

# TURBINE ENGINES

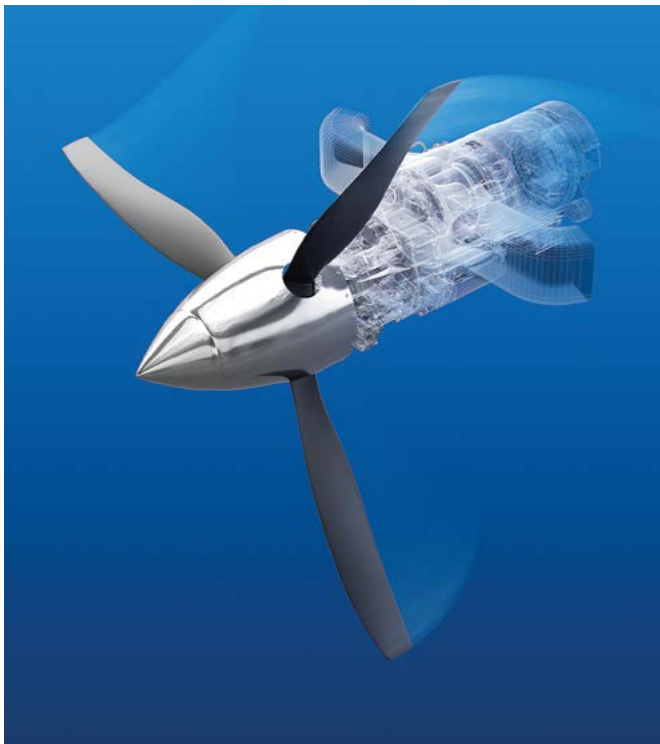
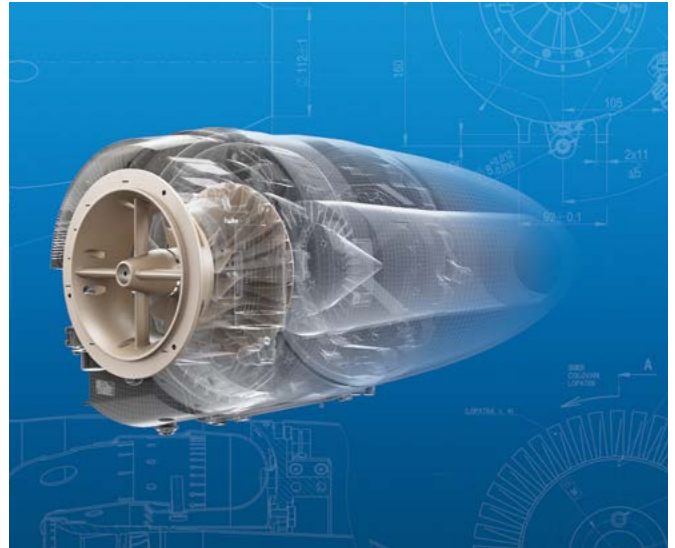


AEROSPACE • INVESTMENT CASTING • CRYOGENICS • SURFACE TREATMENT

# WE DEVELOP AND MANUFACTURE TURBINE ENGINES

We have designed and successfully launched several different engine programs in the past 20 years. Our reliable, **high-quality turbine engines** are designed specifically for use in unmanned aircraft systems.

Our R&D department is currently finishing another development project - a brand **new PBS TJ200 Turbojet Engine** with a completely rebuilt design. It will be the most powerful engine of the PBS jet engines range.



## EVOLUTION OF THE PBS ENGINE PROGRAMS

PBS offers a wide portfolio of customer modifications. We continuously increase the performance of individual types of engines while maintaining installation dimensions. We modify the engines for **in-flight starting**, for **re-use after landing in salt water** and other **specific customer modifications**. In selected types of engines we offer a choice between two versions of lubrication - by a separate oil system or by an oil admixture in the fuel.

We continuously apply our experience from installations in thousands of UAVs, UCAVs and target drones.

## PBS JET ENGINE MODIFICATIONS



**OIL**  
Separate oil system



**SALT WATER**  
Salt water recovery



**PYRO**  
Pyro in-flight ignition



Under development



Under development



Under development

# PBS TJ200

The PBS TJ200 turbojet engine is designed primarily as a propulsion unit for modern UAV and UCAV systems. It is a compact engine of a unique design, fuel lubricated, equipped with BLDC starter-generator, electric metering fuel pump and electronic control system of FADEC type. TJ200 will represent the most powerful propulsion unit from the PBS turbojet engine family.



## MAIN FEATURES

- › Compact design
- › Excellent thrust-to-weight ratio
- › Built-in starter-generator
- › Full authority digital engine control (FADEC)
- › Windmill starting option under 7 sec.



## TECHNICAL PARAMETERS

TECHNICAL PARAMETERS	METRIC	IMPERIAL
Thrust	2,280 N	512.54 lbf
Power supply	28 V DC	28 V DC
Electrical power output	4.0 kW	4.0 kW

DIMENSIONS AND WEIGHT	METRIC	IMPERIAL
Outer diameter*	246 mm	9.68 in
Length (including exhaust nozzle)	730 mm	28.74 in
Weight	28.0 kg	61.73 lb

\*Excluding insulation and equipment

OPERATING ENVELOPE	METRIC	IMPERIAL
Max. altitude	10,000 m	32,808 ft
Max. speed	0.95 M	0.95 M

STARTING ENVELOPE	METRIC	IMPERIAL
Max. altitude	6,000 m	19,685 ft
Max. speed	0.4 to 0.8 M	0.4 to 0.8 M

# PBS TJ150

The PBS TJ150 small jet engine has been developed for unmanned aerial vehicles (UAVs) and target drones.



## MAIN FEATURES

- › Compact design
- › Excellent thrust-to-weight ratio
- › The built-in starter-generator allows a reliable start and power supply to the deck network
- › Windmill starting option under 7 sec.



OIL



SALT WATER



PYRO



## TECHNICAL PARAMETERS

PARAMETERS	METRIC	IMPERIAL
Thrust	1,500 N	337 lbf
Power supply	28 V DC	28 V DC
El. power output	600 - 2,250 W	600 - 2,250 W
SFC	0.12 kg/N/h	1.138 lb/lbf/hr
TBO	25 - 50 hrs	25 - 50 hrs

DIMENSIONS	METRIC	IMPERIAL
Outer diameter	272 mm	10.71 in
Length	636 mm	25.04 in
Weight	17.10 kg	37.70 lb

OPERATING ENVELOPE	METRIC	IMPERIAL
Max. altitude	10,000 m	32,808 ft
Max. speed	0.9 M	0.9 M
Ambient temperature	-50/+45 °C	-58/+113 °F

STARTING ENVELOPE	METRIC	IMPERIAL
Max. altitude	6,000 m	19.685 lbf
Max. speed	0.6 M	0.6 M
Ambient temperature	-35/+45 °C	-31/+113 °F

# PBS TJ100

The PBS TJ100 jet engine has been developed for unmanned aerial vehicles (UAVs) including target drones, remote carriers, unmanned combat systems and missiles.



## MAIN FEATURES

- › Excellent thrust-to-weight ratio
- › Compact design
- › Built-in starter-generator
- › Electric starting
- › Ground or in-flight restart
- › Windmill starting option under 7 sec.



OIL



SALT WATER



PYRO



## TECHNICAL PARAMETERS

PARAMETERS	METRIC	IMPERIAL
Thrust	1,100 - 1,250 N	247 - 281 lbf
Power supply	28 V DC	28 V DC
El. power output	700 - 2,300 W	700 - 2,300 W
SFC	0.126 kg/N/h	1.236 lb/lbf/hr
TBO	25 - 300 hrs	25 - 300 hrs

DIMENSIONS	METRIC	IMPERIAL
Outer diameter	272 mm	10.71 in
Length	636 mm	25.04 in
Weight	17.60 kg	38.80 lb

OPERATING ENVELOPE	METRIC	IMPERIAL
Max. altitude	10,000 m	32,808 ft
Max. speed	0.9 M	0.9 M
Ambient temperature	-50/+45 °C	-58/+113 °F

STARTING ENVELOPE	METRIC	IMPERIAL
Max. altitude	6,000 m	19,685 ft
Max. speed	0.6 M	0.6 M
Ambient temperature	-35/+45 °C	-31/+113 °F

# PBS TJ80-120

The PBS TJ80-120 jet engine has been designed for unmanned aerial vehicles (UAVs) including target drones, remote carriers, unmanned combat systems and missiles.



## MAIN FEATURES

- › Best thrust-to-weight ratio in its category
- › Compact design
- › Built-in starter generator
- › Ground or in-flight restart
- › Windmill starting option under 7 sec.



SALT  
WATER



PYRO



## TECHNICAL PARAMETERS

PARAMETERS	METRIC	IMPERIAL
Thrust	900 - 1,200 N	202 - 269 lbf
Power supply	28 V DC	28 V DC
El. power output	650 - 2,250 W	650 - 2,250 W
SFC	0.125 kg/N/h	1.226 lb/lbf/hr
TBO	25 - 50 hrs	25 - 50 hrs

DIMENSIONS	METRIC	IMPERIAL
Outer diameter	235 mm	9.25 in
Length	636 mm	25.04 in
Weight	12.80 kg	28.22 lb

OPERATING ENVELOPE	METRIC	IMPERIAL
Max. altitude	10,000 m	32,808 ft
Max. speed	0.9 M	0.9 M
Ambient temperature	-50/+45 °C	-58/+113 °F

STARTING ENVELOPE	METRIC	IMPERIAL
Max. altitude	6,000 m	19,685 ft
Max. speed	0.6 M	0.6 M
Ambient temperature	-35/+45 °C	-31/+113 °F

# PBS TJ40-G1

The PBS TJ40-G1 turbojet engine has been developed for UAVs, target drones and other unmanned systems.



## MAIN FEATURES

- › Excellent thrust-to-weight ratio
- › Compact design
- › Built-in starter-generator
- › Electric starting
- › Ground or in-flight restart
- › Starting option under 7 sec.



SALT  
WATER



PYRO



## TECHNICAL PARAMETERS

PARAMETERS	METRIC	IMPERIAL
Thrust	395 - 425 N	89 - 96 lbf
Power supply	14 V DC	14 V DC
El. power output	150 W	150 W
SFC	0.147 kg/N/h	1.442 lb/lbf/hr
TBO	50 hrs	50 hrs

DIMENSIONS	METRIC	IMPERIAL
Outer diameter	147 mm	5.79 in
Length	304 mm	11.97 in
Weight	3.40 kg	7.50 lb

OPERATING ENVELOPE	METRIC	IMPERIAL
Max. altitude	9,000 m	29,528 ft
Max. speed	0.8 M	0.8 M
Ambient temperature	-50/+50 °C	-58/+122 °F

STARTING ENVELOPE	METRIC	IMPERIAL
Max. altitude	4,500 m	14,764 ft
Max. speed	0.35 M	0.35 M
Ambient temperature	-40/+50 °C	-40/+122 °F

# PBS TJ40-G2

The PBS TJ40-G2 turbojet engine has been developed for UAVs, target drones and other unmanned systems.



## MAIN FEATURES

- › Excellent thrust-to-weight ratio
- › Compact design
- › Built-in starter-generator
- › High electric power output
- › Ground or in-flight restart
- › Starting option under 7 sec.



SALT  
WATER



PYRO



## TECHNICAL PARAMETERS

PARAMETERS	METRIC	IMPERIAL
Thrust	395 - 425 N	89 - 96 lbf
Power supply	28 V DC	28 V DC
El. power output	1,100 W	1,100 W
SFC	0.147 kg/N/h	1.442 lb/lbf/hr
TBO	50 hrs	50 hrs

DIMENSIONS	METRIC	IMPERIAL
Outer diameter	147 mm	5.79 in
Length	373 mm	14.69 in
Weight	3.80 kg	8.38 lb

OPERATING ENVELOPE	METRIC	IMPERIAL
Max. altitude	9,000 m	29,528 ft
Max. speed	0.8 M	0.8 M
Ambient temperature	-50/+50 °C	-58/+122 °F

STARTING ENVELOPE	METRIC	IMPERIAL
Max. altitude	4,500 m	14,764 ft
Max. speed	0.35 M	0.35 M
Ambient temperature	-40/+50 °C	-40/+122 °F

# TURBOPROP ENGINE PBS TP100

The PBS TP100 turboprop engine is suitable for MALE UAVs. The engine is designed for use in both pusher and tractor configuration.



## MAIN FEATURES

- › Low weight
- › Small installation dimensions
- › Excellent power-to-weight ratio
- › Digital interface for control and monitoring
- › Stable operation at high altitudes and high temperatures
- › Ability to run at cold temperatures below -30 °C without preheating
- › Pusher and tractor configuration option



## TECHNICAL PARAMETERS

PARAMETERS	METRIC	IMPERIAL
Output shaft speed	2,158 RPM	2,158 RPM
Power supply	28 V DC	28 V DC
El. power output	720 - 3,700 W	720 - 3,700 W
Max output power	180 kW	241 HP
Specific fuel consumption	0.548 kg/kW/h	0.901 lb/HP/hr

DIMENSIONS	METRIC	IMPERIAL
Height x width (no exhaust)	398 x 330 mm	15.67 x 13.00 in
Length	891 mm	35.08 in
Weight	61.60 kg	135.80 lb

OPERATING ENVELOPE	METRIC	IMPERIAL
Max. altitude	9,000 m	29,528 ft
Ambient temperature	-50/+45 °C	-58/+113 °F

STARTING ENVELOPE	METRIC	IMPERIAL
Max. altitude	6,000 m	19,685 ft
Ambient temperature	-30/+45 °C	-22/+113 °F

# TURBOSHAFT ENGINE PBS TS100

The PBS TS100 turboshaft engine is suitable for light and ultralight UAV helicopters weighing up to 1,000 kg. The engine offers a power take-off of up to 180 kW.



## MAIN FEATURES

- › Low weight
- › Small installation dimensions
- › Excellent power-to-weight ratio
- › Digital interface for control and monitoring
- › Stable operation at high altitudes and high temperatures
- › Ability to run at cold temperatures below -30 °C without preheating
- › Two output shaft speed configurations



## TECHNICAL PARAMETERS

PARAMETERS	METRIC	IMPERIAL
Output shaft speed (ZA/DA)	5,978/2,158 RPM	5,978/2,158 RPM
Power supply	28 V DC	28 V DC
El. power output	720 - 3,700 W	720 - 3,700 W
Max output power	180 kW	241 HP
Specific fuel consumption	0.548 kg/kW/h	0.901 lb/HP/hr

DIMENSIONS	METRIC	IMPERIAL
Height x width (no exhaust)	398 x 330 mm	15.67 x 13.00 in
Length (ZA/DA)	829/881 mm	32.64/34.69 in
Weight (ZA/DA)	56.70/61.30 kg	125.00/135.10 lb

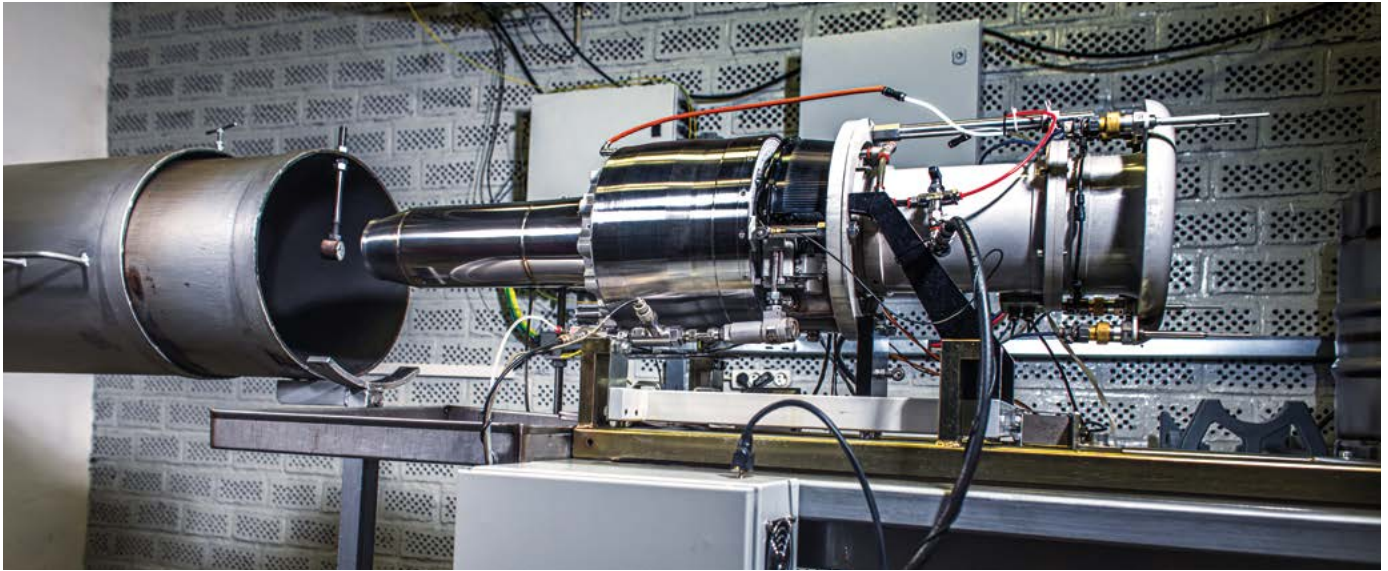
OPERATING ENVELOPE	METRIC	IMPERIAL
Max. altitude	9,000 m	29,528 ft
Ambient temperature	-50/+45 °C	-58/+113 °F

STARTING ENVELOPE	METRIC	IMPERIAL
Max. altitude	6,000 m	19,685 ft
Ambient temperature	-30/+45 °C	-22/+113 °F

# PBS TESTING FACILITY

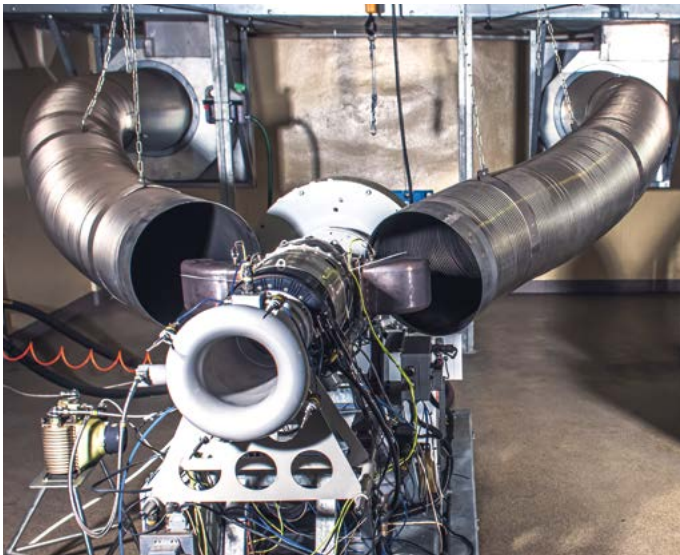
The development and production of UAV turbine engines at PBS is also supported by our own extensive in-house testing facility. More than 50 experienced flight test engineers

and technicians have a total of 16 specialized testing cells at their disposal for comprehensive testing of turbine engines as well as auxiliary power units and environmental control systems.



## TESTING CAPABILITIES

- › Turbojet engines with a thrust of up to 2,500 N
- › Flight speed simulations of up to 0.8 M
- › Testing with an air pressure of up to 1,200 kPa
- › Temperatures from -60 to 80 °C
- › G-force limit tests
- › Vibration and impact tests
- › Complete ATP and production testing



# ABOUT US

PBS is a globally recognized engineering brand with a history of over two hundred years.

The company specializes in the R&D and manufacturing of turbine engines, APUs, and ECS systems designed for unmanned aerial vehicles, medium helicopters, and airplanes.

PBS also develops and produces cryogenic equipment for the world's largest manufacturers of gas liquefaction systems.

PBS Foundry is one of the leading suppliers of nickel and cobalt-based superalloy castings in Europe.



DOA



POA & MOA



AS 9100,  
ISO 9001 & ISO 14001



Non-destructive  
testing (PT, RT)



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