

**COMANDO DA AERONÁUTICA
DEPARTAMENTO DE PESQUISAS E DESENVOLVIMENTO
CENTRO TÉCNICO AEROESPACIAL**

TYPE CERTIFICATE DATA SHEET No. ER-9411

Type Certificate Holder:

THE ENSTROM HELICOPTERS CORPORATION
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ER-9411-01
Sheet 01

ENSTROM

MODELS
480
480B

October 2005

This data sheet, which is part of Type Certificate No. 9411, prescribes conditions and limitations under which the product, for which the Type Certificate was issued, meets the airworthiness requirements of the Brazilian Aeronautical Regulations.

I - ENSTROM 480 (Normal Category Rotorcraft) - 5PCLH, approved 12 September 1995.

ENGINE One Allison 250-C20W.

FUEL SPECIFICATION Mil-T-5624, Grade JP-4 or JP-5; Aviation Turbine Fuels ASTM-D1655 Jet A or A-1 (or Allison Spec. EMS-64) or Jet B; Mil-T-83133, Grade JP-8; JP-1 or Diesel #1 fuel conforming to ASTM D1655, Jet A; Artic Diesel Fuel DF-A (W-F-800B) conforming to ASTM D1655, Jet A or Jet A-1.

ENGINE LIMITS

	<u>Takeoff (5 min.)</u>	<u>Max. Continuous</u>
Torque Pressure	66 psi (285 hp)	60 psi (256 hp)
Output Shaft Speed	103% (6 196 rpm)	103% (6 196 rpm)
Turbine Outlet Temperature	810° C	737° C
Gas Generator Speed	105% (53 519 rpm)	105% (53 519 rpm)

ROTOR LIMITS

	Power Off	Power On
Maximum	385 rpm	Maximum 365 rpm
Minimum	334 rpm	Minimum 357 rpm

AIRSPPEED LIMITS

Never exceed **225** km/h (140 mph) (122 knots) IAS. For reduction in V_{NE} with altitude and gross weight, see Brazilian approved Rotorcraft Flight Manual.

C.G. LIMITS

Maximum Forward C.G. is +3 403 mm (+134.0 in), at all G.W. up to 998 kg (2 200 lb), decreasing linearly to +3 463 mm (+136.35 in), at 1 292 kg (2 850 lb).

Maximum Aft C.G. is +3 632 mm (+143.0 in), at all G.W. up to 1 134 kg (2 500 lb), decreasing linearly to +3 594 mm (+141.50 in), at 1 292 kg (2 850 lb).

ALTITUDE LIMITS	3 962 m (13 000 feet) maximum height density altitude. For Reduction in altitude with gross weight, see Brazilian approved Rotorcraft Flight Manual
MAXIMUM WEIGHTS	1 292 kg (2 850 lb)
MINIMUM CREW	One (1) at +2 517 mm (+99.1 in) station.
PASSENGERS	One (1) at +2 387 mm (+94.0 in), and Three (3) at +2 872 mm (+113.1 in); or One (1) at +2 517 mm (+99.1 in) and One (1) at +2 872 mm (+113.1 in).
MAXIMUM BAGGAGE	68 kg (150 lb) at +4876 mm (+192.0 in)
FUEL CAPACITY	339.5 liters (266.6 kg) (89.7 Gallons-588 lb) at + 3673 mm (+144.6 in); 11.4 liters (3.0 Gallons) unusable.
OIL CAPACITY	5.3 liters (5.1 kg) (11.25 lb) at +3886 mm (+153.0 in)
CONTROL SYSTEM RIGGING	Refer to Maintenance Manual.
SERIAL NUMBERS ELIGIBLE	S/N 5002 thru 5042, and 5044.

II - ENSTROM 480B (Normal Category Rotorcraft) - 5PCLH, approved 05 October 2005.

ENGINE	One Rolls-Royce 250-C20W.		
FUEL SPECIFICATION	Mil-T-5624, Grade JP-4 or JP-5; Aviation Turbine Fuels ASTM-D1655 Jet A or A-1 (or Allison Spec. EMS-64) or Jet B; Mil-T-83133, Grade JP-8; JP-1 or Diesel #1 fuel conforming to ASTM D1655, Jet A; Artic Diesel Fuel DF-A (W-F-800B) conforming to ASTM D1655, Jet A or Jet A-1.		
ENGINE LIMITS		<u>Takeoff (5 min.)</u>	<u>Max. Continuous</u>
	Torque Pressure	72 psi (305 hp)	65 psi (276 hp)
	Output Shaft Speed	103% (6 196 rpm)	103% (6 196 rpm)
	Turbine Outlet Temperature	810° C	737° C
	Gas Generator Speed	105% (53 519 rpm)	105% (53 519 rpm)
ROTOR LIMITS	Power Off	Power On	
	Maximum 385 rpm	Maximum	372 rpm
	Minimum 334 rpm	Minimum	365 rpm
AIRSPEED LIMITS	Never exceed 232 km/h (144 mph) (124 knots) IAS. For reduction in V_{NE} with altitude and gross weight, see Brazilian approved Rotorcraft Flight Manual.		

C.G. LIMITS	Longitudinal: Maximum Forward C.G. is +3 403 mm (+134.0 in), at all G.W. up to 998 kg (2 200 lb), decreasing linearly to +3477 mm (+136.9 in), at 1 361 kg (3 000 lb). Maximum Aft C.G. is +3 632 mm (+143.0 in), at all G.W. up to 1 134 kg (2 500 lb), decreasing linearly to +3580 mm (+140.95 in), at 1 391 kg (3 000 lb). Lateral: Maximum asymmetric moment $\pm 86,41$ kgm (7 500 in-lb)
ALTITUDE LIMITS	3 048 m (10 000 feet) maximum height density altitude at 1 391 kg (3 000 lb) gross weight. 3 962 m (13 000 feet) maximum height density altitude at 1 293 kg (2 850 lb) gross weight. For Reduction in altitude with gross weight, see Brazilian approved Rotorcraft Flight Manual
MAXIMUM WEIGHTS	1 391 kg (3 000 lb)
MINIMUM CREW	One (1) at +2 517 mm (+99.1 in) station.
PASSENGERS	One (1) at +2 387 mm (+94.0 in), and Three (3) at +2 872 mm (+113.1 in); or One (1) at +2517 mm (+99.1 in) and One (1) at +2 872 mm (+113.1 in).
MAXIMUM BAGGAGE	68 kg (150 lb) at +4876 mm (+192.0 in)
FUEL CAPACITY	339.5 liters (266.6 kg) (90 gallons- 607 lb) at + 3 673 mm (+144.6 in); 11.4 liters (3.0 gallons) unusable.
OIL CAPACITY	5.68 liters (5.26 kg) (11.6 lb) at +3886 mm (+153.0 in)
CONTROL SYSTEM RIGGING	Refer to Maintenance Manual.
SERIAL NUMBERS ELIGIBLE	S/N 5043, 5045 and subsequent.

DATA PERTINENT TO ALL MODELS

DATUM	3640 mm (143 334 in.) forward of main rotor hub centerline
LEVELING MEANS	Lower longer on of pylon section.
SERIAL NUMBERS ELIGIBLE	A FAA Certificate of Airworthiness for Export, endorsed as noted under Import Requirements, must be submitted for each individual rotorcraft for which application for a Brazilian Airworthiness Certificate is made.
IMPORT REQUIREMENTS	A Brazilian Airworthiness Certificate must be issued in the basis of the Airworthiness Certificate for Exportation issued by the FAA, including the following statement: "The rotorcraft covered by this Certificate has been inspected, tested and found to comply with the Brazilian approved type design as defined by the CTA Type Certificate No 9411, and is in condition for safe operation."

**IMPORT
REQUIREMENTS
(Cont.)**

The CTA Reports H.10-1380-02, dated 27 December 1994 or further revisions, and H.10-1382-00, dated 05 October 2005, or further revisions, contains the Brazilian requirements for the acceptance of these aircraft (See Note 4).

**CERTIFICATION
BASIS**

Brazilian Type Certificate No. 9411 issued on 12 September 1995 based on the RBHA 27, which endorses the FAR 27, effective 24 November 1964, as amended by 27-1 thru 27-23, effective September 1988; RBHA/FAR 27.337, 27.351, 27.395, 27.401, 27.501, 27.613, 27.629, 27.663, 27.685, 27.727, 27.783, 27-861 and 27.865(a) as amendment 27-26, effective 05 April 1990; RBHA/FAR 27.775 as amended by 27-27, effective 22 October 1990; RBHA/FAR 27.2 as amendment 27-28, effective 16 August 1991; and RBHA/FAR 36 amendment 20 (Appendix J) effective 11 September 1992, plus the Brazilian Special Conditions listed in the CTA Fax/letter n^o 385/FDH/IFI/93, dated 20 September 1993.

EQUIPMENT

The basic required equipment as prescribed in the applicable airworthiness regulations must be installed in the helicopters for certification, and, in addition, those equipments established in the Report No H.10-1380-0, and The FAA approved Brazilian Rotorcraft Flight Manual issued for the applicable helicopters serial numbers.

NOTES:**NOTE 1**

Current Weight and Balance Report, with List of Equipment included in the certificated empty weight, interior arrangement and loading instructions, when necessary, must be provided for each helicopter at the time of the original certification. The Certificated empty weight and corresponding center of gravity locations must include unusable fuel as tabulated below:

Model	Fuel blander Part Number	Unusable Fuel
480 & 480B	4122009, Rev A, -, -2 & -4	0.9 kg (2 lb) at +3 642 mm (+143.4 in)
	4122052, No Rev., -1 & -2	5.17 kg (11.4 lb) at +3 642 mm (+143.4 in)

NOTE 2

Rotorcraft operation must be in accordance with the FAA approved Brazilian Rotorcraft Flight Manual. All placards required in either the FAA approved Brazilian Rotorcraft Flight Manual or the Certification Basis must be installed in the helicopter in accordance with the following document: Report H.10-1380-02 item 8.

NOTE 3

Information essential for the proper maintenance of the helicopter is contained in the pertinent model Maintenance Manual. The retirement times of critical parts are listed in the following table. These values of retirement times of service life can not be increased without CTA Engineering Approval.

The following special notations augment the Service Life Table specifying limitations and/or special conditions associated with authorized Gross Weights and service lives.

NOTE 3 (Cont.)

SERVICE LIFE – HOURS					
Part Number	Component	Model		EH-480	EH-480
		Weight	(kg) (lb)	1.292 2.850	1.292 2.850
ECD 084-1	Tension – torsion strap			1.200*	1.200*
ECD 100 (all dash Number)	Tail rotor gear set			1.200	1.000
ECD-100-1, -2	Tail Rotor Gear set			1.200	1.000
ECD 4000 (All dash Number)	Drive Belt			5.500	5.500
ECD 4056-1, -3	Bearing lower Pulley Assembly			1.200	1.200
20368	Reservoir Cylinder (Pop Out Floats)			?	?
28-13106-3	Ring Gear Carrier			2.400	2.400
28-13108 (All dash Number)	Main Rotor Ring Gear and Pinion Set			3.700	3.700
28-14207-9	Pitch Change Bellcrank Assembly			3.130	N/A
28-14207-101	Picth Change Bellcrank Assembly			15.000	15.000
28-14280-1	Main Rotor Hub Plate (Upper)			5.000	N/A
28-14280-3	Main Rotor Hub Plate (Upper)			+	N/A
28-14280-5	Main Rotor Hub Plate (Upper)			+	4.592
28-14281-1	Main Rotor Hub Plate (Lower)			5.000	N/A
28-14281-3	Main Rotor Hub Plate (Lower)			+	N/A
28-14281-5	Main Rotor Hub Plate (Lower)			+	4.592
28-14320-12, -13	Thrust Bearing (Lamiflex)			? ?	N/A
28-150074-11, -13	Tail Rotor Spindle			1.200	1.200
4110006-17, -18	Pylon/Keel Attachment Plate			10.000	N/A
4112034-11	Vibration Absorber Beam (Tailcone)			3.835	3.835
4130002-11	Ring Gear Carrier			1.200	N/A
4130045 (All dash Number)	Main Rotor Ring Gear and Pinion Set			3.700	2.300
4131003-15, -21	Splined Driveshaft, Overrunning Clutch			3.500	3.500
4166024-15, -23	Vibration Absorber Beam (Cyclic Control System)			1.200	1.200

? ? Retire from service 5 calendar years from date of manufacture all Lamiflex bearings serial number 5997 and prior.

Retire from service 5 calendar years from date of installation* or 8 calendar years from date of manufacture, which ever occurs first, all Lamiflex bearings serial numbers 5998 and subsequent.

* Date of installation is defined as the date the Lamiflex bearing packaging is opened.

+ No time limit. Remove Component on condition per Maintenance Manual inspection criteria.

? Retire from service 15 years from the original test date marked on manufacture's label.

* Retire from service 24 months after date of installation or 1 200 hours, whichever occurs first.

N/A Not Approved for installation.

NOTE 4

The differences of the Brazilian airplanes in relation to the basic FAA type design are summarized below:

1. The Brazilian Airplane Flight Manual.
2. The Markings and placards in the Portuguese language, listed in the CTA Reports H.10-1380-02, dated 27 December 1994 or further revisions, and H.10-1382-00, dated 05 October 2005, or further revisions.

- NOTE 5** Enstrom Model 480, S/N 5001 was certificated 07 June 1993, with 4-place seating. It is eligible for 5 place seating when retrofitted in conformance with enstrom drawing 4119775 “Aft Bench Seat Installation” and 4192034 “Battery Installation.”
- NOTE 6** Enstrom Models 480 and 480B are eligible for installation of Cargo Hook Kit No. 4220024. When so equipped they must be operated within the prescribed limitations of Flight Manual Supplement No. 1.
- NOTE 7** Enstrom Models 480 and 480B are eligible for installation of Snowshoe Kit No. 4220016 when operated within the prescribed limitations of Flight Manual Supplement No. 2.
- NOTE 8** Enstrom Models 480 and 480B are eligible for installation of external fuel filter Kit No. 4220035 when operated within the prescribed limitations of Flight Manual Supplement No. 3.
- NOTE 9** Enstrom Models 480 and 480B are eligible for installation of Baggage Box Extension Kit No. 4220029 when operated within the prescribed limitations of Flight Manual Supplement No. 4.
- NOTA 10** Enstrom Model 480 and 480B are eligible for installation of Camera Door Kit No. 4220079 when operated within the prescribed limitation of Flight Manual Supplement No. 5.
- NOTA 11** Enstrom model 480 is eligible for installation of Increased Rotor Speed Kit No. 4230002 when operated within the prescribed limitations of Flight Manual Supplement No. 6. This kit also requires oil cooling system installation, P/N 4129100-3, and installation of the ring gear carrier, P/N 28-13106-6, in the main rotor transmission.
- NOTA 12** Enstrom Model 480 is eligible for installation of Air Conditioning System Kit No. 4220102 when operated within the prescribed limitations of Flight Manual Supplement No. 7; and maintained in accordance with Enstrom TH-28/480 Maintenance Manual Supplement No. 1.
- NOTA 13** Enstrom Models 480 and 480B are eligible for installation of Pop-Out Floats Kit No. 4220091 when operated within the prescribed limitations of Flight Manual Supplement No. 8 and No. 6, respectively; and maintained in accordance with Enstrom TH-28/480 Maintenance Manual Supplement No. 2.
- NOTA 14** Enstrom Model 480, Serial Number 5039 Thru 5042 and 5044 are eligible for conversion to Model 480B when equipped in accordance with Enstrom 480B Conversion Kit No. 4230026.
- NOTA 15** Helicopter Model 480 Serial Numbers 5005, 5021, 5023, 5035 are ineligible for certification in any category.

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