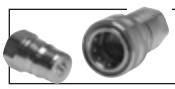
When ordering, please state shipping length!

Parcel service:	max. 2 m
Express:	max. 3 m
Freight:	max 6 m

Hydraulic valves from page 452



Hydraulic couplings from page 170

Cutting ring fittings from page 77

Functional nut on page 99

Pressure gauge from page 366

Electric tube bending device on page 545

Precision hydraulic tubes - seamless — EN 10305-4 (DIN 2445/2)

Materials: E 235+N (ST 37.4 normally annealed - NBK), all tubes undergo eddy current or ultrasound testing, tolerances in accordance with DIN 2391, quality grade C, operating pressure in accordance with DIN 2413
Manufacturer lengths: 6 m ±1 m
Temperature range: 0°C to +120°C without pressure reductions, higher temperatures are possible for reduced pushing

Type **black phosphatised**	Type **zinc-plated/ chromatised**	Tube Ø external	Wall thickness	Calculated pressure*
HR 4 x 1**	HR 4 x 1 V	4	1	502 bar
HR 5 x 1**	---	5	1	416 bar
HR 6 x 1**	HR 6 x 1 V	6	1	374 bar
HR 6 x 1.5**	HR 6 x 1.5 V	6	1.5	528 bar
HR 6 x 2**	---	6	2	665 bar
HR 8 x 1**	HR 8 x 1 V	8	1	289 bar
HR 8 x 1.5**	HR 8 x 1.5 V	8	1.5	414 bar
HR 8 x 2**	HR 8 x 2 V	8	2	528 bar
HR 10 x 1	HR 10 x 1 V	10	1	249 bar
HR 10 x 1.5	HR 10 x 1.5 V	10	1.5	358 bar
HR 10 x 2**	---	10	2	460 bar
HR 12 x 1	HR 12 x 1 V	12	1	210 bar
HR 12 x 1.5	HR 12 x 1.5 V	12	1.5	305 bar
HR 12 x 2	HR 12 x 2 V	12	2	393 bar
HR 12 x 2.5	HR 12 x 2.5 V	12	2.5	476 bar
HR 14 x 2	---	14	2	343 bar
HR 15 x 1	---	15	1	171 bar
HR 15 x 1.5	HR 15 x 1.5 V	15	1.5	249 bar
HR 15 x 2	HR 15 x 2 V	15	2	323 bar
HR 15 x 2.5	---	15	2.5	393 bar
HR 15 x 3	---	15	3	460 bar
HR 16 x 1.5	HR 16 x 1.5 V	16	1.5	234 bar
HR 16 x 2	HR 16 x 2 V	16	2	305 bar
HR 16 x 3	---	16	3	435 bar
HR 18 x 1	---	18	1	143 bar
HR 18 x 1.5	HR 18 x 1.5 V	18	1.5	210 bar
HR 18 x 2	HR 18 x 2 V	18	2	274 bar
HR 18 x 2.5	---	18	2.5	335 bar
HR 20 x 1	HR 20 x 1 V	20	1	100 bar
HR 20 x 1.5	HR 20 x 1.5 V	20	1.5	191 bar
HR 20 x 2	HR 20 x 2 V	20	2	249 bar
HR 20 x 2.5	HR 20 x 2.5 V	20	2.5	305 bar
HR 20 x 3	HR 20 x 3 V	20	3	358 bar
HR 20 x 4	---	20	4	460 bar
HR 22 x 1.5	HR 22 x 1.5 V	22	1.5	174 bar
HR 22 x 2	HR 22 x 2 V	22	2	228 bar
HR 22 x 2.5	HR 22 x 2.5 V	22	2.5	280 bar
HR 22 x 3	---	22	3	329 bar
HR 25 x 1.5	HR 25 x 1.5 V	25	1.5	154 bar
HR 25 x 2	HR 25 x 2 V	25	2	202 bar
HR 25 x 2.5	HR 25 x 2.5 V	25	2.5	249 bar
HR 25 x 3	HR 25 x 3 V	25	3	294 bar
HR 25 x 4	---	25	4	379 bar
HR 25 x 4.5	---	25	4.5	420 bar
HR 28 x 1.5	HR 28 x 1.5 V	28	1.5	139 bar
HR 28 x 2	HR 28 x 2 V	28	2	182 bar
HR 28 x 3	---	28	3	265 bar
HR 30 x 2.5	HR 30 x 2.5 V	30	2.5	210 bar
HR 30 x 3	HR 30 x 3 V	30	3	249 bar
HR 30 x 4	---	30	4	323 bar
HR 30 x 5	---	30	5	393 bar
HR 35 x 2	HR 35 x 2 V	35	2	147 bar
HR 35 x 2.5	HR 35 x 2.5 V	35	2.5	182 bar
HR 35 x 3	---	35	3	216 bar
HR 35 x 4	---	35	4	281 bar
HR 35 x 5	---	35	5	343 bar
HR 38 x 3	---	38	3	200 bar
HR 38 x 4	HR 38 x 4 V	38	4	261 bar
HR 38 x 5	---	38	5	319 bar
HR 38 x 6	---	38	6	375 bar
HR 42 x 2	HR 42 x 2 V	42	2	124 bar
HR 42 x 3	HR 42 x 3 V	42	3	182 bar
HR 42 x 4	---	42	4	238 bar

* calculated acc. to DIN 2413 Validity range III for dynamic loading $P=\frac{20 \times K \times s \times c}{S \times (da + s \times c)}$ (bar).
material parameter K = 226 N/mm² (torsional endurance).
safety factor S = 1.5 for static and dynamic loading. Factor c to take into account the wall thickness deviation for static and dynamic loading = 0.8 for tubes with outside diameters of 4 and 5; 0.85 for tubes with outside diameters of 6 and 8; and 0.9 for larger tube outside diameters.
Notes:
The stated calculated pressures do not take into account any corrosion surcharge. Tubes with a diameter ratio of $\frac{\text{since}}{\text{diam. max.}} \geq 1.35$ have also been calculated for a predominantly static load in accordance with DIN 2413 Validity range III,

however with K = 235 N/mm².

** oiled instead of phosphatised