

FCL, LCL and freight calculation

Fill a container yourself or share one? How is chargeable weight worked out?

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Online interactive version: <https://ozgurkonakci.com/en/guide/fcl-lcl-freight/>

SHORT ANSWER

With FCL a container belongs to one shipper and the rate is fixed per container; with LCL several shippers' cargo shares a container and is charged on W/M (per m³ or per tonne, whichever is greater). Carriers charge on the greater of actual and volumetric weight: in air freight, volumetric weight = $L \times W \times H \text{ (cm)} \div 6,000$.

FCL and LCL

FCL (Full Container Load): The container is used by a single shipper. The cargo is loaded at the shipper's premises, the door is sealed, and the container reaches the consignee without being opened. The rate is fixed per container; you pay the same even if the container travels half empty.

LCL (Less than Container Load): Cargo from several shippers is combined in the same container by a consolidator. At origin it is loaded into the container at a **CFS** (container freight station) warehouse, and at destination it is separated again at a warehouse. The rate is based on the cargo's volume or weight.

	FCL	LCL
Pricing	Per container	Per m ³ or per tonne (W/M)
Transit time	Shorter	Longer, because of consolidation and deconsolidation
Risk of damage	Lower (the container is not opened)	Higher (the cargo is handled several times)
Suitable for	Enough cargo to fill a container	Small and medium volumes

CBM: calculating volume

In sea and road freight, volume is measured in **cubic metres (m³, CBM)**.

CBM = length × width × height (in metres) × number of packages

Example: 10 pallets of 120 × 80 × 150 cm → $1.2 \times 0.8 \times 1.5 \times 10 = 14.4 \text{ m}^3$

Chargeable weight

So that they do not lose money on light cargo that takes up a lot of space, carriers convert volume into weight and charge on **whichever is greater: the actual weight or the volumetric weight**. This is called **chargeable weight**. The conversion factor depends on the mode of transport:

- **Sea LCL (W/M):** $1 \text{ m}^3 = 1,000 \text{ kg}$. If the cargo is 3 m^3 and $1,200 \text{ kg}$, it is charged on 3 "revenue tonnes".
- **Air:** Volumetric weight = $(\text{length} \times \text{width} \times \text{height in cm}) \div 6,000$. This means $1 \text{ m}^3 \approx 167 \text{ kg}$. Express courier companies mostly use a factor of 5,000.
- **Road groupage:** In common practice $1 \text{ m}^3 = 333 \text{ kg}$. Charging can also be based on loading metres (LDM).

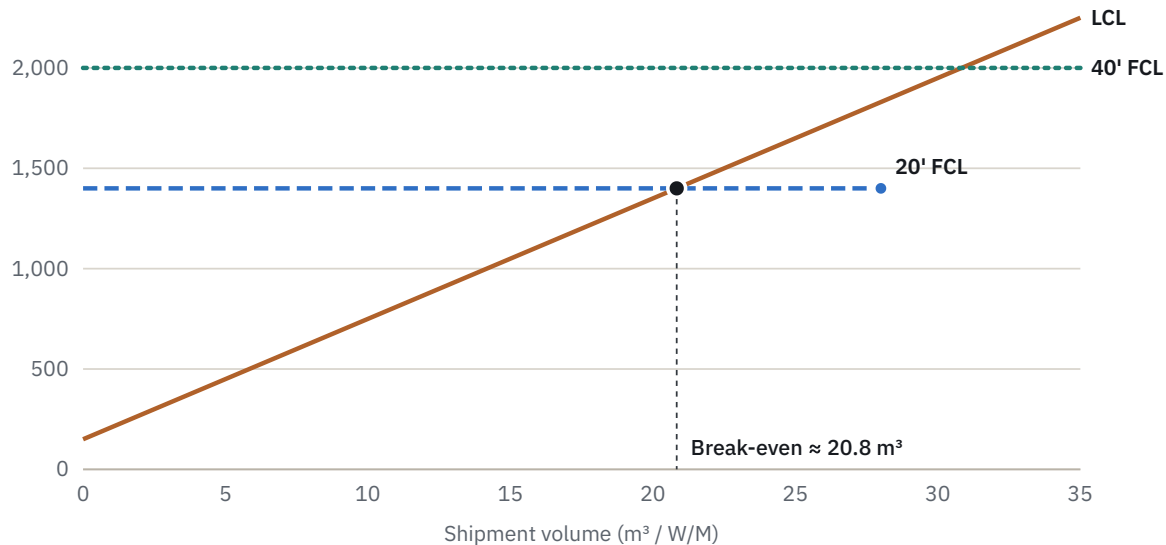
Example shipment	Actual weight	Volume	Sea LCL (W/M)	Air ($\div 6,000$)	Road (333 kg/m ³)
4 cartons, 60 × 40 × 40 cm	48 kg	0.384 m ³	0.38 W/M	64 kg	128 kg
10 pallets, 120 × 80 × 150 cm	3,200 kg	14.4 m ³	14.4 W/M	2,400 → 3,200 kg	4,795 kg
2 machine crates, 200 × 120 × 100 cm	5,000 kg	4.8 m ³	5.0 W/M	800 → 5,000 kg	1,598 → 5,000 kg

Where there is an arrow, the actual weight is greater than the volumetric weight, so the charge is based on the actual weight. Chargeable weight = the greater of actual weight and volumetric weight. In sea LCL most consolidators apply a minimum charge of 1 W/M; in practice the first example would be charged on 1 W/M.

FCL or LCL? The break-even point

As volume grows, the LCL cost rises in a straight line, while FCL stays fixed per container. Beyond a certain point FCL becomes cheaper, even if the container travels half empty. In the chart below you can change the prices to match your own quotation and see the break-even point.

Total freight by shipment volume (USD)



Example assumptions (not real prices): LCL 60 USD/W/M + 150 USD fixed charges per shipment; 20' FCL 1,400 USD; 40' FCL 2,000 USD. On these assumptions a 20' FCL is cheaper than LCL from about 20.8 m³. Practical capacity is taken as 28 m³ for a 20' container and 58 m³ for a 40'.

The default values are **examples**, not real market prices. Freight rates change very quickly with the route, the season and market conditions. When deciding, take into account not only the freight but also CFS and deconsolidation charges in LCL, transit time and the risk of damage.

Test yourself

1. A carton of 80 × 60 × 50 cm weighing 25 kg is going by air. What is the chargeable weight? (*Answer: $80 \times 60 \times 50 \div 6,000 = 40$ kg. Since 40 kg > 25 kg, it is charged on 40 kg.*)
2. In LCL, how many W/M is a 4.5 m³, 3,800 kg shipment charged on? (*Answer: 4.5. The volume is greater than the weight in tonnes.*)
3. What is the drawback of LCL for fragile cargo with a high risk of damage? (*Answer: It is handled several times during consolidation and deconsolidation.*)

Frequently asked questions

How is W/M calculated in LCL?

The cargo's volume in cubic metres is compared with its weight in tonnes and the larger figure is charged. A 3 m³, 1,200 kg shipment is charged on 3 W/M; a 2 m³, 3,500 kg shipment on 3.5 W/M. Most consolidators apply a 1 W/M minimum.

How do you work out volumetric weight in air freight?

Length × width × height (cm) ÷ 6,000. An 80 × 60 × 50 cm carton has a volumetric weight of 40 kg; if it actually weighs 25 kg, it is charged on 40 kg. Express couriers mostly use a factor of 5,000.

When should you choose FCL over LCL?

LCL cost rises with volume while FCL is fixed. On the example assumptions in this guide a 20' FCL becomes cheaper from about 21 m³, but a real decision should weigh current quotes, CFS charges, transit time and the risk of damage together.

SOURCES

IATA practice: volumetric weight factor in air cargo of 6,000 cm³/kg

W/M practice in sea LCL: 1 m³ = 1,000 kg

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