ODELYA

Tubular Steel Materials

Tubing
the
World

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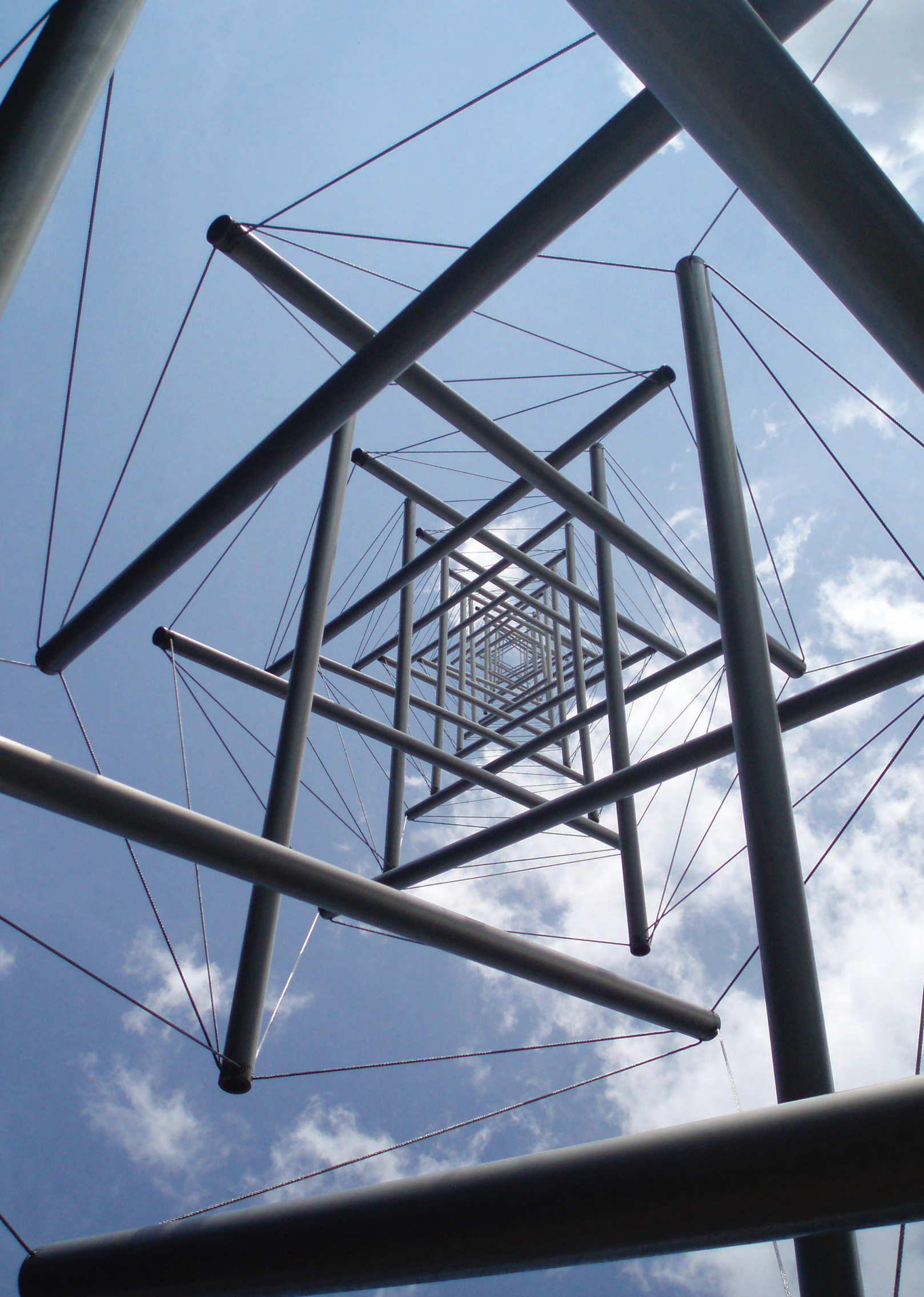


ABOUT US

Odelya International Steel Industry & Trade Co. supplies a wide range of high quality steel products since its foundation year in 2004. Located in Istanbul - Turkey, Odelya beneficially uses its geographical position in order to meet continuously growing demand of the most challenging markets world-wide.

Extensive Opportunities

We specialize in providing first class quality ERW or SAW steel tubes and flat and long steel materials. Odelya® supplies three product lines: Tubular Steel Materials', 'Piping Project Materials' and 'Rolled Steel Materials', which are widely used in many applications and industries, such as energy, construction, engineering, automobile, boiler industry, etc.

Odelya® has an opportunity to provide an extensive range of steel products and steel grades, with variety of sizes and surface conditions. Moreover, all required joints, connectors, fittings, valves and other accessories are available to complete the project requirements.

Years of experience in steel industry give us opportunity and confidence to create customized tube solutions for every specific requirement and application. Consequently, along with standardized products, we are able to use appropriate steel grades, manufacturing process and finishing operations, adjusting product characteristics for very specific customer requirements.

Excellence in Quality of Products and Services

Odelya® Steel products meet strictest quality criteria, as manufacturing process is under continuous control, all required quality tests are performed and all loading and shipment activities are supervised by qualified members of Odelya team.

Nowadays the quality of a product is not the only factor for successful business, quality of service and safe delivery on-time are important as well. We are proud to say that working with Odelya® means excellent quality of steel products and services. Odelya® has established a reliable and trustable network of partners and customers around the World due to its competent and cooperated work of Odelya's team. As a result, our customers and partners derive optimum benefits from Odelya® flexible, fast and profitable solutions.

Success of Odelya Projects

Odelya® has a valuable experience of successfully completing even large piping projects, as we provide better solutions along with expert consultancy. Starting of fully understanding of project requirements and providing the most competitive and reliable solution, our team creates a project management plan with clear deadlines in order to assure safe and on-time delivery of the products. Furthermore, all necessary documentation and shipment procedures can be arranged by our dedicated experts.

Why Choose Odelya?

Odelya is a reliable supplier and partner, as comprehensive services and optimized solutions are fundamental issues of Odelya's vision. Additionally, offered solutions are innovative, flexible and competitive, as the main focus of Odelya is on customer's requirements and excellent quality of products.

ERW WATER AND GAS PIPES

Odelya® ERW Water and Gas carbon steel pipes are used in civil and industrial installations for water and gas distribution applications.

Odelya® High Frequency Electric Welded Pipes are manufactured by cold-forming a steel sheet into a cylindrical shape. The manufacturing process of Odelya® ERW tubes uses high frequency alternating current, which assures a higher quality weld.

Due to high durability against seam corrosion, hook cracks and strong seam bonding, demand for ERW (Electric Resistance Welded) steel tubing in fluid and gas conveyance applications has been increased by years. Odelya® offers wide range of environment-friendly products with superior properties for safe and healthy consumer usage to meet the global demand.

Odelya® ERW Water & Gas Conveyance Tubes vary on their material types, surface conditions, processing types, and are available as: carbon or stainless, black (self-colour), surface-coated, galvanized, threaded and coupled, plain or bevelled end...

Application

Odelya® ERW Water & Gas Pipes are ideal for transmission of liquids and natural gas, air and non-aggressive gases. Moreover, Odelya® welded steel pipes are used in: plumbing, water supply and treatment, gas distribution, fire extinguisher systems, air-conditioning systems, irritation, heating equipment, white goods, sprinkler systems, compressed air distribution.

Production Range

Outside Diameter: Ø17,1 mm – Ø 610 mm (0,675 inch – 24 inch)
Wall Thickness: 1,4 mm – 12,7 mm (0,055 – 0,500 inch)
Length: Standard length is 6 meters. (From 2 meters to 13 meters, on request)
Tolerances may vary according to standards. Please contact us to get full clarification.

Production Standards

EN 10217-1 (NF A 49-142, SI 530, BSI BS 3059-1, BSI BS 3601, DIN 1626, DIN 1628, DIN 2458)
EN 10224 (NF A 49-150, DIN 1626, DIN 1628, SI 530)
EN 10255 (ISO 65, BS 1387, DIN 2440, DIN 2441, DIN 2448, NFA 49-145, SI 103, UNI 8863)
ISO 65 (EN 10255, BS 1387, DIN 2440, DIN 2441, DIN 2448, NFA 49-145, SI 103, UNI 8863)
ASTM A 53 (BS 3601, DIN 1626, SI 530)
ASTM A 589
ASTM A 795 (SI 4314)

Material Quality

EN 10255, ISO 65	S195T
EN 10224	L235, L275, L355
EN 10217-1	P195TR1, P195TR2, P235TR1, P235TR2, P265TR1, P265TR2
DIN 17100 / DIN 1626	St 33, St 37, St 44, St 52
ASTM A 53	Grade A, B
ASTM A 589	Grade A, B
ASTM A 795	Grade A, B
BS 3601	Gr 430
SI 103	S 332, S 414

Notice: Please contact our experienced sales team in order to get full clarification for other production norms and material quality unlisted in this page.

Galvanizing Standards
EN 10240 (UNI 5745), DIN 2444, EN ISO 1461 (BS 729), ASTM A 90, SI 918.

Threading and Coupling Standards
ISO 7/1, DIN 2986, DIN 2999, BS 21, BS EN 10226-1, ANSI B1 20.1, EN10255, SI 50.3
ASTM A 53
Steel Threaded Pipe Fittings: EN 10241

Finishing Operations (Pipe End)
Plain – square end, bevelled end, threaded and coupled, grooved pipes.

Surface Condition
Black self-colored (uncoated), protective oil / black varnish, hot dip galvanized (zinc coating), primer coating, epoxy coating, polyethylene coating.

QUALITY TESTS
Continuous quality controls during and after production process and various types of coatings applied, enable Odelya® ERW Water & Gas Tubes strong against corrosion, leaking and damages.

Hydrostatic Test
Testing of leakage in the welded areas by high pressure water applies according to further application and requirements (Leak Tightness).

Non-Destructive Tests
Eddy Current Test: Detection of the defects on the surface and testing quality of the weld and the material using electromagnetic device.
Ultrasonic Test: Automatic ultrasonic rotary plant precisely detects possible defects in the weld zone.

Visual & Dimensional Inspections
Accurate information about dimensions and quality of tubes is provided using tape, caliper, ultrasonic device, gauge and cord.

Chemical Analysis
Spectral analysis of the chemical composition

Mechanical & Technological Properties
Tensile test, flattening test, bending test, impact test, drift expansion test, fracture toughness test

Metallographic Examination
Revealing the structure of metals and their alloys with light optical or scanning electron microscope

Surface Coating Tests (for coated pipes)
Coated ERW Steel Pipes are also tested to assure optimum impact resistance, peeling power, coating elongation, indentation hardness, adherence quality, bond strength, coating resistivity, film thickness etc., which are applicable according to the requirements of related standards and upon request.

Please refer to page 52 for more details about our Quality Assurance Policies.

Odelya® ERW Water & Gas Pipes Production Range

Outside Diameter		Wall Thickness																					
	inch	0,055	0,063	0,071	0,079	0,091	0,102	0,114	0,126	0,142	0,157	0,177	0,197	0,213	0,220	0,248	0,280	0,315	0,346	0,394	0,433	0,492	0,500
inch	**mm**	**1,4**	**1,6**	**1,8**	**2**	**2,3**	**2,6**	**2,9**	**3,2**	**3,6**	**4**	**4,5**	**5**	**5,4**	**5,6**	**6,3**	**7,1**	**8**	**8,8**	**10**	**11**	**12,5**	**12,7**
0,675	**17,1**																						
0,677	**17,2**																						
0,839	**21,3**																						
0,866	**22**																						
1	**25,4**																						
1,050	**26,7**																						
1,059	**26,9**																						
1,181	**30**																						
1,252	**31,8**																						
1,260	**32**																						
1,315	**33,4**																						
1,327	**33,7**																						
1,378	**35**																						
1,575	**42,2**																						
1,669	**42,4**																						
1,752	**44,5**																						
1,902	**48,3**																						
2,126	**54**																						
2,374	**60,3**																						
2,874	**73**																						
2,996	**76,1**																						
3,5	**88,9**																						
4	**101,6**																						
4,252	**108**																						
4,5	**114,3**																						
5	**127**																						
5,5	**139,7**																						
5,563	**141,3**																						
6,5	**165,1**																						
6,226	**168,3**																						
7	**177,8**																						
8,626	**219,1**																						
10,748	**273**																						
10,750	**273,1**																						
12,752	**323,9**																						
14	**355,6**																						
16	**406,4**																						
17,992	**457**																						
20	**508**																						
24	**610**																						

EN 10224	EN 10217-1	EN 10255, ISO 65			EN 10255 H	EN 10255 M	EN 10255 L

Odelya® EN 10224 Non-alloy Steel Tubes

Odelya® EN 10224 Water Steel Tubes are manufacturing by longitudinally welded process (butt and electric) with outside diameter ranging from 26,9 mm to 610 mm (1,095 to 24 inch). Odelya® EN 10224 Carbon Steel Pipes are supplied as welded, cold formed (cold finished), hot finished. Heat treatment is performed for Odelya® Steel Tubes to achieve better required properties.

Manufacturing Process	Outside Diameter Range		Wall Thickness Range	
	mm	inch	mm	inch
Butt Weld (BW)	26,9 – 114,3	1,059 – 4,5	2,0 – 6,3	0,079 – 0,248
Electric Welded (EW)	26,9 – 610	1,059 – 22,016	1,4 – 16	0,055 – 0,630 (5/8)

Outside Diameter		Wall Thickness & Weight per Unit Length (kg/m)																	
inch	inch	0,079	0,091	0,102	0,114	0,126	0,142	0,157	0,177	0,197	0,213	0,220	0,248	0,280	0,315	0,346	0,394	0,433	0,492
	mm	**2**	**2,3**	**2,6**	**2,9**	**3,2**	**3,6**	**4**	**4,5**	**5**	**5,4**	**5,6**	**6,3**	**7,1**	**8**	**8,8**	**10**	**11**	**12,5**
1,059	**26,9**	1,23	1,40	1,56	1,72	1,87	2,07	2,26	2,49	2,70	2,86	2,94	3,20	3,47	3,73				
1,181	**30**	1,38	1,57	1,76	1,94	2,11	2,34	2,56	2,83	3,08	3,28	3,37	3,68	4,01	4,34				
1,252	**31,8**	1,47	1,67	1,87	2,07	2,26	2,50	2,74	3,03	3,30	3,52	3,62	3,96	4,32	4,70				
1,260	**32**	1,48	1,68	1,89	2,08	2,27	2,52	2,76	3,05	3,33	3,54	3,65	3,99	4,36	4,73	5,03			
1,327	**33,7**	1,56	1,78	1,99	2,20	2,41	2,67	2,93	3,24	3,54	3,77	3,88	4,26	4,66	5,07	5,40			
1,378	**35**	1,63	1,85	2,08	2,30	2,51	2,79	3,06	3,38	3,70	3,94	4,06	4,46	4,89	5,33	5,69	6,17	6,51	
1,496	**38**	1,78	2,02	2,27	2,51	2,75	3,01	3,35	3,72	4,07	4,34	4,47	4,92	5,41	5,92	6,34	6,70	7,32	
1,575	**40**	1,87	2,14	2,40	2,65	2,90	3,23	3,55	3,94	4,32	4,61	4,75	5,24	5,76	6,31	6,77	7,40	7,87	
1,669	**42,4**	1,99	2,27	2,55	2,82	3,09	3,44	3,79	4,21	4,61	4,93	5,08	5,61	6,18	6,79	7,29	7,99	8,52	
1,752	**44,5**	2,10	2,39	2,69	2,97	3,26	3,63	3,99	4,44	4,87	5,21	5,37	5,93	6,55	7,20	7,75	8,51	9,09	9,86
1,902	**48,3**	2,28	2,61	2,93	3,25	3,56	3,97	4,37	4,86	5,34	5,71	5,90	6,53	7,21	7,95	8,57	9,44	10,12	11,04
2	**51**	2,42	4,76	3,10	3,44	3,77	4,21	4,64	5,16	5,67	6,07	6,27	6,94	7,69	8,48	9,16	10,11	10,85	11,87
2,126	**54**	2,56	2,93	3,30	3,65	4,01	4,47	4,93	5,49	6,04	6,47	6,68	7,41	8,21	9,07	9,81	10,85	11,66	12,79
2,244	**57**	2,71	3,10	3,49	0,75	4,25	4,74	5,23	5,83	6,41	6,87	7,10	7,88	8,74	9,67	10,46	11,59	12,48	13,72
2,374	**60,3**	2,88	3,29	3,70	4,10	4,51	5,03	5,55	6,19	6,82	7,31	7,55	8,39	9,31	10,32	11,18	12,40	13,37	14,73
2,5	**63,5**	3,03	3,47	3,90	4,33	4,76	5,32	5,87	6,55	7,21	7,74	8,00	8,89	9,87	10,95	11,87	13,19	14,24	15,72
2,756	**70**	3,35	3,84	4,32	4,80	5,27	5,89	6,51	7,27	8,01	8,60	8,89	9,90	11,01	12,23	13,28	14,80	16,00	17,72
2,874	**73**	3,50	4,01	4,51	5,01	5,51	6,16	6,81	7,60	8,38	9,00	9,31	10,36	11,54	12,82	13,93	15,54	16,82	18,65
2,996	**76,1**	3,65	4,19	4,71	5,23	5,75	6,44	7,11	7,95	8,77	9,41	9,74	10,80	12,08	13,43	14,60	16,30	17,66	19,60
3,248	**82, 5**	3,97	4,55	5,12	5,69	6,26	7,00	7,74	8,66	9,56	10,27	10,62	11,84	13,20	14,70	15,99	17,88	19,40	21,58
3,5	**88,9**	4,29	4,91	5,53	6,15	6,76	7,57	8,37	9,37	10,34	11,12	11,50	12,83	14,32	15,96	17,38	19,46	21,13	23,55
4	**101,6**	4,91	5,63	6,35	7,06	7,76	8,70	9,63	10,78	11,91	12,81	13,26	14,81	16,55	18,47	20,14	22,59	24,58	27,47
4,252	**108**	5,23	6,00	6,76	7,52	8,27	9,27	10,26	11,49	12,70	13,66	14,14	15,80	17,67	19,73	21,53	24,17	26,31	29,44
4,5	**114,3**	5,54	6,35	7,16	7,97	8,77	9,83	10,88	12,18	13,48	14,50	15,01	16,78	18,77	20,97	22,89	25,72	28,02	31,38
5	**127**	6,17	7,07	7,98	8,87	9,77	10,95	12,13	13,59	15,04	16,19	16,76	18,75	20,99	23,48	25,65	28,85	31,47	35,29
5,236	**133**	6,46	7,41	8,36	9,30	10,24	11,49	12,72	14,26	15,78	16,99	17,59	19,68	22,04	24,66	26,95	30,33	33,09	37 ,14
5,5	**139,7**	6,79	7,79	8,79	9,78	10,77	12,08	13,39	15,00	16,61	17,88	18,52	20,72	23,22	25,98	28,41	31,98	34,91	39,21
5,563	**141,3**	6,87	7,88	8,89	9,90	10,90	12,22	13,54	15,18	16,81	18,10	18,74	20,97	23,50	26,30	28,75	32,38	35,35	39,70
6	**152,4**	7,42	8,51	9,60	10,69	11,77	13,21	14,64	16,41	18,17	19,58	20,27	22,70	25,44	28,49	31,16	35,12	38,36	43,12
6,26	**159**	7,74	8,89	10,03	11,16	12,29	13,80	15,29	17,14	18,99	20,45	21,18	23,72	26,60	29,79	32,59	36,74	40,15	45,16
6,226	**168,3**	8,20	9,42	10,62	11,83	13,03	14,63	16,21	18,18	20,13	21,69	22,47	25,17	28,22	31,62	34,61	39,04	42,67	48,03
7	**177,8**	8,67	9,95	11,23	12,51	13,78	15,46	17,14	19,23	21,31	22,96	23,78	26,64	29,89	33,50	36,67	41,38	45,25	50,95
7,626	**193,7**	9,45	10,86	12,25	13,64	15,03	16,88	18,71	21,00	23,27	25 ,07	25,98	29,11	32,67	36,63	40,12	45,30	49,56	55,85
8,626	**219,1**	10,71	12,30	13,88	15,56	17,04	19,13	21,22	23,81	26,40	28,46	29,48	33,06	37,12	41,65	45,64	51,56	56,45	63,68
9,626	**244,5**	11,96	13,74	15,51	17,28	19,04	21,39	23,72	26,63	29,53	31,84	32,99	37,0 1	41,57	46,66	51,15	57,83	63,34	71,51
10,74	**273**	13,37	15,35	17,34	19,32	21,29	23,92	26,53	29,80	33,04	35,63	36,93	41,43	46,56	52,28	57,33	64,86	71,07	80,30
12,75	**323,9**			20,60	22,96	25,31	28,43	31,55	35,44	39,32	42,41	43,96	49,34	55,47	62,32	68,38	77,4 1	84,88	95,99
14	**355,6**			22,63	25,22	27,81	31,25	34,68	38,96	43,23	46,63	48,33	54,27	61,02	68,57	75,26	85,22	93,48	105,76
16	**406,4**			25,89	28,86	31,82	35,76	39,69	44,60	49,49	53,40	55,35	62,16	69,91	78,60	86,28	97,75	107,26	121,42
18	**457**					31,81	40,25	44,68	50,21	55,73	60,14	62,34	70,02	78,77	88,58	97,26	110,23	120,98	137,02
20	**508**					39,83	44,78	49,71	55,87	62,02	66,93	69,38	77,94	87,70	89,64	108,33	122,81	134,82	152,74
22	**559**					43,86	49,31	54,75	61,53	68,31	73,72	76,42	85,87	96,63	108,70	119,40	135,38	146,65	168,46
24	**610**					47,88	53,83	59,78	67,19	74,60	80,51	83,47	93,79	105,56	118,76	130,47	147,96	162,48	184,18

Chemical Composition

Steel Name	Steel Number	C max,%	Si max,%	Mn max,%	P max,%	S max,%
L235	0252	0,16	0.35	1,20	0.030	0.025
L275	0260	0,20	0.40	1,40	0.030	0.025
L355	0419	0,22	0.55	1,60	0.030	0.025

Mechanical Properties

Steel Name	Tensile Strength (R_m) MPa (N/mm²)	Yield Strength (ReH min.) MPa (N/mm²)		Elongation A min. (%) (L_o=5,65$\sqrt{S_o}$)		Diameter of mandrel for the weld bend test	For the drift expanding test[c] %increase in d/D[d] ratio	
		T ≤ 16 mm	T > 16 mm	Longitudinal	Transverse		≤ 0,8	0,8 >
L235	360 – 500	235	225	25	-	3T	10	12
L275	430 – 570	275	265	21	40, 28 / 27	4T	8	10
L355	500 – 650	355	345	21	-	4T	6	8

Odelya® EN 10255 Steel Tubes for Welding & Threading

Odelya® EN 10255 Non-Alloy Steel Tubes are manufactured by longitudinally welded process in three types: heavy, medium and light. Heat treatment is applied for Odelya® EN 10255 type L, for other types heat treatment is optional. Odelya Int' Steel Industry and Trade Co. supplies steel tubes for water and gas conveyance with alternative finishes and protection of tube ends besides tubes with bare plain ends.

Note: Odelya® ISO 65 ERW Steel Tubes dimensions and weight table is identical to those of Odelya® EN 10255.

Odelya® EN 10255 Heavy & Medium Series

Nominal Dia. (DN) Nominal Bore (NB / NPS)		Specified Outside Diameter (D)		Thread Size	Outside Diameter O.D. (mm)				Heavy Series (H)				Medium Series (M)			
									Wall Thickness (T)		Mass per Unit Length		Wall Thickness (T)		Mass per Unit Length	
				R	Max.		Min.				Plain -end	Socketed			Plain -end	Threaded & Socketed
mm	inch	mm	inch		mm	inch	mm	inch	mm	inch	kg/m	kg/m	mm	inch	kg/m	kg/m
10	⅜	17,2	0,677	⅜	17,5	0,689	16,7	0,657	2,9	0,114	1,02	1,03	2,3	0,091	0,839	0,845
15	½	21,3	0,839	½	21,8	0,858	21,0	0,827	3,2	0,126	1,44	1,45	2,6	0,102	1,21	1,22
20	¾	26,9	1,059	¾	27,3	1,075	26,5	1,043	3,2	0,126	1,87	1,88	2,6	0,102	1,56	1,57
25	1	33,7	1,327	1	34,2	1,346	33,3	1,311	4,0	0,157	2,93	2,95	3,2	0,126	2,41	2,43
32	1 ¼	42,4	1,669	1 ¼	42,9	1,689	42,0	1,654	4,0	0,157	3,79	3,82	3,2	0,126	3,10	3,13
40	1 ½	48,3	1,902	1 ½	48,8	1,921	47,9	1,886	4,0	0,157	4,37	4,41	3,2	0,126	3,56	3,60
50	2	60,3	2,374	2	60,8	2,394	59,7	2,350	4,5	0,177	6,19	6,26	3,6	0,142	5,03	5,10
65	2 ½	76,1	2,996	2 ½	76,6	3,016	75,3	2,965	4,5	0,177	7,93	8,05	3,6	0,142	6,42	6,54
80	3	88,9	3,5	3	89,5	3,524	88,0	3,465	5,0	0,197	10,3	10,5	4,0	0,157	8,36	8,53
100	4	114,3	4,5	4	115,0	4,528	113,1	4,453	5,4	0,213	14,5	14,8	4,5	0,177	12,2	12,5
125	5	139,7	5,5	5	140,8	5,543	138,5	5,453	5,4	0,213	17,9	18,4	5,0	0,197	16,6	17,1
150	6	165,1	6,5	6	166,5	6,555	163,9	6,453	5,4	0,213	21,3	21,9	5,0	0,197	19,8	20,4

Odelya® EN 10255 Light Series (Type L)

Nominal Dia. (DN) Nominal Bore (NB / NPS)		Specified Outside Diameter (D)		Thread Size	Outside Diameter O.D. (mm)				Light Series (L)			
									Wall Thickness (T)		Mass per Unit Length	
				R	Max.		Min.				Plain -end	Threaded & Socketed
mm	inch	mm	inch		mm	inch	mm	inch	mm	inch	kg/m	kg/m
10	⅜	17,2	0,677	⅜	17,4	0,685	16,7	0,657	2,0	0,079	0,750	0,756
15	½	21,3	0,839	½	21,7	0,854	21,0	0,827	2,3	0,091	1,08	1,09
20	¾	26,9	1,059	¾	27,1	1,067	26,4	1,039	2,3	0,091	1,40	1,41
25	1	33,7	1,327	1	34,0	1,339	33,2	1,307	2,9	0,114	2,20	2,22
32	1 ¼	42,4	1,669	1 ¼	42,7	1,681	41,9	1,650	2,9	0,114	2,82	2,85
40	1 ½	48,3	1,902	1 ½	48,6	1,913	47,8	1,882	2,9	0,114	3,25	3,29
50	2	60,3	2,374	2	60,7	2,390	59,6	2,346	3,2	0,126	4,51	4,58
65	2 ½	76,1	2,996	2 ½	76,0	2,992	75,2	2,961	3,2	0,126	5,75	5,87
80	3	88,9	3,5	3	88,7	3,492	87,9	3,461	3,2	0,126	6,76	6,93
90	3 ½	101,6	4,0	3 ½	101,2	4,024	100,3	3,949	3,6	0,142	8,70	8,88
100	4	114,3	4,5	4	113,9	4,090	113,0	4,449	3,6	0,142	9,83	10,1
125	5	139,7	5,5	5	140,8	5,543	138,5	5,453	4,5	0,177	15,0	15,5
150	6	165,1	6,5	6	166,5	6,555	163,9	6,453	4,5	0,177	17,8	18,4

Odelya® EN 10255 Light Series (Type L1 & L2)

Nominal Dia. (DN) Nominal Bore (NB / NPS)		Specified Outside Diameter (D)		Thread Size	Light Series (Type L1)								Light Series (Type L2)							
					Outside Diameter O.D. (mm)				Wall Thickness		Mass per Unit Length		Outside Diameter O.D. (mm)				Wall Thickness		Mass per Unit Length	
				R	max.		min.				Plain-end	Threaded & Socketed	max.		min.				Plain-end	Threaded & Socketed
mm	inch	mm	inch		mm	inch	mm	inch	mm	inch	kg/m	kg/m	mm	inch	mm	inch	mm	inch	kg/m	kg/m
10	⅜	17,2	0,677	⅜	17,4	0,685	16,7	0,657	2,0	0,079	0,742	0,748	17,1	0,673	16,7	0,657	1,8	0,071	0,670	0,676
15	½	21,3	0,839	½	21,7	0,854	21,0	0,827	2,3	0,091	1,08	1,09	21,4	0,843	21,0	0,827	2,0	0,079	0,947	0,956
20	¾	26,9	1,059	¾	27,1	1,067	26,4	1,039	2,3	0,091	1,39	1,40	26,9	1,059	26,4	1,039	2,3	0,091	1,38	1,39
25	1	33,7	1,327	1	34,0	1,339	33,2	1,307	2,9	0,114	2,20	2,22	33,8	1,331	33,2	1,307	2,6	0,102	1,98	2,00
32	1¼	42,4	1,669	1¼	42,7	1,681	41,9	1,650	2,9	0,114	2,82	2,85	42,5	1,673	41,9	1,650	2,6	0,102	2,54	2,57
40	1½	48,3	1,902	1½	48,6	1,913	47,8	1,882	2,9	0,114	3,24	3,28	48,4	1,906	47,8	1,882	2,9	0,114	3,23	3,27
50	2	60,3	2,374	2	60,7	2,390	59,6	2,346	3,2	0,126	4,49	4,56	60,2	2,37	59,6	2,346	2,9	0,114	4,08	4,15
65	2 ½	76,1	2,996	2 ½	76,0	2,992	75,2	2,961	3,2	0,126	5,73	5,85	76,0	2,992	75,2	2,961	3,2	0,126	5,71	5,83
80	3	88,9	3,5	3	89,4	3,520	87,9	3,461	3,6	0,142	7,55	7,72	88,7	3,492	87,9	3,461	3,2	0,126	6,72	6,89
100	4	114,3	4,5	4	114,9	4,524	113,0	4,449	4	0,157	10,8	11,1	113,9	4,484	113,0	4,449	3,6	0,142	9,75	10,0

Odelya® EN 10255 Light Series (Type L1 & L2)

Steel Name	Steel Number	C max,%	Mn max,%	P max,%	S max,%	Yield Strength (R_{eH} min.)	Tensile Strength (R_m)	Elongation (A min.)
						MPa	MPa	%
S 195T	1.0026	0,20	1,40	0,035	0,030	195	320 - 520	20

Odelya® EN 10217-1 Steel Tubes for Pressure Purposes

Odelya® EN 10217-1 Electric-Resistance Welded Water and Gas Steel Pipes are manufactured by longitudinally electric-resistance welded process with outside diameter varied from 17,2 mm to 610 mm (0,677 to 24 inch).

Manufacturing Process	Starting Material	Forming Operation	Technical Delivery Conditions
Electric Welded (EW)	Hot rolled strip	Cold formed (+ welded)	As welded / Normalised weld zone / Full pipe normalized
	Normalising rolled strip		
	Hot rolled or normalising rolled strip	Cold formed (+ welded) + hot stretch reduced at a controlled temperature to give a normalised condition	Normalised rolled / Full pipe normalized
	Cold rolled + stress relieved	Cold formed (+ welded)	

Odelya® EN 10217-1 ERW Steel Tubes for Pressure Purposes

Outside Diameter		Wall Thickness & Weight per Unit length (kg/m)																			
inch	inch	0,055	0,063	0,071	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
	mm	1,4	1,6	1,8	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
0,677	**17,2**	0,55	0,62	0,68	0,75	0,85	0,94	1,02	1,10	1,21	1,30										
0,709	**18**	0,57	0,65	0,72	0,79	0,89	0,99	1,08	1,17	1,28	1,38										
0,748	**19**	0,61	0,69	0,76	0,84	0,95	1,05	1,15	1,25	1,37	1,48										
0,787	**20**	0,64	0,73	0,81	0,89	1,00	1,12	1,22	1,33	1,46	1,58										
0,839	**21,3**	0,69	0,78	0,87	0,95	1,08	1,20	1,32	1,43	1,57	1,71	1,86									
0,866	**22**	0,71	0,80	0,90	0,99	1,12	1,24	1,37	1,48	1,63	1,78	1,94	2,10								
0,984	**25**	0,81	0,92	1,03	1,13	1,29	1,44	1,58	1,72	1,90	2,07	2,27	2,47								
1	**25,4**	0,83	0,94	1,05	1,15	1,31	1,46	1,61	1,75	1,94	2,11	2,32	2,52								
1,059	**26,9**	0,88	1,00	1,11	1,23	1,40	1,56	1,72	1,87	2,07	2,26	2,49	2,70								
1,181	**30**	0,99	1,12	1,25	1,38	1,57	1,76	1,94	2,11	2,34	2,56	2,83	3,08	3,37	3,68						
1,252	**31,8**	1,05	1,19	1,33	1,47	1,67	1,87	2,07	2,26	2,50	2,74	3,03	3,30	3,62	3,96	4,32	4,70				
1,260	**32**	1,06	1,20	1,34	1,48	1,68	1,89	2,08	2,27	2,52	2,76	3,05	3,33	3,65	3,99	4,36	4,73				
1,327	**33,7**	1,12	1,27	1,42	1,56	1,78	1,99	2,20	2,41	2,67	2,93	3,24	3,54	3,88	4,26	4,66	5,07				
1,378	**35**	1,16	1,32	1,47	1,63	1,85	2,08	2,30	2,51	2,79	3,06	3,38	3,70	4,06	4,46	4,89	5,33	5,69			
1,496	**38**	1,26	1,44	1,61	1,78	2,02	2,27	2,51	2,75	3,01	3,35	3,72	4,07	4,47	4,92	5,41	5,92	6,34			
1,575	**40**	1,33	1,52	1,70	1,87	2,14	2,40	2,65	2,90	3,23	3,55	3,94	4,32	4,75	5,24	5,76	6,31	6,77			
1,669	**42,4**	1,42	1,61	1,80	1,99	2,27	2,55	2,82	3,09	3,44	3,79	4,21	4,61	5,08	5,61	6,18	6,79	7,29			
1,752	**44,5**	1,49	1,69	1,90	2,10	2,39	2,69	2,97	3,26	3,63	3,99	4,44	4,87	5,37	5,93	6,55	7,20	7,75			
1,902	**48,3**	1,62	1,84	2,06	2,28	2,61	2,93	3,25	3,56	3,97	4,37	4,86	5,34	5,90	6,53	7,21	7,95	8,57			
2	**51**	1,71	1,95	2,18	2,42	4,76	3,10	3,44	3,77	4,21	4,64	5,16	5,67	6,27	6,94	7,69	8,48	9,16			
2,126	**54**	1,82	2,07	2,32	2,56	2,93	3,30	3,65	4,01	4,47	4,93	5,49	6,04	6,68	7,41	8,21	9,07	9,81	10,85		
2,244	**57**	1,92	2,19	2,45	2,71	3,10	3,49	0,75	4,25	4,74	5,23	5,83	6,41	7,10	7,88	8,74	9,67	10,46	11,59		
2,374	**60,3**	2,03	2,32	2,60	2,88	3,29	3,70	4,10	4,51	5,03	5,55	6,19	6,82	7,55	8,39	9,31	10,32	11,18	12,40		
2,5	**63,5**	2,14	2,44	2,74	3,03	3,47	3,90	4,33	4,76	5,32	5,87	6,55	7,21	8,00	8,89	9,87	10,95	11,87	13,19		
2,756	**70**	2,37	2,70	3,03	3,35	3,84	4,32	4,80	5,27	5,89	6,51	7,27	8,01	8,89	9,90	11,01	12,23	13,28	14,80		
2,874	**73**	2,47	2,82	3,16	3,50	4,01	4,51	5,01	5,51	6,16	6,81	7,60	8,38	9,31	10,36	11,54	12,82	13,93	15,54		
2,996	**76,1**	2,58	2,94	3,30	3,65	4,19	4,71	5,23	5,75	6,44	7,11	7,95	8,77	9,74	10,80	12,08	13,43	14,60	16,30		
3,248	**82,5**	2,80	3,19	3,58	3,97	4,55	5,12	5,69	6,26	7,00	7,74	8,66	9,56	10,62	11,84	13,20	14,70	15,99	17,88		
3,5	**88,9**	3,02	3,44	3,87	4,29	4,91	5,53	6,15	6,76	7,57	8,37	9,37	10,34	11,50	12,83	14,32	15,96	17,38	19,46		
4	**101,6**	3,46	3,95	4,43	4,91	5,63	6,35	7,06	7,76	8,70	9,63	10,78	11,91	13,26	14,81	16,55	18,47	20,14	22,59		
4,252	**108**	3,68	4,20	4,71	5,23	6,00	6,76	7,52	8,27	9,27	10,26	11,49	12,70	14,14	15,80	17,67	19,73	21,53	24,17	26,31	
4,5	**114,3**	3,90	4,45	4,99	5,54	6,35	7,16	7,97	8,77	9,83	10,88	12,18	13,48	15,01	16,78	18,77	20,97	22,89	25,72	28,02	
5	**127**		4,95	5,56	6,17	7,07	7,98	8,87	9,77	10,95	12,13	13,59	15,04	16,76	18,75	20,99	23,48	25,65	28,85	31,47	
5,236	**133**		5,18	5,82	6,46	7,41	8,36	9,30	10,24	11,49	12,72	14,26	15,78	17,59	19,68	22,04	24,66	26,95	30,33	33,09	
5,5	**139,7**		5,45	6,12	6,79	7,79	8,79	9,78	10,77	12,08	13,39	15,00	16,61	18,52	20,72	23,22	25,98	28,41	31,98	34,91	
5,563	**141,3**		5,51	6,19	6,87	7,88	8,89	9,90	10,90	12,22	13,54	15,18	16,81	18,74	20,97	23,50	26,30	28,75	32,38	35,35	
6	**152,4**		5,95	6,68	7,42	8,51	9,60	10,69	11,77	13,21	14,64	16,41	18,17	20,27	22,70	25,44	28,49	31,16	35,12	38,36	
6,26	**159**		6,21	6,98	7,74	8,89	10,03	11,16	12,29	13,80	15,29	17,14	18,99	21,18	23,72	26,60	29,79	32,59	36,74	40,15	
6,226	**168,3**		6,58	7,39	8,20	9,42	10,62	11,83	13,03	14,63	16,21	18,18	20,13	22,47	25,17	28,22	31,62	34,61	39,04	42,67	
7	**177,8**				8,67	9,95	11,23	12,51	13,78	15,46	17,14	19,23	21,31	23,78	26,64	29,89	33,50	36,67	41,38	45,25	
7,626	**193,7**				9,45	10,86	12,25	13,64	15,03	16,88	18,71	21,00	23,27	25,98	29,11	32,67	36,63	40,12	45,30	49,56	
8,626	**219,1**				10,71	12,30	13,88	15,56	17,04	19,13	21,22	23,81	26,40	29,48	33,06	37,12	41,65	45,64	51,56	56,45	63,68
9,626	**244,5**				11,96	13,74	15,51	17,28	19,04	21,39	23,72	26,63	29,53	32,99	37,01	41,57	46,66	51,15	57,83	63,34	71,51
10,748	**273**				13,37	15,35	17,34	19,32	21,29	23,92	26,53	29,80	33,04	36,93	41,43	46,56	52,28	57,33	64,86	71,07	80,30
12,752	**323,9**						20,60	22,96	25,31	28,43	31,55	35,44	39,32	43,96	49,34	55,47	62,32	68,38	77,41	84,88	95,99
14	**355,6**						22,63	25,22	27,81	31,25	34,86	38,96	43,23	48,33	54,27	61,02	68,57	75,26	85,22	93,48	105,76
16	**406,4**						25,89	28,86	31,82	35,76	39,69	44,60	49,49	55,35	62,16	69,91	78,60	86,28	97,75	107,26	121,42
18	**457**								35,81	40,25	44,68	50,21	55,73	62,34	70,02	78,77	88,58	97,26	110,23	120,98	137,02
20	**508**								39,83	44,78	49,71	55,87	62,02	69,38	77,94	87,70	98,64	108,33	122,81	134,82	152,74
22	**559**								43,86	49,31	54,75	61,53	68,31	76,42	85,87	96,63	108,70	119,40	135,38	148,65	168,46
24	**610**								47,88	53,83	59,78	67,19	74,60	83,47	93,79	105,56	118,76	130,47	147,96	162,48	184,18

Chemical Composition

Steel name	Steel number	C max,%	Si max,%	Mn max,%	P max,%	S max,%	Cr max,%	Mo max,%	Ni max,%	Al tot min ,%	Cu max,%	Nb max,%	Ti max,%	V max,%	Cr+Cu+Mo+Ni max,%
P195T R1	1.0107	0.13	0.35	0.7	0.025	0.02	0.3	0.08	0.3	-	0.3	0.01	0.04	0.02	0.7
P195TR2	1.0108	0.13	0.35	0.7	0.025	0.02	0.3	0.08	0.3	0.02	0.3	0.01	0.04	0.02	0.7
P235TR1	1.0254	0.16	0.35	1.2	0.025	0.02	0.3	0.08	0.3	-	0.3	0.01	0.04	0.02	0.7
P235TR2	1.0255	0.16	0.35	1.2	0.025	0.02	0.3	0.08	0.3	0.02	0.3	0.01	0.04	0.02	0.7
P265TR1	1.0258	0.2	0.4	1.4	0.025	0.02	0.3	0.08	0.3	-	0.3	0.01	0.04	0.02	0.7
P265TR2	1.0259	0.2	0.4	1.4	0.025	0.02	0.3	0.08	0.3	0.02	0.3	0.01	0.04	0.02	0.7

Mechanical Properties

Steel Grade	Yield Strength (R_{eH} min.) MPa (N/mm ²)		Tensile Strength (R_m) MPa (N/mm ²)	Elongation A min. (%) Longitudinal / Transverse	Impact Properties Longitudinal 0°C, - 10°C / Transverse 0°C
	T ≤ 16 mm	16 ‹ T ≤ 40 mm			
P195TR1	195	185	320 – 440	27 / 25	-
P195TR2	195	185	320 – 440	27 / 25	40, 28 / 27
P235TR1	235	225	360 – 500	25 / 23	-
P235TR2	235	225	360 – 500	25 / 23	40, 28 / 27
P265TR1	265	255	410 – 570	21 / 19	-
P265TR2	265	255	410 – 570	21 / 19	40, 28 / 27

Odelya® ASTM A 53 Welded Steel Pipes

Odelya® ASTM A 53 welded steel, black and hot-dipped, galvanized (zinc-coated) tubes are manufactured as furnace-butt welded (Grade A) and electric-resistance welded (Grade A,B). Production range of this standard specification vary between 17,1 mm and 610 mm (NPS 3/8 to 24 inclusive).

Odelya® ASTM A 53 Plain End and Threaded & Coupled Pipes

Nominal Bore (NB / NPS) Nominal Dia. (DN)		Outside Diameter (D)		Wall Thickness		Nominal Weight per Unit Length				Weight Class	Sch No	Test Pressure * psi (MPa)			
						Plain End		Treaded & Coupled				Plain End		Treaded & Coupled	
inch	mm	inch	mm	inch	mm	lb/ft	kg/m	lb/ft	kg/m			Gr. A	Gr. B	Gr. A	Gr. B
3/8	10	0.675	17,1	0,091	2,31	0,57	0,84	0,57	0,84	STD	40	700(4800)	700(4800)	700(4800)	700(4800)
				0,126	3,20	0,74	1,10	0,74	1,10	XS	80	850(5900)	850(5900)	850(5900)	850(5900)
1/2	15	0,840	21,3	0,109	2,77	0,85	1,27	0,86	1,27	STD	40	700(4800)	700(4800)	700(4800)	700(4800)
				0,147	3,73	1,09	1,62	1,09	1,62	XS	80	850(5900)	850(5900)	850(5900)	850(5900)
				0,188	4,78	1,31	1,95				160	900(6200)	900(6200)		
3/4	20	1,050	26,7	0,113	2,87	1,13	1,69	1,14	1,69	STD	40	700(4800)	700(4800)	700(4800)	700(4800)
				0,154	3,91	1,48	2,20	1,48	2,21	XS	80	850(5900)	850(5900)	850(5900)	850(5900)
1	25	1,315	33,4	0,133	3,38	1,68	2,50	1,69	2,50	SDT	40	700(4800)	700(4800)	700(4800)	700(4800)
				0,179	4,55	2,17	3,24	2,19	3,25	XS	80	850(5900)	850(5900)	850(5900)	850(5900)
				0,250	6,35	2,85	4,24				160	950(6500)	950(6500)		
1 1/4	32	1,660	42,2	0,140	3,56	2,27	3,39	2,28	3,40	STD	40	1200(8300)	1300(9000)	1000(6900)	1100(7600)
				0,191	4,85	3,00	4,47	3,03	4,49	XS	80	1800(12400)	1900(13100)	1500(10300)	1600(11000)
				0,250	6,35	3,77	5,61				160	1900(13100)	2000(138 00)		
1 1/2	40	1,900	48,3	0,145	3,68	2,72	4,05	2,74	4,04	STD	40	1200(8300)	1300(9000)	1000(6900)	1100(7600)
				0,200	5,08	3,63	5,41	3,65	5,39	XS	80	1800(12400)	1900(13100)	1500(10300)	1600(11000)
2	50	2,375	60,3	0,154	3,91	3,66	5,44	3,68	5,46	STD	40	2300(15 900)	2500(17200)	2300(15900)	2500(17200)
				0,218	5,54	5,03	7,48	5,08	7,55	XS	80	2500(17200)	2500(17200)	2500(17200)	2500(17200)
2 1/2	65	2,875	73,0	0,203	5,16	5,80	8,63	5,85	8,67	STD	40	2500(17200)	2500(17200)	2500(17200)	2500(17200)
				0,276	7,01	7,67	11,41	7,75	11,52	XS	80	2500(17200)	2500(17 200)	2500(17200)	2500(17200)
3	80	3,500	88,9	0,125	3,18	4,51	6,72					1290(8 900)	1500(1000)		
				0,156	3,96	5,58	8,29					1600(11000)	1870(12900)		
				0,188	4,78	6,66	9,92					1930(13330)	2260(16600)		
				0,216	5,49	7,58	11,29	7,68	11,35	STD	40	2220(15 300)	2500(17200)	2200(15200)	2500(17200)
				0,250	6,35	8,69	12,93					2500(17200)	2500(17200)		
				0,281	7,14	9,67	14,40					2500(17200)	2500(17200)		
				0,300	7,62	10,26	15,27	10,35	15,39	XS	80	2500(17200)	2500(17200)	2500(17200)	2500(17200)
3 1 /2	90	4,000	101,6	0,125	3,18	5,18	7,72					1120(7700)	1310(19 000)		
				0,156	3,96	6,41	9,53					1400(6700)	1640(11300)		
				0,188	4,78	7,66	11,41					1690(11700)	1970(13600)		
				0,226	5,74	9,12	13,57	9,27	13,71	STD	40	2030(14000)	2370(16300)	2000(13800)	2400(16500)

(continued) (please see the previous page)

Odelya® ASTM A 53 Plain End and Threaded & Coupled Pipes

Nominal Bore (NB / NPS) Nominal Dia. (DN)		Outside Diameter (D)		Wall Thickness		Nominal Weight per Unit Length				Weight Class	Sch No	Test Pressure ' psi (MPa)			
						Plain End		Treaded & Coupled				Plain End		Treaded & Coupled	
inch	mm	inch	mm	inch	mm	lb/ft	kg/m	lb/ft	kg/m			Gr. A	Gr. B	Gr. A	Gr. B
				0,250	6,35	10, 02	14,92					2250(15500)	2500(17200)		
				0,281	7,14	11,17	16,63					2500(17200)	2500(17200)		
				0,318	8,08	12,52	18,63	12,67	18,82	XS	80	2800(19300)	2800(19300)	2800(19300)	2800(19300)
4	100	4,500	114,3	0,125	3,1 8	5,85	8,71					1000(6900)	1170(8100)		
				0,156	3,96	7,24	10,78					1250(8600)	1460(10100)		
				0,188	4,78	8,67	12,91					1500 (10300)	1750(12100)		
				0,219	5,56	10,02	14,91					1750(12100)	2040(14100)		
				0,237	6,02	10,80	16,07	10,92	16,23	STD	40	1900(13100)	2210(15200)	1900(13100)	2200(15200)
				0,250	6,35	11,36	16,90					2000(13800)	2330(16100)		
				0,281	7,14	12,67	18,87					2250(15100)	2620(18100)		
				0,312	7,92	13,97	20,78					2500(17200)	2800(19300)		
				0,337	8,56	15,00	22,32	15,2 0	22,60	XS	80	2700(18600)	2800(19300)		
5	125	5,563	141,3	0,156	3,96	9,02	13,41					1010(700)	1180(8100)		
				0,188	4,78	10,80	16,09					1220(8400)	1420(9800)		
				0,219	5,56	12,51	18,61					1420(9800)	1650(11400)		
				0,258	6,55	14,63	21,77	14,90	22,07	STD	40	1670(11500)	1950(13400)	1700(11700)	1900(13100)
				0,281	7,14	15,85	23,62					1820(12500)	2120(14600)		
				0,312	7,92	17,51	26,05					2020(13900)	2360(16300)		
				0,344	8,74	19,19	28,57					2230(15400)	2600(17900)		
				0,375	9,52	20,80	30,94	21,04	31,42	XS	80	2430(16800)	2800(19300)	2400(16500)	2800(19300)
6	150	6,625	168,3	0,188	4,78	12,94	19,27					1020(7000)	1190(8200		
				0,219	5,56	15,00	22,31					1190(8200)	1390(9600)		
				0,250	6,35	17,04	25,36					1360(9400)	1580(10900)		
				0,280	7,11	18,99	28,26	19,34	28,58	STD	40	1520(10500)	1780(12300)	1500(10300)	1800(12400)
				0,312	7,92	21,06	31,32					1700(11700)	1980(13700)		
				0,344	8,74	23,10	34,39					1870(12900)	2180(15000)		
				0,375	9,52	25,05	37,28					2040(14100)	2380(16400)		
				0,432	10,97	28,60	42,56	28,88	43,05	XS	80	2350(16200)	2740(18900)	2300(15900)	2700(18600)
8	200	8,625	219,1	0,188	4,78	16,96	25,26					7800(5400)	920(6300)		
				0,203	5,16	18,28	27,22					850(5900)	1000(6900)		
				0,219	5,56	19,68	29,28					910(6300)	1070(7400)		
				0,250	6,35	22,38	33,31				20	1040(7200)	1220(8400)		
				0,277	7,04	24,72	36,31	25,53	38,07		30	1160(7800)	1350(9300)	1200(8300)	1300(9000)
				0,312	7,92	27,73	41,24					1300(9000)	1520(10500)		
				0,322	8,18	28,58	42,55	29,35	43,73	STD	40	1340(9200)	1570(10800)	1300(9000)	1600(11000)
				0,344	8,74	30,45	45,34					1440(9900)	1680(11600)		
				0,375	9,52	33,07	49,20					1570(10800)	1830(12600)		
				0,406	10,31	35,67	53,08				60	1700(11700)	2000(13800)		

(continued) (please see the previous page)

Odelya® ASTM A 53 Plain End and Threaded & Coupled Pipes

Nominal Bore (NB / NPS) Nominal Dia. (DN)		Outside Diameter (D)		Wall Thickness		Nominal Weight per Unit Length				Weight Class	Sch No	Test Pressure ' psi (MPa)			
						Plain End		Treaded & Coupled				Plain End		Treaded & Coupled	
inch	mm	inch	mm	inch	mm	lb/ft	kg/m	lb/ft	kg/m			Gr. A	Gr. B	Gr. A	Gr. B
12	300	12,750	323,8	0,203	5,16	27,23	40,55					570(3900)	670(4600)		
				0,219	5,56	29,34	43,63					620(4300)	720(5000)		
				0,250	6,35	33,41	49,71				20	710(4900)	820(5700)		
				0,281	7,14	37,46	55,75					790(5400)	930(6400)		
				0,312	7,92	41,48	61,69					880(6100)	1030(7100)		
				0,330	8,38	43,81	65,18	45,47	67,72		30	930(6400)	1090(7500)	950(6500)	1100(7600)
				0,344	8,74	45,62	67,90					970(6700)	1130(7800)		
				0,375	9,52	49,61	73,78	51,28	76,21	STD		1060(7300)	1240(8500)	1100(7600)	1200(8300)
				0,406	10,31	53,57	79,70				40	1150(7900)	1240(8500)		
				0,438	11,13	57,65	85,82					1240(85009	1440(9900)		
				0,500	12,70	65,48	97,43	66,91	99,40	XS		1410(9 700)	1650(11400)	1400(9700)	1600(11000)
14	350	14,000	355,6	0,210	5,33	30,96	46,04					540(3700)	630(4300)		
				0,219	5,56	32,26	47,99					560(3900)	660(4500)		
				0,250	6,35	36,75	54,69				10	640(4400)	750(5200)		
				0,281	7,14	41,21	61,35					720(5000)	940(6500)		
				0,312	7,92	45,65	67,90				20	800(5500)	940(6500)		
				0,344	8,74	50,22	74,76					880(6100)	1030(7100)		
				0,375	9,52	54,62	81,25			STD	30	960(6600)	1120(7700)		
				0,438	11,13	63,50	94,55				40	1130(7800)	1310(9000)		
				0,469	11,91	67,84	100,94					1210(8300)	1410(9700)		
				0,500	12,70	72,16	107,39			XS		1290(8900)	1500(10300)		
16	400	16,000	406,4	0,219	5,56	36,95	54,96					490(3400)	570(3900)		
				0,250	6,35	42,09	62,64				10	560(3900)	660(4500)		
				0,281	7,14	47,22	70,30					630(4300)	740(5100)		
				0,312	7,92	52,32	77,83				20	700(4800)	820(5700)		
				0,344	8,74	57,57	85,71					770(5300)	900(6200)		
				0,375	9,52	62,64	93,17			STD	30	840(5800)	980(6800)		
				0,438	11,13	72,86	108,49					990(6800)	1150(790 0)		
				0,469	11,91	77,87	115,86					1060(7300)	1230(8500)		
				0,500	12,70	82,85	123,30			XS	40	1120(7700)	1310(9000)		
18	450	18,000	457	0,250	6,35	47,44	70,60				10	500(3400)	580(4000)		
				0,281	7,14	53,23	79,24					560(3900)	660(4500)		
				0,312	7,92	58,99	87,75				20	620(4300)	730(5000)		
				0,344	8,74	64,93	96,66					690(4800)	800(5500)		
				0,375	9,52	70,65	105,10			STD		750(5200)	880(6100)		
				0,406	10,31	76,36	113,62					810(5600)	950(6500)		
				0,469	11,91	87,89	130,78					940(6500)	1090(7500)		
				0,500	12,70	93,54	139,20			XS		1000(6900)	1170(8100)		

(continued) (please see the previous page)

Odelya® ASTM A 53 Plain End and Threaded & Coupled Pipes

Nominal Bore (NB / NPS) Nominal Dia. (DN)		Outside Diameter (D)		Wall Thickness		Nominal Weight per Unit Length				Weight Class	Sch No	Test Pressure ' psi (MPa)			
						Plain End		Treaded & Coupled				Plain End		Treaded & Coupled	
inch	mm	inch	mm	inch	mm	lb/ft	kg/m	lb/ft	kg/m			Gr. A	Gr. B	Gr. A	Gr. B
20	500	20,000	508	0,250	6,35	52,78	78,55				10	450(3100)	520(3600)		
				0,281	7,14	59,23	88,19					510(3500)	590(4100)		
				0,312	7,92	65,66	97,67					560(3900)	660(4500)		
				0,344	8,74	72,28	107,60					620(4300)	720(5000)		
				0,375	9,52	78,67	117,02			STD	20	680(4700)	790(5400)		
				0,406	10,31	84,04	126,53					730(5000)	850(5900)		
				0,438	11,13	91,59	136,37					790(5400)	920(6300)		
				0,469	11,91	97,92	145,70					850(5900)	950(6500)		
				0,500	12,70	104,23	155,12			XS	30	900(6200)	1050(7200)		
24	600	24,000	610	0,250	6,35	63,47	94,46				10	380(2600)	440(3000)		
				0,281	7,14	71,25	106,08					420(2900)	490(3400)		
				0,312	7,92	79,01	117,51					470(3200)	550(3800)		
				0,344	8,74	86,99	129,50					520(3600)	600(4100)		
				0,375	9,52	94,71	140,88			STD	20	560(3900)	660(4500)		
				0,406	10,31	102,40	152,37					610(4200)	710(4900)		
				0,438	11,13	110,32	164,26					660(4500)	770(5300)		
				0,469	11,91	117,98	175,54					700(4800)	820(5700)		
				0,500	12,70	125,61	186,94			XS		750(5200)	880(6100)		

Chemical Composition

Steel name	Carbon max, %	Manganese max, %	Phosphorus max, %	Sulfur max, %	Copper[A] max, %	Nickel [A] max, %	Cromium [A] max, %	Molybdenum [A] max, %	Vanadium [A] max, %
Type E (electric resistance welded pipe)									
Grade A	0,25	0,95	0,05	0,045	0,50	0,40	0,40	0,15	0,08
Grade B	0,30	1,20	0,05	0,045	0,50	0,40	0,40	0,15	0,08
Type F (furnace butt welded pipe)									
Grade A	0,30	1,20	0,05	0,045	0,40	0,40	0,40	0,15	0,08

[A] - The total composition of those five elements should not be more

Mechanical properties

Steel Grade	Yield Strength, min psi (Mpa)	Tensile Strength, min , psi (Mpa)	Elongation A min. (%) Longitudinal / Transverse
Grade A	30 000 (205)	48 000 (330)	27 / 25
Grade B	35 000 (240)	60 000 (415)	21 / 19

Note: the minimum elongation should be determined for each combination of tension test sample and specified minimum tensile strength.

Odelya® ASTM A 795 Welded Steel Pipes

Odelya® ASTM A 795 Black and Hot-Dipped Zinc-Coated (Galvanized) Steel Tubes are manufactured by longitudinally welded process (furnace-butt and electric-resistance). Odelya® ASTM A 795 welded steel pipes are in outside diameter from 21,3 mm to 273,1 mm (NPS ½ to 10, max. 4 for furnace welded pipes) and are produced in two series: light-weight and standard-weight.

Odelya® ASTM A 795 Light Weight (Schedule 10)

Nominal D iameter (DN) Nominal Bore (NB / NPS)		Outside Diameter (D)		Nominal Wall Thickness (T)		Plain End Weight per Unit Length		Pressure Test			
								Furnace -Welded		ERW Welded	
mm	inch	inch	mm	inch	mm	lb/ft	kg/m	psi	MPa	psi	MPa
20	¾	1,050	26,7	0,083	2,11	0,86	1,28	500	3,45	700	4,83
25	1	1,315	33,4	0,109	2,77	1,41	2,09	500	3,45	700	4,83
32	1¼	1,660	42,2	0,109	2,77	1,81	2,69	500	3,45	1000	6,89
40	1½	1,900	48,3	0,109	2,77	2,09	3,11	500	3,45	1000	6,89
50	2	2,375	60,3	0,109	2,77	2,64	3,93	500	3,45	1000	6,89
65	2 ½	2,875	73,0	0,120	3,05	3,53	5,26	500	3,45	1000	6,89
80	3	3,500	88,9	0,120	3,05	4,34	6,46	500	3,45	1000	6,89
90	3 ½	4,000	101,6	0,120	3,05	4,98	7,41	500	3,45	1200	8,27
100	4	4,500	114,3	0,120	3,05	5,62	8,37	500	3,45	1200	8,27
125	5	5,563	141,3	0,134	3,40	7,78	11,58	-	-	1200	8,27
150	6	6,625	168,3	0,134	3,40	9,30	13,58	-	-	1000	6,89
200	8	8,625	219,1	0,188	4,78	16,69	25,26	-	-	800	5,51
250	10	10,750	273,1	0,188	4,78	21,23	31,62	-	-	700	4,83

Odelya® ASTM A 795 Standart Weight (Schedule 30 & 40)

Nominal Diameter (DN) Nominal Bore (NB / NPS)		Outside Diameter		Nominal Wall Thickness		Plain End Weight per Unit Length		Threaded & Coupled Weight per Unit Length		Pressure Test			
										Furnace -Welded		ERW Welded	
mm	inch	inch	mm	inch	mm	lb/ft	kg/m	lb/ft	kg/m	psi	MPa	psi	MPa
15	½	0,840	21,3	0,109	2,77	0,85	1,27	0,85	1,27	700	4,83	700	4,83
20	¾	1,050	26,7	0,113	2,87	1,13	1,69	1,13	1,68	700	4,83	700	4,83
25	1	1,315	33,4	0,133	3,38	1,68	2,50	1,68	2,50	700	4,83	700	4,83
32	1¼	1,660	42,2	0,140	3,56	2,27	3,39	2,28	3,40	1000	6,89	1000	6,89
40	1½	1,900	48,3	0,145	3,68	2,72	4,05	2,73	4,07	1000	6,89	1000	6,89
50	2	2,375	60,3	0,154	3,91	3,66	5,45	3,69	5,50	1000	6,89	1000	6,89
65	2 ½	2,875	73,0	0,203	5,16	5,80	8,64	5,83	8,68	1000	6,89	1000	6,89
80	3	3,500	88,9	0,216	5,49	7,58	11,29	7,62	11,35	1000	6,89	1000	6,89
90	3 ½	4,000	101,6	0,226	5,74	9,12	13,58	9,21	13,71	1200	8,27	1200	8,27
100	4	4,500	114,3	0,237	6,02	10,80	16,09	10,91	16,25	1200	8,27	1200	8,27
125	5	5,563	141,3	0,258	6,55	14,63	21,79	14,82	22,07	-	-	1200	8,27
150	6	6,625	168,3	0,280	7,11	18,99	28,29	19,20	28,60	-	-	1200	8,27
200	8	8,625	219,1	0,277	7,04	24,72	36,82	25,57	38,09	-	-	1200	8,27
250	10	10,750	273,1	0,307	7,80	34,27	51,05	35,78	53,29	-	-	1000	6,89

Chemical Composition

Steel Name	C max, %	Mn max, %	P max, %	S max, %
Grade A	0,25	0,95	0,035	0,035
Grade B	0,30	1,20	0,035	0,035
Furnace -welded pipe			0,050	0,045

HOLLOW STRUCTURAL SECTIONS

Odelya offers cost-effective, variable, and customized solutions of structural steel tubing for many application areas with accordance to international standards.

Odelya® ERW Structural Steel Tubes with specially-composed chemical and mechanical properties, offer balanced and practical solutions for many constructional and industrial areas, from in-building designs to superstructure applications.

Produced with three typical shapes (circular, square, rectangular), other special shapes (such as elliptical, oval) are also available upon request.

Excellent strength properties, perfect distribution of material around the axis of Odelya® Hollow Sections and superior production quality, provide durability, bendability, and a light weight of steel structures.

Odelya® High Frequency ERW Hollow Structural Sections vary on their material types, surface conditions, processing types, and are available as: carbon or stainless, black (self-colour), surface-coated, galvanized, plain and bevelled-end...

Application

Building and bridge construction, automotive industry, mechanical engineering, framework structures and other components for transportation vehicles, light and heavy duty machinery, building scaffolding structures, amusement parks and playground equipment, furniture, machine and agriculture tools, racks, elevators and platforms for vertical access, space frames, industrial structuring works, greenhouses, solar energy systems, guard rails for staircases, sports galleries, pedestrian walkovers, etc.

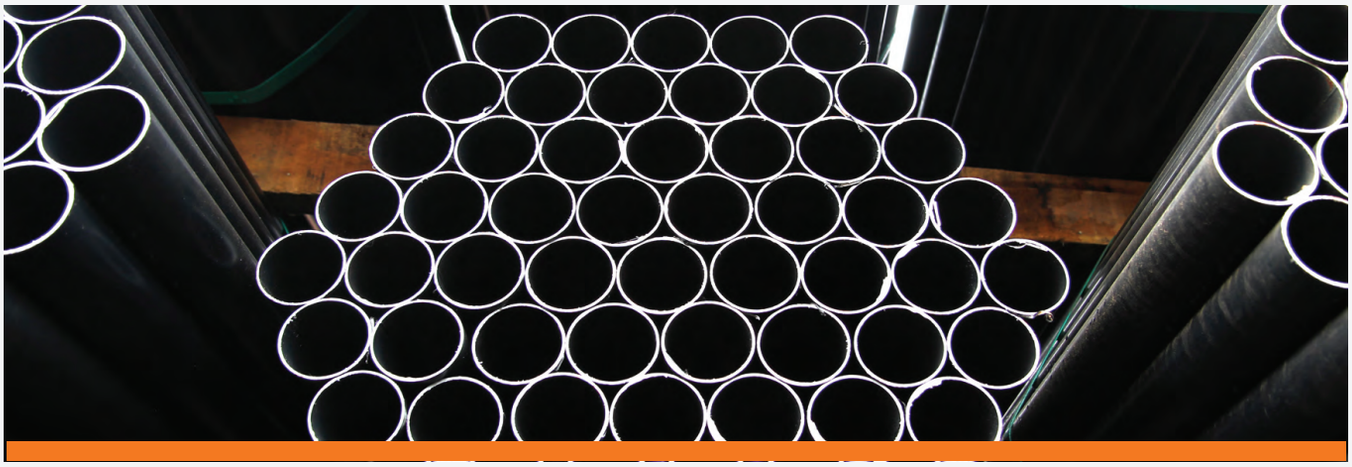
Production Range

Outside Diameter for Circular Tubes: 10 – 406,4 mm (0,39 – 16 inch)
Dimensions of Square Tubes: 10 x 10 – 400 x 400 (0,39 x 0,39 – 15,75 inch)
Dimensions of Rectangular Tubes: 10 x 15 – 300 x 400 (0,39 x 0,59 – 11,81 x 15,75 inch)
Outside Diameter for Scaffold Tubes: 48,3 mm (19 inch)
Wall Thickness: 0,5 mm – 12,5 mm (0,020 – 0,49 inch). Wall thickness of 14 mm may be proposed as a solution for large dimensions (300 x 300 and 350 x 250 mm).
Wall Thickness for Scaffolding Tubes: 3,2 or 4 mm (0,26 or 0,157 inch)
Length: 6 m (standard). According to the requests, length may vary between 2 to 12 meters.
Length of Scaffolding pipes: 4 – 8.5 m

Note: O.D. and other dimensional tolerances depend on sizes and production standards, please contact our sales team for details.

Production Standards

EN 10305-5 (BS 6323(-5), DIN 2395)
EN 10305-3 (BS 6323-5,6, DIN 2394-2, NFA 49-643: XPA 49-646, UNI 7947)
EN 10219 (DIN 2458 (TDC DIN 1615, DIN 17120), DIN 59411, BS 4360, SI 1458-1, NFA 49-541, UNE 36537)
EN 10210 (SI 1458-2)
EN 39 (BS 1139)
ASTM A 500, ASTM A 513
ISO 10799-2 (ISO 4019)



Material Quality

EN 10025	S 195, S 235 JR, S 235 JO, S 235 J2, S 275 JR, S 275 JO, S 275 J2, S 355 JR, S 355 JO, S 355 J2, S 355 K2
EN 10305	E 155, E 190, E 195, E 220, E 235, E 260, E 275, E 320, E 355, E 370
EN 10219	Non-alloy: S235JRH, S275J0H, S275J2H, S355J0H, S355J2H, S355K2H; Fain grain steels: S275NH, S275NLH, S355NH, S355NLH, S460NH, S460NLH; 460 MH
EN 10210	235, S 275, S 355, S 420, S 460
ASTM A 500	Grades A, B, C
ASTM A 513	1008-1040
EN 39	S 235 GT (BS 1139: 34/26, 43/36)

Delivery Conditions
Cold formed, hot formed, cold drawn (hard and soft), cold drawn and stress relieved, with or without subsequent heat treatment, welded and cold sized, normalized, annealed, drawn over a mandrel (DOM), special smooth inside diameter (S.S.I.D.), as-welded and sink-drawn.

Surface Condition
According to the requirements of the application, Odelya® Hollow Sections can be manufactured as, bare, black, self-coloured, painted, red primer painted, oiled, cold rolled, hot finished unpickled, hot rolled pickled steel with chosen protective coatings ('galfan coating' or 'galvanizing –zinc coated').

Finishing Operations
Plain end, square-cut or bevelled

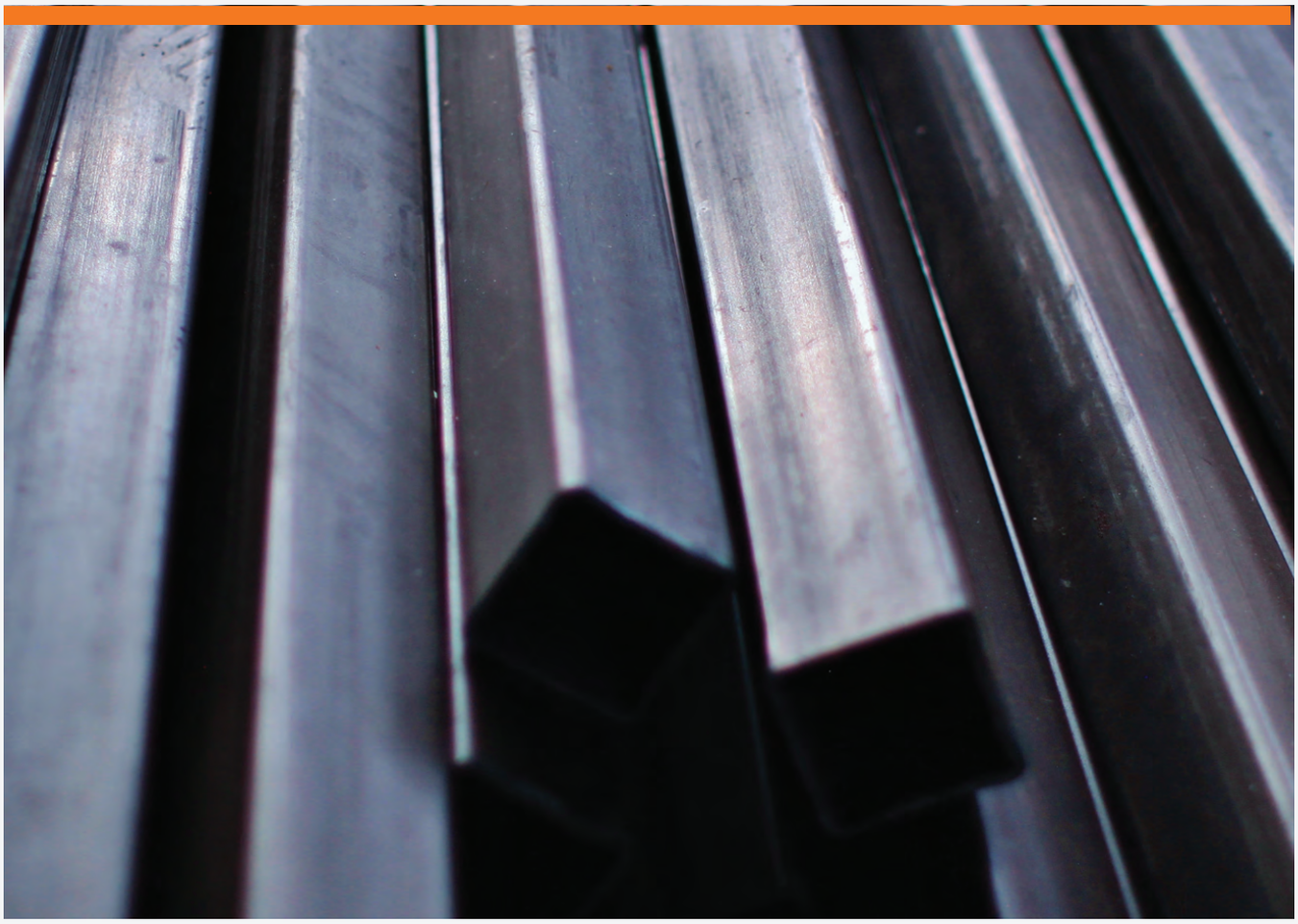
QUALITY TESTS

Chemical Analysis
Spectral analysis of the chemical composition

Mechanical & Technological Tests
Tensile test, impact test, flattening test, flaring test, expanding test, surface roughness test

Visual Inspection & Dimensional Check
Accurate information about dimensions and quality of tubes is provided using tape, caliper, ultrasonic device, gauge and cord

Note: Applied tests vary according to the related standard and application. Please refer to page 52 for more details about our Quality Assurance Policies.



Odelya® EN 10219 Circular, Square and Rectangular Structural Tubes

Odelya® EN 10219 Cold Formed Welded Hollow Sections are manufactured in round, rectangular and square shapes without a subsequent heat treatment. Technical delivery conditions of these ERW non-alloy and fine grain steel industrial pipes are according to European Standard EN 10219-1; precise tolerances, dimensions and sectional properties are supplied according to EN 10219-2.

Odelya® EN 10219 ERW Structural Steel Pipes are supplied in outside diameter ranging from 21,3 to 406,4 mm for circular shapes. Dimensions of Odelya® EN 10219 square structural tubes are ranging from 20 x 20 to 400 x 400 mm, for rectangular structural steel tubes, on the other hand, dimensions are ranging from 40 x 20 to 400 x 300 mm.

Odelya® EN 10219 ERW Circular Hollow Sections

Outside Diameter		Wall Thickness & Weight Per Unit Length (kg/m)										
	inch	0,079	0,098	0,118	0,157	0,197	0,236	0,248	0,315	0,394	0,472	0,492
inch	**mm**	**2**	**2,5**	**3**	**4**	**5**	**6**	**6,3**	**8**	**10**	**12**	**12,5**
0,839	21,3	0,95	1,16	1,35								
1,059	26,9	1,23	1,50	1,77								
1,327	33,7	1,56	1,92	2,27								
1,669	42,4	1,99	2,46	2,91	3,79							
1,902	48,3	2,28	2,82	3,35	4,37	5,34						
2,374	60,3	2,88	3,56	4,24	5,55	6,82						
2,996	76,1	3,65	4,54	5,41	7,11	8,77	10,4	10,8				
3,5	88,9	4,29	5,33	6,36	8,38	10,3	12,3	12,8				
4	101,6	4,91	6,11	7,29	9,63	11,9	14,1	14,8				
4,5	114,3		6,89	8,23	10,9	13,5	16,0	16,8	21,0			
5,5	139,7			10,1	13,4	16,6	19,8	20,7	26,0	32,0		
6,226	168,3			12,2	16,2	20,1	24,0	25,2	31,6	39,0		
7	177,8				17,1	21,3	25,4	26,6	33,5	41,4	49,1	51,0
7,626	193,7				18,7	23,3	27,8	29,1	36,6	45,3	53,8	55,9
8,626	219,1				21,2	26,4	31,5	33,1	41,6	51,6	61,3	63,7
9,626	244,5					29,5	35,3	37,0	46,7	57,8	68,8	71,5
10,748	273					33,0	39,5	41,4	52,3	64,9	77,2	80,3
12,752	323,9					39,3	47,0	49,3	62,3	77,4	92,3	96,0
14	355,6					43,2	51,7	54,3	68,6	85,2	102	106
16	406,4						59,2	62,2	78,6	97,8	117	121

Odelya® EN 10219 ERW Square Hollow Sections

Specified Dimension (H)		Wall Thickness & Weight Per Unit Length (kg/m)										
	inch	0,079	0,098	0,118	0,157	0,197	0,236	0,248	0,315	0,394	0,472	0,492
inch	**mm**	**2**	**2,5**	**3**	**4**	**5**	**6**	**6,3**	**8**	**10**	**12**	**12,5**
0,787	20	1,05										
0,984	25	1,36	1,64	1,89								
1,181	30	1,68	2,03	2,36								
1,575	40	2,31	2,82	3,30	4,20							
1,696	50	2,93	3,60	4,25	5,45	6,56						
2,362	60	3,56	4,39	5,19	6,71	8,13	9,45	9,55				
2,756	70		5,17	6,13	7,97	9,70	11,3	11,5				
3,150	80			7,07	9,22	11,3	13,2	13,5	16,4			
3,543	90			8,01	10,5	12,8	15,1	15,5	18,9			
3,937	100			8,96	11,7	14,4	17,0	17,5	21,4	25,6	28,3	29,1
4,724	120			10,8	14,2	17,5	20,7	21,4	26,4	31,8	35,8	36,9
5,512	140				16,8	20,7	24,5	25,4	31,4	38,1	43,4	44,8
5,906	150				18,0	22,3	26,4	27,4	33,9	41,3	47,1	48,7
6,299	160				19,3	23,8	28,3	29,3	36,5	44,4	50,9	52,6
7,087	180				21,8	27,0	32,1	33,3	41,5	50,7	58,5	60,5
7,874	200				24,3	30,1	35,8	37,2	46,5	57,0	66,0	68,3
8,661	220					33,2	39,6	41,2	51,5	63,2	73,5	76,2
9,843	250					38,0	45,2	47,1	59,1	72,7	84,8	88,0
10,236	260						47,1	49,1	61,6	75,8	88,6	91,9
11,811	300						54,7	57,0	71,6	88,4	104	108
13,780	350								84,2	104	123	127
15,748	400									120	141	147

Odelya® EN 10219 ERW Rectangular Hollow Sections

Specified Dimension (B x H)				Wall Thickness & Weight Per Unit Length (kg/m)										
inch		inch		0,079	0,0 98	0,118	0,157	0,197	0,236	0,248	0,315	0,394	0,472	0,492
		mm		2	2,5	3	4	5	6	6,3	8	10	12	12,5
1,575	0,787	40	20	1,68	2,03	2,36								
1,696	1,181	50	30	2,31	2,82	3,30	4,20							
2,362	1,575	60	40	2,93	3,60	4,25	5,45	6,56						
2,756	1,696	70	50	3,56	4,39	5,19	6,71	8,13						
3,150	1,575	80	40	3,56	4,39	5,19	6,71	8,13						
3,150	2,362	80	60	4,19	5,17	6,13	7,97	9,70						
3,543	1,696	90	50	4,19	5,17	6,13	7,97	9,70						
3,937	1,575	100	40		5,17	6,13	7,97	9,70						
3,937	1,696	100	50		5,56	6,60	8,59	10,5	12,3	12,5				
3,937	2,362	100	60		5,96	7,07	9,22	11,3	13,2	13,5				
3,937	3,150	100	80		6,74	8,01	10,5	12,8	15,1	15,5				
4,724	2,362	120	60		6,74	8,01	10,5	12,8	15,1	15,5	18,9			
4,724	3,150	120	80			8,96	11,7	14,4	17,0	17,5	21,4			
5,512	3,150	140	80				13,0	16,0	18,9	19,4	23,9			
5,906	3,937	150	100				14,9	18,3	21,7	22,4	27,7	33,4	37,7	38,9
6,299	3,150	160	80				14,2	17,5	20,7	21,4	26,4	31,8	35,8	36,9
7,087	3,937	180	100				16,8	20,7	24,5	25,4	31,4	38,1	43,4	44,8
7,874	3,937	200	100				18,0	22,3	26,4	27,4	33,9	41,3	47,1	48,7
7,874	4,724	200	120				19,3	23,8	28,3	29,3	36,5	44,4	50,9	52,6
9,843	5,906	250	150					30,1	35,8	37,2	46,5	57,0	66,0	68,3
10,236	7,087	260	180					33,2		41,2	51,5	63,2	73,5	76,2
11,811	3,937	300	100						35,8	37,2	46,5	57,0	66,0	68,3
11,811	5,906	300	150						40,5	42,2	52,8	64,8	75,4	78,1
11,811	7,874	300	200						45,2	47,1	59,1	72,7	84,8	88,0
13,780	9,843	350	250						54,7	57,0	71,6	88,4	104	108
15,748	7,874	400	200								71,6			108
15,748	11,811	400	300								84,2	104	123	127

Odelya® EN 10219 Round, Square & Rectangular Tubes Tolerances

Characteristic	Circular Tubes	Square & Rectangular Tubes	
Dimensions: Outside Diameter (D), Longest side (H), Shortest side (B)	± 1% with min. of ± 0,5 mm and max. of ± 1,0 mm	Length of side	Tolerance
		H, B < 100	± 1% with min. of ± 0,5
		100 ≤ H, B ≤ 200	± 0,8%
		H, B > 200	± 0,6%
Thickness (T)	T ≤ 5 mm ± 10% T > 5 mm ± 0,5%	T ≤ 5 mm ± 10% T > 5 mm ± 0,5%	
Out-of-roundness	2% for tubes having a diameter ratio not exceeding 100	-	
Concavity / Convexity	-	Max. 0,8% with min. of 0,5 mm	
Squareness of a side	-	90° ± 1 °	
External corner profile (C_1, C_2 or R)	-	T ≤ 6: 1,6 T to 2,4T 6 < T ≤ 10: 2,0T to 3,0T 10 < T: 2,4 T to 3,6T	
Twist (V)	-	2 mm plus 0,5 mm/m length	
Straightness (e)	0,20% for tot al length and 3 mm over any 1 m length	0,15% for total length and 3 mm over any 1 m length	
Mass per Unit Length	± 6% on individual delivered lengths	± 6% on individual delivered lengths	

Chemical Compositions

Odelya® EN 10219 Non-Alloy Quality Steels (wall thickness ≤40mm)

Steel name	Steel number	C max, %	Si max, %	Mn max, %	P max, %	S max, %	N
S235JRH	1.0039	0,17	-	1,40	0,040	0,040	0,009
S275J0H	1.0149	0,20	-	1,50	0,035	0,035	0,009
S275J2H	1.0138	0,20	-	1,50	0,030	0,030	-
S355J0H	1.0547	0,22	0,55	1,60	0,035	0,035	0,009
S355J2H	1.0576	0,22	0,55	1,60	0,030	0,030	-
S355K2H	1.0512	0,22	0,55	1,60	0,030	0,030	-

Odelya® EN 10219 Fine Grain Quality Steels (wall thickness ≤40mm)

Steel Name	Steel number	C max, %	Si max, %	Mn max, %	P max, %	S max, %	Nb	V max,%	Al total min, %	Ti max,%	Cr max,%	Ni max,%	Mo max,%	Cu max,%	N max,%
S275NH	1.0493	0,20	0,40	0,50-1,40	0,035	0,030	0,050	0,05	0,020	0,03	0,30	0,30	0,10	0,35	0,015
S275NLH	1.0497	0,20	0,40	0,50-1,40	0,030	0,025	0,050	0,05	0,020	0,03	0,30	0,30	0,10	0,35	0,015
S355NH	1.0539	0,20	0,50	0,90-1,65	0,035	0,030	0,050	0,12	0,020	0,03	0,30	0,50	0,10	0,35	0,015
S355NLH	1.0549	0,18	0,50	0,90-1,65	0,030	0,025	0,050	0,12	0,020	0,03	0,30	0,50	0,10	0,35	0,015
S460NH	1.8953	0,22	0,60	1,0 -1,70	0,035	0,030	0,050	0,20	0,020	0,03	0,30	0,80	0,10	0,70	0,025
S460NLH	1.8956	0,22	0,60	1,0 -1,70	0,030	0,025	0,050	0,20	0,020	0,03	0,30	0,80	0,10	0,70	0,025

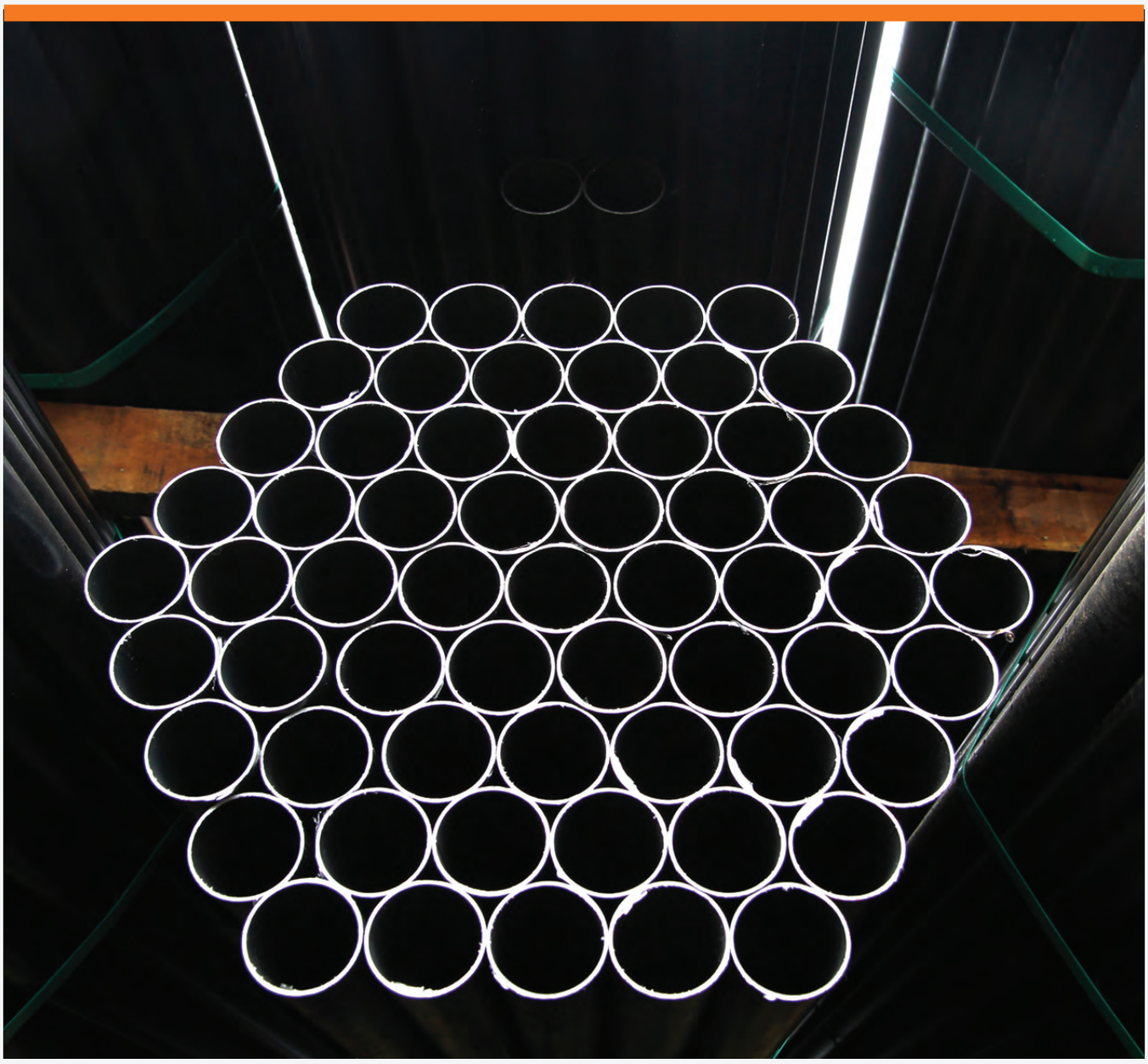
Mechanical Properties

Odelya® EN 10219 Non-Alloy Quality Steels (wall thickness ≤40mm)

Steel Name	Steel Number	Yield Strength (R_{eH} min.) MPa		Tensile Strength (R_m) MPa		Elongation A min . %	Impact test, energy absorbed KV J		
		Wall Thickness (mm)		Wall Thickness (mm)		Wall Thickness (mm)			
		≤ 16	>16 ≤ 40	< 3	≥ 3 ≤ 40	≤ 40	-20 C°	0 C°	20 C°
S235JRH	1.0039	235	225	360-510	360-510	24	-	-	27
S275J0H	1.0149	275	265	430-580	410 -560	20	-	27	-
S275J2H	1.0138	275	265	430-580	410 -560	20	27	-	-
S355J0H	1.0547	355	345	510 -680	470-630	20	-	27	-
S355J2H	1.0576	355	345	510 -680	470-630	20	27	-	-
S355K2H	1.0512	355	345	510 -680	470-630	20	40	-	-

Odelya® EN 10219 Fine Grain Quality Steels (wall thickness ≤40mm)

Steel Name	Steel Number	Yield Strength (R_{eH} min.) MPa		Tensile Strength (R_m) MPa	Elongation A min. %	Impact test, energy absorbed KV J	
		Wall Thickness (mm)		Wall Thickness (mm)	Wall Thickness (mm)		
		≤ 16	> 16 ≤ 40	≤ 40	≤ 40	-50 C°	- 20 C°
S275NH	1.0493	275	265	370-510	24	-	40
S275NLH	1.0497	275	265	370-510	24	27	-
S355NH	1.0539	355	345	470-630	22	-	40
S355NLH	1.0549	355	345	470-630	22	27	-
S460NH	1.8953	460	440	540-720	17	-	40
S460NLH	1.8956	460	440	540-720	17	27	-



Odelya® EN 10210 Structural Hollow Sections

Odelya® EN 10210 Hot Finished Non-Alloy and Fine Grain Steels Structural Tubes are manufactured by a welding process in circular, rectangular, square or elliptical shapes, with or without final heat treatment for hot formed hollow sections, and with subsequent heat treatment for cold formed hollow sections.

Odelya® EN 10210 Structural Hollow Sections of JR, J0, J2 and K2 steel qualities are hot-finished; whereas, the others of N and NHL qualities are normalised.

Odelya® EN 10210 ERW Circular Hollow Sections

Outside Diameter		Wall Thickness & Weight Per Unit Length (kg/m)								
	inch	0,091	0,102	0,26	0,157	0,197	0,248	0,315	0,394	0,492
inch	mm	2,3	2,6	3,2	4	5	6,3	8	10	12,5
0,839	21,3	1,08	1,20	1,43						
1,059	26,9	1,40	1,56	1,87						
1,327	33,7		1,99	2,41	2,93					
1,669	42,4		2,55	3,09	3,79					
1,902	48,3		2,93	3,56	4,37	5,34				
2,374	60,3		3,70	4,51	5,55	6,82				
2,996	76,1		4,71	5,75	7,11	8,77				
3,5	88,9			6,76	8,38	10,3	12,8			
4	101,6			7,77	9,63	11,9	14,8	18,5	22,6	
4,5	114,3			8,77	10,9	13,5	16,8	21,0	25,7	
5,5	139,7				13,4	16,6	20,7	26,0	32,0	39,2
6,226	168,3				16,2	20,1	25,2	31,6	39,0	48,0
7	177,8					21,3	26,6	33,5	41,4	51,0
7,626	193,7					23,3	29,1	36,6	45,3	55,9
8,626	219,1					26,4	33,1	41,6	51,6	63,7
9,626	244,5					29,5	37,0	46,7	57,8	71,5
10,748	273					33,0	41,4	52,3	64,9	80,3
12,752	323,9					39,3	49,3	62,3	77,4	96,0

Odelya® EN 10210 ERW Square Hollow Sections

Specified Dimension (H or B)		Wall Thickness & Weight Per Unit Length (kg/m)							
	inch	0,102	0,26	0,157	0,197	0,248	0,315	0,394	0,492
inch	mm	2,6	3,2	4	5	6,3	8	10	12,5
1,575	40	3,0	3,61	4,39	5,28				
1,696	50	3,81	4,62	5,64	6,85	8,31			
2,362	60	4,63	5,62	6,90	8,42	10,3	12,5		
2,756	70		6,63	8,15	9,99	12,3	15,0		
3,150	80		7,63	9,41	11,6	14,2	17,5		
3,543	90			10,7	13,1	16,2	20,1		
3,937	100			11,9	14,7	18,2	22,6	27,4	
4,724	120				17,8	22,2	27,6	33,7	40,9
5,512	140				21,0	26,1	32,6	40,0	48,7
5,906	150				22,6	28,1	35,1	43,1	52,7
6,299	160				24,1	30,1	37,6	46,3	56,6
7,087	180				27,3	34,0	42,7	52,5	64,4
7,874	200				30,4	38,0	47,7	58,8	72,3
8,661	220					41,9	52,7	65,1	80,1
9,843	250					47,9	60,3	74,5	91,9

Odelya® EN 10210 Rectangular Hollow Sections

Specified Dimension (B x H)				Wall Thickness & Weight Per Unit Length (kg/m)							
inch		inch		0,102	0,26	0,157	0,197	0,248	0,315	0,394	0,492
		mm		2,6	3,2	4	5	6,3	8	10	12,5
1,696	1,181	50	30	3,0	3,61	4,39	5,28				
2,362	1,575	60	40	3,81	4,62	5,64	6,85	8,31			
3,150	1,575	80	40		5,62	6,90	8,42	10,3	12,5		
3,543	1,696	90	50		6,63	8,15	9,99	12,3	15,0		
3,937	1,696	100	50		7,13	8,78	10,8	13,3	16,3		
3,937	2,362	100	60		7,63	9,41	11,6	14,2	17,5		
4,724	2,362	120	60			10,7	13,1	16,2	20,1	24,3	
4,724	3,150	120	80			11,9	14,7	18,2	22,6	27,4	
5,512	3,150	140	80			13,2	16,3	20,2	25,1	30,6	
5,906	3,937	150	100			15,1	18,6	23,1	28,9	35,3	42,8
6,299	3,150	160	80			14,4	17,8	22,2	27,6	33,7	40,9
7,087	3,937	180	100			16,9	21,0	26,1	32,6	40,0	48,7
7,874	3,937	200	100			18,2	22,6	28,1	35,1	43,1	52,7
7,874	4,724	200	120					30,1	37,6	46,3	56,6
9,843	5,906	250	150					38,0	47,7	58,8	72,3
10,236	7,087	260	180					41,9	52,7	65,1	80,1
11,811	7,874	300	200					47,9	60,3	74,5	91,9

Odelya® EN 10210 ERW Round, Square & Rectangular Structural Tubes Tolerances

Character istic	Circular Tubes	Square & Rectangular Tubes
Dimensions: Outside Diameter (D), Longest side (H), Shortest side (B)	± 1% with min. of ± 0,5 mm and max. of ± 10 mm	± 1% with min. of ± 0,5 mm
Thickness (T)	- 10 %	- 10 %
Out -of-roundness	2% for tubes ha ving a diameter to thickness ratio not exceeding 100	-
Concavity / Convexity	-	Max. 0,8% with min. of 0,5 mm
Squareness of a side	-	90° ± 1 °
External corner profile (C_1, C_2 or R)	-	T ≤ 6: 1,6 T to 2,4T 6 < T ≤ 10: 2,0T to 3,0T 10 < T: 2,4 T to 3,6T
Twi st (V)	-	2 mm plus 0,5 mm/m length
Straightness (e)	0,20% for total length and 3 mm over any 1 m length	0,15% for total length and 3 mm over any 1 m length
Mass per Unit Length	± 6% on individual delivered lengths	± 6% on individual delivered lengths

Chemical Composition

Odelya® EN 10210 Non-Alloy Quality Steels (wall thickness ≤ 120 mm)

Steel name	Steel number	C max, %		Si max, %	Mn max, %	P max, %	S max, %	N
		WT ≤ 40	WT > 40 ≤ 120					
S235JRH	1.0039	0,17	0,20	-	1,40	0,040	0,040	0,009
S275J0H	1.0149	0,20	0,22	-	1,50	0,035	0,035	0,009
S275J2H	1.0138	0,20	0,22	-	1,50	0,030	0,030	-
S355J0H	1.0547	0,22	0,22	0,55	1,60	0,035	0,035	0,009
S355J2H	1.0576	0,22	0,22	0,55	1,60	0,030	0,030	-
S355K2H	1.0512	0,22	0,22	0,55	1,60	0,030	0,030	-

Odelya® EN 10210 Fine Grain Quality Steels (wall thickness ≤65mm)

Steel Name	Steel number	C max.,%	Si max.,%	Mn max.,%	P max.,%	S max.,%	Nb	V max.,%	Al total min.,%	Ti max.,%	Cr max.,%	Ni max.,%	Mo max.,%	Cu max.,%	N max.,%
S275NH	1.0493	0,20	0,40	0,50-1,40	0,035	0,030	0,050	0,08	0,020	0,03	0,30	0,30	0,10	0,35	0,015
S275NLH	1.0497	0,20	0,40	0,50-1,40	0,030	0,025	0,050	0,08	0,020	0,03	0,30	0,30	0,10	0,35	0,015
S355NH	1.0539	0,20	0,50	0,90-1,65	0,035	0,030	0,050	0,12	0,020	0,03	0,30	0,50	0,10	0,35	0,020
S355NLH	1.0549	0,18	0,50	0,90-1,65	0,030	0,025	0,050	0,12	0,020	0,03	0,30	0,50	0,10	0,35	0,020
S420NH	1.8750	0,22	0,60	1,0 -1,70	0,035	0,030	0,050	0,20	0,020	0,03	0,30	0,80	0,10	0,70	0,025
S420NLH	1.8751	0,22	0,60	1,0 -1,70	0,030	0,025	0,050	0,20	0,020	0,03	0,30	0,80	0,10	0,70	0,025
S460NH	1.8953	0,22	0,60	1,0 -1,70	0,035	0,030	0,050	0,20	0,020	0,03	0,30	0,80	0,10	0,70	0,025
S460NLH	1.8956	0,22	0,60	1,0 -1,70	0,030	0,025	0,050	0,20	0,020	0,03	0,30	0,80	0,10	0,70	0,025

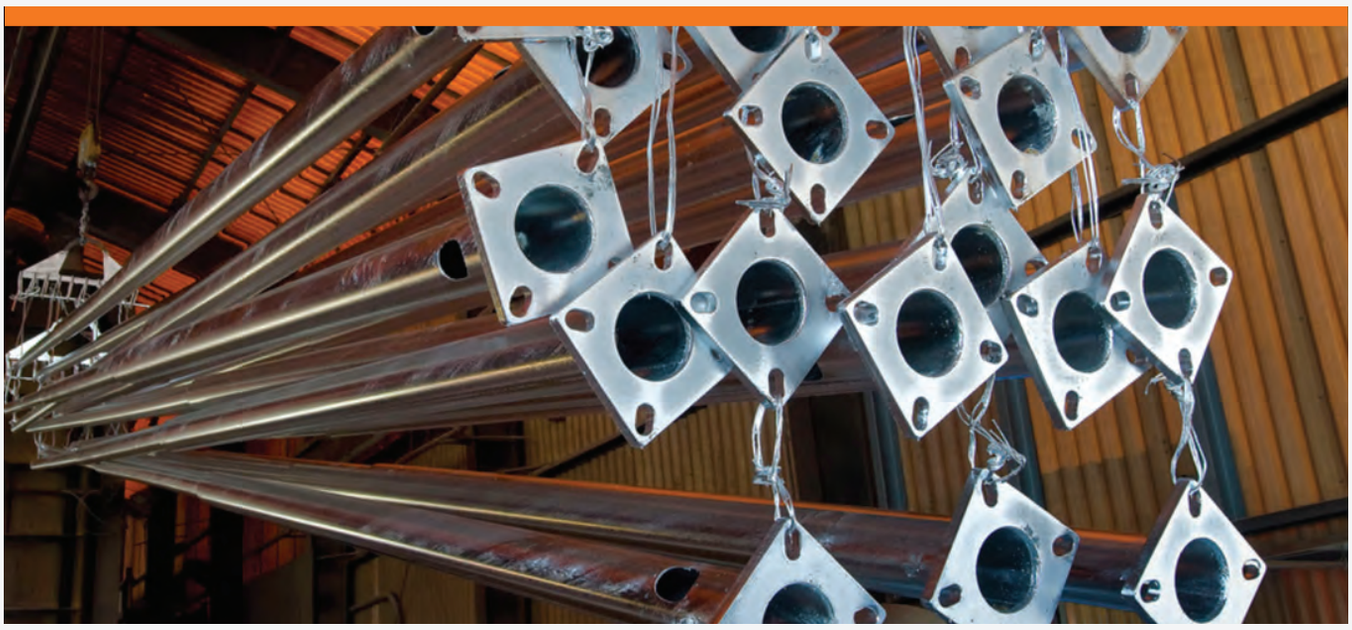
Mechanical Properties

Odelya® EN 10210 Non-Alloy Quality Steels

Steel Name	Steel Number	Yield Strength (R_{eH} min.) MPa						Tensile Strength (R_m) MPa			Elongation A min. %				Impact test, energy absorbed KV J		
		Wall Thickness, mm						Wall Thickness , mm			Wall Thickness, mm						
		≤ 16	>16 ≤ 40	> 40 ≤63	> 63 ≤ 80	> 80 ≤100	> 100 ≤ 120	< 3	> 3≤ 100	> 100 ≤120	≤ 40	> 40 ≤63	> 63 ≤ 100	>100 ≤ 120	-20 C°	0 C°	20 C°
S235JRH	1.0039	235	225	215	215	215	195	360-510	360-510	350-500	24	25	24	22	-	-	27
S275J0H	1.0149	275	265	255	245	235	225	430-580	410 -560	400-540	20	22	21	19	-	27	-
S275J2H	1.0138	275	265	255	245	235	225	430-580	410 -560	400-540	20	22	21	19	27	-	-
S355J0H	1.0547	355	345	335	325	315	295	510 -680	470-630	450-600	20	21	20	18	-	27	-
S355J2H	1.0576	355	345	335	325	315	295	510 -680	470-630	450-600	20	21	20	18	27	-	-
S355K2H	1.0512	355	345	335	325	315	295	510 -680	470-630	450-600	20	21	20	18	40	-	-

Odelya® EN 10210 Fine Grain Quality Steels

Steel Name	Steel Number	Yield Strength (R_{eH} min.) MPa			Tensile Strength (R_m) MPa	Elongation A min. %		Impact test, energy absorbed KV J	
		Wall Thickness (mm)			Wall Thickness (mm)	Wall Thickness (mm) ≤ 65			
		≤ 16	>16 ≤ 40	> 40 ≤ 65	≤ 65	Longitudinal	Transverse	-50 C°	- 20 C°
S275NH	1.0493	275	265	255	370-510	24	22	-	40
S275NLH	1.0497	275	265	255	370-510	24	22	27	-
S355NH	1.0539	355	345	335	470-630	22	20	-	40
S355NLH	1.0549	355	345	335	470-630	22	20	27	-
S420NH	1.8750	420	400	390	520-680	19	17	-	40
S420NLH	1.8751	420	400	390	520-680	19	17	27	-
S460NH	1.8953	460	440	430	540-720	17	15	-	40
S460NLH	1.8956	460	440	430	540-720	17	15	27	-



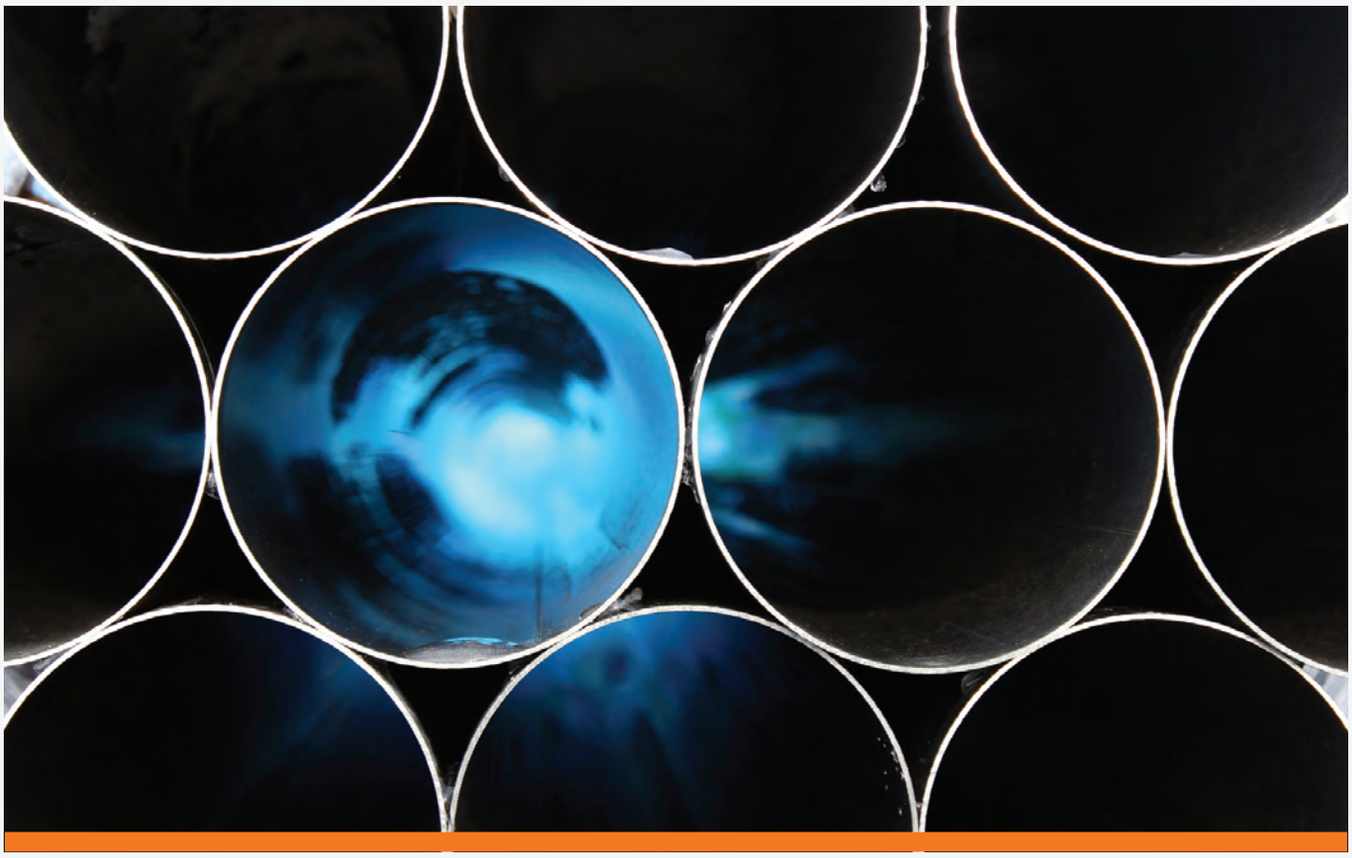
Odelya® EN 10305-3 Structural Steel Tubes

Odelya® EN 10305-3 ERW Cold Sized Structural Steel Tubes are manufactured with precisely defined tolerances on dimensions and with specified surface roughness. Odelya® EN 10305-3 Steel Hollow Sections are available with required coatings, as well as black, pickled, cold rolled.

Delivery Conditions (ERW)	Brief Description
Welded / Cold sized	Normally the product is not heat treated, but suitable for final annealing
Annealed	After the final cold drawing process the pipes are annealed in a controlled atmosphere
Normalised	After the final cold drawing process the pipes are normalised in a controlled atmosphere

Odelya® EN 10305-3 ERW Structural Hollow Sections

Outside Diameter		Tolerances	Wall Thickness																
	inch		0,024	0,032	0,039	0,047	0,059	0,071	0,079	0,067	0,098	0,11	0,118	0,138	0,158	0,177	0,197	0,217	0,236
inch	mm	mm	0,6	0,8	1	1,2	1,5	1,8	2	2,2	2,5	2,8	3	3,5	4	4,5	5	5,5	6
0,236	6	±0,12	■	■	■														
0,315	8		■	■	■	■	■												
0,394	10		■	■	■	■	■												
0,472	12		■	■	■	■	■	■	■										
0,591	15		■	■	■	■	■	■	■	■									
0,630	16		■	■	■	■	■	■	■	■									
0,709	18		■	■	■	■	■	■	■	■	■								
0,748	19		■	■	■	■	■	■	■	■	■	■	■						
0,787	20	±0,15	■	■	■	■	■	■	■	■	■	■	■						
0,866	22		■	■	■	■	■	■	■	■	■	■	■						
0,984	25		■	■	■	■	■	■	■	■	■	■	■						
1,102	28		■	■	■	■	■	■	■	■	■	■	■	■					
1,181	30		■	■	■	■	■	■	■	■	■	■	■	■					
1,260	32	±0,20		■	■	■	■	■	■	■	■	■	■	■					
1,378	35				■	■	■	■	■	■	■	■	■	■					
1,496	38				■	■	■	■	■	■	■	■	■	■	■				
1,575	40				■	■	■	■	■	■	■	■	■	■	■				
1,654	42				■	■	■	■	■	■	■	■	■	■	■				
1,669	42,4				■	■	■	■	■	■	■	■	■	■	■				
1,732	44	±0,25			■	■	■	■	■	■	■	■	■	■	■				
1,772	45				■	■	■	■	■	■	■	■	■	■	■				
1,902	48,3				■	■	■	■	■	■	■	■	■	■	■	■			
1,969	50				■	■	■	■	■	■	■	■	■	■	■	■			
2	51					■	■	■	■	■	■	■	■	■	■	■			
2,165	55	±0,30				■	■	■	■	■	■	■	■	■	■	■			
2,244	57					■	■	■	■	■	■	■	■	■	■	■			
2,362	60					■	■	■	■	■	■	■	■	■	■	■	■	■	
2,5	63,5					■	■	■	■	■	■	■	■	■	■	■	■	■	
2,756	70	±0,35				■	■	■	■	■	■	■	■	■	■	■	■	■	
2,992	76					■	■	■	■	■	■	■	■	■	■	■	■	■	
3,150	80	±0,40				■	■	■	■	■	■	■	■	■	■	■	■	■	
3,504	89						■	■	■	■	■	■	■	■	■	■	■	■	■
3,543	90						■	■	■	■	■	■	■	■	■	■	■	■	■
3,937	100	±0,50					■	■	■	■	■	■	■	■	■	■	■	■	■
4	101,6						■	■	■	■	■	■	■	■	■	■	■	■	■
4,252	108	±0,60					■	■	■	■	■	■	■	■	■	■	■	■	■
4,488	114							■	■	■	■	■	■	■	■	■	■	■	■
4,724	120							■	■	■	■	■	■	■	■	■	■	■	■
5	127	±0,8						■	■	■	■	■	■	■	■	■	■	■	■
5,236	133							■	■	■	■	■	■	■	■	■	■	■	■
5,5	139,7							■	■	■	■	■	■	■	■	■	■	■	■
6,260	159	±1,0						■	■	■	■	■	■	■	■	■	■	■	■
6,614	168							■	■	■	■	■	■	■	■	■	■	■	■



Chemical Composition

Steel Name	Steel Number	C max, %	Si max, %	Mn max, %	P max, %	S max, %
E155	1.0033	0,11	0.35	0.70	0.025	0.025
E195	1.0034	0,15	0.35	0.70	0.025	0.025
E235	1.0308	0,17	0.35	1.20	0.025	0.025
E275	1.0225	0,21	0.35	1.40	0.025	0.025
E355	1.0580	0,22	0.55	1.60	0.025	0.025

Mechanical Properties

Steel Name	Steel Grade	Welded / Cold Sized		Annealed		Normalised		
		Rm, Mpa (N/mm^2)	A, %	Rm, Mpa (N/mm^2)	A, %	Rm, Mpa (N/mm^2)	R_{eH}, MPa (N/mm^2)	A, %
E155	1.0033	290	15	260	28	270 – 410	155	28
E195	1.0034	330	8	290	28	300 – 440	195	28
E235	1.0308	390	7	315	25	340 – 480	235	25
E275	1.0225	440	6	390	21	410 – 550	275	21
E355	1.0580	540	5	450	22	490 - 630	355	22

Note: Rm – tensile strength, R_{eH} – yield strength, A – elongation.

Odelya® EN 10305-5 Square and Rectangular Hollow Sections

Odelya® EN 10305-5 Electric Welded and Cold Sized Square and Rectangular Structural Tubes are manufactured with precisely defined tolerances on dimensions and with specified surface roughness. Odelya® EN 10305-5 Structural Carbon Steel Tubes are available as coated, as well as black, pickled, and cold rolled.

Delivery Conditions (ERW)	Brief Description
Welded / Cold sized	Normally the product is not heat treated, but suitable for final annealing
Annealed	After the final cold drawing process the pipes are annealed in a controlled atmosphere
Normalised	After the final cold drawing process the pipes are normalised in a controlled atmosphere

Odelya® EN 10305-5 Rectangular & Square Structural Hollow Sections

Length of Side					Wall thickness & Weights per Unit Length (kg/m)							
H		B (H)		Tolerance of H and B	inch	0,039	0,049	0,059	0,079	0,098	0,118	0,158
mm	inch	mm	inch		mm	1	1,25	1,5	2	2,5	3	4
15	0,591	15	0,591	±0,2		0,438	0,537	0,632	0,810			
20	0,787	10	0,394	±0,2		0,438	0,537	0,632	0,810			
		15	0,591			0,516	0,635	0,750	0,967			
		20	0,787			0,595	0,733	0,868	1,12			
25	0,984	15	0,591	±0,25		0,595	0,733	0,868	1,12			
		25	0,984			0,752	0,930	1,10	1,44			
30	1,181	10	0,394	±0,25		0,595	0,733	0,868	1,12			
		15	0,591			0,673	0,831	0,985	1,28			
		20	0,787			0,752	0,930	1,10	1,44			
		30	1,181			0,909	1,13	1,34	1,75	2,15	2,39	
34	1,339	20	0,787	±0,25		0,815	1,01	1,20	1,56			
35	1,378	20	0,787	±0,25		0,830	1,03	1,22	1,59	1,95		
		25	0,984			0,909	1,13	1,34	1,75	2,15	2,39	
		35	1,378			1,07	1,32	1,57	2,07	2,54	2,86	
40	1,575	20	0,787	±0,3				1,34	1,75	2,15	2,39	
		25	0,984					1,46	1,91	2,34	2,63	
		30	1,181					1,57	2,07	2,54	2,86	
		40	1,575					1,81	2,38	2,93	3,33	4,25
45	1,772	45	1,772	±0,3				2,05	2,69	3,33	3,80	4,88
50	1,969	20	0,787	±0,3				1,57	2,07	2,54	2,86	
		25	0,984					1,69	2,22	2,74	3,10	
		30	1,181					1,81	2,38	2,93	3,33	4,25
		40	1,575					2,05	2,69	3,33	3,80	4,88
		50	1,969					2,28	3,01	3,72	4,28	5,51

(continued) (please see the previous page)

60	2,362	20	0,787	±0,35				2,38	2,93	3,33	
		30	1,181					2,69	3,33	3,80	4,88
		40	1,575					3,01	3,72	4,28	5,51
		50	1,969					3,32	4,11	4,75	6,14
		60	2,362					3,64	4,50	5,22	6,76
70	2,756	40	1,575	±0,4				3,32	4,11	4,75	6,14
		70	2,756					4,26	5,29	6,16	8,02
80	3,150	20	0,787	±0,5				3,01	3,72	4,28	
		30	1,181					3,32	4,11	4,75	
		40	1,575					3,64	4,50	5,22	6,76
		50	1,969					3,95	4,90	5,69	7,39
		60	2,362					4,26	5,29	6,16	8,02
		80	1,150					4,89	6,07	7,10	9,28
90	3,543	90	3,543	±0,6				5,52	6,86	8,04	10,5
100	3,937	40	1,575	±0,65				4,26	5,29	6,16	8,02
		50	1,969					4,58	5,68	6,63	8,65
		60	2,362					4,89	6,07	7,10	9,28
		80	1,150					5,52	6,86	8,04	10,5
		100	3,937					6,15	7,64	8,99	11,8
120	4,724	40	1,575	±0,7				4,89	6,07	7,10	9,28
		60	2,362					5,52	6,86	8,04	10,5

For other dimensions, please contact us. Mass per unit length calculated according to a density of 7,85 kg/dm3.

Chemical Composition

Steel name	Steel number	C max, %	Si max, %	Mn max, %	P max, %	S max, %
E155	1.0033	0,11	0.35	0.70	0.025	0.025
E195	1.0034	0,15	0.35	0.70	0.025	0.025
E235	1.0308	0,17	0.35	1.20	0.025	0.025
E275	1.0225	0,21	0.35	1.40	0.025	0.025
E355	1.0580	0,22	0.55	1.60	0.025	0.025

Mechanical Properties

Steel Name	Steel Grade	Welded / Cold sized		Annealed		Normalised		
		Rm, Mpa (N/mm²)	A, %	Rm, Mpa (N/mm²)	A, %	Rm, Mpa (N/mm²)	R_{eH}, MPa (N/mm²)	A, %
E155	1.0033	290	15	260	28	270 – 410	155	28
E195	1.0034	330	8	290	28	300 – 440	195	28
E235	1.0308	390	7	315	25	340 – 480	235	25
E275	1.0225	440	6	390	21	410 – 550	275	21
E355	1.0580	540	5	450	22	490 - 630	355	22

Note: Rm – tensile strength, R^{eH} – yield strength, A – elongation.kg/dm3.

Odelya® ASTM A 500 Round, Square and Rectangular Hollow Sections

Odelya® ASTM A 500 Cold Formed Welded Hollow Structural Sections are manufactured in circular, rectangular and square shapes from flat-rolled steel by the electric-resistance-welding (ERW) process with precise control to assure the design strength of the tubular product. Odelya® Hollow Sections are produced without a subsequent heat treatment as Grades A, B and C are used, thus, the tubes can be stress-relieved or annealed depending on the requirement.

Odelya® ASTM A 500 ERW Square Structural Tubes

Nominal Size (H or B)		Wall Thickness & Mass per Unit Length, lb/ft (kg/m)																
	inch	0,039	0,047	0,056	0,063	0,072	0,078	0,083	0,095	0,120	0,125	0,156	0,180	0,188	0,250	0,312	0,375	0,500
inch	mm	1	1,2	1,4	1,6	1,8	2	2,1	2,4	3	3,2	4	4,6	4,8	6,4	8	9,5	12,7
1/2	15	0,240 (0,375)	0,283 (0,421)	0,329 (0,490)	0,363 (0,540)													
5/8	16	0,306 (0,456)	0,363 (0,540)	0,424 (0,631)	0,470 (0,69	0,526 (0,783)												
3/4	20	0,373 (0,555)	0,443 (0,659	0,519 (0,773	0,577 (0,85	0,649 (0,965												
1	25	0,505 (0,752	0,603 (0,897	0,71 (1,060)	0,791 (1,180)	0,893 (1,330)	0,960 (1,450)	1,010 (1,510)	1,140 (1,700)	1,390 (2,070	1,440 (2,150							
1 ¼	32	0,638 (0,94	0,762 (1,130)	0,900 (1,340)	1,010 (1,500)	1,140 (1,690)	1,230 (1,820)	1,300 (1,930)	1,470 (2,180)	1,800 (2,68	1,870 (2,780							
1 1/2	40	0,770 (1,150)	0,922 (1,370)	1,090 (1,620	1,220 (1,810)	1,380 (2,060)	1,490 (2,22)	1,580 (2,350)	1,790 (2,66)	2,210 (3,290	2,290 (3,410)							
2	50									2,94 (4,38)	3,05 (4,54)	3,70 (5,50)	4,17 (6,21)	4,30 (6,42)	5,40 (8,04)			
2 ½	65							2,62 (3,90)	3,01 (4,49)	3,76 (5,59)	3,90 (5,80)	4,76 (7,08)	5,82 (8,67)		7,11 (10,60)			
3	80									4,57 (6,81)	4,75 (7,07)	5,82 (8,66)	6,62 (9,85)	6,86 (10,20)	8,80 (13,10)			
3 1/2	90										5,60 (8,33)	6,88 (10,20)	8,27 (12,33		10,50 (15,60)	12,69 (18,86)		
4	100									6,21 (9,23)	6,45 (9,60)	7,94 (11,80)	9,07 (13,50)	9,41 (14,0)	12,20 (18,20)	14,80 (22,0)	17,30 (25,70	
5	125											10,31 (15,37)		12,0 (17,86)	15,60 (22,9)	19,10 (28,42)	22,40 (33,33)	
6	150												14,0 (20,8)	14,50 (21,60)	19,0 (28,3)	23,30 (34,70)	27,50 (40,90)	35,22 (52,41)
8	200													19,63 (29,2)	25,82 (38,40)	31,84 (47,35)	37,69 (56,04)	48,83 (72,66)
10	250														32,63 (48,56)	40,35 (60,05)	47,89 (71,27)	62,45 (92,94)

Chemical Composition

Element	Grades A, B		Grade C	
	Heat Analysis	Product Analysis	Heat Analysis	Product Analysis
Carbon, max %	0,26	0,30	0,23	0,27
Manganese, max %	1,35	1,40	1,35	1,40
Phosphorus, max %	0,035	0,045	0,035	0,045
Sulfur, max %	0,035	0,045	0,035	0,045
Copper, min %	0,20	0,18	0,20	0,18

Mechanical Properties

	Round Tubes			Square & Rectangular Tubes		
	Grade A	Grade B	Grade C	Grade A	Grade B	Grade C
Tensile strength, min, psi (MPa)	45 000 (310)	58 000(400)	62 000 (427)	45 000 (310)	58 000(400)	62 000 (427)
Yield strength, min, psi (MPa)	33 000 (228)	42 000 (290)	46 000 (317)	39 000 (269)	46 000 (317)	50 000 (250)
Elongation in 2 inches (50,8 mm), min, %	for WT ≥ 0,12 (3,05mm): 25	for WT ≥ 0,18 (4,57mm): 23	for WT ≥ 0,12 (3,05mm): 21	for WT ≥ 0,12 (3,05mm): 25	for WT ≥ 0,18 (4,57mm): 23	for WT ≥ 0,12 (3,05mm): 21

Odelya® ASTM A 500 ERW Round Structural Tubes

Nominal Size		Nominal Wall Thickness & Mass per Unit Length, lb/ft																											
Outside Diameter	in.	0,035	0,042	0,047	0,063	0,072	0,078	0,083	0,095	0,120	0,125	0,134	0,140	0,145	0,152	0,154	0,188	0,203	0,216	0,218	0,220	0,226	0,237	0,250	0,258	0,300	0,313	0,375	0,500
inch	mm	1	1,06	1,2	1,6	1,8	2	2,1	2,4	3,05	3,18	3,40	3,57	3,68	3,86	3,91	4,76	5,16	5,49	5,54	5,59	5,74	6,02	6,4	6,6	7,62	7,94	9,5	12,7
0,625	16	0,221	0,262	0,290																									
0,75	19	0,261	0,318	0,353	0,462																								
1	25	0,361	0,430	0,478	0,630	0,714		0,813																					
1,250	32	0,454	0,542	0,604	0,799	0,906		1,03	1,17		1,45																		
1,500	38	0,548	0,654	0,729	0,967	1,10		1,26	1,43	1,77																			
1,660	42,2												2,28	2,35															
1,900	48,3									2,28			2,64	2,72			3,43												
2,375	60,3										3,01					3,65	4,38			5,03				5,71					
2,500	63,5										3,17						4,63							6,05					
2,875	73										3,68						5,38	5,80						7,06					
3	76,2										3,85	4,09			4,63		5,63	6,07	6,43					7,40					
3,5	88,9										4,52						6,64	7,16	7,59					8,75		10,26			
4	101,6										5,18						7,64				8,89	9,12	9,53	10,09			12,33		
4,5	114,3										5,85						8,64						10,80					16,50	
5	127										6,53						9,64							12,79	13,17		15,66	18,50	24,05
5,5	139,7																								14,56			20,50	26,73
5,563	141,3											7,77					10,77								14,30			20,75	27,06
6	152,4										7,86						11,65							15,48			19,01	22,50	29,4
6,625	168,3										8,70						12,90							17,17			21,10	25,05	32,75
6,875	174,7																13,41							17,85			21,94	26,0	34,10
7	177,8										9,20						13,65							18,18			22,35	26,50	34,75
7,5	190,5																14,65							19,53			24,03	28,50	37,42
7,626	193,7																										24,44	29,0	
8,625	219,1																16,91							22,56			27,79	33,0	43,44
8,75	222,3																16,96							22,90			28,20	33,50	44,11
9,625	244,5																18,91							25,25			31,12	37,0	48,79
10	254,0																19,66							26,26			32,38	38,50	50,78
10,750	273,1																21,17											41,50	54,80
11,25	285,8																22,17							29,64			36,56	43,50	57,48
12,25	311,2																24,17							32,32			39,90	47,50	62,82
12,313	312,8																24,30							32,50			40,11	47,75	63,17
12,5	317,5																24,67							33,0			40,73	48,50	64,15
12,75	323,9																							33,67				49,50	65,50

Odelya® ASTM A 500 ERW Rectangular Structural Steel Tubes

Nominal Size (H x B)		Wall Thickness & Mass per Unit Length, lb/ft (kg/m)																
inch	inch	0,039	0,047	0,056	0,063	0,072	0,078	0,083	0,095	0,120	0,125	0,156	0,180	0,188	0,250	0,312	0,375	0,500
	mm	1	1,2	1,4	1,6	1,8	2	2,1	2,4	3	3,2	4	4,6	4,8	6,4	8	9,5	12,7
1 x ½	25 x 15	0,373 (0,555)	0,443 (659)	0,519 (0,773)	0,577 (0,859)	0,649 (0,965)												
1 ½ x ¾	40 x 20	0,572 (0,851)	0,683 (1,020)	0,805 (1,200)	0,898 (1,340)	1,020 (1,510)	1,090 (1,630)	1,160 (1,720)	1,300 (1,940)	1,600 (2,380)	1,650 (2,460)							
1 ½ x 1	40 x 25	0,658 (0,949)	0,762 (1,130)	0,900 (1,340)	1,010 (1,500)	1,140 (1,690)	1,250 (1,820)	1,300 (1,930)	1,470 (2,180)	1,800 (2,680)	1,870 (7,780)							
2 x 1	50 x 25	0,770 (1,150)	0,922 (1,370)	1,090 (1,620)	1,220 (1,810)	1,380 (2,060)	1,490 (2,220)	1,580 (2,350)	1,790 (2,660)	2,210 (3,290)	2,290 (3,410)	2,290 (3,410)						
3 x 2	80 x 50									3,86 (5,76)	4,03 (6,00)	5,01 (7,46)	5,70 (8,50)					
4 x 2	100 x 50									4,57 (6,81)	4,75 (7,07)	5,82 (8,66)	6,62 (9,85)	6,86 (10,20)	8,80 (13,10)			
4 x 3	100 x 80								4,43 (6,60)	5,39 (8,03)	5,59 (8,31)	7,24 (10,79)	8,27 (12,33)					
6 x 2	150 x 50									6,21 (9,23)	6,45 (9,60)	7,94 (11,80)	9,07 (13,50)	9,41 (14,00)				
6 x 4	150 x 100													12,00 (17,86)	15,60 (22,92)	19,10 (28,42)	22,40 (33,33)	
8 x 4	200 x 100												14,00 (20,80)	14,50 (21,60)	19,00 (28,30)	23,30 (34,70)	27,50 (40,90)	35,22 (52,41)
10 x 6	250 x 150													19,63 (29,20)	25,82 (38,40)	31,84 (47,35)	37,69 (56,04)	48,83 (72,67)
12 x 8	300 x 200														32,63 (48,56)	40,35 (60,05)	47,89 (71,27)	62,45 (92,94)

Odelya® ASTM A 513 ERW Industrial Tubes for Mechanical Applications

Odelya® ASTM A 513 Structural Carbon Steel Tubes for Mechanical Tubing are made of cold-rolled and hot-rolled steel by electric-resistance-welding in circular, square, rectangular and special shapes. Odelya® ASTM A 513 Hollow Sections may be furnished under following conditions: not-annealed (as-welded or as-drawn condition), stress-relieved annealed, normalised and annealed.

Odelya® ASTM A 513 Welded Carbon Steel Hollow Sections are mostly preferred as Type 5 (DOM – drawn over a mandrel) and Type 6 (S.S.I.D – special smooth inside diameter). For other types of Odelya® ASTM A 513 Steel Pipes, please, contact our sales team.

Outside Diameter		Wall Thickness & Mass per Unit Length, lb/ft (kg/m)																							
	inch	0,035	0,049	0,058	0,065	0,083	0,095	0,109	0,120	0,125	0,134	0,156	0,165	0,180	0,188	0,207	0,219	0,238	0,250	0,281	0,284	0,313	0,344	0,375	0,406
inch	mm	1	1,2	1,47	1,65	2,11	2,4	2,77	3,05	3,18	3,40	3,96	4,19	4,57	4,76	5,26	5,56	6,05	6,35	7,14	7,21	7,94	8,74	9,52	10,31
0,625	15,9	0,25 (0,37)	0,30 (0,44)	0,35 (0,52)	0,39 (0,58)	0,48 (0,72)	0,54 (0,80)	0,60 (0,90)	0,65 (0,97)	0,67 (1,0)	0,71 (1,05)														
0,688	17,5	0,28 (0,41)	0,32 (0,48)	0,39 (0,58)	0,43 (0,64)	0,54 (0,80)	0,60 (0,89)	0,68 (1,01)	0,73 (1,09)	0,75 (1,12)	0,79 (1,18)	0,89 (1,32)	0,93 (1,38)												
0,750	19,1	0,30 (0,45)	0,36 (0,53)	0,43 (0,64)	0,48 (0,71)	0,59 (0,88)	0,67 (0,99)	0,75 (1,12)	0,81 (1,21)	0,84 (1,25)	0,89 (1,32)	0,99 (1,48)	1,04 (1,54)												
0,813	20,7	0,33 (0,49)	0,39 (0,58)	0,47 (0,70)	0,52 (0,78)	0,65 (0,97)	0,73 (1,08)	0,82 (1,22)	0,89 (1,33)	0,92 (1,37)	0,97 (1,45)	1,10 (1,63)	1,15 (1,71)	1,22 (1,82)											
0,875	22,2	0,35 (0,52)	0,42 (0,62)	0,50 (0,75)	0,56 (0,84)	0,71 (1,05)	0,79 (1,17)	0,89 (1,33)	0,97 (1,44)	1,0 (1,49)	1,06 (1,58)	1,20 (1,78)	1,25 (1,86)	1,34 (1,99)											
0,938	23,8	0,38 (0,56)	0,45 (0,67)	0,54 (0,81)	0,60 (0,90)	0,76 (1,13)	0,85 (1,27)	0,97 (1,44)	1,05 (1,56)	1,09 (1,62)	1,15 (1,71)	1,30 (1,94)	1,36 (2,03)	1,46 (2,17)	1,50 (2,23)										
1	25,4	0,40 (0,60)	0,48 (0,72)	0,58 (0,87)	0,65 (0,97)	0,81 (1,21)	0,91 (1,36)	1,04 (1,55)	1,13 (1,68)	1,17 (1,74)	1,24 (1,84)	1,40 (2,09)	1,47 (2,19)	1,58 (2,35)	1,63 (2,42)										
1,063	27	0,43 (0,64)	0,51 (0,76)	0,62 (0,93)	0,69 (1,03)	0,87 (1,30)	0,98 (1,46)	1,12 (1,66)	1,21 (1,80)	1,26 (1,87)	1,33 (1,98)	1,51 (2,25)	1,59 (2,36)	1,70 (2,53)	1,75 (2,61)	1,90 (2,82)	1,98 (2,94)	2,10 (3,13)							
1,125	28,6	0,46 (0,68)	0,54 (0,81)	0,66 (0,98)	0,74 (1,10)	0,93 (1,38)	1,04 (1,55)	1,18 (1,76)	1,29 (1,92)	1,34 (1,99)	1,42 (2,11)	1,62 (2,41)	1,69 (2,52)	1,82 (2,71)	1,88 (2,80)	2,04 (3,03)	2,12 (3,16)	2,26 (3,36)							
1,188	30,2	0,48 (0,72)	0,58 (0,86)	0,70 (1,04)	0,78 (1,16)	0,98 (1,46)	1,11 (1,65)	1,26 (1,87)	1,37 (2,04)	1,42 (2,12)	1,51 (2,25)	1,72 (2,56)	1,81 (2,69)	1,94 (2,89)	2,0 (2,99)	2,18 (3,24)	2,27 (3,38)	2,42 (3,60)							
1,250	31,8	0,51 (0,76)	0,61 (0,91)	0,74 (1,10)	0,83 (1,23)	1,03 (1,54)	1,17 (1,74)	1,33 (1,98)	1,45 (2,16)	1,51 (2,24)	1,60 (2,38)	1,83 (2,72)	1,92 (2,85)	2,06 (3,07)	2,13 (3,17)	2,31 (3,44)	2,42 (3,60)	2,58 (3,84)							
1,313	33,4	0,54 (0,80)	0,64 (0,95)	0,78 (1,16)	0,87 (1,29)	1,10 (1,63)	1,23 (1,83)	1,40 (2,09)	1,53 (2,28)	1,59 (2,37)	1,69 (2,52)	1,93 (2,87)	2,03 (3,02)	2,18 (3,25)	2,26 (3,36)	2,45 (3,65)	2,57 (3,82)	2,74 (4,08)	2,85 (4,24)						
1,375	35	0,56 (0,84)	0,67 (1,0)	0,82 (1,22)	0,91 (1,36)	1,15 (1,71)	1,30 (1,93)	1,48 (2,20)	1,61 (2,40)	1,68 (2,50)	1,78 (2,65)	2,04 (3,03)	2,14 (3,18)	2,30 (3,43)	2,39 (3,55)	2,59 (3,86)	2,72 (4,04)	2,90 (4,32)	3,02 (4,49)	3,30 (4,91)					
1,500	38,1	0,61 (0,91)	0,73 (1,09)	0,89 (1,33)	1,0 (1,48)	1,26 (1,87)	1,42 (2,11)	1,62 (2,41)	1,77 (2,64)	1,84 (2,74)	1,96 (2,91)	2,24 (3,33)	2,35 (3,50)	2,54 (3,78)	2,63 (3,91)	2,86 (4,26)	3,0 (4,46)	3,21 (4,78)	3,34 (4,97)	3,66 (5,45)					
1,563	39,7	0,64 (0,95)	0,77 (1,14)	0,93 (1,39)	1,04 (1,55)	1,32 (1,96)	1,49 (2,21)	1,69 (2,52)	1,86 (2,76)	1,92 (2,86)	2,04 (3,04)	2,35 (3,49)	2,47 (3,67)	2,66 (3,96)	2,76 (4,10)	3,0 (4,47)	3,15 (4,68)	3,37 (5,02)	3,51 (5,22)	3,85 (5,73)					
1,625	41,3	0,67 (0,99)	0,80 (1,19)	0,97 (1,44)	1,08 (1,61)	1,37 (2,04)	1,55 (2,30)	1,77 (2,63)	1,94 (2,88)	2,01 (2,99)	2,14 (3,18)	2,45 (3,65)	2,57 (3,83)	2,78 (4,14)	2,88 (4,29)	3,14 (4,67)	3,29 (4,90)	3,53 (5,26)	3,68 (5,47)	4,04 (6,01)					
1,688	42,9	0,69 (1,03)	0,83 (1,23)	1,01 (1,50)	1,13 (1,68)	1,42 (2,12)	1,61 (2,40)	1,84 (2,74)	2,02 (3,00)	2,09 (3,11)	2,22 (3,31)	2,55 (3,8)	2,69 (4,00)	2,9 (4,32)	3,01 (4,48)	3,28 (4,88)	3,44 (5,12)	3,70 (5,50)	3,84 (5,72)	4,23 (6,30)					
1,750	44,5	0,72 (1,07)	0,86 (1,28)	1,05 (1,56)	1,17 (1,74)	1,49 (2,21)	1,67 (2,49)	1,92 (2,85)	2,10 (3,12)	2,18 (3,24)	2,32 (3,45)	2,66 (3,96)	2,80 (4,17)	3,02 (4,50)	3,13 (4,66)	3,42 (5,09)	3,59 (5,34)	3,86 (5,74)	4,01 (5,97)	4,42 (6,58)					
1,768	45	0,73 (1,09)	0,87 (1,30)	1,06 (1,58)	1,18 (1,76)	1,50 (2,23)	1,69 (2,52)	1,94 (2,88)	2,12 (3,16)	2,20 (3,28)	2,35 (3,49)	2,70 (4,01)	2,84 (4,22)	3,06 (4,56)	3,17 (4,72)	3,46 (5,15)	3,64 (5,41)	3,90 (5,81)	4,07 (6,05)	4,48 (6,67)					
1,875	47,6	0,77 (1,15)	0,92 (1,37)	1,12 (1,67)	1,26 (1,87)	1,59 (2,37)	1,80 (2,68)	2,06 (3,06)	2,25 (3,35)	2,34 (3,48)	2,49 (3,71)	2,86 (4,26)	3,02 (4,49)	3,26 (4,85)	3,38 (5,03)	3,69 (5,49)	3,87 (5,76)	4,17 (6,20)	4,34 (6,46)	4,79 (7,12)					
2,000	50,8	0,83 (1,23)	0,99 (1,47)	1,20 (1,79)	1,34 (2,00)	1,70 (2,53)	1,92 (2,86)	2,20 (3,28)	2,41 (3,59)	2,51 (3,73)	2,67 (3,97)	3,07 (4,57)	3,24 (4,82)	3,50 (5,21)	3,63 (5,40)	3,97 (5,91)	4,17 (6,20)	4,49 (6,68)	4,68 (6,96)	5,17 (7,69)	5,21 (7,75)	5,64 (8,39)			
2,125	54	0,88 (1,31)	1,05 (1,56)	1,28 (1,90)	1,43 (2,13)	1,81 (2,70)	2,05 (3,05)	2,35 (3,50)	2,57 (3,83)	2,68 (3,99)	2,85 (4,24)	3,29 (4,89)	3,46 (5,15)	3,74 (5,57)	3,88 (5,78)	4,25 (6,32)	4,46 (6,64)	4,81 (7,15)	5,01 (7,46)	5,54 (8,25)	5,59 (8,32)	6,06 (9,02)			
2,250	57,2	0,93 (1,39)	1,12 (1,66)	1,36 (2,02)	1,52 (2,26)	1,93 (2,87)	2,18 (3,24)	2,50 (3,72)	2,74 (4,07)	2,85 (4,24)	3,03 (4,51)	3,49 (5,20)	3,68 (5,48)	3,99 (5,93)	4,14 (6,16)	4,53 (6,74)	4,76 (7,08)	5,13 (7,63)	5,35 (7,96)	5,92 (8,81)	5,97 (8,89)	6,49 (9,65)			
2,375	60,3		1,18 (1,75)	1,43 (2,13)	1,61 (2,39)	2,04 (3,03)	2,31 (3,43)	2,64 (3,93)	2,90 (4,31)	3,01 (4,48)	3,21 (4,77)	3,70 (5,50)	3,90 (5,80)	4,22 (6,28)	4,38 (6,52)	4,80 (7,14)	5,05 (7,51)	5,44 (8,09)	5,68 (8,45)	6,28 (9,36)	6,34 (9,44)	6,89 (10,25)	7,53 (11,21)	8,01 (11,92)	8,54 (12,71)
2,438	61,9		1,21 (1,80)	1,47 (2,19)	1,65 (2,45)	2,09 (3,11)	2,37 (3,52)	2,72 (4,04)	2,98 (4,43)	3,09 (4,60)	3,29 (4,90)	3,80 (5,66)	4,01 (5,96)	4,34 (6,46)	4,51 (6,71)	4,94 (7,35)	5,19 (7,72)	5,60 (8,33)	5,85 (8,70)	6,48 (9,64)	6,53 (9,72)	7,10 (10,57)	7,70 (11,46)	8,27 (12,30)	8,82 (13,12)
2,500	63,5		1,24 (1,84)	1,51 (2,25)	1,69 (2,52)	2,14 (3,19)	2,43 (3,62)	2,79 (4,15)	3,06 (4,55)	3,18 (4,73)	3,39 (5,04)	3,90 (5,81)	4,12 (6,13)	4,46 (6,64)	4,63 (6,89)	5,07 (7,55)	5,34 (7,94)	5,76 (8,57)	6,01 (8,95)	6,67 (9,92)	6,73 (10,01)	7,31 (10,88)	7,93 (11,80)	8,51 (12,67)	9,09 (13,52)
2,563	65,1		1,27 (1,89)	1,55 (2,31)	1,73 (2,58)	2,20 (3,28)	2,49 (3,71)	2,86 (4,26)	3,14 (4,67)	3,27 (4,86)	3,17 (5,17)	4,01 (5,97)	4,23 (6,29)	4,58 (6,82)	4,76 (7,08)	5,22 (7,76)	5,48 (8,16)	5,92 (8,81)	6,18 (9,20)	6,86 (10,21)	6,92 (10,29)	7,52 (11,19)	8,17 (12,15)	8,77 (13,05)	9,36 (13,93)
2,625	66,7		1,30 (1,94)	1,59 (2,36)	1,78 (2,65)	2,26 (3,36)	2,56 (3,81)	2,94 (4,37)	3,22 (4,79)	3,35 (4,98)	3,57 (5,31)	4,12 (6,13)	4,34 (6,46)	4,70 (7,00)	4,89 (7,27)	5,36 (7,97)	5,63 (8,38)	6,08 (9,05)	6,35 (9,45)	7,05 (10,49)	7,11 (10,58)	7,74 (11,51)	8,39 (12,49)	9,02 (13,42)	9,64 (14,34)
2,750	69,9		1,36 (2,03)	1,67 (2,48)	1,87 (2,78)	2,37 (3,53)	2,68 (3,99)	3,09 (4,59)	3,38 (5,03)	3,52 (5,23)	3,75 (5,58)	4,33 (6,44)	4,89 (6,79)	4,95 (7,36)	5,14 (7,65)	5,63 (8,38)	5,93 (8,82)	6,40 (9,53)	6,69 (9,95)	7,43 (11,05)	7,49 (11,15)	8,15 (12,13)	8,86 (13,18)	9,53 (14,18)	10,18 (15,15)
2,875	73		1,43 (2,12)	1,74 (2,59)	1,95 (2,90)	2,48 (3,69)	2,81 (4,18)	3,23 (4,80)	3,54 (5,26)	3,68 (5,48)	3,93 (5,84)	4,53 (6,74)	4,78 (7,11)	5,18 (7,71)	5,38 (8,01)	5,91 (8,79)	6,22 (9,25)	6,71 (9,99)	7,02 (10,44)	7,80 (11,60)	7,86 (11,70)	8,56 (12,74)	9,30 (13,85)	10,01 (14,90)	10,71 (15,94)
3	76,2			1,82 (2,71)	2,04 (3,03)	2,60 (3,86)	2,94 (4,37)	3,37 (5,02)	3,70 (5,50)	3,85 (5,73)	4,10 (6,10)	4,74 (7,05)	5,00 (7,44)	5,42 (8,07)	5,64 (8,39)	6,18 (9,20)	6,51 (9,69)	7,04 (10,47)	7,35 (10,94)	8,17 (12,16)	8,25 (12,27)	8,99 (13,37)	9,77 (14,54)	10,52 (15,65)	11,26 (16,75)
3,063	77,8			1,86 (2,77)	2,08 (3,10)	2,65 (3,94)	3,00 (4,46)	3,45 (5,13)	3,78 (5,62)	3,93 (5,85)	4,19 (6,24)	4,85 (7,21)	5,11 (7,61)	5,54 (8,25)	5,76 (8,57)	6,32 (9,41)	6,65 (9,90)	7,19 (10,70)	7,52 (11,19)	8,36 (12,44)	8,43 (12,55)	9,19 (13,68)	10,00 (14,88)	10,77 (16,03)	11,53 (17,16)
3,125	79,4			1,90 (2,82)	2,12 (3,16)	2,70 (4,02)	3,06 (4,56)	3,52 (5,23)	3,86 (5,74)	4,02 (5,98)	4,28 (6,37)	4,95 (7,37)	5,22 (7,77)	5,67 (8,43)	5,89 (8,76)	6,47 (9,62)	6,80 (10,12)	7,35 (10,94)	7,69 (11,44)	8,55 (12,72)	8,63 (12,84)	9,40 (13,99)	10,24 (15,23)	11,03 (16,41)	11,81 (17,57)
3,250	82,6			1,98 (2,94)	2,21 (3,29)	2,82 (4,19)	3,19 (4,75)	3,66 (5,45)	4,02 (5,98)	4,19 (6,23)	4,46 (6,64)	5,16 (7,68)	5,44 (8,10)	5,91 (8,79)	6,14 (9,14)	6,74 (10,03)	7,10 (10,56)	7,67 (11,42)	8,02 (11,94)	8,93 (13,29)	9,01 (13,40)	9,83 (14,62)	10,70 (15,92)	11,53 (17,16)	12,35 (18,38)
3,375	85,7			2,02 (3,05)	2,30 (3,42)	2,92 (4,35)	3,31 (4,93)	3,80 (5,66)	4,18 (6,22)	4,35 (6,47)	4,64 (6,90)	5,36 (7,98)	5,66 (8,42)	6,14 (9,14)	6,38 (9,50)	7,01 (10,43)	7,39 (10,99)	7,98 (11,88)	8,35 (12,43)	9,29 (13,83)	9,38 (13,96)	10,24 (15,23)	11,15 (16,59)	12,02 (17,88)	12,88 (19,17)
3,5	88,9			2,13 (3,17)	2,39 (3,55)	3,04 (4,52)	3,44 (5,12)	3,95 (5,88)	4,34 (6,46)	4,52 (6,72)	4,82 (7,17)	5,57 (8,29)	5,88 (8,75)	6,38 (9,50)	6,64 (9,88)	7,29 (10,85)	7,62 (11,43)	8,31 (12,36)	8,70 (12,93)	9,68 (14,40)	9,76 (14,52)	10,65 (15,85)	11,61 (17,28)	12,53 (18,64)	13,43 (19,98)
3,555	90,3			2,16 (3,22)	2,43 (3,61)	3,09 (4,59)	3,49 (5,20)	4,02 (5,98)	4,41 (6,56)	4,59 (6,83)	4,90 (7,29)	5,67 (8,43)	5,98 (8,90)	6,49 (9,66)	6,75 (10,04)	7,41 (11,03)	7,81 (11,62)	8,45 (12,57)	8,84 (13,15)	9,84 (14,64)	9,93 (14,77)	10,84 (16,13)	11,81 (17,58)	12,74 (18,96)	13,67 (20,34)
3,625	92,1					3,15 (4,68)	3,57 (5,31)	4,10 (6,10)	4,50 (6,70)	4,68 (6,97)	5,0 (7,44)	5,79 (8,61)	6,10 (9,08)	6,63 (9,86)	6,89 (10,25)	7,57 (11,26)	7,98 (11,87)	8,63 (12,84)	9,03 (13,43)	10,05 (14,96)	10,14 (15,09)	11,08 (16,48)	12,08 (17,97)	13,03 (19,39)	13,97 (20,79)

(Continued. Please see the previous page.)

	inch	0,035	0,049	0,058	0,065	0,083	0,095	0,109	0,120	0,125	0,134	0,156	0,165	0,180	0,188	0,207	0,219	0,238	0,250	0,281	0,284	0,313	0,344	0,375	0,406
inch	mm	1	1,2	1,47	1,65	2,11	2,4	2,77	3,05	3,18	3,40	3,96	4,19	4,57	4,76	5,26	5,56	6,05	6,35	7,14	7,21	7,94	8,74	9,52	10,31
3,688	93,7					3,21 (4,77)	3,63 (5,40)	4,17 (6,21)	4,58 (6,82)	4,77 (7,10)	5,09 (7,57)	5,89 (8,76)	6,22 (9,25)	6,75 (10,04)	7,02 (10,44)	7,71 (11,47)	8,12 (12,08)	8,79 (13,08)	9,19 (13,68)	10,24 (15,24)	10,34 (15,38)	11,28 (16,79)	12,30 (18,31)	13,28 (19,76)	14,25 (21,20)
3,750	95,3					3,26 (4,85)	3,70 (5,50)	4,25 (6,32)	4,66 (6,94)	4,85 (7,22)	5,18 (7,71)	5,99 (8,92)	6,32 (9,41)	6,87 (10,22)	7,14 (10,63)	7,85 (11,68)	8,27 (12,30)	8,95 (13,32)	9,36 (13,93)	10,43 (15,52)	10,52 (15,66)	11,50 (17,11)	12,54 (18,66)	13,53 (20,14)	14,52 (21,61)
3,875	98,4						3,82 (5,68)	4,39 (6,53)	4,82 (7,17)	5,02 (7,47)	5,36 (7,97)	6,20 (9,22)	6,54 (9,73)	7,10 (10,57)	7,39 (10,99)	8,12 (12,08)	8,56 (12,73)	9,26 (13,78)	9,68 (14,41)	10,80 (16,07)	10,89 (16,21)	11,90 (17,71)	12,98 (19,32)	14,03 (20,87)	15,05 (22,40)
4	101,6						3,95 (5,87)	4,54 (6,75)	4,98 (7,41)	5,19 (7,72)	5,53 (8,23)	6,40 (9,53)	6,76 (10,06)	7,35 (10,93)	7,64 (11,37)	8,40 (12,50)	8,85 (13,17)	9,58 (14,26)	10,03 (14,92)	11,18 (16,63)	11,28 (16,78)	12,33 (18,34)	13,45 (20,01)	14,53 (21,62)	16,0 (23,21)
4,022	102,2						3,97 (5,91)	4,56 (6,79)	5,01 (7,46)	5,22 (7,77)	5,56 (8,28)	6,45 (9,59)	6,81 (10,13)	7,40 (11,0)	7,69 (11,44)	8,45 (12,57)	8,90 (13,25)	9,64 (14,34)	10,09 (15,01)	11,25 (16,74)	11,35 (16,89)	12,41 (18,46)	13,53 (20,14)	14,62 (21,76)	15,70 (23,36)
4,062	103,2						4,01 (5,97)	4,61 (6,86)	5,06 (7,53)	5,27 (7,84)	5,63 (8,37)	4,68 (9,69)	6,88 (10,23)	7,47 (11,12)	7,77 (11,56)	8,53 (12,70)	9,0 (13,39)	9,74 (14,49)	10,19 (15,17)	11,36 (16,91)	11,47 (17,07)	12,53 (18,65)	13,68 (20,36)	14,78 (21,99)	15,87 (23,62)
4,095	104						4,04 (6,01)	4,64 (6,91)	5,10 (7,59)	5,32 (7,91)	5,67 (8,43)	6,57 (9,77)	6,93 (10,31)	7,53 (11,21)	7,83 (11,65)	8,61 (12,81)	9,07 (13,50)	9,82 (14,61)	10,28 (15,29)	11,46 (17,05)	11,57 (17,21)	12,64 (18,81)	13,80 (20,53)	14,91 (22,18)	16,01 (23,82)
4,125	104,8						4,07 (6,06)	4,68 (6,97)	5,14 (7,65)	5,36 (7,97)	5,71 (8,50)	6,62 (9,85)	6,99 (10,40)	7,59 (11,30)	7,89 (11,74)	8,68 (12,91)	9,15 (13,61)	9,90 (14,73)	10,36 (15,42)	11,56 (17,20)	11,66 (17,35)	12,75 (18,97)	13,91 (20,70)	15,03 (22,37)	16,14 (24,02)
4,250	108						4,2 (6,25)	4,83 (7,19)	5,30 (7,89)	5,52 (8,22)	5,89 (8,77)	6,83 (10,16)	7,21 (10,73)	7,84 (11,66)	8,15 (12,12)	8,96 (13,33)	9,44 (14,05)	10,22 (15,21)	10,70 (15,92)	11,94 (17,76)	12,04 (17,92)	13,71 (19,59)	14,37 (21,39)	15,54 (23,12)	16,69 (24,84)
4,375	111,1						4,32 (6,43)	4,97 (7,40)	5,46 (8,13)	5,69 (8,46)	6,07 (9,03)	7,03 (10,46)	7,43 (11,05)	8,07 (12,01)	8,39 (12,48)	9,23 (13,73)	9,72 (14,47)	10,53 (15,67)	11,02 (16,40)	12,30 (18,30)	12,41 (18,47)	13,57 (20,20)	14,82 (22,06)	16,03 (23,85)	17,22 (25,63)
4,5	114,3						4,45 (6,62)	5,12 (7,62)	5,63 (8,37)	5,85 (8,71)	6,25 (9,30)	7,24 (10,78)	7,65 (11,38)	8,31 (12,37)	8,64 (12,86)	9,50 (14,14)	10,02 (14,91)	10,85 (16,15)	11,22 (16,90)	12,68 (18,87)	12,80 (19,04)	14,0 (20,83)	15,29 (22,75)	16,53 (24,60)	17,77 (26,44)
4,562	115,9						4,52 (6,72)	5,20 (7,73)	5,71 (8,49)	5,94 (8,84)	6,34 (9,43)	7,35 (10,93)	7,76 (11,54)	8,43 (12,55)	8,77 (13,05)	9,64 (14,35)	10,17 (15,13)	11,01 (16,39)	11,53 (17,15)	12,87 (19,15)	12,98 (19,32)	14,21 (21,14)	15,52 (23,10)	16,78 (24,97)	18,04 (26,85)
4,593	116,7							5,23 (7,78)	5,75 (8,55)	5,98 (8,90)	6,38 (9,50)	7,40 (11,01)	7,82 (11,63)	8,49 (12,64)	8,83 (13,14)	9,72 (14,46)	10,24 (15,24)	11,10 (16,51)	11,61 (17,28)	12,96 (19,29)	13,08 (19,47)	14,31 (21,30)	15,64 (23,27)	16,91 (25,16)	18,18 (27,05)
4,625	117,5							5,27 (7,84)	5,79 (8,61)	6,02 (8,96)	6,43 (9,57)	7,45 (11,09)	7,87 (11,71)	8,56 (12,73)	8,89 (13,23)	9,78 (14,56)	10,32 (15,35)	11,18 (16,63)	11,70 (17,41)	13,06 (19,43)	13,18 (19,61)	14,41 (21,45)	15,75 (23,44)	17,04 (25,35)	18,31 (27,25)
4,750	120,7							5,42 (8,06)	5,95 (8,85)	6,20 (9,22)	6,61 (9,83)	7,66 (11,40)	8,09 (12,04)	8,80 (13,09)	9,15 (13,61)	10,06 (14,97)	10,61 (15,79)	11,49 (17,10)	12,04 (17,91)	13,43 (19,99)	13,56 (20,18)	14,80 (22,02)	16,22 (24,13)	17,54 (26,10)	
5	127							5,71 (8,49)	6,26 (9,32)	6,53 (9,71)	6,96 (10,36)	8,08 (12,02)	8,53 (12,69)	9,27 (13,80)	9,64 (14,35)	10,61 (15,79)	11,19 (16,65)	12,12 (18,04)	12,69 (18,89)	14,18 (21,10)	14,31 (21,30)	15,66 (23,31)			
5,125	130,2							5,85 (8,70)	6,42 (9,56)	6,69 (9,96)	7,14 (10,63)	8,29 (12,33)	8,75 (13,02)	9,52 (14,16)	9,89 (14,72)	10,89 (16,21)	11,49 (17,09)	12,45 (18,52)	13,03 (19,39)	14,56 (21,67)	14,70 (21,87)				

Chemical Composition

Steel Grade	Carbon, %	Manganese, %	Phosphorus, max %	Sulfur, max %
1008	0,10 max	0,30 – 0,50	0,035	0,035
1009	0,15 max	0,60 max	0,035	0,035
1010	0,08 – 0,13	0,30 – 0,60	0,035	0,035
1012	0,10 – 0,15	0,30 – 0,60	0,035	0,035
1015	0,13 – 0,18	0,30 – 0,60	0,035	0,035
1016	0,13 – 0,18	0,60 – 0,90	0,035	0,035
1017	0,15 – 0,20	0,30 – 0,60	0,035	0,035
1018	0,15 – 0,20	0,60 – 0,90	0,035	0,035
1019	0,15 – 0,20	0,70 – 1,00	0,035	0,035
1020	0,18 – 0,23	0,30 – 0,60	0,035	0,035
1021	0,18 – 0,23	0,60 - 0,90	0,035	0,035
1022	0,18 – 0,23	0,70 – 1,00	0,035	0,035
1023	0,20 – 0,25	0,30 – 0,60	0,035	0,035
1024	0,18 – 0,25	1,30 – 1,65	0,035	0,035
1025	0,22 – 0,28	0,30 – 0,60	0,035	0,035
1026	0,22 – 0,28	0,60 – 0,90	0,035	0,035
1027	0,22 – 0,29	1,20 – 1,55	0,035	0,035
1030	0,28 – 0,34	0,60 – 0,90	0,035	0,035
1033	0,30 – 0,36	0,70 – 1,00	0,035	0,035
1035	0,32 – 0,38	0,60 – 0,90	0,035	0,035
1040	0,37 – 0,44	0,60 – 0,90	0,040	0,050

Odelya® EN 39 Scaffolding Steel Tubes

Odelya® EN 39 Non-alloy Steel Tubes are used with EN 74 couplers in the construction of working scaffolds and falsework. Odelya® EN 39 Scaffolding Pipes are manufactured by electric welding process with close tolerances and high strength ensuring long lifespan and safety of required work. According to requirements, Scaffold Tubes are delivered as hot dip galvanized, bare, painted, and coated or a temporary corrosion protection may be applied.

Outside Diameter is 48,3 mm (19 inch) for this type of structural steel tubes with wall thickness 3,2 or 4,0 mm (0,26 or 0,157 inch).

Chemical Compositions

Steel Name	Steel Number	C max, %	Si max, %	Mn max, %	P max, %	S max, %	Al min, %	Yield Strength (R_{eH} min.) MPa	Tensile Strength (R_m) MPa	Elongation A min. (%)
S235GT	1.0106	0,20	≤ 0,04% - ≤ 0,25%	1,40	0,040	0,045	0,020	325	340 / 520	24

ERW BOILER AND PRESSURE TUBES

Odelya® ERW Boilers and Pressure Tubes are made of heat resisting carbon and low alloyed steels, therefore, can withstand the load at high pressure and high temperature. Odelya® carbon steel Pressure and Boiler Pipes are supplied as cold drawn or hot rolled with required surface protection, ensuring the long lifespan of steel pipes at the most hostile conditions. High quality and wide range of Odelya® Boilers and Pressure Tubes meets requirements of a rising demand in many industries and projects.

Odelya® ERW Boiler & Pressure Tubes vary on their material types, surface conditions, processing types, and are available as: carbon or stainless, black (self-colour), surface-coated, galvanized, plain or bevelled end...

Application

Odelya® Welded Pressure and Boiler steel tubes are used for heat exchangers, steam and marine boilers in boiler industry, steam superheaters, central (district) heating and cooling sistems, distribution of gas, high and low pressure liquid transmission, economisers, pressure equipment, refrigeration, water mains, sewage pipes, etc.

Production Range

Outside Diameter: Ø17,1 mm – Ø 508 mm (3/8 inch – 20 inch)
Wall Thickness: 2,00 mm – 12,5 mm (0,079 - 0,492 inch)
Length: 6 – 12 m
Note: tolerances may vary according to sizes and the standards.

Production Standards

EN 10217-1 (BS 3059-1), EN 10217-2 (BS 3059-2), EN 10217-3
ASTM A 178 (DIN 17177)

Material Quality

EN 10217-1	P 195 TR1, P 195 TR2, P 235 TR1, P 235 TR2, P 265 TR1, P 265 TR2 (DIN St 37.0)
EN 10217-2	P 195 GH, P 235 GH, P 265 GH (DIN grade St 37.8)
EN 10217-3	P 355 N (DIN grade St 52.0)
ASTM A 178	Grade A
BS 3059	Gr 320, Gr 360

Technical Delivery Conditions

Hot rolled with required surface protection or cold formed, hot stretch reduced at a controlled temperature to give a normalized condition.

Finishing Operations

Plain End – Square cut or bevelled.

Surface Conditions

Black self colored/uncoated, surface protective coated (black varnished), hot-dip galvanized (zinc-coated).

QUALITY CONTROL

Hydrostatic Test

Testing of leakage in the welded areas by high pressure water applies according to further application and requirements (Leak Tightness).

Non-Destructive Tests (type TC2 mandatory)

Eddy Current Test: Detection of the defects on the surface and testing quality of the weld and the material using electromagnetic device (on-line). Testing by overpressure can be applied on request.

Ultrasonic test: Automatic ultrasonic rotary plant precisely detects possible defects in the weld zone.

Visual & Dimensional Inspections

Accurate information about dimensions and quality of tubes is provided using tape, caliper, ultrasonic device, gauge and cord.

Chemical Analysis

Spectral analysis of the chemical composition.

Mechanical & Technological Properties

Tensile test, flattening test, flange test, drift expansion, bending test / weld bend test, ilmpact test, fracture toughness test

Metallographic Examination

Revealing the structure of metals and their alloys with light optical or scanning electron microscope.

Note: Applied tests vary according to the related standard and application. Please refer to page 52 for more details about our Quality Assurance Policies.

ERW Boiler & Pressure Tubes Production Range

Outside Diameter		Wall Thickness																
	inch	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
inch	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
0,677	17,2																	
0,709	18																	
0,748	19																	
0,787	20																	
0,839	21,3																	
0,866	22																	
0,984	25																	
1	25,4																	
1,059	26,9																	
1,181	30																	
1,252	31,8																	
1,260	32																	
1,327	33,7																	
1,378	35																	
1,496	38																	
1,575	40																	
1,669	42,4																	
1,752	44,5																	
1,902	48,3																	
2	51																	
2,126	54																	
2,244	57																	
2,374	60,3																	
2,5	63,5																	
2,756	70																	
2,874	73																	
2,996	76,1																	
3,248	82,5																	
3,5	88,9																	
4	101,6																	
4,252	108																	
4,5	114,3																	
5	127																	
5,236	133																	
5,5	139,7																	
5,563	141,3																	
6	152,4																	
6,26	159																	
6,226	168,3																	
7	177,8																	
7,626	193,7																	
8,626	219,1																	
9,626	244,5																	

EN 10217-1, EN 10217-2, EN 10217-3	
ASTM A 178	O.D. 17,1 – 127 mm, (3/8 – 5 in.) WT 2,31 – 9,1 mm (0,091 to 0,360 in.)

Data sheets of Odelya® EN10217-1 ERW Water & Gas Pipes and Boiler & Pressure Tubes are identical. Please refer to page 12, to see the data sheets of Odelya® EN10217-1 belonging to Boiler & Pressure Tubes as well.

Odelya® EN 10217-2 Steel Tubes for Pressure Purposes

Odelya® EN 10217-2 Longitudinally Welded Boiler and Pressure steel tubes are with specified elevated temperature properties.

Manufacturing Process	Starting Material	Forming Operation	Technical Delivery Condition
Electric Welded (EW)	Normalising rolled strip	Cold formed (+welded)	Normalising weld zone or normalising (entire tube)
	Hot rolled or normalising rolled strip	Cold formed (+welded)	Normalising (entire tube)
		Cold formed (+welded) + hot stretch reduced	Normalising (entire tube)
		Cold formed (+welded) + hot stretch reduced at a controlled temperature to give a normalised condition	Normalised rolled

Odelya® EN 10217-2 Welded Steel Tubes

Outside Diameter		Wall Thickness & Weight per Unit Length (kg/m)																
	inch	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
inch	**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**
0,677	**17,2**	0,75	0,85	0,94	1,02	1,10	1,21	1,30										
0,709	**18**	0,79	0,89	0,99	1,08	1,17	1,28	1,38										
0,748	**19**	0,84	0,95	1,05	1,15	1,25	1,37	1,48										
0,787	**20**	0,89	1,00	1,12	1,22	1,33	1,46	1,58										
0,839	**21,3**	0,95	1,08	1,20	1,32	1,43	1,57	1,71	1,86									
0,866	**22**	0,99	1,12	1,24	1,37	1,48	1,63	1,78	1,94	2,10								
0,984	**25**	1,13	1,29	1,44	1,58	1,72	1,90	2,07	2,27	2,47								
1	**25,4**	1,15	1,31	1,46	1,61	1,75	1,94	2,11	2,32	2,52								
1,059	**26,9**	1,23	1,40	1,56	1,72	1,87	2,07	2,26	2,49	2,70								
1,181	**30**	1,38	1,57	1,76	1,94	2,11	2,34	2,56	2,83	3,08	3,37	3,68						
1,252	**31,8**	1,47	1,67	1,87	2,07	2,26	2,50	2,74	3,03	3,30	3,62	3,96	4,32					
1,260	**32**	1,48	1,68	1,89	2,08	2,27	2,52	2,76	3,05	3,33	3,65	3,99	4,36	4,73				
1,327	**33,7**	1,56	1,78	1,99	2,20	2,41	2,67	2,93	3,24	3,54	3,88	4,26	4,66	5,07				
1,378	**35**	1,63	1,85	2,08	2,30	2,51	2,79	3,06	3,38	3,70	4,06	4,46	4,89	5,33	5,69			
1,496	**38**	1,78	2,02	2,27	2,51	2,75	3,01	3,35	3,72	4,07	4,47	4,92	5,41	5,92	6,34			
1,575	**40**	1,87	2,14	2,40	2,65	2,90	3,23	3,55	3,94	4,32	4,75	5,24	5,76	6,31	6,77			
1,669	**42,4**	1,99	2,27	2,55	2,82	3,09	3,44	3,79	4,21	4,61	5,08	5,61	6,18	6,79	7,29			
1,752	**44,5**	2,10	2,39	2,69	2,97	3,26	3,63	3,99	4,44	4,87	5,37	5,93	6,55	7,20	7,75			
1,902	**48,3**	2,28	2,61	2,93	3,25	3,56	3,97	4,37	4,86	5,34	5,90	6,53	7,21	7,95	8,57			
2,008	**51**	2,42	4,76	3,10	3,44	3,77	4,21	4,64	5,16	5,67	6,27	6,94	7,69	8,48	9,16			
2,126	**54**	2,56	2,93	3,30	3,65	4,01	4,47	4,93	5,49	6,04	6,68	7,41	8,21	9,07	9,81	10,85		
2,244	**57**	2,71	3,10	3,49	0,75	4,25	4,74	5,23	5,83	6,41	7,10	7,88	8,74	9,67	10,46	11,59		
2,374	**60,3**	2,88	3,29	3,70	4,10	4,51	5,03	5,55	6,19	6,82	7,55	8,39	9,31	10,32	11,18	12,40		
2,5	**63,5**	3,03	3,47	3,90	4,33	4,76	5,32	5,87	6,55	7,21	8,00	8,89	9,87	10,95	11,87	13,19		
2,756	**70**	3,35	3,84	4,32	4,80	5,27	5,89	6,51	7,27	8,01	8,89	9,90	11,01	12,23	13,28	14,80		
2,874	**73**	3,50	4,01	4,51	5,01	5,51	6,16	6,81	7,60	8,38	9,31	10,36	11,54	12,82	13,93	15,54		
2,996	**76,1**	3,65	4,19	4,71	5,23	5,75	6,44	7,11	7,95	8,77	9,74	10,80	12,08	13,43	14,60	16,30		
3,248	**82,5**	3,97	4,55	5,12	5,69	6,26	7,00	7,74	8,66	9,56	10,62	11,84	13,20	14,70	15,99	17,88		
3,5	**88,9**	4,29	4,91	5,53	6,15	6,76	7,57	8,37	9,37	10,34	11,50	12,83	14,32	15,96	17,38	19,46		
4	**101,6**	4,91	5,63	6,35	7,06	7,76	8,70	9,63	10,78	11,91	13,26	14,81	16,55	18,47	20,14	22,59		
4,252	**108**	5,23	6,00	6,76	7,52	8,27	9,27	10,26	11,49	12,70	14,14	15,80	17,67	19,73	21,53	24,17	26,31	
4,5	**114,3**	5,54	6,35	7,16	7,97	8,77	9,83	10,88	12,18	13,48	15,01	16,78	18,77	20,97	22,89	25,72	28,02	
5	**127**	6,17	7,07	7,98	8,87	9,77	10,95	12,13	13,59	15,04	16,76	18,75	20,99	23,48	25,65	28,85	31,47	
5,236	**133**	6,46	7,41	8,36	9,30	10,24	11,49	12,72	14,26	15,78	17,59	19,68	22,04	24,66	26,95	30,33	33,09	
5,5	**139,7**	6,79	7,79	8,79	9,78	10,77	12,08	13,39	15,00	16,61	18,52	20,72	23,22	25,98	28,41	31,98	34,91	
5,563	**141,3**	6,87	7,88	8,89	9,90	10,90	12,22	13,54	15,18	16,81	18,74	20,97	23,50	26,30	28,75	32,38	35,35	
6	**152,4**	7,42	8,51	9,60	10,69	11,77	13,21	14,64	16,41	18,17	20,27	22,70	25,44	28,49	31,16	35,12	38,36	
6,26	**159**	7,74	8,89	10,03	11,16	12,29	13,80	15,29	17,14	18,99	21,18	23,72	26,60	29,79	32,59	36,74	40,15	
6,226	**168,3**	8,20	9,42	10,62	11,83	13,03	14,63	16,21	18,18	20,13	22,47	25,17	28,22	31,62	34,61	39,04	42,67	
7	**177,8**	8,67	9,95	11,23	12,51	13,78	15,46	17,14	19,23	21,31	23,78	26,64	29,89	33,50	36,67	41,38	45,25	
7,626	**193,7**	9,45	10,86	12,25	13,64	15,03	16,88	18,71	21,00	23,27	25,98	29,11	32,67	36,63	40,12	45,30	49,56	
8,626	**219,1**	10,71	12,30	13,88	15,56	17,04	19,13	21,22	23,81	26,40	29,48	33,06	37,12	41,65	45,64	51,56	56,45	63,68
9,626	**244,5**	11,96	13,74	15,51	17,28	19,04	21,39	23,72	26,63	29,53	32,99	37,01	41,57	46,66	51,15	57,83	63,34	71,51
10,74	**273**	13,37	15,35	17,34	19,32	21,29	23,92	26,53	29,80	33,04	36,93	41,43	46,56	52,28	57,33	64,86	71,07	80,30
12,75	**323,9**			20,60	22,96	25,31	28,43	31,55	35,44	39,32	43,96	49,34	55,47	62,32	68,38	77,41	84,88	95,99
14	**355,6**			22,63	25,22	27,81	31,25	34,86	38,96	43,23	48,33	54,27	61,02	68,57	75,26	85,22	93,48	105,76
16	**406,4**			25,89	28,86	31,82	35,76	39,69	44,60	49,49	55,35	62,16	69,91	78,60	86,28	97,75	107,26	121,42
17,99	**457**					35,81	40,25	44,68	50,21	55,73	62,34	70,02	78,77	88,58	97,26	110,23	120,98	137,02
20	**508**					39,83	44,78	49,71	55,87	62,02	69,38	77,94	87,70	98,64	108,33	122,81	134,82	152,74

Chemical Composition

Steel Name	Steel Number	C	Si max,%	Mn %	P max,%	S max,%	Cr max,%	Mo %	Ni max,%	Al tot min,%	Cu max,%	Nb max,%	Ti max,%	V max,%	Cr+Cu+Mo+Ni max,%
P195GH	1.0348	≤ 0.13	0.35	≤ 0.7	0.025	0.02	0.3	≤ 0.08	0.3	≥ 0,02	0.3	0.01	0.03	0.02	0.7
P235GH	1.0345	≤ 0.13	0.35	≤ 1.2	0.025	0.02	0.3	≤ 0.08	0.3	≥ 0.02	0.3	0.01	0.03	0.02	0.7
P265GH	1.0425	≤ 0.40	0.40	≤ 0,4	0.025	0.02	0.3	≤ 0.08	0.3	≥ 0,02	0.3	0.01	0.03	0.02	0.7

Mechanical Properties

Steel Name	Steel Number	Yield Strength (R_{eH} min.) MPa (N/mm²)	Tensile Strength (R_m) MPa (N/mm²)	Elongation A min. (%) Longitudinal / Transverse	Impact Properties Longitudinal 20°C, 0°C, -10°C / Transverse 20°C, 0°C
P195GH	1,0348	195	320 - 440	27 / 25	-, 40, 28 / -, 27
P235GH	1,0345	235	360 – 500	25 / 23	-, 40, 28 / -, 27
P265GH	1,0425	265	410 - 570	23 / 21	-, 40, 28 / -, 27

Odelya® EN 10217-3 Alloy Fine Grain Steel Tubes for Pressure Purposes

Odelya® EN 10217-3 High Frequency welded Boiler and Pressure tubes are made of weldable alloy fine grain steel. Production range varies between O.D. 17,2 mm and O.D. 508 mm (0,677 to 20 inch).

Manufacturing Process	Starting Material	Forming Operation	Technical Delivery Condition
High Frequency Welded (HFW)	Normalising rolled strip	Cold formed (+welded)	Normalised weld zone
	Hot rolled or normalising rolled strip	Cold formed (+welded) + hot stretch reduced at a controlled temperature to give a normalised condition	Normalised rolled

Odelya® EN 10217-3 Pressure and Boiler pipes

Outside Diameter		Wall Thickness & Weight per Unit Length (kg/m)																
	inch	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
inch	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
0,677	17,2	0,75	0,85	0,94	1,02	1,10	1,21	1,30										
0,709	18	0,7	0,89	0,99	1,08	1,17	1,28	1,38										
0,748	19	0,8	0,95	1,05	1,15	1,25	1,37	1,48										
0,787	20	0,8	1,00	1,12	1,22	1,33	1,46	1,58										
0,839	21,3	0,9	1,08	1,20	1,32	1,43	1,57	1,71	1,86									
0,866	22	0,9	1,12	1,24	1,37	1,48	1,63	1,78	1,94	2,10								
0,984	25	1,13	1,29	1,44	1,58	1,72	1,90	2,07	2,27	2,47								
1	25,4	1,15	1,31	1,46	1,61	1,75	1,94	2,11	2,32	2,52								
1,059	26,9	1,23	1,40	1,56	1,72	1,87	2,07	2,26	2,49	2,70								
1,181	30	1,38	1,57	1,76	1,94	2,11	2,34	2,56	2,83	3,08	3,37	3,68						
1,252	31,8	1,47	1,67	1,87	2,07	2,26	2,50	2,74	3,03	3,30	3,62	3,96	4,32					
1,260	32	1,48	1,68	1,89	2,08	2,27	2,52	2,76	3,05	3,33	3,65	3,99	4,36	4,73				
1,327	33,7	1,56	1,78	1,99	2,20	2,41	2,67	2,93	3,24	3,54	3,88	4,26	4,66	5,07				
1,378	35	1,63	1,85	2,08	2,30	2,51	2,79	3,06	3,38	3,70	4,06	4,46	4,89	5,33	5,69			
1,496	38	1,78	2,02	2,27	2,51	2,75	3,01	3,35	3,72	4,07	4,47	4,92	5,41	5,92	6,34			
1,575	40	1,87	2,14	2,40	2,65	2,90	3,23	3,55	3,94	4,32	4,75	5,24	5,76	6,31	6,77			
1,669	42,4	1,99	2,27	2,55	2,82	3,09	3,44	3,79	4,21	4,61	5,08	5,61	6,18	6,79	7,29			
1,752	44,5	2,10	2,39	2,69	2,97	3,26	3,63	3,99	4,44	4,87	5,37	5,93	6,55	7,20	7,75			
1,902	48,3	2,2	2,61	2,93	3,25	3,56	3,97	4,37	4,86	5,34	5,90	6,53	7,21	7,95	8,57			
2	51	2,4	4,76	3,10	3,44	3,77	4,21	4,64	5,16	5,67	6,27	6,94	7,69	8,48	9,16			
2,126	54	2,5	2,93	3,30	3,65	4,01	4,47	4,93	5,49	6,04	6,68	7,41	8,21	9,07	9,81	10,85		
2,244	57	2,71	3,10	3,49	0,75	4,25	4,74	5,23	5,83	6,41	7,10	7,88	8,74	9,67	10,46	11,59		
2,374	60,3	2,8	3,29	3,70	4,10	4,51	5,03	5,55	6,19	6,82	7,55	8,39	9,31	10,32	11,18	12,40		
2,5	63,5	3,0	3,47	3,90	4,33	4,76	5,32	5,87	6,55	7,21	8,00	8,89	9,87	10,95	11,87	13,19		
2,756	70	3,3	3,84	4,32	4,80	5,27	5,89	6,51	7,27	8,01	8,89	9,90	11,01	12,23	13,28	14,80		
2,874	73	3,5	4,01	4,51	5,01	5,51	6,16	6,81	7,60	8,38	9,31	10,36	11,54	12,82	13,93	15,54		
2,996	76,1	3,6	4,19	4,71	5,23	5,75	6,44	7,11	7,95	8,77	9,74	10,80	12,08	13,43	14,60	16,30		
3,248	82,5	3,9	4,55	5,12	5,69	6,26	7,00	7,74	8,66	9,56	10,62	11,84	13,20	14,70	15,99	17,88		
3,5	88,9	4,2	4,91	5,53	6,15	6,76	7,57	8,37	9,37	10,34	11,50	12,83	14,32	15,96	17,38	19,46		
4	101,6	4,91	5,63	6,35	7,06	7,76	8,70	9,63	10,78	11,91	13,26	14,81	16,55	18,47	20,14	22,59		
4,252	108	5,2	6,00	6,76	7,52	8,27	9,27	10,26	11,49	12,70	14,14	15,80	17,67	19,73	21,53	24,17	26,31	
4,5	114,3	5,5	6,35	7,16	7,97	8,77	9,83	10,88	12,18	13,48	15,01	16,78	18,77	20,97	22,89	25,72	28,02	
5	127	6,17	7,07	7,98	8,87	9,77	10,95	12,13	13,59	15,04	16,76	18,75	20,99	23,48	25,65	28,85	31,47	
5,236	133	6,4	7,41	8,36	9,30	10,24	11,49	12,72	14,26	15,78	17,59	19,68	22,04	24,66	26,95	30,33	33,09	
5,5	139,7	6,7	7,79	8,79	9,78	10,77	12,08	13,39	15,00	16,61	18,52	20,72	23,22	25,98	28,41	31,98	34,91	
5,563	141,3	6,8	7,88	8,89	9,90	10,90	12,22	13,54	15,18	16,81	18,74	20,97	23,50	26,30	28,75	32,38	35,35	
6	152,4	7,4	8,51	9,60	10,69	11,77	13,21	14,64	16,41	18,17	20,27	22,70	25,44	28,49	31,16	35,12	38,36	
6,26	159	7,74	8,89	10,03	11,16	12,29	13,80	15,29	17,14	18,99	21,18	23,72	26,60	29,79	32,59	36,74	40,15	
6,226	168,3	8,20	9,42	10,62	11,83	13,03	14,63	16,21	18,18	20,13	22,47	25,17	28,22	31,62	34,61	39,04	42,67	
7	177,8	8,67	9,95	11,23	12,51	13,78	15,46	17,14	19,23	21,31	23,78	26,64	29,89	33,50	36,67	41,38	45,25	
7,626	193,7	9,45	10,86	12,25	13,64	15,03	16,88	18,71	21,00	23,27	25,98	29,11	32,67	36,63	40,12	45,30	49,56	
8,626	219,1	10,71	12,30	13,88	15,56	17,04	19,13	21,22	23,81	26,40	29,48	33,06	37,12	41,65	45,64	51,56	56,45	63,68
9,626	244,5	11,96	13,74	15,51	17,28	19,04	21,39	23,72	26,63	29,53	32,99	37,01	41,57	46,66	51,15	57,83	63,34	71,51
10,748	273	13,37	15,35	17,34	19,32	21,29	23,92	26,53	29,80	33,04	36,93	41,43	46,56	52,28	57,33	64,86	71,07	80,30
12,752	323,9			20,60	22,96	25,31	28,43	31,55	35,44	39,32	43,96	49,34	55,47	62,32	68,38	77,41	84,88	95,99
14	355,6			22,63	25,22	27,81	31,25	34,86	38,96	43,23	48,33	54,27	61,02	68,57	75,26	85,22	93,48	105,76
16	406,4			25,89	28,86	31,82	35,76	39,69	44,60	49,49	55,35	62,16	69,91	78,60	86,28	97,75	107,26	121,42
18	457					35,81	40,25	44,68	50,21	55,73	62,34	70,02	78,77	88,58	97,26	110,23	120,98	137,02
20	508					39,83	44,78	49,71	55,87	62,02	69,38	77,94	87,70	98,64	108,33	122,81	134,82	152,74

Chemical Composition

Steel name	Steel number	C %	Si max,%	Mn max,%	P max,%	S max,%	Cr max,%	Mo max,%	Ni max,%	Al tot min,%	Cu max,%	N max,%	Nb max,%	Ti max,%	V max,%	Np + Ti + V max,%
P275NL1	1.0488	0,16	0,40	0,50 – 1,50	0.025	0,020	0.30	0.08	0,50	0,020	0.30	0,020	0.05	0.03	0,05	0,05
P275NL2	1.1104	0,16	0,40	0,50 – 1,50	0.025	0,015	0.30	0.08	0,50	0,020	0.30	0,020	0.05	0.03	0,05	0,05
P355N	1.0562	0,20	0.50	0,90 – 1,70	0.025	0.020	0.30	0.08	0.50	0,020	0.30	0,020	0.05	0.03	0.10	0.12
P355NH	1.0565	0,20	0.50	0,90 – 1,70	0.025	0,020	0.30	0.08	0,50	0,020	0.30	0,020	0.05	0.03	0.10	0.12
P355NL1	1.0566	0,18	0.50	0,90 – 1,70	0.025	0,020	0.30	0.08	0,50	0,020	0.30	0,020	0.05	0.03	0.10	0.12
P355NL2	1.1106	0,18	0.50	0,90 – 1,70	0.025	0,015	0.30	0.08	0,50	0,020	0.30	0,020	0.05	0.03	0.10	0.12
P460N	1.8905	0,20	0,60	1,00 – 1,70	0.025	0,020	0.30	0,10	0,80	0,020	0,70	0,020	0.05	0.03	0,20	0,22
P460NH	1.8935	0,20	0,60	1,00 – 1,70	0.025	0,020	0.30	0,10	0,80	0,020	0,70	0,020	0.05	0.03	0,20	0,22
P460NL1	1.8915	0,20	0,60	1,00 – 1,70	0.025	0,020	0.30	0,10	0,80	0,020	0,70	0,020	0.05	0.03	0,20	0,22
P460NL2	1.8918	0,20	0,60	1,00 – 1,70	0.025	0,015	0.30	0,10	0,80	0,020	0,70	0,020	0.05	0.03	0,20	0,22

Mechanical Properties

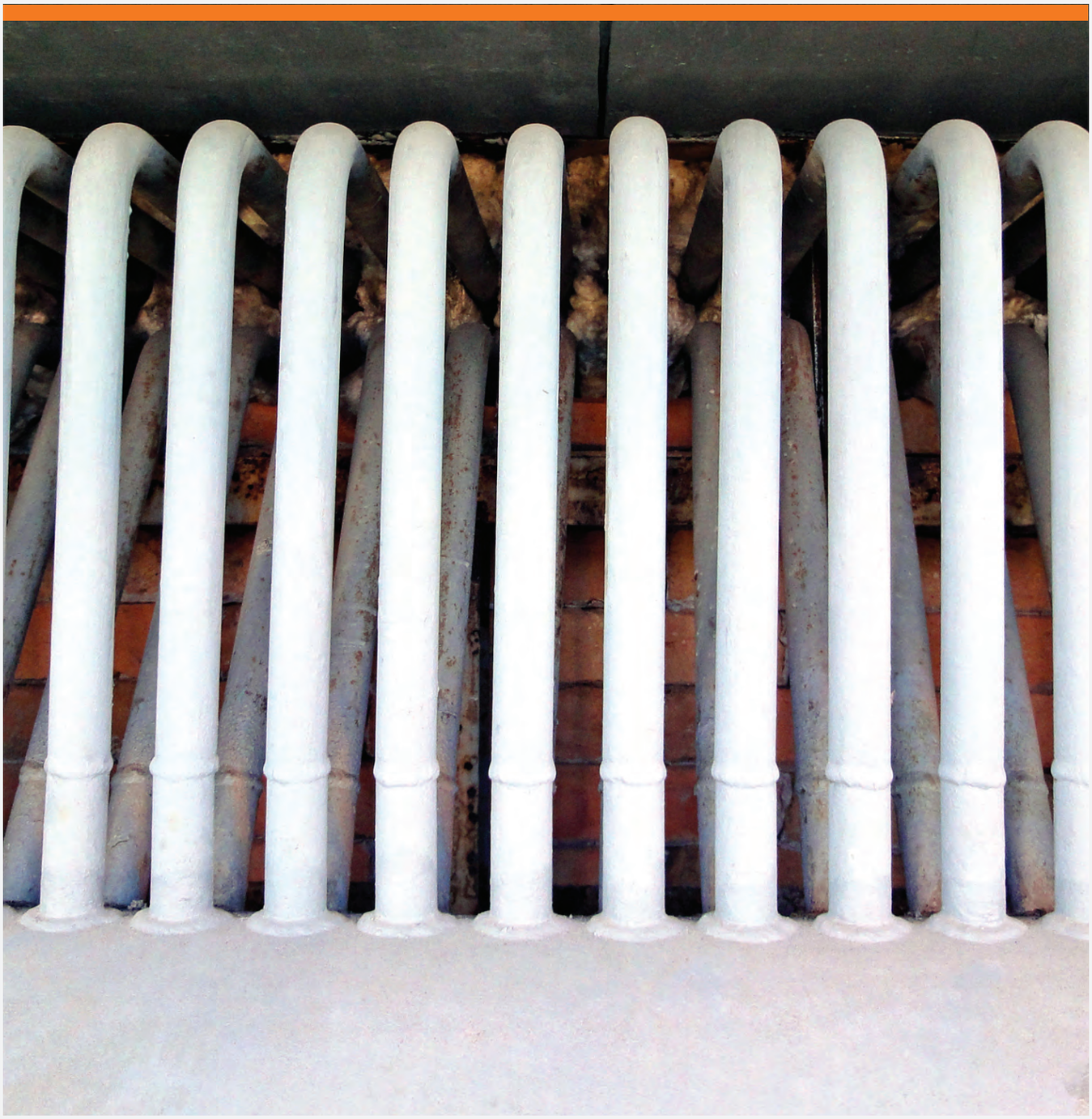
Steel Name	Steel Number	Yield Strength (R_{eH} or $R_{p0,2}$ min.) for Wall Thickness T in mm MPa (N/mm²)			Tensile Strength (R_m) for Wall Thickness T in mm MPa (N/mm²)		Elongation A min. (%)	
		≤ 12	>12 to ≤ 20	>20 to ≤ 40	≤ 20	>20 to ≤ 40	Longitudinal	Transverse
P275NL1	1.0488	275	275	275	390 - 530	390 - 510	24	22
P275NL2	1.1104	275	275	275	390 - 530	390 - 510	24	22
P355N	1,0562	355	355	345	490 - 650	490 - 630	22	20
P355NH	1.0565	355	355	345	490 – 650	490 – 630	22	20
P355NL1	1.0566	355	355	345	490 – 650	490 – 630	22	20
P355NL2	1.1106	355	355	345	490 – 650	490 – 630	22	20
P460N	1.8905	460	450	440	560 - 730	(--)	19	17
P460NH	1.8935	460	450	440	560 - 730	(--)	19	17
P460NL1	1.8915	460	450	440	560 - 730	(--)	19	17
P460NL2	1.8918	460	450	440	560 - 730	(--)	19	17

Odelya® ASTM A 178 Boiler and Superheater Tubes

Odelya® ASTM A178 Longitudinally Electric-Resistance welded carbon steel tubes are produced in Grade A (low-carbon steel), according to the standard norms. Production range of Odelya® ASTM A178 Boiler and Pressure pipes is between O.D. 17,1 mm and O.D. 127 mm (3/8 to 5 inch) with wall thicknesses ranging from 2,31 mm to 9,1 mm (0,091 to 0,360 inch).

Chemical Composition & Mechanical Properties

Steel Grade	Carbon %	Manganese %	Phosphorus max %	Sulfur max %	Tensile Strength, min ksi (MPa)	Yield Strength, min ksi (MPa)	Elongation, min, %
Grade A	0,06 – 0,18	0,27 – 0,63	0,035	0,035	47 (325)	26 (180)	35



PRECISION TUBES

Odelya® ERW Precision Steel tubes are manufactured in a wide range of sizes and shapes (circular, square, rectangular, oval and special shapes).

Excellent mechanical properties, minimized tolerances and high strength of Odelya® Welded Precision Tubes, exceed customer's expectations.

Odelya® Precision Tubular solutions create possibilities to produce your own product for any type of application by choosing the best steel grades and production norms. Moreover, reliable and fast-customized solutions give an opportunity to select strength, formability, weldability, surface quality, required type of coating, material options, and tensile values with dimensional accuracy.

The manufacturing process of Odelya® ERW steel tubes uses high frequency alternating current, which assures a superior quality weld for higher ductility. Sophisticated cutting, deburring and testing processes are applied for Odelya® HFW Precision Tubes to meet the special requirements.

Odelya® ERW Precision Tubes vary on their material types, surface conditions, processing types, and are available as: carbon or stainless, black (self-colour), galvanized, surface-coated, plain or bevelled end...

Application

Automotive industry (safety and reinforcement structures, etc.), mechanical engineering, hydraulic cylinders, furniture, tools, steel goods, household appliances, fitness equipment, sports and leisure equipment, textile machinery industries, heating systems, power generation, engineering workshop products, fencing and packaging industries.

Production Range

Outside Diameter for Circular Tubes: 10 – 406,4 mm (0,39 – 16 inch)
Dimensions of Square Tubes: 10 x 10 – 400 x 400 (0,39 x 0,39 – 15,75 inch)
Dimensions of Rectangular Tubes: 10 x 15 – 300 x 400 (0,39 x 0,59 – 11,81 x 15,75 inch)
Wall Thickness: 0,5 mm – 12,5 mm (0,020 – 0,49 inch)
Length: 6 m (standard). According to the requests, length may vary between 4 and 12 meters.

Outside diameter and other dimensional tolerances depend on sizes and production standards. Contact us for details.

Production standards

EN 10305-2 (BS 6323-6, DIN 2393-(2), NFA 49-341, UNI 7946)
EN 10305-3 (BS 6323-5,6; DIN 2394-(2), UNI 7947)
EN 10305-5 (BS 6323-5)
EN 10219-2
ASTM A 500, ASTM 513

Material Quality

EN 10305	E 155, E 195, E 235, E 275, E 355
ASTM A 500	A, B, C
ASTM A 513	1008-1040
EN 10219-2	Non-alloy: S235JRH, S275J0H, S275J2H, S355J0H, S355J2H, S355K2H; Fain grain steels: S275NH, S275NLH, S355NH, S355NLH, S460NH, S460NLH

Delivery conditions

Cold formed, hot formed, cold drawn (hard and soft), cold drawn and stress relieved, with or without subsequent heat treatment, welded and cold sized, normalized, annealed, drawn over a mandrel (DOM), special smooth inside diameter (S.S.I.D.), as-welded and sink-drawn, cut-to-length.

Surface Condition

According to the requirements of the application, Odelya® Precision Tubes can be manufactured as, black, cold rolled, hot rolled pickled steel with chosen protective coatings (galfan coating or galvanizing: zinc coated). In order to protect the precision tubes from corrosion during storage and transportation, the surface is lightly oiled (by the request the surface may remain dry).

QUALITY CONTROL

Non-Destructive Tests

Eddy Current Test: Detection of the defects on the surface and testing quality of the weld and the material using electromagnetic device.

Ultrasonic Test: Automatic ultrasonic rotary plant precisely detects possible defects in the weld zone.

Visual & Dimensional Inspections

Accurate information about dimensions and quality of tubes can be provided using tape, caliper, ultrasonic device, gauge and cord.

Chemical Analysis

Spectral analysis of the chemical composition

Mechanical & Technological Properties Tests

Tensile test, flattening test, flaring test, drift expansion, surface roughness test, impact test

Hydrostatic Test (Leak Tightness)

Testing of leakage in the welded areas by high pressure water applies according to further application and requirements (for round steel tubes).

Note: Applied tests vary according to the related standard and application. Please refer to page 52 for more details about our Quality Assurance Policies.

Odelya® EN 10305-2 Welded Precision Steel Tubes

Odelya® EN 10305-2 ERW Cold Drawn Precision Steel Tubes are manufactured with precisely defined tolerances on dimensions and with specified surface roughness.

Delivery conditions (ERW)	Description
Cold drawn / Hard	Heat treatment is not applied after the final cold drawing process
Cold drawn	A suitable drawing pass is applied after the final heat treatment
Cold drawn and stress relieved	A stress relieve heat treatment in a controlled atmosphere is applied after the final cold drawing process
Annealed	After the final cold drawing process the pipes are annealed in a controlled atmosphere
Normalised	After the final cold drawing process the pipes are normalised in a controlled atmosphere

Odelya®EN 10305-2 Welded Precision Pipes

Outside Diameter		Tolerances	Wall thickness																				
inch	inch		0,02	0,032	0,039	0,047	0,059	0,071	0,079	0,067	0,098	0,11	0,118	0,138	0,158	0,177	0,197	0,217	0,236	0,276	0,315	0,354	0,394
	mm	mm	0,5	0,8	1	1,2	1,5	1,8	2	2,2	2,5	2,8	3	3,5	4	4,5	5	5,5	6	7	8	9	10
0,394	10	±0,08	■	■	■	■	■	■	■														
0,472	12		■	■	■	■	■	■	■														
0,551	14		■	■	■	■	■	■	■	■	■												
0,591	15		■	■	■	■	■	■	■	■	■												
0,630	16		■	■	■	■	■	■	■	■	■												
0,709	18		■	■	■	■	■	■	■	■	■	■	■	■									
0,787	20		■	■	■	■	■	■	■	■	■	■	■	■	■								
0,866	22		■	■	■	■	■	■	■	■	■	■	■	■	■								
0,984	25		■	■	■	■	■	■	■	■	■	■	■	■	■	■							
1,024	26		■	■	■	■	■	■	■	■	■	■	■	■	■	■							
1,102	28		■	■	■	■	■	■	■	■	■	■	■	■	■	■							
1,181	30		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■						
1,260	32	±0,15	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■						
1,378	35		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■						
1,496	38		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					
1,575	40		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					
1,654	42	±0,20			■	■	■	■	■	■	■	■	■	■	■	■	■	■					
1,772	45				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
1,890	48				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
1,969	50				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
2,165	55	±0,25			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
2,362	60				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
2,559	65	±0,30			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
2,756	70				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
2,953	75	±0,35			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
3,150	80				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
3,346	85	±0,40					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
3,543	90						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
3,740	95	±0,45							■	■	■	■	■	■	■	■	■	■	■	■	■		
3,937	100								■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
4,331	110	±0,50							■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
4,724	120								■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5,118	130	±0,70									■	■	■	■	■	■	■	■	■	■	■	■	■
5,512	140										■	■	■	■	■	■	■	■	■	■	■	■	■
5,906	150	±0,80											■	■	■	■	■	■	■	■	■	■	■

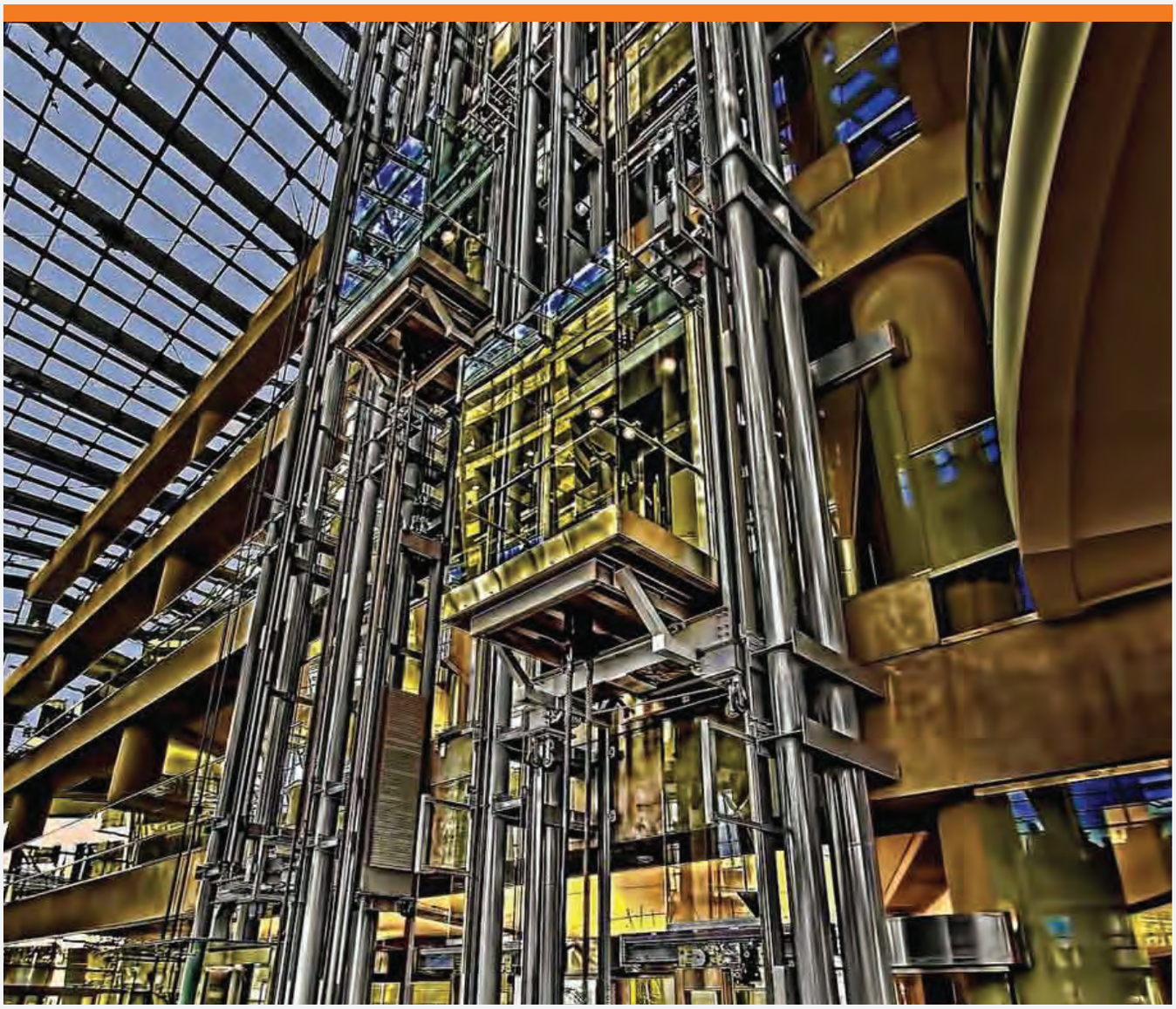
Chemical Composition

Steel name	Steel number	C max, %	Si max, %	Mn max, %	P max, %	S max, %
E155	1.0033	0,11	0.35	0.70	0.025	0.025
E195	1.0034	0,15	0.35	0.70	0.025	0.025
E235	1.0308	0,17	0.35	1.20	0.025	0.025
E275	1.0225	0,21	0.35	1.40	0.025	0.025
E355	1.0580	0,22	0.55	1.60	0.025	0.025

Mechanical Properties

Steel Name	Steel Grade	Cold Drawn / Hard		Cold Drawn / Soft		Cold Drawn & stress relieved			Annealed		Normalised		
		Rm, Mpa (N/mm²)	A, %	Rm, Mpa (N/mm²)	A, %	Rm, Mpa (N/mm²)	R_{eH}, MPa (N/mm²)	A, %	Rm, Mpa (N/mm²)	A, %	Rm, Mpa (N/mm²)	R_{eH}, MPa (N/mm²)	A, %
E155	1.0033	400	6	350	10	350	245	18	260	28	270 – 410	155	28
E195	1.0034	420	6	370	10	370	260	18	290	28	300 – 440	195	28
E235	1.0308	490	6	440	10	440	325	14	315	25	340 – 480	235	25
E275	1.0225	560	5	510	8	510	375	12	390	21	410 – 550	275	21
E355	1.0580	640	4	590	6	590	435	10	450	22	490 - 630	355	22

Note: Rm – tensile strength, R_{eH} – yield strength, A – elongation.



Data sheets of Odelya® EN10305-3, EN10305-5, EN10219, A513 Precision Tubes and Hollow Sections are identical. Please refer to pages 29, 31, 22, 35 respectively to see the other data sheets of standards belonging to Precision Tubes as well.

QUALITY ASSURANCE

Our quality assurance policies are a harmonious combination of our experience in global market and strict dedication to our sophisticated quality management, which ensures accurate and reproductive results.

Quality assurance tests are conducted, regulated and documented with accordance to standards specifications. Thus, for every type of product and its application, mandatory and optional tests are applied to ensure high quality of Odelya® Steel Products. Moreover, Odelya® Quality Assurance Policy includes quality control of manufactured products during packing, loading and shipment procedures as well.

As a result, at the destination point our customers receive Odelya® Tubular Steel Products in a good condition with excellent properties.

Hydrostatic Test

Testing of leakage in the welded areas by high pressure water applies according to further application and requirements (Leak Tightness).

Non-Destructive Tests

Eddy Current Test: Detection of the defects on the surface and testing quality of the weld and the material using electromagnetic device.

Ultrasonic test – Full Body & Weld-zone Ultrasonic Test: Automatic ultrasonic rotary plant precisely detects flaws and monitors weld quality using high frequency sound waves. Ultrasonic inspection ensures 100% flaw detection and immediate elimination.

Mechanical & Technological Properties

Tensile test: Determining mechanical properties, such as yield strength, tensile strength, Young's module, deformation, elongation, strain hardening behavior, and reduction of sample.

Flattening test: Quality, strength and ductility of the weld and the tube is evaluated by pressure application.

Bending test: Evaluating ductility of the tubes and the welds to resist cracking or other surface irregularities during one continuous bend of the material.

Impact test: Determining a total energy required to break the test sample by fracturing impact at high velocity (Charpy, Izod, Drop Weight tests).

Expansion test: Determining the durability of steel tubes to withstand heavy weights and pressure.

Fracture Toughness test: Indicating the amount of stress required to cause brittle or ductile crack extension in a sample with preexisting flaw.

Flange test: boiler steel tubes are examined for the ductility and the ability to withstand the bending process into a tube sheet.

Surface Roughness test: a measurement of the surface texture to ensure that it fits for required application.

Flaring test: alternative to the flange test (evaluation of weld quality) for certain types of tubes used in pressure applications

Visual & Dimensional Inspections

Accurate information about dimensions and quality of tubes is provided using tape, caliper, ultrasonic device, gauge and cord.

Chemical Analysis

Spectral analysis of the chemical composition

Macrographic and Metallographic Examination

Revealing the structure of metals and their alloys with light optical or scanning electron microscope


ZERO
ON
OFF
inch/mm

PACKAGING, MARKING & LOADING FOR SHIPMENT

We know the importance of a safe journey of our steel pipes, so, Odelya® Steel Tubes are transported to the customer by truck, vessel or rail under precise control in order to prevent possible damages and guarantee delivery on-time. Odelya® Tubular Steel Products are packaged, marked and loaded/unloaded according to the strict production standard's specifications, customer's requirements and according to type of pipe and its surface condition (coated, painted, etc.).

Odelya® Steel Pipes are packed in bundles with accordance to the pipe's types: hexagonal, round, square or rectangular. Moreover, maximum diameter and maximum mass of bundles are also determined by pipe type, as for each type there are different limits. The bundles can be binded by wire, timber cleats, steel strap, steel strap underlaid by paper tape or other material. Thus, the ends of a bundle may be wrapped in PE-foil or paper tape and foil as well. Respectively, bundles are considered as individual packages and are marked accordingly.

As an alternative, Odelya® Steel Pipes can be delivered with wooden frame for mechanical protection or as jute wrapped (at bundle ends or entirely).

Odelya® Coated Pipes are packed in a way, which perfectly protects the coating layer of damages occurred by abrasion or impact. Pipe ends also require sustainable protection, thus, the ends of Odelya® Pipes can be sealed with plastic plugs or closed with plastic end caps.

Odelya® Pipe Fittings are carefully packed in metal boxes, carton boxes on wooden palette or timber boxes according to the fitting type and size. Thus, the boxes are strapped and secured with crimped steel clips.
In addition, for higher protection Odelya® Pipe Fitting's threaded connections are capped or plugged.

Odelya® Steel Products are packed and shipped in an economical, adequate and simple way, which guarantees a good condition of delivered to final destination products. Moreover, Odelya provides on-time packaging of steel tubes with continuous control of quality and reliability during packaging and loading processes.

Odelya® Steel Tubing is marked with our brand name Odelya® and also in a way providing clear and easy identification and traceability of the product. The marking is applied according to the standard and customer requirements, so for each type of pipe or pack variety of marking is applied. Consequently, on the surface of pipes, coloring, paint stencil and die stamping are applied, while on bundles, plastic labels and metal tags are used.

On each label or tag of Odelya® Steel Tubes there is required by standard and customer information: mass, steel grade, dimensions, length and other details. Furthermore, if a steel product requires special handling during shipment or loading, this information is stated on the label as well. As every pack of pipes includes the pipes with same dimensions, each pack has a related tag for easy identification of the product.

The loading operations of Odelya® Steel Tubes are under supervision and instructions of our experienced quality assurance team. In addition, the loading process is always completed with accordance to the tube type, its size, volume, customer's requirements and production standard's specifications. For safe and on-time loading/unloading processes of Odelya® Steel Tubing, suitable loading and lifting equipment is used.

Our international experience gives us the confidence of handling well-organized and timely shipments for any types of loadings, such as container-loadings, truck-loading, bulk-shipments etc. In our warehouses, at ports, at the final destination, we will be just near our products to supervise the loading operation.

As Odelya is located in Istanbul, Turkey, we beneficially use its geographical position and different port opportunities creating the most optimized solutions of transporting steel products to the destination point.


ODELYA
www.odelya.com
ORDER NO EX995-201EBJ-B1324
SIZE : 101,6 x 4,00 mm
LENGHT : 6,000 mm
PIECES PER BUNDLE : 19
BUNDLE NO : BA00720461
HEAT NO : 3124760370
PRODUCTION STANDARD : TS EN 10219
QUALITY : S 355J2
MADE IN TURKEY
Tubing the World

Tubing
the
World

odelya.com