



Flowrate Limits for Flow Control Equipment

MSI Technical Bulletin 010

Subject: Flowrate recommendations based on acceptable erosion rates for alloy steel flow control equipment.

The intent of this bulletin is to define recommended limits to the maximum fluid flow rates that MSI equipment should be exposed to in service conditions. These recommendations do NOT apply to relief valves, as they are not meant to be a full bore flow-through device.

	Max Velocity (ft/sec)	Max Flowrate (GPM) (where B is bore in Inches)
Liquid with proppant (or other abrasive particulate)	40	$97.92 \times B^2$
Liquid with no solids (clean liquid)	100	$244.80 \times B^2$
Gas with no solids (clean gas)	200	$489.60 \times B^2$

Calculation example: Liquid with proppant flowing through a 1.75" bore... $97.92 \times 1.75 \times 1.75 = 300$ GPM

Connection Examples	Limiting Bore	40 ft/sec	100 ft/sec	200 ft/sec
		Max Flowrate (GPM)		
1"1502	1.00" on male end	98	245	490
2"1502	1.75" on male end	300	750	1499
3"1502	2.75" on male end	740	1851	3703
4"1502	3.75" on male end	1377	3443	6885
2" Flange Valve	2.06" ID through valve	415	1038	2077
4" Flange Valve	4.06" ID through valve	1614	4035	8070
5" Valve w/ Flanges	5.13" ID through valve	2577	6442	12885
2"1502 straight flowline	1.69" ID through flowline	280	699	1398
3"1502 straight flowline	2.42" ID through flowline	573	1434	2867

Common conversion factors: 1 GPM = 3.78541 L/min 1 GPM = 0.02381 bbl/min 1 GPM = 0.13368 ft³/min

Conversion example: 300 GPM to L/min:

$$300 \text{ GPM} \times \frac{3.78541 \text{ L/min}}{1 \text{ GPM}} = 1135.623 \text{ L/min}$$

Erosion will take place to varying degrees in the presence of any flow. The end user is responsible for determining an appropriate velocity limit based on factors specific to their operation.

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