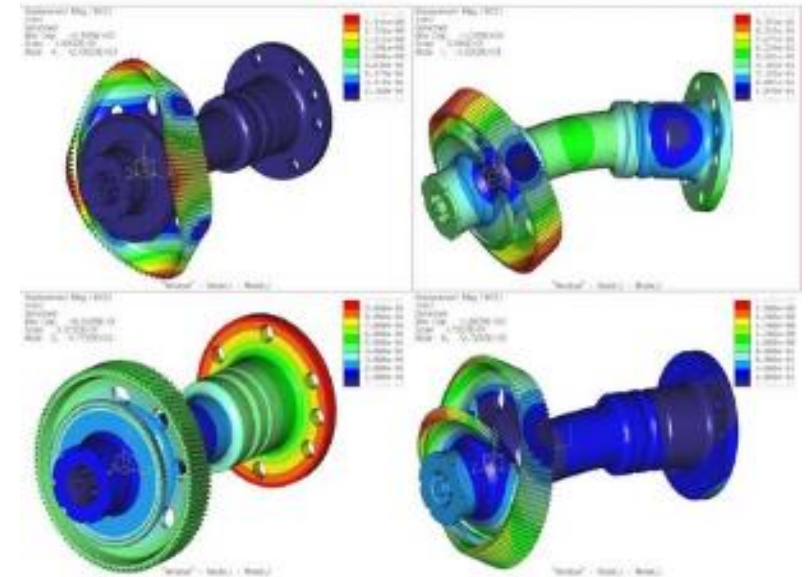
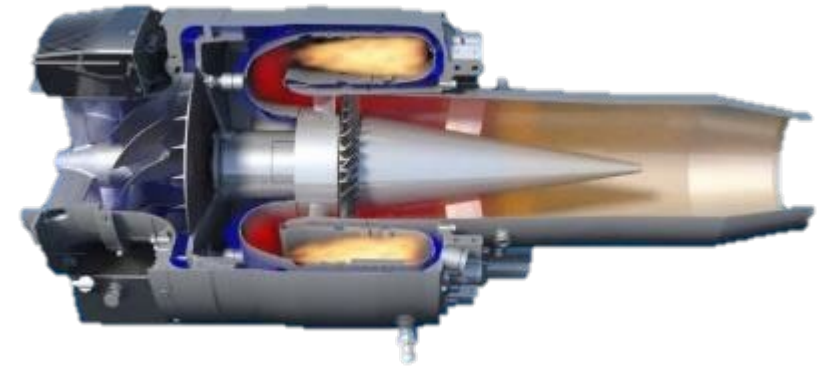
- Customer support
- Testing
- Maintenance
- Repairs
- Overhauls





# RESEARCH AND DEVELOPMENT

- › **Internal R&D capabilities**
- › **Internal experienced engineers**
  - Innovation of existing products
  - Development of new products
  - Thermodynamic and aerodynamic calculations
  - CFD simulations
  - Strength calculations and simulation
  - In-house developed SW for design of flow parts





# LICENCES AND CERTIFICATES



- Approval to design, manufacture and maintain turbine machines and equipment **EASA – DOA, POA, MOA**
- Certificates: AS 9100, ISO 9001, ISO 14001
- Certificate for manufacturing and maintaining the military aerospace products MAA 056 and MAA 076 from the Ministry of Defence
- Civil authorities certificates
- NADCAP for non-destructive testing (PT, RT) and chemical processes
- Certificate of Conformity of the quality system with the requirements of ČSN EN ISO 9001:2009 and ČOS 051622 (AQAP 2110) from the Defence Standardisation, Codification, and Government Quality Assurance Authority



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