Velocity Maximums Chart of various Pipe

DRAFT Only, not for distribution !

Use this chart to determine if a given GPM in a DHW Re-Circ return is too high.

Copper

Type of Pipe	GPM Maximum Flow per Pipe Size			
	Hot ≥ 140° F		Warm < 140° F	Cold ~ 60° F
Copper Type M	2 ft second	3 ft second	5 feet per second	8 feet per second
3/8"	1.0	1.5	2.5	3.95
1/2"	1.6	2.4	4.0	6.35
3/4"	3.2	4.9	8.0	12.9
1"	5.4	8.1	13.7	21.8
1-¼"	8.0	12.2	20.5	32.5
1-½"	11.5	17	28.5	45.5
2"	20	30	49.5	79
2-½"	30	46	77	123
3"	43	65	109	174

Type of Pipe	GPM Maximum Flow per Pipe Size			
	Hot ≥ 140° F		Warm < 140° F	Cold ~ 60° F
Copper Type L	2 ft second	3 ft second	5 feet per second	8 feet per second
3/8"	N/A	1.3	2.16	3.45
1/2"	1.4	2.15	3.6	5.7
3/4"	3.0	4.6	7.6	12.2
1"	5.1	7.7	12.8	20.5
1-¼"	7.8	11.7	19.5	31
1-½"	11	16.5	27.5	44
2"	19	29	48	76
2-½"	29	46	74	119
3"	42	63	106	170

PEX SDR 9

Type of Pipe	GPM Maximum Flow per Pipe Size		
	Re-Circ 140° F Max.	Hot Line < 200° F	Cold Line ~ 60° F
PEX SDR 9	2 feet per second	8 feet per second	10 feet per second
3/8"	0.60	2.4	3.0
1/2"	1.1	3.6	5.7
3/4"	2.2	8.8	11
1"	3.6	14.5	18
1-¼"	5.4	21.7	27
1-½"	7.5	30	37.8
2"	12.9	51.9	64.9
2-½"	19.8	79.2	99
3"	28.1	112	140

These charts can to be used for dedicated return pipe sizing, or to verify if existing pipe is appropriate !