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## MILESTONES

1944

Foundation of Borusan

1968

Halkalı ERW Pipe Plant started production, İstanbul

1979

Borusan Port inaugurated

1998

Borusan and Mannesmann merged their pipe business activities in Turkey

2004

The company name is amended as "Borusan Mannesmann"

2014

Houston OCTG Plant started production, Texas

1958

Borusan Pipe was founded

1976

Gemlik ERW Pipe Plant started production, Bursa

1969

First exports

1994

Borusan Pipe quoted on İstanbul Stock Exchange

2001

Acquisition of cold drawn pipe plant in Vobarno, Italy

2009

Borusan Port expansion completed

2011

Gemlik HSAW Pipe Plant started production, Bursa





# BORUSAN HOLDING AT A GLANCE

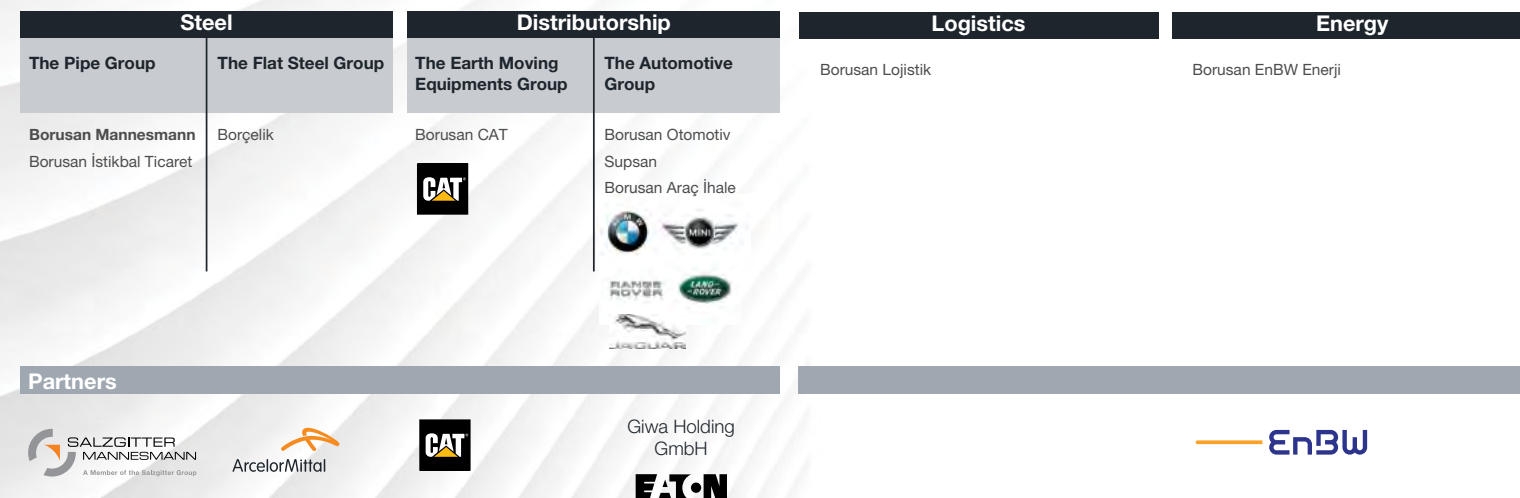
## In 4 major business areas, with 11.000 dedicated employees...

Borusan Group has been among the pioneers of industrialization and corporate governance in Turkey throughout its 75 years of history. The group currently operates in four major business areas including steel, distributorship, logistics and energy. In 2006 Borusan Group signed the United Nations' Global Compact Policy and it supports and adheres by the principles of "good corporate governance" and "sustainability" as a prerequisite component for long-term and permanent success.



## Contribution to Community

Borusan has adopted the principle of giving back to the community with which it does business. In order to better carry out Borusan's social responsibilities, Borusan Kocabişik Foundation was established in 2008, merging the activities of Asım Kocabişik Culture and Education Foundation and Borusan Culture and Arts under a single roof. With a deep social responsibility consciousness, the Borusan Group established the Borusan Center for Culture & Arts on October 15, 1997. The Borusan Center for Culture and Arts is a member of the International Society of Contemporary Music (ISCM) and the European Music Council (EMC) and organizes the annual Mediterranean Contemporary Music Days. Though it began with modest numbers, the chamber orchestra was transformed into one of the leading Turkish philharmonic ensembles under its former artistic director and principal conductor Sascha Goetzel. Giving its concert premiere in May 1999, BIPO has since become a prominent element of Istanbul's cultural scene.



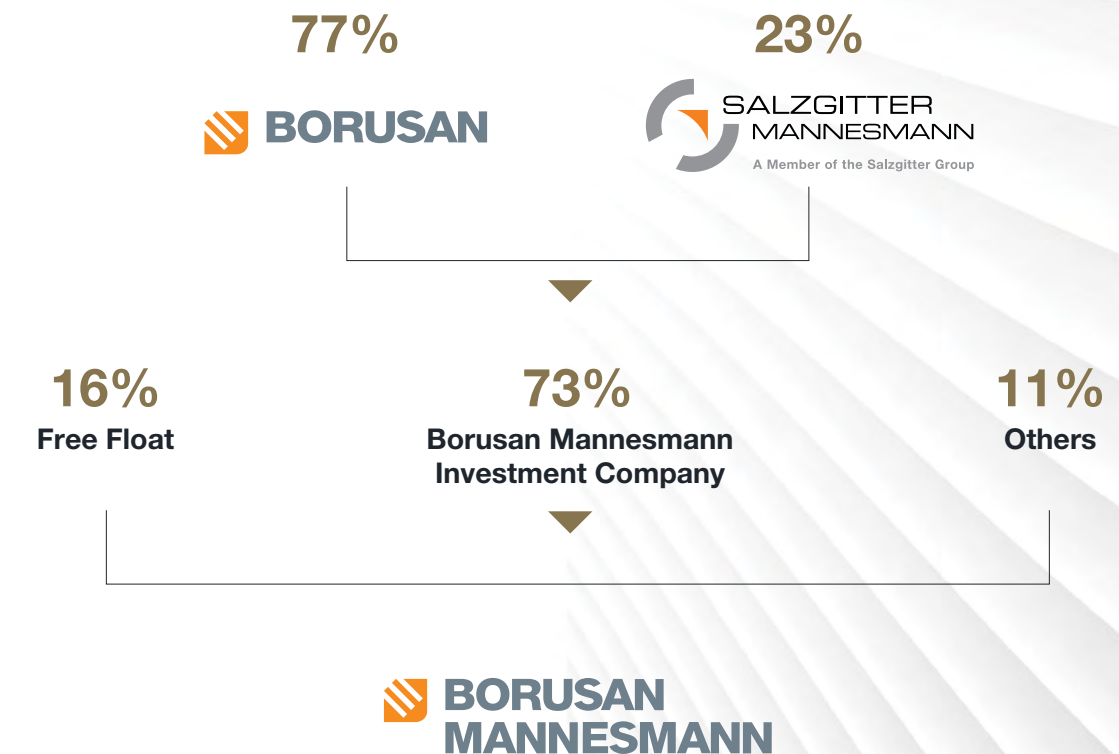
# BORUSAN MANNESMANN IN BRIEF

**"Celebrating its 60th anniversary, Borusan Mannesmann is among the leading manufacturer of steel pipes in the world with its 1.4 million tons of annual production capacity."**

Steel pipe manufacturing is the core business of the Borusan Group, a conglomerate made up of 15 companies spread over four different industries; steel, distributorship, logistics and energy with around 7 billion USD turnover and more than 11.000 employees. Borusan Mannesmann currently continues its production activities with its 6 facilities in 3 different countries in Turkey, Italy and USA.

The company's product range includes; water pipes, oil and gas line pipes, industrial pipes and profiles, installation pipes, OCTG pipes and hollow sections. Borusan Mannesmann has wide experience and range of track records in oil and gas pipeline projects both in domestic and international markets with high grade API standards.

A dynamic, highly qualified staff, regularly trained to keep abreast of new manufacturing and management, ensure that production conforms to exacting quality standards. Borusan Mannesmann has become the standard-bearer for trust and quality in the sector by bringing added value to products and services with 1.800 highly qualified employees and the continuously improving work force.





# 6 FACILITIES IN 3 CONTINENTS

## USA / Texas

### Houston Plant

Sectors served: Energy Sector  
 Capacity : 300 kton  
 Workforce : 300  
 Area : 500.000 m<sup>2</sup>

## Italy

### Vobarno Plant

Sectors served: Engineering Technologies  
 Capacity : 30 kton  
 Workforce : 90  
 Area : 24.000 m<sup>2</sup>

## Turkey

### Gemlik ERW Pipe Plant

Sectors served: Energy, Construction,  
 Water Transmission  
 Capacity : 650 kton  
 Workforce : 750  
 Area : 388.000 m<sup>2</sup>

## Turkey

### Gemlik HSAW Pipe Plant

Sectors served: Energy, Construction,  
 Water Transmission  
 Capacity : 300 kton  
 Workforce : 140  
 Area : 70.000 m<sup>2</sup>

### Halkalı Plant

Sectors served: Engineering Technologies  
 Capacity : 100 kton  
 Workforce : 450  
 Area : 67.000 m<sup>2</sup>

### Bursa Service Center

Sectors served: Automotive  
 Capacity : 20 million piece / year  
 Workforce : 60  
 Area : 10.000 m<sup>2</sup>



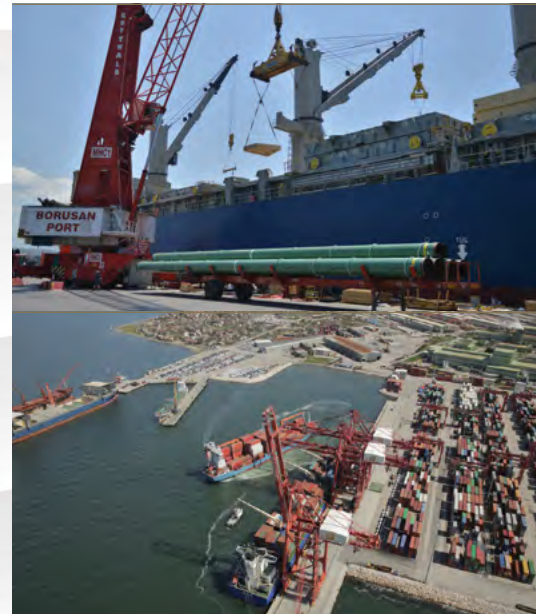


# CUSTOMER BENEFITS

## Exceeding Limits with Continuous R&D

Borusan Mannesmann's research and development philosophy enables us to carry out research activities in all markets and develop new products for our customer's and market needs. As Borusan Mannesmann; we also conduct joint projects together with our raw material suppliers in developing special material qualities for the manufacture of desired product. We collaborate in performing trial productions and troubleshooting activities to maintain excellence in product and process design and implementation to the best possible extent.

As a company that embraces Lean 6 Sigma methodology; launching breakthrough technologies, improving production and process control steps, is a part of our daily life.



## Integrated Delivery Services

Challenging the dynamics of global competition, Borusan Mannesmann gets the maximum benefits from the location advantage of its plants. Borusan Mannesmann's state of the art Houston Plant has direct rail and barge accesses with dedicated trucks. Also owned solely by Borusan Group, Borusan Port in Gemlik location is one of Europe's most important ports in terms of both size and location. Its physical conditions and Equipment Park enables Borusan Port to serve container and bulk vessels at the same time with the capacity to handle 5 million tons of cargo, 250.000 vehicles and 400.000 TEU containers.

Borusan Mannesmann regularly provides shipping to many different destinations in the world - an ability, which gives the company a certain edge on transportation by sea. Borusan Logistics is our delivery partner that provides services of chartering and project transportation, as well as international bulk, container, land, railway and air transportation. As a solution partner with its reliable services and tracking systems in international transportation, Borusan Logistics creates value for us in terms of our "port to door" deliveries.

## Turnkey Synergetic Solutions

Our customers are assured that all of our products meet their expectations varying from internationally recognized specifications to special requirements. Borusan Mannesmann provides turnkey products either with its modern integrated facilities or reliable processing suppliers, for its customers.

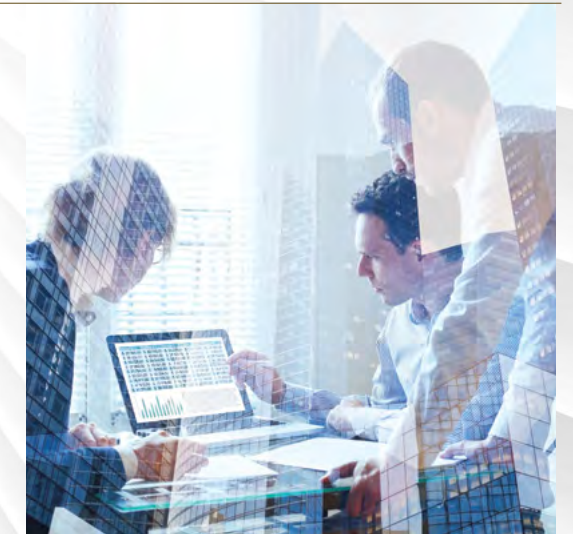


## VOC - Most Valuable Driving Force

Borusan Mannesmann has been capturing the requirements and feedback of our customers to provide the best product and service quality. We have been applying the VOC - Voice of Customer process since 2003. Serving to our customers and delivering synergetic solutions in the most cost effective way is a consistent discipline in Borusan Mannesmann. We aim to compose personal recipes for special market needs. This approach leads us to go beyond ourselves and present valuable services for our customers.

## Well Established Sales Organization

Borusan Mannesmann's sales experts provide fast response and reliable technical consultation in close cooperation with our customers before and after the sales process. Our sales organization is made of professional local representatives who speak our customer's language in their market and always provide the best solutions for the business. Company's representatives are carefully picked from the best of highly qualified distributors in the local market. We provide the best solutions; in your country, in your language with equipped people.





## OUR TEAM

There is no limit of the human potential. Success brings the desire to achieve more. Having a principle of 'being one step ahead', our talented workforce is dedicated to achieve a high level of customer service. Our sales organization consists of the experts of their fields, both in planning, sales and trade operations. The educational and developmental programs which will create a significant difference for Borusan members in means of business processes and personal development are designed by the Borusan Academy. The Leadership and Sales Faculty programs are jointly offered with the assistance of Sabanci University, Executive Development Unit. They consist of various certification programs which include long-term postgraduate level education and development topics prepared by locally and internationally renowned experts in their fields.



## QEHS Management

Borusan Group companies all share a common set of guiding principles, which help this vast enterprise to operate in complete harmony. These principles are commitments to productivity, innovation and environmental responsibility.

From raw material to finished product, Borusan Mannesmann determines the impacts on environment and in order to reduce impacts, controls each step of the process. Our Environmental Management System certificate (ISO 14001) proves our commitment to environment.

Healthy performance is delivered through healthy people. In compliance with Occupational Health and Safety Management Standard (OHSAS 18001) Borusan Mannesmann endeavors to protect health and safety of its work force and service providers.

Borusan Mannesmann; exemplary with its modern management approach as well as its investments, has been applying The Lean Six Sigma methodology since 2002 and Voice of Customer (VOC) process since 2003.

The Lean Six Sigma methodology is a highly disciplined business management strategy that seeks to remove the causes of defects in production and business processes, and to continuously improve productivity, profitability and customer satisfaction. Besides with the VOC process, we capture the requirements and feedback from our customers to provide the best product and service quality.

Ongoing efforts to improve customer satisfaction brought Borusan Mannesmann, Complaints Handling Management Systems Certificate (ISO 10002); which is a first in steel pipe sector globally.



### Quality System Certificates



- Quality Management Certificates
  - ISO/TS 16949
  - ISO 9001
  - ISO 14001
  - ISO 10002
  - OHSAS 18001
  - API Q1
  - TSE EN/ISO/IEC 17025
- International Certificates
  - API 5L
  - API 5CT
  - ENAGAS Homologation-Spain/12"-48" DSAWH
  - AD-MERKBLATT W0/TRD 100, W4/TRD 102
  - Germanischer Lloyd: DIN 1626 St 37.0
  - DVGW-EN 10255
  - PED-Pressure Equipment Directive 97/ 23/EC-EN 10217
  - CE marked-Construction Product Directive 89/106/EC-EN 10210 - EN 10219
  - FM Approval
  - UL/CUL Listed
  - NSF Certified





ENERGY





# OCTG-CASING AND TUBING

## Sizes

Outside Diameter	Wall Thickness	Length
26,7 mm - 339,7 mm	2,87 mm - 13,06 mm	6,00 m - 18,30 m
1.050" - 13.375"	0.113" - 0.514"	19,68 ft - 60,04 ft

## Production Standards & Material Qualities

- API 5CT certified for threaded and coupled casing and tubing (According to API 5B)
- Full ERW grade range: H40, J55/K55, L80, N80, FBNAU, P110 and Q125
- Proprietary as rolled 80, 90 grade available
- Enhanced high collapse versions of L80 and P110 grades available



## Tests & Certificates

- API 5CT
- Visual and dimensional inspection
- Mechanical Tests: Tensile, Flattening, Expanding
- Steady scarfing with 100% weldline ultrasonic testing
- Hydrotesting in place of 100%
- Consistent wall thickness with oversize drift options available
- Reduced tolerances through statistical process control
- Uniform concentricity, roundness, straightness and cylindricity
- Fully normalized weld zones
- NDT Standards: U/S (ASTM E 213 Level 3)
- Suitable for directional drilling and multiple fracturing operations
- Accredited lab tests and third party inspections available (full body and weld line UT, EMI, SEA)

## Finishing Operations

- Plain end square cut or high quality API 5B certified threading and coupling
- Premium and semi-premium threads available
- High quality threaded compound, couplings and protectors
- Torque controlled coupling application
- External corrosion prevention with durable and environmentally safe coating





## Tubing - Production Range

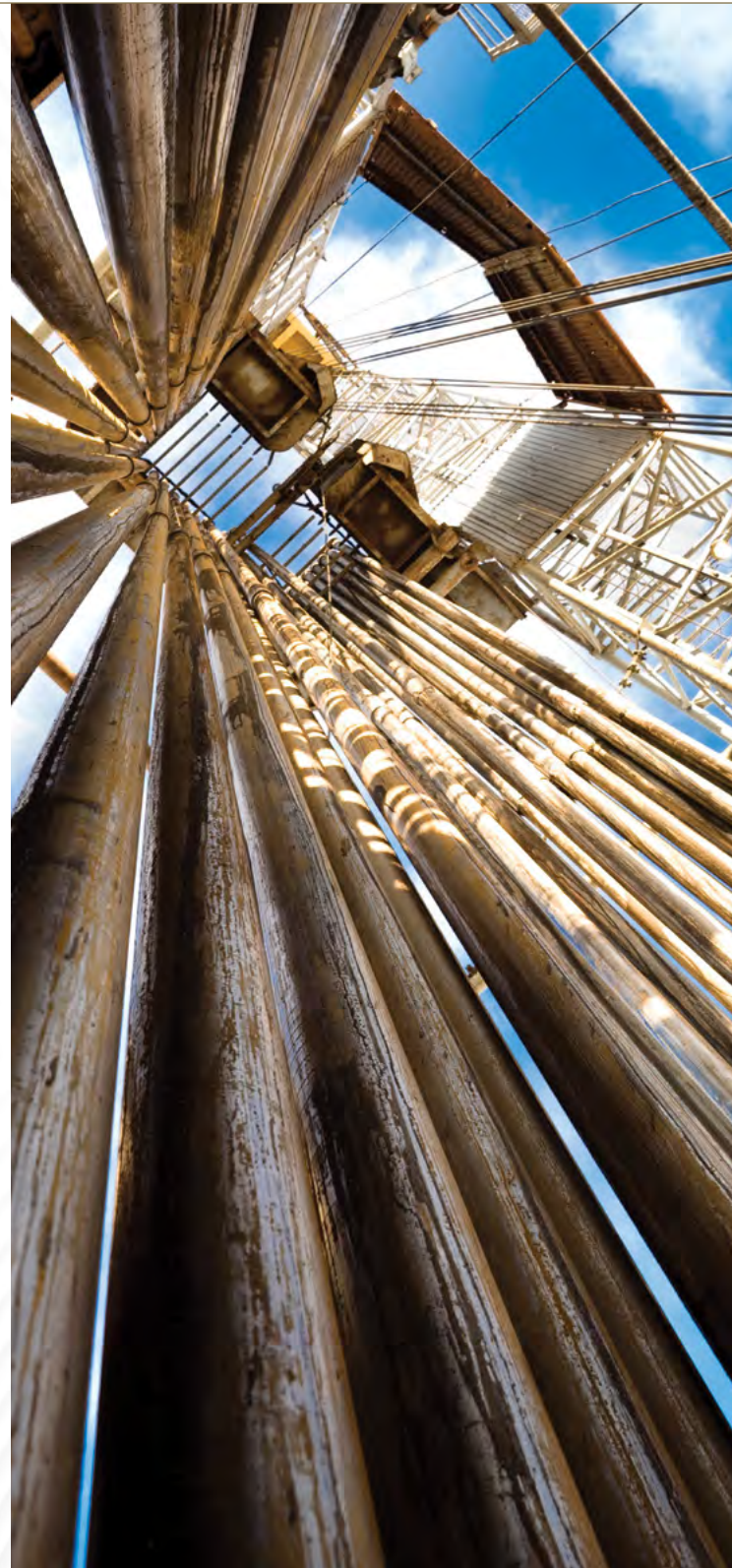
	Range 1	Range 2	Range 3
(ft)	20.0 - 24.0	28.0 - 32.0	38.0 - 42.0

### Labels

Nominal linear mass shown for information and assistance in ordering only (T&C: threaded and coupled)

OD (inch)	Non-Upset T&C Nominal Linear mass (lb/ft)	External Upset T&C Nominal Linear mass (lb/ft)	Wall Thickness (inch)
1.050	1.14	1.20	0.113
1.050	1.48	1.54	0.154
1.315	1.70	1.80	0.133
1.315	2.19	2.24	0.179
1.660	2.09	-	0.125
1.660	2.30	2.40	0.140
1.660	3.03	3.07	0.191
1.900	2.40	-	0.125
1.900	2.75	2.90	0.145
1.900	3.65	3.73	0.200
1.900	4.42	-	0.250
1.900	5.15	-	0.300
2.063	3.24	-	0.156
2.063	4.50	-	0.225
2.375	4.00	-	0.167
2.375	4.60	4.70	0.190
2.375	5.80	5.95	0.254
2.375	6.60	-	0.295
2.375	7.35	7.45	0.336
2.875	6.40	6.50	0.217
2.875	7.80	7.90	0.276
2.875	8.60	8.70	0.308
2.875	9.35	9.45	0.340
2.875	10.50	-	0.392
3.500	7.70	-	0.216
3.500	9.20	9.30	0.254
3.500	10.20	-	0.289
3.500	12.70	12.95	0.375
4.000	9.50	-	0.226
4.000	10.70	11.00	0.262
4.500	12.60	12.75	0.271
4.500	15.20	-	0.337

API 5CT Tubing grades: J55, J55N, N80Q, L80, P110, FBNAU



## Casing - Production Range

Range Lengths:	Range 1	Range 2	Range 3	Extra long
(ft)	18.0 - 25.0	25.0 - 34.0 (95% 28ft min)	34.0 - 48.0 (95% 36ft min)	48.0 - 65.00

### Labels

Nominal linear mass shown for information and assistance in ordering only (T&C: threaded and coupled)

OD (inch)	T&C Nominal linear mass (lb/ft)	Wall Thickness (inch)
4.5	9.50	0.205
4.5	10.50	0.224
4.5	11.60	0.250
4.5	13.50	0.290
4.5	15.10	0.337
4.5	16.60	0.375
4.5	18.90	0.430
4.5	21.50	0.500
5	11.50	0.220
5	13.00	0.253
5	15.00	0.296
5	18.00	0.362
5.5	14.00	0.244
5.5	15.50	0.275
5.5	17.00	0.304
5.5	20.00	0.361
5.5	23.00	0.415
5.5	26.00	0.476
5.5	26.80	0.500
5.5	29.70	0.562
6.625	20.00	0.288
6.625	24.00	0.352
6.625	28.00	0.417
6.625	32.00	0.475
6.625	35.00	0.525
7	17.00	0.231
7	20.00	0.272
7	23.00	0.317
7	26.00	0.362
7	29.00	0.408
7	32.00	0.453
7	35.00	0.498
7	38.00	0.540
7	41.00	0.590
7.625	24.00	0.300

Grades

- API 5CT: H40, J55, N80, L80, L80-D10, P110

- API 5CT Monogrammed Proprietary: N80HC, L80HC, L80 EHC, P110 HC, P110 EHC, P110 HSCY

- Proprietary (no API Monogram): B-80, B90, Borusan-K55HC, B-110CY,

OD (inch)	T&C Nominal linear mass (lb/ft)	Wall Thickness (inch)
7.625	26.40	0.328
7.625	29.70	0.375
7.625	33.70	0.430
7.625	39.00	0.500
7.625	42.80	0.562
7.625	45.30	0.595
8.625	24.00	0.264
8.625	28.00	0.304
8.625	32.00	0.352
8.625	36.00	0.400
8.625	40.00	0.450
8.625	44.00	0.500
9.625	32.30	0.312
9.625	36.00	0.352
9.625	40.00	0.395
9.625	43.50	0.435
9.625	47.00	0.472
9.625	53.50	0.545
9.625	58.40	0.595
10.75	32.75	0.279
10.75	40.50	0.350
10.75	45.50	0.400
10.75	51.00	0.450
10.75	55.50	0.495
10.75	60.70	0.545
10.75	65.70	0.595
11.75	42.00	0.333
11.75	47.00	0.375
11.75	54.00	0.435
11.75	60.00	0.489
13.375	48.00	0.330
13.375	54.50	0.380
13.375	61.00	0.430
13.375	68.00	0.480
13.375	72.00	0.514

- End finish options\*: PE, STC, LTC, BTC

- Please contact our sales department for premium and semi-premium connections availability



# ERW LINE PIPES

## Sizes

Outside Diameter	Wall Thickness	Length
21,3 mm - 339,7 mm	2,8 mm - 12,7 mm*	6,00 m - 18,30 m
0.84" - 13.375"	0.109" - 0.500"	19,68 ft - 60,04 ft

\*From US mill up to 15,88 mm available

## Production Standards & Material Qualities

Line Pipe	
API 5L, PSL 1, PSL 2	A, B, X42, X46, X52, X56, X60, X65, X70
CSA Z 245.1	Gr 241-Gr 359
EN ISO 3183	L245-L485 (N, M, NE, ME)
SI 530	Grade B



## Tests & Certificates

- Visual and Dimensional Inspection
- Mechanical Tests:  
Tensile, Flattening, Expanding, Bending  
Weld Ductility, Fracture Toughness, PP, PE Testing
- Metallographic Examination  
Purity Analysis
- Chemical Analysis
- Hydrostatic Test
- Non Destructive Inspection:  
Eddy Current, Ultrasonic Test (Weld Check)  
Ultrasonic (full body, optional)
- Mill Test Certificates  
Acc. to EN 10204 2.1; 2.2; 3.1; 3.2
- NDT Standards  
UT (EN ISO 10893-11 Level U2), ET (EN ISO 10893-2 Level E2), API, EN ISO 3183, CSA Z.245.1

## Threading

114.3 mm ≤ OD ≤ 323.9 mm: API 5L  
(Line Pipe according to API 5B)

## Finishing Operations

Plain End-Square cut or bevelled / Zaplok  
Black self colored / uncoated  
Mill protective coating (black varnish) on outside surface  
Epoxy lining and coating (AWWA C210), API RP5L2  
3 Layer PE coating (DIN 30670, ISO 21809-1)  
3 Layer PP coating (DIN 30678, ISO 21809-1)

## Heat Treatment

21.3 mm ≤ OD ≤ 88.9 mm: full body  
114.3 mm ≤ OD ≤ 323.9 mm: weld seam  
21.3 mm ≤ OD < 219.1 mm: off-line heat treatment.

## Production Range

OD	Wall Thickness (mm & inch)																								
	mm	2,8	3,0	3,2	3,6	3,68	3,7	4,0	4,5	5,1	5,2	6	6,6	7	7,1	8,1	8,4	8,6	9,0	9,5	10,0	11	12	12,7	
mm	inch	0.109	0.113	0.133	0.140	0.145	0.147	0.154	0.179	0.200	0.203	0.237	0.258	0.277	0.280	0.318	0.331	0.337	0.354	0.375	0.394	0.432	0.472	0.500	
21,3	1/2	1,28	1,35	1,43	1,57	1,60	1,61	1,71																	
26,9	3/4	1,66	1,77	1,87	2,07	2,11	2,12	2,26	2,49																
33,7	1	2,13	2,27	2,41	2,67	2,72	2,74	2,93	3,24	3,60															
42,4	1 1/4	2,73	2,91	3,09	3,44	3,51	3,53	3,79	4,21	4,69	4,77														
48,3	1 1/2	3,14	3,35	3,56	3,97	4,05	4,07	4,37	4,86	5,43	5,53														
60,3	2 3/8	3,97	4,24	4,51	5,03	5,14	5,16	5,55	6,19	6,94	7,07														
73	2 7/8	4,85	5,18	5,51	6,16	6,29	6,32	6,81	7,60	8,54	8,69	9,91	10,81	11,39	11,54										
88,9	3 1/2	5,95	6,35	6,76	7,57	7,73	7,77	8,37	9,37	10,54	10,73	12,27	13,39	14,14	14,32										
114,3	4 1/2		8,23	8,77	9,83	10,04	10,09	10,88	12,18	13,73	13,99	16,02	17,53	18,52	18,77	21,21	21,94	22,42	23,37	24,55					
141,3	5 9/16		10,23	10,90	12,22	12,49	12,55	13,54	15,18	17,13	17,45	20,02	21,92	23,18	23,50	26,61	27,53	28,14	29,36	30,88	32,38				
168,3	6 5/8			13,03	14,62	14,94	15,02	16,21	18,18	20,53	20,91	24,01	26,32	27,84	28,22	32,00	33,12	33,87	35,36	37,20	39,04	42,67			
219,1	8 5/8				19,13	19,55	19,65	21,22	23,81	26,91	27,43	31,53	34,59	36,61	37,12	42,15	43,65	44,64	46,63	49,10	51,56	56,45	61,29	64,64	
273	10 3/4							26,53	29,80	33,69	34,34	39,51	43,36	45,92	46,56	52,91	54,81	56,07	58,59	61,73	64,86	71,07	77,24	81,52	
323,9	12 3/4							31,55	35,44	40,09	40,87	47,04	51,64	54,70	55,47	63,08	65,35	66,87	69,89	73,65	77,41	84,88	92,30	97,46	
339,7	13 3/8								37,20	42,08	42,89	49,37	54,21	57,43	58,23	66,24	68,63	70,22	73,40	77,36	81,30	89,16	96,97	102,41	



# SPIRALLY WELDED LINE PIPES

## Sizes

Outside Diameter	Wall Thickness	Length
508 mm - 3.048 mm	4,78 mm - 25,4 mm	Single lengths up to 24,50 m*

\* For piling pipes single lengths up to 50,0 m

## Production Standards & Material Qualities

API 5L	PSL1 - PSL2 GRA - X80 (N, M)
ISO 3183	L555 - X80 (N, M, ME)
GOST 20295	K34 - K60



## Coating Standards

- Dual Layer Abrasion Resistant FBE OD Coating: API 5L7, CSA Z 245-20, NACE RP 0394, AWWA C213
- FBE (Fusion Bonded Epoxy) OD Coating: API 5L7, CSA Z 245-20, NACE RP 0394, AWWA C213
- Polyethylene OD Coating: DIN 30670, TS 5139, NF A 49-710, UNI 9099, EN ISO 21809-1
- Polypropylene OD Coating: DIN 30678, NF A 49-711, EN ISO 21809-1
- Flow Coat Epox ID Coating: API RP 5L2, EN 10301
- Epoxy ID Coating: AWWA C 210

## Quality Certificates

- AD 2000 W0
- AD 2000 W4
- AD 2000 HP0
- ISO 3834-2

## Tests & Certificates

- Tensile Test
- Vickers Hardness Test
- Charpy Impact Test
- Weld Bend Test
- DWTT Test
- CTOD Test
- Macro and Micro Examination
- Chemical Analysis Test

## Production Range

OD	Wall Thickness (mm & inch)																									
	mm	4,78	5,16	5,56	6,35	7,14	7,92	8,74	9,52	10,31	11,13	11,91	12,70	13,49	14,27	15,00	16,66	17,48	18,26	19,05	20,62	22,23	23,83	25,40		
mm	inch	0.188	0.203	0.219	0.250	0.281	0.312	0.344	0.375	0.406	0.438	0.469	0.500	0.531	0.562	0.591	0.656	0.688	0.719	0.750	0.812	0.875	0.938	1		
508	20																									
559	22																									
610	24																									
660	26																									
711	28																									
762	30																									
813	32																									
864	34																									
914	36																									
965	38																									
1.016	40																									
1.067	42																									
1.118	44																									
1.168	46																									
1.219	48																									
1.270	50																									
1.321	52																									
1.372	54																									
1.422	56																									
1.524	60																									
1.626	64																									
1.676	66																									
1.727	68																									
1.829	72																									
2.032	80																									
2.083	82																									
2.235	88																									
2.540	100																									
2.794	110																									
3.048	120																									

up to 50,0 meter  
 up to 24,5 meter  
 Min. length 8 meters



# TUBES FOR PRESSURE PURPOSE / BOILER TUBES

## Sizes

Outside Diameter	Wall Thickness	Length
21,3 mm - 339,7 mm	2,0 mm - 12,7 mm	5,00 m - 18,30 m

## Production Standards & Material Qualities

ASTM A 178	GrA, GrC, GrD
EN 10217-1 (BS 3059 Part 1)	P195 TR1/TR2, P235 TR1/TR2, P265 TR1/TR2
EN 10217-2 (BS 3059 Part 2)	P195 GH, P235 GH, P265 GH
EN 10217-3	P355 N, P355 NH

## Quality Certificates

AD-2000 WO, AD-2000 W4, PED

## Finishing Operations

- Plain End-Square cut or bevelled
- Black self colored/uncoated
- Surface protective coating (black varnished)

## NDT Standards

UT (EN ISO 10893-11), ET (EN ISO 10893-2)



## Tests & Certificates

- Visual and Dimensional Inspection
- Mechanical Tests:
  - Tensile Test, Flattening Test, Flaring Test
  - Expanding Test
- Metallographic Examination
- Chemical Analysis
- Hydrostatic Test
- Non Destructive Inspection:
  - In-Line Ultrasonic (weld check)
  - Eddy Current
- Mill Test Certificates  
Acc. to EN 10204 2.1; 2.2; 3.1; 3.2  
PED Certified-Pressure Equipment Directive 2014/68/eu Certified

## Production Range

OD mm	Wall Thickness (mm)																	
	2,0	2,3	2,6	2,9	3,2	3,6	4,0	4,5	5,0	5,5	6,0	7,1	8,0	8,8	10,0	11,0	12,0	12,7
21,3																		
25,4																		
26,9																		
31,8																		
33,7																		
42,4																		
44,5																		
48,3																		
51,0																		
57,0																		
60,3																		
63,5																		
73,0																		
76,1																		
82,5																		
88,9																		
101,6																		
114,3																		
127,0																		
133,0																		
139,7																		
141,3																		
159,0																		
168,3																		
177,8																		
219,1																		
244,5																		
273,1																		
323,9																		
339,7																		

Please contact our sales department for tolerances.





WATER TRANSMISSION





# ERW WATER PIPES

## Sizes

Outside Diameter	Wall Thickness	Length
21,3 mm - 339,7 mm	2,0 mm - 12,7 mm	3,00 m - 18,30 m

## Production Standards & Material Qualities

- Production Norms  
EN 10224, EN 10255, ISO 65, ASTM A 53, ASTM A 795, ASTM A 589
- Galvanizing Norms  
EN 10240, EN ISO 1461 (BS 729), ASTM A 53, NFA 49-700, UNI 5745
- Production Standard For Threading and Coupling (1/2"-6")  
ISO 7/1, ANSI B.1.20.1, EN 10255
- Grooving (3/4"-12") according to Victaulic Standard.
- Our Medium Series Pipes can be used up to 25 bar operating pressure for water.
- Material Qualities  
DIN 17100 St 37, St 44, St 52  
EN 10025 S 195, S 235, S 275, S 355  
Gr A, Gr B



## Production Range (EN 10255)

Outside Diameter (mm)	Nominal Bore		Wall Thickness (mm)									
	(mm)	(inch)	2,0	2,3	2,6	2,9	3,2	3,6	4,0	4,5	5,0	5,4
21,3	15	1/2	L2	L/L1	M		H					
26,9	20	3/4		L2/L1/L	M		H					
33,7	25	1			L2	L/L1	M		H			
42,4	32	1 1/4			L2	L/L1	M		H			
48,3	40	1 1/2				L2/L1	M		H			
60,3	50	2				L2	L/L1	M		H		
76,1	65	2 1/2					L2/L1	M		H		
88,9	80	3					L2/L	L1	M		H	
114,3	100	4						L2/L	L1	M		H
139,7	125	5								L	M	H
165,1	150	6								L	M	H

- H Heavy Series
- M Medium Series
- L Light Series

Unit Weights for Black Plain End Pipes						
Outside Diameter (inch)	Outside Diameter (mm)	Unit Weights L Series (kg/mt)	Unit Weights L1 Series (kg/mt)	Unit Weights L2 Series (kg/mt)	Unit Weights M Series (kg/mt)	Unit Weights H Series (kg/mt)
1/2	21,30	1,08	1,08	0,95	1,21	1,44
3/4	26,90	1,40	1,39	1,38	1,56	1,87
1	33,70	2,20	2,20	1,98	2,41	2,93
1 1/4	42,40	2,82	2,82	2,54	3,10	3,79
1 1/2	48,30	3,25	3,24	3,23	3,56	4,37
2	60,30	4,51	4,49	4,08	5,03	6,19
2 1/2	76,10	5,75	5,73	5,71	6,42	7,93
3	88,90	6,76	7,55	6,72	8,36	10,30
4	114,30	9,83	10,80	9,75	12,20	14,50
5	139,70	15,00			16,60	17,90
6	165,10	17,80			19,80	21,30

## Tests & Certificates

- Visual and Dimensional Inspection
- Leak tightness testing: Hydrostatic Test, Eddy Current Test
- Destructive Tests: Flattening, Bending
- Mechanical Tests
- Chemical Analysis
- Metallographic Examination
- Others as required by the standards
- Ultrasonic weld seam test if applicable for gas pipes
- Mill Test Certificates  
- Issued upon request according to EN 10204 2.1; 2.2; 3.1; 3.2
- NDT Standards:  
- ET (EN ISO 10893-2), ET (ASTM E309)

## Finishing Operations

- Plain end (square cut or bevelled)
- Threaded and coupled (Max OD: 168.3 mm)
- Grooved
- Outside protective coating (black or red varnished), temporary oil application  
(Other colors are available upon request.)
- Hot dip galvanizing
- PE, PP Coating
- Bare Pipe (Uncoated)



TABLE X2.2 Dimensions, Weights (Masses) per Unit Length, and Test Pressures for Plain-End Pipe

NPS Designator	DN Designator	Specified Outside Diameter, in (mm)	Specified Wall Thickness, in (mm)	Nominal Weight (Mass) per Unit Length, Plain End, lb/ft (kg/m)	Weight Class	Schedule No.	Test Pressure, psi (kPa)	
							Grade A	Grade B
1/2	15	0.840 (21.3)	0.109 (2.77)	0.85 (1.27)	STD	40	700 (4800)	700 (4800)
			0.147 (3.73)	1.09 (1.62)	XS	80	850 (5900)	850 (5900)
			0.188 (4.78)	1.31 (1.95)	...	160	900 (6200)	900 (6200)
			0.294 (7.47)	1.72 (2.55)	XXS	...	1000 (6900)	1000 (6900)
3/4	20	1.050 (26.7)	0.113 (2.87)	1.13 (1.69)	STD	40	700 (4800)	700 (4800)
			0.154 (3.91)	1.48 (2.20)	XS	80	850 (5900)	850 (5900)
			0.219 (5.56)	1.95 (2.90)	...	160	950 (6500)	950 (6500)
			0.308 (7.82)	2.44 (3.64)	XXS	...	1000 (6900)	1000 (6900)
1	25	1.315 (33.4)	0.133 (3.38)	1.68 (2.50)	STD	40	700 (4800)	700 (4800)
			0.179 (4.55)	2.17 (3.24)	XS	80	850 (5900)	850 (5900)
			0.250 (6.35)	2.85 (4.24)	...	160	950 (6500)	950 (6500)
			0.358 (9.09)	3.66 (5.45)	XXS	...	1000 (6900)	1000 (6900)
1 1/4	32	1.660 (42.2)	0.140 (3.56)	2.27 (3.39)	STD	40	1200 (8300)	1300 (9000)
			0.191 (4.85)	3.00 (4.47)	XS	80	1800 (12400)	1900 (13000)
			0.250 (6.35)	3.77 (5.61)	...	160	1900 (13100)	2000 (13800)
			0.382 (9.70)	5.22 (7.77)	XXS	...	2200 (15200)	2300 (15900)
1 1/2	40	1.900 (48.3)	0.145 (3.68)	2.72 (4.05)	STD	40	1200 (8300)	1300 (9000)
			0.200 (5.08)	3.63 (5.41)	XS	80	1800 (12400)	1900 (13100)
			0.281 (7.14)	4.86 (7.25)	...	160	1950 (13400)	2050 (14100)
			0.400 (10.16)	6.41 (9.56)	XXS	...	2200 (15200)	2300 (15900)
2	50	2.375 (60.3)	0.154 (3.91)	3.66 (5.44)	STD	40	2300 (15900)	2500 (17200)
			0.218 (5.54)	5.03 (7.48)	XS	80	2500 (17200)	2500 (17200)
			0.344 (8.74)	7.47 (11.11)	...	160	2500 (17200)	2500 (17200)
			0.436 (11.07)	9.04 (13.44)	XXS	...	2500 (17200)	2500 (17200)
2 1/2	65	2.875 (73.0)	0.203 (5.16)	5.80 (8.63)	STD	40	2500 (17200)	2500 (17200)
			0.276 (7.01)	7.67 (11.41)	SXS	80	2500 (17200)	2500 (17200)
			0.375 (9.52)	10.02 (14.90)	...	160	2500 (17200)	2500 (17200)
			0.552 (14.02)	13.71 (20.39)	XXS	...	2500 (17200)	2500 (17200)
3	80	3.500 (88.9)	0.125 (3.18)	4.51 (6.72)	...	...	1290 (8900)	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 (15600)
			0.216 (5.49)	7.58 (11.29)	STD	40	2220 (15300)	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)	XS	80	2500 (17200)	2500 (17200)
			0.438 (11.13)	14.34 (21.35)	...	160	2500 (17200)	2500 (17200)
			0.600 (15.24)	18.60 (27.68)	XXS	...	2500 (17200)	2500 (17200)
			0.125 (3.18)	5.18 (7.72)	...	...	1120 (7700)	1310 (9000)
			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)	STD	40	2030 (14000)	2370 (16300)			
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)	XS	80	2800 (19300)	2800 (19300)			
4	100	4.500 (114.3)	0.125 (3.18)	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)	STD	40	1900 (13100)	2210 (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)	XS	80	2700 (18600)	2800 (19300)
			0.438 (11.13)	19.02 (28.32)	...	120	2800 (19300)	2800 (19300)
			0.531 (13.49)	22.53 (33.54)	...	160	2800 (19300)	2800 (19300)
			0.674 (17.12)	27.57 (41.03)	XXS	...	2800 (19300)	2800 (19300)
5	125	5.563 (141.3)	0.156 (3.96)	9.02 (13.41)	...	...	1010 (7000)	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)	STD	40	1670 (11500)	1950 (13400)
			0.281 (7.14)	15.87 (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)	XS	80	2430 (16800)	2800 (19300)
			0.500 (12.70)	27.06 (40.28)	...	120	2800 (19300)	2800 (19300)

NPS Designator	DN Designator	Specified Outside Diameter, in (mm)	Specified Wall Thickness, in (mm)	Nominal Weight (Mass) per Unit Length, Plain End, lb/ft (kg/m)	Weight Class	Schedule No.	Test Pressure, psi (kPa)	
							Grade A	Grade B
6	150	6.625 (168.3)	0.625 (15.88)	32.99 (49.11)	...	160	2800 (19300)	2800 (19300)
			0.750 (19.05)	38.59 (57.43)	XXS	...	2800 (19300)	2800 (19300)
			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)	STD	40	1520 (10500)	1780 (12300)
			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)	XS	80	2350 (16200)	2740 (18900)
			0.562 (14.27)	36.43 (54.20)	...	120	2800 (19300)	2800 (19300)
			0.719 (18.26)	45.39 (67.56)	...	160	2800 (19300)	2800 (19300)
8	200	8.625 (219.1)	0.864 (21.95)	53.21 (79.22)	XXS	...	2800 (19300)	2800 (19300)
			0.188 (4.78)	16.96 (25.26)	...	...	780 (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)	...	30	1160 (7800)	1350 (9300)
			0.312 (7.92)	27.73 (41.24)	...	...	1300 (9000)	1520 (10500)
			0.322 (8.18)	28.58 (42.55)	STD	40	1340 (9200)	1570 (10800)
			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)
			0.438 (11.13)	38.33 (57.08)	...	...	1830 (12600)	2130 (14700)
0.500 (12.70)	43.43 (64.64)	XS	80	2090 (14400)	2430 (16800)			
0.594 (15.09)	51.00 (75.92)	...	100	2500 (17200)	2800 (19300)			
0.719 (18.26)	60.77 (90.44)	...	120	2800 (19300)	2800 (19300)			
0.812 (20.62)	67.82 (100.92)	...	140	2800 (19300)	2800 (19300)			
0.875 (22.22)	72.49 (107.88)	XXS	...	2800 (19300)	2800 (19300)			
0.906 (23.01)	74.76 (111.27)	...	160	2800 (19300)	2800 (19300)			
10	250	10.750 (273.0)	0.188 (4.78)	21.23 (31.62)	...	...	630 (4300)	730 (5000)
			0.203 (5.16)	22.89 (34.08)	...	...	680 (4700)	800 (5500)
			0.219 (5.56)	24.65 (36.67)	...	...	730 (5000)	860 (5900)
			0.250 (6.35)	28.06 (41.75)	...	20	840 (5800)	980 (6800)
			0.279 (7.09)	31.23 (46.49)	...	...	930 (6400)	1090 (7500)
			0.307 (7.80)	34.27 (51.01)	...	30	1030 (7100)	1200 (8300)
			0.344 (8.74)	38.27 (56.96)	...	...	1150 (7900)	1340 (9200)
			0.365 (9.27)	40.52 (60.29)	STD	40	1220 (8400)	1430 (9900)
			0.438 (11.13)	48.28 (71.87)	...	...	1470 (10100)	1710 (11800)
			0.500 (12.70)	54.79 (81.52)	XS	80	1670 (11500)	1950 (13400)
			0.594 (15.09)	64.49 (95.97)	...	60	1990 (13700)	2320 (16000)
			0.719 (18.26)	77.10 (114.70)	...	100	2410 (16600)	2800 (19300)
0.844 (21.44)	89.38 (133.00)	...	120	2800 (19300)	2800 (19300)			
1.000 (25.40)	104.23 (155.09)	XXS	140	2800 (19300)	2800 (19300)			
1.125 (28.57)	115.75 (172.21)	...	160	2800 (19300)	2800 (19300)			
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)	...	...	930 (6400)	1090 (7500)
			0.344 (8.74)	45.62 (67.90)	...	...	970 (6700)	1130 (7800)
			0.375 (9.52)	49.61 (73.78)	STD	...	1060 (7300)	1240 (8500)
			0.406 (10.31)	53.57 (79.70)	...	40	1150 (7900)	1340 (9200)
			0.438 (11.13)	57.65 (85.82)	...	...	1240 (8500)	1440 (9900)
			0.500 (12.70)	65.48 (97.43)	XS	...	1410 (9700)	1650 (11400)
			0.562 (14.27)	73.22 (108.92)	...	60	1590 (11000)	1850 (12800)
0.688 (17.48)	88.71 (132.04)	...	80	1940 (13400)	2270 (15700)			
0.844 (21.44)	107.42 (159.86)	...	100	2390 (16500)	2780 (19200)			
1.000 (25.40)	125.61 (186.91)	XXS	120	2800 (19300)	2800 (19300)			
1.125 (28.57)	139.81 (208.00)	...	140	2800 (19300)	2800 (19300)			
1.312 (33.32)	160.42 (238.68)	...	160	2800 (19300)	2800 (19300)			



## A795/A795M

**TABLE 1 Dimensions, Weights, and Test Pressure For Light -Weight Fire Protection Pipe- Schedule 10**

NPS Designator	DN Designator	Outside Diameter		Nominal Wall Thickness		Weight Plain End		Furnace-Welded	Seamless and Electric-Resistance-Welded		
		in.	mm	in.	mm	lb/ft	kg/m		psi	kPa	kPa
3/4	20	1.050	(26.7)	0.083	(2.11)	0.86	(1.28)	500	(3400)	700	(4800)
1	25	1.315	(33.4)	0.109	(2.77)	1.41	(2.09)	500	(3400)	700	(4800)
1 1/4	32	1.660	(42.2)	0.109	(2.77)	1.81	(2.69)	500	(3400)	1000	(6900)
1 1/2	40	1.900	(48.3)	0.109	(2.77)	2.09	(3.11)	500	(3400)	1000	(6900)
2	50	2.375	(60.3)	0.109	(2.77)	2.64	(3.93)	500	(3400)	1000	(6900)
2 1/2	65	2.875	(73.0)	0.120	(3.05)	3.53	(5.26)	500	(3400)	1000	(6900)
3	80	3.500	(88.9)	0.120	(3.05)	4.34	(6.46)	500	(3400)	1000	(6900)
3 1/2	90	4.000	(101.6)	0.120	(3.05)	4.98	(7.41)	500	(3400)	1200	(8300)
4	100	4.500	(114.3)	0.120	(3.05)	5.62	(8.37)	500	(3400)	1200	(8300)
5	125	5.563	(141.3)	0.134	(3.40)	7.78	(11.58)	B	B	1200	(8300)
6	150	6.625	(168.3)	0.134	(3.40)	9.30	(13.85)	B	B	1000	(6900)
8	200	8.625	(219.1)	0.188C	(4.78)	16.96	(25.26)	B	B	800	(5500)
10	250	10.750	(273.1)	0.188C	(4.78)	21.23	(31.62)	B	B	700	(4800)

**TABLE 2 Dimensions,Weights, Test Pressures For Standard-Weight Fire Protection Pipe -Schedule 30 and Schedule 40**

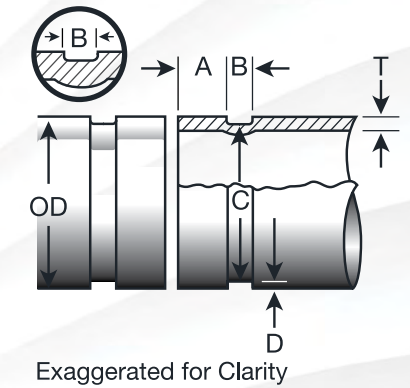
NPS Designator	DN Designator	Specified Outside Diameter		Nominal Wall Thickness		Weight Plain End		Weight Threaded and Coupled		Furnace-Welded	Seamless and Electric-Resistance-Welded		
		in.	mm	in.	mm	lb/ft	kg/m	lb/ft	kg/m		psi	kPa	kPa
1/2	15	0.840	(21.3)	0.109	(2.77)	0.85	(1.27)	0.85	(1.27)	700	(4800)	700	(4800)
3/4	20	1.050	(26.7)	0.113	(2.87)	1.13	(1.69)	1.13	(1.68)	700	(4800)	700	(4800)
1	25	1.315	(33.4)	0.133	(3.38)	1.68	(2.50)	1.68	(2.50)	700	(4800)	700	(4800)
1 1/4	32	1.660	(42.2)	0.140	(3.56)	2.27	(3.39)	2.28	(3.40)	1000	(6900)	1000	(6900)
1 1/2	40	1.900	(48.3)	0.145	(3.68)	2.72	(4.05)	2.73	(4.07)	1000	(6900)	1000	(6900)
2	50	2.375	(60.3)	0.154	(3.91)	3.66	(5.45)	3.69	(5.50)	1000	(6900)	1000	(6900)
2 1/2	65	2.875	(73.0)	0.203	(5.16)	5.80	(8.64)	5.83	(8.68)	1000	(6900)	1000	(6900)
3	80	3.500	(88.9)	0.216	(5.49)	7.58	(11.29)	7.62	(11.35)	1000	(6900)	1000	(6900)
3 1/2	90	4.000	(101.6)	0.226	(5.74)	9.12	(13.58)	9.21	(13.71)	1200	(8300)	1200	(8300)
4	100	4.500	(114.3)	0.237	(6.02)	10.80	(16.09)	10.91	(16.25)	1200	(8300)	1200	(8300)
5	125	5.563	(141.3)	0.258	(6.55)	14.63	(21.79)	14.82	(22.07)	C	C	1200	(8300)
6	150	6.625	(168.3)	0.280	(7.11)	18.99	(28.29)	19.20	(28.60)	C	C	1200	(8300)
8	200	8.625	(219.1)	0.277A	(7.04)	24.72	(36.82)	25.57	(38.09)	C	C	1200	(8300)
10	250	10.750	(273.1)	0.307A	(7.80)	34.27	(51.05)	35.78	(53.29)	C	C	1000	(6900)

## FIRE SPRINKLER PIPES - FIRESIST®



### Sizes

Outside Diameter	Wall Thickness
26,9 mm - 323,9 mm	2,00 mm - 12,70 mm



### Technical Specifications

- FM approved
- UL/C-UL Listed
- NFS certified
- Tight tolerances
- Consistent wall thickness, straightness, roundness
- CE, PED certified
- Pressure tested
- Reliable high steel quality
- Galvanised sandblasted varnished coated black, red (RAL 3000, RAL 3002, RAL 3009) or grey (RAL 7012)
- Plain Ends, Grooved or Threaded & Coupled
- Custom length availability



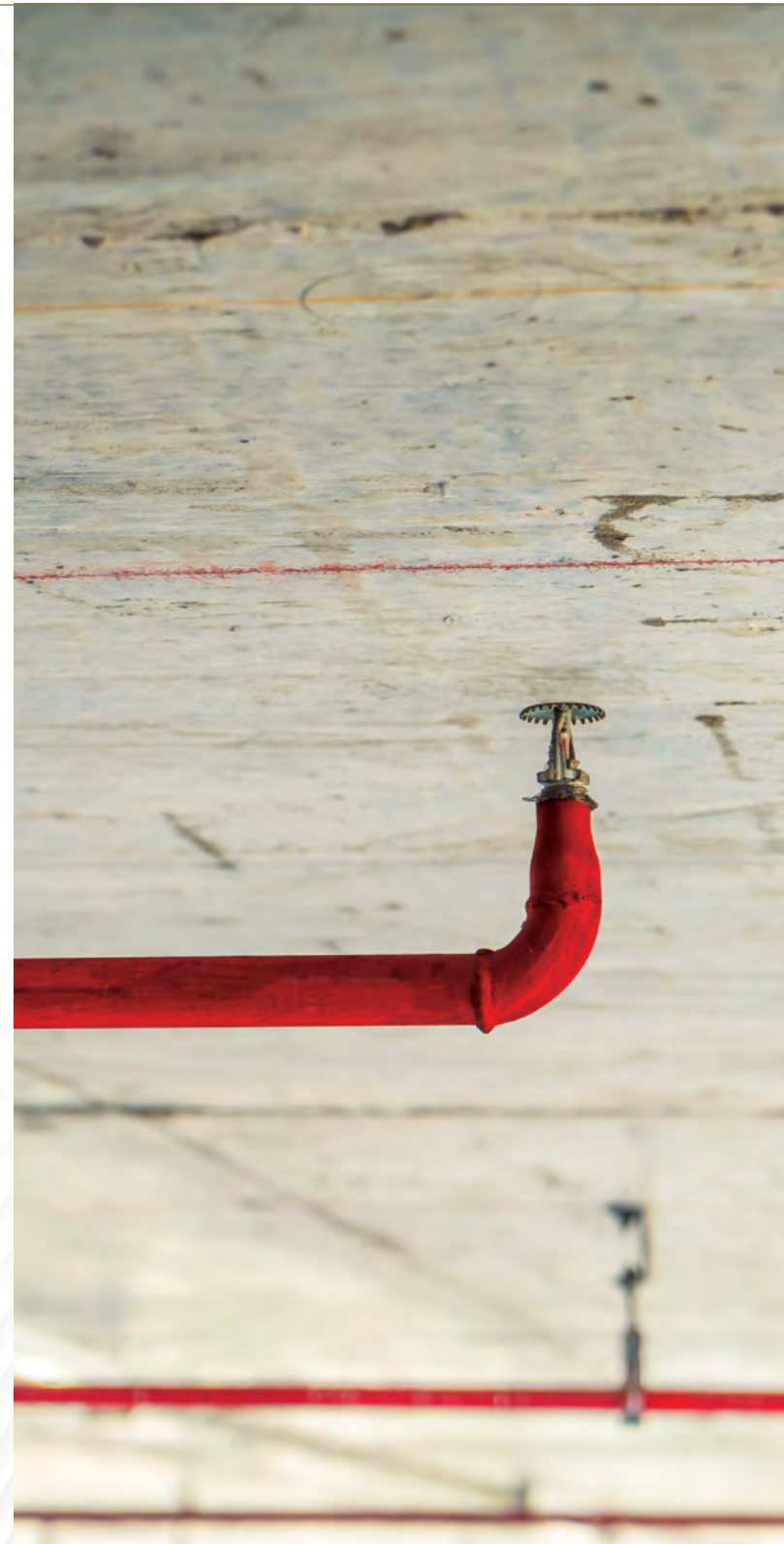


## EN FM & UL

	OD (mm)	Wall Thickness (mm)	FM	UL
Light Wall	33,7	2,0	✓	
	33,7	2,6	✓	
	42,4	2,0	✓	
	42,4	2,3	✓	
	42,4	2,6	✓	
	48,3	2,0	✓	
	48,3	2,6	✓	
	60,3	2,0	✓	
	60,3	2,9	✓	
	76,1	2,18	✓	
	76,1	2,9	✓	
	88,9	2,36	✓	
	88,9	3,2	✓	
	114,3	2,6	✓	
	114,3	3,6	✓	
139,7	3,4	✓		

	OD (mm)	Wall Thickness (mm)	FM	UL
EN 10255 Medium	33,7	3,2	✓	✓
	42,4	3,2	✓	✓
	48,3	3,2	✓	✓
	60,3	3,6	✓	✓
	76,1	3,6	✓	✓
	88,9	4,0	✓	✓
	114,3	4,5	✓	✓
	139,7	5,0	✓	✓
	165,1	5,0	✓	✓

	OD (mm)	Wall Thickness (mm)	FM	UL
EN 10255 Heavy	21,3	3,2	✓	
	26,9	3,2	✓	
	33,7	4,0	✓	
	42,4	4,0	✓	
	48,3	4,0	✓	
	60,3	4,5	✓	
	76,1	4,5	✓	
	88,9	5,0	✓	
	114,3	5,4	✓	
	139,7	5,4	✓	
	165,1	5,4	✓	



## ASTM FM & UL

	Nominal Sizes (inch)	OD (mm)	Wall Thickness (inch)	Wall Thickness mm	Weight lb/ft	Weight kg/mt PE	FM	UL	
Light Wall	1	33,4	0.102	2,60	1,34	1,99	✓		
	1 1/4	42,2	0.091	2,30	1,53	2,27	✓		
	1 1/4	42,2	0.102	2,60	1,71	2,55	✓		
	1 1/2	48,3	0.102	2,60	1,97	2,93	✓		
	2	60,3	0.114	2,90	2,76	4,10	✓		
	2 1/2	73	0.114	2,90	3,52	5,23	✓		
	3	88,9	0.126	3,20	4,54	6,76	✓		
	4	114,3	0.142	3,60	6,60	9,83	✓		
	5	141,3	0.134	3,40	7,68	11,43	✓		
	1	33,4	0.079	2,00	1,05	1,56	✓		
SCH 7	1 1/4	42,2	0.079	2,00	1,34	1,99	✓		
	1 1/2	48,3	0.084	2,13	1,63	2,43	✓		
	2	60,3	0.084	2,13	2,05	3,06	✓		
	2 1/2	73	0.086	2,18	2,67	3,97	✓		
	3	88,9	0.093	2,36	3,38	5,04	✓		
4	114,3	0.108	2,60	4,81	7,16	✓			
SCH 10	3/4"	26,7	0.083	2,11	0,86	1,28	✓	✓	
	1"	33,4	0.109	2,77	1,41	2,09	✓	✓	
	1 1/4"	42,2	0.109	2,77	1,81	2,69	✓	✓	
	1 1/2"	48,3	0.109	2,77	2,09	3,11	✓	✓	
	2"	60,3	0.109	2,77	2,64	3,93	✓	✓	
	2 1/2"	73	0.120	3,05	3,53	5,26	✓	✓	
	3"	88,9	0.120	3,05	4,34	6,46	✓	✓	
	3 1/2"	101,6	0.120	3,05	4,98	7,41	✓	✓	
	4"	114,3	0.120	3,05	5,62	8,37	✓	✓	
	5"	141,3	0.134	3,4	7,78	11,58	✓	✓	
	6"	168,3	0.134	3,4	9,30	13,85	✓	✓	
	8"	219,1	0.188	4,78	16,96	25,26	✓	✓	
	10"	273,1	0.188	4,78	21,23	31,62	✓	✓	
	12"	323,8	0.188	4,78	25,28	37,61	✓	✓	
	SCH 30	1"	33,4	0.114	2,9	1,46	2,18	✓	
1 1/4"		42,2	0.117	2,97	1,93	2,87	✓		
1 1/2"		48,3	0.125	3,18	2,37	3,53	✓		
2"		60,3	0.125	3,18	3,00	4,48	✓		
2 1/2"		73	0.188	4,78	5,40	8,04	✓		
3"		88,9	0.188	4,78	6,65	9,92	✓		
3 1/2"		101,6	0.188	4,78	7,65	11,41	✓		
4"		114,3	0.188	4,78	8,66	12,91	✓		
8"		219,1	0.277	7,04	24,70	36,81	✓		
10"		273,1	0.307	7,8	34,24	51,03	✓		
12"		323,8	0.33	8,38	43,77	65,20	✓		
SCH 40		1/2"	21,3	0.109	2,77	0,85	1,27	✓	✓
		3/4"	26,7	0.113	2,87	1,13	1,69	✓	✓
		1"	33,4	0.133	3,38	1,68	2,50	✓	✓
		1 1/4"	42,2	0.140	3,56	2,27	3,39	✓	✓
	1 1/2"	48,3	0.145	3,68	2,72	4,05	✓	✓	
	2"	60,3	0.154	3,91	3,66	5,45	✓	✓	
	2 1/2"	73	0.203	5,16	5,80	8,64	✓	✓	
	3"	88,9	0.216	5,49	7,58	11,29	✓	✓	
	3 1/2"	101,6	0.226	5,74	9,12	13,58	✓	✓	
	4"	114,3	0.237	6,02	10,80	16,09	✓	✓	
	5"	141,3	0.258	6,55	14,63	21,79	✓	✓	
	6"	168,3	0.280	7,11	18,99	28,29	✓	✓	
	8"	219,1	0.322	8,18	30,45	45,34	✓	✓	
	10"	273,1	0.365	9,27	40,52	60,29	✓	✓	
	SCH 80	1/2"	21,3	0.147	3,73	1,09	1,62	✓	
3/4"		26,7	0.154	3,91	1,47	2,20	✓		
1"		33,4	0.179	4,55	2,19	3,25	✓		
1 1/4"		42,2	0.191	4,85	3,03	4,49	✓		
1 1/2"		48,3	0.200	5,08	3,65	5,39	✓		
2"		60,3	0.218	5,54	5,08	7,55	✓		
2 1/2"		73	0.276	7,01	7,75	11,52	✓		
3"		88,9	0.300	7,62	10,35	15,39	✓		
3 1/2"		101,6	0.318	8,08	12,67	18,82	✓		
4"		114,3	0.337	8,56	15,20	22,60	✓		
5"		141,3	0.375	9,52	21,04	31,42	✓		
6"		168,3	0.432	10,97	28,88	43,05	✓		
8"		219,1	0.500	12,70	44,00	65,41	✓		



# WATER WELL CASING PIPES

## Sizes

Outside Diameter	Wall Thickness	Length
33,4 mm - 323,9 mm	3,2 mm - 9,5 mm	6,00 m - 18,30 m

## Production Standards & Material Qualities

- ASTM A 589 Type I, II, III, IV Production Standard
- Reliable High Steel Quality
- From Grade A or Grade B Material Quality
- Weldable
- Threadable

## Finishing Operations

- Threaded Option up to 6"
- Hot Dip Galvanised Option up to 6"

## Tests & Certificates

- Visual and Dimensional Inspection
- Leak tightness testing: Hydrostatic Test, Eddy Current Test
- Destructive Tests: Flattening, Bending
- Mechanical Tests
- Chemical Analysis
- Metallographic Examination
- Others as required by the standards
- Mill Test Certificates
  - Issued upon request according to EN 10204 2.1; 2.2; 3.1; 3.2
- NDT Standards:
  - ET (EN ISO 10893-2), ET (ASTM E309)

## Product Options Weight per Foot (Lbs)

Nominal Size	Wall Thickness	Threaded and Coupled	Plain End
1	0.133	1.69	1.68
1-1/4	0.140	2.28	2.27
1-1/2	0.145	2.74	2.72
2	0.154	3.68	3.65
2-1/2	0.203	5.85	5.79
3	0.216	7.68	7.58
3-1/2	0.226	9.27	9.11
4	0.237	10.92	10.79
5	0.258	14.90	14.63
6	0.280	19.34	18.99
8	0.322	-	28.58
10	0.365	-	40.52
12	0.375	-	49.61



# SPIRALLY WELDED WATER LINE PIPES

## Sizes

Outside Diameter	Wall Thickness	Length
508 mm - 3.048 mm	5,16 mm - 25,4 mm	Single lengths up to 24,50 m

## Production Standards & Material Qualities

EN 10217-1	P195 - P265 TR1&TR2
EN 10224	L235 - L355
AWWA C 200	Grade 30 - Grade 50
UNI 6363	Fe 360 - Fe 510

\*Production Range: See page 21

## Coating Standards

- Dual Layer Abrasion Resistant FBE OD Coating: API 5L7, CSA Z 245-20, NACE RP 0394, AWWA C213
- FBE (Fusion Bonded Epoxy) OD Coating: API 5L7, CSA Z 245-20, NACE RP 0394, AWWA C213
- Polyethylene OD Coating: DIN 30670, TS 5139, NF A 49-710, UNI 9099, EN ISO 21809-1
- Polypropylene OD Coating: DIN 30678, NF A 49-711, EN ISO 21809-1
- Flow Coat Epox ID Coating: API RP 5L2, EN 10301
- Epoxy ID Coating: AWWA C 210
- Cement Mortar: AWWA C 205, DIN 2614, BS 534, EN 10298





CONSTRUCTION





# CIRCULAR HOLLOW SECTIONS

## Sizes

### Circular Hollow Sections

Outside Diameter	Wall Thickness	Length
21,3 mm - 339,7 mm	2,0 mm - 12,7 mm	5,00 m - 12,0 m

## Production Standards & Material Qualities

EN 10305-5	E 195, E 235, E 275, E 355
BS EN 10029	GR 43 C
ASTM A 500	GR A, GR B, GR C
EN 10219 (BS 6363)	S 235, S 275, S 355, S 460 MH, NH (J0H, JRH, J2H, K2H, GR 34/26, GR 43/36)



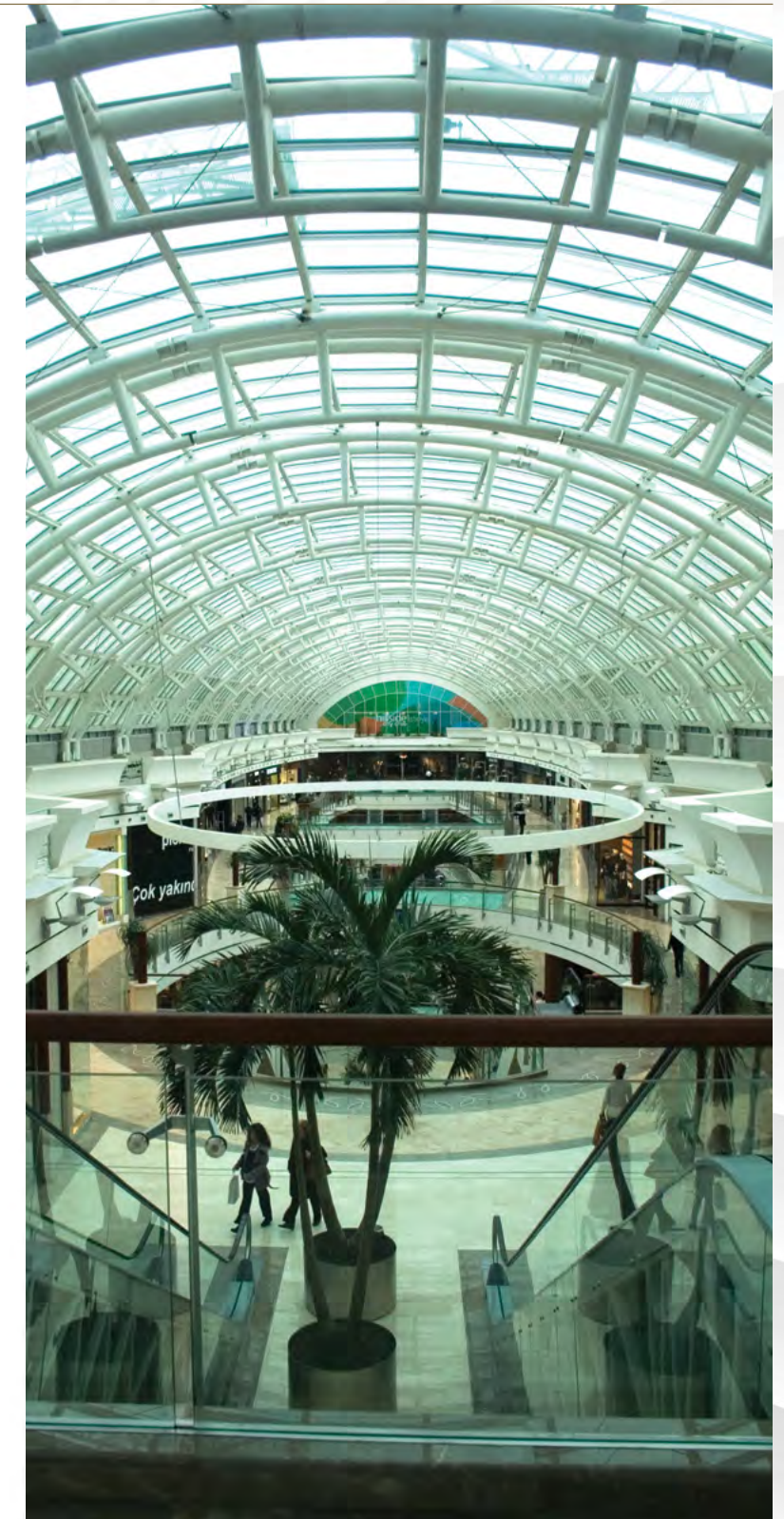
## Tests & Certificates

- Visual and Dimensional Inspection
- Mechanical Tests:
  - Tensile Test
  - Flattening Test, Flaring Test
  - Expanding Test
  - Impact Test
- Metallographic Examination
- Chemical Analysis
- Non Destructive Inspection: In-Line Ultrasonic (weld check)
  - In-Line and offline Eddy Current (for round tubes)
- Mill Test Certificates
  - According to EN 10204 2.1; 2.2; 3.1; 3.2
- NDT Standards
  - ET (ISO 10893-2)
- Quality Certificates
  - EN 10219 - EN10210 CE marked

## Finishing Operations

Plain End-Square cut or bevelled  
Black, self-colored/uncoated

Mill protective oil coating; for both round, square and rectangular tubes, black varnish for outside surface of round tubes.





## Production Range (EN 10219)

OD mm	Wall Thickness (mm)																		
	2,0	2,5	2,7	2,9	3,0	3,2	3,6	4,0	5,0	5,5	6,0	7,0	8,0	8,5	9,20	10,0	11,0	12,0	12,7
21,3																			
25,0																			
26,9																			
32,0																			
33,7																			
38,0																			
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48,3																			
51,0																			
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60,3																			
63,5																			
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76,1																			
82,5																			
88,9																			
101,6																			
114,3																			
127,0																			
133,0																			
139,7																			
141,3																			
159,0																			
165,1																			
168,3																			
177,8																			
219,1																			
244,5																			
273,0																			
323,9																			
339,7																			



## SELF ANCHOR

### Sizes

Outer Diameter	Wall Thickness
1/2" - 3"	S355JRH up to 7.2 mm
	28Mn6 up to 6.1 mm

### Production Standards

EN 10210  
EN 10219-1





# FOUNDATION / PILING TUBES

## Sizes

### For Spirally Welded Pipes

Outside Diameter	Wall Thickness	Length
508 mm - 3.048 mm	5,16 mm - 25,4 mm	Single lengths up to 50,0 m

### For ERW micro Piling Pipes

Outside Diameter	Wall Thickness	Length
21,3 mm - 339,7 mm	2,8 mm - 12,7 mm	6,00 m - 18,30 m



## Production Standards & Material Qualities

EN 10219-1	Grade including S355, J2H, S460 MH, S550 J2H
EN 10219-1	CE marking according to S355, S460 MH
ASTM A252	Grade including Grade 3
Inner weld bead removed	

## Coating Standards

EN 12944 - 5

## Most Common Piling Tube Sizes

Diameter (mm)	Wall Thickness (mm)	kg/meter
76,1	6,3	10,84
88,9	6,3	12,83
114,3	6,3	16,78
114,3	8	20,97
139,7	8	25,98
139,7	10	31,99
168,3	10	39,04
168,3	12,5	48,03
219,1	10	51,57
219,1	12,5	63,69
273,0	10	64,86
273,0	12,5	80,30
323,9	10	77,41
323,9	12,5	95,99

Chemical (max)	C	Mn	P	S	CEV%
S 460 MH	0,20%	1,70%	0,035%	0,03%	0,46%
S 550 J2H	0,16%	2,20%	0,03%	0,03%	0,47%

Mechanical	Yield Strength (Mpa) min	Tensile Strength (Mpa) min	Elongation min	Impact Energy -20°C
S 460 MH	460	530-720	17%	40 Joule
S 550 J2H	550	605-760	14%	27 Joule



ENGINEERING TECHNOLOGIES





# ENGINEERING TECHNOLOGIES

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## Production Standards

- Welded Cold Sized Tubes : EN 10305-3
- Welded Cold Drawn Tubes : EN 10305-2
- Welded Cold Sized Square and Rectangular Tubes : EN 10305-5

Note: Other standards such as ASTM A513, JIS G 3445 etc. upon request

## Steel Grades

- Structural Steels : E235, E275, E355
- DQ Steels : DC01, DC03, DC04
- HSLA Steels : S315MC, S355MC, S420MC, S460MC, S500MC, S550MC, S600MC, S700MC
- Dual Phase Steels : DP500, DP600, DP800
- Heat Treatable Steels : 20MnB5, 22MnB5, 26MnB5, 30MnB5, 34MnB5
- Coated (Galvanized, aluminized) Steels : DX51, DX52, DX53, S220, S350

Note: Other grades upon request



## Tests & Inspections

- Visual Examination
- Dimensional Inspection
- Metallographic Inspection
- Tensile Test
- Drift Expanding / Flaring Test
- Flattening Test
- Hardness Testing (HV, HRB, HRC)
- Ultrasonic Testing
- Flanging Test
- Chemical Analysis
- Eddy Current Testing
- Surface Roughness Measurement

## Inspection Documents

- MTC (Mill Test Certificates) acc. to EN 10204 3.1; 2.2

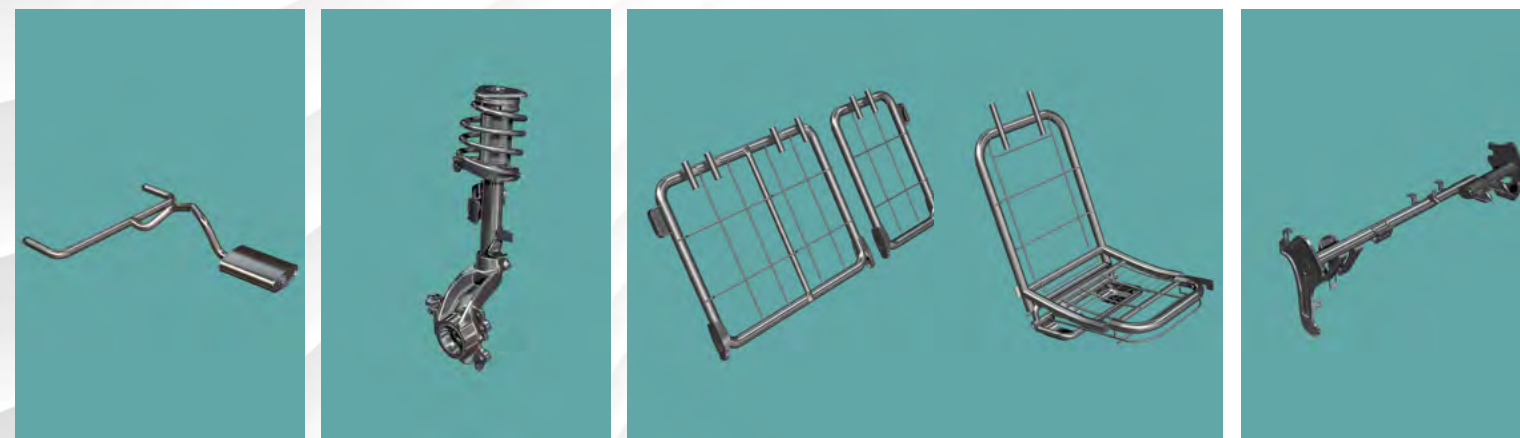


# AUTOMOTIVE TUBES

Borusan Mannesmann is a highly recognized manufacturer for its product and service quality in automotive industry. Our plants, one in Vobarno-Italy and one in Halkali-Turkey are specialized in production of value added precision tubes that are used in crucial parts of vehicles. Working together; our sales, quality and design teams manage all kinds of technical, schematic inquiries and come up with custom made solutions. As a reliable supplier of automotive sector for years Borusan Mannesmann's products are commonly used in; shock absorbers, cardan shafts, exhausts, gas springs, car&bus seat frames, head rests, door impact beams, cross car beams, steering columns and tie rods.



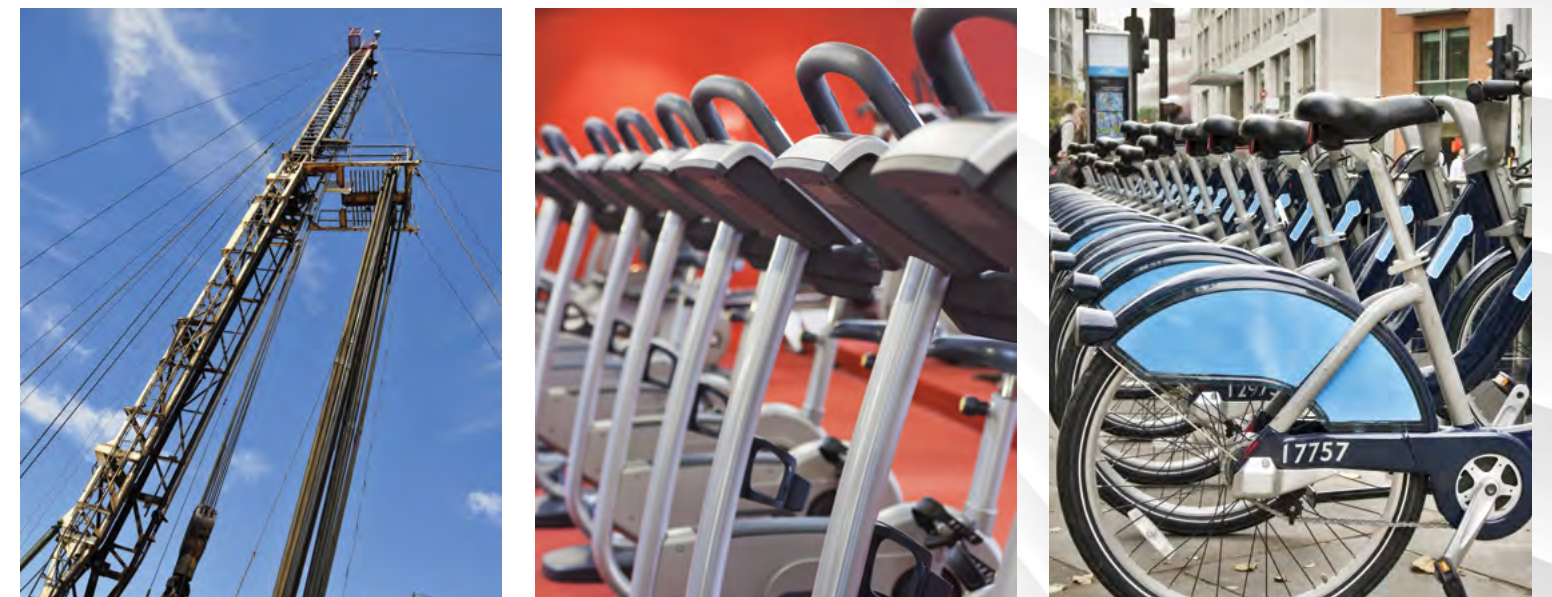
Door Impact Beams    Tie Rod Tubes    Cardan Shaft Tubes    Steering Column Tubes    Head Rest Tubes



Exhaust Tubes    Shock Absorber Tubes    Seat Frame Tubes    Cross Car Beams Tubes

# INDUSTRIAL APPLICATIONS

Borusan Mannesmann's wide production range in precision business, enables company to serve in various kinds of industries ranging from hydraulic - pneumatic applications and drilling to mechanical applications. We are proud of being a preferred supplier of these industries for years with our delicate approach in meeting the most stringent customer requirements.





## Welded Cold Sized Tubes for Precision Applications

OD mm	Wall Thickness (mm)																					
	0,7	0,8	0,9	1,00	1,10	1,20	1,30	1,40	1,50	1,60	1,70	1,80	1,90	2,00	2,20	2,40	2,50	2,60	2,80	3,00	3,30	3,50
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76																						
83																						
93																						

- S3 (Cold Rolled)
- S2 (Pickled)
- S1 (Black)

Welded Cold Sized Tubes (EN 10305-3)  
 Please contact our sales department for intermediate sizes.  
 Delivery Conditions:  
 + CR1 : Welded and cold sized, suitable for final annealing  
 + CR2 : Welded and cold sized, not intended for heat treatment  
 + N : Normalized  
 + A : Annealed

## Welded Cold Drawn Tubes for Precision Applications

OD mm	Wall Thickness (mm)																											
	0,7	0,8	0,9	1	1,25	1,5	1,75	2	2,25	2,5	2,75	3	3,25	3,5	4	4,25	4,5	5	5,5	6	6,5	7	7,5	8	8,5	9	10	
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101 - 105																												
106 - 110																												
111 - 120																												
121 - 130																												

Cold Drawn Welded Steel Tubes (EN 10305-2)  
 Please contact our sales department for intermediate sizes.  
 Delivery Conditions:  
 +C = Cold finished/hard  
 LC = Cold finished/soft  
 +N = Normalized  
 +SR = Cold finished and stress relieved  
 +A = Annealed  
 Steel Grades mainly used: E195, E235, E275, E355



## ASTM A 513 Mechanical Tubing (Type V-VI)

OD (inch)	Wall Thickness (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	
0.625																									
0.688																									
0.750																									
0.813																									
0.875																									
0.938																									
1.000																									
1.063																									
1.125																									
1.188																									
1.250																									
1.313																									
1.375																									
1.500																									
1.563																									
1.625																									
1.688																									
1.750																									
1.768																									
1.875																									
2.000																									
2.125																									
2.250																									
2.375																									
2.438																									
2.500																									
2.563																									
2.625																									
2.750																									
2.875																									
3.000																									
3.063																									
3.125																									
3.250																									
3.375																									
3.500																									
3.555																									
3.625																									
3.688																									
3.750																									
3.875																									
4.000																									
4.022																									
4.062																									
4.095																									
4.125																									
4.250																									
4.375																									
4.500																									
4.562																									
4.593																									
4.625																									
4.750																									
5.000																									
5.125																									

Delivery Conditions:  
M.D., S.S.I.D.  
M.D.: Mandrel Drawn  
S.S.I.D.: Special  
Smooth Inside  
Diameter  
Standard Norms  
Supplied: ASTM A 513  
Steel Grades Mainly  
Used: 1008-1040

Please contact our  
sales department for  
any inquiries.

## Welded Hollow Sections for Precision Applications (EN 10305-5)

Side Length b x h (mm)	Wall Thickness (mm)									
	0,8	0,9	1,00	1,20	1,50	2,00	2,50	3,00	3,50	4,00
8 x 20										
10 x 10										
10 x 15										
10 x 18										
10 x 20										
10 x 25										
10 x 30										
10 x 33										
10 x 35										
10 x 40										
10 x 50										
12,7 x 12,7										
15 x 15										
15 x 20										
15 x 25										
21 x 21										
15 x 30										
15 x 35										
15 x 40										
15 x 50										
16 x 16										
17 x 21										
17 x 35										
18 x 18										
18 x 30										
19 x 19										
20 x 20										
20 x 25										
20 x 30										
20 x 35										
20 x 40										
20 x 45										
20 x 50										
20 x 55										
20 x 80										
20 x 60										
23 x 30										
25 x 25										
25,4 x 25,4										
25,4 x 50,8										
25 x 30										
25 x 35										
25 x 40										
25 x 45										
25 x 50										
25 x 55										
25 x 60										
27 x 27										
30 x 30										
30 x 35										
30 x 40										
30 x 45										
30 x 50										
30 x 60										
30 x 70										
30 x 80										
30 x 90										
32 x 32										
32 x 60										
33 x 60										
35 x 35										
35 x 40										
35 x 45										
35 x 50										
35 x 75										
38 x 38										
40 x 40										
40 x 50										
40 x 60										
40 x 70										
40 x 80										
44,5 x 44,5										
45 x 45										
50 x 50										
50 x 60										
50 x 80										
50,8 x 50,8										
60 x 60										

— S3 (Cold Rolled)  
— S2 (Pickled)  
— S1 (Black)

Welded Cold Sized Square and Rectangular Tubes (EN 10305-5)  
Please contact our sales department for intermediate  
sizes and other shapes such as oval, flat oval etc.

Delivery Conditions:

+ CR1 : Welded and cold sized, suitable for final annealing  
+ CR2 : Welded and cold sized, not intended for heat treatment  
+ N : Normalized  
+ A : Annealed





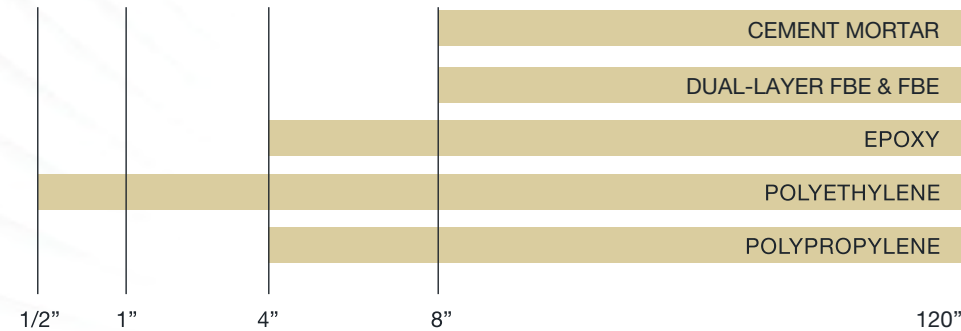
COATINGS AND LININGS



# COATINGS AND LININGS

## Scope and Field of Application

Borusan Mannesmann products are manufactured with modern equipments offering a wide range of anti-corrosive coatings. The below graph illustrates the type of coatings applied externally and internally according to standards and special customer requirements.



## Surface Preparation

The process enabling the appropriate surface cleanliness and smoothness level according to the type of coating is applied by blasting method. (Sa 2 1/2) (DIN 55928, SIS 55900)

## Galvanizing

Especially for water pipes, BMB Galvanizing operations are currently applied to export U.S and many of European countries. (ASTM A53, TS EN 10240)

## PE-PP Coating

Excellent protection for buried pipes, high mechanical strength and corrosion resistance. Low, medium or high-density polyethylene or polypropylene coating.

3 Layer Coating Method:

Layer 1: Electrostatic epoxy primer.

Layer 2: Extrusion adhesive wrapping for spiral, electrostatic adhesive layer for ERW.

Layer 3: Extrusion polyethylene or polypropylene wrapping for spiral, hot extrusion for ERW.

For PE: EN ISO 21809-1 (DIN 30670, NF A 49-710, UNI 9099)

For PP: EN ISO 21809-1 (DIN 30678, NFA 49-711)

## Flow-Coat Epoxy Lining

For gas transmission lines in order to reduce pipewall roughness thus increasing throughput. Average thickness 60 µm. (API RP 5L2)

## Epoxy

Various epoxy coatings enabling hygienic inner surface for potable water transportation and outer surface to resist soil or sea water corrosion. Coating thickness of up to 600 micron. (AWWA C 210, TS 5140, EN 12944-5)

## FBE-Fusion Bonded Epoxy

Provides high protection of pipe lines used for transmission of oil, gas and water. (AWWA C 213, API 5L7, CSA Z 245-20, NACE RP 0394)

## Dual-Layer Abrasion Resistant FBE

Dual layer fusion bonded epoxy provides a perfect abrasion and impact resistance, also maintains an excellent protection for gas-oil line pipes. (AWWA C 213, API 5L7, CSA Z 245-20, NACE RP 0394)

## Cement Mortar ID Coating

Specifically for potable water pipe lines cement mortar ID coating provides hygienic and excellent corrosion resistance and protection. On demand regular cement mortar ID coating or synthetic dispersion added special cement mortar ID coating can be applied. (AWWA C 205, DIN 2614, BS 534, TS 10298)

## Tests Performed

Coating Thickness	MFR and MVR Test	PE/PP Breaking Elongation Test
Holiday Testing	CD (Cathodic Disbondment Test)	PE Penetration Test
Impact Strength	DSC Test (Glass Transition Temperature Test)	PE/FBE/PP Impact Test
Bond Strength	Manuel Holiday Test	Cross Cut Test
Indentation Hardness	PE/PP Adhesion Test	Epoxy Bend Test
Coating Resistivity	Wet Sponge Pinhole Test	V Cut Test
Elongation Percentage at Break	Hot Water Adhesion Test	FBE Interface Contamination & Porosity Test
	Buchholz Measurement	Cross Section Porosity
	Shore A & Shore D Measurement	Low temperature Flexibility Test



