

Table 12: Permissible stresses for copper and copper alloy pipes

Material (annealed)	Specified minimum tensile strength (N/mm ²)	Design temperature (°C)										
		≤50	75	100	125	150	175	200	225	250	275	300
Copper	215	41	41	40	40	34	1,13	0,75				
Aluminium brass	325	78	78	78	78	78	51	1,00				
Copper- nickel 95/5 and 90/10	275	68	68	67	2,71	64	62	59	56	52	48	44
Copper- nickel 70/30	365	81	79	77	75	73	71	69	67	2,71	64	62
Equations	$b = \frac{Dt_0}{2.5\rho}$	$E = mc^2$										

Table 2: Application of mechanical joints

Systems	Kind of connections			Classification of pipe system	Fire endurance test condition (7)
	Pipe unions	Compression couplings	Slip-on joints		
FLAMMABLE FLUIDS (FLASHPOINT ≤ 60°C)					
1 Cargo oil lines (1)	+	+	+	dry	30 min dry (*)
2 Crude oil washing lines (1)	+	+	+	dry	30 min dry (*)
3 Vent lines (3)	+	+	+	dry	30 min dry (*)
INERT GAS					
4 Water seal effluent lines	+	+	+	wet	30 min wet (*)
5 Scrubber effluent lines	+	+	+	wet	30 min wet (*)
6 Main lines (1) (2)	+	+	+	dry	30 min dry (*)
7 Distribution lines (1)	+	+	+	dry	30 min dry (*)
FLAMMABLE FLUIDS (FLASHPOINT > 60°C)					
8 Cargo oil lines (1)	+	+	+	dry	30 min dry (*)
9 Fuel oil lines (2) (3)	+	+	+	wet	30 min wet (*)
10 Lubricating oil lines (2) (3)	+	+	+	wet	30 min wet (*)
11 Hydraulic oil (2) (3)	+	+	+	wet	30 min wet (*)
12 Thermal oil (2) (3)	+	+	+	wet	30 min wet (*)