

Temperature De-Rating Chart



When should 500 psi. be 320 psi.? When it's hot!

The effect of elevated temperature on any hose system is significant and often overlooked. Since the lay line of most hoses indicates the maximum WP and the maximum temperature, it can be assumed the hose assembly will achieve both at the same time. Hot hoses get soft and are more pliable, hampering the ability of the attachment to hold the couplings securely on the hose. Since Campbell's pressure ratings are established by testing at 70°F, we established a separate pressure de-rating chart for elevated temperatures.

Elevated Temperature De-rating Chart – de-rating factor applies to hose system pressure ratings										
Hose Type	70°	90°	150°	200°	250°	300°	350°	400°	450°	500°
Steam	1.00	0.95	0.81	0.68	0.56	0.44	0.32	0.20	0.08	N/R
Hot Tar & Asphalt	1.00	0.95	0.81	0.68	0.56	0.44	0.32	0.20	0.08	N/R
PVC	1.00	0.82	0.30	N/R						
Rubber	1.00	0.91	0.64	0.42	0.20	N/R	N/R	N/R	N/R	N/R
Chemical	1.00	0.91	0.64	0.42	0.20	N/R	N/R	N/R	N/R	N/R
Air	1.00	0.91	0.64	0.42	0.20	N/R	N/R	N/R	N/R	N/R
Soft	1.00	0.91	0.64	0.42	0.20	N/R	N/R	N/R	N/R	N/R

How the De-rating chart works:

The chart lists temperatures across the top and hose type down the left column. Based on your hose system application, locate the appropriate de-rating factor and multiply it by the hose system pressure rating in the pressure chart above.

Steam hose example:

1. **Hose** - 3/4" steam hose, rated to 250 psi. at 406°(F).
2. **Coupling/Attachment** - Campbell Viton Seal Ground Joint Couplings with crimp ferrule are rated to 1250 psi. at 70°(F).
3. **Operating temperature** - 406°
4. **De-rating factor at 406°** - .20
5. **Hose System de-rating** - $1250 \times .20 = 250 \text{ psi.}^*$

Rubber hose example:

1. **Hose** - 3" air hose rated to 500 psi.
2. **Coupling/Attachment** - Long Shank Crimpnology Nipple with Long Ferrule rated to 600 psi.
3. **Operating temperature** - 150°(F)
4. **De-rating factor** - .64
5. **Hose System de-rating** - $600 \text{ psi.} \times .64 = 384 \text{ psi.}^*$

** After the de-rating is calculated for the fitting and attachment, check maximum working pressure of the hose. The hose system should never operate at a higher pressure than the lowest rated component. (Example: 150 psi rated hose with 500 psi rated coupling and attachment at 90°(F). The de-rating factor is .90. So, the newly calculated pressure rating is $500 \times .90 = 450 \text{ psi.}$ Since the hose is rated to 150 psi., then the maximum working pressure of the system is still 150 psi.*

On a typical summer day at any construction site, compressors crank out high pressure air to operate tools and equipment. Between the weather and the compressor motors, the compressed air gets dangerously hot. So hot, that those hoses can no longer safely operate at the intended pressure rating. Our de-rating chart shows that at 150°(F) the hose system should operate at 64% of the pressure rating given for 70°(F). That's when 500 psi., should be 320 psi.

Know the safety limits of hoses. Use the Campbell de-rating chart when specifying hoses at elevated temperatures.