

PRODUCT CATALOGUE

**Believe in Your Power!**



# Erciyes Anadolu Holding

Crossing over the borders of Turkey and reaching out to the world, today Erciyes Anadolu Holding is operating in a wide array of industries ranging from furniture to textiles, chemicals to marketing, iron and steel to energy, leading each industry of activity. With 30 companies under its roof, Erciyes Anadolu Holding operates in 8 different industries. Erciyes Anadolu Holding houses industry leader brands like İstikbal, Bellona, Mondihome, Boyçelik, HES Cable, Boyteks, Form Sünger and Gümüşsuyu.

As one of Turkey's largest industrial enterprises, Erciyes Anadolu Holding provides value to the sectors it operates in with its integrated production and investment oriented approach. The Holding continues to add momentum to the Turkish economy with its almost 13 thousand employees, a total of 2,000 dealers in country and abroad, and investments towards a sustainable growth. Through expansion into activities in new fields, making its brands available in every corner of Turkey, as well as reaching consumers in 140 countries through nearly 300 international dealers, Erciyes Anadolu continues to be an innovator in the international arena while striving to represent Turkey the way it deserves.

Through a management approach dedicated to efficiency and the implementation of powerful human resources, Erciyes Anadolu Holding continues its growth record of accomplishment by expanding in each field of activity and investments. The holding has 6 companies within Turkey's Top 500 Largest Industrial Enterprises, as ranked by the Istanbul Chamber of Industry, and another 2 in Turkey's Second Largest Industrial Enterprises list.

## THE GROUP STRUCTURE

SECTORS - **8**

STORES OF THE BRANDS (LOCAL) - **1,5K**

COMPANIES - **30**

STORES OF THE BRANDS (ABROAD) - **OVER 250**

COMPANIES IN ISO FIRST 500 - **6**

COUNTRIES EXPORTED BY THE GROUP - **OVER 140**

EMPLOYEES OF THE GROUPS - **13K**



Watch our introduction movie



## Believe In Your Power!

Boycelik...

One of the forthcoming investments of Erciyes Anadolu Holding, an industrial leader in Turkey and the world over...

Raw materials supplier to Europe's largest mattress and furniture manufacturer... Supporting the manufacturing industry with quality product and service...

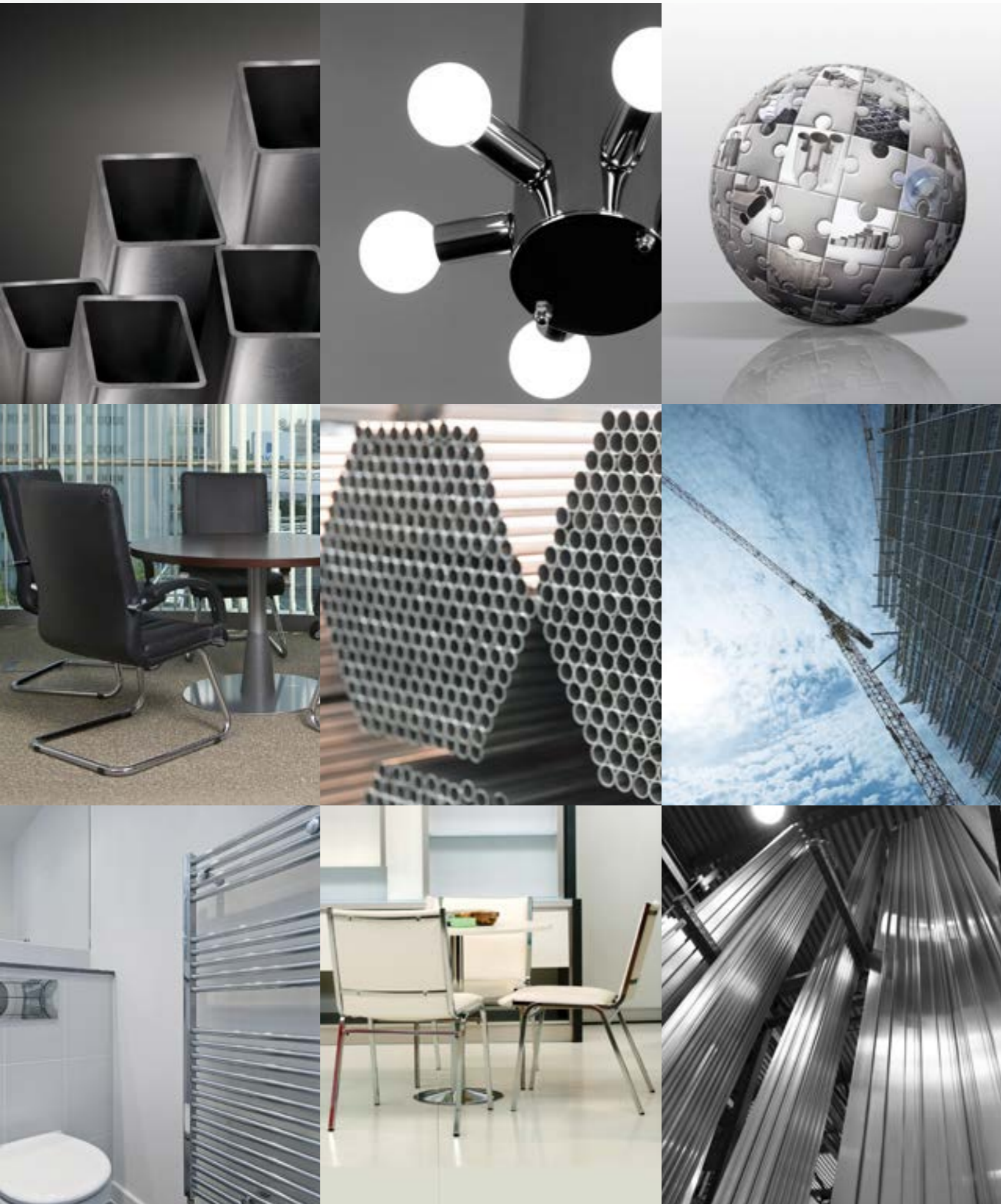
Operating on 112 thousand m2 of total area of which 60 thousand m2 is covered and 52 thousand m2 is open area.

Manufacturing round and rectangular tubes and wire-spring production in 2 main facilities.

Boycelik serves the furniture, automotive, home appliance and construction industries by providing tube, pipe and steel sheet products manufactured at its Tube & Pipe facility; and serves the furniture and textile industries with steel wire, Bonnell Spring, S Spring, SL(Smartlink) Spring, Pocket Spring, Off-Set Spring, custom products and spring units manufactured at its Wire & Spring facility. With complete and strict control at every stage of each process, Boycelik complies with national and international quality control systems such as TSE-ISO-EN-9000 Quality Management System, TSE-ISO-EN-14000 Environment Management System, ISG-OHSAS TS 45001 Worker Health Safety Management System, TS-ISO/IEC 27001 Info Sec Management System, TS-ISO 50001 Energy Management System, CE, Oekotex Certificate always providing service and products in conformity to these certificates of quality.

Boycelik derives strength from customer satisfaction upon quality service and products, continuing to be a manufacturing power in the future, just as it has been in the past.





## Round & Rectangular Tubes

Adding value to production...

Boycelik manufactures tubes and profiles for an array vastly different industries ranging furniture, white goods, automotive, construction, towel warmer tubes, installation systems, playground, decoration and metal household supplies. Boycelik has an annual production capacity of 150 thousand tons in tube, and steel plate production. All production processes from raw material entry, to non destructive testing methods during production and final finish treatments are supported with physical and chemical tests. NDT (Eddy Current) methods and inside diameter scarfing processes can be utilized during production.

The tube and profile production at Boycelik is in conformity to the company's TSE-ISO-EN-9000 Quality Management System, TSE-ISOEN-14000 Enviroment Management System, ISG-OHSAS TS 45001 Worker Health Safety Management System, TS-ISO/IEC 27001 Info Sec Management System, TS-ISO 50001 Energy Management System, CE and TSE certificates so that customers receive quality products and services.



## Production Range and Options

Boycelik manufactures tubes with a thickness ranging from 0,5 mm – 3,00 mm and diameter range between  $\varnothing$ 10 mm –  $\varnothing$ 76 mm, as well as square, rectangular and special section tubes that fall within this range.

Boycelik is also able to carry out multiple cutting process with a +0,5 mm tolerance on  $\varnothing$ 13 mm to  $\varnothing$ 50,8 mm diameter and 320 mm-7850 mm cutting length.



Production Standards	EN 10305-3, EN 10305-5, EN 10219	
Production Range (mm)	Outside diameter range of tubes	$\varnothing$ 13 mm- $\varnothing$ 76 mm
	Square tube range	10x10 mm-60x60 mm
	Rectangular tube range	10x20 mm-40x80 mm
	Material thickness range	0,5 mm-3,0 mm
	Length range	3000 mm-10000 mm
	Multiple cutting length range	320 mm-7850 mm
Optional Processes	Production with narrowed tolerances	
	Tube production with galvanized coated steel sheet	
	Products suitable for galvanizing process	
	Products suitable for polishing and chrome coating processes	
	Cut to length products with multiple cutting process	
	IDS internal diameter scarfing	
IDS (Internal diameter scarfed) tubes & profiles production range	Non destructive testing with Eddy Current Method	
	Corrosion resistant oil application	
	Outside diameter range of tubes	$\varnothing$ 21 mm- $\varnothing$ 76 mm
	Square tube range	20x20 mm-60x60 mm
	Rectangular tube range	15x20 mm-40x80 mm
	Material thickness range	0,90 mm-2,0mm



## Square Tubes

Boycelik's square tubes are manufactured to international standards on the latest technology machinery to various customer specifications on quality, from cold and hot rolled strips as suitable to further coating applications. The square tubes are used mainly in the construction and furniture industries in structural, automotive, shelving, truss system, awning, panel, metal household supplies, decoration and playground production. The square tubes presented to Boycelik customers are manufactured in conformity to TS EN 10305-3 and TS EN 10219 production standards.

The square tubes manufactured to TS EN 10219 standards have CE mark and square tubes have high resistance against corrosion. The advantage of having a wide stock option allows Boycelik to meet customer demands on standard products instantly, while being able to engage custom orders and deliver on time.

Production Standards		Optional Processes		Cut to Length Ranges	
TS EN	: 10305-5, 10219-1	• Tube production with galvanized coated steel sheet		Size Range	: 10x10 mm-40x40 mm
DIN	: 2395, 59411	• Products suitable for galvanizing process		Thickness Range	: 0,5 mm-2,0 mm
TS	: 6475, 5317	• Products suitable for polishing and chrome coating processes		Cutting Length	: 320 mm-7850 mm
		• Cut to length products with multiple cutting processes		Length Tolerance	: (+) 0,5 mm
		• Corrosion resistant oil application			
		• IDS (internal diameter scarfing)			
		• Eddy Current Testing			
		• Jute or wooden chest (some special length) packing optionally			
Production Range					
External Sizes	: 10x10mm, 60x60mm				
Thickness	: 0.5 mm, 3,00 mm				
Length	: 3.000mm, 10.000mm				



Production range for square tubes according to EN 10305-5/ EN 10219 standards and theoretical unit weights (kg/m)

Size (mm)	Thickness (mm)											
	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	2.0	2.5	3.0	
10x10	0.15	0.18	0.20	0.23	0.26	0.28	0.33					
15x15	0.23	0.27	0.31	0.36	0.40	0.44	0.52	0.63				
19x19	0.29	0.35	0.41	0.46	0.52	0.57	0.68	0.84				
20x20	0.31	0.36	0.42	0.48	0.54	0.59	0.71	0.87	1.12			
25x25		0.46	0.53	0.61	0.68	0.75	0.89	1.10	1.44	1.76	1.92	
30x30			0.64	0.73	0.82	0.91	1.08	1.34	1.75	2.15	2.39	
31,75x31,75				0.77	0.87	0.96	1.15	1.42	1.87	2.31	2.74	
38,1x38,1				0.93	1.05	1.16	1.38	1.72	2.27	2.81	3.33	
40x40				0.98	1.10	1.22	1.46	1.81	2.38	2.93	3.33	
45x45					1.24	1.38	1.84	2.28	2.69	3.33	3.80	
50x50						1.54	1.84	2.28	3.01	3.72	4.28	
60x60							2.21	2.75	3.64	4.50	5.22	



## Rectangular Tubes

The rectangular tubes manufactured by Boycelik to meet different needs are presented to industrialists service. Rectangular tubes are manufactured to international standards on the latest technology machinery to various customer specifications on quality, from cold and hot rolled strips as suitable to further coating applications. Internal diameter scarfed products manufactured in special sections for use in various industries are put through the Eddy Current test method before being presented to customers.

The rectangular tubes presented to Boycelik customers are manufactured in conformity to TS EN 10305-3 and TS EN 10219 production standards. The rectangular tubes manufactured to TS EN 10219 standards have CE mark and rectangular tubes have high resistance against corrosion. The advantage of having a wide stock option allows Boycelik to meet customer demands on standard products instantly, while being able to engage custom orders and deliver on time.

Production Standards	
TS EN	: 10305-5, 10219-1
DIN	: 2395, 59411
TS	: 6475, 5317

Production Range	
Dış ölçüler	: 10x20 mm - 40x80 mm
Et kalınlığı	: 0.5 mm - 3,00 mm
Boy	: 3.000 mm - 10.000 mm

Cut to Length Ranges	
Ebat aralığı	: 10x20 mm - 30x50 mm
Kalınlık aralığı	: 0,5 mm - 2,0 mm
Kesim uzunluğu	: 320 mm - 7850 mm
Uzunluk toleransı	: (+) 0,5 mm

Optional Processes	
• Tube production with galvanized coated steel sheet	
• Products suitable for galvanizing process	
• Products suitable for polishing and chrome coating processes	
• Cut to length products with multiple cutting processes	
• Corrosion resistant oil application	
• IDS (internal diameter scarfing)	
• Eddy Current Testing	
• Jute or wooden chest (some special length) packing optionally	



Production range for rectangular tubes according to EN 10305-5/ EN 10219 standards and theoretical unit weights (kg/m)												
Size (mm)	Thickness (mm)											
	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	2.0	2.5	3.0	
10x20	0.23	0.27	0.31	0.36	0.40	0.44	0.52	0.75				
10x25	0.27	0.32	0.37	0.42	0.47	0.52	0.61	0.87	0.97			
10x30	0.31	0.36	0.42	0.48	0.54	0.59	0.71	0.75	1.12			
15x20	0.27	0.32	0.37	0.42	0.47	0.52	0.61	0.87	0.97			
15x25	0.31	0.36	0.42	0.48	0.54	0.59	0.71	0.99	1.12			
15x30	0.34	0.41	0.48	0.54	0.61	0.67	0.80	0.99	1.28			
16x60					1.05	1.16	1.38	1.72	2.27	2.81	3.33	
20x25	0.34	0.41	0.48	0.54	0.61	0.67	0.80	1.10	1.28			
20x30		0.46	0.53	0.61	0.68	0.75	0.89	1.34	1.44	1.76	1.92	
20x40			0.64	0.73	0.82	0.91	1.08	1.57	1.75	2.15	2.39	
20x50					0.96	1.07	1.27	1.81	2.07	2.54	2.86	
20x60					1.10	1.22	1.46	1.34	2.38	2.93	3.33	
20x70					1.24	1.38	1.84	2.28	2.69	3.33	3.80	
25x40					0.89	0.99	1.37	1.69	1.91	2.34	2.63	
25x50					1.03	1.14	1.18	1.46	2.22	2.74	3.10	
30x40					0.96	1.07	1.46	1.81	2.07	2.54	2.86	
30x50					1.10	1.22	1.65	2.05	2.38	2.93	3.33	
30x60					1.24	1.38	1.84	2.28	2.69	3.33	3.80	
30x70						1.54	2.21	2.75	3.01	3.72	4.28	
30x80						1.70	2.03	2.53	3.35	4.16	4.96	
40x50					1.24	1.38	1.84	2.28	2.69	3.33	3.80	
40x60						1.54	2.21	2.75	3.01	3.72	4.28	
40x80								3.22	3.64	4.50	5.22	





## Industrial Tubes

The industrial tubes manufactured by Boycelik provide the best solutions to meet customer expectations for all types of industrial use. Industrial tubes are manufactured to international standards on the latest technology machinery to various customer specifications on quality, with selection of proper steel grades from cold and hot rolled strips as suitable to further coating applications. Internal diameter scarfed products manufactured in special sections for use in various industries are put through the Eddy Current test method before being presented to customers.

The industrial tubes presented to Boycelik customers to meet decorative and practical needs in the decoration and furniture industries are manufactured in conformity to TS EN 10305-3 and 10219 production standards. The industrial tubes with EN 10219 standard have CE mark and industrial tubes have high resistance against corrosion. The advantage of having a wide stock option allows Boycelik to meet customer demands on standard products instantly, while being able to engage custom orders and deliver on time.

Production Standards	
TS EN	: 10305-3, 10219
DIN	: 2394
TS	: 6476
Production Range	
External Sizes	: ø10 mm - ø76 mm
Thickness	: 0.5 mm - 3,00 mm
Length	: 3.000 mm - 10.000 mm
Cut to Length Ranges	
Size Range	: ø10 mm - ø50,8 mm
Thickness Range	: 0,5 mm - 2,0 mm
Cutting Length	: 320 mm - 7850 mm
Length Tolerance	: (+) 0,5 mm
Optional Processes	
<ul style="list-style-type: none"> <li>• Tube production with galvanized coated steel sheet</li> <li>• Products suitable for galvanizing process</li> <li>• Products suitable for polishing and chrome coating processes</li> <li>• Cut to length products with multiple cutting processes</li> <li>• Corrosion resistant oil application</li> <li>• IDS (internal diameter scarfing)</li> <li>• Eddy Current Testing</li> <li>• Jute or wooden chest (some special length) packing optionally</li> </ul>	



Production range for Industrial tubes according to EN 10305-5/ EN 10219 standards and theoretical unit weights (kg/m)

Size (mm)	Thickness (mm)											
	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	2.0	2.5	3.0	
ø10	0.12	0.14	0.16	0.18	0.20	0.22	0.26					
ø12	0.14	0.17	0.20	0.22	0.25	0.27	0.32	0.39				
ø13	0.15	0.18	0.21	0.24	0.27	0.30	0.35	0.43	0.54			
ø15	0.18	0.21	0.25	0.28	0.31	0.35	0.41					
ø15,6	0.19	0.22	0.26	0.29	0.33	0.36	0.43					
ø16	0.19	0.23	0.26	0.30	0.34	0.37	0.44	0.54	0.69			
ø17	0.20	0.24	0.28	0.32	0.36	0.39	0.47	0.57	0.74			
ø18	0.22	0.26	0.30	0.34	0.38	0.42	0.50	0.61	0.79			
ø19	0.23	0.27	0.32	0.36	0.40	0.44	0.53	0.65	0.84			
ø20	0.24	0.29	0.33	0.38	0.42	0.47	0.56	0.68	0.89			
ø21	0.25	0.30	0.35	0.40	0.45	0.49	0.59	0.72	0.94			
ø22	0.27	0.32	0.37	0.42	0.47	0.52	0.62	0.76	0.99			
ø25	0.30	0.36	0.42	0.48	0.53	0.59	0.70	0.87	1.13			
ø25,4	0.31	0.37	0.43	0.49	0.54	0.60	0.72	0.88	1.15			
ø28	0.34	0.41	0.47	0.54	0.60	0.67	0.79	0.98	1.28			
ø28,6	0.35	0.41	0.48	0.55	0.61	0.68	0.81	1.00	1.31			
ø30		0.44	0.51	0.58	0.65	0.72	0.85	1.05	1.38			
ø32		0.46	0.54	0.62	0.69	0.76	0.91	1.13	1.48	1.82	2.15	
ø34		0.49	0.57	0.66	0.73	0.81	0.97	1.20	1.58	1.94	2.29	
ø35		0.51	0.59	0.67	0.76	0.84	1.00	1.24	1.63			
ø38		0.55	0.64	0.73	0.82	0.91	1.09	1.35	1.78	2.19	2.59	
ø40				0.77	0.87	0.96	1.15	1.42	1.87	2.31	2.74	
ø42				0.81	0.91	1.01	1.21	1.50	1.97	2.44	2.89	
ø45				0.87	0.98	1.09	1.30	1.61	2.12	2.62	3.11	
ø48				0.93	1.05	1.16	1.38	1.72	2.27	2.81	3.33	
ø48,3				0.94	1.05	1.17	1.39	1.73	2.28	2.82	3.35	
ø50,8				0.99	1.11	1.23	1.47	1.82	2.41	2.98	3.54	
ø54				1.05	1.18	1.31	1.56	1.94	2.56	3.18	3.77	
ø57				1.11	1.25	1.38	1.65	2.05	2.71	3.36	4.00	
ø60				1.17	1.31	1.46	1.74	2.16	2.86	3.55	4.22	
ø63,5						1.54	2.04	2.29	3.03	3.76	4.48	
ø70								2.21	2.53	3.35	4.16	4.96
ø76								2.22	2.76	3.65	4.53	5.40



## Oval and Elliptical Tubes

Boycelik manufactured oval tubes are preferred by Turkish and global industrialists in the furniture and decoration trades for their decorative designs. Oval tubes are manufactured to international standards on the latest technology machinery to various customer specifications on quality, made with special materials that can be formed easily on cold and hot rolled strips as suitable to further coating applications.

The oval and elliptical tubes presented to Boycelik customers are manufactured in conformity to TS EN 10305-5 production standards. The oval and elliptical tubes have high resistance against corrosion. The advantage of having a wide stock option allows Boycelik to meet customer demands on standard products instantly, while being able to engage custom orders and deliver on time.

Production Standards	
TS EN	: 10305-5
Production Range	
External Sizes	: 0.5 mm - 3,00 mm
Length	: 3.000 mm - 10.000 mm
Cut to Length Ranges	
Thickness Range	: 0,5 mm - 2,0 mm
Cutting Length	: 320 mm - 7850 mm
Length Tolerance	: (+) 0,5 mm
Optional Processes	
<ul style="list-style-type: none"> <li>• Products suitable for galvanizing process</li> <li>• Products suitable for polishing and chrome coating processes</li> <li>• Cut to length products with multiple cutting processes</li> <li>• Corrosion resistant oil application</li> <li>• IDS (internal diameter scarfing)</li> <li>• Eddy Current Testing</li> <li>• Jute or wooden chest (some special length) packing optionally</li> </ul>	



Production range for special section tubes according to EN 10305-5/ EN 10219 standards and theoretical unit weights (kg/m)

Size (mm)	Thickness (mm)										
	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	2.0	2.5	3.0
Flat Oval 10x20	0.19	0.23	0.26	0.30	0.34	0.37	0.44	0.54	0.69		
Flat Oval 14x24	0.25	0.30	0.35	0.40	0.45	0.49	0.59	0.72	0.94		
Flat Oval 15x30	0.30	0.36	0.42	0.48	0.53	0.59	0.70	0.87	1.13		
Flat Oval 16x40		0.46	0.54	0.62	0.69	0.76	0.91	1.13	1.48		
Flat Oval 18x36		0.44	0.51	0.58	0.65	0.72	0.85	1.05	1.38		
Flat Oval 20x35		0.41	0.48	0.55	0.61	0.68	0.81	1.00	1.31		
Elliptical 20x40		0.46	0.54	0.62	0.69	0.76	0.91	1.13	1.48		
Flat Oval 20x40			0.57	0.66	0.73	0.81	0.97	1.20	1.58		
Flat Oval 25x40		0.51	0.59	0.67	0.76	0.84	1.00	1.24	1.63		
Flat Oval 25x50				0.81	0.91	1.01	1.21	1.50	1.97	2.44	2.89
Flat Oval 30x50					0.98	1.09	1.30	1.61	2.12	2.62	3.11
Flat Oval 30x60					1.11	1.23	1.47	1.82	2.41	2.98	3.54
Flat Oval 32x50					0.98	1.09	1.30	1.61	2.12	2.62	3.11

Please contact our sales department for sizes not listed here.





## Special Products

In order to meet narrowed tolerance requirements on size, physical specification and surface quality demands from customers, Boycelik applies additional processes apart from its standard manufacture for the production of precision tubes. Internal diameter scarfed products manufactured in special sections for

use in various industries are put through the Eddy Current test method before being presented to customers. This method spots possible welding zone and body cracks during production.



Eddy Current Tested Tubes Production Range	
Tube Outside Diameter	Ø13 mm - Ø76 mm
Square Tube Size	10x10 mm - 60x60 mm
Rectangular Tube Size	10x20 mm - 40x80 mm
Material Thickness	0,5 mm-3,0 mm

Internal Diameter Scarfed Tube Production Range	
Tube Outside Diameter	Ø21 mm - Ø76 mm
Square Tube Size	20x20 mm - 60x60 mm
Rectangular Tube Size	15x20 mm - 40x80 mm
Material Thickness	0,9 mm-2,0 mm





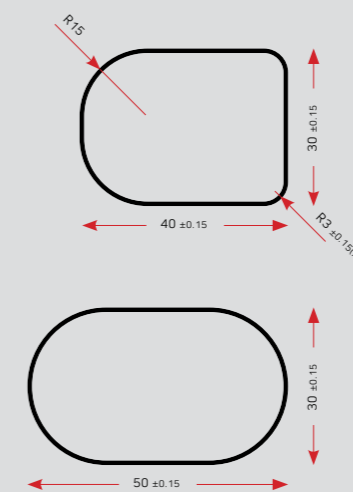
## Towel Warmer Tubes

The towel warmer tubes and profiles manufactured by Boycelik are preferred for their aesthetic and decorative properties by the decoration and furniture industries, and can be manufactured to meet various qualities, using cold and hot rolled strips, as suitable to further coating applications on

the latest technology machinery. Boycelik manufactured towel warmer tubes are shipped out to customers after being put through non destructive Eddy Current test processes.



Tube Sizes	Special Section Profile Sizes
19x0,80 mm	D Profile 30x40 mm
19x0,90 mm	D Profile 32x32 mm
20x0,80 mm	Flat Oval Profile 30x50 mm
20x0,90 mm	
21x0,80 mm	
21x0,90 mm	
22x0,80 mm	
22x0,90 mm	
25x0,80 mm	
25x0,90 mm	
25,4x0,80 mm	
25,4x0,90 mm	



## Product Technical Specifications

Boycelik manufactures according to TS EN 10305-3, TS EN 10305-5 DIN 2394, DIN 2395 standards. Boycelik can manufacture suitable for galvanizing, polishing, chrome coating or painting processes. Weld beads can manufacture in different side. Internal Diameter Scarfed can be applied for Towel Warmer Tubes.



## Fittings Tubes

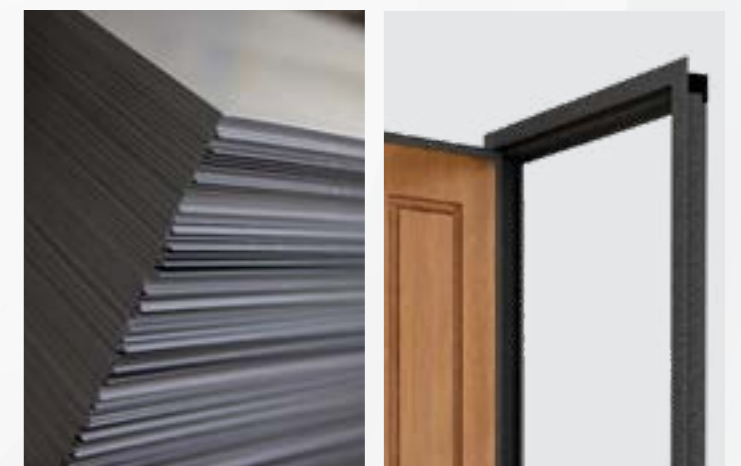
Boycelik, gained a prominent position for itself in the heating systems industry for the supply of fitting pipes used for panel radiator connection equipment. Boycelik's capacity for on time technical support and service solutions for fittings pipes has been applauded by its industrial customers.

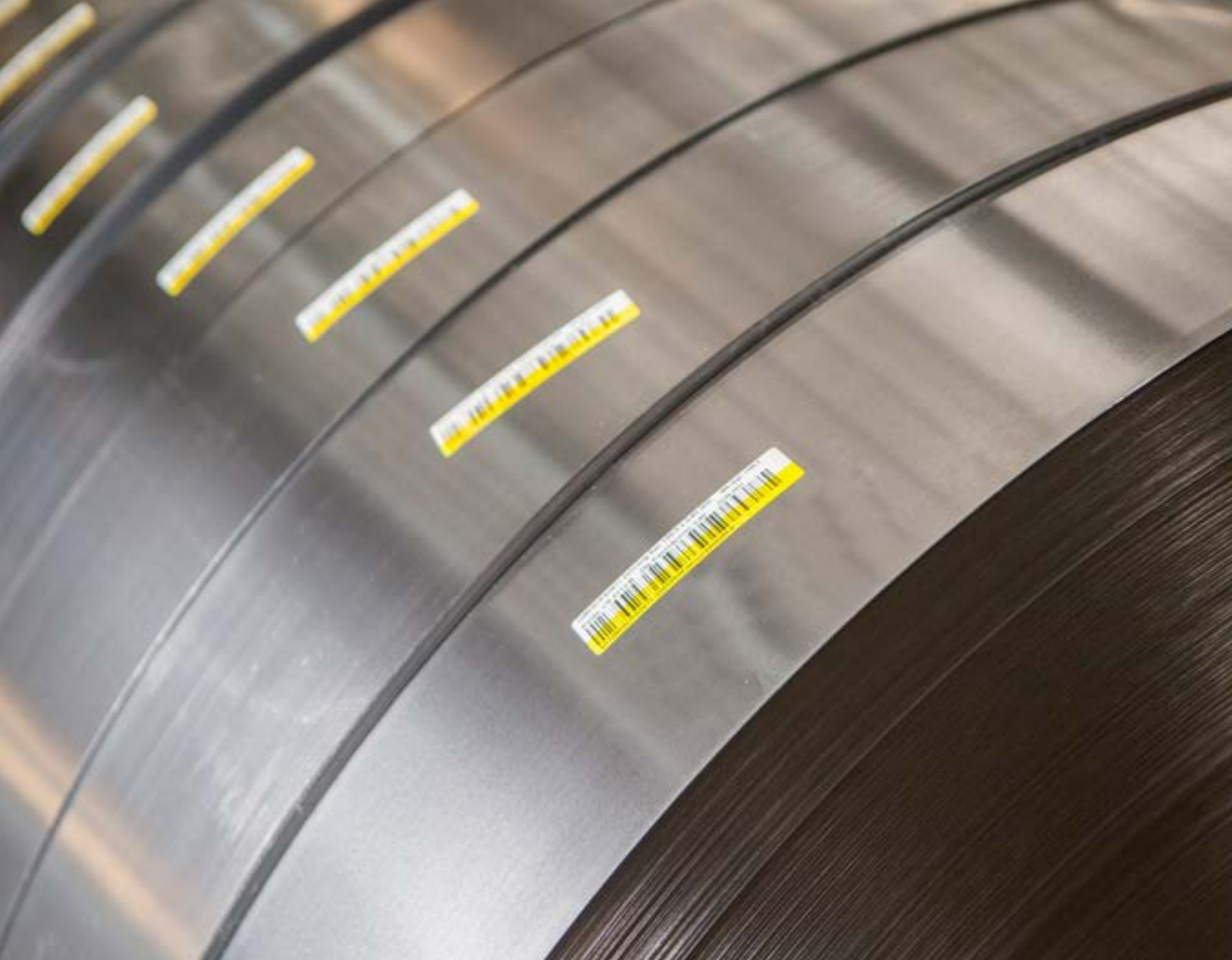


## Stell Sheet (Cut to Length Line)

Boycelik production facilities include a steel sheet line as well contributing to facilitate consumers' lives. Steel sheets are used by an array of industries including the steel door manufacturing industry, home appliance industries for products such as ironing boards, wheelbarrows and ladders; electrical household appliance industry for products like stove, oven and cooker, steel goods industries for products like lockers, electric panel, and fire cabinets as well as metal furniture and accessories.

Steel Sheet (Cut to Length Line)	
Thickness (mm)	0,50 - 2,00
Wideness (mm)	175-1550
Length (mm)	300-4000





## Strip Steel (Slitting Line)

Boycelik facilities include a slitting line allowing us to meet consumer requests for cold and hot rolled strip steel in various dimensions. Strip steel is used in the home appliances, steel goods and in metal furniture and components industries. Strip steel is made ready for shipment in vertical or horizontal placement with or without pallets.



Strip Steel (Slitting Line)	
Thickness (mm)	0,50 - 3,00
Wideness (mm)	30-1600



## Product Technical Specifications

Quality control processes at Boycelik facilities minimize error rates so that all production meets standards and customer specifications. Boycelik assures high quality from raw material supply to final product delivery to customer. All phases of production from raw material entry to non destructive tests and finish applications at Boycelik are supported with physical and chemical testing.

## MECHANICAL TESTS APPLIED TO TUBES & PROFILES

**Mechanical Test:** Tensile test is applied to a sample from the raw material or the final product to examine conformity with accepted standards and customer requests.

**Chemical Test:** Not only before accepting the raw material, but also during production process, chemical tests are applied to samples to examine conformity with accepted standards.

**Hardness Test:** With this test, surface hardness of the raw material or the final product is measured.

**Expanding Test:** Several samples are collected during production process and are expanded using special techniques to control whether there are cracks or openings through the seam.

**Flattening Test:** Several samples are collected during production process and are flattened using special techniques to control whether there are cracks or openings through the seam.

**Bending Test:** Several samples are collected during production process and are bended by 90° to observe the durability of the seam in shaping the final product.



## NON-DESTRUCTIVE TESTS APPLIED TO TUBES & PROFILES (NDT)

**Eddy Current Test:** Boycelik tests EC code products with automatic separation electromagnetic device which is integrated tube line in accordance with TS EN 10305-3&5 standards to avoid welding defects..

**Surface Roughness Test:** Regarding to customer specifications, Boycelik test surface roughness of sheet accord with products to be coated.



Mechanical and Chemical specifications for tubes

Steel Grade		Mechanical Specifications		Chemical Analysis				
Steel Name	Steel Number	Minimum value for +CR1 delivery at room temperature'		Maximum Composition Rate (%)				
		Tensile Strength, Rm (Mpa)	"Elongation, A (%)"	C	Si	Mn	P	S
E155	1.0033	290	15	0.11	0.35	0.70	0.025	0.025
E195	1.0034	330	8	0.15	0.35	0.70	0.025	0.025
E235	1.0308	390	7	0.17	0.35	1.20	0.025	0.025
E275	1.0225	440	6	0.21	0.35	1.40	0.025	0.025
E355	1.0580	540	5	0.22	0.55	1.60	0.025	0.025

Mechanical specifications and chemical analysis for TS EN 10305-3 and EN 10305-5 standards

Steel Grade		Mechanical Specifications				Chemical Analysis					
Steel Name	Steel Number	Isıl İşleme Tabi Tutulmamış				Maximum composition rate (%)					
		Minimum yield strength, ReH (Mpa)	Tensile Strength, Rm (Mpa)		Elongation, A (%)	C	Si	Mn	P	S	N
Material Thickness (mm)		≤16	<3	≥3	≤40						
S235JRH	1.0039	235	360 - 510	360 - 510	24	0.17	-	1.40	0.040	0.040	0.009
S275J0H	1.0149	275	430 - 580	410 - 560	20	0.20	-	1.50	0.035	0.035	0.009
S275J2H	1.0138	275	430 - 580	410 - 560	20	0.20	-	1.50	0.030	0.030	-
S355J0H	1.0547	355	510 - 680	470 - 630	20	0.22	0.55	1.60	0.035	0.035	0.009
S355J2H	1.0576	355	510 - 680	470 - 630	20	0.22	0.55	1.60	0.030	0.030	-
S355K2H	1.0512	355	510 - 680	470 - 630	20	0.22	0.55	1.60	0.030	0.030	-

Mechanical specifications and chemical analysis for TS EN 10219 standards



**DIMENSIONAL TOLERANCE TABLE FOR EN 10305-3 AND EN 10305-5 STANDARDS**

PARAMETERS	Rectangular (B,H)	Square (B,B)	Circular section, ØD
Rectangular Section, H, B	10 x 20 ±0,20	40 x 50 ±0,30	15 x 15 ±0,20
	10 x 30 ±0,25	40 x 60 ±0,35	20 x 20 ±0,20
	15 x 20 ±0,20	40 x 80 ±0,50	20 ≤ ØD ≤ 30 ±0,15
	15 x 25 ±0,25		32 ≤ ØD ≤ 42,4 ±0,20
	15 x 30 ±0,25		44 ≤ ØD ≤ 51 ±0,25
	20 x 30 ±0,25		55 ≤ ØD ≤ 63,5 ±0,30
	20 x 40 ±0,30		70 ≤ ØD ≤ 76 ±0,35
Circular Section, ØD	20 x 40 ±0,30	50 x 50 ±0,30	
	20 x 50 ±0,30	60 x 60 ±0,35	
	20 x 60 ±0,35		
	30 x 40 ±0,30		
	30 x 50 ±0,30		
	30 x 60 ±0,35		
Squaring of sides	90° ±1°		- -
Corner Radius, R	T ≤ 2,5 for R ≤ 1,5xT 2,5 < T ≤ 4 for R ≤ 2,2xT		- -
Straigthness, e	For B,H ≤ 30 mm; Length x 0,0025 (mm) and 1 m maximum 3 mm per meter length		ØD > 15 mm for; Length x 0,002 (mm)
	For B,H > 30 mm; Length x 0,0015 (mm) and 1 m maximum 3 mm per meter length		ØD ≤ 15 mm for; Depends on agreement
Concavity/Convexity	Should not exceed the size tolerance of the related side		- -
Twist, V	For B or H ≤ 30 mm V ≤ 3 mm For B or H > 30 mm ; V ≤ B/10 or V ≤ H/10		- -
Deviation in the weld seam position	% ±10'u or ±3 mm (Whichever is greater)		- -
Thickness, T	If T ≤ 1,5 mm; ±0,15 mm		
	T > 1,5 mm ise; ±0,1xT or T ±0,35 (whichever is smaller)		
Length Tolerance, L	Standard Tolerance	L = 6000 mm	+100 mm
	Tolerance for option 11 and 12	For L ≤ 500 mm length;	Depends on agreement
		For 500 < L ≤ 2.000 mm length;	+3 mm
		For 2.000 < L ≤ 5.000 mm length;	+5 mm
For 5.000 < L ≤ 8.000 mm length;	+10 mm		
For L > 8.000 mm length;	Depends on agreement		

**MECHANICAL TEST TABLE FOR EN 10305-3 AND EN 10305-5 STANDARDS**

	Material	E155	E195	E235	E275	E355
Expansion	% increase on diameter (for T ≤ 4 mm)	22	20	18	15	15
	% increase on diameter (for T ≤ 4 mm)	17	15	12	10	10
Flattening	Welding should bear no tears or cracks					

The above table provides values of tolerance limits per standards. Manufacturing may be carried out at narrower tolerance limits per specifications.



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