Liquid Flowmeter Sizing

Variable area flowmeters suitable for liquid service have a capacity rating based on water at 70°Fahrenheit. Flowmeters suitable for gas service have a capacity rating based on air at STP (70°F, 14.7 PSIA) conditions. The correction factors listed below are used to calculate the flow capacity when using a liquid other than water or a gas other than air at STP conditions.

LIQUID CORRECTION FORMULA

Water Equivalent Flow Rate = Customer Liquid Flow Rate X Liquid Correction Factor

- Step 1: Convert Customer Liquid Flow Rate unit of measure to a standard unit of measure for water flow (GPM or CC/MIN).
- Step 2: Calculate Liquid Specific GravityCorrection Factor from given values.
- Step 3: Determine the Water Equivalent Flow Rate from the product of the Customer Liquid Flow Rate and the Liquid Correction Factor.
- Calculate the maximum or minimum flow rate for the customer's conditions.

Step 1: Convert Customer Liquid Flow Rate unit of measure to a standard unit of measure for water flow.

Customer Liquid Flow Rate _____GPM / CC/MIN

Liquid Flow Rate Conversions						
From	To GPM	From	To CC/MIN			
GPH	Divide by 60	GPM	Multiply by 3,785			
CC/MIN	Divide by 3,785	GPH	Multiply by 63.08			
CC/HR	Divide by 227,100	CC/HR	Divide by 60			
LPM	Multiply by 3.785	LPM	Multiply by 1,000			
LPH	Multiply by 227.1	LPH	Multiply by 16.67			
M³/MIN	Multiply by 264.2	M³/MIN	Multiply by 1,000,000			
M³/HR	Multiply by 4.402	M³/HR	Multiply by 16,667			
PINTS/MIN	Divide by 8	PINTS/MIN	Multiply by 473.1			
FT³/MIN	Multiply by 7.48	FT³/MIN	Multiply by 28,320			
FT³/HR	Divide by 8.021	FT³/HR	Multiply by 472			
KG/MIN	Multiply by (0.264 ÷ SpGr)	KG/MIN	Multiply by (1,000 ÷ SpGr)			
KG/HR	Divide by (227 X SpGr)	KG/HR	Multiply by (16.67 ÷ SpGr)			
LBS/MIN	Divide by (8.347 X SpGr)	LBS/MIN	Multiply by (453.6 ÷ SpGr)			
LBS/HR	Divide by (500.8 X SpGr)	LBS/HR	Multiply by (7.56 ÷ Spgr)			
GMS/MIN	Divide by (3,785 X SpGr)	GMS/MIN	Divide by SpGr			
GMS/HR	Divide by (227,000 X SpGr)	GMS/HR	Divide by (60 X SpGr)			

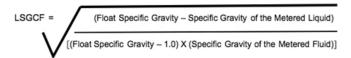
Step 2: Calculate Liquid Correction Factor from given values

This information is required to size for liquids other than water:

- Specific Gravity of Liquid: @ Operating Conditions
- Liquid Temperature:______°F @ Operating Conditions
- Liquid Viscosity: cps @Operating Conditions Specific Gravity of the Float to be used: ____

Float Specific Gravity				Liquid	Liquid Density Conversions	
Teflon	2.20	316 SS	8.04	From	To Specific Gravity	
Glass	2.53	Hastelloy C	8.94	LBS/FT ³	Divide by 62.4	
Sapphire	3.99	Carboloy	15.00	KG/M³	Divide by 1,000	
Titanium	4.50	Tantalum	16.60	API	[141.5 ÷ (131.5+API)]	
316L SS	8.03			g/cm³	= SpGr	

Liquid Specific Gravity Correction Factor (LSGCF) formula:



3. Determine the Water Equivalent Flow Rate

Water Equivalent Flow Rate = Customer's Liquid Flow Rate ÷ LSGCF Water Equivalent Flow Rate = __

4. Calculate the maximum or minimum flow rate for the customer's conditions. (Customer Liquid Flow Rate Scale)

Customer Liquid Flow Rate Scale = Catalog Flow Rate ÷ LSGCF @ 70° F Customer Liquid Flow Rate Scale = _____