TYPE CERTIFICATE DATA SHEET Nº 2005T13

Type Certificate Holder:

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EA-2005T13-16
Sheet 01

EMBRAER

ERJ 190-100 STD
ERJ 190-100 LR
ERJ 190-100 IGW
ERJ 190-100 ECJ
ERJ 190-100 SR
ERJ 190-200 STD
ERJ 190-200 LR
ERJ190-200 IGW

30 March 2012

This data sheet, which is part of Type Certificate No. 2005T13, 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 - Model ERJ 190-100 STD (Transport Category), approved on 30 August 2005.

ENGINE	Two General Electric Engines (GE) model CF34-10E5, CF34-10E5A1, CF34-10E6, CF34-10E6A1 and CF34-10E7. See Note 9.
APU	Hamilton Sundstrand model APS 2300.
FUEL	Brazilian Specification ANP No. 1/2003 – QAV1; ASTM Specification D-1655 JET A or JET A1; Specification MIL-T-83133A JP-8; Chinese Specification GB6537-2006 N° 3 Jet Fuel (PRC N° 3 Kerosene).
APU LIMITS	Maximum RPM: 108% Maximum EGT: 1 032°C (Start) 717°C (Running) Other limitations as stated in Hamilton Sundstrand Document No ESR 1235.
OIL	Engine, APU and IDG: MIL-PRF-7808 or MIL-PRF-23699.
AIRSPEED LIMITS	Maximum operating limit speed (V_{MO}): • 0 to 2 438 m (*): 556 km/h (300 keas) • 3 048 to 8 805 m (*): 593 km/h (320 keas)

- 8 805 to 12 497 m: 0.82 Mach
  (*) Linear variation from 2 438 m to 3 048 m.

Maneuvering speed (V_A):

- 0 (*): 463 km/h (250 keas)
- 7 800 m (*): 512 km/h (276 keas)
- 9 962 m (*): 515 km/h (278 keas)
- 9 962 m a 12 497 m: 0.82 Mach
  (*) Linear variation between 0, 7 800 m and 9 962 m.

AIRSPEED LIMITS (Cont.)

Maximum flap extended speed (V_{FE}):

- Flap Position 1: 426 km/h (230 kcas)
- Flap Position 2: 398 km/h (215 kcas)
- Flap Position 3: 370 km/h (200 kcas)
- Flap Position 4: 333 km/h (180 kcas)
- Flap Position 5: 333 km/h (180 kcas)
- Flap Position Full: 306 km/h (165 kcas)

Maximum landing gear operating speed (V_{LO}):

- Retraction: 435 km/h (235 keas*)
- Extension: 491 km/h (265 keas*)
  * kcas up to 6096 m

Maximum landing gear extended speed (V_{LE}): 491 km/h (265 kcas)

Maximum tire ground speed: 362 km/h (225 mph)

C. G. RANGE

(landing gear extended)

47 790 kg	16 117 to 16 953 mm (6% to 28.7% MAC)
47 000 kg	16 117 to 16 964 mm (6% to 29% MAC)
37 000 kg	16 117 to 16 964 mm (6% to 29% MAC)
31 500 kg	16 117 to 16 839 mm (6% to 25.6% MAC)
30 600 kg	16 817 mm (25% MAC)
28 000 kg	16 552 to 16758 mm (17% to 23,4% CMA)

(flight limit extension)

47 790 kg	16 043 to 17 026 mm (4% to 30.7% MAC)
47 000 kg	16 043 to 17 037 mm (4% to 31% MAC)
37 000 kg	16 043 to 17 037 mm (4% to 31% MAC)
31 500 kg	16 043 to 16 912 mm (4% to 27.6% MAC)
28 000 kg	16 448 to 16 831 mm (15% to 25,4% MAC)

Straight-line variation between the points given.

Moment due to landing gear retraction:

- -418 500 kg x mm.
  (The aircraft CG is moved forward with the retraction.)

The area limited by points: 31500kg (6% MAC), 28000kg (17% MAC), 28000kg (23,4% MAC), 37000kg (29% MAC), 40400kg (29% MAC), 30100kg (22% MAC), 29500kg (18,4% MAC) is not allowed for takeoff.

MAXIMUM WEIGHT

Ramp: 47 950 kg

Takeoff: 47 790 kg

	Landing: 43 000 kg Zero Fuel: 40 800 kg
MAXIMUM PASSENGERS	114
MAXIMUM BAGGAGE	Cargo compartment — Maximum load (kg) • Forward: 1 850 • Aft: 1 650
FUEL CAPACITY	Maximum usable fuel: 16 152.6 liters (two tanks of 8 076.3 liters with CG at +16 378 mm). Unusable fuel: 113.4 liters (56.7 liters at 0.811 kg/liter in each tank).
SERIAL NUMBERS ELIGIBLE	19000002, 19000004, 19000006 and subsequent.

II - <u>Model ERJ 190-100 LR (Transport Category), approved on 30 August 2005.</u>

ENGINE	Two General Electric Engines (GE) model CF34-10E5, CF34-10E5A1, CF34-10E6, CF34-10E6A1 and CF34-10E7. See Note 9.
APU	Hamilton Sundstrand model APS 2300.
FUEL	Brazilian Specification ANP No. 1/2003 – QAV1; ASTM Specification D-1655 JET A or JET A1; Specification MIL-T-83133A JP-8; Chinese Specification GB6537-2006 N° 3 Jet Fuel (PRC N° 3 Kerosene).
APU LIMITS	Maximum RPM: 108% Maximum EGT: 1 032°C (Start) 717°C (Running) Other limitations as stated in Hamilton Sundstrand Document No ESR 1235.
OIL	Engine, APU and IDG: MIL-PRF-7808 or MIL-PRF-23699.
AIRSPEED LIMITS	Maximum operating limit speed (V_{MO}): • 0 to 2 438 m (*): 556 km/h (300 keas) • 3 048 to 8 805 m (*): 593 km/h (320 keas) • 8 805 to 12 497 m: 0.82 Mach (*) Linear variation from 2 438 m to 3 048 m. Maneuvering speed (V_A): • 0 (*): 463 km/h (250 keas) • 7 800 m (*): 512 km/h (276 keas) • 9 962 m (*): 515 km/h (278 keas) • 9 962 m a 12 497 m: 0.82 Mach (*) Linear variation between 0, 7 800 m and 9 962 m.

Maximum flap extended speed (V_{FE}):

- Flap Position 1: 426 km/h (230 kcas)
- Flap Position 2: 398 km/h (215 kcas)
- Flap Position 3: 370 km/h (200 kcas)
- Flap Position 4: 333 km/h (180 kcas)
- Flap Position 5: 333 km/h (180 kcas)
- Flap Position Full: 306 km/h (165 kcas)

Maximum landing gear operating speed (V_{LO}):

- Retraction 435 km/h (235 keas)
- Extension 491 km/h (265 keas)
  * kcas up to 6096 m

Maximum landing gear extended speed (V_{LE}): 491 km/h (265 kcas)

Maximum tire ground speed: 362 km/h (225 mph)

C. G. RANGE

(landing gear extended)

50 300 kg	16 220 to 16 912 mm (8,8% to 27.6% MAC)
48 090 kg	16 117 to 16 945 mm (6% to 28,5% MAC)
47 000 kg	16 117 to 16 964 mm (6% to 29% MAC)
37 000 kg	16 117 to 16 964 mm (6% to 29% MAC)
31 500 kg	16 117 to 16 839 mm (6% to 25.6% MAC)
30 600 kg	16 817 mm (25% MAC)
28 000 kg	16 552 to 16 758 mm (17% to 23.4% MAC).

(flight limit extension)

50 300 kg	16 146 to 16 986 mm (6,8% to 29.6% MAC)
48 090 kg	16 043 to 17 019 mm (4% to 30,5% MAC)
47 000 kg	16 043 to 17 037 mm (4% to 31% MAC)
37 000 kg	16 043 to 17 037 mm (4% to 31% MAC)
31 500 kg	16 043 to 16 912 mm (4% to 27.6% MAC)
28 000 kg	16 448 to 16831 mm (15% to 25.4% MAC)

Straight-line variation between the points given.

Moment due to landing gear retraction:

- -418 500 kg x mm.
  (The aircraft CG is moved forward with the retraction.)

The area limited by points: 31500kg (6% MAC), 28000kg (17% MAC), 28000kg (23,4% MAC), 37000kg (29% MAC), 40400kg (29% MAC), 30100kg (22% MAC), 29500kg (18,4% MAC) is not allowed for takeoff.

MAXIMUM WEIGHT

Ramp:	50 460 kg
Takeoff:	50 300 kg
	50 000 kg *post mod. BS 190-00-0002
	47 790 kg *pós-mod. BS 190-00-0012
Landing:	43 000 kg
Zero Fuel:	40 800 kg

MAXIMUM PASSENGERS

114

MAXIMUM BAGGAGE

Cargo compartment Maximum load (kg)

- Forward: 1 850
- Aft: 1 650

FUEL CAPACITY

Maximum usable fuel: 16 152.6 liters (two tanks of 8 076.3 liters with CG at +16 378 mm).
Unusable fuel: 113.4 liters (56.7 liters at 0.811 kg/liter in each tank)

SERIAL NUMBERS ELIGIBLE

19000002, 19000004, 19000006 and subsequent.

III - <u>Model ERJ 190-100 IGW (Transport Category), approved on 30 August 2005.</u>

ENGINE

Two General Electric Engines (GE) model CF34-10E5, CF34-10E5A1, CF34-10E6, CF34-10E6A1 and CF34-10E7.
See Note 9.

APU

Hamilton Sundstrand model APS 2300.

FUEL

Brazilian Specification ANP No. 1/2003 – QAV1;
ASTM Specification D-1655 JET A or JET A1;
Specification MIL-T-83133A JP-8;
Chinese Specification GB6537-2006 N° 3 Jet Fuel (PRC N° 3 Kerosene).

APU LIMITS

Maximum RPM: 108%
Maximum EGT: 1 032°C (Start)
717°C (Running)
Other limitations as stated in Hamilton Sundstrand Document No ESR 1235.

OIL

Engine, APU and IDG: MIL-PRF-7808 or MIL-PRF-23699.

AIRSPEED LIMITS

Maximum operating limit speed (V_{MO}):

- 0 to 2 438 m (*): 556 km/h (300 keas)
- 3 048 to 8 805 m (*): 593 km/h (320 keas)
- 8 805 to 12 497 m: 0.82 Mach

(*) Linear variation from 2 438 m to 3 048 m.

Maneuvering speed (V_A):

- 0 (*): 463 km/h (250 keas)
- 7 800 m (*): 512 km/h (276 keas)
- 9 962 m (*): 515 km/h (278 keas)
- 9 962 m a 12 497 m: 0.82 Mach

(*) Linear variation between 0, 7 800 m and 9 962 m.

Maximum flap extended speed (V_{FE}):

- Flap Position 1: 426 km/h (230 kcas)
- Flap Position 2: 398 km/h (215 kcas)
- Flap Position 3: 370 km/h (200 kcas)
- Flap Position 4: 333 km/h (180 kcas)

- Flap Position 5: 333 km/h (180 kcas)
- Flap Position Full: 306 km/h (165 kcas)

Maximum landing gear operating speed (V_{LO}):

- Retraction: 435 km/h (235 keas*)
- Extension: 491 km/h (265 keas*)

* kcas up to 6096 m

Maximum landing gear extended speed (V_{LE}): 491 km/h (265 kcas)

Maximum tire ground speed: 362 km/h (225 mph)

51800 kg 16290 to 16890mm (10.7 % to 27 % MAC)

C. G. RANGE

(landing gear extended)

48 090 kg 16 117 to 16 945 mm (6% to 28.5% MAC)
47 000 kg 16 117 to 16 964 mm (6% to 29% MAC)
37 000 kg 16 117 to 16 964 mm (6% to 29% MAC)
31 500 kg 16 117 to 16 839 mm (6% to 25.6% MAC)
30 600 kg 16 817 mm (25% MAC)

28 000 kg 16 552 to 16 758 mm (17% to 23.4% MAC).

(flight limit extension)

51 800 kg 16 216 to 16 964 mm (8.7% to 29% MAC)
48 090 kg 16 043 to 17 019 mm (4% to 30.5% MAC)
47 000 kg 16 043 to 17 037 mm (4% to 31% MAC)
37 000 kg 16 043 to 17 037 mm (4% to 31% MAC)
31 500 kg 16 043 to 16 912 mm (4% to 27.6% MAC)
28 000 kg 16 448 to 16 831 mm (15% to 25.4% MAC)

Straight-line variation between the points given.
Moment due to landing gear retraction:

- -418 500 kg x mm.
  (The aircraft CG is moved forward with the retraction.)

The area limited by points: 31500kg (6% MAC), 28000kg (17% MAC), 28000kg (23,4% MAC), 37000kg (29% MAC), 40400kg (29% MAC), 30100kg (22% MAC), 29500kg (18,4% MAC) is not allowed for takeoff.

MAXIMUM WEIGHT

Ramp: 51 960 kg (See Note 15)
Takeoff: 51 800 kg (See Note 11)
46 000 kg *pós-mod. BS 190-00-0008
50 000 kg *pós-mod. BS 190-00-0020
Landing: 44 000 kg
Zero Fuel: 40 900 kg

MAXIMUM PASSENGERS **114**

MAXIMUM BAGGAGE

Cargo compartment	Maximum load (kg)
• Forward	1 850
• Aft	1 650

FUEL CAPACITY

Maximum usable fuel: 16 152.6 liters (two tanks of 8 076.3 liters with CG at +16 378 mm).
Unusable fuel: 113.4 liters (56.7 liters at 0.811 kg/liter in each tank).

SERIAL NUMBERS ELIGIBLE

19000002, 19000004, 19000006 and subsequent.

IV - <u>Model ERJ 190-100 ECJ (Transport Category), approved on 30 October 2007.</u>

ENGINE

Two General Electric Engines (GE) model CF34-10E7B or CF34-10E6. See Note 9.

APU

Hamilton Sundstrand model APS 2300.

FUEL

Brazilian Specification ANP No. 1/2003 – QAV1;
ASTM Specification D-1655 JET A or JET A1;
Specification MIL-T-83133A JP-8.
Chinese Specification GB6537-2006 N° 3 Jet Fuel (PRC N° 3 Kerosene).

APU LIMITS

Maximum RPM: 108%
Maximum EGT: 1 032°C (Start)
717°C (Running)
Other limitations as stated in Hamilton Sundstrand Document No ESR 1235.

OIL

Engine, APU and IDG: MIL-PRF-7808 or MIL-PRF-23699.

AIRSPEED LIMITS

Maximum operating limit speed (V_{MO}):

- 0 to 2 438 m (*): 556 km/h (300 keas)
- 3 048 to 8 805 m (*): 593 km/h (320 keas)
- 8 805 to 12 497 m: 0.82 Mach

(*) Linear variation from 2 438 m to 3 048 m.

Maneuvering speed (V_A):

- 0 to 4 572 m (*): 491 km/h (265 keas)
- 7 800 m (*): 512 km/h (276 keas)
- 9 962 m (*): 515 km/h (278 keas)
- 9 962 m a 12 497 m: 0.82 Mach

(*) Linear variation between 4572 m, 7 800 m and 9 962 m.

Maximum flap extended speed (V_{FE}):

- Flap Position 1: 426 km/h (230 kcas)
- Flap Position 2: 398 km/h (215 kcas)
- Flap Position 3: 370 km/h (200 kcas)
- Flap Position 4: 333 km/h (180 kcas)
- Flap Position 5: 333 km/h (180 kcas)
- Flap Position Full: 306 km/h (165 kcas)

Maximum landing gear operating speed (V_{LO}):

- Retraction: 435 km/h (235 keas*)
- Extension: 491 km/h (265 keas*)

* kcas up to 6096 m

Maximum landing gear extended speed (V_{LE}): 491 km/h (265 kcas)

Maximum tire ground speed: 362 km/h (225 mph)

C. G. RANGE
(landing gear extended)

54 500 kg	16 415 a 16 849 mm (14,1 % a 25,9 % da CMA)
51 800 kg(*)	16 290 a 16 890 mm (10,7% a 27% da CMA)
48 090 kg	16 117 to 16 945 mm (6% to 28.5% MAC)
47 000 kg	16 117 to 16 964 mm (6% to 29% MAC)
37 000 kg	16 117 to 16 964 mm (6% to 29% MAC)
31 500 kg	16 117 to 16 839 mm (6% to 25.6% MAC)
30 600 kg	16 817 mm (25% MAC)
29 500 kg	16 573 mm (18.4% MAC)

(Values between 29,500 kg and 48,090 are valid for all ERJ 190-100 ECJ airplanes)

(flight limit extension)

54 500 kg	16 341 to 16 923 mm (12,1 % to 27,9 % MAC)
51 800 kg(*)	16 216 to 16 964 mm (8,7% to 29% MAC)
48 090 kg	16 043 to 17 019 mm (4% to 30.5% MAC)
47 000 kg	16 043 to 17 037 mm (4% to 31% MAC)
37 000 kg	16 043 to 17 037 mm (4% to 31% MAC)
31 500 kg	16 043 to 16 912 mm (4% to 27.6% MAC)
30 600 kg	16 890 mm (27% MAC)

(Values between 30 600 kg and 48 090 kg are valid for all ERJ 190-100 ECJ airplanes)

Straight-line variation between the points given.
Moment due to landing gear retraction:

- 414 100 kg x mm.
- 418 500 kg x mm. (*)

(The aircraft CG is moved forward with the retraction.)

The area limited by the points: 30 100 kg (22% MAC), 30 600 kg (25% MAC), 37 000 kg (29% MAC) and 40 400 kg (29% MAC) is not allowed for takeoff.

MAXIMUM WEIGHT

Ramp:	54 700 kg	51 960 kg (*)
Takeoff:	54 500 kg	51 800 kg (*)
Landing:	45 800 kg	44 000 kg (*)
Zero Fuel:	36 500 kg	40 900 kg (*)

35 250 kg * pos-mod SB LIN190-00-0007-00

MAXIMUM PASSENGERS

19 (limited by RBHA/14 CFR Part 25.807(g))
See note 4.

MAXIMUM BAGGAGE

Cargo compartment	Maximum load (kg)
• Forward	320
• Aft	1040

FUEL CAPACITY

Maximum usable fuel: 27 232.0 liters (16 155 liters in wing tanks and 11077.0 liters in auxiliary fuel tanks).
Maximum usable fuel: 16 152,6 liters(two tanks of 8 076.3 liters in wing tanks with CG at +16 378 mm)(*)
Unusable fuel: 165.2 liters (72.1 liters at 0.803 kg/liter in each wing tank and 21 liters in auxiliary tanks).
Unusable fuel: 113.4 liters (56.7 liters at 0.811 kg/liter in each wing tank)(*).

SERIAL NUMBERS ELIGIBLE

19000109 and subsequent.
(*) Data applicable only to airplanes S/N 19000109 to 19000225 without SB190LIN-28-0011 incorporated.

V - Model ERJ 190-100 SR (Transport Category), approved on 21 January 2010.

ENGINE

Two General Electric Engines (GE) model CF34-10E5A1 and CF34-10E7. See Note 9.

APU

Hamilton Sundstrand model APS 2300.

FUEL

Brazilian Specification ANP No. 1/2003 – QAV1;
ASTM Specification D-1655 JET A or JET A1;
Specification MIL-T-83133A JP-8;
Chinese Specification GB6537-2006 N° 3 Jet Fuel (PRC N° 3 Kerosene).

APU LIMITS

Maximum RPM: 108%
Maximum EGT: 1 032°C (Start)
717°C (Running)
Other limitations as stated in Hamilton Sundstrand Document No ESR 1235.

OIL

Engine, APU and IDG: MIL-PRF-7808 or MIL-PRF-23699.

AIRSPEED LIMITS

Maximum operating limit speed (V_{MO}):

• 0 to 2 438 m (*):	556 km/h (300 keas)
• 3 048 to 8 805 m (*):	593 km/h (320 keas)
• 8 805 to 12 497 m:	0.82 Mach

(*) Linear variation from 2 438 m to 3 048 m.

Maneuvering speed (V_A):

• 0 (*):	463 km/h (250 keas)
• 7 800 m (*):	512 km/h (276 keas)
• 9 962 m (*):	515 km/h (278 keas)

- 9 962 m a 12 497 m: 0.82 Mach
  (*) Linear variation between 0, 7 800 m and 9 962 m.

Maximum flap extended speed (V_{FE}):

- Flap Position 1: 426 km/h (230 kcas)
- Flap Position 2: 398 km/h (215 kcas)
- Flap Position 3: 370 km/h (200 kcas)
- Flap Position 4: 333 km/h (180 kcas)
- Flap Position 5: 333 km/h (180 kcas)
- Flap Position Full: 306 km/h (165 kcas)

Maximum landing gear operating speed (V_{LO}):

- Retraction: 435 km/h (235 keas*)
- Extension: 491 km/h (265 keas*)
  * kcas up to 6096 m

Maximum landing gear extended speed (V_{LE}): 491 km/h (265 kcas)

Maximum tire ground speed: 362 km/h (225 mph)

C. G. RANGE
(landing gear extended)

45 990 kg	16 117 to 16 964 mm (6% to 29% MAC)
37 000 kg	16 117 to 16 964 mm (6% to 29% MAC)
31 500 kg	16 117 to 16 839 mm (6% to 25.6% MAC)
30 600 kg	16 817 mm (25% MAC)
28 000 kg	16 552 to 16758 mm (17% to 23.4% MAC)

(flight limit extension)

45 990 kg	16 043 to 17 037 mm (4% to 31% MAC)
37 000 kg	16 043 to 17 037 mm (4% to 31% MAC)
31 500 kg	16 043 mm (4% MAC)
28 000 kg	16 448 to 16 831 mm (15% to 25.4% MAC)

Straight-line variation between the points given.
Moment due to landing gear retraction:

- -418 500 kg x mm.
  (The aircraft CG is moved forward with the retraction.)

The area limited by points: 31500kg (6% MAC), 28000kg (17% MAC), 28000kg (23,4% MAC), 37000kg (29% MAC), 40400kg (29% MAC), 30100kg (22% MAC), 29500kg (18,4% MAC) is not allowed for takeoff.

MAXIMUM WEIGHT

Ramp:	46 150 kg
Takeoff:	45 990 kg
Landing:	43 000 kg
Zero Fuel:	40 800 kg

MAXIMUM PASSENGERS 98

MAXIMUM BAGGAGE

Cargo compartment	Maximum load (kg)
• Forward:	1 850

- Aft: 1 650

Fuel Capacity

Maximum usable fuel: 16 152.6 liters (two tanks of 8 076.3 liters with CG at +16 378 mm).
Unusable fuel: 113.4 liters (56.7 liters at 0.811 kg/liter in each tank).

SERIAL NUMBERS ELIGIBLE

19000339 and on

DATA PERTINENT TO ALL ERJ 190-100 MODELS

DATUM

A perpendicular plane to the fuselage centerline, located at 14 443 mm ahead of the wing stub front spar. This spar is located 414 mm ahead of the wing jack point.

LEVELING MEANS

Plumb line between the points P1 to P2 located inside the landing gear compartment on the left side, as illustrated below.

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MEAN AERODYNAMIC CHORD

Length: 3 682 mm.
Leading edge of mean aerodynamic chord: X: 15 896 mm
Y: –5 644 mm
Z: –663 mm

Certification basis

RBHA 25 (Airworthiness Requirements - Transport Category Aircraft), corresponding to 14 CFR Part 25, including amendments 25-1 through 25-101, plus the following amendments:

- Amendment 25-102, except paragraph 25.981(c);
- Amendment 25-103, integral;
- Amendment 25-104, integral;
- Amendment 25-105, integral;
- Amendment 25-107, except paragraph 25.735(h);
- Amendment 25-108, integral;
- Amendment 25-109, integral;
- Amendment 25-110, integral;
- Amendment 25-112, integral;
- Amendment 25-113, integral;
- Amendment 25-114, integral;
- Amendment 25-117, integral; and
- Amendment 25-120, integral.

Note: ERJ 190-100 auxiliary fuel tanks complies with amendment 102 paragraph 25.981(c).

CERTIFICATION BASIS (Cont.)

Special Conditions:

- Engine torque loads for sudden engine stoppage (RBHA 21.16; RBHA/14 CFR Part 25.361) - FCAR HES-01;
- Interaction of systems and structures (RBHA 21.16; RBHA/14 CFR Part 25.671 and 25.1309) - FCAR HES-06;
- High intensity radiated fields (HIRF) protection (RBHA 21.16, RBHA/14 CFR Part 25.1309, 25.1333, 25.1431 and 25.1529) - FCAR HSI-01;
- Operation without normal electrical power (RBHA 21.16, RBHA/14 CFR Part 25.1165(b), 25.1309, 25.1333(b) and 25.1351) - FCAR HSI-02;
- Electronic flight control system: control surface position awareness (RBHA 21.16, RBHA/14 CFR Part 21.16, 25.143, 25.671 and 25.672) - FCAR HDE-02;
- Performance credit for ATTCS during go-around (RBHA 21.16, RBHA 25.117, 25.119(a), 25.121(d), 25.904, 25.1309 and Appendix I) - FCAR HDE-17;
- "Steep Approach Mode Functionality (SAM)" (RBHA/14 CFR Part 21.26, 25.125, 25.143(g) & 25.143(b)) - FCAR HDE-27; and
- "Seats with Non-Traditional, Large, and Non-Metallic Panels" (RBHA/14 CFR Part 25.853) – FCAR HES-44.

DATA PERTINENT TO ERJ 190-100 ECJ:

"Interaction of systems and structures" (RBHA 21.16; RBHA/14 CFR Part 25.671 & 25.1309) - FCAR ES-06.

Equivalent Levels of Safety Findings:

- Checked maneuver loads (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.331(c)(2)) - FCAR HES-13;
- Fuel tank crashworthiness (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.721 and 25.963(d)) - FCAR HES-19;
- Minor crash criteria (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.721 and 25.963(d)) - FCAR HES-20;
- Emergency exit locator signs (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.811(d)(3)) - FCAR HES-36.
- Equipment, systems and installations (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.1309) - FCAR HSI-15;
- Equivalent level of safety finding for position lights (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.1389(b), 25.1391, 25.1393 & 25.1395) - FCAR HSI-27;
- Cabin ventilation – humidity requirement (RBHA 21.21(b)(1), RBHA/14 CFR Part 25.831(g)) - FCAR HSI-38;
- Performance credit for use of automatic power reserve (APR) during reduced thrust takeoffs (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.904, 25.149 and Appendix I) - FCAR HDE-16;
- Flight critical thrust reverser (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.933(a)(1)(ii) & 25.1309(b)(1) - FCAR HPR-06;
- Digital only display of turbine engine high/intermediate pressure rotor speed (N2) (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.901, 25.1305, 25.1309, 25.1321 and 25.1549) - FCAR HPR-14;
- Adoption of APU harmonized requirements (RBHA 21.21(b)(1); RBHA/14 CFR Part 25 Subparts E, F and G) - FCAR HPR-17; and

- Lack of on/off switch for ATTCS system (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.117, 25.119(a), 25.121(d), 25.904, 25.1301, 25.1309, Appendix I) - FCAR HPR-23.

CERTIFICATION BASIS (Cont.)

DATA PERTINENT TO ERJ 190-100 ECJ:

- "Emergency Exit Locator Sign near Type III Door" (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.811(d)(1)) – FCAR EI-01.
- "Emergency Exit Locator Sign near Type I Door" (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.811(d)(3)) – FCAR EI-02.
- "Emergency Exit Sign Dimensions" (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.812(b)(1) – FCAR EI-03.
- "In-flight Accessible Class C Baggage Compartment" (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.857(c)) – FCAR EI-04.

Exemptions:

- Uncontained engine rotor burst hitting pressurized cabin [RBHA/14 CFR Part 25.841(a)(2)(i) and (ii)] - Granted through Ordinance DAC (ANAC) No. 595/DGAC, dated 28 June 2005; and
- Uncontrollable high engine thrust [RBHA/14 CFR Part 25.901(c)] - Granted through Ordinance DAC (ANAC) No. 548/DGAC, dated 16 June 2005.

DATA PERTINENT TO ERJ 190-100 ECJ:

- "Passenger Cabin Interior Doors" [RBHA 11.25(b)(5); RBHA/14 CFR Part 25.813(e)] – EI-05, Granted through Ordinance DAC (ANAC) No. 299/ANAC dated 18 August 2008;
- "Firm Handhold" [RBHA 21.21(b)(1); RBHA/14 CFR Part 25.785(j)] – EI-06, Granted through Ordinance DAC (ANAC) No. 298/ANAC dated 18 August 2008;
- "Dynamic Test Requirements for Side-Facing Divans (Sofas) / General Occupant Protection for Occupants of Multiple Place Side-facing Seats (Divans) Installation" [RBHA 11.25(b)(5); 25.562, 25.785] – EI-07, Granted through Ordinance DAC (ANAC) No. 300/ANAC dated 18 August 2008.

Noise Standards:

- RBHA 36 (Noise Standard - Type Certification), corresponding to ICAO Annex 16, Volume I Chapter 3 (third edition), and including all amendments effective on the date the ERJ-190 certification by the ANAC.

Fuel venting and exhaust emission requirements:

- RBHA 34 (Fuel Venting and Exhaust Emission Requirements for Turbine Engine Powered Airplanes - Type Certification), corresponding to the 14 CFR Part 34 and including the amendment effective on the date the ERJ-190 certification by the ANAC.

Optional design requirements complied with:

- RBHA/14 CFR Part 25.801 – Ditching;

CERTIFICATION BASIS (Cont.)

- RBHA/14 CFR Part 25.1403 – Wing icing detection lights;
- RBHA/14 CFR Part 25.1411 and 25.1415 – Safety equipment required for ditching certification;
- RBHA/14 CFR Part 25.1419 – Ice protection; and
- RBHA/14 CFR Part 25.1421 – Megaphones.

Application date for type certification:

- ERJ 190-100 STD: 30 May 2001;
- ERJ 190-100 LR: 30 May 2001;
- ERJ 190-100 IGW: 30 May 2001; and
- ERJ 190-100 ECJ: 16 November 2006.

PRODUCTION BASIS

Production approved under CHE E-7203-01, dated 11 Dec. 2008.

Required Equipment

The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the airplane. The approved equipment is listed in the Embraer Technical Report 190-100TDSD.
The ANAC approved airplane flight manual P/N AFM-1868 must be on board.

VI - Model ERJ 190-200 STD (Transport Category), approved on 30 June 2006.

ENGINE

Two General Electric Engines (GE) model CF34-10E5, CF34-10E5A1, CF34-10E6, CF34-10E6A1 and CF34-10E7.
See Note 9.

APU

Hamilton Sundstrand model APS 2300.

FUEL

Brazilian Specification ANP No. 1/2003 – QAV1;
ASTM Specification D-1655 JET A or JET A1;
Specification MIL-T-83133A JP-8;
Chinese Specification GB6537-2006 N° 3 Jet Fuel (PRC N° 3 Kerosene).

APU LIMITS

Maximum RPM: 108%
Maximum EGT: 1 032°C (Start)
717°C (Running)
Other limitations as stated in Hamilton Sundstrand Document No ESR 1235.

OIL

Engine, APU and IDG: MIL-PRF-7808 or MIL-PRF-23699.

AIRSPEED LIMITS

Maximum operating limit speed (V_{MO}):

- 0 to 2 438 m (*): 556 km/h (300 keas)
- 3 048 to 8 805 m (*): 593 km/h (320 kcas)
- 8 805 to 12 497 m: 0.82 Mach

(*) Linear variation from 2 438 m to 3 048 m.

Maneuvering speed (V_A):

- 0 (*): 469 km/h (253 keas)
- 7 800 m (*): 515 km/h (278 keas)
- 9 920 m (*): 517 km/h (279 keas)
- 9 920 m a 12 497 m: 0.82 Mach

(*) Linear variation between 0, 7 800 m and 9 920 m.

AIRSPEED LIMITS (Cont.)

Maximum flap extended speed (V_{FE}):

- Flap Position 1: 426 km/h (230 kcas)
- Flap Position 2: 398 km/h (215 kcas)
- Flap Position 3: 370 km/h (200 kcas)
- Flap Position 4: 333 km/h (180 kcas)
- Flap Position 5: 333 km/h (180 kcas)
- Flap Position Full: 306 km/h (165 kcas)

Maximum landing gear operating speed (V_{LO}):

- Retraction: 463 km/h (250 keas*)
- Extension: 491 km/h (265 keas*)

* kcas up to 6096 m

Maximum landing gear extended speed (V_{LE}): 491 km/h (265 kcas)

Maximum tire ground speed: 362 km/h (225 mph)

CG RANGE
(landing gear extended)

48 790 kg	16 966 to 17 849 mm (7% to 31% MAC)
38 000 kg	16 966 to 17 849 mm (7% to 31% MAC)
31 800 kg	16 966 to 17 724 mm (7% to 27.6% MAC)
30 600 kg	17 702 mm (27% MAC)
29 500 kg	17 285 mm (18.4% MAC)

(flight limit extension)

48 790 kg	16 892 to 17 905 mm (5% to 32.5% MAC)
38 000 kg	16 892 to 17 905 mm (5% to 32.5% MAC)
31 800 kg	16 892 to 17 776 mm (5% to 29% MAC)
30 600 kg	17 757 mm (28,5% MAC)
48 790 kg	16 966 to 17 849 mm (7 to 31% MAC)
38 000 kg	16 966 to 17 849 mm (7 to 31% MAC)

CG RANGE (Cont.)

Straight-line variation between the points given.

Moment due to landing gear retraction:

- -418 500 kg x mm.
  (The aircraft CG is moved forward with the retraction.)
- The area limited by the points: 30 100 kg (22% MAC), 30 600 kg (27% MAC), 38 000 kg (31% MAC) and 43 400 kg (31% MAC) is not allowed for takeoff.

MAXIMUM WEIGHT

Ramp:	48 950 kg
Takeoff:	48 790 kg
Landing:	45 000 kg
Zero Fuel:	42 500 kg

MAXIMUM PASSENGERS 124

MAXIMUM BAGGAGE

Cargo Compartment:	Maximum Load (kg):
• Forward	1 900
• Aft	1 800

Fuel Capacity

Maximum usable fuel: 16 152.6 liters (two tanks of 8 076.3 liters with CG at +17 191 mm).
Unusable fuel: 113.4 liters (56.7 liters at 0.811 kg/liter in each tank).

SERIAL NUMBERS ELIGIBLE 19000005, 19000029 and subsequent.

VII - <u>Model ERJ 190-200 LR (Transport Category), approved on 30 June 2006.</u>

ENGINE

Two General Electric Engines (GE) model CF34-10E5, CF34-10E5A1, CF34-10E6, CF34-10E6A1 and CF34-10E7.
See Note 8.

APU Hamilton Sundstrand model APS 2300.

FUEL

Brazilian Specification ANP No. 1/2003 – QAV1;
ASTM Specification D-1655 JET A or JET A1;
Specification MIL-T-83133A JP-8;
Chinese Specification GB6537-2006 N° 3 Jet Fuel (PRC N° 3 Kerosene).

APU LIMITS

Maximum RPM: 108%
Maximum EGT: 1 032°C (Start)
717°C (Running)
Other limitations as stated in Hamilton Sundstrand Document No ESR 1235.

OIL Engine, APU and IDG: MIL-PRF-7808 or MIL-PRF-23699.

AIRSPEED LIMITS

Maximum operating limit speed (V_{MO}):

- 0 to 2 438 m (*): 556 km/h (300 keas)
- 3 048 to 8 805 m (*): 593 km/h (320 kcas)
- 8 805 to 12 497 m: 0.82 Mach

(*) Linear variation from 2 438 m to 3 048 m.

Maneuvering speed (V_A):

- 0 (*): 469 km/h (253 keas)
- 7 800 m (*): 515 km/h (278 keas)
- 9 920 m (*): 517 km/h (279 keas)
- 9 920 m to 12 497 m: 0.82 Mach

(*) Linear variation between 0, 7 800 m and 9 962 m.

Maximum flap extended speed (V_{FE}):

- Flap Position 1: 426 km/h (230 kcas)
- Flap Position 2: 398 km/h (215 kcas)
- Flap Position 3: 370 km/h (200 kcas)
- Flap Position 4: 333 km/h (180 kcas)
- Flap Position 5: 333 km/h (180 kcas)
- Flap Position Full: 306 km/h (165 kcas)

Maximum landing gear operating speed (V_{LO}):

- Retraction: 463 km/h (235 keas*)
- Extension: 491 km/h (265 keas*)

* kcas up to 6096 m

Maximum landing gear extended speed (V_{LE}): 491 km/h (265 kcas)

Maximum tire ground speed: 362 km/h (225 mph)

CG RANGE

(landing gear extended)

50 790 kg	17 058 to 17 849 mm (9.5 to 31% MAC)
48 790 kg	16 966 to 17 849 mm (7% to 31% MAC)
38 000 kg	16 966 to 17 849 mm (7% to 31% MAC)
31 800 kg	16 966 to 17 724 mm (7% to 27.6% MAC)
30 600 kg	17 702 mm (27% MAC)
29 500 kg	17 385 mm (18.4% MAC)

(flight limit extension)

50 790 kg	16 966 to 17 849 mm (7,5 to 31% MAC)
48 790 kg	16 892 to 17 905 mm (5% to 32.5% MAC)
38 000 kg	16 892 to 17 905 mm (5% to 32.5% MAC)
31 800 kg	16 892 to 17 776 mm (5% to 29% MAC)
30 600 kg	17 757 mm (28,5% MAC)

Straight-line variation between the points given.

Moment due to landing gear retraction:

- -418 500 kg x mm.
  (The aircraft CG is moved forward with the retraction.)
- The area limited by the points: 30 100 kg (22% MAC), 30 600 kg (27% MAC), 38 000 kg (31% MAC) and 43 400 kg (31% MAC) is not allowed for takeoff.

MAXIMUM WEIGHT

Ramp:	50 590 kg
Takeoff:	50 790 kg
Landing:	45 000 kg
Zero Fuel:	42 500 kg

MAXIMUM PASSENGERS

124

MAXIMUM BAGGAGE

Cargo Compartment:	Maximum Load (kg):
• Forward	1 900
• Aft	1 800

Fuel Capacity	Maximum usable fuel: 16 152.6 liters (two tanks of 8 076.3 liters with CG at +17 191 mm). Unusable fuel: 113.4 liters (56.7 liters at 0.811 kg/liter in each tank).
SERIAL NUMBERS ELIGIBLE	19000005, 19000029 and subsequent.

VIII - <u>Model ERJ 190-200 IGW (Transport Category), approved on 30 June 2006.</u>

ENGINE	Two General Electric Engines (GE) model CF34-10E5, CF34-10E5A1, CF34-10E6, CF34-10E6A1 and CF34-10E7. See Note 8.
APU	Hamilton Sundstrand model APS 2300.
FUEL	Brazilian Specification ANP No. 1/2003 – QAV1; ASTM Specification D-1655 JET A or JET A1; Specification MIL-T-83133A JP-8; Chinese Specification GB6537-2006 N° 3 Jet Fuel (PRC N° 3 Kerosene).
APU LIMITS	Maximum RPM: 108% Maximum EGT: 1 032°C (Start) 717°C (Running) Other limitations as stated in Hamilton Sundstrand Document No ESR 1235.
OIL	Engine, APU and IDG: MIL-PRF-7808 or MIL-PRF-23699.
AIRSPEED LIMITS	Maximum operating limit speed (V_{MO}): • 0 to 2 438 m (*): 556 km/h (300 keas) • 3 048 to 8 805 m (*): 593 km/h (320 kcas) • 8 805 to 12 497 m: 0.82 Mach (*) Linear variation from 2 438 m to 3 048 m. Maneuvering speed (V_A): • 0 (*): 469 km/h (253 keas) • 7 800 m (*): 515 km/h (278 keas) • 9 920 m (*): 517 km/h (279 keas) • 9 920 m to 12 497 m: 0.82 Mach (*) Linear variation between 0, 7 800 m and 9 962 m.
AIRSPEED LIMITS (Cont.)	Maximum flap extended speed (V_{FE}): • Flap Position 1: 426 km/h (230 kcas) • Flap Position 2: 398 km/h (215 kcas) • Flap Position 3: 370 km/h (200 kcas) • Flap Position 4: 333 km/h (180 kcas)

- Flap Position 5: 333 km/h (180 kcas)
- Flap Position Full: 306 km/h (165 kcas)

Maximum landing gear operating speed (V_{LO}):

- Retraction: 463 km/h (235 keas*)
- Extension: 491 km/h (265 keas*)

* kcas up to 6 096 m

Maximum landing gear extended speed (V_{LE}): 491 km/h (265 kcas)

Maximum tire ground speed: 362 km/h (225 mph)

CG RANGE

(landing gear extended)

52 290 kg	17 124 to 17 849 mm (11.3 to 31% MAC)
48 790 kg	16 966 to 17 849 mm (7% to 31% MAC)
38 000 kg	16 966 to 17 849 mm (7% to 31% MAC)
31 800 kg	16 966 to 17 724 mm (7% to 27.6% MAC)
30 600 kg	17 702 mm (27% MAC)
29 500 kg	17 385 mm (18.4% MAC)

(flight limit extension)

52 290 kg	17 050 to 17 849 mm (7,5 to 31% MAC)
48 790 kg	16 892 to 17 905 mm (5% to 32.5% MAC)
38 000 kg	16 892 to 17 905 mm (5% to 32.5% MAC)
31 800 kg	16 892 to 17 776 mm (5% to 29% MAC)
30 600 kg	17 757 mm (28,5% MAC)

CG RANGE

(Cont.)

Straight-line variation between the points given.

Moment due to landing gear retraction:

- -418 500 kg x mm.
  (The aircraft CG is moved forward with the retraction.)
- The area limited by the points: 30 100 kg (22% MAC), 30 600 kg (27% MAC), 38 000 kg (31% MAC) and 43 400 kg (31% MAC) is not allowed for takeoff.

MAXIMUM WEIGHT

Ramp:	52 450 kg
Takeoff:	52 290 kg
Landing:	45 800 kg
Zero Fuel:	42 600 kg

MAXIMUM PASSENGERS

124

MAXIMUM BAGGAGE

Cargo Compartment:	Maximum Load (kg):
• FORWARD	1 900
• AFT	1 800

Fuel Capacity

Maximum usable fuel: 16 152.6 liters (two tanks of 8 076.3 liters with CG at +17 191 mm).

Unusable fuel: 113.4 liters (56.7 liters at 0.811 kg/liter in each tank).

SERIAL NUMBERS ELIGIBLE

19000005, 19000029 and subsequent.

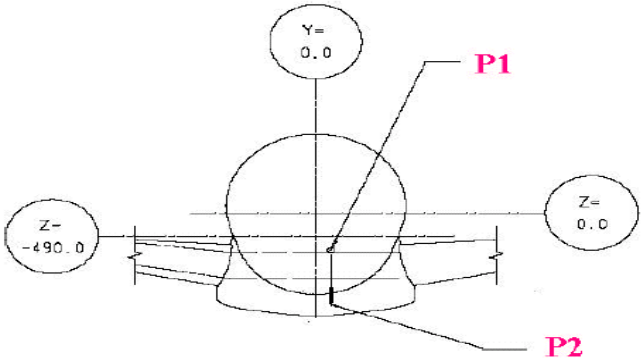
DATA PERTINENT TO ALL MODELS 190-200

DATUM

A perpendicular plane to the fuselage centerline, located at 15 256 mm ahead of the wing stub front spar. This spar is located 414 mm ahead of the wing jack point.

LEVELING MEANS

Plumb line between the points P1 to P2 located inside the landing gear compartment on the left side, as illustrated below.



LEVELING OF FUSLG COORDINATE POINTS			
POINT	X	Y	Z
P1	18768.00	-250.00	-774.87
P2	18768.00	-250.00	-1683.47

MEAN AERODYNAMIC CHORD

Length: 3 682 mm.
Leading edge of mean aerodynamic chord: X: 16 708 mm
Y: –5 644 mm
Z: –663 mm

Certification basis

RBHA 25 (Airworthiness Requirements - Transport Category Aircraft), corresponding to 14 CFR Part 25, including amendments
25-1 through 25-101, plus the following amendments:

- Amendment 25-102, except paragraph 25.981(c);
- Amendment 25-103, integral;
- Amendment 25-104, integral;
- Amendment 25-105, integral;
- Amendment 25-107, except paragraph 25.735(h);
- Amendment 25-108, integral;
- Amendment 25-109, integral;
- Amendment 25-110, integral;
- Amendment 25-112, integral;
- Amendment 25-113, integral;
- Amendment 25-114, integral; and
- Amendment 25-117, integral.

Special Conditions:

- Engine torque loads for sudden engine stoppage (RBHA 21.16; RBHA/14 CFR Part 25.361) - FCAR HES-01;
- Interaction of systems and structures (RBHA 21.16; RBHA/14 CFR Part 25.671 and 25.1309) - FCAR HES-06;
- High intensity radiated fields (HIRF) protection (RBHA 21.16, RBHA/14 CFR Part 25.1309, 25.1333, 25.1431 and 25.1529) - FCAR HSI-01;
- Operation without normal electrical power (RBHA 21.16, RBHA/14 CFR Part 25.1165(b), 25.1309, 25.1333(b) and 25.1351) - FCAR HSI-02;
- Electronic flight control system: control surface position awareness (RBHA 21.16, RBHA/14 CFR Part 21.16, 25.143, 25.671 and 25.672) - FCAR HDE-02; and
- Performance credit for ATTCS during go-around (RBHA 21.16, RBHA 25.117, 25.119(a), 25.121(d), 25.904, 25.1309 and Appendix I) - FCAR HDE-17.
- Seats with Non-Traditional, Large, and Non-Metallic Panels" (RBHA/14 CFR Part 25.853) – FCAR HES-44.

Equivalent Levels of Safety Findings:

- Checked maneuver loads (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.331(c)(2)) - FCAR HES-13;
- Fuel tank crashworthiness (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.721 and 25.963(d)) - FCAR HES-19;
- Minor crash criteria (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.721 and 25.963(d)) - FCAR HES-20;
- Emergency exit locator signs (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.811(d)(3)) - FCAR HES-36.
- Equipment, systems and installations (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.1309) - FCAR HSI-15;

CERTIFICATION BASIS (Cont.)

- Equivalent level of safety finding for position lights (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.1389(b), 25.1391, 25.1393 & 25.1395) - FCAR HSI-27;
- Cabin ventilation – humidity requirement (RBHA 21.21(b)(1), RBHA/14 CFR Part 25.831(g)) - FCAR HSI-38;
- Performance credit for use of automatic power reserve (APR) during reduced thrust takeoffs (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.904, 25.149 and Appendix I) - FCAR HDE-16;
- Flight critical thrust reverse (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.933(a)(1)(ii) & 25.1309(b)(1) - FCAR HPR-06;
- Digital only display of turbine engine high/intermediate pressure rotor speed (N2) (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.901, 25.1305, 25.1309, 25.1321 and 25.1549) - FCAR HPR-14;
- Adoption of APU harmonized requirements (RBHA 21.21(b)(1); RBHA/14 CFR Part 25 Subparts E, F and G) - FCAR HPR-17; and
- Lack of on/off switch for ATTCS system (RBHA 21.21(b)(1); RBHA/14 CFR Part 25.117, 25.119(a), 25.121(d), 25.904, 25.1301, 25.1309, Appendix I) - FCAR HPR-23.
- "Photoluminescent Exit Sign" (RBHA/14 CFR Part 25.812(b)(1)(ii), 25.812(i)) – FCAR HES-43.

Exemptions:

- Uncontained engine rotor burst hitting pressurized cabin [RBHA/14 CFR Part 25.841(a)(2)(i) and (ii)] - Granted through Ordinance DAC No. 595/DGAC, dated 28 June 2005; and
- Uncontrollable high engine thrust [RBHA/14 CFR Part 25.901(c)] - Granted through Ordinance DAC No. 548/DGAC, dated 16 June 2005.

Noise Standards:

- RBHA 36 (Noise Standard - Type Certification), corresponding to ICAO Annex 16, Volume I Chapter 3 (third edition), and including all amendments effective on the date the ERJ-190 certification by the ANAC.

Fuel venting and exhaust emission requirements:

- RBHA 34 (Fuel Venting and Exhaust Emission Requirements for Turbine Engine Powered Airplanes - Type Certification), corresponding to the 14 CFR Part 34 and including the amendment effective on the date the ERJ-190 certification by the ANAC.

Optional design requirements complied with:

- RBHA/14 CFR Part 25.1403 – Wing icing detection lights;
- RBHA/14 CFR Part 25.1411 and 25.1415 – Safety equipment required for ditching certification;

- RBHA/14 CFR Part 25.1419 – Ice protection; and
- RBHA/14 CFR Part 25.1421 – Megaphones.

Application date for type certification of all models of the ERJ 190-200: 31 December 2001.

PRODUCTION BASIS

Models ERJ 190-200 STD, LR and IGW: Production approved under
CHE E-7203-01, on 08 November 2006.

EQUIPMENTS

The basic required equipment as prescribed in the applicable airworthiness regulations (see certification basis) must be installed in the airplane. The approved equipment is listed in the Embraer Technical Report 190-200TDSD.
The ANAC approved airplane flight manual P/N AFM-1868 must be on board.

DATA PERTINENT TO ALL MODELS ERJ 190

ENGINE LIMITS

	CF34-10E6, CF34-10E5, CF34-10E5A1, CF34-10E6A1, CF34-10E7, CF34-10E7-B
Operating conditions:	
• Normal takeoff (1):	
ITT Max CF34-10E6	938ºC
ITT Max CF34-10E6A1	983ºC
ITT Max CF34-10E5	939ºC
ITT Max CF34-10E5A1	983ºC
ITT Max CF34-10E7	943ºC
N1 Max (% 6325)	100%
N2 Max (% 18018)	100%
• Maximum takeoff (ATTCS) (1) (4):	
ITT Max	983ºC
N1 Max (% 6325)	100%
N2 Max (% 18018)	100%
• Maximum continuous:	
ITT Max	960º C
N1 Max (% 6325)	100%
N2 Max (% 18018)	100%
• Ground Start:	
ITT Max	740º C
• In flight start:	

	ITT Maxi	875º C	
	Oil temperature:		
	• Maximum continuous:	155º C	
	• Minimum for starting:	- 40º C	
	Oil pressure:		
	• Maximum transient (3) (after cold start):	5 psid (Min) (2)	250 psid (Max)
	Minimum pressure:		
	• Takeoff power	70 psid	
	• Steady state idle	25 psid	

ENGINE LIMITS (Cont.)

Notes:

(1) Thrust levels above maximum continuous are limited to 5-minute periods. The 5-minute ATTCS limit is extended to 10 minutes for operations with one engine inoperative.

(2) For oil temperature less than –20ºC, the minimum pressure is 5 psid for the first 2 minutes after engine start. After 2 minutes on steady state idle or if power engine were elevated under steady state idle, the minimum pressure of the oil is 25 psid. Applicable to aircrafts with FADEC version 5.02 or installed later.

(3) During cold weather operations, oil pressure peaks to full scale may occur due to high oil viscosity. The engine must remain at idle until oil pressure returns to normal operating range.

(4) ATTCS is not applicable to CF34-10E5A1, CF34-10E6A1 engines.

MINIMUM CREW

Two (2): pilot and copilot.

LUBRICANT OIL CAPACITY

Per engine:
- Total (liters/U.S quarts): 14,7 (15,6)
- Usable (liters/U.S quarts): 13,5 (14,4)

HIDRAULIC OIL TANK CAPACITY

Per system: Sis1 = 37,0 liters / Sis2 = 50,6 liters / Sis3 = 13,5 liters.
Total (tree systems): 101,10 liters.

MAXIMUM ALTITUDES

Operating: 12 497 m (41 000 ft)
Takeoff and landing: 4 267 m (14 000 ft)

temperature Operating **LIMITS**

Altitude:	Maximum:	Minimum:
• Sea Level:	+ 52°C	-54°C -40°C (ground operation)
• 7 620 m (25 000 ft):	+ 0.0°C	-54°C

	• 11 000 m (36 089 ft):	-21.5°C	-65°C
	• 12 497 m (41 000 ft):	-21.5°C	-65°C
LIMIT OF FUEL TANK TEMPERATURE	-40ºC (-40 ºF) minimum		

Control Surface **MOVEMENTS** (See AMM for tolerances)

Rudder (1):	31.5º left	31.5º right
Horizontal stabilizer:	11.0º TE up	4.0º TE down
Aileron:	25º.0 TE up	15.0º TE down
Elevator(2):	25.0º TE up	18.0º TE down
Ground spoilers:	60º	
Outboard spoilers:	40º	

(1) For zero airspeed on the ground; maximum deflections vary according to airspeed.
(2) For zero airspeed; maximum deflections vary according to airspeed.

Control Surface **MOVEMENTS (Cont.)**

Flapes and Slats:

Flap setting position	Inboard flap (main / aft)	Outboard flap	Slat position	
			1	2, 3 & 4
0	0.0º / 0.0º	0º	0.0º	0.0º
1	7.1º / 15.4º	7.0º	12.0º	15.0º
2	10.1º / 16.6º	10.1º	12.0º	15.0º
3	20.2º / 19.2º	20.0º	12.0º	15.0º
4	20.2º / 19.2º	20.0º	20.0º	25.0º
5	20.2º / 19.2º	20.0º	20.0º	25.0º
Full	37.1º / 22.0º	36.5º	20.0º	25.0º

Deflections shown in degrees (º) are in the planes normal to hinge lines, excepting for the flaps, which are in stream wise planes normal to wing reference plane.
Deflections of a surface supported at another movable surface are relative to the parent surface. Stabilizer defections are relative to the airplane horizontal reference.
For tolerance see AMM.

NOTES:

NOTE 1 Weight and balance. Current weight and balance report, including the list of equipment that are part of the certificated basic empty weight and loading instructions, must be provided for each aircraft at the time of original certification.
The certificated basic empty weight and corresponding center of gravity location must include the total engine oil, hydraulic fluid and unusable fuel.

NOTE 2 Markings and placards. All markings and placards required by the applicable certification requirements (see certification basis) and by the operational requirements must be installed in the appropriate locations.

NOTE 3 Continuing Airworthiness. The mandatory systems certification maintenance requirements, raised from the safety analysis, are listed in the "Appendix A Part 1 - Certification Maintenance Requirements (CMR)" of the document MRB Report P/N 1928, Revision 1 or subsequent ANAC approved revision.

The mandatory structure certification maintenance requirements, raised from the damage tolerance analysis, are listed in the "Appendix A Part 2 - Airworthiness Limitation Inspections (ALI) - Structures" of the document MRB Report P/N 1928, Revision 1 or subsequent ANAC approved revision.

The list of the tasks raised from the compliance with the RBHA/14 CFR Part 25.981 Amdt. 102 (a) and (b) is provided in the "Appendix A Part 3 – Fuel System Limitation Items (FSL)" of the document MRB Report P/N 1928, Revision 1 or subsequent ANAC approved revision.

The list of the life-limited components is provided in the "Appendix A Part 4 – Life - Limited Items (LLI) of the document MRB Report P/N 1928, Revision 1 or subsequent ANAC approved revision.

Remarks: MRB Report P/N 1928 applies to all ERJ 190-100 and ERJ190-200, except for ERJ190-100ECJ model. For the ERJ 190-100 ECJ model, the Appendix A (Part 1, 2, 3 and 4) of the Maintenance Planning Guide (MPG) document P/N 2928 must be considered as reference for mandatory maintenance requirements mentioned above.

The Structures Repair Manual P/N 1929 is approved and controlled by ANAC, and all Service Bulletins issued by Embraer are approved by ANAC, except Alert Service Bulletins. A statement of this approval by ANAC must be stamped in each Service Bulletin.

The Structures Repair Manual P/N 2773 is applicable to model ERJ 190-100 ECJ.

NOTE 4 The ERJ 190-100 ECJ is approved for 0 (zero) passenger if no interior is installed or up to 19 (nineteen) passengers if interior is approved through STC/CHST or equivalent modification factory incorporated.
The Lineage 1000 aircraft is configured to "private, not for hire or common carriage use" unless Service Bulletin SB-190LIN-00-005 Modification of Pocket Doors to Support Commercial Charter Operation is installed.

NOTE 5 Systems containing user modifiable data: the systems containing user modifiable data are:

- User Partition of the Owner Requirements Table (ORT) of the SATCOM (Satellite Communication System);
- Airline Modifiable Information (AMI) of the Communication Management Function (CMF);
- System Setting Data - Airline Operational Data (APM) of the Configuration Monitor System – host configuration monitor (NIC); and
- User Application of the Aircraft Condition Monitoring Function (ACMF).
- User modifiable data are not approved by ANAC as part of the airplane type design.

NOTE 6 The models ERJ 190-100 and 190-200 are often referred to in Embraer marketing literature as “EMBRAER 190” and “EMBRAER 195” respectively. The ERJ 190-100 IGW and ERJ 190-200 IGW are referred to in Embraer marketing literature as “EMBRAER 190 AR” and “EMBRAER 195 AR” respectively. These names are strictly marketing designations and are not part of the official models designation.
The ERJ 190-100 ECJ model is frequently mentioned in Embraer publicity literature as “Lineage1000”.

NOTE 7 Type design definition. The type design which was submitted for ANAC evaluation and which is considered ANAC approved is defined by the following Embraer documents:

- 190-100TDSD_ECJ. “Type Design Standard Document”, revision B, or later acceptable revisions;
- 190EBD001 “Engineering Basic Data”, revision L, dated 10 August 2009 or later acceptable revisions;
- Annex I to ANAC FCAR HT-03 (List of all OTP/TSO/JTSO/etc. articles installed in the ERJ 190-100 ( ) aircraft), dated 29 June 2005 or later acceptable revision; and
- Aircraft Interior Configuration Report, issued for each ERJ 190-100 ( ) serial number airplane.
- 190-200TDSD. “Type Design Standard Document”, revision /2 dated 26 August 2005 or later acceptable revision;
- 190EBD200 “Engineering Basic Data”, revision G dated 1 July 2005 or later acceptable revision;
- Annex I to ANAC FCAR HT-03 (“List of all OTP/TSO/JTSO/etc. articles installed in the ERJ 190-100 ( ) aircraft”), dated 29 June 2005 or later acceptable revision; and
- “Aircraft Interior Configuration Report”, issued for each ERJ 190-200 ( ) serial number airplane.

NOTE 8 Engine Control Plugs part numbers ECP 2041M42P02, 2041M42P06, 2041M42P08 and 2041M42P09 are not permitted on any ERJ 190-100 and ERJ 190-200 CF34-10E engines configuration.

NOTE 9 The CF34-10E5, CF34-10E5A1, CF34-10E6, CF3410E6 A1, CF34-10E7 and CF34-10E7-B engines designation, as presented in the Engine Parts List, must contain the suffix Gxx, which defines the specific engine configuration. For the ERJ 190-100 and ERJ 190-200 model, the following designations are approved for operation: CF34-10E6G03, CF34-10E6A1G03, CF34-10E5G03, CF34-10E5A1G03, CF34-10E6G05 CF34-10E6A1G05, CF34-10E5G05, CF34-10E5A1G05, CF34-10E7G03, CF34-10E7G05, CF34-10E5G07, CF34-10E5A1G07, CF34-10E6G07, CF34-10E6A1G07, CF34-10E7G07 and CF34-10E7-BG07.
The engine nameplate may display the model (example: CF34-10E6) and the Gxx suffix (example: G05) in separate fields.

NOTE 1O Emergency Exit Locator Sign ELOS (FCAR HES-36) is not applicable for ERJ 190-100 ECJ model.

NOTE 11 For ERJ 190-100 IGW model, Pós-Mod Service Bulletin 190-00-0008, Maximum Takeoff Weight will be 46 000 kg and Pós-Mod Service Bulletin 190-00-0009, Maximum Takeoff Weight will be 51 800 kg.

NOTE 12 Models ERJ 190-100 STD, -100LR, -100 IGW, -100 SR and -100 ECJ type design reliability and performance are approved according to RBHA/14 CFR Part 25 Appendix K and are considered adequate for Extended Range Operations (ETOPS) up to 120 minutes when operated and maintained as per CMP-2356 - ERJ 190 Configuration, Maintenance and Procedures (CMP) document for models ERJ 190-100 STD, -100LR and -100 IGW or CMP-2852 - ERJ 190 Configuration, Maintenance and Procedures (CMP) document for model ERJ 190-100 ECJ.

NOTE 13 Performance data for landing on grooved or porous friction course (PFC) runway has been approved for ERJ190-100 and ERJ190-200 models according to Design Change Approval (DCA) 0190-000-00136-2008/ANAC. The operators that wish to use this approved data must obtain operational approval from their local authority, and additionally the operators should coordinate with the airport authority in order that appropriate standards are followed. The AFM, as required by RBHA/14 CFR Part 25.1587, should unmistakably present the conditions under which such performance data may be used.

NOTE 14 The ERJ 190-100 IGW, is referred in Embraer marketing literature as EMBRAER 190 PR, serial numbers 190 00214 and 190 00277, as delivered to the Brazilian Air Force, must be operated in accordance with the Approved Flight Manual Document Nº 1868 and maintained in accordance with MPG-3175 and CMP-2356. For operation under civilian rules, compliance with 25.785 (h)(2) must be demonstrated.

NOTE 15 For ERJ 190-100 IGW model, Pós-Mod Service Bulletin 190-00-0008, Maximum Takeoff Weight will be 46 000 kg and Pós-Mod Service Bulletin 190-00-0009, Maximum Takeoff Weight will be 51 960 kg.

NOTE 16 In order to comply with Operational Requirements RBHA 121.312 (e)(3) the aircraft models ERJ190-100 STD,-100 LR and -100 IGW and ERJ190-200 STD,-200 LR and -200-IGW that embodied modification according to DCA 190-025-00147-2008/ANAC meet the flammability certification requirement RBHA /14CFR Part 25.856 (b) “Thermal/Acoustic Insulation for Burnthrough Protection”.

NOTE 17 The type certificate holder has changed its commercial name. All the ANAC documentation issued to the previous name up to this date remains valid. All documentation issued previously bearing the previous name continues valid.

OBS: Original in the Portuguese language signed by:

HÉLIO TARQUÍNIO JÚNIOR
Gerente Geral de Certificação de Produto Aeronáutico
(General Manager, Aeronautical Product Certification)