

INFORMATION SHEET

Pressure change of cylinders with temperature

Gas will contract and expand with temperature, if a gas gets colder will it contract and become denser, if a gas gets hotter it will expand and become less dense. This is why hot air rises and cold air sinks.

If contained in a fixed volume such as a cylinder if the gas gets colder and contracts (and no air can enter) then the pressure will drop and conversely when the gas gets warmer and expands (and no air can escape) the pressure will increase.

This is what leads to changes in pressure of cylinders charged at one temperature and then stored at another.

This pressure change can be calculated using Charles Law and the below table shows what happens 200 and 300 bar cylinders when charged at a room temperature of 20°C

Remember although the pressure has changed due to temperature there is still exactly the same amount of air within the cylinder.

Temperature °C	200 Bar	300 Bar
0	186	280
10	193	290
20	200	300
30	207	311
40	214	321
50	220	331
60	227	341
70	234	352
80	241	362
90	248	372
100	255	382

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Scott Safety is a global business unit of Tyco International that supplies a variety of industries through manufacturing facilities located in the United States, United Kingdom, Asia, Finland and Australia.

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