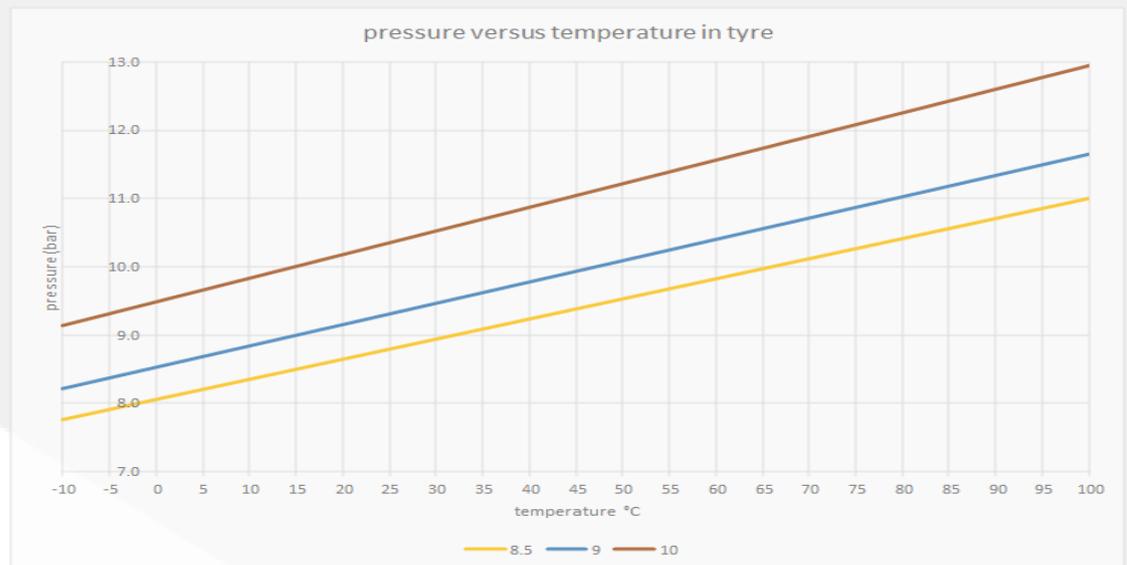




Everyone is aware of the influence of the temperature on the pressure in tyres. Higher temperatures equals higher pressures. Nevertheless a regular question asked is the precise relationship; and what are the consequences of the high temperature.



When the amount of air molecules doesn't change in a tyre, then the pressure is proportional to the temperature, as the volume stays constant. An important remark is that temperature has to be measured in degrees Kelvin and not in degrees Celsius or Fahrenheit. The unit for the pressure does not matter.

The relationship between a temperature in degrees Celsius and the temperature in Kelvin is a shift from the 0 point. 0 K (degrees Kelvin) corresponds to -273.15 °C. 0 °C thus corresponds with 273.15 K, 15 °C corresponds to 288.15 K.

Based on these theoretical data we come to following chart that gives a relationship on the x-axis is the temperature in °C and on the y axis the pressure in bar in a band. We start from the standard of a band on 9 bar at 15 °C, this is the blue line.

From experience, we know that the internal temperature in the tyre in the winter ranges from the external temperature of -10 °C at standstill to 30 à 40 °C while driving. A hot day during the summer, internal temperatures rises standard around 75°C with peak moments to 90 °C or more. This is determined by the warming of the rubber of the tires on the hot road.

You notice immediately that the pressure in the tire can amount to 11.5 à 12 bar!

A tyre that has half a bar negative pressure at the reference temperature of 15°C, the yellow line, will come above 9 bar starting from 35 °C. At a measurement it will not be possible to see that it is underinflated!

Some inflate their tyres intentionally higher than the target. This implies that during summertime, pressure can rise to 13°C ! This value approaches safety limits and implies more wear.

