



Z-Group Steel Holding, a.s.



ŽELEZÁŘNY
VESELÍ



ŽELEZÁŘNY
HRÁDEK



POLDI



VÁLCOVNY TRUB
CHOMUTOV

www.steel-holding.cz



TUBES - HOT EXTRUDED
BARS
SPECIAL PROFILES
INGOTS



TUBES - SEAMLESS CARBON & ALLOY STEEL



TUBES - COLD DRAWN
- WELDED
- ZINC DIPPING
SPECIAL PROFILES

SYSTEM AND PRODUCT CERTIFICATES:



SYSTEM:

- EN ISO 9001
- EN ISO 14001

PRODUCT:

- API 5L
- CPD EN 10210
- PED 97-23 AD-2000 Merkblatt W 0
- Lloyd's Register EMEA
- Bureau Veritas
- Det Norske Veritas
- IBR
- GOST 8731-74
- Razreshenie TU-14-3R-55-2001
- Razreshenie EN 10216 and ASME SA335



SYSTEM:

- EN ISO 9001

PRODUCT:

- PED 97-23 AD-2000 Merkblatt W 0
- DVGW
- EN 10219
- EN 10255
- CE 0045 CPD 0940



SYSTEM:

- EN ISO 9001

PRODUCT:

- Det Norske Veritas
- PED 97-23 AD-2000 Merkblatt W 0



VÁLCOVNÝ TRUB CHOMUTOV

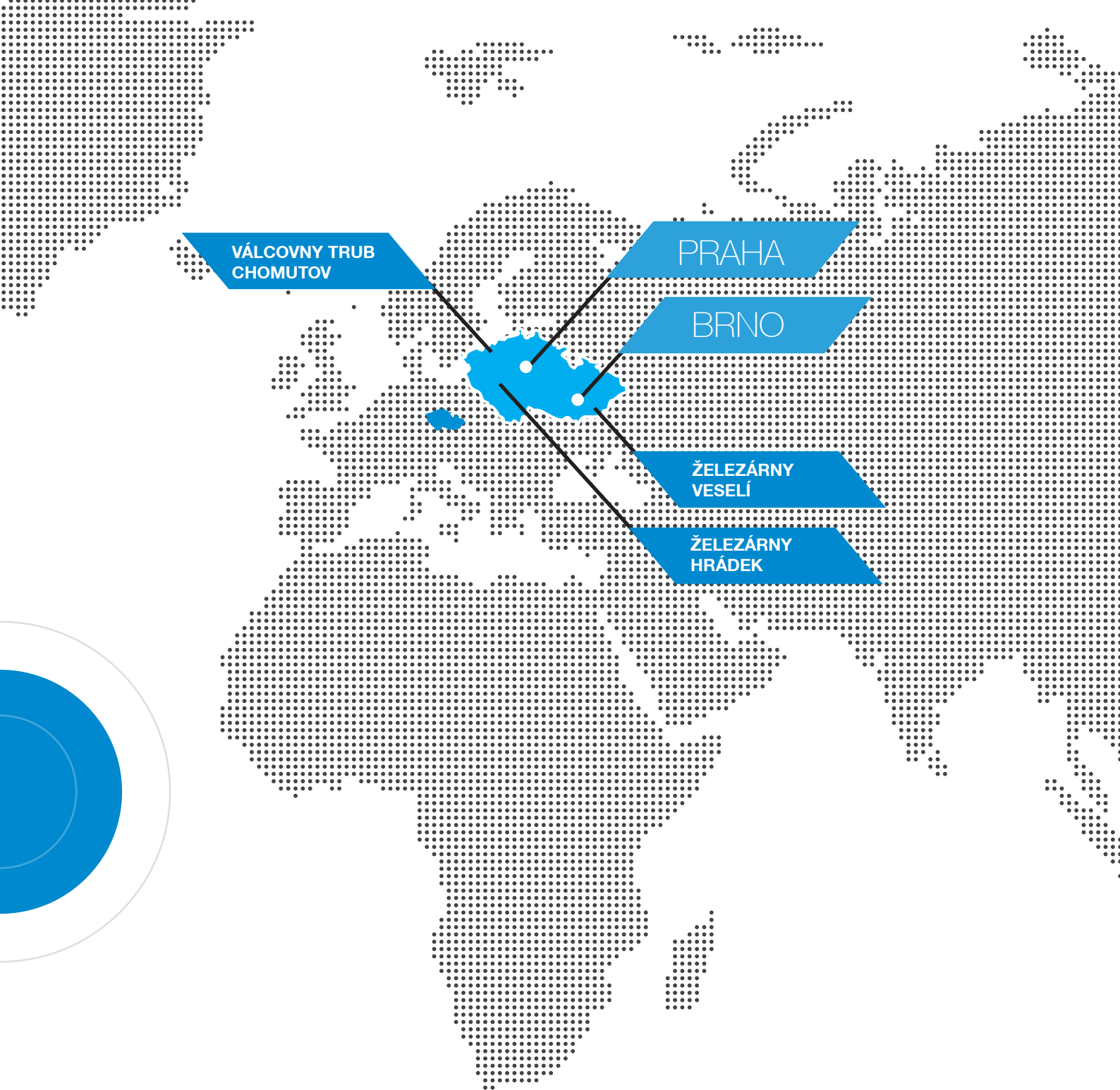
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Z-Group Steel Holding, a.s.

Z-GROUP Steel holding is the noteworthy successor of a long tradition of Czech-Moravian metallurgical and ironworking companies, including:

Válcovny trub Chomutov

founded by the Mannesmann company
in 1890

Železářny Hrádek

founded by entrepreneur Rudolf
Hudlický in 1900

Železářny Veselí

founded in 1962

We are engaged in the manufacturing and processing of:

TUBES - seamless steel hot rolled, steel welded and cold drawn, hot extruded

BARS - steel cold drawn, peeled, bright

SPECIAL PROFILES - steel thin walled

INGOTS - square, rounded, polygonal

Our products are exported to more than 45 countries worldwide, to customers in the following industries: power engineering, the chemical industry, extraction of mineral resources, construction, engineering and the automotive industry.





**VÁLCOVNY TRUB
CHOMUTOV**

Seamless carbon steel tubes - standards EN / DIN / CSN / GOST

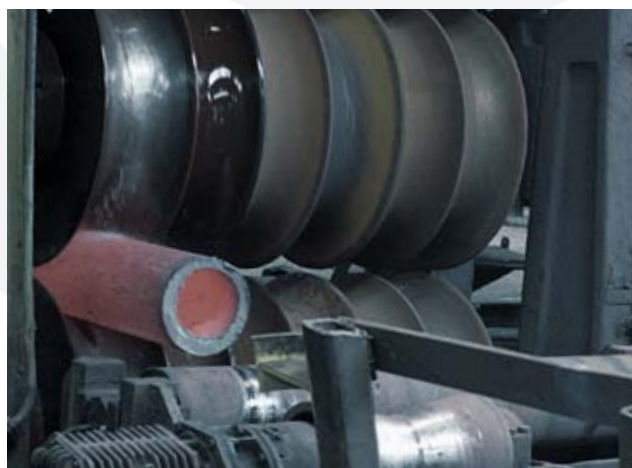
EN 10216	PART 1	PART 2	PART 3	PART 4
STEEL GRADE	P195	P195GH	P275NL1/NL2	P215NL
	P235	P235GH	P355N/NH	P265NL
	P265	P265GH	P355NL1/NL2	
PART 1:	Tubes can be delivered either in quality grade TR1 or TR2.			
PART 2, 3, 4:	Tubes can be delivered in test categories TC1 or TC2.			
EN 10225				
STEEL GRADE	S355G1+N	S355G14+N	S355G15+N	
EN 10210-1, 2				
STEEL GRADE	S235JRH	275J0H	S355J0H	S355K2H
		S275J2H	S355J2H	S355NH
				S355NLH
EN 10297-1	PART 1			
STEEL GRADE	E235, E275, E275K2 E315, E355, E355K2			

20MNV6/1.5217 MECHANICAL PROPERTIES

$R_{e \min}$ = 410 MPa
 $R_{m \min}$ = 550 MPa
 A = 18 %

C	MN	SI	P	S	V
0.16 – 0.22	1.30 – 1.70	0.10 – 0.50	max. 0.030	max. 0.030*	0.10 – 0.20

DIN 1629				
STEEL GRADE	St 37.0	St 44.0	St 52.0	
DIN 17121 // EN 10220				
STEEL GRADE	RSt 37-2	St 44-2	St 52-3	
	St 37-3	St 44-3		
ČSN 42 0250 // ČSN 42 0251				
STEEL GRADE	11 353	11 503	12 021	12 040
	11 453	11 523	12 022	
GOST 8731 // GOST 8732 // GOST 19281				
STEEL GRADE	10, 20			
	09G2S with yield limit up to 345 MPa			
ISO 3183				
STEEL GRADE		L245NE (BNE)		
		L290NE (X42NE)		
		L360NE (X52NE)		
		L415NE (X60NE)		



Outside diameter [mm]	WALL THICKNESS [mm]																											
	10	11	12,5	14,2	16	17,5	20	22,2	25	28	30	32	36	40	45	50	50,8	52,0	54,0	55,0	58,0	60	62	65	68	70	72	
273																												
279																												
298,5																												
305																												
318																												
323,9																												
330																												
343																												
355,6																												
368																												
394																												
406,4																												
419																												
426																												
445																												
457																												
470																												
495																												
508																												
521																												
530																												
546																												
559																												
572																												
610																												

For steel grade **20MNV6** minimal wall thickness of tube: 28 mm

LENGTH RANGE	Random - up to 14 m Fixed - after agreement with tolerance -0/+50 mm
TUBE ENDS	Plain or after agreement with bevel 30° +5°/-0° or 37,5° +/-2,5° in the whole wall thickness range. After agreement tube ends can be protected by plastic caps or plastic bevel protectors.
SURFACE	Bare or outside surface protected by transparent or black lacquer as short time corrosion protection. For EN ISO 3183 outside and inside surface with non-destructive testing acc to EN ISO 10893-10 U3/C and EN ISO 10893-8.
PACKING	Tubes are delivered loosed.
CERTIFICATION	In accordance with EN 10204 either in English, German, French or Russian languages. NOTE: The manufacturer's certified QA system has undergone a specific assessment as per PED 97/23/EC
MARKING	In accordance with standard and customer's requirements.



EN 10216	Seamless steel tubes for pressure purposes - Technical delivery conditions
PART 1:	Non-alloy steel tubes with specified room temperature properties
PART 2:	Non-alloy and alloy steel tubes with specified elevated temperature properties
PART 3:	Alloy fine grain steel tubes
PART 4:	Non-alloy and alloy steel tubes with specified low temperature properties
EN 10225	Weldable structural steels for fixed offshore structures - Technical delivery conditions
EN 10210-1, 2	Hot finished structural hollow section of non-alloy and fine grain structural steels
	Technical delivery requirements and dimensions
EN 10297-1	Seamless circular steel tubes for mechanical and general engineering purposes
	Technical delivery conditions
PART 1:	Non-alloy and alloy steel tubes
DIN 1629	Hot formed seamless steel tubes from non-alloy steels with special quality requirements
	Technical and delivery conditions
DIN 17121	Seamless steel circular tubes for structural engineering purposes
EN 10220	Seamless and welded steel tubes - Dimension and masses per unit length
ČSN 42 0250	Hot formed seamless tubes
ČSN 42 0251	Seamless steel tubes with specified elevated temperature properties
GOST 8731	Hot rolled seamless steel tubes. Technical conditions
GOST 8732	Hot rolled seamless steel tubes. Assortment.
GOST 19281	Rolled material from steel with higher strength
ISO 3183	Oil and gas industry - steel pipes for linepipes



Seamless carbon steel tubes - standards ASTM / ASME / API 5L

	ASTM A53 / ASME SA53	ASTM A106 / ASME SA106	ASTM A252 / ASME SA252	ASTM A333 / ASME SA333
STEEL GRADE	A	A	Gr 2	Gr 1
	B	B	Gr 3	Gr 6
		C		

Manufacturer is authorized to use monogram API Spec. 5L - Licence number 5L - 0286.

API 5L	PSL 1	PSL 2
STEEL GRADE	A	BN
	B	X42N
	X42	X52N
	X46	X60N

standard pressure up to 20.5 MPa (2 970 psi)

Outside diameter	WALL THICKNESS																																		
	inch	0,375	0,438	0,500	0,562	0,625	0,688	0,750	0,812	0,844	0,875	1,000	1,125	1,188	1,250	1,406	1,438	1,500	1,594	1,781	1,969	2,000	2,062	2,125	2,200	2,283	2,344	2,441	2,500	2,559	2,677	2,756	2,835		
mm	NPS	mm	9,53	11,13	12,70	14,27	15,88	17,48	19,05	20,62	21,44	22,23	25,40	28,58	30,18	31,75	35,71	36,53	38,10	40,49	45,24	50,01	50,80	52,37	53,98	55,88	58,00	59,54	62,00	63,50	65,00	68,00	70,00	72,00	
273	10																																		
323,8	12																																		
355,6	14																																		
406,4	16																																		
457	18																																		
508	20																																		
559	22																																		
610	24																																		

LENGTH RANGE	Random - up to 14 m Fixed - after agreement with tolerance -0/+50 mm
TUBE ENDS	Plain or after agreement with bevel 30° +5°/-0° or 37,5° +/-2,5° in the whole wall thickness range. For wall thickness over 22 mm also bevels 37,5°/10° ± 2,5° (acc ASTM/ANSI B16.25/ASME B16.25/ASME B16.9). After agreement tube ends can be protected by plastic caps or plastic bevel protectors.
SURFACE	Bare or outside surface protected by transparent or black lacquer as short time corrosion protection. After agreement with non-destructive testing acc to ASTM E213. Pipes acc PSL2 always with non-destructive testing acc to ASTM E213.
PACKING	Tubes are delivered loosed.
CERTIFICATION	In accordance with EN 10204 either in English or German languages.
MARKING	In accordance with standard and customer's requirements.

ASTM A53 / ASME SA53	Standard specification for pipe, steel, black and hot-dipped, zinc-coated, welded and seamless
ASTM A106 / ASME SA106	Standard specification for seamless carbon steel pipe for high-temperature service
ASTM A252 / ASME SA252	Standard specification for welded and seamless steel pipe piles
ASTM A333 / ASME SA333	Standard specification for seamless and welded steel pipe for low-temperature
API 5L	Specification for linepipes

Seamless boiler steel tubes - standards EN / DIN / TU

EN 10216-2 TC2 // EN 10 220 // DIN 17175 // III // DIN 2448	
STEEL GRADE	P235GH, P265GH, 16Mo3, 14MoV6-3, 13CrMo4-5, 10CrMo9-10, 13CrMo4-4, 15NiCuMoNb5-6-4, St35.8, St45.8, 15Mo3
STEEL GRADE	X10CrMoVNb9-1
TU-14-3R-55-2001	
STEEL GRADE	20, 12 CH1MF, 15GS, 15CHM, 15CH1M1F
ČSN 42 0251	
STEEL GRADE	12022, 15 020, 15 121, 15 128, 15 313

Outside diameter [mm]	WALL THICKNESS [mm]																						
	17,5	20	22,2	25	28	30	32	36	40	45	50	50,8	52,0	54,0	55,0	58,0	60	62	65	68	70	72	
273																							
279																							
298,5																							
305																							
318																							
323,9																							
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495																							
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521																							
530																							
546																							
559																							
572																							
610																							

Only steel grades P235GH, P265GH, 16Mo3 / St35.8, St45.8, 15Mo3, 20, 15020

VALID FOR STEEL GRADE X10CRMVNB9-1

Outside diameter [mm]	WALL THICKNESS [mm]							
	22,2	25	28	30	32	36	40	45
273								
323,9								
355,6								
406,4								

LENGTH RANGE	Random - up to 11 (12) m Fixed - after agreement with tolerance -0/+50 mm
TUBE ENDS	Plain or after agreement with bevel 30° +5°/-0° or 37,5° +/-2,5° in the whole wall thickness range. After agreement tube ends can be protected by plastic caps or plastic bevel protectors.
SURFACE	Descaled on outside and inside surface by grinding or pickling with non-destructive testing acc EN ISO 10893-10 or SEP 1915. Outside surface can be protected by transparent or black lacquer as short time corrosion protection.
PACKING	Tubes are delivered loosed.
CERTIFICATION	In accordance with EN 10204 in English, German, French or Russian languages. NOTE: The manufacturer's certified QA system has undergone a specific assessment as per PED 97/23/EC and per AD 2000 Merkblatt W0/TRD100.
MARKING	In accordance with standard and customer's requirements.

EN 10216-2	Seamless steel tubes for pressure purposes - non-alloy and alloy steel tubes with specified elevated temperature
EN 10 220	Seamless and welded steel tubes - dimensions and masses per unit length
DIN 17175	Seamless steel tubes for high temperature
DIN 2448	Seamless and welded steel tubes - dimensions and masses per unit length
TU-14-3R-55-2001	Seamless steel tubes for pressure purposes. Technical conditions
ČSN 42 0251	Seamless steel tubes with specified elevated temperature properties



Seamless boiler steel tubes - standards ASTM A335 / ASME SA335

ASTM A335 // ASME SA 335 // ASTM A 999	
STEEL GRADE	P 1, P 2, P 11, P 12, P 22, P 36, P5, P91
LENGTH RANGE	Random - up to 11 (12) m Fixed - after agreement with tolerance -0/+50 mm
TUBE ENDS	Plain or after agreement with bevel 30° +5°/-0° in the whole wall thickness range. After agreement tube ends can be protected by plastic caps or plastic bevel protectors.
SURFACE	Descaled on outside and inside surface by grinding or pickling with non-destructive testing acc ASTM E213. Outside surface can be protected by transparent or black lacquer as short time corrosion protection.
PACKING	Tubes are delivered loosed.
CERTIFICATION	In accordance with EN 10204 in English or German languages. NOTE: The manufacturer's certified QA system has undergone a specific assessment as per PED 97/23/EC.
MARKING	In accordance with standard and customer's requirements.

Outside diameter		WALL THICKNESS																													
		inch	0,688	0,750	0,812	0,875	1,000	1,062	1,125	1,188	1,250	1,312	1,375	1,406	1,438	1,562	1,750	1,969	2,000	2,062	2,125	2,200	2,283	2,344	2,441	2,500	2,559	2,677	2,756	2,835	
mm	NPS	mm	17,48	19,05	20,62	22,23	25,4	26,97	28,58	30,18	31,75	33,32	34,93	35,71	36,53	39,67	44,45	50,01	50,8	52,37	53,98	55,88	58,00	59,54	62,00	63,50	65,00	68,00	70,00	72,00	
273	10																														
323,8	12																														
355,6	14																														
406,4	16																														
457	18																														
508	20																														
559	22																														
610	24																														

Only for steel grades P1, P2

Valid for steel grade P5 and P91

Outside diameter		WALL THICKNESS													
		inch	0,875	1,000	1,062	1,094	1,125	1,188	1,250	1,312	1,375	1,406	1,438	1,562	1,750
mm	NPS	mm	22,23	25,4	26,97	27,79	28,58	30,18	31,75	33,32	34,93	35,71	36,53	39,67	44,45
273,1	10														
323,8	12														
355,6	14														
406,4	16														

ASTM A335 // ASME SA335	Standard specification for seamless ferritic alloy-steel pipe for high temperature service
ASTM A 999	Specification for General requirements for specialized alloy and stainless steel pipe



44043 SK 33







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Steel tubes for precise use

Welded cold calibrated tubes

DS	ČSN EN 10305-3	TDC	ČSN EN 10305-3
DS	ČSN 426713	TDC	ČSN 420142
DS	DIN 2394-1	TDC	DIN 2394-2
DS	ŽV 426715	TDC	ŽV 426715

Welded cold drawn tubes

DS	ČSN EN 10305-2	TDC	ČSN EN 10305-2
DS	ČSN 426714	TDC	ČSN 420142
DS	DIN 2393-1	TDC	DIN 2393-2
DS	GOST 10707	TDC	GOST 10707

Seamless cold drawn tubes

DS	ČSN EN 10305-1	TDC	ČSN EN 10305-1
DS	ČSN 426710	TDC	ČSN 420260
DS	ČSN 426711	TDC	ČSN 420260
DS	ČSN 426712	TDC	ČSN 420260
DS	DIN 2391-1	TDC	DIN 2391-2

Seamless cold drawn tubes for hydraulic and pneumatic systems

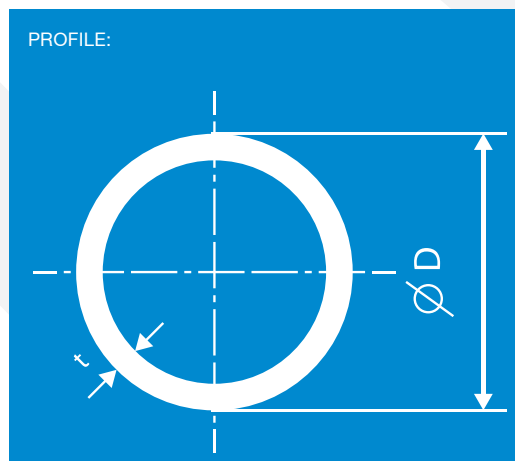
DS	ČSN EN 10305-4	TDC	ČSN EN 10305-4
DS	ČSN 426718	TDC	ČSN 426718
DS	DIN 2391-1	TDC	DIN 2391-2
DS	GOST 11017	TDC	GOST 11017

LIST OF STANDARD STEEL GRADES (other can be agreed too):

E195, E215, E235, E275, E355 AND ITS EQUIVALENT ACC TO STANDARDS DIN, ČSN, GOST



LIST OF STANDARD DIMENSIONS (other can be agreed too):



- A** welded VF - cold calibrated
- X** group A - welded DC
- B** welded - cold drawn
- C** seamless - cold drawn
- D** seamless - cold drawn for hydraulic systems
- dimensional compliance of drawn tubes of B, C, D groups - optional performance

Outside diameter	WALL THICKNESS - t																			
	[mm]																			
mm	0,7	0,8	1,0	1,2	1,3	1,5	1,8	2,0	2,2	2,3	2,5	2,6	2,8	3,0	3,2	3,5	3,8	4,0	4,5	5,0
6,0																				
8,0																				
9,0																				
10,0	X	X	X	X	X	X														
11,0																				
12,0	X	X	X	X	X	X	X	X												
14,0	X	X	X	X	X	X	X	X												
15,0																				
16,0		X	X	X	X	X	X	X												
18,0		X	X	X	X	X	X	X												
19,0			X	X	X	X	X	X												
20,0			X	X	X	X	X	X												
22,0			X	X	X	X	X	X												
25,0			X	X	X	X	X	X												
26,0			X	X	X	X	X	X												
27,0				X	X	X	X	X												
28,0			X	X	X	X	X	X												
30,0			X	X	X	X	X	X												
32,0			X	X	X	X	X	X												
33,0						X	X	X												
35,0						X	X	X												
38,0			X	X	X	X	X	X												
40,0			X	X	X	X	X	X												
42,0																				
45,0																				
48,0																				
50,0																				
51,0																				
55,0																				
60,0																				
63,0																				
70,0																				
76,0																				
83,0																				
89,0																				
95,0																				
100,0																				
105,0																				
110,0																				

Longitudinal welded steel tubes

Steel tubes, longitudinal welded, smooth (*)

DS	ČSN EN 10219-1	TDC	ČSN EN 10219-2
DS	ČSN EN 10296-1	TDC	ČSN EN 10296-2
DS	ČSN 425723	TDC	ČSN 420152
DS	DIN 1615, DIN 1626	TDC	DIN 2458
DS	GOST 10704		

Tubes made of non-alloy steels, suitable for welding and thread cutting (**)

DS	ČSN EN 10255 +A1	TDC	ČSN EN 10255 +A1
DS	ČSN 425710,11,12	TDC	ČSN 420142
DS	DIN 2440	TDC	DIN 2440
DS	GOST 3262	TDC	GOST 3262
DS	ASTM A53	TDC	ASTM A53
DS	NFA 49145	TDC	NFA 49145
DS	ISO 65	TDC	ISO 65

Welded steel tubes for pressure containers and equipment (***)

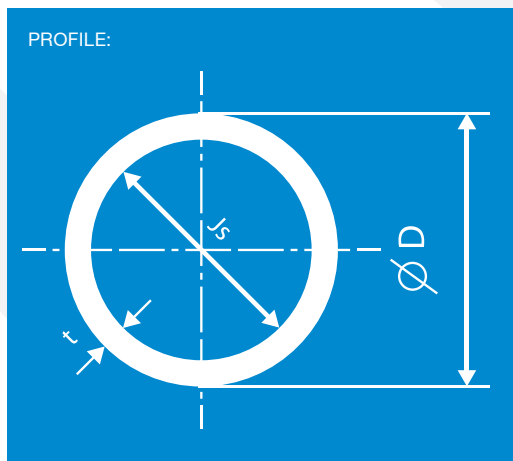
DS	ČSN EN 10217-1,2,3,4	TDC	ČSN EN 10217-1,2,3,4
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LIST OF STANDARD STEEL GRADES (other can be agreed too):

**S235JRH, S275JRH, S275JOH, S275J2H, S355JRH, S355JOH, S355JRH (*),
S195T(**), P195TR1, P195TR2, P235TR1, P235TR2, P265TR1, P265TR2 (***)
AND ITS EQUIVALENT ACC TO STANDARDS ČSN, DIN, GOST**



LIST OF STANDARD DIMENSIONS (other can be agreed too):



Outside diameter		WALL THICKNESS - t [mm]																
[mm]	[inch]	1,5	1,8	2,0	2,1	2,3	2,5	2,6	2,9	3,0	3,1	3,2	3,5	3,6	3,8	4,0	4,2	4,5
12,0																		
14,0																		
15,0																		
16,0																		
17,2	3/8"																	
18,0																		
20,0																		
21,3	1/2"																	
22,0																		
25,0																		
26,0																		
26,9	3/4"																	
28,0																		
30,0																		
32,0																		
33,7	1"																	
35,0																		
38,0																		
40,0																		
42,0																		
42,4	1 1/4"																	
45,0																		
48,0																		
48,3	1 1/2"																	
50,0																		
51,0																		
55,0																		
57,0																		
58,0																		
60,0																		
60,3	2"																	
70,0																		
76,1	2 1/2"																	
83,0																		
88,9	3"																	
102,0																		
108,0																		
114,3	4"																	

- E** tubes longitudinally welded - smooth
- F** suitable for thread cutting
- G** welded steel tubes for pressure containers and equipment
- dimensional compliance of welded tubes of E, G groups - optional performance



Welded steel profiles of non-circular cross section

Square and rectangular profiles - cold calibrated

DS	ČSN EN 10305-5	TDC	ČSN EN 10305-5
DS	ČSN EN 10219-1	TDC	ČSN EN 10219-2
DS	ČSN 426935-ČSN 426936	TDC	ČSN 420121
DS	DIN 2395-1	TDC	DIN 2395-2,3
DS	BS 6363	TDC	BS 6363
DS	GOST 8639, GOST 8645	TDC	GOST 8639

Square and rectangular profiles - cold drawn

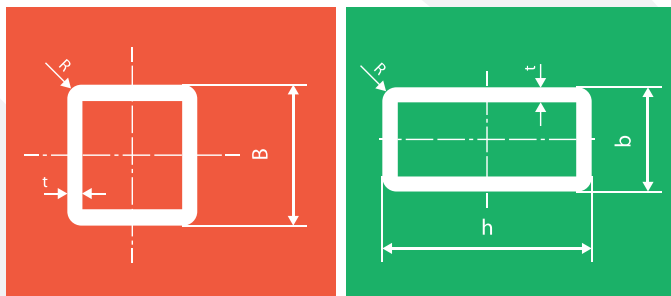
DS	ČSN EN 10305-5	TDC	ČSN EN 10305-5
DS	ČSN 426935-ČSN 426936	TDC	ČSN 420121
DS	DIN 2395-1	TDC	DIN 2395-2,3
DS	GOST 8639, GOST 8645	TDC	GOST 8639

LIST OF STANDARD STEEL GRADES (other can be agreed too):

**E155, E195, E235, S235JRH, S275JOH, S275J2H, E275, E355, S355JOH, S355J2H
AND ITS EQUIVALENT ACC TO STANDARDS ČSN, DIN, GOST, BS**



LIST OF STANDARD DIMENSIONS (other can be agreed too):



Outside diameter H [mm]	Outside diameter B [mm]	WALL THICKNESS - t [mm]								
		0,8	1,0	1,2	1,5	2,0	2,5	3,0	3,5	4,0
8,0	8,0									
10,0	10,0									
12,0	12,0									
14,0	14,0									
15,0	10,0									
	15,0									
16,0	16,0									
18,0	12,0									
	18,0									
19,0	19,0									
20,0	10,0									
	15,0									
	20,0									
25,0	10,0									
	15,0									
	20,0									
	25,0									
28,0	25,0									
	28,0									
30,0	10,0									
	15,0									
	18,0									
	20,0									
	25,0									
	30,0									
32,0	32,0									
34,0	34,0									
35,0	15,0									
	20,0									
	25,0									
	35,0									
38,0	38,0									
40,0	15,0									
	20,0									
	25,0									
	30,0									
	35,0									
	40,0									
45,0	20,0									
	25,0									

Outside diameter H	Outside diameter B	WALL THICKNESS - t [mm]									
		0,8	1,0	1,2	1,5	2,0	2,5	3,0	3,5	4,0	4,3
[mm]	[mm]										
45,0	35,0										
	45,0										
50,0	20,0										
	25,0										
	30,0										
	35,0										
	40,0										
	50,0										
52,0	40,0										
	52,0										
55,0	55,0										
60,0	20,0										
	30,0										
	40,0										
	60,0										
64,0	64,0										
65,0	25,0										
	30,0										
	40,0										
70,0	11,0										
	30,0										
	35,0										
	40,0										
	50,0										
	60,0										
80,0	30,0										
	35,0										
	40,0										
	50,0										
	60,0										
90,0	40,0										
100,0	30,0										
	34,0										
	35,0										
	40,0										
	60,0										
	80,0										
120,0	60,0										

- I range of cold drawn profiles
- H range of cold calibrated profiles
- dimensional compliance of I, H groups - optional performance

Thin wall special profiles

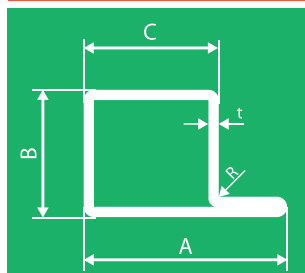
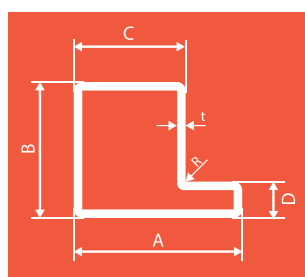
CLOSED PROFILES - WELDED

DS	ČSN 426930-FLAT OVAL	TDC	ČSN 420121
DS	ČSN 426931-ELLIPSE	TDC	ČSN 420121
DS	ČSN 426939-"L" PROFILE	TDC	ČSN 420121
DS	ČSN 426946-"T" PROFILE	TDC	ČSN 420121
DS	ŽV 426990	TDC	ČSN 420121

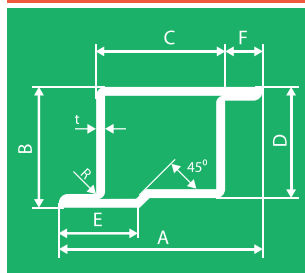
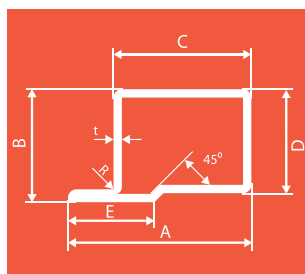
LIST OF STANDARD STEEL GRADES (other can be agreed too):

11320, 11321, 11343, 11373 AND ITS EQUIVALENT ACC TO STANDARDS EN, DIN, GOST, BS

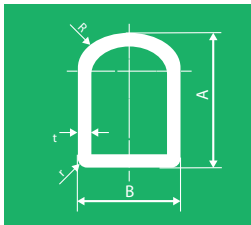
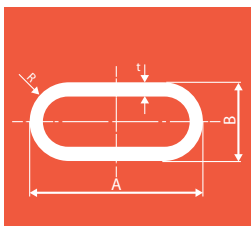
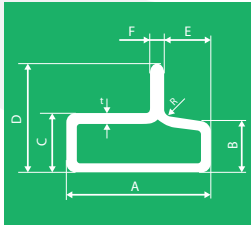
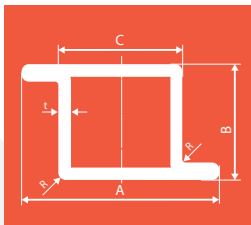
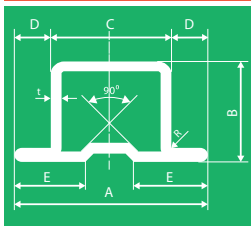
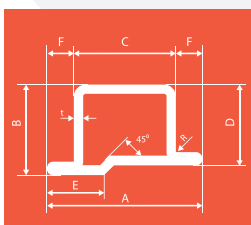
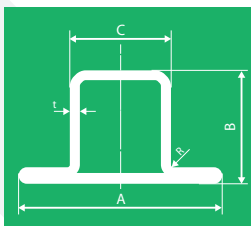
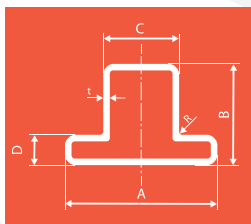
LIST OF STANDARD DIMENSIONS (other can be agreed too):



Profile number (spec)	OUTSIDE DIAMETER A	OUTSIDE DIAMETER B	OUTSIDE DIAMETER C	OUTSIDE DIAMETER D	OUTSIDE DIAMETER E	WALL THICKNESS T
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
3930115	50,0	37,0	37,0	12,0	x	1,5
3900716	36,0	37,0	25,0	12,0	x	1,6
3900712	36,0	37,0	25,0	12,0	x	1,3
3900715	36,0	37,0	25,0	12,0	x	1,5
3900915	32,0	26,5	20,0	3,5	x	1,5
3930220	35,0	34,0	20,0	3,0	x	2,0
3630320	49,0	34,0	34,0	3,0	x	2,0
3930420	55,0	34,0	40,0	3,0	x	2,0
3931020	60,0	40,0	40,0	5,0	x	2,0
3901320	70,0	34,0	55,0	3,0	x	2,0
3930520	85,0	34,0	70,0	3,0	x	2,0
3930620	95,0	34,0	80,0	3,0	x	2,0



Profile number (spec)	OUTSIDE DIAMETER A	OUTSIDE DIAMETER B	OUTSIDE DIAMETER C	OUTSIDE DIAMETER D	OUTSIDE DIAMETER E	OUTSIDE DIAMETER F	WALL THICKNESS T
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
4830120	35	38	20	34	20	x	2
4830220	49	38	34	34	25	x	2
4830320	55	38	40	34	25	x	2
4830420	70	38	55	34	25	x	2
4830520	85	38	70	34	25	x	2
4830620	95	38	80	34	25	x	2
4831320	50	38	20	34	25	15	2
4831420	64	38	38	34	25	15	2
4831520	70	38	40	34	25	15	2
4831620	85	38	55	34	25	15	2
4831720	100	38	70	34	25	15	2
4831820	110	38	80	34	25	15	2



Profile number (spec)	OUTSIDE DIAMETER A	OUTSIDE DIAMETER B	OUTSIDE DIAMETER C	OUTSIDE DIAMETER D	OUTSIDE DIAMETER E	WALL THICKNESS T
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
4630112	50,0	37,0	28,0	12,0	x	1,25
4600812	47,0	37,0	25,0	12,0	x	1,25
4601415	56,0	37,0	32,0	12,0	x	1,50
4630212	49,0	37,0	25,0	12,0	x	1,25
4601320	50,0	34,0	20,0	x	x	2,00
4630620	64,0	34,0	34,0	x	x	2,00
4630720	70,0	34,0	40,0	x	x	2,00
4630320	85,0	34,0	55,0	x	x	2,00
4630420	100,0	34,0	70,0	x	x	2,00
4630520	110,0	34,0	80,0	x	x	2,00
3930520	85,0	34,0	70,0	3,0	x	2,0
3930620	95,0	34,0	80,0	3,0	x	2,0

Profile number (spec)	OUTSIDE DIAMETER A	OUTSIDE DIAMETER B	OUTSIDE DIAMETER C	OUTSIDE DIAMETER D	OUTSIDE DIAMETER E	OUTSIDE DIAMETER F	WALL THICKNESS T
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
4830720	50	38	20	34	25	15	2
4830820	64	38	34	34	25	15	2
4830920	70	38	40	34	25	15	2
4831020	85	38	55	34	25	15	2
4831120	100	38	70	34	25	15	2
4831220	110	38	80	34	25	15	2
4831920	64	38	34	15	25	x	2
4832315	64	38	34	15	25	x	2

Profile number (spec)	OUTSIDE DIAMETER A	OUTSIDE DIAMETER B	OUTSIDE DIAMETER C	OUTSIDE DIAMETER D	OUTSIDE DIAMETER E	WALL THICKNESS T
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
3830120	50,0	34,0	20,0	x	x	2,0
3830220	64,0	34,0	34,0	x	x	2,0
3830320	70,0	34,0	40,0	x	x	2,0
3800320	85,0	34,0	55,0	x	x	2,0
3830420	100,0	34,0	70,0	x	x	2,0
3830520	110,0	34,0	80,0	x	x	2,0
3032215	40,0	20,0	10,0	x	x	1,5
3032220	40,0	20,0	10,0	x	x	2,0
3031715	50,0	20,0	10,0	x	x	1,5
3031315	50,0	30,0	15,0	x	x	1,5
3030135	87,0	27,0	13,5	x	x	3,5

Profile number (spec)	OUTSIDE DIAMETER A	OUTSIDE DIAMETER B	OUTSIDE DIAMETER R	OUTSIDE DIAMETER r	OUTSIDE DIAMETER C	WALL THICKNESS T
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
4833712	40,0	20,0	10,0	x	x	1,2
4833715	40,0	20,0	10,0	x	x	1,5
4834720	55,0	30,0	15,0	x	x	2,0
3130515	72,0	20,0	102,9	4,95	x	1,5
3130318	80,0	38,0	75,0	12,50	x	1,8
3130320	80,0	38,0	75,0	12,50	x	2,0

Thin wall special profiles

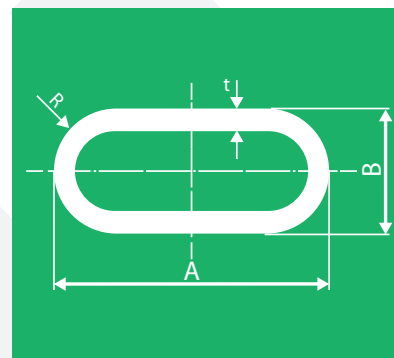
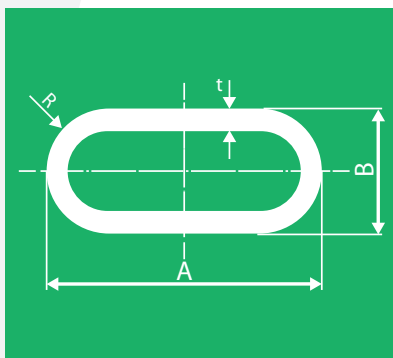
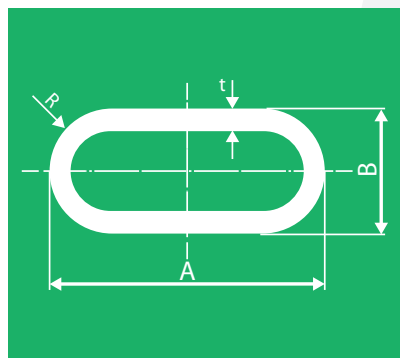
CLOSED WELDED PROFILES - COLD DRAWN

DS	ČSN 426930-FLAT OVAL	TDC	ČSN 420121
DS	ČSN 426931-ELLIPSE	TDC	ČSN 420121
DS	ČSN 426939- "L" PROFILE	TDC	ČSN 420121
DS	ČSN 426946- "T" PROFILE	TDC	ČSN 420121
DS	ŽV 426990	TDC	ČSN 420121

LIST OF STANDARD STEEL GRADES (other can be agreed too):

11320, 11321, 11343, 11373 AND ITS EQUIVALENT ACC TO STANDARDS EN, DIN, GOST, BS

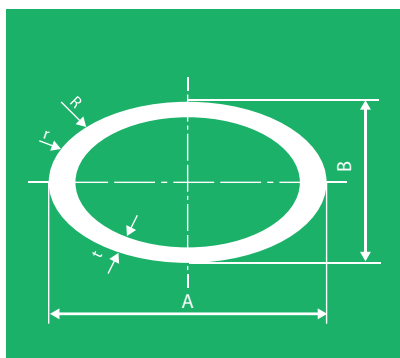
LIST OF STANDARD DIMENSIONS (other dimensions and shapes can be agreed too):



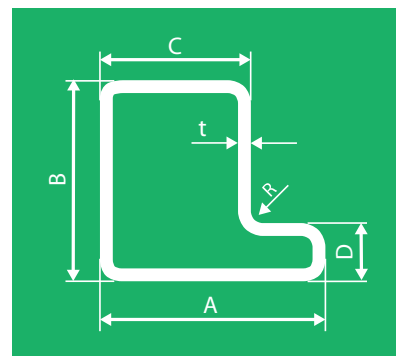
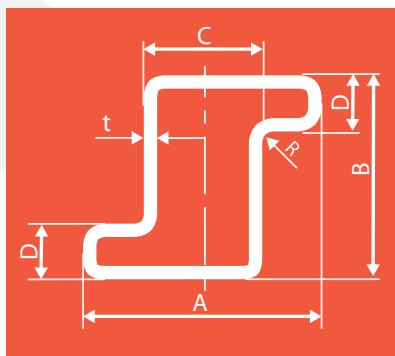
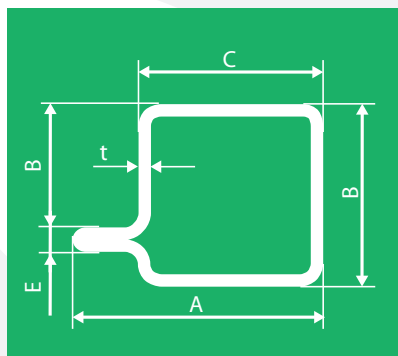
Profile number (spec)	OUTSIDE DIAMETER			WALL THICKNESS
	A	B	r	t
	[mm]	[mm]	[mm]	[mm]
3032810	20,0	6,0	3,0	1,0
3000315	20,0	10,0	5,0	1,5
3030315	20,0	11,5	5,8	1,5
3031412	23,0	13,0	6,5	1,2
3030415	23,0	13,0	6,5	1,5
3032415	25,0	15,0	7,5	1,7
3032420	25,0	15,0	7,5	2,0
3031320	26,0	12,0	6,0	1,0
3031515	30,0	15,0	7,5	1,5
3031520	30,0	15,0	7,5	2,0
3031112	30,0	16,0	8,0	1,2

Profile number (spec)	OUTSIDE DIAMETER			WALL THICKNESS
	A	B	r	t
	[mm]	[mm]	[mm]	[mm]
3031115	30	16	8	1,5
3031120	30	16	8	2,0
3031620	35	15	8	2,0
3000515	38	20	10	1,5
3030520	38	20	10	2,0
3030215	40	10	5	1,5
3032320	40	14	7	2,0
3032215	40	20	10	1,5
3032220	40	20	10	2,0
3031010	50	10,2	5,1	1,0
3031010	50	20	10	1,5

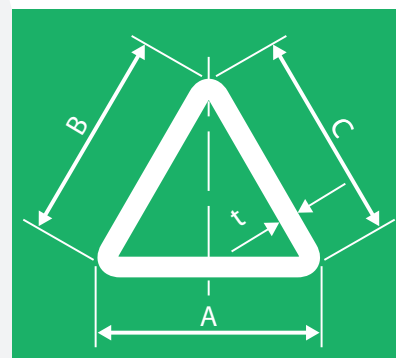
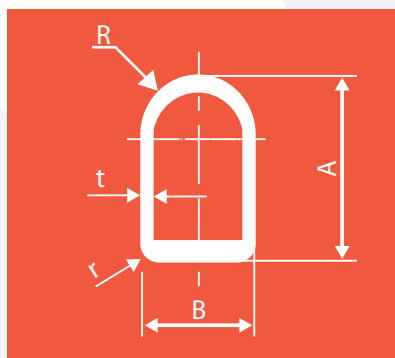
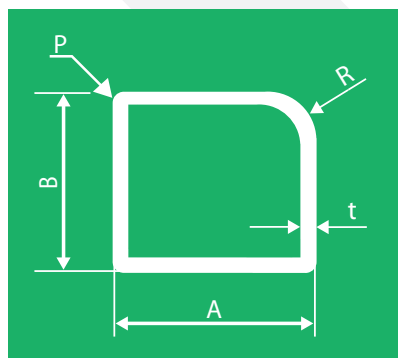
Profile number (spec)	OUTSIDE DIAMETER			WALL THICKNESS
	A	B	r	t
	[mm]	[mm]	[mm]	[mm]
3031715	50	20	10	1,5
3031720	50	20	10,0	2,0
3031920	50	25	12,5	2,0
3031215	50	30	15	1,5
3031220	50	30	15	2,0
3032715	55	25	12,5	1,5
3032720	55	25	12,5	2,0
3032620	60	30	15	2,0
3032525	60	40	20	2,5
3030910	68	9	4,5	1,0



Profile number (spec)	OUTSIDE DIAMETER				WALL THICKNESS T
	A	B	R	r	T
	[mm]	[mm]	[mm]	[mm]	[mm]
3100712	25,0	17,0	17,0	6,5	1,25
3130230	40,0	20,0	40,0	10,0	3,00

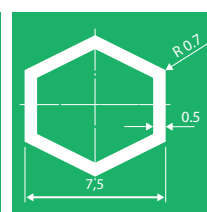
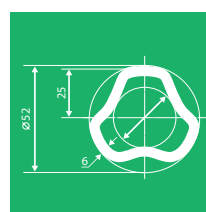
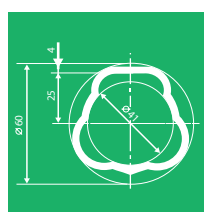
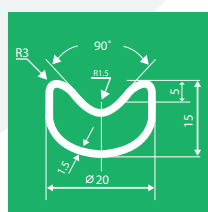
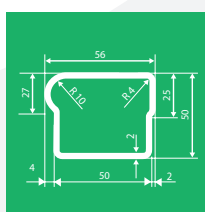
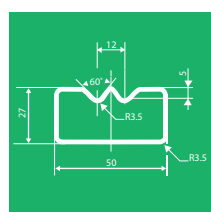


Profile number (spec)	OUTSIDE DIAMETER A	OUTSIDE DIAMETER B	OUTSIDE DIAMETER C	OUTSIDE DIAMETER D	OUTSIDE DIAMETER E (or other)	WALL THICKNESS T
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
4832020	40,0	30,0	30,0	20,0	4,0	2,0
3830630	70,0	40,0	50,0	20,0	R=1,5t	3,0
3930830	60,0	40,0	40,0	20,0	R=1,5t	3,0



Profile number (spec)	OUTSIDE DIAMETER				WALL THICKNESS
	A	B	R	r	t
	[mm]	[mm]	[mm]	[mm]	[mm]
3430220	30,0	28,0	6,0	1,5t	2,00
3405020	30,0	30,0	6,0	1,5t	2,00
3430615	40,0	28,0	6,0	1,5t	1,50
3430420	50,0	28,0	6,0	1,5t	2,00
3430320	50,0	30,0	6,0	1,5t	2,00
4833712	40,0	20,0	10,0	1,5t	1,20
4833512	38,0	22,0	11,0	1,5t	1,20
4833825	60,0	30,0	15,0	1,5t	2,50
	A	B	C	r	t
4833215	30,0	30,0	30,0	x	1,50
4833915	35,0	35,0	35,0	x	1,50
4834315	61,0	45,0	45,0	x	1,50
4834215	65,0	49,0	49,0	x	1,50

OTHER SHAPES (other dimensions can be agreed too):



Thin wall special profiles - open

OPEN PROFILES

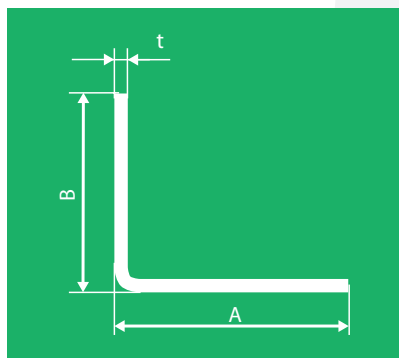
DS	ČSN 426949	TDC	ČSN 420121
DS	ČSN 426950	TDC	ČSN 420121
DS	ČSN 426963	TDC	ČSN 420121
DS	ČSN 426968	TDC	ČSN 420121
DS	ČSN 426964	TDC	ČSN 420121

LIST OF STANDARD STEEL GRADES (other can be agreed too):

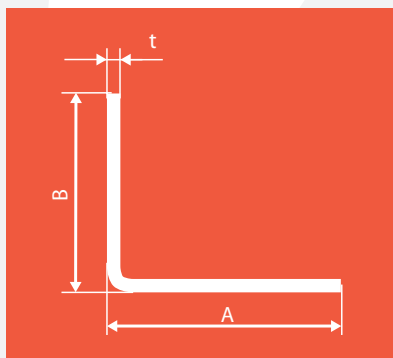
STEELS ACC TO ČSN: 11320, 11321, 11343, 11373 AND ITS EQUIVALENT ACC TO STANDARDS EN, DIN, GOST AND BS

LIST OF STANDARD SHAPES AND DIMENSIONS (other dimensions and shapes can be agreed too):

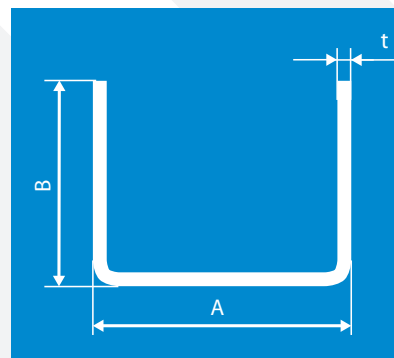
1) „L“ SHAPE



2) „L“ SHAPE



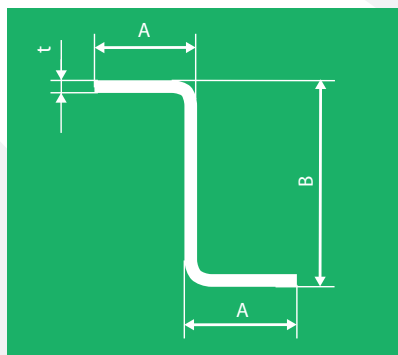
3) „U“ SHAPE



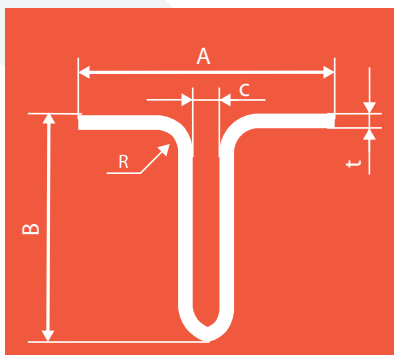
Profile number	PROFILE NAME	OUT-SIDE DIA-METER A	OUT-SIDE DIA-METER B	OUT-SIDE DIA-METER C	WALL THICKNESS t (mm)													
		[mm]	[mm]	[mm]	0,7	1,0	1,2	1,5	1,8	2,0	2,3	2,5	2,9	3,0	3,2	3,5	3,8	4,0
1	isosceles shape „L“	MIN.10	MIN.10	X														
	ČSN 426949	MAX.60	MAX.60	X														
2	unequal shape „L“	MIN.10	MIN.10	X														
	ČSN 426950	MAX.60	MAX.60	X														
3	„U“ shape-ČSN 426963	10	10															



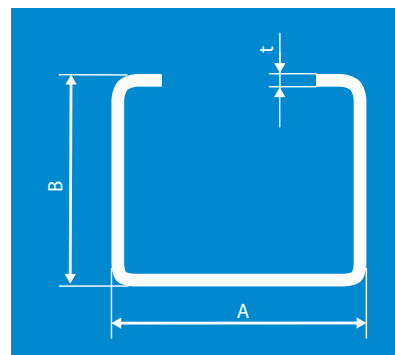
4) „Z“ SHAPE



5) „T“ SHAPE



6) „C“ SHAPE



Pro- file num- ber	PROFILE NAME	OUT- SIDE DIA- METER A	OUT- SIDE DIA- METER B	OUT- SIDE DIA- METER C	WALL THICKNESS t (mm)													
		[mm]	[mm]	[mm]	0,7	1,0	1,2	1,5	1,8	2,0	2,3	2,5	2,9	3,0	3,2	3,5	3,8	4,0
4	"Z" shape - ČSN 426964	MIN.15	MIN.20	X														
		MAX.50	MAX.100	X														
5	"T" shape-number 7735015																	
	galvanized																	
6	"C" SHAPE-ČSN 426968	MIN.10	MIN.10	X														
		MAX.100	MAX.60	X														



List of product design

LIST OF PRODUCTS IN GROUPS:

PRODUCT GROUP	NAME OF PRODUCT IN GROUP
A	WELDED - COLD CALIBRATED
B	WELDED - COLD DRAWN
C	SEAMLESS - COLD DRAWN
D	SEAMLESS - COLD DRAWN (FOR HYDRAULIC SYSTEMS)
E	LONGITUDINAL WELDED - SMOOTH
F	WELDED - FOR THREAD CUTTING
G	FOR PRESSURE CONTAINERS AND EQUIPMENT
H	NON-CIRCULAR PROFILES - COLD CALIBRATED
I	NON-CIRCULAR PROFILES - COLD DRAWN
J	SPECIAL PROFILES - WELDED
K	SPECIAL PROFILES - WELDED - DRAWN
L	SPECIAL PROFILES - OPEN

SURFACE DESIGN:

PRODUCT GROUP	DEFINITION - DESCRIPTION	RELATION TO GROUP
SCALED	Final surface by bending of hot rolled steel strip. Surface can be scaled.	A,B,E,F,G,H,J,K,L
BRIGHT	Final surface by bending of hot rolled steel strip, event. by annealing in a controlled atmosphere	A,B,C,D,E,H,I,J,K,L
PICKLED - MATT	Final surface by bending of hot rolled steel strip, chemically descaled	A,B,E,F,G,H,J,K,L
GALVANIZED	Material after chemical treatment hot-dip galvanized acc to EN 10240, event. EN ISO 1461	A,E,F,H,J *)
DRAWN ON STEARAN	Material surface coloured by the rest of soap	B,D,I,K,
DRAWN ON OIL	Metallic silver smooth surface is covered by thin layer of oil	B,D,I,K,
PRESERVED	Material corrosion protected by dipping. Outside and inside tube surface covered by thin layer of anticorrosive agent	A,B,C,D,E,F,G,H,I,J,K,L

*) can be agreed for other product groups too

MECHANICAL PROPERTIES DESIGN:

CONDITION	DEFINITION - DESCRIPTION	RELATION TO GROUP
WELDED - NON-ANNEALED	Welded from bended strip, outside the weld joint the mechanical-technological properties dependent on base material. Only limited ability for cold forming.	A,E,F,G,H,J
DRAWN - NON-ANNEALED	Condition +c(bk): cold drawn with high level of reduction - high mechanical properties, minimum ability for cold forming.	B,C,D,G,I,K
	Condition +lc(bkw): cold drawn with low level of reduction - rather high mechanical properties, limited ability for cold forming.	B,C,D,G,I,K
NORMALIZED	Condition +n(nbk): material heat treated - normalized in a controlled atmosphere. Mechanical properties and ability for cold forming comply with specific product standard. Material surface slightly decarburized.	A,B,C,D,E,F,G,H*,I*,J*,K*,L* *) releasing the internal stress after forming can cause a longitudinal deformation of the product (deflection) with limited possibility of settlement

DESIGN BY TUBE END TREATMENT:

PRODUCT GROUP	DEFINITION - DESCRIPTION	RELATION TO GROUP
CUT	Tube end condition determined by the cross-cutting technologies - warm slice fleeting saw. Any „burr“ is not removed, the maximum height knives to be given to the appropriate standard for product	A,E,F,G,H,J,L
CLEAN CUT	Tube end condition determined by the transverse-cutting technology, so called „cold cut“, perpendicular to the longitudinal axis of the product, with limited incidence of burrs.	A,B,C,D,E,F,G,H,I,J,K,L
MILLED	Cross-cutting burrs removed by the milling; the mostly used method is when bevels on the outer and inner surface creates a „v“ shape.	A,E,F,G
	Cross-cutting burrs removed by the milling; bevelling from the outer side at angle of 45°, aligning the tube head and spiking the inner side, there is so called bevel for „V“ weld (for pipes jointed by welding).	E,F
	Cross-cutting burrs removed by the milling; the outer and inner surface is spiked, head aligned, so called vertical milling.	A,E,F,G
WITH THREAD „KG“	After milling there are milled threads „KG“ shape on tube ends, used together with appropriated accessories for cold watertight connection to the distribution of liquids.	F
BRUSHED	Fine burrs removed by brushing right at the service cutting operation - only applied to the material cut to fixed lengths by RSA device.	A,B,C,D,E

DESIGN BY STRAIGHTNESS:

PRODUCT GROUP	DEFINITION - DESCRIPTION	RELATION TO GROUP
NON STRAIGHTENED	The longitudinal straightness is determined by manufacturing process and material properties. The deviation conforming to the relevant standard.	A,B,C,D,E,F,G,H,I,J,K,L
STRAIGHTENED	The material subjected to straightening by the hyperbolic straightening machines. For non-circular cross-section profiles only equal to dimension of max 60mm. The deviation conforming to the relevant standard.	A,B,C,D,E,F,G,H*,I*,J*,K*,L* *) upto dimension of max 60 mm, depending on special profile shape
PRECISE STRAIGHTENED	The material subjected to straightening by the hyperbolic straightening machines. Due to the tapered straightness deviation operation performed twice. The deviation conforming to the relevant standard.	A,B,C,D,E,F,G

DESIGN BY CHECKING METHOD:

PRODUCT GROUP	DEFINITION - DESCRIPTION	RELATION TO GROUP
LEAKAGE TEST - NDT	Eddy current testing on defectomat förster c class (cp), acc to en iso 10893-1	A,B,C,D,E,F,G
DISCONTINUITY DETECTION - NDT	Eddy current testing on defectomat förster c class (cp), acc to en iso 10893-2	A,B,C,D,E,F,G
LEAKAGE TEST	Leakage testing of tube dimension 16 - 114 mm, internal pressure upto 8MPa, by the hydraulic press.	A,B*,E,F,G *) by agreement

List of production and finishing operations:

LIST OF PRODUCT GROUPS

PRODUCT GROUP	PRODUCT GROUP DESCRIPTION
A	WELDED - COLD CALIBRATED
B	WELDED - COLD DRAWN
C	SEAMLESS - COLD DRAWN
D	SEAMLESS - COLD DRAWN (FOR HYDRAULIC SYSTEMS)
E	LONGITUDINAL WELDED - SMOOTH
F	WELDED - FOR THREAD CUTTING
G	FOR PRESSURE CONTAINERS AND EQUIPMENT
H	NON-CIRCULAR PROFILES - COLD CALIBRATED
I	NON-CIRCULAR PROFILES - COLD DRAWN
J	SPECIAL PROFILES - WELDED
K	SPECIAL PROFILES - WELDED - DRAWN
L	SPECIAL PROFILES - OPEN
M	HOT OR COLD ROLLED COILS AND STRIPS
N	FULL MATERIAL (DRAWN, ROLLED)
O	WELDED CONSTRUCTIONS

FINISHING OPERATIONS

OPERATION	DEFINITION - DESCRIPTION	RELATION TO GROUP
COIL SLITTING	Steel coil slit to requested strips suitable for specific tube diameter production	M
TUBE END MILLING	Tube ends finished by special equipment conforming to standard, customer requirement, event. Final application	A,B,E,F,G
TUBE END THREADING	Taper threads of appropriate size complying customer requirements. Can be supplemented by connecting fittings.	F
HEAT TREATMENT	Normalizing in a controlled atmosphere conforming to standard, customer requirement and/or final application	A,B,C,D,E,F,G,H,I,J,K,L,N,
STRAIGHTENING	On hyperbolic straightening machine the straight deviation reduced conforming to standard, customer requirement and/or final application	A,B,C,D,E,F,G,H*,I*,J*,K*,L*,N*) up to dimension of 60 mm
NON DESTRUCTIVE TESTING	Material leakage and discontinuity tested by eddy current test acc to EN 10893-1, EN 10893-2 (upto e2h level) conforming to standard, customer requirement and/or final application	A,B,C,D,E,F,G
PRESSURIZING	Leakage testing by internal pressure upto 8MPa conforming to standard, customer requirement and/or final application	A,B,C,D,E,F,G
CHEMICAL TREATMENT - PICKLING	Scales, corrosion and other surface stains removed by chemical treatment (mostly used as preparation for further production processes - drawing, galvanizing etc)	A,B,C,D,E,F,G,O
HOT DIP GALVANIZING	Material after chemical treatment hot-dip galvanized acc to EN 10240, event. EN ISO 1461. Tubes for thread cutting galvanized acc to EN 10240 suitable for drink-able water distribution systems	E,F,O
SERVICE CUTTING	Produced material, event. Material delivered by customer, cross-cutted with high accuracy. Facility equipped with surface washing, drying, end brushing and automatic lengths checking	A,B,C,D,E
PACKING	After all operations finishing material packed by packing machine and bundled with steel strips or packed and checked on packing benches.	A,B,C,D,E,F,G,H,I,J,K,L,N
PRESERVATION	Material is preserved in oil bath against rust. We use Ferrocote by Quaker	A,B,C,D,E,F,G,H,I,J,K,L,N

(all presented operations can be processed also on material delivered by customer)

LIST OF PRODUCT GROUPS:

OPERATION	DEFINITION - DESCRIPTION	RELATION TO GROUP
DC WELDING	Cold rolled steel strip after forming longitudinal DC welded. Outside diameter cold calibrated to required dimension.	A,H,J
HF WELDING	Cold or hot rolled steel strip after forming longitudinal HF welded. Outside diameter cold calibrated to required dimension.	A,B,E,F,G,H,J
COLD DRAWING	Longitudinal welded or seamless tubes after heat and chemical treatment cold drawn resulting high dimensional accuracy with quality surface.	C,D,I,K







ŽELEZÁRNY
HRÁDEK

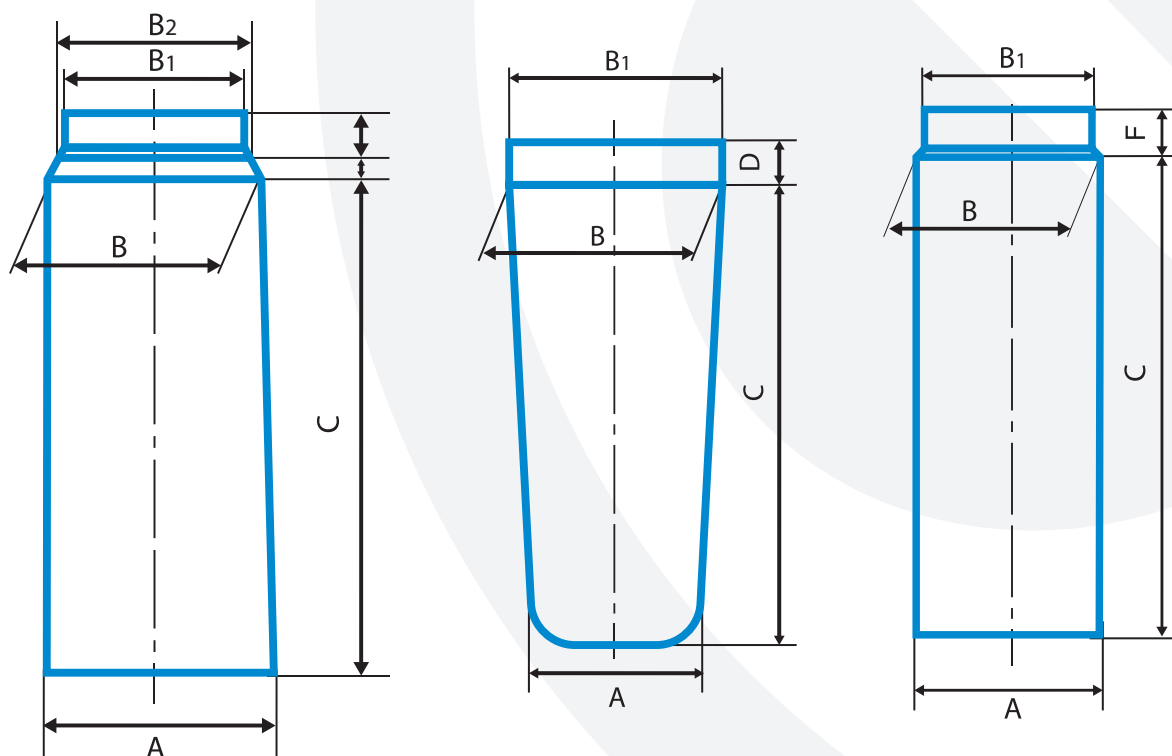


POLDI

INGOT FORMATS - STEEL MILL IN HRADEK

POLYGONAL, ROUNDED, SQUARE - BASIC DIMENSIONS

MOULDS	NOMINAL SIZE	A	B	B1	B2	C	D	D1	INGOT LENGTH	INGOT SHAPE	WEIGHT KG/PC
		mm	mm	mm	mm	mm	mm	mm			
K 460	460	465	440	440		1245	150		1395	rounded	1680
520 P	520	520	440	440		945	150		1095	polygonal	1575
KD 460	465	464	440	440		1440	150		1590	rounded	1940
585 P	585	603	554	554		1120	150		1270	polygonal	2460
650 PK	640	650	609	609		1090	150		1240	polygonal	2960
650 P	655	650	609	609		1525	150		1675	polygonal	3660
680 PK	680	680	665	665		1260	150		1410	polygonal	3540
680 P	685	680	665	665		1455	150		1605	polygonal	4050
365 V	365	288	365	365		1590	180		1770	square	1225
K 600	600	597	577	535		1120	160		1280	rounded	2460
KS 600	600	601	577	535		1340	160		1500	rounded	2950
KD 650	650	636	615	535	577	1445	160	70	1675	rounded	3660
K 650	650	632	615	535	577	1140	160	70	1370	rounded	2960
K 680	680	669	650	570	626	1225	160	70	1455	rounded	3540
KD 680	680	672	650	570	626	1420	160	70	1650	rounded	4050



PRODUCTION OF OTHER INGOT SHAPES POSSIBLE



STEEL MILL: PROPERTIES

Furnace type and capacity	EAF/LF/VD - 11 t/h
Source material	scrap
Quantity per heat	45 t
Max quantity of heats per day / week	270 / 1800 t
Min quantity for batch or PO	1 heat = 45 t
Possibility of vacuum degassing	yes VD
Checking method	visual inspection only
Steel killing	by Al
Max dispatched quantity per day and number of days/weeks to earliest possible dispatch	200 t / 10 days

ACHIEVED PARAMETERS AFTER VACUUM DEGASSING:

- deep dehydrogenization of low and medium alloy carbon steel melt to level below 1,5 ppm H₂, measured by HYDRIS device. Acc to requirement it is possible below 1,2 ppm H₂.
- deep desulfurization, S max 50 (30) ppm (analysis by LECO device)
- denitrogenization, N max 70 ppm - melt; N max 90 ppm - ingot
- total oxygen max 15 ppm





List of produced steel

The list of produced steel informative only. It is possible to produce steel acc to entire foreign equivalents, depending on the agreement with the steel mill technician. It is also possible to produce steel with chemical content adjustments acc to agreement.

STEEL GRADE 11		
ČSN	DIN	EN
11 110	10 S 20	10 S 20
11 120		
11 140	35 S 20	35 S 20
11 375	St 37-2	S 235J 0
11 500	St 50-2	E 295
11 523	St 52-3	S 355J 0
11 600	St 60-2	E 335
11 700	St 70-2	E 360

STEEL GRADE 13	
ČSN	DIN
13 180	80 Mn 4
13 240	37 MnSi 5
13 242	42 MnV 7
13 270	60 SiMn 5

STEEL GRADE 14		
ČSN	DIN	EN
14 109	100 Cr 6	100 Cr 6
14 209	100 CrMn 6	100 CrMnSi 6-4
14 140	37 Cr 4	100 CrMnMo 7
14 220	16 MnCr 5	37 Cr(S) 4
14 221	20 MnCr 5	16 MnCr(S) 5
14 240		20 MnCr(S) 5
14 260	54 SiCr 6	
14 331		
14 341		

STEEL GRADE 19	
ČSN	DIN
19 083	C 45 W
19 132	C 70 W 2
19 152	C 80 W 2
19 191	C 105 W 1
19 221	C 110 W
19 312	90 MnCrV 8
19 420	140 Cr 3
19 452	62 SiMnCr 4

STEEL GRADE 12			
ČSN	DIN	EN	GOST
12 020	C 22.8	P 250 GH	
12 022	C 22	C 22 E, R	
12 023	C 15	C 15 E, R	
12 040	CK 35	C 35 E, R	35
12 041	CK 40	C 40 E, R	40
12 050	CK 45	C 45 E, R	45
12 051	CK 50	C 50 E, R	50
12 060	CK 55	C 55 E, R	55
12 061	CK 60	C 60 E, R	60

STEEL GRADE 15			
ČSN	DIN	EN	GOST
15 020		16 Mo 3	
15 121	13 CrMo 44	13 CrMo 4-5	
15 124	20 CrMo 5	18 CrMo(S) 4	
15 130	25 CrMo 4	25 CrMo(S) 4	
15 131	34 CrMo 4	34 CrMo(S) 4	35 XM
15 142	42 CrMo 4	42 CrMo(S) 4	38 XM
15 230			
15 231			
15 240			
15 241	30 CrMoV 9	31 CrMoV 9	
15 260	50 CrV 4	51 CrV 4	
15 320	25 CrMoV 55		
		50 CrMo 4	

STEEL GRADE 16			
ČSN	DIN	EN	UNI
16 220	13 NiCr 6	18 NiCr 5-4	39 NiCrMo 3
16 231	19 CrNi 8		
16 341	36 CrNiMo 4		
16 420	14 NiCr 14	15 NiCr 13	
16 520	14 NiCr 18		BS
	15 CrNi 6	17 CrNi 6-8	817 M40
	17 CrNiMo 6	18 CrNiMo 7-6	
		34 CrNiMo 6	
		30 CrNiMo 8	

STEEL	STATUS	DIN	EN
xx xxx.0	without heat treatment	U	U
xx xxx.1	normalize annealed	N	(+N)
xx xxx.2	annealed (method)		
xx xxx.3	soft annealed	G	(+A)
	annealing with microstructure guarantee	GKZ	(+AC)
xx xxx.4	hardened		
xx xxx.5	normalize annealed & tempered		
xx xxx.6	quench tempered to lower strength	V	(+QT)
xx xxx.7	quench tempered to medium strength	V	(+QT)
xx xxx.8	quench tempered to upper strength	V	(+QT)
xx xxx.9	according to special agreement		



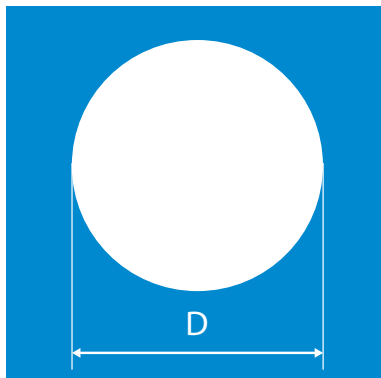
Standard steel for tube production

BASIC STEEL GRADE	STEEL GRADE	
	Steel grade	Valid for
P235	P195	EN 10216-1
	P195GH	EN 10216-2
	P235	EN 10216-1
	E235	EN 10297-1
	S235JRH	EN 10210-1
St 44.0	Rst 37.2	DIN 17 121
	St 37.0	DIN 1629
	St 44.0	DIN 1629
S355J2H	St 44.2	DIN 17121
	11 523	ČSN 41 1523
	P355N	EN 10216-3
	P355NH	EN 10216-3
	S355L0H	EN 10210-1
	S355J2H	EN 10210-1
	E355	EN 10297-1
	E355K2	EN 10297-1
	St 52.0	DIN 1629
	St 52.3	DIN 17121
B/C	Grade 6	ASTM A 333
	Grade A	ASTM A 106
	Grade B	ASTM A 106
	Grade C	ASTM A 106
	Grade B	API 5L PSL1
	X 42	API 5L PSL1
	Grade 241	Z245.1-02
P275NL2	Grade 290	Z245.1-02
	P275NL1	EN 10216-3
	P275NL2	EN 10216-3
	E275	EN 10297-1
P265	E275K2	EN 10297-1
	P265	EN 10216-1
P355NL	P265GH	EN 10216-2
	11 523	ČSN 41 1523
	P355N	EN 10216-3
	P355NH	EN 10216-3
	P355NL1	EN10216-3
	P355NL2	EN10216-3
	S355J0H	EN 10210-1
	S355J2H	EN10210-1
	E355	EN10297-1
	E355K2	EN10297-1
	S355NH	EN10210-1
	S355NLH	EN10210-1
	St 52.0	DIN 1629
	St 52.3	DIN 17121
St 35.8/P235GH	St 35.8	DIN 17175
	P235GH	EN 10216-2
St 45.8	St 45.8	DIN 17175
B/C/1026	Grade 1026	ASTM A 519
	Grade B	ASTM A 53
	Grade B	ASTM A 106
	Grade C	ASTM A 106
09G2S	09G2S	GOST 19281

BASIC STEEL GRADE	STEEL GRADE	
	Steel grade	Valid for
	X52	API 5L PSL1
	X46	API 5L PSL1
	X42	API 5L PSL1
	X52N	API 5L PSL2
	Grade B	ASTM A 106
	Grade C	ASTM A 106
	Grade 6	ASTM A 333
	L360NB	EN 10208-2
	11 523	ČSN 41 1523
	P355N	EN 10216-3
	P355NH	EN 10216-3
	P355NL1	EN10216-3
	P355NL2	EN10216-3
	S355J0H	EN10210-1
	S355J2H	EN10210-1
	E355	EN10297-1
	E355K2	EN10297-1
	S355NH	EN10210-1
	S355NLH	EN10210-1
	St 52.0	DIN 1629
X60	St 52.3	DIN 17121
	S355G1+N	EN 10225
	S355G14+N	EN 10225
	Grade 241	Z245.1-02
	Grade 290	Z245.1-02
	Grade 359	Z245.1-02
	X60	API 5L PSL1
	X56	API 5L PSL1
	X60N	API 5L PSL2
	X56N	API 5L PSL2
P11	S 420 NH	EN10210-1
	S 420 NLH	EN10210-1
	10CrMo5-5	EN 10216-2
P22	P11	ASTM A 335
	15313	ČSN 41 5313
	P22	ASTM A 335
	10CrMo9-10	DIN 17175
15128	10CrMo9-10	EN 10216-2
	11CrMo9-10	EN 10216-2
	15128	ČSN 41 5128
16Mo3	14MoV63	DIN 17175
	14MoV63	EN 10216-2
	15020	ČSN 41 5020
	15Mo3	DIN 17175
15121	16Mo3	EN 10216-2
	15121	ČSN 41 5121
	13CrMo4-4	DIN 17175
	13CrMo4-5	EN 10216-2
P2	P12	ASTM A 335
P1	P2	ASTM A 335
	P1	ASTM A 335

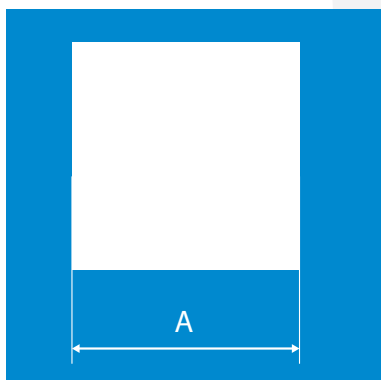


Hot rolled steel



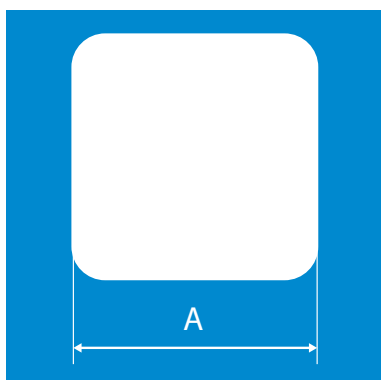
ROUND BARS

DS	ČSN 425510
DS	DIN 1013
DS	ČSN EN 10060
TDC	ČSN 420138, ČSN 420220
TDC	ČSN EN 10083-2, 3
TDC	ČSN EN 10025+ A1
TDC	ČSN EN 10084



SQUARE BARS

DS	ČSN 425520
DS	DIN 1014
DS	ČSN EN 10059
TDC	ČSN 420138
TDC	ČSN 420220
TDC	ČSN EN 10083 - 2, 3
TDC	ČSN EN 10025 + A1
TDC	ČSN EN 10084



BILLETS

DS	ČSN 425121
TDC	ČSN 420188

after agreement it is possible to supply also middle sizes

DS - dimensional specification

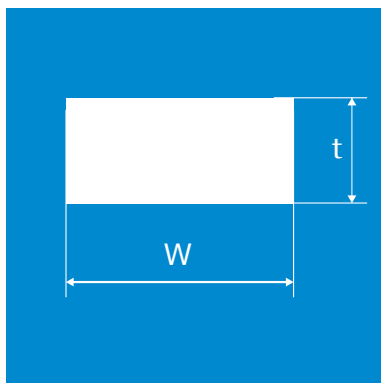
TDC - technical delivery condition



D-DIAMETER [mm]	WEIGHT [kg/m]	D-DIAMETER [mm]	WEIGHT [kg/m]	D-DIAMETER [mm]	WEIGHT [kg/m]
16	1.58	41	10.40	66	26.90
17	1.78	42	10.90	67	27.70
18	2.00	43	11.40	68	28.50
19	2.23	44	11.90	70	30.20
20	2.47	45	12.50	71	31.10
21	2.72	46	13.10	73	32.90
22	2.98	47	13.60	75	34.70
23	3.26	48	14.20	76	35.60
24	3.55	49	14.80	78	37.50
25	3.85	50	15.40	80	39.50
26	4.17	51	16.10	82	41.50
27	4.49	52	16.70	83	42.50
28	4.83	53	17.30	85	44.50
29	5.18	54	18.00	88	47.70
30	5.55	55	18.70	90	49.90
31	5.92	56	19.30	95	55.60
32	6.31	57	20.00	100	61.70
33	6.71	58	20.70	105	68.00
34	7.13	59	21.50	110	74.60
35	7.55	60	22.20	115	81.50
36	7.99	61	23.00	120	88.80
37	8.44	62	23.70	125	96.30
38	8.90	63	24.50	130	104.00
39	9.38	64	25.30	135	112.40
40	9.87	65	26.00	140	121.00
				150	139.00

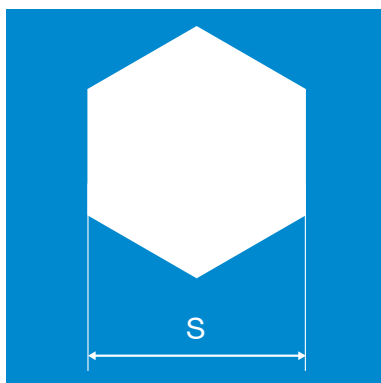
A-SIDE [mm]	WEIGHT [kg/m]	A-SIDE [mm]	WEIGHT [kg/m]	A-SIDE [mm]	WEIGHT [kg/m]
15	1.77	32	8.04	62	30.20
16	2.01	33	9.08	65	33.17
17	2.27	34	9.62	70	38.47
18	2.54	35	9.62	75	44.15
19	2.83	37	10.75	80	50.24
20	3.14	39	11.94	85	56.72
21	3.46	40	12.56	90	63.59
22	3.80	42	13.85	95	70.85
23	4.15	43	14.50	100	78.50
24	4.52	45	15.90	105	86.55
25	4.91	47	17.34	110	94.99
26	5.31	50	19.63	115	103.82
27	5.72	52	21.23	120	113.04
28	6.15	55	23.75	130	133.00
29	6.60	57	25.50	140	154.00
30	7.07	60	28.26		

A-SIDE [mm]	WEIGHT [kg/m]	A-SIDE [mm]	WEIGHT [kg/m]	A-SIDE [mm]	WEIGHT [kg/m]
40	12.3	70	37.8	100	77.0
45	15.7	75	42.0	110	93.0
50	19.1	80	49.0	120	111.0
55	23.4	85	55.0	130	130.0
60	27.6	90	62.0	140	151.0
65	32.7	95	69.0		



FLAT BARS

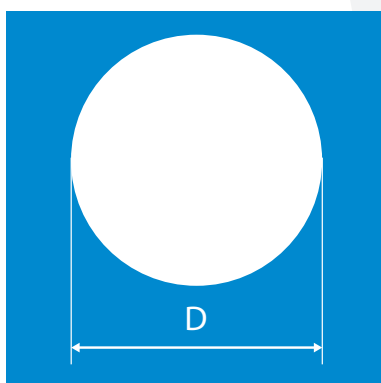
DS	ČSN 425522
DS	DIN 1017
DS	ČSN EN 10058
TDC	ČSN 420138
TDC	ČSN 420220
TDC	ČSN EN 10083 - 2, 3
TDC	ČSN EN 10025 + A1
TDC	ČSN EN 10084



HEXAGONAL BARS

DS	ČSN 425530
DS	DIN 1015
DS	ČSN EN 10061
TDC	ČSN 420138
TDC	ČSN 420220
TDC	ČSN EN 10083 - 2, 3
TDC	ČSN EN 10025 + A1
TDC	ČSN EN 10084

Peeled steel



ROUND BARS H9 AND H11

DS	ČSN 426515.32
DS	DIN 668, DIN 671
DS	ČSN EN 10278
TDC	ČSN 420134, ČSN 420240
TDC	DIN 1651
TDC	DIN 1652
TDC	ČSN EN 10277





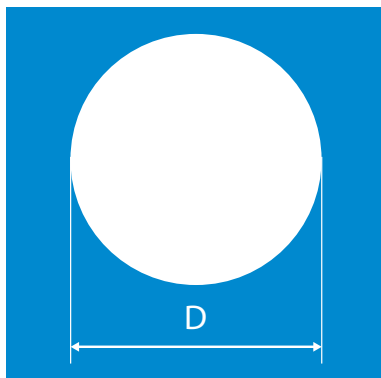
W-WIDTH [mm]	T-THICKNESS [mm]	W-WIDTH [mm]	T-THICKNESS [mm]
22	10 - 16	55	5 - 34
25	8 - 18	60	5 - 40
28	7 - 18	65	5 - 40
30	5 - 20	70	5 - 40
32	5 - 22	80	5 - 40
35	5 - 25	90	5 - 40
40	5 - 30	100	5 - 34
45	5 - 34	110	5 - 34
50	5 - 34		

S-SPANNER JAWS [mm]	WEIGHT [kg/m]	S-SPANNER JAWS [mm]	WEIGHT [kg/m]	S-SPANNER JAWS [mm]	WEIGHT [kg/m]
16	1.74	29	5.72	48	15.66
17	1.96	30	6.12	50	17.00
18	2.20	32	6.96	52	18.38
19	2.45	33	7.40	55	20.57
20	2.72	34	7.86	57	22.09
21	2.87	36	8.81	60	24.48
22	3.29	37	9.30	62	26.13
23	3.60	38	9.82	65	28.72
24	3.92	40	10.68	67	30.52
25	4.25	41	11.34	70	33.31
26	4.60	43	12.57	72	35.24
27	4.96	45	13.77		
28	5.33	46	14.38		

D-DIAMETER [mm]	WEIGHT [kg/m]	D-DIAMETER [mm]	WEIGHT [kg/m]	D-DIAMETER [mm]	WEIGHT [kg/m]
10	0.62	33	7.13	56	19.33
11	0.75	34	7.55	57	20.00
12	0.89	35	7.99	58	20.70
13	1.04	36	8.90	59	21.45
14	1.21	37	8.44	60	22.20
15	1.39	38	8.90	61	22.95
16	1.58	39	9.37	62	23.70
17	1.78	40	9.86	63	24.47
18	2.00	41	10.33	64	25.23
19	2.23	42	10.88	65	26.05
20	2.47	43	11.40	66	26.91
21	2.72	44	11.94	67	27.73
22	2.98	45	12.49	68	28.51
23	3.26	46	13.05	69	29.32
24	3.55	47	13.57	70	30.21
25	3.85	48	14.21	72	32.28
26	4.17	49	14.73	75	34.68
27	4.49	50	15.41	78	37.50
28	4.83	51	15.98	80	39.46
29	5.55	52	16.67	85	44.55
30	5.92	53	17.22	90	49.94
31	6.31	54	17.99	95	55.64
32	6.71	55	18.65	100	61.55

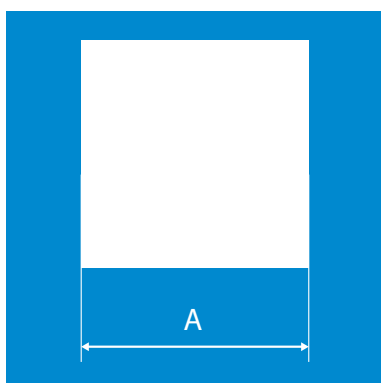


Cold drawn steel



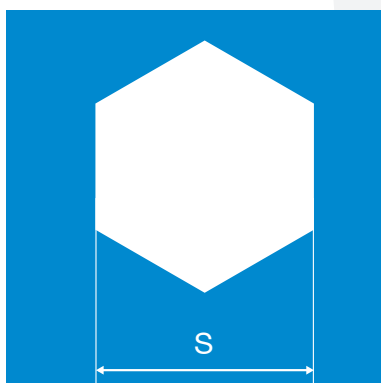
ROUND BARS

DS	ČSN 426510
DS	DIN 668
DS	ČSN EN 10278
TDC	ČSN 420134
TDC	DIN 1651
TDC	DIN 1652
TDC	ČSN EN 10277



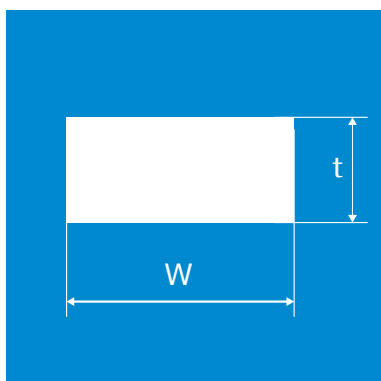
SQUARE BARS

DS	ČSN 426520
DS	DIN 178
DS	ČSN EN 10278
TDC	ČSN 420134
TDC	DIN 1651
TDC	DIN 1652
TDC	ČSN EN 10277



HEXAGONAL BARS

DS	ČSN 426530
DS	DIN 176
DS	ČSN EN 10278
TDC	ČSN 420134
TDC	DIN 1651
TDC	DIN 1652
TDC	ČSN EN 10277



FLAT BARS

DS	ČSN 426530
DS	DIN 176
DS	ČSN EN 10278
TDC	ČSN 420134
TDC	DIN 1651
TDC	DIN 1652
TDC	ČSN EN 10277

After agreement it is possible to supply also middle sizes.



D-DIAMETER [mm]	WEIGHT [kg/m]	D-DIAMETER [mm]	WEIGHT [kg/m]	D-DIAMETER [mm]	WEIGHT [kg/m]
16	1.58	26	4.17	42	10.88
16.5	1.68	27	4.49	44	11.94
17	1.78	28	4.83	45	12.49
17.5	1.89	30	5.55	46	13.05
18	2.00	31	5.92	48	14.21
18.5	2.11	32	6.31	50	15.41
19	2.23	33	6.71	52	16.67
20	2.47	34	7.13	54	17.99
21	2.72	35	7.55	55	18.65
22	2.98	36	7.99	56	19.34
23	3.26	38	8.90	57	20.03
24	3.55	39	9.38	58	20.74
25	3.85	40	9.86	60	22.20

A-SIDE [mm]	WEIGHT [kg/m]	A-SIDE [mm]	WEIGHT [kg/m]
16	2.01	32	8.04
17	2.27	35	9.62
18	2.54	40	12.56
20	3.14	45	15.10
22	3.80	50	19.62
24	4.52	55	23.75
25	4.91	60	28.26
30	7.07		

S-SPANNER JAWS [mm]	WEIGHT [kg/m]	S-SPANNER JAWS [mm]	WEIGHT [kg/m]
16	1.74	32	6.96
17	1.97	34	7.86
18	2.20	36	8.81
19	2.45	37	9.31
20.5	2.85	38	9.82
21	3.00	41	11.43
22	3.29	46	14.39
24	3.92	50	17.00
25.4	4.41	55	20.56
26	4.60	60	24.78
27	4.96	65	28.72
28	5.33	70	33.31
30	6.12		

W-WIDTH [mm]	T-THICKNESS [mm]	W-WIDTH [mm]	T-THICKNESS [mm]
18	10 - 12	45	4 - 25
20	8 - 16	50	4 - 32
22	8 - 16	56	4 - 32
25	8 - 20	63	5 - 32
28	6 - 20	70	5 - 32
32	6 - 25	80	6 - 32
36	5 - 25	90	6 - 32
40	5 - 25	100	8 - 32

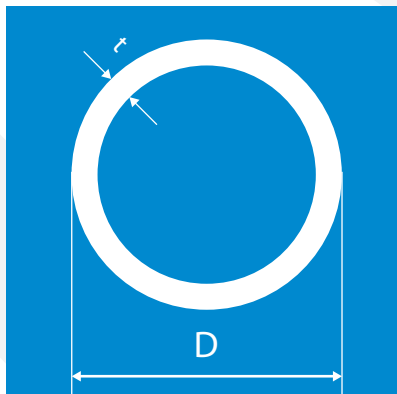
BRIGHT STEEL BARS

PROFILE	CONDITION	SIZE [mm]	TOLERANCE ACC ISO	BAR LENGTH [m]
	drawn	16 - 60	h 11, h9	2.0 - 6.0
	peeled	16 - 100	h 11, h9	2.0 - 6.0
	drawn	16 - 60	h 11, h9	2.0 - 6.0
	drawn	16 - 60	h 11, h9	2.0 - 6.0
	drawn	16 - 60	h 11, h9	2.0 - 6.0





DS AND TDC - CSN EN 10297-1



We manufacture seamless hot extruded tubes acc [CSN EN 10297-1](#). Production range is shown in the table.

Tubes are produced of steel grades [ST 35](#); [ST 37](#); [C 22.8](#); [100CR6](#); [34CR4](#); [16MC5](#); [32CRB4](#); [50CRV4](#) and [14NICR14](#). After agreement other steel grades can be supplied too. We can also supply hot extruded steel profiles upto circumscribed circle of 130 mm diameter. Usual steel grades: [ST 37 \(S235JRG2\)](#) or [ST 52 \(S355J2G3\)](#), after agreement other steel grades can be supplied too. Seamless tubes of corrosion resistant steel grades acc to [EN 10216-5](#) can also be supplied after agreement.

Outside diameter D and wall thickness t can be agreed gradually by 0.1 mm.

OUT- SIDE DIAME- TER	WALL THICKNESS [mm]																			
	[mm]	4,5	5,0	5,5	6,0	6,5	7,0	7,5	8,0	8,5	9,0	9,5	10,0	10,5	11,0	11,5	12,0	13,0	14,0	16,0
30,0																				
32,0																				
34,0																				
36,0																				
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110,0																				
112,0																				
114,0																				



Z-Group Steel Holding, a.s.
www.steel-holding.cz



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