GMV MEGAVAC®

-size	DN	"	"	mm	PSI	MPa	PSI	MPa	mm	mm/Hg	kg/100m	REF.
-12	19	3/4	1.22	30.9	350	2.4	1400	9.6	65	635	62	12GMV
-16	25	1	1.45	36.9	300	2.1	1200	8.4	75	635	75	16GMV
-20	31	1.1/4	1.75	44.6	250	1.7	1000	6.8	100	635	92	20GMV
-24	38	1.1/2	2.01	51.1	162	1.1	648	4.4	130	635	106	24GMV
-32	51	2	2.51	63.8	112	0.8	448	3.2	150	635	170	32GMV
-40	63	2.1/2	3.02	76.7	68	0.5	272	2.0	180	635	207	40GMV
-48	76	3	3.51	89.2	62	0.4	248	1.7	230	635	243	48GMV
-56	89	3.1/2	4.01	101.9	56	0.4	224	1.5	250	635	268	56GMV
-64	102	4	4.51	114.6	56	0.4	224	1.5	300	635	305	64GMV

RECOMMENDED FOR Petroleum and water based hydraulic fluids in suction lines or in low pressure return lines.

TUBE NBR (Nitrile) based.

REINFORCEMENT -12, -16, -20: fibre braid reinforced with helical spiral wire to prevent collapse; -24 to -64: spiralled fibre reinforced with helical spiral wire to prevent collapse.

COVER CR (Chloroprene) based. MSHA approved.

TEMPERATURE RANGE -40°C to +135°C constant and +150°C intermittent. For water emulsions, etc. see Temperature Limits Table.

STANDARDS SAE 100R4.

COUPLINGS -12 to -20: MegaCrimp®; -24, -32: GlobalSpiral Plus.

CHARACTERISTICS/BENEFITS Half the bend radius of SAE 100R4.

Flexible.

Lightweight.

MATERIAL TO BE CONVEYED

Some applications require specialised oils or chemicals to be conveyed through the system. Product selection must assure compatibility of the hose tube, cover, couplings and 'O' rings with the fluid used. Additional caution must be exercised when selecting a hose for gaseous applications where permeation can occur. Permeation of fluid through the hose wall may occur when a hose is used in combination with fluids such as (but not limited to) liquid and gas fuels, refrigerants, helium, fuel oil, natural gas, LPG and Freon.

Consider the possibility of hazardous effects of permeation through the hose, such as explosions, fires and toxicity. Refer to applicable standards for specific applications such as fuels and refrigerants. If fluids permeate through the hose tube, consider the use of perforated covers to prevent fluid build-up under the cover. Also ensure the compatibility of the system fluid not only with the hose tube, but also with the reinforcement, cover, fittings and other components since permeation may expose the entire hose assembly to the system fluid.

Biodegradable fluids

Traditionally, most common hydraulic fluids are petroleum-based oils. For applications in environmentally sensitive areas, the industry is now moving towards more environmentally friendly fluids, either synthetic (primarily ester based) or vegetable based. Vegetable oils are gaining ground over synthetic ones because they cost less and biodegrade faster.

The challenge of biodegradable fluids? They easily permeate ordinary hose tubes, causing blisters and sweating on the cover of the hose, with premature hose failure as a consequence. Selecting the hose with the proper tube compound is key in assuring full compatibility to handle also the aggressive environmentally-safe hydraulic fluids.

Vegetable based oils usually have good compatibility with rubber hose products whereas synthetic ester oils are more aggressive and must be used with caution. General compatibility guidelines for rubber hoses are as follows:

	Vegetable based	Synthetic ester based
Spiral reinforced hose GxK	generally OK	caution
Spiral reinforced hose EFGxK	OK	generally OK
Wire braid hose	OK	generally OK
Textile braid hose	OK	generally OK

RECOMMENDED BIODEGRADABLE FLUIDS:

- Shell Naturelle HF-E46 - Synthetic ester
- IRM901 - Paraffinic mineral oil
- Binol Hydrap - Rape seed oil
- Elf Oil 15W40 - Engine 0.1
- Hydrolub Bio 46 - Synthetic ester
- IGOL MATIC 259 - Mineral oil

Please contact Gates application engineering department for further fluid compatibility tests for your specific fluid.

Water temperature limits for hydraulic hoses

According to ISO 8330 *"Rubber and plastic hoses and hose assemblies - Vocabulary"*, the working temperature is the *"maximum or minimum temperature at which a hose is designed to be serviceable"*. This temperature range is indicated in the hose pages. However, note that the nature of the hydraulic fluid used can lower the maximum working temperature. The below chart shows the maximum working temperature for Gates hoses when used with water-based hydraulic fluids.

The main reasons for lowering maximum working temperatures of hydraulic systems using water-based hydraulic fluids are:

› Hot water can leach the plasticiser out of the rubber compound, whereby the hose becomes stiff and brittle.

› Heated water even under pressure can de-gas and cause gas bubbles. These gas bubbles contain about 20% oxygen which will lead to oxidation of the metal parts of the system.

› Mixed phases of hot water and steam can occur, which causes several issues like tube popcorning, permeation of steam through the walls of the hose and even steam hammer.

Maximum Temperature limits for Water, Water/Oil Emulsions and Water/Glycol Solutions.

HOSE	Pressure lines	Return lines
EFGxK, MxK, HD-UHP, CM2T, M2T, G2, G1, G2L, LOL, EFGxKL, M4KL	+93°C	+82°C
G2H, G1H, Megatech, G2XH, G3H, GTH, M4KH, M3KH, GMV	+107°C	+82°C
TH8, TH7	+70°C	+70°C

CAUTION!

The fluid manufacturer's recommended maximum temperature for any given fluid must not be exceeded. If different from the above listed hose temperatures, the lower limit must be chosen.

HYDRAULIC SYSTEM PRESSURE DROP

Pressure

Factors that can influence the amount of pressure drop:

› **Friction**
This is the turbulence of fluid against the inside walls of the hose assembly and within itself generating heat and causing pressure drop.

› **Type of fluid**
Different fluids behave differently under pressure. Thicker fluids are moved with greater difficulty and will exhibit greater pressure drop because of greater friction loss.

› **Temperature of the fluid**
Warming fluids thins them, so they are moved more easily.

› **Length of hose assembly**
The longer the hose assembly, the more surface area there is for friction to decrease pressure.

› **Size (I.D.) of hose**
Affects the fluid velocity for a given flow rate. Higher velocities result in greater pressure drop. Therefore, a larger I.D. hose will produce less pressure drop.

› **Type of couplings and adaptors**
Any change in bore or change in direction (such as with 45° or 90° elbow) can increase the amount of pressure drop. So keep hose assembly routing as smooth as possible.

› **Flow rate**
Pressure drop increases with flow rate for the same size hose.

Why is knowing the amount of pressure drop so important?

Suppose you need 275 bar of output from a hose assembly for hydraulic equipment to run efficiently. There will be some pressure drop and you must allow for it in plumbing the system with hose, couplings and adaptors. This means that the input pressure to the hose assembly must be equal to the output, plus the amount of pressure drop. If the pressure drop in this example is 10 bar, then you will need 285 bar of input.

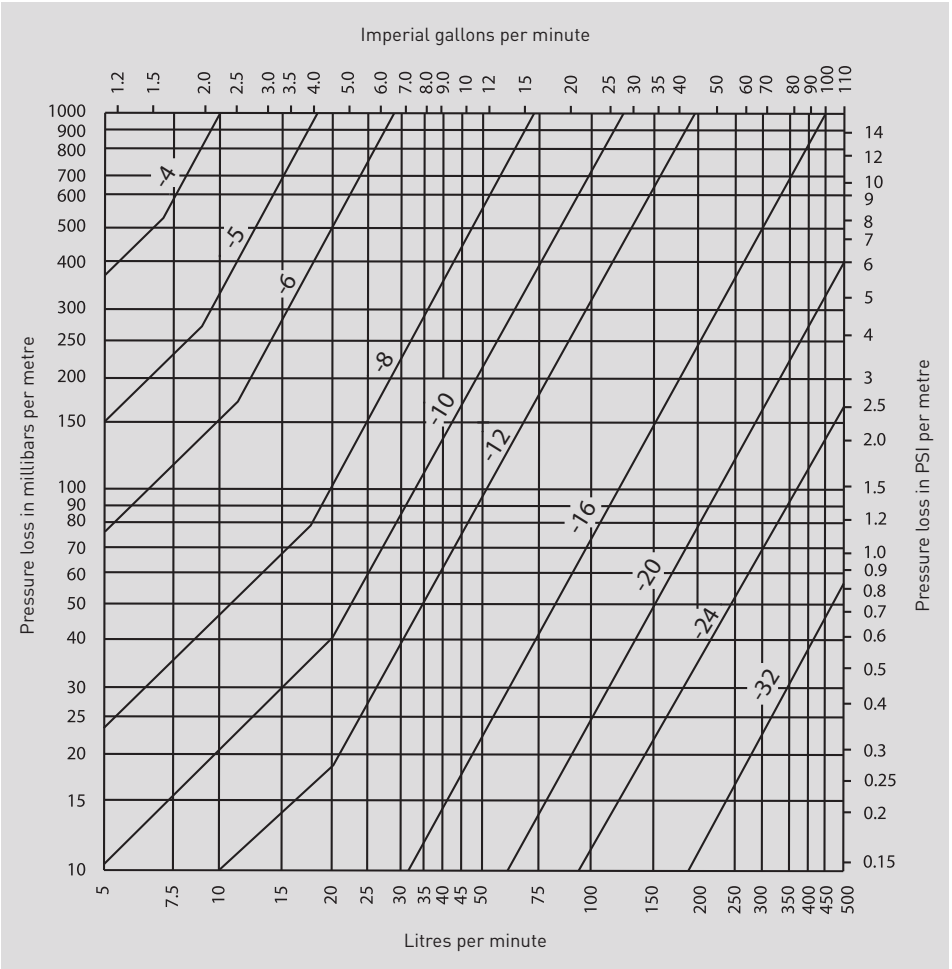
Output pressure = input pressure - pressure drop

275 bar = 285 bar - 10 bar

How can you determine the amount of pressure drop?

The best way is to contact your Gates representative who is trained and equipped to quickly solve such problems for you. He will need the following information: type of application, fluid type and viscosity (at desired temperature), fluid temperature, fluid flow rate, hose size and length, number and type of fittings. The following graph will also help you to determine the amount of pressure drop.

Hose pressure drop



Based on: fluid viscosity 20 cSt
specific gravity 0.875