



Airconditioning capacity — the ‘ton’

Most of us have heard about the **Ton*** in connection with Heat Load or capacity of airconditioning equipment. The Ton (TR)** in Refrigeration & Airconditioning is a unit indicating a certain *Quantity of Heat*. This “Quantity of Heat” is different from temperature which only says how hot the substance is but not *how much heat* it contains.

The two most common units for stating the heat quantity are the **British thermal unit (Btu)** and the **Calorie (cal)**.

- The Btu is the quantity of heat needed to raise the temperature of 1 lb. of water by 1° Fahrenheit
- The Calorie is the metric unit of heat quantity. It is the heat needed to raise the temperature of 1 gram of water by 1° Celsius. Since a calorie is a very small measurement, it is practical to use thousand calories as the unit for airconditioning and it is expressed as Kilo Calorie (K Cal).

*One Ton Refrigeration was originally conceived to describe the quantity of heat removed to freeze 1 Ton (1 American Short Ton is 2000 pounds) of water at 32°Fahrenheit to ice at the same temperature in 24 hours.

**The airconditioning engineer uses the term ‘Ton Refrigeration’ (TR), popularly referred to as ‘Ton’, when associated with refrigeration & airconditioning. We will use the term ‘Ton’ or its abbreviation ‘TR’ in this book

$$1 \text{ Ton Refrigeration} = 12000 \text{ Btu/hr or } 3000 \text{ K Cal/hr}$$