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## **Tuns, tons, and tonnage**

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Some say that we owe our modern system of measuring ships, at least in part, to Julius Caesar and the natural thirst of the British peoples. Through efforts initiated by Julius Caesar in 54 B.C., portions of the British Isles were integrated with the European mainland. Regular trade developed. One of the products produced on the European mainland that was in short supply in Britain was wine. The British peoples gradually developed a prodigious thirst for wine and it came to be imported in large quantity. The usual means for shipping wine was in wooden casks called "tuns". A tun was basically a barrel, but was much smaller in circumference than is common nowadays. The tun was relatively easy for one person to handle and was easy to stow in the hold of ships of the day.

Gradually, ships began to be graded by how many tuns they could carry. Somewhere in this evolution, the spelling – as applied to the capacity of ships – changed to "tons". Also, as transport became more sophisticated and mechanized and as ships became larger, the old-fashioned wine cask or tun fell out of use. As a matter of interest, the original barrels used to transport oil were built to hold 42 U.S. gallons (they were actually constructed to hold whiskey). They, too, have fallen into disuse, replaced by the 55-gallon drum, but the measurement unit survives.

Now, "ton" is used by the maritime community to measure both cubic capacity and weight. The ton as a unit of weight developed independently of the ton as a unit of capacity and originated ashore.

As a unit of cubic capacity, a ton is equivalent to 100 cubic feet. The two most common tonnage measurements for ships with regard to capacity are gross tonnage and net tonnage. Gross tonnage (GT) is the carrying capacity of the ship's hull (generally below the upper deck). Net tonnage (NT) is the gross tonnage with subtractions made for non-cargo spaces, such as crew's quarters, ships' stores, engine rooms, bunkers, etc. The net tonnage is a measurement of the earning capacity of the ship. The terms "gross register tonnage" and "net register tonnage" refer to the respective tonnages as shown on the ship's official government certificate of registry.

As a unit of weight, a ton is usually denominated as a long ton (2,240 pounds) or a metric ton (1,000 kilograms or 2,204.6 pounds). The short ton (2,000 pounds) is less frequently used in

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the maritime industry. The most common tonnage measurement utilized for ships with regard to weight is deadweight tonnage (DWT). Deadweight is the total weight of cargo, stores, and fuel carried by a ship at its maximum permitted draft. Deadweight tonnage is the deadweight expressed in tons avoirdupois (i.e., long tons). Lightweight tonnage is the weight of the ship as delivered from the yard – the hull, machinery and fittings fully constructed, but with minimal fuel, supplies, and spare parts. Displacement is the weight of the ship with everything on board (deadweight plus lightweight) and is equal to the weight of the displaced water. Deadweight tonnage is basically the ship's earning capacity expressed in units of weight, whereas net tonnage is the ship's earning capacity expressed in units of volume.

Governments soon latched on to tonnage as a means of calculating the tax or duty to be assessed against ships calling in their ports. When the United States Government was established, the Constitution specifically provided that Congress had the power to lay and collect taxes, duties, imposts, and excises. Further, the Constitution specifically prohibited the various states (without the consent of Congress) from laying "any Duty of Tonnage". The Customs Service (now called Customs and Border Protection) is charged with assessment and collection of tonnage taxes and light duties. Both the tonnage tax and light duty (or light money) are assessed based on the ship's net tonnage, as well as its registration and the location from which it arrives. Exemptions are provided for ships registered in nations that grant reciprocal exemptions for U.S. ships.

Nations and at least two international waterways (the Suez and Panama Canals) developed over time different methods for computing tonnage as a measurement of capacity. After all, you could hardly go through the exercise of stuffing tuns into every newly-built ship to determine its tonnage. The methods became very complex (sometimes called fantastical) and were only understood by specialists called admeasurers. In an effort toward uniformity, the International Convention on Tonnage Measurement of Ships, 1969 was developed under the auspices of the International Maritime Organization (IMO). The Tonnage Convention established uniform principles and rules with respect to determination of tonnage on ships engaged on international voyages.

The Convention is generally forward-looking. Thus, ships predating adoption of the Convention are allowed to retain their old tonnage measurements for twelve years in the absence of a major rebuild. Even after twelve years, pre-existing ships may retain their old tonnage measurements for the purpose of application to them of relevant requirements under other existing international conventions.

The U.S. legislation and regulations adopting the Tonnage Convention for ships of the United States provide details on whether the new convention tonnage measurement or the old regulatory tonnage measurement is to be utilized by pre-existing U.S. ships to determine application of various international conventions and U.S. laws. The matter can quickly get very complicated, particularly with regard to such things as the International Safety Management (ISM) Code and the Global Maritime Distress Safety System (GMDSS). Technically, both are

part of the Safety of Life at Sea (SOLAS) Convention, but they are treated as new requirements for purposes of application of the Tonnage Convention.

The United States now has four systems for measuring tonnage of ships. In addition to convention tonnage, a ship of the United States may be eligible for measurement under the regulatory system, the dual tonnage system, or the simplified measurement system. The dual tonnage system is basically a grandfather clause for U.S. ships built before September 29, 1965, when the regulatory system became controlling for most domestic purposes. The simplified measurement system is available to vessels that are either not self-propelled, under 79 feet in length, or operated for pleasure only.

The drinking habits of the British peoples have thus laid the basis for an extremely complex system or systems of maritime regulation that no one person (clearly not this writer) fully understands.

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