



# ARTROM STEEL TUBES S.A.

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 Subscribed and Paid Share Capital: 291.587.538,34 lei

## 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 partially replaced by EN 10210);
- EN 10297-1;
- EN 10210-1, 2;
- EN 10216-1, 3;
- ASTM A519;
- ASTM A105.

### 2. Used for

- Mechanical application;
- General engineering purposes

### 3. Dimensions

Hot or Cold rolled tubes acc. DIN 2448 or EN 10297-1 or EN 10210-2 or ASME B36.10M in dimensional range corresponding to the workshop CPE (Tab.1.1 and Tab.1.2) or ASSEL (Tab.2 and Tab.3) or Cold rolling and drawing (Tab.4.1 and Tab.4.2);

Cold rolled tubes for machining acc. ISO 2938 Tab.5;

Hot rolled tubes for machining acc. ISO 2938 Tab.6;

Quenching and tempering dimensional range Tab. 7.

### 4. Tolerances

Standard	Outside Diameter	Tolerances	Wall Thickness	Tolerances	Weight
DIN 1629, DIN 1630	$OD \leq 130$	$\pm 1\%$ (but $\pm 0.5\text{mm}$ is permitted)	$WT \leq 2Sn$ $2Sn < WT \leq 4Sn$ $WT > 4Sn$	+15/-10% +12.5/-10% $\pm 9\%$	+12/-8% for each tube +10/-5% for lots over 10 t
	$130 < OD \leq 244.5$		$WT \leq 0.05OD$ $0.05OD < WT \leq 0.11OD$ $WT > 0.11OD$	+17.5/-12.5% $\pm 12.5\%$ $\pm 10\%$	
EN 10210-1,2		$\pm 1\%$ sau $\pm 0.5\text{mm}$ (which is higher)		-10%	+8% / -6%
EN 10297-1, EN 10216-1		$\pm 1\%$ sau $\pm 0.5\text{mm}$ ( which is higher )		$\pm 12.5\%$ sau $\pm 0.4\text{mm}$ ( which is higher )	-
EN 10297-1 (S690G2QL1 , S770QL, S890QL1)		$OD = + / - 0.8\%$		$WT = + / - 10\%$	-
EN 10216-3- hot rolled		$\pm 1\%$ or $\pm 0.5\text{mm}$ ( which is higher )		$\pm 12.5\%$ or $\pm 0.4\text{mm}$ ( which is higher )	-
EN 10216-3-hot rolled		$\pm 0.5\%$ or $\pm 0.3\text{mm}$ ( which is higher )		$\pm 10\%$ or $\pm 0.2\text{mm}$ ( which is higher )	-

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LRQA:  
ISO 9001  
ISO 14001  
ISO 45001

LRQA:  
IATF 16949

TUV:  
PED/AD-2000 W0/W4  
Vd TUV

TUV CPR:  
EN 10210-1,2  
EN 10255

DNV  
RINA  
LR

Standard	Outside Diameter	Tolerances	Wall Thickness	Tolerances	Weight
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			
ASTM A519, hot rolled	As agreed				
Sn - Nominal wall thickness according to DIN 2448					

### 5. Chemical Composition

Steel group	C	Mn	P	S	N	Cr	Si	Mo	Al	Ni	V	Cu	Nb	Ti	W
	[%]														
St37.0, St37.4, S235, P195, P235, P275, E235, C10E, C15E, 1010	max. 0.17		max. 0.040	max. 0.040	max. 0.009										
St44.0, St44.4, S275, P265, E 275, 1020	max. 0.21		max. 0.040	max. 0.040	max. 0.009										
St52.0, St52.4, S355, E355, P265, P355, Fe510, OL52.3,1022	max. 0.22	max. 1.70	max. 0.040	max. 0.035			max. 0.60		min. 0.020						
C45, C35E, , 1035, 1045	max. 0.50	max. 0.9	max. 0.040	max. 0.040			max. 0.40								
16MnCr5	0.14-0.19	1.0-1.3	max. 0.035	max. 0.035		0.8-1.1	max. 0.4								
4140, 42CrMo4	0.38-0.43	0.75-1.0	max. 0.040	max. 0.040		0.8-1.1	0.15-0.30	0.15-0.25							
4130	0.28-0.33	0.4-0.6	max. 0.040	max. 0.040		0.8-1.1	0.15-0.35	0.15-0.25							
20MnV6, E470	0.16-0.22	1.3-1.7	max. 0.03	max. 0.035	max. 0.02		0.1-0.50		min. 0.01						
S690G2QL1	0.14-0.18	1.20-0.70	max. 0.016	max. 0.005	max. 0.009	0.50-0.80	0.20-0.30	0.20-0.40	0.015-0.030	max. 0.25	0.06-0.12	max. 0.25	max. 0.05	max. 0.05	0.10-0.70
S770QL	0.14-0.18	1.40-1.70	max. 0.016	max. 0.005	max. 0.0090	0.50-0.70	0.20-0.30	0.20-0.40	0.020-0.030	0.20-0.25	0.06-0.12	max. 0.25	max. 0.05	max. 0.05	
S890QL1	0.14-0.21	max. 1.75	max. 0.020	max. 0.010	max. 0.020	max. 1.10	0.10-0.50	0.20-0.80	0.015-0.050	max. 1.70	max. 0.15	max. 0.35	max. 0.05	max. 0.05	max. 1.30

### 6. Mechanical Properties

Steel group	Tensile Strength [N/mm <sup>2</sup> ]	Yield Limit [N/mm <sup>2</sup> ]	Elongation min. [%]	Impact test Average on three sample min. [J]
St37.0, St37.4, S235, P195, P235, P275, E235, C10E, C15E, 1010	350-480	min 235	25	
St44.0, St44.4, S275, P265, E 275, 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, 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	

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TUV:  
PED/AD-2000 W0/W4  
Vd TUV

TUV CPR:  
EN 10210-1,2  
EN 10255

DNV  
RINA  
LR

<b>S690G2QL1</b>	WT≤40: 770-960 40<WT≤65: 700-880	WT≤40: min. 690 40<WT≤50: min. 650 50<WT≤65: min. 615	16 long/14 transv.	at T=-60°C WT≤20: 40 long/20 transv 20<WT≤40: 30 long/20 transv 40<WT≤65: 25 long.
<b>S770QL</b>	WT≤20: 820-1000 20<WT≤32: 770-980 32<WT≤40: 770-950 40<WT≤50: 720-950	WT≤20: min. 770 20<WT≤25: min. 740 25<WT≤32: min. 720 32<WT≤40: min. 700 40<WT≤50: min. 670	15 long/13 transv	at T=-60°C WT≤20: 40 long/27 transv 20<WT≤65: 30 long/27 transv
<b>S890QL1</b>	12≤WT≤20: 960-1100 20<WT≤40: 920-1070 40<WT≤50: 870-1040 50<WT≤65: 870-1040	12≤WT≤20: min. 890 20<WT≤40: min. 850 40<WT≤50: min. 820 50<WT≤65: min. 800	14 long/12 transv	at T=-45°C 12≤WT≤20: 45 long 20<WT≤65: 40 long

## 7. Lengths

- Random lengths: 4÷12m (13.12÷39.7 ft) or Fixed lengths within the random length in length range corresponding to the workshop CPE (Tab.1) or ASSEL (Tab.2 and Tab.3) or Cold rolling and drawing (Tab.4 and Tab.8).

## 8. Protection

- Unprotected;
- External varnished with black or clear lacquer;
- If required, the tubes can be delivered with plastic plugs 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:

TUV-PED, AD; CE; DNV; RINA; ZUS, UHP