Hydraulic Piping

- Steel pipes, copper pipes, stainless steel pipes, and rubber hoses are used in piping for hydraulic equipment.
- Copper pipes are not used in common practice because it accelerates oxidation of petroleum-based hydraulic fluids. Stainless steel pipes are used in applications that require resistance to corrosion such in chemical equipment or for marine vessels.

Types of steel pipe for piping

Standard	Name	Code	Details
JIS G 3452 (2004)	Carbon steel pipe for piping	SGP	Use for piping for mist, water, oil, gas, and air with relatively low operating pressure.
JIS G 3454 (2007)	Carbon steel pipe for middle pressure service	STPG370, 410	Pipes for pressure service with relatively low pressure at 350°C maximum
JIS G 3455 (2005)	Carbon steel pipe for high-pressure service	STS370, 410, 480	Pipes for pressure service with high pressure at 350°C maximum
JIS G 3459 (2004)	Stainless steel pipe for piping	SUS304TP, etc.	Stainless steel pipes used for piping for corrosion resistance or for low-/high-temperature applications
JIS G 3456 (2004)	Carbon steel pipe for high-temperature piping	STPT	Carbon steel pipes for high-temperature application exceeding 350°C
JFPS 1006 (Aug. 2000) Previous JOHS 102 (1964)	Precision carbon steel pipe for hydraulic piping	OST1, 2	Use for piping using bite type tube fittings with Japan Oil Hydraulics Standards.

Nominal pipe size: Specifies the outer diameter of pipes in either series A or series B.
Schedule number: Designates the thickness of pipes in the range from 10 to 160. Abbreviated as Sch in some cases.

Steel pipe selection

Check the operating pressure and flow velocity for selecting steel pipes.

● Selection criteria based on operating pressure

Steel pipe dimensions												Selection criteria based on operating pressure					
Nominal size		Outer diameter mm	SGP		STS370 STPG370 (Sch80)		STS370 (Sch160)		STPT410 (XXS) Special thick steel pipe		OST2		Operating pressure MPa {kgf/cm²}					
													Less than 1.5 {15}	More than 1.5 {15}, no greater than 7 {70}	More than 70 {70}, no greater than 14 {140}	More than 14 {140}, no greater than 21 {210}	More than 21 {210}, no greater than 28 {280}	More than 28 {280}, no greater than 32 {320}
Series A	Series B		Thickness mm	Area cm²	Thickness mm	Area cm²	Thickness mm	Area cm²	Thickness mm	Area cm²	Thickness mm	Area cm²						
8	¼	13.8	2.3	0.66	3.0	0.48	–	–	–	–			SGP or STPG370 (Sch40)	STS370 (Sch80)				
10	⅜	17.3	2.3	1.27	3.2	0.93	–	–	–	–								
15	½	21.7	2.8	2.04	3.7	1.54	4.7	1.19	–	–				STPG370 (Sch80)				STS370 (Sch160)
20	¾	27.2	2.8	3.66	3.9	2.96	5.5	2.06	–	–								
25	1	34.0	3.2	5.98	4.5	4.91	6.4	3.53	–	–								
32	1¼	42.7	3.5	10.0	4.9	8.50	6.4	7.02	9.7	4.26								
40	1½	48.6	3.5	13.6	5.1	11.6	7.1	9.29	10.2	6.24								
50	2	60.5	3.8	22.0	5.5	19.2	8.7	14.6	11.1	11.5								STPT410 (XXS)
65	2½	76.3	4.2	36.2	7.0	30.5	9.5	25.8	14.0	18.3					STS370 (Sch160)			
80	3	89.1	4.2	51.1	7.6	42.9	11.1	35.2	15.2	27.1								
100	4	114.3	4.5	87.1	8.6	74.1	13.5	59.9	17.1	50.4								
8		8									1.5	0.20	OST2					
10		10									2.0	0.28						
15		15									2.5	0.79						
18		18									2.5	1.33						
22		22									3.0	2.01						

● Guide for flow velocity in the pipe

Pipe line	Flow velocity
Pump suction pipe line	0.8 m/s maximum
Pump discharge pipe line, hydraulic pipe line	4 m/s maximum
Fluid return pipe line	3 m/s maximum