Vacuum and Hose Performance

To ensure the selection of the right hose for a particular application, it is important to understand the potential effects of vacuum and its relationship to hose construction. Vacuum is also properly referred to as negative pressure which further helps to explain its effects on hose.

The primary factors that affect hose performance under vacuum are hose size and construction, temperature and bend radius. Hose construction determines the 'hoop' strength or the relative ability of the hose to resist collapse. Generally, smaller IDs, thicker walls, external reinforcement such as wire wrap or covers and bonding together the hose layers serve to increase hoop strength. As the temperature of a hose increases, the hoop strength typically decreases because the hose material softens. As a hose approaches its static bend radius limit, hoop strength can be adversely affected because the hose profile will go from round to oval. If combinations of these factors exist (i.e. large ID, thin wall, high temperature, extreme bending), hoop strength is reduced further.

Teflon® hose is a relatively thin walled product and is therefore subject to vacuum collapse if not properly specified and protected. With single braided smooth bore hose, the unbonded metal braid (the pressure handling element of the hose) is of limited value in a vacuum application, especially as temperature increases. The addition of internal or external springs or bonded covers is the best way to overcome potential vacuum collapse. Certain styles and smaller sizes, such as 'HV' convoluted, high pressure and -03 through -10 medium pressure smooth bore are rated for 28" Hg at ambient temperature and within specified bend radii.

When vacuum is involved in an application, always determine the expected range of temperature and the potential bending conditions before specifying a particular hose. A common mistake to be avoided involves the use of a transfer hose connected to an 'upstream' valve. Since the hose assembly is open ended, the vacuum that is created when the valve is closed can be overlooked. However as fluid continues to flow downstream, the vacuum created can often exceed 28" Hg, causing even a 'full vacuum' rated hose to collapse. In this case, additional reinforcement is recommended.

UK Part Codes	USA Part Code	Inches of Hg
TTWV13.5B01	T1568-8	28
TTWV19.8B01	T1568-12	28
TTWV25.9B01	T1568-16	25
TTWV32.3B01	T1568-20	20
TTWV38.8B01	T1568-24	12
TTWV51.2B01	T1568-32	5
T1568-24HV	T1568-24HV	28
T1568-32HV	T1568-32HV	28
T1568-48HV	T1568-48HV	28
T1568-64HV	T1568-64HV	28
TSRV3.4B01	T1167-3	28
TSRV4.9B01	T1167-4	28
TSRV6.5B01	T1167-5	28
TSRV7.9B01	T1167-6	28
TSRV10.5B01	T1167-8	28
TSRV12.8B01	T1167-10	28
TSRV15.9B01	T1167-12	20
TSRV22.2B01	T1167-16	14
T1764-04	T1764-04	28
T1764-05	T1764-05	28
T1764-06	T1764-06	28
T1764-07	T1764-07	28
T1764-08	T1764-08	28
T1764-10	T1764-10	28
T1764-12	T1764-12	28