

MECHANICAL TUBES

1. Standards

DIN 1629 (has been partially replaced by EN 10297-1);
 DIN 1630 (has been partially replaced by EN 10297-1);
 DIN 17124 (has been partially replaced by EN 10297-1);
 DIN 17204 (has been partially replaced by EN 10297-1);
 DIN 17121 (has been with EN 10210);
 EN 10297-1;
 EN 10210-1, 2;
 EN 10216-1, 3;
 ASTM A519;
 ASTM A105;
 NFA 49-311;
 NFA 49-312;
 UNI 7729;
 STAS 530/1.

2. Used for

- Mechanical application;
- General engineering purposes.

3. Dimensions

Cold rolled tubes acc. DIN/EN - Tab.1;
 Hot rolled tubes acc. DIN/EN - Tab.2.1; Tab. 2.2;
 Hot rolled tubes acc. ASTM A519 - Tab.3;
 Cold rolled tubes acc. ISO 2938 - Tab.4; Hot rolled
 tubes acc. ISO 2938 - Tab.5.

4. Tolerances

Standard	Outside Diameter	Tolerances	Wall Thickness	Tolerances	Weight
DIN 1629, DIN 1630	OD≤130	±1% (but ± 0.5mm is permitted)	WT≤ 2Sn 2Sn<WT≤4Sn WT>4Sn	+15/-10%	+12/-8% for each tube +10/-5% for lots over 10t
				+12.5/-10%	
	130<OD≤244.5		+9%		
			+17.5/-12.5%		
		0.05OD <WT≤0.11OD WT>0.11OD	±12.5%		
			±10%		
EN 10210-1,2		±1% or ±0.5mm (which is higher)		-10%	+8% / -6%
EN 10297-1, EN 10216-1		±1% or ±0.5mm (which is higher)		±12.5% or ±0.4mm (which is higher)	-
EN 10216-3- hot rolled		±1% or ±0.5mm (which is higher)		±12.5% or ±0.4mm (which is higher)	-
EN 10216-3- cold rolled		±0.5% or ±0.3mm (which is higher)		±10% or ±0.2mm (which is higher)	-
ASTM A519, hot rolled	OD<76.17	±0.51 mm	WT<15 WT≥15	±12.5% ±10%	-
	76.2<OD<114.27	±0.64 mm	WT<15 WT≥15	±10% ±7.5%	
	114.3<OD<152.37	±0.79 mm			
	152.4<OD<190.47	±0.94 mm	WT<15 WT≥15	±10% ±10%	
	190.5<OD<228.57	±1.14 mm			

Standard	Outside Diameter	Tolerances		Wall Thickness	Tolerances	Weight
ASTM A519, cold rolled	OD≤53.31	OD: +0.30mm	ID: -0.30mm	WT≤25%OD & ID<38.1	±10%	
	53.31<OD≤63.47	OD: +0.35mm	ID: -0.35mm	WT≤25%OD & ID≥38.1	±7.5%	
	63.47<OD≤73.63	OD: +0.40mm	ID: -0.40mm	WT>25%OD & ID<38.1	±12.5%	
	73.63<OD≤83.79	OD: +0.45mm	ID: -0.45mm	WT>25%OD & ID≥38.1	±10%	
	83.79<OD≤93.95	OD: +0.55mm	ID: -0.55mm			
	93.95<OD≤104.11	OD: +0.65mm	ID: -0.65mm			
	104.11<OD≤114.27	OD: +0.75mm	ID: -0.75mm			

Sn - Nominal wall thickness according to DIN 2448

5. Chemical Composition (%)

Steel group	C	Mn	P max	S max	N max	Cr	Si	Mo	Al min
St37.0, St37.4, S235, P195, P235, P275, E235, OLT35, C10E, C15E, 1010	max 0.17		0.040	0.040	0.009				
St44.0, St44.4, S275, P265, E 275, OLT45, 1020	max 0.21		0.040	0.040	0.009				
St52.0, St52.4, S355, E355, Tu52-b, P265, P355, Fe510, OL52.3,1022	max 0.22	max 1.70	0.040	0.035			max 0.60		0.020
C45, C35E, OLT65, 1035, 1045	max 0.50	max 0.9	0.040	0.040			max 0.40		
16MnCr5	0.14-0.19	1.0-1.3	0.035	0.035		0.8-1.1	max 0.4		
4140, 42CrMo4	0.38-0.43	0.75-1.0	0.040	0.040		0.8-1.1	0.15-0.30	0.15-0.25	
4130	0.28-0.33	0.4-0.6	0.040	0.040		0.8-1.1	0.15-0.35	0.15-0.25	
20MnV6, E470	0.16-0.22	1.3-1.7	0.03	0.035	0.02		0.1-0.50		0.01

6. Mechanical Properties

Steel group	Tensile Strength	Yield Limit	Elongation
	N/mm ²	N/mm ²	min (%)
St37.0, St37.4, S235, P195, P235, P275, E235, OLT35, C10E, C15E, 1010	350÷480	min 235	25
St44.0, St44.4, S275, P265, E 275, OLT45, 1020	420÷550	min 275	21
St52.0, St52.4, S355, E355, Tu52-b, P265, P355, Fe510, OL52.3,1022	500÷650	min 355	21
C45, C35E, OLT65, 1035, 1045	min 580	min 305	16
16MnCr5	HB =max 207 (Delivery status: Annealed)		
4140, 42CrMo4	HRB =max 85 (Delivery status: Annealed)		
4130	HRB =max 81 (Delivery status: Annealed)		
20MnV6, E470	min 600	min 430	17

7. Lengths

- Random lengths: 4÷12m (13.12÷39.7 ft), acc. Tab 1÷5;
- Fixed lengths within the random lengths range.

8. Protection

- Unprotected;
- External varnished with black or clear lacquer;
- If required, the tubes can be delivered with plastic caps at both ends.

9. Marking

According to standard or per customer request.

10. Delivery

Bundles up to:

- 2000 kg (4400 lbs) - cold drawn tubes;
- 4000 kg (8800 lbs) - hot rolled tubes.

Quantity tolerances: ±5% per size or / and per total.

The bundles will have one tag applied at each end, marked according to standard or at customer's request.

11. Mill test report

Mill test reports are issued to customer requirements. Usually they comply with DIN 50049, EN 10204.

12. Quality certified:

LR, ZUS, TUV, UHP, PED, CE, MLPTL, DNV, GL, CE.

Tab.1 COLD ROLLED MECHANICAL TUBES acc. EUROPEAN NORMS


WT	mm	2	2.3	2.6	2.9	3.2	3.6	4	4.5	5	5.6	6.3	7.1	8	8.8	10	11	12.5	
	in	0.079	0.091	0.102	0.114	0.126	0.142	0.157	0.177	0.197	0.220	0.248	0.280	0.315	0.346	0.394	0.433	0.492	
OD	Max Length (m)																		
mm	in																		
16	0.630	10	10	10	10	10	10												
19	0.749	10	10	10	10	10	10												
20	0.787	10	10	10	10	10	10	10	10	10									
21.3	0.839	10	10	10	10	10	10	10	10	10									
25	0.984	10	10	10	10	10	10	10	10	10	10	10							
25.4	1.000	10	10	10	10	10	10	10	10	10	10	10							
26.9	1.059		10	10	10	10	10	10	10	10	10	10	10						
30	1.181			12	12	12	12	12	12	12	12	12	12	12					
31.8	1.252			12	12	12	12	12	12	12	12	12	12	12					
33.7	1.327			12	12	12	12	12	12	12	12	12	12	12					
38	1.496				12	12	12	12	12	12	12	12	12	12	12	12			
42.4	1.669					12	12	12	12	12	12	12	12	12	12	12			
44.5	1.752					12	12	12	12	12	12	12	12	12	12	12			
48.3	1.902					12	12	12	12	12	12	12	12	12	12	12			
51	2.008						11	11	11	11	11	11	11	11	11	11			
54	2.126						10	10	10	10	10	10	10	10	10	10	10	10	
57	2.244							9	9	9	9	9	9	9	9	9	9	9	
60.3	2.374							9	9	9	9	9	9	9	9	9	9	9	
63.5	2.500								9	9	9	9	9	9	9	9	9	9	
70	2.756								9	9	9	9	9	9	9	9	9	9	
73	2.874										9	9	9	9	9	9	9	9	
76.1	2.996										9	9	9	9	9	9	9	9	
82.5	3.248										9	9	9	9	9	9	9	9	
88.9	3.500											9	9	9	9	9	9	9	
95	3.740												9	9	9	9	9	9	
101.6	4.000													9	9	9	9	9	
108	4.252														9	9	9	9	


Notes:

- Intermediate sizes can be produced subject to agreement before ordering;
- Weight: $We=10.68 (OD-WT) \times WT, [lbs/ft]$;
 $We=0.0246615 \times (OD-WT) \times WT, [kg/m]$.
- Cold mechanicals acc. DIN 1629, DIN 1630, do not cover surface and precision size request for DIN 2391.
For these tubes please consult Precision Program.

Tab. 2.1 HOT ROLLED MECHANICAL TUBES acc. EUROPEAN NORMS - ASSEL MILL

WT	7.1	8.0	8.8	10.0	11.0	12.5	14.2	16.0	17.5	20.0	22.2	25.0	28.0	30.0	32.0	35.0	36.0	40.0	45.0	50.0	55.0	60	
	0.280	0.315	0.346	0.394	0.433	0.492	0.559	0.630	0.689	0.787	0.874	0.984	1.102	1.181	1.260	1.378	1.417	1.575	1.772	1.969	2.165	2.362	
OD	min-max length (m)																						
60.3	2.374			9-11	9-11	9-11	8-10	7.5-10															
63.5	2.5			9.5-11	9-11	8-11	7.2-10	7-10	7-10														
70.0	2.756			9-10.5	9-11	7-11	6.5-11	6-10	6-10	6-9													
73.0	2.874			8-10	7.5-10	7-10.5	6.5-10.5	6-10	5.6-10	5.6-9													
76.1	2.996			8-10	7-10	6.5-10	5.8-10.5	5.5-10.5	5.5-10	5.5-9													
82.5	3.248			6.9-10.5	6.5-10	5.9-10	5.6-10	5.4-10	5.3-10	4.5-9	5.2-9	5.5-9											
88.9	3.5			6.3-10	5.8-10	5.6-10	5.4-10	5.2-10	5.0-10	4.9-9	4-9	4.5-9											
95.0	3.740			5.8-10	5.6-10	5.3-10	5.2-9	5.0-9.0	4.8-9.0	4.0-9.0	4.0-9.0	4.0-9.0											
101.6	4			5.5-7.0	5.0-7.0	4.5-7	4.3-8.0	4.2-8.0	4.0-7.0	4.0-7.0	4.0-7.0	4.0-7.0											
108.0	4.252			5.5-7.0	4.8-7.0	4.7-7	4.4-8.0	4.1-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.0	4.0-7.0								
114.3	4.500			5.5-7.0	5.0-7.0	5.0-7.0	4.2-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.0	4.0-7.0	4.0-7.0							
121.0	4.764	9.5-11	9-11	8.5-11	5.5-7.0	5.0-7.0	4.3-7.0	4.2-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.0	4.0-7.0	4.0-7.0	4.0-6.5	4.0-6.5					
127.0	5	9.0-11	8.5-11	8-11	7.5-11	5.0-7.0	4.5-7.0	4.3-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.5	4.0-7.0	4.0-7.0	4.0-6.5	4.0-6.5				
133.0	5.236	9.0-11	8.5-11	8-11	7.5-11	5.0-7.0	4.3-7.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.5	4.0-7.0	4.0-6.5	4.0-6.5					
139.7	5.5	9.0-11	8.5-11	8-11	7.5-11	6-9.0	5.0-7.0	4.5-8.0	4.2-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.0	4.0-7.0	4.0-6.5	4.0-6.5				
146.0	5.748	8.5-11	8.0-11	7.5-11	7.5-11	7.0-11	5-7.0	4.5-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.5	4.0-7.0	4.0-6.5	4.0-6.5				
152.4	6	8.5-11	8.0-11	7.5-11	7.0-11	6.6-11	4.5-7.0	4.5-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.5	4.0-7.5	4.0-7.0	4.0-6.5	4.0-6.3				
159.0	6.260	8.0-11	7.5-11	7.5-11	7.0-11	6.5-11	4.5-7.0	4.5-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.5	4.0-7.5	4.0-7.0	4.0-6.5	4.0-6.5	4.0-6.3			
165.1	6.5	8.6-11	8.0-11	7.5-11	7.0-11	6.7-11	6.4-11	4.5-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.5	4.0-7.5	4.0-7.0	4.0-6.5	4.0-6.3			
168.3	6.626	8.5-11	8.0-11	7.5-11	7.0-11.5	6.5-11.5	6.2-11.5	4.5-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.5	4.0-7.5	4.0-7.0	4.0-6.5	4.0-6.5			
177.8	7	8.5-11	7.5-11	7.5-11	7.0-11.5	6.5-11.5	6.2-11.5	4.5-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.5	4.0-7.5	4.0-7.0	4.0-6.5	4.0-6.5	4.0-6.2		
193.7	7.626		8.5-11	7.5-11	7.0-11.5	6.5-11.5	6.2-11	6-10	4.2-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.9	4.0-7.5	4.0-7.5	4.0-7.0	4.0-6.5	4.0-6	4.0-5.7	
203.0	7.992		8.0-11	7.5-11	7.0-11.5	6.5-11.5	6.2-11	6-10	4.2-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.5	4.0-7.5	4.0-7.5	4.0-7.5	4.0-7.0	4.0-6.5	4.0-6.0	
216.0	8.504		8.0-11	7.5-11	7.0-11.5	6.5-11	6.2-11	6-10	7-9.0	4.2-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.9	4.0-7.5	4.0-7.5	4.0-7.5	4.0-7.5	4.0-7.0	4.0-6.5	4.0-6.3	4.0-5.9
219.1	8.626		8.0-11	7.5-11	7.0-11.5	6.5-11	5.8-10.8	6-10	7-9.0	4.2-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.8	4.0-7.5	4.0-7.5	4.0-7.5	4.0-7.5	4.0-7.0	4.0-6.5	4.0-6.0	4.0-5.7
224.0	8.819										4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.5	4.0-7.5	4.0-7.5	4.0-7.5	4.0-7.0	4.0-7.0	4.0-6.5	4.0-6.0	4.0-5.6
229.0	9.016										4.0-8.0	4.0-8.0	4.0-8.0	4.0-8.0	4.0-7.5	4.0-7.5	4.0-7.5	4.0-7.5	4.0-7.0	4.0-6.7	4.0-6.2	4.0-5.7	4.0-5.4
244.5	9.626										4.5-7.0	4.5-7.0	4.5-7.5	4.5-7.5	4.5-7.0	4.5-7	4.5-7	4.0-6.5	4.5-6.5	4.5-6.2	4.5-5.7	4.5-5.4	
250.0	9.843												4.5-7.5	4.5-7.5	4.5-7.0	4.5-7	4.5-7	4.0-6.5	4.5-6.5	4.5-6.2	4.5-5.7	4.5-5.4	


 category H1 -OD/WT>12.5 and Mannesmann ASSEL mill

 category H2 - OD≥60 and reducing mill

 polygonal appearance

 category H4 - OD/WT<4 and calibrating mill

 category H3 - 4<OD/WT<12.5 and calibrating mill

 lengths over 11m (max 33% of the command between 10.6 and 11.5 for DRL and min 67% of the command between 8 and 11m)

Notes:

1. Intermediate sizes are available as follow:

- for OD<82,5 and OD/WT<12.5, any time;
- for OD<82,5 or OD/WT>12.5, subject of agreement before ordering.

2. Weight:

- $We = 0.0246615x(OD-WT)xWT$ [kg/m];
- $We = 10.68 (OD-WT)xWT$ [lbs/ft].

Tab. 2.2 HOT ROLLED MECHANICAL TUBES acc. EUROPEAN NORMS - CPE MILL

WT	mm	2.3	2.6	2.77	2.87	2.9	3.2	3.6	3.91	4	4.5	5	5.5	6.02	6.3	7.1	7.62	8.0	8.56	8.8	9.5	10.0	11.0	11.13	
	in	0.091	0.102	0.109	0.113	0.114	0.126	0.142	0.154	0.157	0.177	0.197	0.217	0.237	0.248	0.280	0.300	0.315	0.337	0.346	0.375	0.394	0.433	0.438	
OD		Min-max. Length (m)																							
mm	in																								
21.3	0.839	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12															
26.7	1.051	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12															
26.9	1.059	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12															
30.0	1.181		6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12														
31.8	1.252		6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12													
33.4	1.315		6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12												
33.7	1.327		6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12											
38.0	1.496		6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12										
42.2	1.661		6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12										
42.4	1.669		6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12									
48.3	1.902		6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12								
51.0	2.008		6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12							
54.0	2.126					6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12						
57.0	2.244					6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12					
60.3	2.374					6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12				
63.5	2.500					6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12			
70.0	2.756					6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12
73.0	2.874					7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13
76.1	2.996					7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	6÷12	6÷12	6÷12
82.5	3.248									7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	6÷12	6÷12	6÷12
88.9	3.500									6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12
95.0	3.740										7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13
101.6	4.000										7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13
108.0	4.252										7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13
114.3	4.500										7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13	7÷13
121.0	4.760																6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12	6÷12

HP1
HP2
HP3
HP4

- rolling R1 (OD<33.7);
- rolling R1 or R2 (OD>=33.7, WT<3);
- rolling R1 or R2 (OD>=33.7 and OD/WT>=10);
- rolling R1 or R2 (OD>=33.7 and OD/WT<10).

Polygonal appearance.

Tab. 3 HOT ROLLED MECHANICAL TUBES acc. ASTM A519

WT	mm	2.41	2.8	3.8	4.8	5.6	7.6	9.5	12.7	15.9	19.1	22.2	25.4	28.6	31.8	34.9	38.1	41.3	44.5	47.6	50.8	54.0	57.2	
	in	0.095	0.110	0.150	0.189	0.220	0.299	0.374	0.500	0.626	0.752	0.874	1.000	1.126	1.252	1.374	1.500	1.626	1.752	1.874	2.000	2.126	2.252	
OD		Max L [m]																						
mm	in																							
21.3	0.838	12.0	12.0	12.0																				
26.7	1.051	12.0	12.0	12.0	12.0																			
33.4	1.315	12.0	12.0	12.0	12.0	12.0																		
42.2	1.661	12.0	12.0	12.0	12.0	12.0																		
48.3	1.902	12.0	12.0	12.0	12.0	12.0	12.0																	
57.2	2.252		12.0	12.0	12.0	12.0	12.0																	
60.3	2.374		12.0	12.0	12.0	12.0	12.0																	
63.5	2.500		12.0	12.0	12.0	12.0	12.0	12.0																
69.9	2.752		12.0	12.0	12.0	12.0	12.0	10.5	11.0	10.0														
73.0	2.874		13.0	13.0	13.0	13.0	13.0	10.0	10.5	10.0														
76.2	3.000		13.0	13.0	13.0	13.0	13.0	10.0	10.0	10.5														
82.6	3.252		13.0	13.0	13.0	13.0	13.0	10.5	10.0	10.0														
88.9	3.500		12.0	12.0	12.0	12.0	12.0	10.0	10.0	10.0	9.0	9.0	9.0											
95.3	3.752			13.0	13.0	13.0	13.0	10.0	10.0	9.0	9.0	9.0	9.0											
101.6	4.000			13.0	13.0	13.0	13.0	7.0	7.0	8.0	7.0	7.0	7.0											
108.0	4.252		13.0	13.0	13.0	13.0	13.0	7.0	7.0	8.0	8.0	8.0	8.0	7.0										
114.3	4.500			13.0	13.0	13.0	13.0	7.0	7.0	8.0	8.0	8.0	8.0	7.0	7.0									
120.7	4.752							7.0	7.0	8.0	8.0	8.0	8.0	7.0	7.0	6.5								
127.0	5.000							11.0	7.0	8.0	8.0	8.0	8.0	7.5	7.0	6.5								
133.4	5.252							11.0	7.0	8.0	8.0	8.0	8.0	8.0	7.0	6.5								
139.7	5.500							11.0	7.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0	6.5							
141.3	5.563							11.0	7.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0	6.5							
146.1	5.752							11.0	7.0	8.0	8.0	8.0	8.0	8.0	7.5	7.0	6.5							
152.4	6.000							11.0	7.0	8.0	8.0	8.0	8.0	8.0	7.5	7.0	6.3							
158.8	6.252							11.0	7.0	8.0	8.0	8.0	8.0	8.0	7.5	7.0	6.5	6.5	6.3					
165.1	6.500							11.0	11.0	8.0	8.0	8.0	8.0	8.0	7.5	7.5	6.5	6.5	6.3					
168.3	6.626							11.5	11.5	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.0	6.5	6.5					
171.5	6.752							11.5	11.5	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.0	6.5	6.5					
177.8	7.000							11.5	11.5	8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.0	7.0	6.5					
184.2	7.252									8.0	8.0	8.0	8.0	8.0	8.0	7.5	7.0	7.0	6.5	6.2				
190.5	7.500									8.0	8.0	8.0	8.0	8.0	7.9	7.5	7.0	7.0	6.5	6.0				
193.7	7.626									8.0	8.0	8.0	8.0	8.0	7.9	7.5	7.0	7.0	6.5	6.0	6.0			
196.9	7.752									8.0	8.0	8.0	8.0	8.0	7.9	7.5	7.0	7.0	6.5	6.0	6.0	5.7		
203.2	8.000									8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.0	6.5	6.5	6.0		
209.6	8.252									8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.0	6.5	6.5	6.0		
215.9	8.500									8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	7.0	6.5	6.5	6.0		
219.1	8.626									8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.5	7.5	5.5	5.5	5.5	5.0	5.0	
222.3	8.752									8.0	8.0	8.0	8.0	8.0	8.0	7.0	7.0	7.0	6.5	6.5	6.0	5.6		
228.6	9.000									8.0	8.0	8.0	8.0	8.0	7.5	7.5	7.0	7.0	6.7	6.2	6.2	5.7	5.4	
244.5	9.625													7.5	7.0	7.0	6.5	6.5	6.5	6.2	6.2	5.7	5.4	
250.0	9.843													7.5	7.0	7.0	6.5	6.5	6.5	6.2	6.2	5.7	5.4	

Notes:

1. ASTM A519 cold worked, dimensions 108-200mm, are available only with the producer's consulting.
2. Weight: $We=10.68x(OD-WT)xWT$ [lbs/ft]; $We=0.0246615x(OD-WT)xWT$ [Kg/m].

**Tab. 4 DIMENSIONS AND CLEAN TURNED SIZES FOR HOLLOW
HOLLOW BAR FOR MACHINING**

COLD ROLLING

Nom sizes			EXECUTION DIMENSIONS							
OD	ID	WT	OD	ID	WT	Odmin	Odmax	Idmin	Idmax	Weight
32	25	3.5	32.5	24.5	4.0	32.1	32.9	23.3	25.7	2.81
32	20	6.0	32.5	19.5	6.5	32.1	32.9	17.9	21.1	4.17
32	18	7.0	32.5	17.5	7.5	32.1	32.9	15.9	19.1	4.62
32	16	8.0	32.5	15.5	8.5	32.1	32.9	13.7	17.3	5.03
36	28	4.0	36.5	27.5	4.5	36.1	36.9	26.1	28.9	3.55
36	25	5.5	36.5	24.5	6.0	36.1	36.9	22.9	26.1	4.51
36	20	8.0	36.5	19.5	8.5	36.1	36.9	17.7	21.3	5.87
40	32	4.0	40.5	31.5	4.5	40.1	40.9	30.1	32.9	4.00
40	28	6.0	40.5	27.5	6.5	40.1	40.9	25.9	29.1	5.45
40	25	7.5	40.5	24.5	8.0	40.1	40.9	22.7	26.3	6.41
40	20	10.0	40.5	19.5	10.5	40.1	40.9	17.5	21.5	7.77
45	36	4.5	45.5	35.5	5.0	45.1	45.9	34.1	36.9	4.99
45	32	6.5	45.5	31.5	7.0	45.1	45.9	29.9	33.1	6.65
45	30	7.5	45.5	29.5	8.0	45.1	45.9	27.7	31.3	7.40
45	28	8.5	45.5	27.5	9.0	45.1	45.9	25.7	29.3	8.10
45	26	9.5	45.5	25.5	10.0	45.1	45.9	23.6	27.4	8.75
45	25	10.0	45.5	24.5	10.5	45.1	45.9	22.5	26.5	9.06
45	20	12.5	45.5	19.5	13.0	45.1	45.9	17.3	21.7	10.42
50	40	5.0	51.0	39.6	5.7	50.6	51.4	38.0	41.2	6.37
50	36	7.0	51.0	35.6	7.7	50.6	51.4	33.9	37.3	8.22
50	34	8.0	51.0	33.6	8.7	50.6	51.4	31.8	35.4	9.08
50	32	9.0	51.0	31.6	9.7	50.6	51.4	29.7	33.5	9.88
50	30	10.0	51.0	29.6	10.7	50.6	51.4	27.6	31.6	10.63
50	28	11.0	51.0	27.6	11.7	50.6	51.4	25.5	29.7	11.34
50	25	12.5	51.0	24.6	13.2	50.6	51.4	22.3	26.9	12.31
63	53	5.0	63.5	52.3	5.6	63.0	64.0	50.6	54.0	8.00
71	60	5.5	71.7	59.3	6.2	71.2	72.2	57.6	61.0	10.02
75	63	6.0	76.1	62.5	6.8	75.6	76.6	60.8	64.2	11.62
80	67	6.5	80.8	66.4	7.2	80.3	81.3	64.7	68.1	13.07

Note: Nominal sizes are assured by machining with OD centring for a finished part length of maximum 3 x OD or maximum 200 mm (whichever is smaller).

**Tab. 5 DIMENSIONS AND CLEAN TURNED SIZES FOR HOLLOW
HOLLOW BAR FOR MACHINING
HOT ROLLING**

Nom sizes			EXECUTION DIMENSIONS							
OD	ID	WT	OD	ID	WT	Odmin	Odmax	Idmin	Idmax	Weight
56	45	5.5	57.0	44.6	6.2	56.6	57.4	43.1	46.1	7.77
56	40	8.0	57.0	39.6	8.7	56.6	57.4	37.8	41.4	10.36
56	38	9.0	57.0	37.6	9.7	56.6	57.4	35.7	39.5	11.31
56	36	10.0	57.0	35.6	10.7	56.6	57.4	33.7	37.5	12.22
56	32	12.0	57.0	31.6	12.7	56.6	57.4	29.4	33.8	13.87
56	30	13.0	57.0	29.6	13.7	56.6	57.4	27.3	31.9	14.63
63	50	6.5	63.5	49.3	7.1	63.0	64.0	47.5	51.1	9.88
63	45	9.0	63.5	44.3	9.6	63.0	64.0	42.4	46.2	12.76
63	43	10.0	63.5	42.3	10.6	63.0	64.0	40.2	44.4	13.83
63	40	11.5	63.5	39.3	12.1	63.0	64.0	37.1	41.5	15.34
63	36	13.5	63.5	35.3	14.1	63.0	64.0	32.8	37.8	17.18
71	56	7.5	71.7	55.5	8.1	71.2	72.2	53.7	57.3	12.70
71	50	10.5	71.7	49.5	11.1	71.2	72.2	47.4	51.6	16.59
71	45	13.0	71.7	44.5	13.6	71.2	72.2	42.1	46.9	19.49
71	40	15.5	71.7	39.5	16.1	71.2	72.2	37.0	42.0	22.08
75	60	7.5	76.1	59.3	8.4	75.6	76.6	57.5	61.1	14.02
75	56	9.5	76.1	55.5	10.3	75.6	76.6	53.4	57.6	16.71
75	50	12.5	76.1	49.7	13.2	75.6	76.6	47.4	52.0	20.48
75	45	15.0	76.1	44.7	15.7	75.6	76.6	42.2	47.2	23.39
80	63	8.5	80.8	62.4	9.2	80.3	81.3	60.5	64.3	16.25
80	60	10.0	80.8	59.4	10.7	80.3	81.3	57.3	61.5	18.50
80	56	12.0	80.8	55.4	12.7	80.3	81.3	53.1	57.7	21.33
80	50	15.0	80.8	49.4	15.7	80.3	81.3	46.9	51.9	25.21
85	70	7.5	85.9	69.5	8.2	85.4	86.4	67.7	71.3	15.71
85	67	9.0	85.9	66.5	9.7	85.4	86.4	64.6	68.4	18.23
85	65	10.0	85.9	64.5	10.7	85.4	86.4	62.4	66.6	19.84
85	61	12.0	85.9	60.5	12.7	85.4	86.4	58.2	62.8	22.93
85	55	15.0	85.9	54.5	15.7	85.4	86.4	52.0	57.0	27.18
85	50	17.5	85.9	49.5	18.2	85.4	86.4	47.0	52.0	30.39
85	45	20.0	85.9	44.5	20.7	85.4	86.4	42.0	47.0	33.28
90	75	7.5	90.9	74.3	8.3	90.4	91.4	72.4	76.2	16.91
90	71	9.5	90.9	70.3	10.3	90.4	91.4	68.2	72.4	20.47
90	67	11.5	90.9	66.3	12.3	90.4	91.4	64.0	68.6	23.84
90	63	13.5	90.9	62.3	14.3	90.4	91.4	60.0	64.6	27.01
90	60	15.0	90.9	59.5	15.7	90.4	91.4	57.0	62.0	29.12
90	56	17.0	90.9	55.5	17.7	90.4	91.4	53.0	58.0	31.95
90	50	20.0	90.9	49.5	20.7	90.4	91.4	47.0	52.0	35.84
90	45	22.5	90.9	44.5	23.2	90.4	91.4	41.6	47.4	38.73
95	80	7.5	96.0	79.2	8.4	95.5	96.5	77.3	81.1	18.15
95	75	10.0	96.0	74.2	10.9	95.5	96.5	72.1	76.3	22.88
95	71	12.0	96.0	70.4	12.8	95.5	96.5	68.1	72.7	26.26
95	69	13.0	96.0	68.4	13.8	95.5	96.5	66.0	70.8	27.98
95	67	14.0	96.0	66.4	14.8	95.5	96.5	63.9	68.9	29.64
95	63	16.0	96.0	62.4	16.8	95.5	96.5	59.9	64.9	32.81

Tab. 5 HOT ROLLING - table continued

Nom sizes			EXECUTION DIMENSIONS							
OD	ID	WT	OD	ID	WT	Odmin	Odmax	Idmin	Idmax	Weight
95	59	18.0	96.0	58.4	18.8	95.5	96.5	55.9	60.9	35.79
95	56	19.5	96.0	55.4	20.3	95.5	96.5	52.9	57.9	37.90
95	50	22.5	96.0	49.6	23.2	95.5	96.5	46.7	52.5	41.65
100	85	7.5	101.6	84.2	8.7	101.1	102.1	82.3	86.1	19.93
100	80	10.0	101.6	79.2	11.2	101.1	102.1	77.0	81.4	24.97
100	75	12.5	101.6	74.2	13.7	101.1	102.1	71.8	76.6	29.70
100	71	14.5	101.6	70.2	15.7	101.1	102.1	67.7	72.7	33.26
100	67	16.5	101.6	66.2	17.7	101.1	102.1	63.7	68.7	36.62
100	63	18.5	101.6	62.4	19.6	101.1	102.1	59.7	65.1	39.64
100	59	20.5	101.6	58.4	21.6	101.1	102.1	55.7	61.1	42.62
100	56	22.0	101.6	55.4	23.1	101.1	102.1	52.5	58.3	44.72
100	50	25.0	101.6	49.4	26.1	100.9	102.3	46.1	52.7	48.60
106	90	8.0	107.1	89.1	9.0	106.6	107.7	87.2	91.1	21.77
106	85	10.5	107.1	84.1	11.5	106.6	107.7	82.0	86.3	27.11
106	80	13.0	107.1	79.3	13.9	106.6	107.7	76.8	81.9	31.95
106	75	15.5	107.1	74.3	16.4	106.6	107.7	71.8	76.9	36.68
106	71	17.5	107.1	70.3	18.4	106.6	107.7	67.8	72.9	40.25
106	67	19.5	107.1	66.3	20.4	106.6	107.7	63.6	69.1	43.62
106	63	21.5	107.1	62.3	22.4	106.6	107.7	59.6	65.1	46.79
106	59	23.5	107.1	58.3	24.4	106.6	107.7	55.4	61.3	49.76
106	56	25.0	107.1	55.5	25.8	106.6	107.7	52.4	58.7	51.73
106	50	28.0	107.1	49.5	28.8	106.6	107.7	46.2	52.9	55.61
112	95	8.5	113.1	94.1	9.5	112.5	113.7	92.1	96.1	24.27
112	90	11.0	113.1	89.1	12.0	112.5	113.7	86.8	91.4	29.92
112	85	13.5	113.1	84.1	14.5	112.5	113.7	81.6	86.6	35.26
112	80	16.0	113.1	79.1	17.0	112.5	113.7	76.5	81.7	40.29
112	75	18.5	113.1	74.1	19.5	112.5	113.7	71.3	76.9	45.01
112	71	20.5	113.1	70.3	21.4	112.5	113.7	67.5	73.1	48.40
112	63	24.5	113.1	62.3	25.4	112.5	113.7	59.1	65.5	54.94
112	59	26.5	113.1	58.3	27.4	112.5	113.7	54.9	61.7	57.91
112	56	28.0	113.1	55.3	28.9	112.5	113.7	51.7	58.9	60.01
112	50	31.0	113.1	49.3	31.9	112.5	113.7	45.5	53.1	63.88
118	100	9.0	119.2	99.0	10.1	118.6	119.8	96.9	101.1	27.17
118	95	11.5	119.2	94.0	12.6	118.6	119.8	91.6	96.4	33.12
118	90	14.0	119.2	89.2	15.0	118.6	119.8	86.6	91.8	38.55
118	85	16.5	119.2	84.2	17.5	118.6	119.8	81.6	86.8	43.89
118	80	19.0	119.2	79.2	20.0	118.6	119.8	76.4	82.0	48.93
118	75	21.5	119.2	74.2	22.5	118.6	119.8	71.4	77.0	53.66
118	71	23.5	119.2	70.2	24.5	118.6	119.8	67.2	73.2	57.22
118	63	27.5	119.2	62.2	28.5	118.6	119.8	58.8	65.6	63.75
118	59	29.5	119.2	58.2	30.5	118.6	119.8	54.6	61.8	66.72
118	55	31.5	119.2	54.2	32.5	118.5	119.9	50.3	58.1	69.49
125	106	9.5	126.3	104.9	10.7	125.7	126.9	102.7	107.1	30.50
125	100	12.5	126.3	99.1	13.6	125.7	126.9	96.6	101.6	37.80
125	95	15.0	126.3	94.1	16.1	125.7	126.9	91.5	96.7	43.75
125	90	17.5	126.3	89.1	18.6	125.7	126.9	86.5	91.7	49.40

Tab. 5 HOT ROLLING - table continued

Nom. sizes			EXECUTION DIMENSIONS							
OD	ID	WT	OD	ID	WT	Oadmin	Odmax	ldmin	ldmax	Weight
125	85	20.0	126.3	84.1	21.1	125.7	126.9	81.3	86.9	54.74
125	80	22.5	126.3	79.3	23.5	125.7	126.9	76.3	82.3	59.58
125	71	27.0	126.3	70.3	28.0	125.7	126.9	66.9	73.7	67.88
125	65	30.0	126.3	64.3	31.0	125.7	126.9	60.6	68.0	72.86
125	60	32.5	126.3	59.3	33.5	125.6	127.0	55.3	63.3	76.67
125	55	35.0	126.3	54.3	36.0	125.6	127.0	50.0	58.6	80.17
132	112	10.0	133.0	110.8	11.1	132.4	133.7	108.7	113.0	33.37
132	106	13.0	133.0	104.8	14.1	132.4	133.7	102.2	107.5	41.34
132	102	15.0	133.0	100.8	16.1	132.4	133.7	98.2	103.5	46.42
132	98	17.0	133.0	96.8	18.1	132.4	133.7	94.2	99.5	51.29
132	95	13.5	133.0	93.8	19.6	132.4	133.7	91.2	96.5	54.81
132	90	21.0	133.0	89.0	22.0	132.4	133.7	86.2	91.9	60.22
132	84	24.0	133.0	83.0	25.0	132.4	133.7	79.9	86.2	66.59
132	80	26.0	133.0	79.0	27.0	132.4	133.7	75.7	82.4	70.58
132	71	30.5	133.0	70.0	31.5	132.4	133.7	66.2	73.9	78.85
132	65	33.5	133.0	64.0	34.5	132.3	133.7	59.9	68.1	83.81
140	120	10.0	141.3	118.7	11.3	140.6	142.0	116.4	121.0	36.23
140	118	11.0	141.3	116.7	12.3	140.6	142.0	114.2	119.2	39.13
140	112	14.0	141.3	110.7	15.3	140.6	142.0	108.0	113.4	47.54
140	106	17.0	141.3	104.9	18.2	140.6	142.0	102.2	107.6	55.25
140	100	20.0	141.3	98.9	21.2	140.6	142.0	96.0	101.8	62.79
140	95	22.5	141.3	93.9	23.7	140.6	142.0	90.8	97.0	68.73
140	90	25.0	141.3	88.9	26.2	140.6	142.0	85.6	92.2	74.37
140	80	30.0	141.3	78.9	31.2	140.6	142.0	75.0	82.8	84.72
140	70	35.0	141.3	68.9	36.2	140.6	142.0	64.6	73.2	93.83
140	65	37.5	141.3	63.9	38.7	140.6	142.0	59.4	68.4	97.92
150	125	12.5	151.5	123.7	13.9	150.8	152.3	121.2	126.3	47.17
150	122	14.0	151.5	120.9	15.3	150.8	152.3	118.2	123.7	51.39
150	118	16.0	151.5	116.9	17.3	150.8	152.3	114.0	119.9	57.26
150	112	19.0	151.5	110.9	20.3	150.8	152.3	107.9	114.0	65.68
150	106	22.0	151.5	104.9	23.3	150.8	152.3	101.8	108.1	73.67
150	100	25.0	151.5	98.9	26.3	150.8	152.3	95.6	102.3	81.20
150	95	27.5	151.5	93.9	28.8	150.8	152.3	90.3	97.6	87.15
150	90	30.0	151.5	88.9	31.3	150.8	152.3	85.1	92.8	92.78
150	80	35.0	151.5	78.9	36.3	150.8	152.3	74.6	83.3	103.1
150	75	37.5	151.5	73.9	38.8	150.8	152.3	69.4	78.5	107.8
160	136	12.0	161.6	134.6	13.5	160.8	162.4	131.9	137.3	49.31
160	132	14.0	161.6	130.6	15.5	160.8	162.4	127.8	133.4	55.85
160	125	17.5	161.6	123.6	19.0	160.8	162.4	120.8	126.4	66.82
160	122	19.0	161.6	120.8	20.4	160.8	162.4	118.0	123.6	71.04
160	118	21.0	161.6	116.8	22.4	160.8	162.4	113.8	119.8	76.90
160	112	24.0	161.6	110.8	25.4	160.8	162.4	107.4	114.2	85.32
160	105	27.5	161.6	103.8	28.9	160.8	162.4	100.1	107.5	94.58
160	100	30.0	161.6	98.8	31.4	160.8	162.4	94.8	102.8	100.8
160	95	32.5	161.6	93.8	33.9	160.8	162.4	89.6	98.0	106.8

Tab. 5 HOT ROLLING - table continued

Nom. sizes			EXECUTION DIMENSIONS							
OD	ID	WT	OD	ID	WT	Oadmin	Odmax	ldmin	ldmax	Weight
160	90	35.0	161.6	88.8	36.4	160.8	162.4	84.4	93.2	112.4
160	80	40.0	161.6	78.8	41.4	160.8	162.4	74.0	83.6	122.7
170	145	12.5	171.7	143.5	14.1	170.9	172.6	140.7	146.4	54.80
170	140	15.0	171.7	138.5	16.6	170.9	172.6	135.7	141.4	63.49
170	135	17.0	171.7	134.5	18.6	170.9	172.6	131.7	137.4	70.23
170	130	20.0	171.7	128.7	21.5	170.9	172.6	125.7	131.8	79.64
170	126	22.0	171.7	124.7	23.5	170.9	172.6	121.5	128.0	85.89
170	118	26.0	171.7	116.7	27.5	170.9	172.6	113.1	120.4	97.80
170	110	30.0	171.7	108.7	31.5	170.9	172.6	104.7	112.8	108.9
170	100	35.0	171.7	98.7	36.5	170.9	172.6	94.3	103.2	121.7
170	90	40.0	171.7	88.7	41.5	170.9	172.6	83.9	93.6	133.3
180	150	15.0	181.8	148.4	16.7	180.9	182.7	145.5	151.3	68.00
180	145	17.5	181.8	143.4	19.2	180.9	182.7	140.4	146.4	76.99
180	140	20.0	181.8	138.6	21.6	180.9	182.7	135.5	141.7	85.34
180	135	22.5	181.8	133.6	24.1	180.9	182.7	130.3	136.9	93.73
180	130	25.0	181.8	128.6	26.6	180.9	182.7	125.0	132.2	101.8
180	125	27.5	181.8	123.8	29.0	180.9	182.7	120.0	127.6	109.3
180	112	34.0	181.8	110.6	35.6	180.9	182.7	106.1	115.1	128.4
180	100	40.0	181.8	98.6	41.6	180.9	182.7	93.6	103.6	143.8
190	160	15.0	191.0	155.8	17.6	189.6	192.4	150.9	160.7	75.26
190	155	17.5	191.0	151.8	19.6	189.6	192.4	146.5	157.1	82.85
190	150	20.0	191.0	146.8	22.1	189.6	192.4	141.0	152.6	92.05
190	146	22.0	191.0	142.8	24.1	189.6	192.4	136.6	149.0	99.20
190	140	25.0	191.0	136.4	27.3	189.6	192.4	129.6	143.2	110.2
190	132	29.0	191.0	127.6	31.7	189.6	192.4	120.0	135.2	124.5
190	120	35.0	191.0	115.0	38.0	189.6	192.4	107.6	122.4	143.4
190	118	36.0	191.0	112.4	39.3	189.6	192.4	104.8	120.0	147.0
190	106	42.0	191.0	100.0	45.5	189.6	192.4	91.4	108.6	163.3
200	170	15.0	203.0	168.2	17.4	201.5	204.5	163.3	173.1	79.64
200	165	17.5	203.0	162.2	20.4	201.5	204.5	156.7	167.7	91.87
200	160	20.0	203.0	157.0	23.0	201.5	204.5	150.9	163.1	102.1
200	155	22.5	203.0	151.8	25.6	201.5	204.5	145.3	158.3	112.0
200	150	25.0	203.0	146.6	28.2	201.5	204.5	139.5	153.7	121.6
200	140	30.0	203.0	135.6	33.7	201.5	204.5	127.5	143.7	140.7
200	130	35.0	203.0	124.8	39.1	201.5	204.5	117.1	132.5	158.0
200	126	37.0	203.0	120.4	41.3	201.5	204.5	112.3	128.5	164.7
200	120	40.0	203.0	114.0	44.5	201.0	205.0	105.0	123.0	173.9
212	180	16.0	214.1	177.7	18.2	212.5	215.7	172.5	182.9	87.93
212	175	18.5	214.1	172.7	20.7	212.5	215.7	167.1	178.3	98.73
212	170	21.0	214.1	167.7	23.2	212.5	215.7	161.5	173.9	109.2
212	160	26.0	214.1	157.7	28.2	212.5	215.7	150.5	164.9	129.3
212	150	31.0	214.1	145.3	34.4	212.5	215.7	136.9	153.7	152.4
212	140	36.0	214.1	134.7	39.7	212.5	215.7	126.9	142.5	170.7
212	130	41.0	214.1	124.1	45.0	212.5	215.7	115.3	132.9	187.7
212	125	43.5	214.1	118.3	47.9	212.5	215.7	110.0	127.0	196.3

Tab. 5 HOT ROLLING - table continued

Nom. sizes			EXECUTION DIMENSIONS							
OD	ID	WT	OD	ID	WT	Oadmin	Odmax	ldmin	ldmax	Weight
212	112	50.0	214.1	104.7	54.7	212.5	215.7	50.35	59.05	215.0
212	102	55.0	214.1	94.1	60.0	212.5	215.7	55.20	64.80	228.0
224	180	22.0	226.2	177.6	24.3	224.5	227.9	21.90	26.70	121.0
224	170	27.0	226.2	166.6	29.8	224.5	227.9	26.85	32.75	144.3
224	160	32.0	226.2	155.8	35.2	224.5	227.9	31.70	38.70	165.8
224	144	40.0	226.2	138.2	44.0	224.5	227.9	40.50	47.50	197.7
224	132	46.0	226.2	125.2	50.5	224.5	227.9	46.50	54.50	218.8
224	124	50.0	226.2	117.2	54.5	224.5	227.9	50.15	58.85	230.8
224	120	52.0	226.2	112.4	56.9	224.5	227.9	52.40	61.40	237.6
224	114	55.0	226.2	105.8	60.2	224.5	227.9	55.40	65.00	246.4
236	204	16	238.4	200.6	18.9	236.6	240.2	17.01	20.79	102.3
236	196	20	238.4	191.8	23.3	236.6	240.2	20.97	25.63	123.6
236	190	23	238.4	185	26.7	236.6	240.2	24.03	29.37	139.4
236	180	28	238.4	176.6	30.9	236.6	240.2	27.81	33.99	158.1
236	170	33	238.4	168	35.2	236.6	240.2	31.68	38.72	176.4
236	160	36	238.4	155.4	41.5	236.6	240.2	37.35	45.65	201.5
236	156	40	238.4	152.6	42.9	236.6	240.2	38.61	47.19	206.8

Note: Nominal sizes are assured by machining with OD centring for a finished part length of maximum 3 x OD or maximum 200 mm (whichever is smaller).