DEPARTMENT OF TRANSPORATION
FEDERAL AVIATION ADMINISTRATION

A60CE
Revision 13
Embraer S.A.
EMB-505
March 9, 2022

TYPE CERTIFICATE DATA SHEET NO. A60CE

This data sheet which is part of Type Certificate No. A60CE prescribes conditions and limitations under which the product for which the type certificate was issued meets the airworthiness requirements of Title 14 of the Code of Federal Regulations.

Type Certificate Holder	Embraer S.A. Rodovia Presidente Dutra KM 134 Distrito De Eugenio De Melo 12247-004 -- São José dos Campos -- SP Brazil
Type Certificate Holder Record	Empresa Brasileira de Aeronáutica S.A. (EMBRAER) changed company name to Embraer S.A. effective November 19, 2010.

I. Model EMB-505, (Commuter Category), (See certification basis) Approved December 14, 2009

Engines:

Two Pratt & Whitney Canada PW535E turbofans
Engine TC #E00053EN — Certified December 11, 2009
OR
Two Pratt & Whitney Canada PW535E1 turbofans
Engine TC #E00053EN – Certified September 5, 2019

Fuel:

ASTM Specification D1655-JET A and JET A-1,
Military Specification MIL-DTL-83133-JP8,
Brazilian Specification CNP08-QAV-1
Russian Specification GOST 10227-86 TS-1
(Use the latest version of the Standard Specifications)

Engine Limits:

Static thrust standard day, sea level

Engine Model	PW535E	PW535E1
Takeoff	3,360 lb. (1,494.6 daN)	3,478 lb. (1,547.1 daN)
ATR (5 minutes)	3,360 lb. (1,494.6 daN)	3,478 lb. (1,547.1 daN)
ATR (10 minutes)	3,360 lb. (1,494.6 daN) (see NOTE 8)	3,478 lb. (1,547.1 daN)

Maximum permissible engine rotor operating speeds (Takeoff and Maximum Continuous)

N_1 (fan)	100% (100% = 15,850 rpm)
N_2 (Gas Gen.)	101% (101% = 34,310 rpm)
N_1 Transient (operation 20 sec.)	102% (102% = 16,167 rpm)

Engine Limits, Continued:

N_2 Transient (operation 20 sec.)	103% (103% = 34,989 rpm)

Maximum permissible interturbine gas temperatures

Takeoff	700 Degrees C
ATR	725 Degrees C
Max. continuous	680 Degrees C
Transient (starting 5 sec.)	740 Degrees C
	765 Degrees C (see NOTE 8)
Transient (operation 20 sec.)	740 Degrees C
	765 Degrees C (see NOTE 8)

Airspeed Limitations:

V_{MO} (maximum operating)

Sea level to 26,000 ft.	320 KIAS
Sea level to 27,600 ft.	320 KIAS (see NOTE 11)

M_{MO} above 26,000 ft.	0.78 Mach
M_{MO} above 27,600 ft.	0.80 Mach (see NOTE 11)

V_{FE} (maximum flap extended)

8 degrees (takeoff)	180 KIAS
26 degrees (takeoff/landing)	170 KIAS
35 degrees (takeoff/landing)	160 KIAS (see NOTE 9)

V_{MC} (minimum control speed)

For takeoff	97 KIAS
For takeoff	99 KIAS (see NOTE 11)

Note – The value presented above refers to the maximum V_{MC} for the aircraft envelope (the value can change according to the temperature, altitude, weight, and flaps)

V_{LO} (landing gear operating)

Gear Retract and Extent	250 KIAS

V_{LE} (landing gear extended)	250 KIAS
Maximum tire ground speed	182 Knots

Center of Gravity Limits:

Forward Limits:

Takeoff and Landing (landing gear extended)
From 293.57 in. of the datum (36% MAC) at 11,354 lb. to 284.69 in. of the datum (25% MAC) at 12,346 lb. and to 279.84 in. of the datum (19% MAC) at 15,102 lb. and to 279.84 in. of the datum (19% MAC) at 17,968 lb up to 280.17 in. of the datum (19.4% MAC) at 18,387 lb.

In-Flight extension
From 284.69 in. of the datum (25% MAC) at 12,346 lb. to 278.23 in. of the datum (17% MAC) at 15,102 lb. and to 278.23 in. of the datum (17% MAC) at 18,387 lb.

Aft Limits:

Takeoff and Landing (landing gear extended)
From 298.41 in. of the datum (42% MAC) at 11,354 lb. to 295.82 in. of the datum

Center of Gravity Limits, Continued:

(38.8% MAC) at 14,220 lb. up to 289.77 in. of the datum (31.3% MAC) at 18,387 lb.

In-Flight extension
From 295.82 in. of the datum (38.8% MAC) at 14,220 lb. to 292.19 in. of the datum (34.3% MAC) at 18,387 lb.

Moment due to landing gear retraction: (-4,531.67 in.-lb.)
The aircraft CG is moved forward with the retraction.

For aircraft equipped with PW535E1 engines:
Forward Limits:

Takeoff and Landing (landing gear extended)
From 293.6 in. of the datum (36% MAC) at 11,354 lb. to 284.7 in. of the datum (25% MAC) at 12,346 lb. and to 279.8 in. of the datum (19% MAC) at 15,102 lb. and to 279.8 in. of the datum (19% MAC) at 17,648 lb. up to 280.3 in. of the datum (19.6% MAC) at 18,551 lb.

In-Flight extension
From 284.7 in. of the datum (25% MAC) at 12,346 lb. to 278.2 in. of the datum (17% MAC) at 15,102 lb. and to 278.2 in. of the datum (17% MAC) at 17,648 lb. and to 278.7 in. of the datum (17.6% MAC) at 18,551 lb.

Aft Limits:

Takeoff and Landing (landing gear extended)
From 298.4 in. of the datum (42% MAC) at 11,354 lb. to 295.7 in. of the datum (38.7% MAC) at 14,263 lb. up to 289.5 in. of the datum (31.0% MAC) at 18,551 lb.

In-Flight extension
From 295.7 in. of the datum (38.7% MAC) at 14,263 lb. to 291.9 in. of the datum (34.3% MAC) at 18,551 lb.

Moment due to landing gear retraction: (-4,531.67 in.-lb.)
The aircraft CG is moved forward with the retraction.

Notes: In-Flight Extension is a region on the Weight × CG Envelope not allowed for landing or takeoff.
Consider straight linear variation between the given points.
Consider all points located after aircraft reference Datum.

Datum:

Reference Datum is located 90 inches forward and 6.06 inches leftward of the nose jack pad position.

Leveling Means:

Located in the main door region on the omega beam between frames 11 and 12 (see AMM for further information)

Maximum Weight:

Takeoff	17,968 lb.
	18,387 lb. (see NOTE 10)
	18,551 lb. (see NOTE 11)
Landing	16,865 lb.
	17,042 lb. (see NOTE 10)
	17,272 lb. (see NOTE 11)
Zero Fuel	13,999 lb.
	14,220 lb. (see NOTE 10)
	14,263 lb. (see NOTE 11)
Ramp	18,078 lb.
	18,497 lb. (see NOTE 10)
	18,617 lb. (see NOTE 11)

Minimum Crew for all Flights (See NOTE 5 for cockpit equipment/arrangement restrictions):

One pilot (in the left pilot seat) plus additional equipment as specified in the Limitations Section of the FAA Approved Airplane Flight Manual

OR

One pilot and one copilot

No. of Seats:

Maximum of eleven occupants. Refer to the Airplane Flight Manual (AFM-2665) section 6 "Weight & Balance" for seat configurations and moment arms.

Maximum Baggage:

Forward baggage compartment	110 lb. (39.37 in. aft of datum)
Aft baggage compartment	463 lb. (396.85 in. aft of datum)
LH forward cabinet	44 lb. (135.83 in. aft of datum)
RH refreshment center	71 lb. (146.06 in. aft of datum)
Lavatory cabinet	33 lb. (318.11 in. aft of datum)

Some airplanes have stowage compartments in the LH forward cabinet, Lavatory cabinet, RH refreshment center and Aft baggage compartment with higher load capacities. Refer to their respective placards to find this information.

Fuel Capacity (usable):

Total usable fuel 5,353.2 lb. (2,428.2 kg.) @ 6.701 lb./US gal. (0.803 kg./liter)
Two wing tanks with ~ 2,676.6 lb. (1,214 kg.) usable each; 275.59 in. aft of datum;

For aircraft equipped with PW535E1 engines:
Total usable fuel 5,402.2 lb. (2,450.4 kg.) @ 6.701 lb./US gal. (0.803 kg./liter)
Two wing tanks with 2,701.1 lb. (1,225.2 kg.) usable each; 275.98 in. aft of datum

(see NOTE 1 for unusable fuel)

Oil Capacity (total):

Tank mounted on each uninstalled engine: 8.6 U.S. quarts (8.14 liter) total each engine; 386.85 in. aft of datum; (see NOTE 1)

Volume to fill "dry" engine to "Max" level installed engine:

	PW535E Pre SB 30488	PW535E Post SB 30488 and PW535E1
Left engine	10.47 US quarts	9.81 US quarts
Right engine	9.53 US quarts	9.33 US quarts

Maximum Operating Altitude:
45,000 ft.

Control Surface Movements:

Elevator	Up	25 +1/-1 degrees
	Down	15 +1/-1 degrees
Elevator Trim Tab	Up	2.7 +1/-1 degrees
	Down	9.3 +1/-1 degrees
Rudder	Right	34 +1/-1 degrees
	Left	34 +1/-1 degrees
Rudder Trim Tab	Right	17 +2/-1 degrees
	Left	17 +2/-1 degrees
Aileron	Up	25 +0.5/-0.5 degrees
	Down	15 +0.5/-0.5 degrees
Aileron Trim Tab	Up	18 +2/-1 degrees
	Down	18 +2/-1 degrees
Outboard Wing Flap	TO	8 +1/-1 degrees
	TO/Land	26 +1/-1 degrees
	Land	35 +1.5/-1.5 degrees
Inboard Wing Flap	TO	7.8 +1/-1 degrees
	TO/Land	25 +1/-1 degrees
	Land	33.4 +1.5/-1.5 degrees (see NOTE 9)
Horizontal Stabilizer	Up	2 +0.5/-0.5 degrees
	Down	13 +0.5/-0.5 degrees
Ventral Rudder	Right	30 +1/-1 degrees
	Left	30 +1/-1 degrees

See Airplane Maintenance Manual (AMM) for rigging instructions.

Manufacturer's Serial Numbers:
50500004 and up

Import Requirements:

A U.S. airworthiness certificate may be issued on the basis of a Brazilian Certificate of Airworthiness for Export signed by a representative of the Agência Nacional De Aviação Civil (ANAC) containing the following statement: "The aircraft covered by this certificate has been examined and found to comply with U.S. Type Certificate No. A60CE and to be in a condition for safe operation."

Refer to the applicable bilateral agreement to verify eligibility for import into the United States of both new and used aircraft based on the scope of the agreement, to identify any required statements by the exporting authority on the export certificate of airworthiness (or equivalent document), and for procedures for coordinating exceptions to conformity statements on these documents. Refer to FAA Order 8130.2, *Airworthiness Certification of Aircraft*, for requirements for issuance of an *airworthiness certificate* for imported aircraft.

Certification Basis - Model EMB-505:

(1) Part 23 of Title 14 of the Code of Federal Regulations effective February 1, 1965, as amended by Amendments 23-1 through 23-57

(2) Part 36 of Title 14 of the Code of Federal Regulations effective December 1, 1969, as amended by Amendments 36-1 through 36-28 (Amendments 36-1 through 36-31 for aircraft equipped with PW535E1 engines)

(3) Part 34 of Title 14 of the Code of Federal Regulations effective September 10, 1990, as amended by Amendments 34-1 through 34-3

(4) Special Conditions as follows:
- (a) 23-235-SC, Full Authority Digital Engine Control (FADEC) System
- (b) 23-243-SC, High Altitude Operations
- (c) 23-244-SC, Ice Protection - Auto Inhibited Anti-ice System
- (d) 23-242-SC, Flight Performance, Flight Characteristics, and Operating Limitations
- (e) 23-241-SC, High Fuel Temperature
- (f) 23-254-SC, Single-Place Side-Facing Lavatory Seat Dynamic Test Requirements, issued August 31, 2011
- (g) 23-257-SC, Inflatable Side-Facing Seat Three-Point Restraint Safety Harness with an Integrated Airbag Device in the Side-Facing Divan Aft Position, issued March 16, 2012

(5) Equivalent levels of safety as follows:
- (a) ACE-09-01: 14 CFR § 23.1555(d)(1); Control Markings - Usable Fuel Capacity
- (b) ACE-10-01: 14 CFR §§ 23.1305, 23.1309, 23.1321 and 23.1549; Digital Only Display of N2, Oil Temperature, Oil Pressure, and Fuel Flow
- (c) ACE-09-12: 14 CFR § 23.608 and 23.807; Ditching Emergency Exits
- (d) ACE-09-17: 14 CFR § 23.1553; Digital Fuel Quantity Indication
- (e) ACE-09-18: 14 CFR § 23.815; Cabin Aisle Width
- (f) ACE-10-02: 14 CFR § 23.855(c); Cargo and Baggage Compartment Fire Protection
- (g) ACE-10-05: 14 CFR § 23.5(b)(4); ATR Function Deactivation
- (h) ACE-10-04: 14 CFR § 23.841(b); Cabin Pressurization for High Altitude Takeoff and Landing Operations
- (i) ACE-10-03: 14 CFR §§ 23.1389(b), 23.1391, 23.1393, 23.1395; Position Light Intensity Requirements
- (j) ACE-09-11: 14 CFR § 23.853(d)(2); No Smoking Placard
- (k) ACE-13-05: 14 CFR § 23.672(c)(1); Spoiler Control System
- (l) AT00921CE-A-C-1 CFR § 23.815(b); Aisle Height at Video Monitor

(6) Exemptions as follows:
- (a) No. 9550A granted to use a relaxed “Dutch Roll” damping criteria above 18,000 ft. in lieu of damping criteria of 14 CFR § 23.181(b), issued June 14, 2009, Regulatory Docket No. FAA-2007-28080
- (b) No. 9302B granted to address the requirement 23.3(d), issued March 17, 2010, Regulatory Docket No. FAA-2006-26659 (see NOTE 7)
- (c) No. 10321 granted to address the requirement 23.562(a), issued July 20, 2011. Regulatory Docket No. FAA-2011-0336

(7) Compliance with ice protection has been demonstrated in accordance with 14 CFR § 23.1416 and 23.1419 and special conditions 23-244-SC.

(8) Not approved for ditching. Compliance with the provisions for ditching equipment in accordance with 14 CFR § 23.1415(a)(b) has not been demonstrated.

Certification Basis, Continued:

Type Certificate A60CE issued December 14, 2009.

Application for type certificate dated October 9, 2006 (extended to February 28, 2007).

RVSM Approval: S/N 50500004 and on: All airplanes are equipped with dual Goodrich Smart Probe RVSM capable Air Data Computers, and Garmin G1000 or G3000 pilot's and copilot's Primary Flight Displays as standard equipment. Each operator must obtain RVSM operating approval directly from the FAA.

Production Basis:

Production Certificate No. 346CE

The manufacturer Embraer Executive Aircraft Inc. located in Melbourne, Florida, is licensed by Embraer S.A. to manufacture the Model Aircraft listed in this Type Certificate Data Sheet. S/N 50500118 and subsequent may be produced either by Embraer Executive Aircraft Inc. in Melbourne, Florida or Embraer S.A. in Brazil. The manufacturer can be confirmed by the aircraft data plate. Aircraft produced by Embraer Executive Aircraft Inc. in Melbourne, Florida with a S/N 50500118 or 50500122 were produced under the Type Certificate**.**

Equipment:

The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the airplane for certification.

Service Information:

Service bulletins, structural repair manuals, vendor manuals, AFMs, and overhaul and maintenance manuals, which contain a statement that the document is approved by ANAC are accepted by the FAA and are considered FAA approved. (These approvals pertain to the design data only).

NOTES:

NOTE 1. A current weight and balance report, including a list of equipment included in the certificated empty weight, and loading instructions when necessary must be provided for each aircraft at the time of original certification.

The certificated empty weight and corresponding center of gravity location must include:

Unusable fuel	50.26 lb. at 6.701 lb/US gal. at 256.22 in. aft of datum
Full engine oil	35.27 lb. at 386.85 in. aft of datum; includes the oil from the engine installation (filters and lines)
Hydraulic Fluid	19.40 lb. at 313.50 in. aft of datum

NOTE 2. Airplanes must be operated according to the FAA Approved Airplane Flight Manual (AFM), part number AFM-2665 dated December 11, 2009 or later approved revision. Required placards and markings are listed in Chapter Eleven (11) of the Aircraft Illustrated Parts Catalog (AIPC) and Airplane Maintenance Manual (AMM).

NOTE 3. See Maintenance Manual, Chapter Four (4), "Airworthiness Limitations" for Systems Airworthiness Limitations, Structure Airworthiness Limitations (ALI) and Life-Limited Items (LLI). The life limit for rotating parts on the PW535E/PW535E1 engine is in the Airworthiness Limitations Manual, Pratt & Whitney Canada P/N 3072702, latest revision.

NOTES, continued:

NOTE 4. All replacement seats (crew and passenger), although they may comply with TSO C127, must also be demonstrated to comply with installation requirements into the aircraft listed in 14 CFR §§ 23.2, 23.561, 23.562, and 23.785.

The foam cushion buildup of all seats (crew and passenger) may not be altered. Any deviations in the foam construction or stiffness must be demonstrated by test or analysis to comply with the 14 CFR 23.562 paragraph.

NOTE 5. Approval for operation with a minimum crew of one pilot is based upon the cockpit equipment installation and arrangement evaluated during FAA certification testing. No significant changes may be made to the installed cockpit equipment or arrangement (EFIS, autopilot, avionics, etc.), except as permitted by the approved MMEL, without prior approval from the responsible Aircraft Certification Office.

NOTE 6. The EMB-505 is often referred to in Embraer marketing literature as the "PHENOM 300" and "Phenom 300E". These names are strictly marketing designations and are not part of the official model designation.

NOTE 7. The EMB-505 is not eligible for operations under 14 CFR part 121.

NOTE 8. Post SB 505-73-0001 incorporation.

NOTE 9. Post SB 505-27-0011 incorporation or with an equivalent factory-incorporated mod.

NOTE 10. Post SB 505-00-0008 incorporation or with an equivalent factory-incorporated mod.

NOTE 11. For aircraft equipped with PW535E1 engines.

END