

AIRCRAFT STRUCTURES (FIXED WING)

MZFW – MAXIMUM ZERO FUEL WEIGHT

An important term that is frequently used is the Maximum Zero Fuel Weight (MZFW). This is an important structural limitation for large transport aircraft and is the maximum mass of the aircraft including the useful load², excluding the weight of the fuel.

	EPAX:	180	CRW/PAX:/..../..
	EZFW:	64777	MZFW: (S)	69500
BAL/LROP	ETOW:	75775	MTOW: (S)	80000
FW(E): 64.8	ELDW:	67905	MLDW: (S)	73500
/C: T13	REMF:	3128	MIN DIV:	2910
ROP: 40653				
	ACTZFW:	ACTTOW:

Figure 1 - Maximum Zero Fuel Weight

This is a structural limitation to prevent excessive bending stresses in the wing root area. As the aircraft uses fuel in the wings, they become lighter, and in this case, can cause bending stresses at the wing root if the weight of the aircraft without fuel is above the maximum. Large aircraft also have center fuel tanks. In this case, the fuel in the center tanks is used before the wing tanks for this purpose.

In order to ensure the ZFW is within limits, an estimated zero fuel weight (EZFW) is given based on the estimated passenger numbers (in this case, 180) prior to departure for comparison against the MZFW to ensure this limitation is not exceeded. (See Fig. 3).

² Useful Load is the sum of the total weight of the crew, passengers, baggage, usable fuel, and drainable oil. It is the basic empty weight subtracted from the maximum allowable gross weight.