MAKILA

FOR THE EC225/725 / ROOIVALK / AS 332/352 / AS 330

PROVEN DESIGN, LOW COST, RELIABLE & HIGH PERFORMING

The Makila family new generation turboshafts were specially developed to power 11-ton class twins, like Eurocopter's EC 225 and EC 725.

The Makila engines incorporate the latest achievements in engine control system architecture, materials and state of the art technologies.

The Makila family

> Entered in service in 1980.
> 6 Millions operating hours.
> 1,750 engines delivered.

Generating Power and Performance

> The Makila experience

- High performance in hostile environments.
- Front air intake means no installation losses.
- New FADEC-controlled bleed valve optimizes specific fuel consumption (SFC) and surge margins.
- New power turbine with blade containment shield for over-speed protection on Makila 2A.
- Drawing on the benefits of the latest technological evolutions, the Makila 2A offers 14% more power than the Makila 1A2 (ISA, Sea level).

> Missions

- Off-shore, utility, defence, EMS.

> Simple modular design

- 4 replaceable modules for easy maintenance.
- Boroscope and magnetic indicator inspections without removal of modules and accessories.
- Good accessibility and easy removal, few specific tools for modular maintenance.

> Low direct maintenance costs

- The target TBO for the Makila 2A engine is 3,500 hours.
- Long component life.

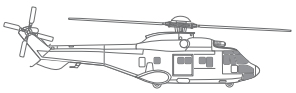
> Dual channel FADEC

- Dual channel FADEC with over-speed protection improves overall safety and decreases pilot work load.
- The Makila 2A dual channel FADEC surpasses current JAR E amendment 11 performance.

SAFRAN
Turbomeca

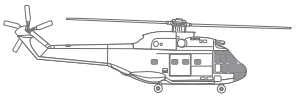
PROVEN DESIGN, LOW COST, RELIABLE & HIGH PERFORMING **MAKILA**

> Helicopters:



EC 225/725
powered by two Makila 2A/2A1

Rooivalk
powered by two Makila 1K2



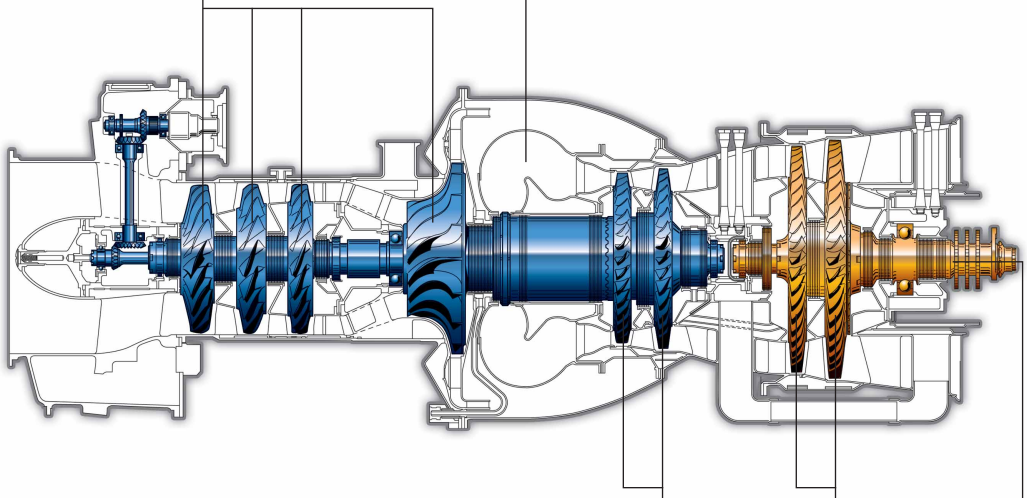
SA 330 Puma
powered by two Makila 1A1

AS 332/532 Super Puma
powered by two Makila 1A/1A1/1A2

FADEC
- More than 20 years of experience.

Compressor
- 3 axial and 1 centrifugal stage.

Annular combustion chamber
- With manifold drain.
- Optimized emission reduction.



2 stage gas generator turbine
- Best high temperature aloys.

Power output shaft
- 23,000 rpm.

2 stage power turbine
- New power turbine with blade containment shield for over-speed protection on Makila 2A.

Maintaining close contact with Makila operators worldwide
- Turbomeca-approved Repair & Overhaul centers.
- 24/7 Turbomeca hotline.

> Power rating (ISA, sea level, kW/shp):

Makila	*1A1*	*1A2*	*1K2*	*2A*
> Application	**SA 330 AS 332/532**	**AS 332 AS 532 Mk2**	**Rooivalk**	**EC 225/725**
> One Engine Inoperative (OEI)				
OEI 2.5 minutes		1,573/2,109	1,573/2,109	1,801/2,415
OEI 2.5 minutes	1,400/1,877	1,467/1,967	1,467/1,967	1,667/2,235
OEI continuous	1,330/1,784	1,420/1,904	1,420/1,904	1,617/2,168
> All Engines Operative (AEO)				
Take-off	1,357/1,820	1,376/1,845	1,376/1,904	1,567/2,101
Max. continuous	1,185/1,589	1,236/1,657	1,236/1,657	1,395/1,870

> Description:

- Makila 2A OEI 30 sec. rating can be used up to 30 seconds in cumulated time without any shop visit required.

Turbomeca is dedicated to the design, production, sale and support of gas turbines for helicopters. Turbomeca offers the world's most comprehensive range of engines, along with strong industrial cooperation associated to close-by customer services structures. Dedicated to 2,350 customers in 155 countries, Turbomeca provides a proximity service thanks to its 16 sites, 26 Maintenance Centers, 24 Repair & Overhaul Centers and 90 Field representatives and Field technicians.

Turbomeca 02/2011 - Tam-Tam Design - Photo credit: ©Turbomeca - ©Studio Pons - ©Eurocopter (Gouhier) - ©DR

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