

TRANSPORTATION CONVERSION TABLES AND CALCULATIONS

Seafreight & Airfreight

Seafreight:

Physical Weight

From	To	Multiply by
Pounds	Kilos	0.4536
Kilos	Pounds	2.2046
Metric Ton	Kilos	1,000
Long Ton	Pounds	2,240
Short Ton	Pounds	2,000

Temperature

From	To	Calculation
Fahrenheit (F)	Celsius (C)	$(F-32) \times 5/9$
Celsius (C)	Fahrenheit (F)	$(C \times 9/5) + 32$

Linear Measure

From	To	Multiply by
Inches	Centimeters	2.54
Centimeters	Inches	.393701
Meters	Feet	3.281

Volume

From	To	Multiply by
Cubic Meters	Cubic Feet	35.3147
Cubic Feet	Cubic Inches	1,728
Cubic Meters	Cubic Centimeters	1,000,000

Seafreight Trade Lane Conversions

Weight Or Measure Metric (W/M)	1,000 Kilos or 1 Cubic Meter
US Domestic	100 Pounds or 1 Cubic Foot
Caribbean	2,000 Pounds or 40 Cubic Feet

Air to Sea Conversions

From	To	Multiply By	If Iata
Volume Kilos	Cubic Meters	0.006	6,000
Volume Kilos	Cubic Meters	0.007	7,000

When you do not have enough cargo to fully use all the space or physical weight limitations of an entire ocean container you have what is called less-than-containerload (LCL) cargo. If your cargo is too large to fit inside any type of ocean container, you have what is called break-bulk ocean cargo. Either way, the cost of the "space" your cargo will utilize inside a consolidated ocean container or loose on a breakbulk ocean vessel compared to cost associated with the physical weight of your cargo is used in calculating ocean freight cost.

Most LCL freight cost is based on the higher of 1,000 kilos or 1 cubic meter and referred to as weight or measure (W/M) metric.

*Example: Nine pallets, each 150kgs and 122cm x 101.5cm x 127cm
(English Standard Measure, each 330.7lbs and 48in x 40in x 50in)*

9 pallets x 122cm x 101.5cm x 127cm / 1,000,000 cubic centimeters = 14.15 cubic meters

OR

9 pallets x 48in x 40in x 50in = cubic inches / 1,728 = cubic feet / 35.314 = 14.15 cubic meters

The physical weight of this shipment is 9 pallets x 150 kilos = 1,350 physical kilos. For the volume of this cargo not to exceed the physical weight, the physical weight would need to be at least 14,150 kilos. Since this is not the case, the ocean freight would be calculated based on 14.15 cubic meters.

The most commonly used calculation in the US domestic LCL markets of Hawaii, Alaska and Puerto Rico is the greater of 100 pounds or 1 cubic foot, and in the Caribbean LCL market is the greater of 2,000 pounds or 40 cubic feet. Metric Ton, Short Ton and Long Ton values are used as the basis of breakbulk ocean cargo freight calculations.

Air/Sea Freight Combination

Air Freight, Sea Freight and Air/Sea Combination services can be calculated and quickly compared using the above provided AIR/SEA FREIGHT CONVERSION table. Use 0.006 factor if comparing to airfreight based on IATA standard of 6,000 cubic centimeters per one physical kilogram and use 0.007 factor if comparing to airfreight based on 7,000 cubic centimeters per one physical kilogram. In the Example, 2,359 volume kilos of airfreight (based on IATA standard) x 0.006 = 14.15 cubic meters sea freight.

Airfreight:

Physical Weight

From	To	Multiply by
Pounds	Kilos	0.4536
Kilos	Pounds	2.2046
Metric Ton	Kilos	1,000

Air Freight Dim Factors

Using Centimeters To Calculate Volume Kilos	Using Inches To Calculate Volume Pounds	Using Inches To Calculate Volume Kilos
6,000	166	366
7,000	194	428

Linear Measure

From	To	Multiply by
Inches	Centimeters	2.54
Centimeters	Inches	.393701

Linear Measure

From	To	Calculation
Fahrenheit (F)	Celsius (C)	(F-32)X5/9
Celsius (C)	Fahrenheit (F)	(CX9/5)+32

Dimensional weight, also called dim weight or volume weight, is used because the space a package takes on an aircraft may cost more than the physical weight of the package. For every shipment dimensional weight is compared to the physical weight, and the greater of the two is used to determine the shipment cost. IATA standard dimensional weight is based on 6,000 cubic centimeters per one physical kilogram and calculated as follows:

$$\text{Length (cm)} \times \text{width (cm)} \times \text{height (cm)} / 6,000 = \text{volume kilos}$$

International transportation rates are predominately expressed in metric measure. For countries in which English Standard measure is more commonly used, the same dimensional weight formula is used, but with different factors or divisors. Using inches, the same volume weight can be expressed as either volume pounds by using a divisor of 166 or as volume kilos using a divisor of 366.

Example: Nine pallets, each 150kgs and 122cm x 101.5cm x 127cm
(English Standard Measure, each 330.7lbs and 48in x 40in x 50in)
 $9 \text{ pallets} \times 122\text{cm} \times 101.5\text{cm} \times 127\text{cm} / 6,000 = 2,359 \text{ volume kilos}$
 $9 \text{ pallets} \times 150\text{kgs} = 1,350 \text{ physical kilos}$
or
 $9 \text{ pallets} \times 48\text{in} \times 40 \text{ in} \times 50\text{in} / 366 = 2,359 \text{ volume kilos}$
 $9 \text{ pallets} \times 150\text{kgs} = 1,350 \text{ physical kilos}$
or
 $9 \text{ pallets} \times 48\text{in} \times 40\text{in} \times 50\text{in} / 166 = 5,205 \text{ volume pounds}$
 $9 \text{ pallets} \times 330.7\text{lbs} = 2,976 \text{ physical pound}$

The chargeable weight of the nine pallets is expressed as either 2,359 chargeable kilos or 5,205 chargeable pounds. To verify the accuracy of the calculations— $2,359 \text{ volume kilos} \times 2.2046 = 5,205 \text{ volume pounds}$.

In some trades, particularly in the US domestic airfreight market, the more commonly used dimensional factor is based on 7,000 cubic centimeters per one physical kilogram. Volume weight is calculated using the same formula, but with different factors of 7,000, 194 or 428 per the table provided above.

Typically, large airfreight cargos are expressed as tons referring to the higher of either physical metric tons or volume metric tons. One metric ton = 1,000 kilograms, therefore the example cargo would be referred to as just under 2 1/2 tons.

ABOUT SHAPIRO

Shapiro, a third generation family-owned business founded in 1915, provides creative and flexible logistics services. With six offices, over 100 employees, and worldwide strategic alliances, Shapiro is the supply chain partner that delivers customized, compliant, and reliable solutions to address your specific import and export needs. Only Shapiro has an experienced and personable staff that truly cares about your company and commits themselves to proactively achieving your business goals.