GENERAL TECHNICAL TUBING INFORMATION

Tube Selection and Sizing

Proper tube material, type and size for a given application and type of fittings is critical for efficient and trouble free operation of the fluid system. Selection of proper tubing involves choosing the right tube material, and determining the optimum tube size(O.D. and wall thickness).

In order to make proper selection, the following information about the fluid system must be gathered first:

Fluid System Parameters

1. Type of fluid
2. Operating temperature range
3. Type of line: pressure, return or suction
4. Maximum operating pressure
5. Maximum flow rate

Selection of tube material depends on the fluid, the operating temperature range and the maximum operating pressure. The tube O.D. and wall thickness selection depends on the last four parameters above and the maximum operating temperature.

STEEL HYDRAULIC TUBING WORKING PRESSURES

NOMINAL TUBE O.D. (IN.)	SEE NOTE^	NOMINAL TUBE WALL THICKNESS (IN.)											
		0.028	0.035	0.049	0.065	0.083	0.095	0.109	0.120	0.134	0.148	0.156	0.188
1/8	1	5,600	7,000	–	–	–	–	–	–	–	–	–	–
1/8	2	6,800	9,000	–	–	–	–	–	–	–	–	–	–
1/8	3	6,650	8,450	–	–	–	–	–	–	–	–	–	–
3/16	1	3,750	4,650	–	–	–	–	–	–	–	–	–	–
3/16	2	4,250	5,500	–	–	–	–	–	–	–	–	–	–
3/16	3	4,250	5,450	–	–	–	–	–	–	–	–	–	–
1/4	1	2,800	3,500	4,900	6,500	–	–	–	–	–	–	–	–
1/4	2	3,100	3,950	5,800	8,200	–	–	–	–	–	–	–	–
1/4	3	3,100	3,950	5,750	7,800	–	–	–	–	–	–	–	–
5/16	1	2,250	2,800	3,900	5,200	–	–	–	–	–	–	–	–
5/16	2	2,400	3,100	4,500	6,250	–	–	–	–	–	–	–	–
5/16	3	2,450	3,100	4,500	6,150	–	–	–	–	–	–	–	–
3/8	1	1,850	2,350	3,250	4,350	*5,550	*6,350	–	–	–	–	–	–
3/8	2	2,000	2,500	3,650	5,050	*6,700	*7,950	–	–	–	–	–	–
3/8	3	2,000	2,550	3,650	5,000	*6,550	*7,600	–	–	–	–	–	–
1/2	1	–	1,750	2,450	3,250	4,150	*4,750	*5,450	*6,000	–	–	–	–
1/2	2	–	1,850	2,650	3,650	4,800	*5,600	*6,600	*7,450	–	–	–	–
1/2	3	–	1,850	2,700	3,650	4,800	*5,550	*6,450	*7,200	–	–	–	–
5/8	1	–	1,400	1,950	2,600	3,300	3,800	*4,350	*4,800	–	–	–	–
5/8	2	–	1,450	2,100	2,850	3,700	4,350	*5,050	*5,650	–	–	–	–
5/8	3	–	1,500	2,100	2,850	3,750	4,350	*5,050	*5,600	–	–	–	–
3/4	1	–	1,150	1,650	2,150	2,750	3,150	3,650	*4,000	–	–	–	–
3/4	2	–	1,200	1,700	2,350	3,050	3,500	4,100	*4,600	–	–	–	–
3/4	3	–	1,200	1,750	2,350	3,050	3,550	4,150	*4,600	–	–	–	–
7/8	1	–	1,000	1,400	1,850	2,350	2,700	3,100	*3,400	–	–	–	–
7/8	2	–	1,050	1,450	1,950	2,550	2,950	3,450	*3,850	–	–	–	–
7/8	3	–	1,050	1,500	2,000	2,600	3,000	3,500	*3,900	–	–	–	–
1	1	–	875	1,200	1,600	2,050	2,350	2,700	3,000	*3,350	*3,700	–	–
1	2	–	900	1,250	1,700	2,200	2,550	3,000	3,300	*3,750	*4,200	–	–
1	3	–	900	1,300	1,750	2,250	2,600	3,000	3,350	*3,800	*4,200	–	–
1 1/8	1	–	–	1,100	1,450	1,850	2,100	2,400	2,650	*3,000	*3,300	–	–
1 1/8	2	–	–	1,150	1,500	1,950	2,250	2,650	2,900	*3,300	*3,700	–	–
1 1/8	3	–	–	1,150	1,550	2,000	2,300	2,650	2,950	*3,300	*3,700	–	–
1 1/4	1	–	–	1,000	1,300	1,650	1,900	2,200	2,400	*2,700	*2,950	*3,100	*3,750
1 1/4	2	–	–	1,000	1,350	1,750	2,000	2,350	2,600	*2,950	*3,250	*3,450	*4,250
1 1/4	3	–	–	1,000	1,350	1,750	2,050	2,350	2,650	*2,950	*3,300	*3,500	*4,300
1 1/2	1	–	–	–	1,100	1,400	1,600	1,800	2,000	*2,250	*2,450	*2,600	*3,150
1 1/2	2	–	–	–	1,100	1,450	1,650	1,950	2,150	*2,400	*2,700	*2,850	*3,500
1 1/2	3	–	–	–	1,150	1,450	1,700	1,950	2,150	*2,450	*2,700	*2,850	*3,500
1 3/4	1	–	–	–	925	1,200	1,350	1,550	1,700	*1,900	*2,100	*2,250	*2,700
1 3/4	2	–	–	–	950	1,250	1,400	1,650	1,800	*2,050	*2,250	*2,400	*2,950
1 3/4	3	–	–	–	950	1,250	1,450	1,650	1,850	*2,050	*2,300	*2,400	*2,950
2	1	–	–	–	800	1,050	1,200	1,350	1,500	1,650	*1,850	*1,950	*2,350
2	2	–	–	–	850	1,050	1,250	1,400	1,600	1,750	*1,950	*2,100	*2,550
2	3	–	–	–	850	1,100	1,250	1,450	1,600	1,800	*2,000	*2,100	*2,550
2 1/4	1	–	–	–	*700	*900	*1,050	*1,200	*1,350	*1,500	*1,650	*1,750	*2,100
2 1/4	2	–	–	–	*750	*950	*1,100	*1,250	*1,400	*1,550	*1,750	*1,850	*2,250
2 1/4	3	–	–	–	*750	*950	*1,100	*1,250	*1,400	*1,600	*1,750	*1,850	*2,250

Reference Working Pressures at Approximately 4:1 Design Factor (psi) Steel Hydraulic Tubing SAJ525

^ Pressure values listed opposite numbers 1, 2, and 3 for each tube O.D. were derived from the Barlow, Boardman, and Lamé formulas, respectively, with 12,500 psi allowable stress factor

* Not normally considered suitable for 37° single flaring to SAE J533