



TEMPERATURE CONTROLLERS... PORTABLE CHILLERS... CENTRAL CHILLERS... PUMP TANK STATIONS... TOWER SYSTEMS...

SUBJECT: PROCESS WATER FLOW

FYI #294 3/15/2011

Turbulent Flow Chart

Using This Chart:

Find the ID of your pipe or mold passage and follow across to find the minimum recommended flow rate for turbulent flow.

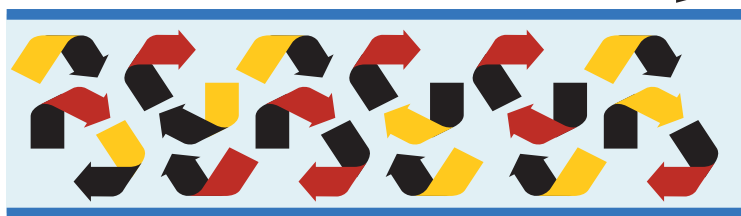
Passage Diameter		Flow Rate	
Inches	Millimeter	Gallons/minute	Liters/minute
1/8	3.18	0.45	1.67
1/4	6.35	0.89	3.35
7/16	11.11	1.56	5.86
1/2	12.70	1.79	6.70
5/8	15.88	2.23	8.37
3/4	19.05	2.68	10.04
1	25.40	3.57	13.39

1. Based on 60°F water & a Reynolds number of 10,000.
2. A Reynolds number of 4,000 is considered turbulent.
3. Adding glycol will increase the minimum flow rate required.
4. Calculate your Renolds number :
 $Reynolds\ number = 2,800 \times GPM / D$ (internal diameter in inches).

Types of Flow

- Turbulent
 - Wall Scrubbing
 - Best Heat Transfer
- Laminar
 - Creates Boundary Layers
 - Poor Heat Transfer

TURBULENT FLOW



LAMINAR FLOW

