Embraer launches E-190F/-195F passenger-converted freighter to challenge 737F & ATR72-600F markets. The E-190F/-195F provide 13.1 and 14.3 tonne maximum payloads.

Embraer debuts E-Jet freighters

The E-190 and -195 conversion programme has been planned for several years, but Embraer waited until the first feedstock aircraft had reached the 15-year-old mark. "Many cargo operators are reliant on P-to-F conversions because they operate at a low utilisation rates, and the cost of a factory-built freighter is too high. Only when aircraft approach their mid-life stage does a typical P-to-F conversion become economically viable," explains Daniel Galhardo, director of strategy, at Embraer Commercial Aviation.

At the start of 2022 are about 380 E-190s and 140 E-195s in active service. From the point of feedstock acquisition, many early production E-190s and -195s will become available as they are increasingly replaced for newer generation E-190E2s and -195E2s. "Importantly, operating a large jet aircraft, such as a 737F, on thinner routes adds increases operational complexity. Volumetrically the 737-300F and the E-195F are similar, making it possible to carry similar payloads, but at a much lower trip cost in the case of the E-195F," adds Galhardo.

The Embraer freighter is expected to provide up to a 25% lower cost per trip compared to a 737-300F, and a 20-25% lower cost than turboprops. There are instances in this sector when an operator flies at full payload outbound, but with less cargo inbound, reducing mission profitability and yield. "The E-Jets' low trip cost will open up many arenas that have remained closed to 737F operators," describes Galhardo.

It has been forecast that the E-190F/-195F fleet will exceed 200 aircraft in the next five to 10 years, as part of a movement in the industry to gravitate towards lower CO2 emissions, and legacy freighters are withdrawn.

The Embraer freighter will have an optimal operational range between 600nm and 1,400nm, and a range between 2,100nm and 2,300nm. "The Embraer freighter is more dynamic than a turboprop, and its palletised cargo can interline with larger aircraft carrying industry standard pallets," Galhardo adds.

The health crisis has been the impetus for many freight operators and logistic providers to re-evaluate their position and focus on future expansion. The freighters size and low operating economics allow operators to build new routes and markets at minimal risk.

PAYLOAD CHARACTERISTICS OF E-190 & E-195 FREIGHTERS

Aircraft type	E-190F AR feedstock	E-195F AR feedstock
MTOW - lbs	114,199	115,280
MZFW - lbs	90,169	93,917
OEW - lbs	61,179	61,677
Maximum structural payloads - lbs	28,990	31,520
Maindeck payload		
ULDs	96 x 125 (6) + 96 x 60.4 (1) + LD-3(1)	96 x 125 (6) + 96 x 60.4 (1) + LD-3(1)
Maindeck freight volume - cu. ft.	2,850	3,280
Maindeck tare weight - lbs	1,559	1,759
Lower deck bulk volume - cu. ft.	770	890
Lower deck tare weight - lbs	N/A	N/A
Total volume - cu. ft.	3,620	4,170
Total tare weight - lbs	1,559	1,759
Net structural payload - lbs	27,431	29,761
Maximum packing density - lbs/cu ft	7.56	7.14
Volumetric payload @ 6.4lbs/cu ft	23,530	37,105

Payload

Introduced in 2005, the E-190AR has a maximum take-off weight (MTOW) of 114,199lbs. Eight feet longer in length, the E-195AR was introduced in 2006 and has a MTOW of 115,280lbs. As freighters, the E-190F will have a maximum payload of 28,990lbs and 31,520lbs for the E-195F.

The E-190F has a maximum packing density of 7.56lbs per cu. ft., and the E-195F a maximum packing density of 7.14lbs per cu. ft. At a typical eCommerce packing density of 6.5lbs per cu. ft., and excluding tare weight, the E-190F/-195F are capable of revenue payloads totalling 23,530lbs and 27,105lbs; and the 737-300F 31,369lbs.

The E-190F has a main deck freight capacity of 2,850 cu. ft., and a lower lobe bulk capacity of 770 cu. ft., equating to a combined volumetric capacity of 3,620 cu. ft. The eight-position main deck loading configuration includes six 96 x 125 x 73(H), a single 96 x 60.4 x 73 (H), and one LD-3.

The E-195F has a 10-position palletised main deck freight capacity totalling 3,280 cu. ft., and 890 cu. ft., lower lobe bulk stowage, equating to a combined volumetric payload of 4,170 cu. ft. *(see table, this page)*. A typical nine-position maindeck loading configuration will include six 96 x 125 x 73(H), a single 96 x 60.4 x 73 (H), and one LD-3.

The 737-300F has a typical maindeck capacity of 3,980 cu. ft. across nine pallet positions, plus 973 cu. ft. of lower lobe bulk storage, to total 4,953 cu. ft. The 10-pallet position 737-700F has a main deck capacity of 3,816 cu. ft. and a 966 cu. ft. lower lobe volume to total 4,782 cu. ft.

Embraer P-to-F modifications such as the main cargo door, CLS, and integrated systems will be supported by the manufacturer. "The maintenance centre will have access to all the manuals and records," says Galhardo.

It is believed that the freighter will be important for the Asia Pacific market where many ageing 737-300F need replacing, including areas in South America and Africa. European, and US carriers will look at towards the aircraft to expand existing networks. AC