



# EU AERONAUTICS RESEARCH CO-OPERATION



**SE Ivchenko-Progress**



# INTERNATIONAL RECOGNITION OF CERTIFICATION AUTHORITIES



**Quality Systems Certification Authority  
of "QUALITY" Certification Centre  
(Russian Federation)  
Certificate of Compliance  
POCC UA.MX04.B00034  
POCC UA.MX04.B00043  
POCC UA.MX04.B00044**



**Bureau Veritas (France)  
Certificate No. 213617,  
No. 010-UKR and  
No. 010-UKF**



**Aviation Register of  
Interstate Aviation Committee  
(ARMAK)  
Certificates No. SPR-15,  
No. R-3, No. R-69 and others**



**ГОСАВИАСЛУЖБА**

**State Department of Aviation  
Transport of Ukraine**

**Certificates No. VR 0036,  
No. TD 0005 and others**

\* Totally 59 certificates of various types.

# THE BASIC SPHERES OF ACTIVITIES



**DESIGN**



**MANUFACTURE**



**OVERHAUL**



**TEST AND DEVELOPMENT**



**PUTTING IN SERIES PRODUCTION AND IMPROVEMENT OF CONSUMER'S CHARACTERISTICS**



**More than 60 certificates of Bureau Veritas, EASA, Central Civil Aviation Administration of China, IAC AR and GosAviaSluzhba of Ukraine confirm a type design conformity, quality, reliability and the right to design, manufacture, overhaul and upgrade the engines.**

# DIRECTIONS OF ACTIVITY

An-12



AI-20K Series 5, AI-20M Series 6

Ми-1



AI-26B

Yak-40



AI-25 Series 2

An-10



AI-20A, AI-20K Series 5

Be-12



AI-20D Series 4

Yak-42D



D-36 Series 1

IL-18



AI-20A, AI-20K Series 5, AI-20M Series 6

An-24



AI-24 Series 2, AI-24T

An-72



D-36 Series 1A

# CORPORATION ACTIVITY

IVCHENKO-PROGRESS CORPORATION WAS FOUNDED ON 12.01.2007  
THE FOUNDATORS ARE SE "IVCHENKO-PROGRESS" and JSC "MOTOR SICH"



Mi-26T



Be-200



An-148



Mi-8MT(Mi-17)



An-70



Mi-2M



An-124



An-140



Yak-130

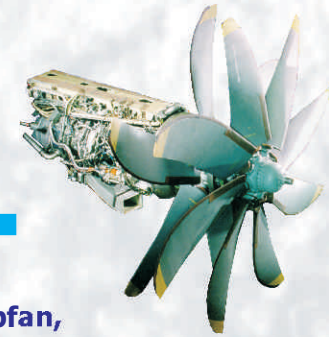
# Milestones in development of SE Ivchenko-Progress gas turbine aero engines



**65 years**

The aero engines designed by SE Ivchenko-Progress power 54 types of A/C in 122 countries of the world.

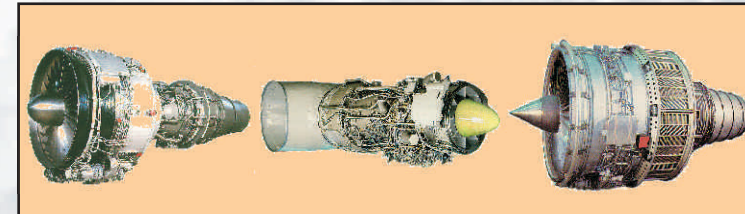
Total operating time of GTEs exceeds 300 million hours



**D-27** propfan, **TV3-117VMA-SBM1** turboprop, **D-436** turbofan, **AI-22** turbofan, **AI-222** turbofan, **AI-450** turboshaft, **AI-450** turboprop, **SPM-21** turbofan

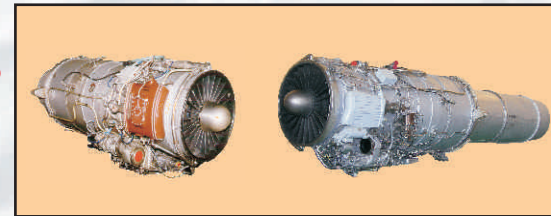
**4-th stage**

Turbofans with high power and thrust:  
**D-136, D-18T**



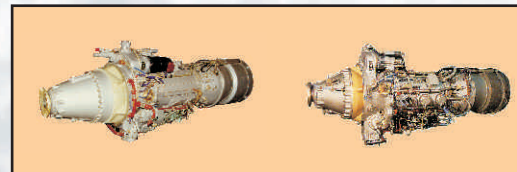
**3-rd stage**

Turbofans:  
**AI-25, AI-25TЛ, D-36**  
APUs: **AI-9, AI-9V**



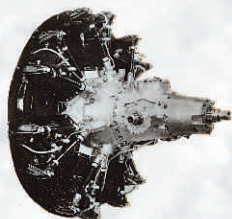
**2-nd stage**

Turboprops:  
**AI-20, AI-24**  
APU: **AI-8**



**1-st stage**

Piston engines:  
**AI-26, AI-14, AI-4**





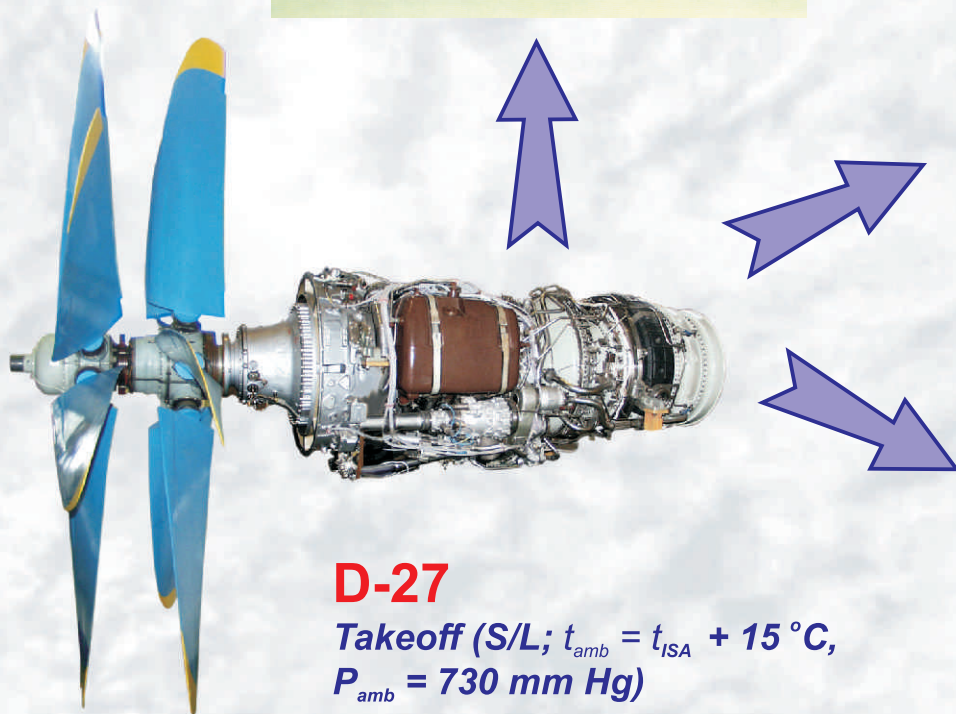
**Advanced  
engines**

# D-27

An-180



An-70,-70T



A-42PE



## D-27

Takeoff (S/L;  $t_{amb} = t_{ISA} + 15^\circ\text{C}$ ,  
 $P_{amb} = 730 \text{ mm Hg}$ )

$N_e$ , ehp	14 000
$C_N$ , kg/h/ehp	0.170



# D-436T1, D-436-148, D-436TP

Tu-334-100



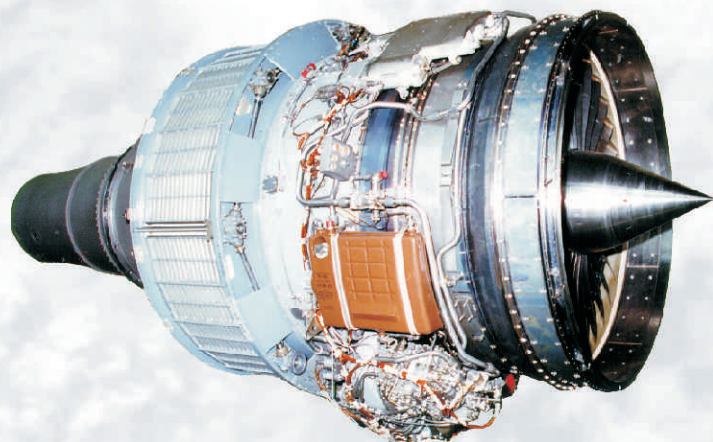
D-436T1

Be-200



D-436TP

D-436T1, D-436-148, D-436TP



An-148,-158,-168,-178



D-436-148

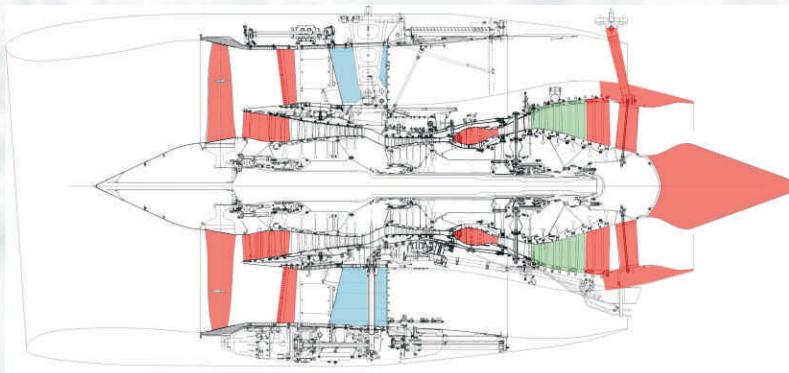
Takeoff (S/L static; ISA)

	D-436T1	D-436TP	D-436-148	D-436-148FM
R, kgf	7 650	7 650	7 000	7500
C <sub>R</sub> , кг/кгf·h	0,364	0,356	0,351	

# D-18T series 3M, D-18T series 5



**D-18T series 3M**



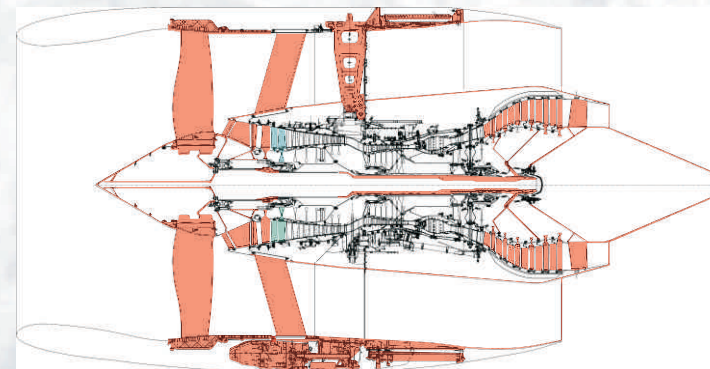
**R, kgf 23430**



**An-124-200**



**D-18T series 5**



**R, kgf 27500**



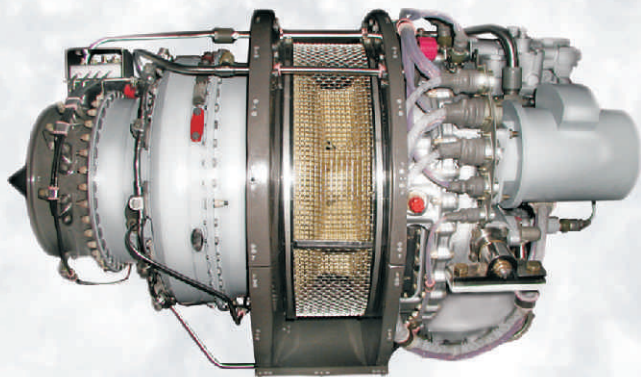
**An-124-300**



# AI-450, AI-450M, AI-450-2



**AI-450**



Helicopters with takeoff weight of 3100...3400 kg

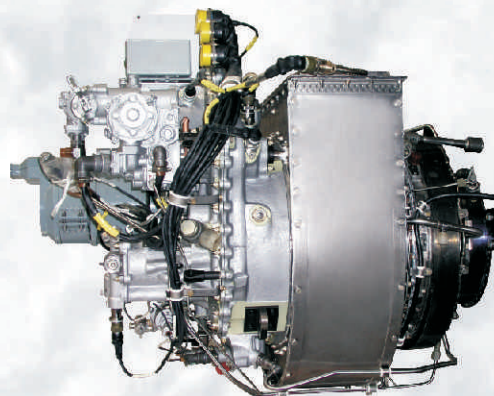


Takeoff (S/L static; ISA)

**AI-450**

N, hp 465

**AI-450M**



Mi-2M

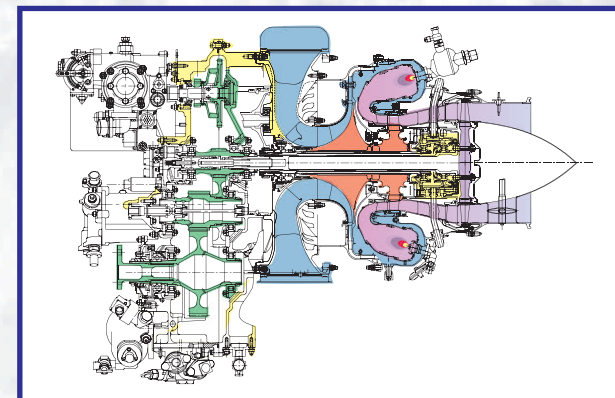


Takeoff (S/L static; ISA)

**AI-450M**

N, hp 400  
C<sub>N</sub>, kg/h/hp 0.260

**AI-450-2**



Helicopters with takeoff weight of 3000...3300 kg



Takeoff (S/L static; ISA)

**AI-450-2**

N, hp 630...730  
C<sub>N</sub>, kg/h/hp 0.255

# AI-450S

Yak-18T



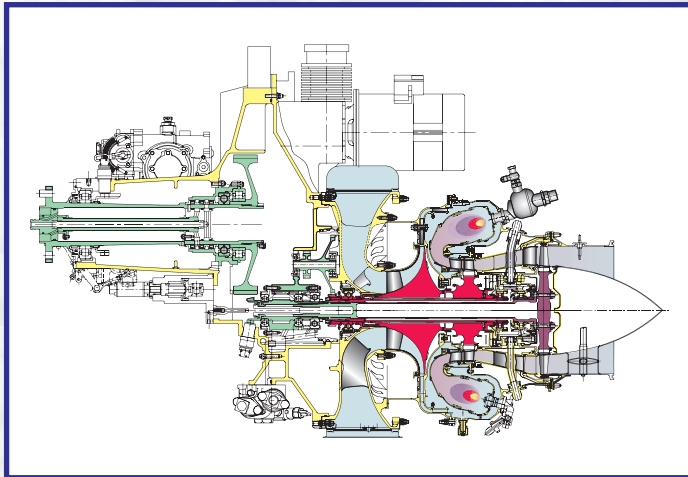
UAV



Light multi-purpose aircraft



Light trainers



## AI-450S

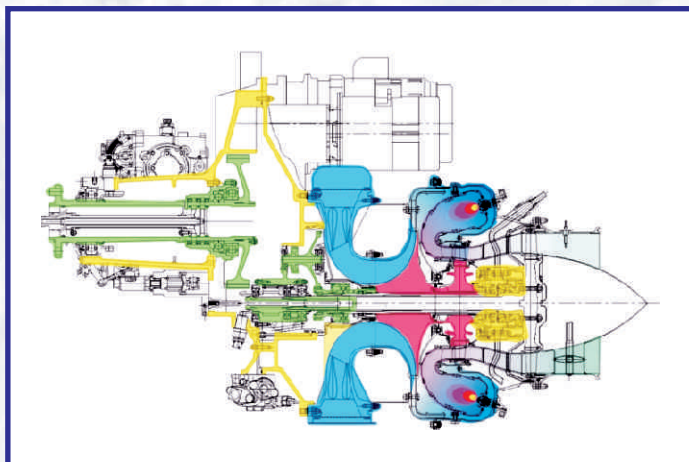
Takeoff  
(S/L static; ISA)

N, hp      400...550

# AI-450S-2, AI-450BP, -450BP-2



**AI-450S-2**



**EV-55**



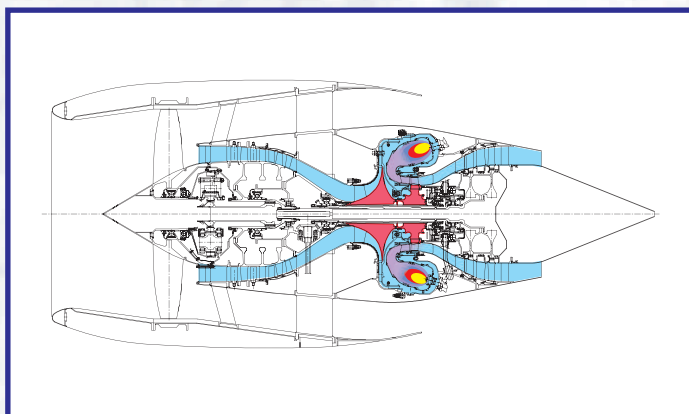
**Light multi-purpose aircraft**



**Takeoff**  
(S/L static; ISA) N, hp

**AI-450S-2**  
630...730

**AI-450BP, -450BP-2**



**UAV**



**Takeoff**  
(S/L static; ISA)

**AI-450BP, -450BP-2**

R, kgf 410...560  
C<sub>R</sub>, kg/h/kgf 0.370

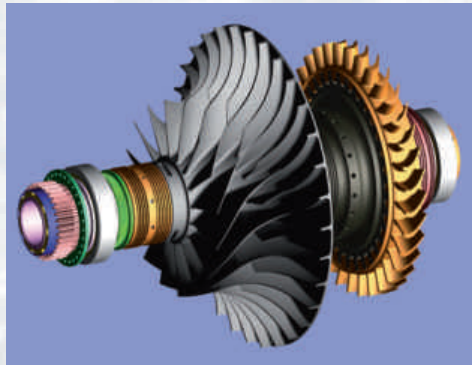
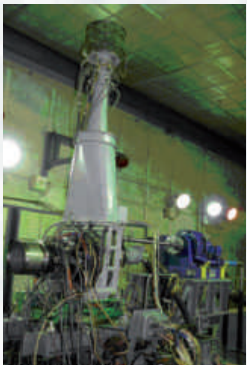
**PROPULSION INTEGRATION**  
ADVANCED STRUCTURE OF SMALL  
GAS TURBINE ENGINE

**THE PROJECT CONSORTIUM**  
39 participants, 14 countries

**Total budget: 33,7 MIL. EUR**  
**EC contribution: 18,1 MIL. EUR**

Effectiveness of the small aircraft, its competitiveness, affordable operation costs and safety directly depends on the efficiency of the small turboprop engine which powered the aircraft

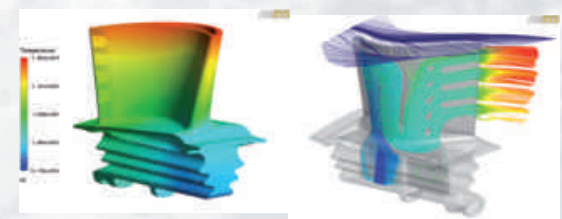
- Decreasing of weight of the power unit for 6 – 8 %
- Decreasing of fuel consumption for 7-12 %
- Decreasing of overall dimensions of the power unit
- Extension of engine service life and its systems for 10 – 15 %
- Decreasing of maintenance costs for 7 – 9 %



Small engine test bench facilities for prospective design experimental investigations



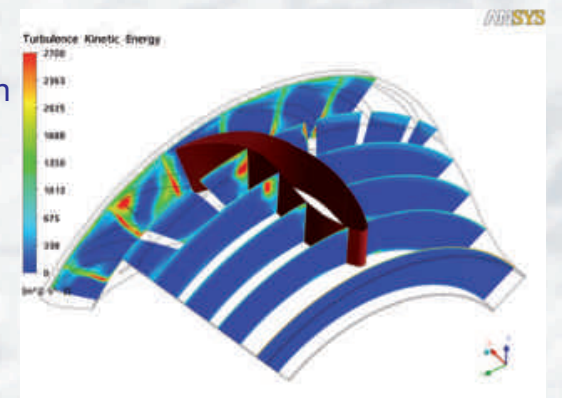
Small turbine blade design optimisation



Small turbine blade cooling system design

Small turbine blade external flow and cooling system CFD calculations

Design optimization of interturbine diffuser by CFD calculations



Thank you for your attention

