How Tyre Pressure Varies with Temperature

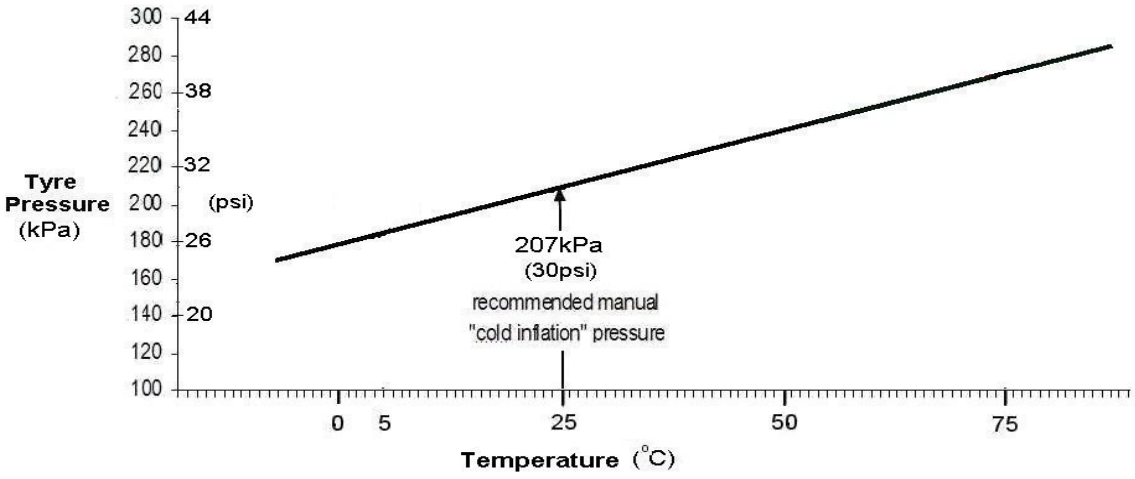
Air temperature has a significant effect on the “cold inflation pressure”. The standard temperature at which manufactures specify their tyre pressures is 25°C. Ideally tyres should always be measured and inflated at this temperature but of course this is unrealistic. The recommended rule is to always check tyres in the morning or in the shade before rising temperatures or radiant heat can affect pressures. Tyre pressure can change approximately 7kPa (1psi) for every 5.5°C (approx) change in tyre temperature. It will go down with lower temps, and up with higher temps.

If tyres are inflated in the morning at a low temperature and the daily maximum is say 20°C higher than the morning, then the tyre pressures would increase in the order of 28kPa (4psi) during the day and could exceed the tyre's maximum. Alternatively, if tyres are inflated to placard pressures when they are hot or in the heat of the day, cold pressures will probably be dangerously low the following morning. If air must be added to hot tyres, the accepted rule is to add about 28kPa (4psi) to the placard pressure and recheck when cold..

Winter temperatures also need some consideration. If the vehicle is parked in a warm garage when tyres are inflated, then there will be a reduction in pressure if driven out in the cold. For safety it may be necessary to add 7kpa (1psi) for each 5.5°C in temperature difference to compensate.

The difference between summer and winter should also be taken into account. For example, if a tyre is inflated to 240kPa (35 psi) in summer, it could have an inflation pressure of 160kPa (23 psi) 6 months later in winter. This represents a normal loss of 40kPa (6 psi) over the six months and an additional loss of 40kPa (6psi) due to temperature change. At 160kPa (23 psi), this tyre is severely under-inflated.

Example:



Even a short drive can generate enough heat, due to tyre flexing, that will result in tyres that may be under-inflated by several psi the following morning. For example, tyres under test monitored for changes in tyre pressure in 5 minute intervals, inflated to 103kPa (15psi),138kPa (20psi),172kPa (25psi) and 207kPa (30psi) and all run under the same load, the air pressure in all of the tyres went up about 7kPa (1 psi) during every 5 minutes of use for the first 20 minutes of operation.