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HOLLOW BAR CHART

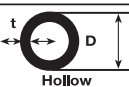
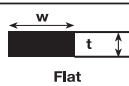
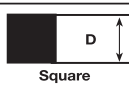
OD	ID	Wall (mm)		OD	ID	Wall (mm)		OD	ID	Wall (mm)		OD	ID	Wall (mm)
32	16	8,0		95	63	16,0		160	90	35,0		236	190	23,0
40	20	10,0		95	75	10,0		160	100	30,0		250	150	50,0
40	25	7,5		100	56	22,0		160	112	24,0		250	160	45,0
45	20	12,5		100	71	14,5		160	132	14,0		250	180	35,0
45	28	8,5		100	80	10,0		170	100	35,0		250	200	25,0
50	25	12,5		106	56	25,0		170	118	26,0		267	167	50,0
50	32	9,0		106	63	21,5		170	140	15,0		267	187	40,0
56	28	14,0		106	71	17,5		180	100	40,0		267	197	35,0
56	36	10,0		106	80	13,0		180	112	34,0		267	217	25,0
63	32	15,5		112	63	24,5		180	125	27,5		273	173	50,0
63	40	11,5		112	80	16,0		180	140	20,0		273	193	40,0
63	45	9,0		112	90	11,0		180	150	15,0		273	201	36,0
63	50	6,5		118	63	27,5		190	106	42,0		273	223	25,0
71	36	17,5		118	80	19,0		190	120	35,0		298	198	50,0
71	45	13,0		118	90	14,0		190	132	29,0		298	226	36,0
71	56	7,5		125	71	27,0		190	140	25,0		298	242	28,0
75	40	17,5		125	90	17,5		190	150	20,0		325	225	50,0
75	50	12,5		125	100	12,5		190	160	15,0		325	240	42,5
75	60	7,5		132	71	30,5		200	112	44,0		325	254	35,5
80	40	20,0		132	90	21,0		200	140	30,0		325	273	26,0
80	45	17,5		132	106	13,0		200	160	20,0		355	255	50,0
80	50	15,0		140	80	30,0		212	125	43,5		355	275	40,0
80	63	8,5		140	90	25,0		212	150	31,0		355	291	32,0
85	45	20,0		140	100	20,0		212	160	26,0		355	305	25,0
85	55	15,0		140	112	14,0		212	170	21,0		355	315	20,0
85	67	9,0		150	80	35,0		224	125	49,5		406	306	50,0
90	50	20,0		150	90	30,0		224	160	32,0		406	326	40,0
90	63	13,5		150	106	22,0		224	180	22,0		406	336	35,0
90	71	9,5		150	116	17,0		236	140	48,0		406	342	32,0
95	50	22,5		150	125	12,5		236	170	33,0		406	356	25,0

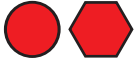
NON STANDARD SIZES AVAILABLE ON REQUEST

Chemical Composition	C%	Si%	Mn%	P%	S%	V%
DIN 1629 - ST 52.0	0,22 Max	0,10 - 0,55	0,20 - 1,60	0,040 Max	0,035 Max	
ISO 2938 - 20MnV6	0,16 - 0,22	0,10 - 0,50	1,30 - 1,70	0,045 Max	0,050 Max	0,08 - 0,15

Mechanical Properties	Tensile - N/mm ²	Yield - N/mm ²	Elongation % Min
DIN 1629 - ST 52.0 - as rolled	500 - 650	335 - 355	22
ISO 2938 - 20MnV6 - as rolled	620	450	17

FORMULA FOR THEORETICAL MASS CALCULATION (Kg's/mtr)

Section	Formula x Spec	AL	Brass	Bronze	Copper	Steel	Stainless
 Round	D x D x	0,002132	0,006657	0,006924	0,00701	0,00616	0,00631
 Hollow	(D-t) x t x	0,0085	0,026	0,02778	0,028	0,02466	0,0253
 Flat	W x t x	0,002712	0,00848	0,00882	0,00889	0,00786	0,00804
 Square	D x D x	0,002712	0,00848	0,00882	0,00889	0,00786	0,00804
 Hexagon	D x D x	0,00235	0,007344	0,007638	0,00776	0,0068	0,006963

SPECIFICATIONS TO BS 970: PART 1: 1983	BRIGHT CARBON STEELS	
GRADE	SPECIFICATION AND APPLICATIONS	COLOUR CODES
(EN1A) 220M07	FREE CUTTING STEEL — BOLTS, BUSHES, COUPLINGS, NUTS, PINS AND STUDS	
(EN3B) 070M20	CARBON STEEL (LOW TENSILE STRENGTH) — BOLTS, COUPLINGS, NUTS, SHAFTS AND STUDS	
(EN8) 080M40	CARBON AXLE STEEL — AXLES, BOLTS, BRACKETS, CONNECTING RODS, CRANKSHAFTS, DRIVING RINGS, DYNAMO AND ELECTRIC MOTOR SHAFTS.	

SPECIFICATIONS TO BS 970: PART 1: 1983	BLACK CARBON STEELS	
GRADE	SPECIFICATIONS AND APPLICATIONS	COLOUR CODES
(EN3A) 070M20	CARBON STEEL (LOW TENSILE STRENGTH) — BOLTS, COUPLINGS, NUTS, SHAFTS AND STUDS.	
(EN8) 080M40	CARBON AXLE STEEL — AXLES, BOLTS, BRACKETS, CONNECTING RODS, CRANKSHAFTS.	
(EN9) 070M55	CARBON STEEL (MODERATE WEAR RESISTANCE) — CAMS, CRANKSHAFTS, CYLINDERS, MACHINE TOOLS, SMALL GEARS AND SPROCKETS.	

SPECIFICATIONS TO BS 970: PART 1: 1983	ALLOY STEELS	
GRADE	SPECIFICATIONS AND APPLICATIONS	COLOUR CODES
(EN19) 709M40	1% CHROME, MOLYBDENUM STEEL — AXLE SHAFTS, CRANKSHAFTS, CONNECTING RODS, GEARS, HIGH-TENSILE BOLTS AND STUDS.	
(EN24) 817M40	1½% NICKEL, CHROME, MOLYBDENUM STEEL — AXLE SHAFTS, PINION SLEEVES, HIGH TEMPERATURE BOLTS, POWER TRANSMISSION GEARS, SPINDLE GEARS, SLIDE RACKS AND CAMS.	
(EN26) 826M40	2½% NICKEL, CHROME, MOLYBDENUM STEEL — SIMILAR TO EN24 BUT FOR HEAVIER SECTIONS.	
(EN36B) 655M13	CASE HARDENING STEEL — AUTO AND HEAVY VEHICLE TRANSMISSIONS. COMPONENTS, STEERING WORMS AND TIMING WHEELS.	

MECHANICAL AND HARDNESS VALUES

HEAT TREATED CONDITION	UTS MPa (N/mm ²)	BHN	HRC	VHN (Vickers)	TON/SQ INCH
P	540-695	160-207		168-218	35 - 45
Q	625-775	170-229		178-241	40 - 50
R	700-850	201-255		212-269	45 - 55
S	775-925	223-277	18.8-28.8	234-292	50 - 60
T	850-1000	248-302	24.2-32.1	261-319	55 - 65
U	925-1075	269-331	27.6-35.5	284-350	60 - 70
V	1000-1150	293-352	30.9-37.9	309-372	65 - 75
W	1075-1225	311-375	33.1-40.4	328-396	70 - 80
X	1150-1300	341-388	36.6-41.8	360-410	75 - 85
Y	1225-1375	363-401	39.1-43.1	383-425	80 - 90
Z	1550 min	444 min	47.1 min	474 min	100 min