

# Aircraft Profile: E175

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## Aircraft Profile: E175

### E175 – member of the family

Embraer's E175 has been a successful part of the Brazilian manufacturer's product range, but even with a next-generation model on the horizon, the company continues to develop the aircraft.



The Embraer E175 is part of the Brazilian E-Jet family, which straddles the regional and single-aisle markets. The other members of the family are the similarly sized E170, as well as the larger E190 and E195 models. In total more than 1,000 aircraft have been delivered.

All current models are powered by General Electric engines, and have significant commonality in aircraft systems and avionics. The fuselage cross-section is identical for all members of the family and accommodates four-abreast seating.

The E170 was the first version to be built and entered service in 2004. In response to market feedback, Embraer launched the E175, which has typically eight more seats. The first E175 was delivered in 2005 and has outsold its smaller stable-mate, accounting for virtually the entire current order backlog.

The E175 is available in three major versions differentiated primarily by their maximum take-off weights and associated ranges. The models are designated as standard (STD), long-range (LR) and augmented range (AR) versions. The E170 and E175 compete with Bombardier's CRJ700 and CRJ900 models.

### Future developments

Embraer has announced the launch of the second generation of the E-Jet family, which it identifies by the designation E2. The family comprises three models: E175-E2, E190-E2 and E195-E2. The E175 has been stretched by a single seat row and is the smallest aircraft in the second-generation family.

Embraer is targeting 2018 for entry into service of the E190-E2, but the E175-E2 is not scheduled to follow until 2020. The company is introducing a number of modifications and enhancements to improve the fuel efficiency on the current-generation E-Jet that will narrow the gap to the E2, with particular focus on the E175.

## Aircraft Characteristics

### Seating/range

Max seating	88 at 30-inch pitch
Typical seating	78 at 32-inch pitch
Maximum range (LR version)	2,200nm (4,074km) (5,950km)

## Technical characteristics

MTOW (LR version)	38.79 tonnes (85,517 lb)
OEW	21.87 tonnes (48,114 lb)
MZFW	31.70 tonnes (69,880lb)
Fuel capacity	11,625 litres
Engines	CF34-8E
Thrust	14,200 lbf (63kN)

## Fuels and times

Block fuel 200 nautical miles (nm)	1,095kg
Block fuel 500nm	1,969kg
Block time 200nm	53 minutes
Block time 500nm	96 minutes

## Fleet data

Entry into Service	2005
In service	194
Operators (current)	16
In Storage	0
On order	180 (excluding E2 versions)
Built peak year (2008)	55
Built 2013	24
Average age	4.6 years

## Indicative maintenance reserves

C-check reserve	\$15-\$17 per flight hour
Higher checks reserve	\$10-\$15/flight hour
Engine overhaul	\$75-\$100/engine flight hour hour
Engine LLP	\$87/engine cycle
Landing gear refurbishment	\$9-\$10/cycle
Wheels brakes and tyres	\$40-\$45/cycle
APU	\$25-\$30/APU hour
Component overhaul	\$110-\$130/flight hour

Source: Airfinance Journal research

"With its future secured in the medium term, the [E175's] values and lease rates will remain stable and benefit from the overall market recovery"

Olga Razzhivina, senior Istat appraiser, Oriel

## ISTAT APPRAISERS' VIEWS

### Avitas



#### Martin O'Hanrahan, director, asset valuation

The Embraer 175LR has so far proven to be the most popular member of the Brazilian manufacturer's 170/175 aircraft family with close to 140 of the type in service. However, the LR version accounts for fewer than 30 orders in a backlog of more than 180 aircraft for the type as a whole. The standard 175 model has only about 60 aircraft in service, but accounts for the large majority of the backlog. Total options for all models exceed 400.

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The 175LR has drawn the benefit of being part of a family of purpose-built small airliners rather than a stretched derivative such as the competing Bombardier CRJ designs. The larger 190/195 models have proven even more successful in the marketplace in terms of sales.

Embraer is developing a new generation of E-Jets (with the designation E2) to succeed the original E-Jet family, and the first Embraer 175-E2 is due to enter commercial service in 2020. The design will have a slightly shorter range but about 10 extraseats depending on cabin configuration. Further, the engines will be replaced by the PW1000G geared turbofan. As of January 2014 the manufacturer had secured 100 firm orders and 100 options for the E175-E2.

Avitas would place the value of a newly manufactured Embraer 175LR at \$28.9 million.

## Oriel



### **Olga Razzhivina, senior Istat appraiser**

With a typical 76-seat capacity the E175 is the second smallest of the four E-Jet family members. The E175 fleet is highly concentrated in the US (some 80% of the order book). Its US popularity was boosted by relaxation of the scope clauses allowing regional operators to up-gauge from 50- to 76-seater aircraft. Consequent contracts from American, United, Republic and SkyWest added 277 orders in 2013 alone. These numbers include the SkyWest order for 100 E175-E2 next-generation models, which is to succeed the current E175 in 2020.

Apart from the generational switch, Embraer has introduced an enhanced E-Jet with improved fuel efficiency and aerodynamics, which will translate positively into the residual values and may mitigate the depreciation for those built at the tail end of production. Continuous development of an aircraft type is important: although it creates an operational gap between the youngest and the oldest, it signals the original equipment manufacturer's long-term commitment and enables competition with new types introduced to the market.

With its future secured in the medium term, the values and lease rates will remain stable and benefit from the overall market recovery. We see the introduction of the enhanced E175 and further progression to the E2 generation as positives for the type overall. Increasing concentration in the US could be a concern if the type does not receive wider acceptance, especially in the Asia-Pacific markets.

## IBA



### **Jonathan McDonald, senior aviation analyst**

Traditionally IBA has viewed all Embraer 170/175/190/195 aircraft in a positive light in terms of market value behaviour and projected base values, and the E175 is no exception. However, in recent months trader feedback has suggested that values and lease rates of used Embraer 175 aircraft are perhaps not quite as buoyant as they had once been. There are a number of trends that may help to explain this.

The UK carrier Flybe, which is in the midst of a restructuring programme, is a major operator of E175s and E195s. As part of the restructuring programme, the carrier is returning all of its E195s imminently. Although, to date, IBA is not aware of them returning any E175s, there may be some concern at the situation. LOT, the Polish carrier, another major operator of E-Jets, is facing economic challenges and is in the process of general fleet reductions, which could impact E175 availability.

The improvements to the latest production standard aircraft, for which traders report seeing buoyant lease rates/market values, are also putting some downward pressure on the values of older examples of the E175. New production standards for E175s and general demand for releasing aircraft when they are around six years to nine years old has led to a significant disconnect from the lease rates when they were new. E175 aircraft are readily placed in the secondary market, but not at rentals as high as those hoped for by lessors.

## VALUES E175LR

<b>Build year</b>	2004*	2006	2008	2010	2012
<b>Avitas view</b>	13.5	15.8	18.3	21.2	24.7
<b>Oriel view</b>	13.5	15.0	17.0	19.0	21.0
<b>IBA view</b>	14.5	15.0	17.1	20.0	24.2

Assuming Standard Istat criteria

### Indicative Lease Rates (\$000s/month)

<b>Build year</b>	2004*	2006	2008	2010	2012
<b>Avitas view</b>	125-150	140-165	155-180	175-205	195-230
<b>Oriel view</b>	150	160	170	180	205
<b>IBA view</b>	145-165	150-170	165-185	180-205	195-220

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