



AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL - BRASIL

TYPE CERTIFICATE DATA SHEET Nº EM-9802

Type Certificate Holder:

TURBOMECA S.A.
64511 - Bordes Cedex
FRANCE

EM-9802-04

Sheet 01

TURBOMECA

ARRIEL 2B; ARIEL 2C
ARRIEL 2S1; ARIEL 2B1

ARRIEL 2C1; ARIEL 2C2; 2S2

22 December 2008

Engines of models described herein conforming with this data sheet, which is part of Type Certificate No. 9802, meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Brazilian Aeronautical Regulations provided they are installed, operated, and maintained as prescribed by the approved manufacturer's manuals and other instructions.

MODELS ARIEL 2B, ARIEL 2C, ARIEL 2S1, ARIEL 2B1.

TYPE Turboshaft engine consisting of an axial air intake, an axial compressor and a centrifugal compressor driven by a single stage turbine, a combustion chamber, and a single stage power turbine driving a reduction gearbox located at the rear. An accessory drive gearbox, driven by the gas generator, is located at the front.

RATINGS (See Note 1)	kW (shp)	ARRIEL 2B	ARRIEL 2C	ARRIEL 2S1	ARRIEL 2B1
	Maximum continuous	543 (728)	531 (712)	592 (794)	543 (728)
	Takeoff	557 (747)	531 (712)	601 (806)	557 (747)
	30 second OEI	#	704 (944)	735 (985)	#
	2-minute OEI	#	635 (851)	663 (889)	#
	Continuous OEI	#	610 (818)	639 (857)	#
	AEO 30-minutes (See note 12)	#	#	601 (806)	#

CONTROL SYSTEM	Single channel electronic engine control system with manual backup.				
STARTING	The automatic starting sequence is ensured by the Engine Electronic Control Unit. For detail, see Installation Manual.				
FUEL / ADDITIVES	Refer to Installation Manual for approved fuel and additive specification.				
OIL, LUBRICATION / ADDITIVES	Refer to Installation Manual for approved oil specifications.				
IGNITION	Low tension, high energy system, including:				
	- 1 high-energy (H.E) ignition unit				
	- 2 ignition cables				
	- 2 igniter plugs				
	All Models				
	ARRIEL 2B	ARRIEL 2C	ARRIEL 2S1	ARRIEL 2B1	
TEMPERATURE LIMITS	See Note 2	--	--	--	
PRESSURE LIMITS	See Note 5	--	--	--	
DIMENSIONS	Length, cm (in)	118.0 (46.50)	--	153.9 (60.6)	114.0 (44.88)
	Width , cm (in)	50.0 (19.61)	--	50.3 (19.8)	49.0 (19.33)
	Height, cm (in)	62.0 (24.25)	--	71.4 (28.1)	61.6 (24.25)
WEIGHT	Weight / Dry / Maximum / kg (lb) Refer to engine manual for definition of dry weight	134 (295)	131 (289)	--	132.2 (291.5)
CENTER OF GRAVITY	Refer to Installation Manual		All Models		
DRIVE SHAFT TYPE	Refer to Installation Manual		All Models		
AIR BLEED		See Note 10	--	--	--

CERTIFICATION BASIS

The Certification Basis for the engine are those indicated in the RBHA 21.29 and in the RBHA 33, which endorses the 14 CFR Part 33 effective 01 February 1965 including Amendments 33-14; and for Arriel 2C FAA Special Condition No. SC-33-ANE-05 published on 15 April 1996.

<u>Model</u>	<u>Application</u>	<u>Issued TC</u>
ARRIEL 2B	18 May 1998	02 Sep. 1998
ARRIEL 2C	18 May 1998	02 Sep. 1998
ARRIEL 2S1	08 July 1999	04 Feb. 2002
ARRIEL 2B1	18 July 2002	14 Nov. 2002

MODELS

ARRIEL 2C1, ARRIEL 2C2, ARRIEL 2S2

TYPE

Turboshaft engine consisting of an axial air intake, an axial compressor and a centrifugal compressor driven by a single stage turbine, a combustion chamber, and a single stage power turbine driving a reduction gearbox located at the rear. An accessory drive gearbox, driven by the gas generator, is located at the front.

RATINGS

(See Note 1)

kW (shp)	ARRIEL 2C1	ARRIEL 2C2	ARRIEL 2S2
Maximum continuous	531 (712)	612 (821)	601 (806)
Takeoff (5min)	581 (778)	612 (821)	601 (806)
OEI (30 sec)	718 (962)	750 (1 006)	771 (1 034)
OEI (2 min)	646 (865)	713 (956)	699 (937)
OEI Continuous	616 (825)	640 (858)	659 (884)
AEO 30-minutes (See note 12)	#	612 (821)	601 (806)

CONTROL SYSTEM

Dual channel electronic engine control system with optional mechanical backup.

STARTING

The automatic starting sequence is ensured by the Engine Electronic Control Unit. For detail, see Installation Manual.

FUEL / ADDITIVES

Refer to Installation Manual for approved fuel and additive specification.

OIL, LUBRICATION / ADDITIVES

Refer to Installation Manual for approved oil specifications.

IGNITION	Low tension, high energy system, including: - 1 high-energy (H.E) ignition unit - 2 ignition cables - 2 igniter plugs		All Models		
		ARRIEL 2C1	ARRIEL 2C2	ARRIEL 2S2	
TEMPERATURE LIMITS		See Note 2	--		
PRESSURE LIMITS		See Note 5	--		
DIMENSIONS	Length, cm (in)	1 015 (39.9)	--	1539 (60.6)	
	Width , cm (in)	498 (19.6)	--	497 (19.6)	
	Height, cm (in)	576 (22.6)	--	715 (28.1)	
WEIGHT	Weight / Dry / Maximum / kg (lb) Refer to engine manual for definition of dry weight	129.2 (285)	131.5 (290)	131.2 (289)	
CENTER OF GRAVITY	Refer to Installation Manual		All Models		
DRIVE SHAFT TYPE	Refer to Installation Manual		All Models		
AIR BLEED		See Note 10	--	--	--
CERTIFICATION BASIS	The Certification Basis for the engine are those indicated in the RBHA 21.29 and in the RBHA 33, which endorses the 14 CFR Part 33 effective 01 February 1965, including Amendments 1 through 14; RBHA/14 CFR 33.28, Amendment 15, FAA Special Conditions 33-ANE-05 and 33-001-SC published 19 June 1998.	<u>Model</u>	<u>Application</u>	<u>Issued TC</u>	
		ARRIEL 2C1	17 Jan. 2001	30 Sep. 2001	
		ARRIEL 2C2	29 Aug. 2006	12 March 2007	
		ARRIEL 2S2	16 Feb. 2006	22 Dec. 2008	
IMPORT REQUIREMENTS	Each engine imported separately and/or spare parts must be accompanied by an export airworthiness approval issued by DGAC, attesting that the particular engine and/or parts were submitted to the governmental quality control before delivery and are in conformity with the ANAC approved type design.				

NOTES:**NOTE 1****Engine Ratings.**

Engine ratings are based on calibrated test rig with performance under the following conditions:

Static, sea level standard conditions (59°F, 29.92 in.Hg)

No air bleed, no accessory power extraction

6 000 rpm output shaft drive speed for **2B, 2C, 2C1 and 2C2**

6 409 rpm output shaft drive speed for **2S1 and 2S2**

Fuel load heat value : 43 136 kJ/kg (18 545 BTU/lb)

The ratings given above are minimum final test performance of production and overhaul engines in accordance with engine acceptance test specification:

No. 0.292.02.945.0 for 2B No. 0.292.02.944.0 for 2C

No. 0.292.02.941.0 for 2S1 No. 0.292.02.949.0 for 2B1

No. 0.292.02.948.0 for 2C1 No. 0.292.02.952.0 for 2C2

No. 0.292.02.953.0 for 2S2

Use the exhaust pipe specified below with calibrated test bed air intake No. 6.528.12.500.1 for 2B, 2B1, 2C, 2C1, 2C2, 2S1 and 2S2.

Exhaust pipe No. 0.292.81.500.0 is part of the engine definition (primary exhaust pipe), and is common to the **2B, 2C, 2S1, 2B1, 2C1 and No. 0.292.81.502.0 to the 2C2 and 2S2.**

NOTE 2**Maximum Permissible Temperatures - °C (°F)**

- Gas Generator Exhaust Temp. T45	ARRIEL 2B	ARRIEL 2C	ARRIEL 2S1	ARRIEL 2B1
In Flight				
30 second OEI rating	#	1000 (1 832)	--	#
2 minute OEI rating	#	941 (1 726)	--	#
Continuous OEI rating	#	912 (1 674)	--	#
Takeoff rating	915 (1 679)	912 (1 674)	--	915 (1 679)
Max. Continuous rating	849 (1 561)	877 (1 611)	--	849 (1 560)

**NOTE 2
(Cont.)**

	ARRIEL 2C1	ARRIEL 2C2	ARRIEL 2S2
On Start-up			
For an unlimited duration	750 (1 382)	--	--
Maximum overtemperature (<10 sec)	865 (1 589)	--	--
If limits are exceeded, refer to Maintenance Manual for required action.			
- Fuel Temperature			
Maximum temperature: normal fuels	+ 50°C	--	--
JP4	+ 43°C	--	--
restricted use fuels	+ 25°C	--	--
For definition of normal and restricted use fuels, see Installation Manual.			
- Use of anti-icing additive for fuel temperature < -20°C			
- The fuel temperature conditions for engine starting are described in the Installation Manual.			
<u>Maximum Permissible Temperatures - °C (F)</u>			
- Gas Generator Exhaust Temp. T45			
In Flight			
30 second OEI rating	1000 (1 832)	996 (1825)	996 (1825)
2 minute OEI rating	941 (1 726)	944 (1731)	944 (1731)
Continuous OEI rating	912 (1 674)	926 (1699)	926 (1699)
Takeoff rating	912 (1 674)	929 (1704)	930 (1706)
Max. Continuous rating	877 (1 611)	891 (1636)	893 (1639)
On Start-up			
For an unlimited duration	750 (1 382)	--	--
Maximum overtemperature (<10 sec)	865 (1 589)	840 (1544)	865 (1 589)
If limits are exceeded, refer to Maintenance Manual for required action.			
- Fuel Temperature			
Maximum temperature: normal fuels	+ 50°C	+ 55°C	+50°C
JP4	+ 43°C	--	+43°C
restricted use fuels	+ 25°C	--	#

**NOTE 3
(Cont.)**

	ARRIEL 2B	ARRIEL 2C	ARRIEL 2S1	ARRIEL 2B1
Minimum stabilized	35 381	--	--	--
Maximum transient (<20 sec):				
power on	42 613	--	--	--
power off	47 305	--	--	--
Minimum transient (<20 sec)	26 584	--	--	--
Maximum stabilized	42 418	--	--	--

If limits are exceeded, refer to Maintenance Manual. 100% = 39 095 rpm.

Maximum / Minimum Permissible Engine Operating Speeds (rpm).

	ARRIEL 2C1	ARRIEL 2C2	ARRIEL 2S2
- Gas Generator Speed (N1)			
Maximum Stabilized Speed			
30 second OEI rating	54 986	55 265	55 178
2 minute OEI rating	53 126	53 275	53 348
Continuous OEI rating	52 506	52 764	52 776
Takeoff rating	52 776	53 079	53 089
Maximum continuous rating	51 637	51 922	51 959
AEO 30 minute rating	#	53 079	53 089
Minimum Stabilized Speed			
Idle mode speed range	34 914 to 35 435	--	25 013 to 27 097
Flight mode (manual control mode)	32 308	--	--
Transient speed			
Maximum over speed (< 20 s)	53 312	--	53 661

For variation of these limits with outside air temperature (OAT), refer to Installation Manual. For required action if limits are exceeded, refer to Maintenance Manual. 100 % N1 = 52 110 rpm

- Power Turbine Speed (N2)

Limit values authorized other than during starting and idle (FLIGHT mode)

**NOTE 3
(Cont.)**

	ARRIEL 2C1	ARRIEL 2C2	ARRIEL 2S2
Minimum stabilized	35 381	--	--
Maximum transient (<20 sec):			
power on	42 613	--	43 719
power off	47 305	--	47 305
Minimum transient (<20 sec)	26 584	--	26 584
Maximum stabilized	42 418	--	42 418

If limits are exceeded, refer to Maintenance Manual. 100% N2= 39 095 rpm.

NOTE 4

	ARRIEL 2B	ARRIEL 2 C	ARRIEL 2S1	ARRIEL 2B1
Power Turbine Unit Limits / daN.m (ft.lb)				
30 second OEI rating	#	116.8 (861)	120.3 (855)	#
2 minute OEI rating	#	107.3 (791)	113.2 (833)	#
Continuous OEI rating	#	103.0 (760)	102.5 (756)	#
AEO 30minute rating	#	#	92.5 (682)	#
Takeoff	91.3 (673)	92.5 (682)	--	91.3 (673)
Maximum continuous	91.3 (673)	92.5 (682)	--	91.3 (673)
Max. Over-torque (transient < 20 sec)	132.2 (975)	--	143 (1055)	132.2 (975)
	ARRIEL 2C1	ARRIEL 2C2	ARRIEL 2S2	
Power Turbine Unit Limits / daN.m (ft.lb)				
30 second OEI rating	118.70 (875)	119.3 (879)	120.3 (855)	
2 minute OEI rating	107.90 (796)	116.0 (855)	113.2 (833)	
Continuous OEI rating	101.55 (749)	101.8 (750)	102.5 (756)	
AEO 30minute rating	#	#	92.5 (682)	
Takeoff	92.50 (682)	97.3 (717)	92.5 (682)	
Maximum continuous	92.50 (682)	97.3 (717)	92.5 (682)	
Max. Over-torque (transient < 20 sec)	132.20 (975)	--	143 (1055)	

NOTE 5Pressure Limits

a) Minimum/Maximum fuel pressure

- Normal operation, i.e. excluding starting phase:

The minimum (absolute) pressure is defined by the highest of the following conditions:

20 kPa (2.9 psi)

35% of atmospheric pressure,

7 kPa (1 psig) above the vapor pressure of the fuel used,

Fuel pressure corresponding to a vapor volume over Liquid volume ratio of 0.3.

- During the starting phase or at relight:

Fuel pressure must not be less than 25% below the atmospheric pressure.

- Maximum pressure:

Less than or equal to 150 kPa (21.8 psi) (relative pressure), whether during starting phase or in normal operation.

b) Oil pressure

Maximum Oil Pressure : 600 kPa (87.0 psi)

Minimum Oil Pressure: 110 kPa (16.0 psi)

Normal operating range: 200 to 600 kPa (29.0 to 87.0 psi)

NOTE 6Accessory Drive Provisions: all Models.

Drive	Direction of Rotation ⁽¹⁾	Rotation Speed rpm	Maximum Torque in Overload N.m (in.lb)	Maximum Static Overhang N.m (in.lb)	Fuse Shaft Breakaway Torque N.m (in.lb)	Maximum Permanent Shaft Power	
						Twin Engine situation kW (shp)	OEI kW (shp)
Starter-generator (2B/2B1)	C	11 330	50 (442)	25 (221)	95 (841)	7.5 (10.1)	(single engine)
Starter-generator (2C/2C1)	C	11 330	50 (442)	25 (221)	95 (841)	3.5 (04.7)	5.0 (6.7)
Starter-generator (2S1/2S2)	C	11 330	50 (442)	25 (221)	95 (841)	7.5 (10.1)	7.5 (10.1)
Starter-generator (2C2)	C	11 330	50 (442)	25 (221)	95 (841)	5.0 (06.7)	5.0 (6.7)
Oil Cooling Fan output (2S1/2S2)	CC	12 253	10 (088)	15 (133)	100 (885)	1.5 (02.0)	1.5 (2.0)
Oil Cooling Fan output (2C2)	CC	11 452	10 (088)	15 (133)	100 (885)	1.5 (02.0)	1.5 (2.0)

**NOTE 6
(Cont.)**

Drive	Direction of Rotation ⁽¹⁾	Rotation Speed rpm	Maximum Torque in Overload N.m (in.lb)	Maximum Static Overhang N.m (in.lb)	Fuse Shaft Breakaway Torque N.m (in.lb)	Maximum Permanent Shaft Power Twin Engine situation kW (shp)	OEI kW (shp)
-------	--	--------------------------	---	--	--	--	-----------------

For accessories:

Oil pump pack	C	11 883					
HP fuel pump (only 2B)	CC	11 883					
LP fuel pump	CC	11 883					
Control System Alternator	CC	12 180					

For Engine:

Gas generator Rotor	CC	52 110					
Free turbine rotor	C	39 095					
(2B/2B1/2C/2C1/2C2)							
Free turbine rotor (2S1/2S2)	C	41 832					
Output shaft	C	6 000					
(2B/2B1/2C/2C1/2C2)							
Output shaft (2S1/2S2)	C	6 409					

(1) C: Clockwise; CC: counterclockwise.

The rotation direction of the power drives for the accessories is indicated considering the power drive seen from the outside. The rotation direction of the engine rotors is indicated with respect to viewing the engine from its rear end. For further details see Installation Manual.

Oil cooling fan output drive is available on 2S1, 2S2 and 2C2 only.

NOTE 7 The Models shown on the TCDS have the following general characteristics:

<u>Models</u>	<u>Characteristics</u>
ARRIEL 2S1	Base Model
ARRIEL 2B	Similar to ARRIEL 2S1. The rating structure is simplified for single engine application: Takeoff and Maximum Continuous ratings only. The main differences are the mounts, provision for the tail rotor drive, and the deletion of the oil cooler fan drive on the reduction gearbox.
ARRIEL 2C	Similar to ARRIEL 2S1. The main differences are the mounts and the deletion of the oil cooler fan drive on the reduction gearbox.
ARRIEL 2B1	Similar to ARRIEL 2B. The main difference is the dual channel electronic engine control system.
ARRIEL 2C1	Similar to ARRIEL 2C. The main difference is the dual channel electronic engine control system.
ARRIEL 2C2	Similar to ARRIEL 2C1. The main differences are the increased power ratings (thermal and torque), the HIP/SARM rating (similar to 2S1), new HPT material and new axial compressor wheel.
ARRIEL 2S2	Similar to ARRIEL 2C2. The main differences are the mounts, which are those of the ARRIEL 2S1

NOTE 8 Bleed air extraction

P3 air bleed for aircraft use. Maximum flow rate at standard sea level conditions:

Take-off rating, 100 g/s (0.220 lb/s)

Maximum continuous rating, 98 g/s (0.216 lb/s)

For further details, see Installation Manual.

NOTE 9 Fuel Supply Requirements

The ARRIEL 2B, 2B1, 2C, 2C1, 2C2, 2S1 and 2S2 have a fuel filter supplied with the engine. Fuel icing inhibitor additive is required when operating with fuel temperatures below -20°C (-4°F) for ARRIEL 2B/2B1/2C/2C1/2S1 and -30°C (-22°F) for ARRIEL 2C2/2S2

NOTE 10 Fuel or Oil additives

Fuel icing inhibitor additive is required when operating with fuel temperatures below -20°C (-4°F) for ARRIEL 2B/2B1/2C/2C1/2S1 and -30°C (-22°F) for ARRIEL 2C2/2S2

Refer to Installation Manual for approved fuel and oil additive specifications.

NOTE 11 Air Intake Requirements.

The ARRIEL engines have not been tested to evaluate the effects of foreign object ingestion other than rain water. Foreign object ingestion characteristics of airframe air inlet and engine combination are to be evaluated prior to approval of the engine installation, for all remaining foreign objects.

The ARRIEL engines do not have anti-icing provisions and have not been tested to evaluate the effects of icing conditions. Anti-icing characteristics of airframe, air inlet, and engine combination are to be evaluated prior to approval of the engine installation.

The ARRIEL 2B engine meets the requirements of 14 CFR Part 33.68(a)(b) when installed with Eurocopter AS 350 B3 helicopter air intake P/N 350.A.54.1080.04 and protection screen P/N 350.A.58.1607.03. The engine is not approved for operation in icing conditions with Eurocopter AS 350 B3 sand filter P/N 704.A.41.650.010.

The ARRIEL 2C engine meets the requirements of 14 CFR Part 33.68(a)(b) when installed with Eurocopter AS 365 N3 helicopter air intake ducts consisting of P/N 365.A.24.0110.04/05 (MGB section, left/right sides respectively) and P/N 365.A.54.5022.01 (engine compartment section, both sides), along with protection screen P/N 365.A.24.1067.02/03 (left/right sides respectively).

The ARRIEL 2S1 engine meets the requirements of 14 CFR Part 33.68(a)(b) when installed with Sikorsky S76C+ helicopter air intake assembly Part Number (P/N) 76300-07761-101.

The ARRIEL 2B1 engine meets the requirements of 14 CFR Part 33.68(a)(b) when installed with EUROCOPTER EC 130 helicopter air intake P/N 350.A.54.1080.04 and protection screen 350.A.58.1607.03. The engine is not approved for operation in icing conditions with Eurocopter EC 130 sand filter P/N 704.A.41.650.010.

The ARRIEL 2C1 engine meets the requirements of 14 CFR Part 33.68(a)(b) when installed with Eurocopter AS 365 N3 helicopter air intake ducts consisting of P/N 365.A.24.0110.04/05 (MGB section, left/right sides respectively) and P/N 365.A.54.5022.01 (engine compartment section, both sides), along with protection screen P/N 365.A.24.1067.02/03 (left/right sides respectively).

The ARRIEL 2C2 engine meets the requirements of 14 CFR Part 33.68(a)(b) when installed with Eurocopter AS 365 N3 helicopter air intake ducts consisting of P/N 365.A.24.0110.04/05 (MGB section, left/right sides respectively) and P/N 365.A.54.5022.01 (engine compartment section, both sides), along with protection screen P/N 365.A.24.1067.02/03 (left/right sides respectively).

The ARRIEL 2S2 engine meets the requirements of 14 CFR Part 33.68(a)(b) when installed with:

- An air intake assembly as per SIKORSKY drawing: P/N 0401277880
- A barrier filter P/N 76302-07800
- An inlet bell mouth P/N 76304-07009-049
- An heated internal duct joining the plenum chamber to the engine air inlet P/N 0401277880

NOTE 12 Operators who use the AEO (All Engine Operative) 30-minute power rating must comply with the airworthiness limitations as specified in the Maintenance Manual.

NOTE 13 Engine Monitoring Transmitters: Refer to Installation Manual.

NOTE 14 Oil System: Refer to Installation Manual.

NOTE 15 Engine Fire Detector:
The ARRIEL 2B, 2B1, 2C, 2C1, 2C2 and 2S2 feature mounting and wiring for installation of three fire detectors. Fire detectors are not part of the engine definition.
The ARRIEL 2S1 has no fire detectors installed on the engine.

NOTE 16 Life-limited components are listed in DGAC-approved Chapter 5 of the engine Maintenance Manual.

NOTE 17 Permissible overhaul and inspection intervals are listed in DGAC approved Chapter 5 of the engine Maintenance Manual.

NOTE 18 Operational and Service Instruction

	ARRIEL 2B	ARRIEL 2C	ARRIEL 2S1	ARRIEL 2B1
Performance Manual No.	X 292 M5 001 9	X 292 M1 001 9	X292 L0 001 9	X 292 N5 002 9
Installation Manual No.	X 292 M0 001 2	X 292 M1 001 2	X292 L0 001 1	X 292 N5 001 9
Operation Manual No.	See Note 19	See Note 19	See Note 19	See Note 19
Maintenance Manual No.	X 292 M5 450 2	X 292 M1 450 2	X292 L0 301 2	X 292 N5 450 2
Repair Manual No.	X 292 M5 500 2	X 292 M1 500 2	X292 L0 500 2	X 292 N5 500 2
	ARRIEL 2C1	ARRIEL 2C2	ARRIEL 2S2	
Performance Manual No.	X 292 N4 002 9	X 292 N6 002 9	X 292 P5 001 9	
Installation Manual No.	X 292 N4 001 2	X 292 N6 404 1	X 292 P5 001 2	
Operation Manual No.	See Note 19	See Note 19	See Note 19	
Maintenance Manual No.	X 292 N4 450 2	X 292 N6 450 2	X 292 P5 451 2	
Repair Manual No.	X 292 N4 500 2	X 292 N6 500 2	X 292 P5 550 2	

NOTE 19 The Operation Manual is contained within Chapter 15 of the Installation Manual.

NOTE 20 Service bulletins, structural repair manuals, vendor manuals, aircraft flight manuals, and overhaul and maintenance manuals, which contain a statement that the document is DGAC approved, are accepted by the ANAC and are considered ANAC approved. These approvals pertain to the type design only.



HÉLIO TARQUÍNIO JÚNIOR

**Gerente-Geral Substituto, Certificação de Produto Aeronáutico
(Acting Manager, Aeronautical Product Certification)**