Specific heat capacity

@wikipedia

Amount of heat required to change the temperature of one unit of mass by one unit of temperature:

$$c_m = \frac{\delta Q}{\delta m \cdot \delta T}$$

Symbol	Dimension	SI units	Oil metric units	Oil field units
c_m	$L^2 T^{2\ 1}$	J/(kgK)	J/(kgK)	BTU/(lbm°F)

Specific Heat Capacity depends on the way the heat is transferred and as such is not a material property.

The two major heat transfer processes are isobaric and isohoric which define:

Isobaric specific heat capacity	Isochoric specific heat capacity
c_{mp}	c_{mV}

Both c_{mp} and c_{mV} are material properties and properly tabulated for the vast majority of materials.

Specific Heat Capacity c_m relates to Volumetric Heat Capacity c_v and density of the matter ρ as:

(1) $$c_m = \rho \cdot c_v$$

In many technical papers the "m" or "v" index is omitted which leads to confusion between Specific Heat Capacity c_m and Volumetric Heat Capacity c_v .

For multiphase fluid in thermodynamic equilibrium the Specific Heat Capacity c_m is:

(2) $$c_m = \frac{\sum_\alpha s_\alpha \rho_\alpha c_{m\alpha}}{\sum_\alpha s_\alpha \rho_\alpha}$$

where

s_α	α-phase volume share, subjected to $\sum_\alpha s_\alpha = 1$
ρ_α	α-phase Fluid Density
$c_{v\alpha}$	α-phase Volumetric Heat Capacity

See also

Physics / Thermodynamics / Thermodynamic process / Heat Transfer / Heat Capacity

[Heat] [Volumetric Heat Capacity]