



AESTEIRON
STEELS LLP



Petrochemical

Power Generation

Oil & Gas

Marine Precision Engineering

Pharmaceutical **Aerospace**

SPECIALITY STEEL
SOLUTION



About us :

'AESTEIRON Steels LLP' is a leading manufacturer and distributor who deals in various steel products such as stainless steel, alloy steel, carbon steel, nickel & special metals alloys. Our products are broadly valued for its outstanding fabrication and finishing, sturdiness and cost effectiveness. Equipped with an experience of over 4 decades in industrial steel & executing over 100 large projects satisfactorily, 'AESTEIRON Steel LLP' has emerged as a leading producer of pipes & pipes fittings that are quality certified by TUV Rheinland (INDIA), PED & ISO 9001 : 2015.

AESTEIRON Steels LLP' has begun its journey in the year 2007. We make sure that we offer the best quality products by latest industry standards along with modern technologies. Our product line represents the highest standard in productivity and reliability terms.

Our products are procured from certified vendors in the market who offer quality standard products with competitive prices.

'AESTEIRON Steels LLP' is a client focused company - we purely value our customer requirements and expectation, which is evident with the growing consumer base over the years as we consistently strive to enrich our customer experience.

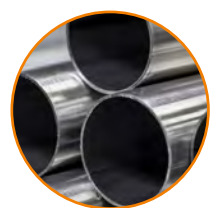
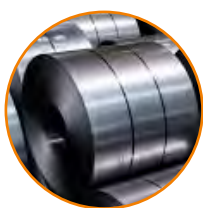


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INTRODUCTION TO THE COMPANY

AESTEIRON has an in-depth experience of over 4 decades of steel industry and constantly taps it to its client's advantage.

AESTEIRON believes in 100% performance and consistency in its services, which is vital for creating lasting customer values. Client trust and satisfaction have been an integral part of AESTEIRON for the past 40 years. This is what drives us to find the very best solutions for our clients in any given situation.





Our store is furnished and equipped with top-notch quality materials while ensuring secure planning and a cost-effective purchasing process.

We are focused on making an ideal atmosphere to ensure great customer service with premium support. We currently have two central warehouses in Kalamboli plot No -1439/ Taloja Plot No -112, which stores more than 6000 tons of pipes, flanges, elbows, and butt-weld fittings, and pipe accessories.

This clearly shows our tremendous expertise in the aspects of the product knowledge, its standards & its applied science. This vast reservoir of expertise helps us assist our customers in planning, construction, and maintenance management.

With our reliable and efficient logistics services, we can vouch for the 'on-time delivery' of our products and services.

EN & DIN Standards

Pipes / Tubes As per DIN EN



Aesteiron provides, Coating, Marking (Trademark material designation) cutting & beveling, tapering, short blasting or as per required specification.

Standards

Carbon Steels

Seamless pipes	DIN EN 10216-1 to 4
Welded pipes	10217-1 to 6
Precision steel pipes	10305-1 to 5

Stainless Steels

Seamless pipes	10216-5
Welded pipes	10217-7
Precision steel pipes	10305-1 to 2

Line Pipes

Seamless and welded pipes	10208 and ISO 3183
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Material Grades

- P235TR1
- P235GH TC1 and TC2
- 16Mo3, 13CrMo4-5
- P215NL, P265NL, 12Ni14, X10Ni9
- L290NB, L360NB, L290NE, L360NE
- 1.4301, 1.4306, 1.4307, 1.4541
- 1.4401, 1.4404, 1.4571
- 1.4410 (Superduplex), 1.4462 (Duplex)
- 1.4529, 1.4539, 1.4547

Types

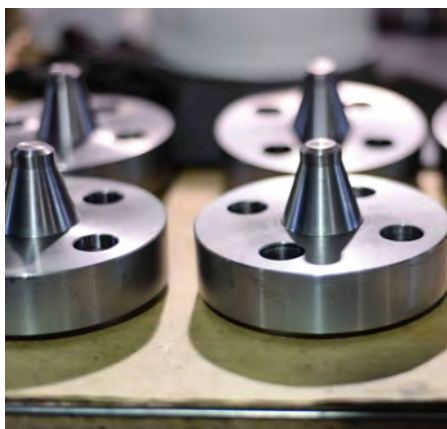
Seamless and welded

Dimensions and Weights

Carbon Steels / DIN EN 10220

Stainless Steels / DIN EN ISO 1127

DIN and EN Flanges



Aesteiron provides, Coating, Marking (Trademark material designation) cutting & beveling, tapering, short blasting or as per required specification.

Standards DIN EN 1092-1 and DIN

Neck Flanges

Typ	DIN
Weld Neck Flanges	11 2627-2638
Weld Neck Collars	34 2673-2676
Slip-on Flanges	12 86029/30
Threaded Flanges	13 2565-2569

Flat Flanges

Flanges for welding	01 2573, 2576
Loose Flanges	02 2641/2, 2655/6
Loose Flanges	04 2673-2676
Blind Flanges	05 2527

Collars

Flat Collars	32 2641/2, 2655/6
Weld-on Collars	37 2641/2

Flanges for vessels, process apparatus and automated welding process

PAS 1057-6, Special Flanges acc. to drawing

Material Grades

- S235JR / RSt 37-2, S355J2 / St 52-3
- P250GH / C 22.8, P245GH, P265GH
- 16Mo3, 13CrMo4-5
- P355QH1 / W/TStE 355
- 1.4301, 1.4307, 1.4541
- 1.4401, 1.4404, 1.4571
- 1.4410 (Superduplex), 1.4462 (Duplex)
- 1.4529, 1.4539, 1.4547

Pressure Classes

PN 6 to 400

Facing

Acc. to DIN 2526, DIN EN 1092-1 and to customer specification

Dimensions

Standard dimensions

DIN EN and DIN Butt-weld Fittings



Aesteiron provides, Coating, Marking (Trademark material designation) cutting & beveling, tapering, short blasting or as per required specification.

DIN EN 10253 and DIN Standards

Butt-weld Fittings

Typ	DIN
Elbows	A/B 2605 Teil 1/2
Tees	A/B 2615 Teil 1/2
Reducers, concentric	B 2616 Teil 2
Reducers, eccentric	A/B 2616 Teil 1/2
Caps	B 2617
Special Fittings made of plates, round-bar steels acc. to drawing	

Material Grades

- S235 / St 37.0
- P235GH / St 35.8
- P250GH, P265GH
- 16Mo3, 13CrMo4-5

- L290NB / L290NE
- L360NB / L360NE
- P355QH1 / W/TStE 355
- 1.4301, 1.4306, 1.4307, 1.4541
- 1.4401, 1.4404, 1.4571
- 1.4410 (Superduplex), 1.4462 (Duplex)
- 1.4529, 1.4539, 1.4547

Types

Seamless and welded

Elbow Types

2D, 3D and 5D or as per customer specification

Dimensions

All standard dimensions

ASTM, ASME & API Standards

ASTM / ASME / API - Pipes & Tubes



Aesteiron provides, Coating, Marking (Trademark material designation) cutting & beveling, tapering, short blasting or as per required specification.

Standards

B 36.10, B 36.19 and API 5L

Material Grades

- SA 53 Gr. B, A/SA 106 Gr. B, API 5L Gr. B
- SA 335 Gr. P5, P9, P11, P12, P22, P91
- SA 333 Gr. 6
- API 5L Gr. X52, X60, X65
- SA 312 Gr. TP 304/L, TP 316/L
- Duplex, Special Alloys

Wall Thicknesses

All schedules

Types

Seamless and welded

Dimensions

1/2" to 48"

ASTM/ASME/API Flanges



Aesteiron provides, Coating, Marking (Trademark material designation) cutting & beveling, tapering, short blasting, requirement as per our customer specification.

Standards

B 16.5, B 16.47 Series A+B and B.S. 3293 API 6A

Material Grades

- SA 105/C21, P250GH
- SA 182 Gr. F5, F9, F11, F12, F22, F91
- SA 350 Gr. LF2, W/TStE 355, P355QH1, W/TStE 355
- SA 694 Gr. F52, F60, F65
- SA 182 Gr. F304/L, F316/L
- 1.4541, 1.4571
- F53 (Superduplex), F51 (Duplex)
- Special Alloys

Pressure Classes

Class 150–2500
2,000 – 20,000 psi

Types

- Blind Flanges
- Lap Joint Flanges
- Long Welding Neck Flanges
- Orifice Flanges B 16.36
- Socket Welding Flanges
- Slip-on Flanges
- Spectacle Blind B 16.48
- Weld Neck Flanges
- Threaded Flanges
- Flanges according to drawings

Facings

- RF and RTJ
- Above all requirements covered acc. to our customer required specification.

Dimensions

1/2" to 48"

ASTM / ASME Butt-weld Fittings



Aesteiron provides, Coating, Marking (Trademark material designation) cutting & beveling, tapering, short blasting, requirement as per our customer specification.

Standards

B 16.9

Material grades

- SA 234 Gr WPB
- SA 234 Gr WP5, WP9, WP11, WP12, WP22, WP91
- SA 420 Gr WPL6
- SA 860 Gr WPHY42, WPHY52
- L290NB / L290NE
- L360NB / L360NE
- SA 403 Gr WP304/L, WP316/L
- Duplex, Special Alloys

Wall thicknesses

Schedule

Types

- Caps Elbows, seamless and welded
- Elbows, seamless and welded
- Reducers, concentric and eccentric, seamless and welded
- Stub Ends
- Tees, seamless and welded
- All Special Fittings are made of plates, Rods steels acc. to drawing

Elbow types

LR :- Long Radius
SR :- Short Radius

Dimensions

1/2" to 48"

ASME, EN & DIN Standards

ASME / ASTM Screws, Bolts and Nuts



Standards

- Screws
DIN ISO 4014, 4016 and 4017
- Nuts
DIN ISO 4032 and DIN ISO 4034
- Stud bolts DIN 2510
- B 16.5 and B 18.2.2

Grades

- 4.6, Grade 5
- 24 CrMo 5 and Ck 35
DIN 17240 / DIN EN 10269

- V4A, V2A, A2-70, A4-70
- 1.4301, 1.4401, 1.4541, 1.4571
DIN 17440 / DIN EN 10269
- ASTM/ ASME SA 193 Gr. B7 stud bolts
- ASTM/ ASME SA 194 Gr. 2H nuts
- Other materials to customer specifications

Dimensions

For all standard flange sizes

ASME / ASTM High-Pressure Fittings



Standards

High pressure forged steel fittings and branch outlet fittings

Material Grades

- A/SA 105/C21
- A/SA 182 Gr. F5, F11, F12, F22, F91
- A/SA 350 Gr. LF2, W/TStE 355
- A/SA 182 Gr. F304/L, F316/L
- 1.4541, 1.4571
- F53 (Superduplex), F51 (Duplex)

Pressure Classes

Class 2000, 3000, 6000, 9000

Wall Thicknesses

All schedules

Designs

Socket weld (SW) and threaded (NPT)

Surfaces

Black, galvanized and hot-dip galvanized

Dimensions

1/4" to 4"

Pipes & Tubes Standard

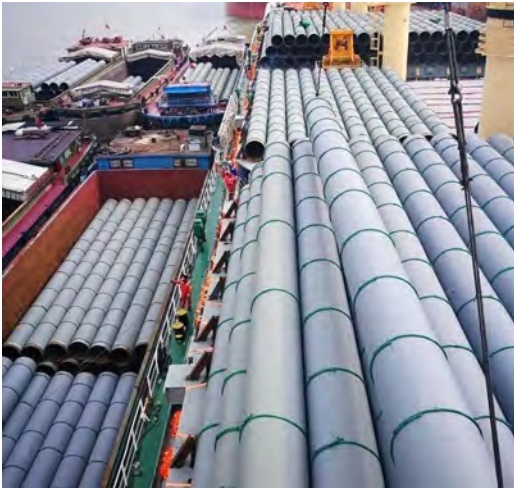


Lucrative Expertise for Steel Piping & Tubing

When it comes to steel pipes & tubes, we have a vast diversity of inventory, storage capacity, packaging & logistics services, and that helps us fulfill our customer demands without any shortcomings.



Piping & Tubing Expertise



Because of our customer's trust and appreciation in our steel piping expertise for many long years, we were able to establish and expand our two fully automated pipe storage capacity design systems located centrally in Taloja, Plot No. 112. We can supply the steel piping as per DIN and ASME standards ranging from Carbon steel, Stainless steel, and API line pipes as per DIN EN ISO 3183.

We even stock pipes which can be utilized in the storage and refrigeration industry. We can also stock and supply custom pipes to meet customer's -custom made and specific requirements for special uses and applications.

We define each batch as per quality and priority and dispatch the products based on top priority customer demands, clearing our storage space and guarantee precision handling of our customer's orders.

EN Standards Comparison

DIN EN 10216 Seamless Steel Pipes for Pressure

DIN Replacement	EN	Description
1629 / 1630	10216-1	Non-alloy steel tubes with specified room temperature properties
17175	10216-2	Non-alloy and alloy steel tubes with specified elevated temperature properties
17179	10216-3	Alloy fine grain steel tubes
17173	10216-4	Non-alloy and alloy steel tubes with specified by temperature properties
17458 / 17459	10216-5	Stainless steel tubes

DIN EN 10217 Welded Steel Pipes for Pressure

DIN Replacement	EN	Description
1626 / 1628	10217-1	Non-alloy steel tubes with specified room temperature properties
17177	10217-2	Electric welded non-alloy & alloy steel tubes with specified elevated temperature properties
	10217-5	Submerged arc welded non-alloy & alloy steel tubes with specified elevated temperature properties
17178	10217-3	Alloy fine grain steel tubes
17174	10217-4	Electric welded non-alloy steel tubes with specified low temperature properties
17174	10217-6	Submerged arc welded non-alloy steel tubes with specified low temperature properties
17457	10217-7	Stainless steel tubes

(Petroleum and Natural Gas Industries) Steel Pipes for Pipeline Transportation Systems

DIN Replacement	EN	Description
10208-1 / -2	ISO 3183	Petroleum and natural gas industries / steel pipes for pipeline transportation systems

DIN EN 10208/ISO 3183 - Steel Pipes for Pipelines for Combustible Fluids

DIN Replacement	EN	Description
2470-1	10208-1	Requirement class A (to 16 bar operating pressure)
2470-2 / 17172	10208-2	Requirement class B (over 16 bar operating pressure)

Gas Infrastructure / Pipelines for Maximum Operating Pressure ≤ 16 Bar

DIN Replacement	EN	Description
2470-1	12007-1	General functional requirements
	12007-2	Specific functional requirements for polyethylene (MOP) up to and including 10 bar
	12007-3	Specific functional requirements for steel
	12007-4	Specific functional requirements for renovation
	12007-5	Service lines – Specific functional requirements

DIN EN 10305 – Steel Pipes for Precision Applications

DIN Replacement	EN	Description
2391-1 / -2	10305-1	Seamless cold drawn steel tubes
2393-1 / -2	10305-2	Welded cold drawn steel tubes
2394-1 / -2	10305-3	Welded cold sized steel tubes
2391-1 / -2 in connection with DIN 1630	10305-4	Cold drawn seamless tubes for hydraulic and pneumatic power systems
2395-1 / -2	10305-5	Welded and cold sized square and rectangular tubes
	10305-6	Cold drawn welded tubes for hydraulic and pneumatic power systems

DIN EN 10210 – Hot Finished Structural Sections

DIN Replacement	EN	Description
17120 – 17125	10210-1	Hot finished structural hollow sections
59410	10210-2	Hot finished structural hollow sections of non-alloy and fine grain steels (Dimensions)

DIN EN 10296 – Welded Steel Tubes for Mechanical and General Engineering Purposes

DIN Replacement	EN	Description
1626 / 17123	10296-1	Welded circular steel tubes for mechanical and general engineering purpose (Non-alloy and alloy steels)
17455	10296-2	Welded circular steel tubes for mechanical & general engineering purpose (Stainless steels)

Non-Alloy Steel Pipes – Welding and Threading

DIN Replacement	EN	Description
2440 / 2441	10255	Non-alloy steel pipes suitable for welding and threading

DIN EN 10219 – Cold Formed Structural Hollow Sections

DIN Replacement	EN	Description
17119/-20/-23	10219-1	Cold formed structural hollow sections of non-alloy and fine grain steels
59411	10219-2	Cold formed structural hollow sections of non-alloy and fine grain steels

DIN EN 10297 – Seamless Steel Tubes for Mechanical and General Engineering

DIN Replacement	EN	Description
1629 / 17124	10297-1	Seamless circular steel tubes for mechanical and general engineering purpose (Non-alloy and alloy steels)
17456	10297-2	Seamless circular steel tubes for mechanical & general engineering purpose (Stainless steels)

Seamless Steel Pipes for Pressure Applications

DIN EN 10216 in comparison to earlier DIN Standards

DIN	EN	Area of Application
1629 / 1630	10216-1	Non-alloy steel tubes with specified room temperature properties
17175	10216-2	Non-alloy and alloy steel tubes
17179	10216-3	Alloy fine grain steel tubes with specified room temperature properties
17173	10216-4	Non-alloy and alloy steel tubes with specified low temperature properties
17458 / 17459	10216-5	Stainless steel tubes

Non-alloy steel tubes with specified properties of room temperature

Application: acc. to rules and standards of DVGW, TRB, TRD and AD 2000 Data Sheet W4 (only TR2 approved under PED)

Standards (DIN)	Operating Temperature / Working Pressure	Size Range	EN Materials	Notes
EN 10216-1 (DIN 1629)	to 300° C / to 160 bar	10,2–711,0 mm	P235TR1 (St 37.0) P265TR1 (St 44.0)	TR1 without impact test
EN 10216-1 (DIN 1630)	to 300° C / to unlimited		P235TR2 (St 37.4) P265TR2 (St 44.4)	TR2 impact test a 0° C (optional –10° C)

Non-alloy and alloy steel tubes with specified properties of elevated temperature

Application: pipeline & plant engineering, pressure vessels and apparatus engineering, Boiler construction

Standards (DIN)	Operating Temperature / Working Pressure	Size Range	EN Materials	Notes
EN 10216-2 (DIN 17175)	Non-alloy tubes: TC1 / to 450° C / 160 bar TC2 / to 450° C / unlimited Alloy tubes: TC2 / to 600° C / unlimited	10,2–711,0 mm	P235GH (St 35.8) P265GH (St 45.8) 16Mo3 (15Mo3) 13CrMo4-5 (13CrMo44)	TC1 without US testing TC2 with US testing (generally with alloy steels)

Alloy fine grain steel tubes

Application: Apparatus, general mechanical engineering and tool-building, pressure vessel, pipelines,

Standards (DIN)	Test classes	Size range	EN materials
EN 10216-3 (DIN 17179)	TC1 without US testing TC2 with US testing	10,2–711,0 mm	basic quality P355N (StE 355) P460N (StE 460) special low temperature quality P275NL2 (EStE 285) P355NL2 (EStE 355) P460NL2 (EStE 460) low temperature quality P275NL1 (TStE 285) P355NL1 (TStE 355) P460NL1 (TStE 460) elevated temperature quality P355NH (WStE 355) P460NH (WStE 460)

Non-alloy and alloy steel tubes with specified low temperature properties

Application: Apparatus, general pipeline engineering, pressure vessel and refrigeration system

Standards (DIN)	Test Classes	Size Range	EN Materials	Official Rule (DIN)
EN 10216-4 (DIN 17173)	Non-alloy tubes: TC1 without US testing TC2 with UA testing Alloy tubes: general TC2	10,2–711,0 mm	P215NL (TTSt 35N) P255QL (TTSt 35V) 12Ni14 (10Ni14) X12Ni5 (12Ni19)	AD 2000 Data Sheet W4/W10

Stainless steel tubes

Application: Pressure vessel, apparatus pipeline & plant engineering (transportation of corrosive materials)

Standards (DIN)	Test Classes / Operating Temperature	Size Range	EN Materials (comparable to ASTM A312)		AD 2000-W2 Rule
EN 10216-5 (DIN 17459) EN 10216-5 (DIN 17459)	TC1 without US testing TC2 with US testing Generally TC2 / from 500° C operating temperature	6,0–610,0 mm	V2A-Series	TP 304 (1.4301) TP 304L (1.4306) TP 304L (1.4307) TP 321 (1.4541)	Enteral tubes: AD 2000-W2/ TC1 Line pipes: OD ≤ 42.4 mm and wall ≤ 3,6 mm: AD 2000-W2/ TC1 OD > 42.4 mm or wall > 3,6 mm: AD 2000-W2/ TC2 Casting tubes for pressure vessels: AD 2000-W2/ TC2
			V4A-Series	TP 316 (1.4401) TP 316L (1.4404)	
			Super-Duplex	TP 316Ti (1.4471) 1.4410	
			Duplex	1.4462 TP 904L (1.4539)	

Welded Steel Pipes for Pressure Applications

DIN EN 10217 in comparison to earlier DIN standards

DIN	EN	Conditions of Use
1629 / 1628	10217-1	Non-alloy steel tubes with specified room temperature properties
17177	10217-2	Electric welded non-alloy & alloy steel tubes with specified elevated temperature properties
	10217-5	Submerged arc welded non-alloy & alloy steel tubes with specified elevated temperature properties
17178	10217-3	Alloy fine grain steel tubes
17174	10217-4	Electric welded non-alloy steel tubes with specified low temperature properties
17174	10217-6	Submerged arc welded non-alloy steel tubes with specified low temperature properties
17457	10217-7	Stainless steel tubes

Non-alloy steel tubes with specified properties of room temperature

Application: As per rules and standards of DVGW, TRB, TRD and AD 2000 Data Sheet W4 (only TR2 approved under PED)

Standards (DIN)	Operating Temperature / Working Pressure	Size Range	EN Materials (DIN)	Scope of Testing
EN 10217-1 (DIN 1626)	to 300° C / to 160 bar	10,2–2.540 mm	P235TR1 (St 37.0) P265TR1 (St 44.0)	TR1 without impact test
EN 10217-1 (DIN 1628)	to 300° C / to unlimited		P235TR2 (St 37.4) P265TR2 (St 44.4)	TR2 impact test at 0° C (optional –10° C)

Electric welded non-alloy and alloy steel tubes with specified properties of elevated temperature

Submerged arc welded non-alloy and alloy steel pipes with specified properties of high temperature

Application: Pipeline construction, pressure vessel, plant engineering and shipbuilding

Standards (DIN)	Welding Techniques	Size Range	EN Materials (DIN)	Scope of Testing
EN 10217-2 (DIN 17177)	Electric welded (HFW = high frequency welding)	10,2–508,0 mm	P235GH (St 37.8) P265GH (St 42.8)	TC1 without impact test
EN 10217-5	Submerged arc welded (SAW = submerged arc welded) SAWL longitudinal welded/ SAWH spiral welded	406,4–2,540 mm	16Mo3 (15 Mo 3) 13CrMo4-5 (13 CrMo 4 4)	TC2 with US testing (generally with alloy steels)

Alloy fine grain steel tubes

Application: Pressure vessels, apparatus and general mechanical engineering

Standards (DIN)	Welding Techniques	Size Range	EN Materials (DIN)		Scope of Testing
EN 10217-3 (DIN 17178)	Electric welded (HFW = high frequency welding)	10,2–508,0 mm	basic quality	P355N (StE 355) P460N (StE 460)	TC1 without US testing TC2 with US testing (generally with alloy steels)
	Submerged arc welded (SAW = submerged arc welded)	406,4–2,540 mm	special low temperature quality	P275NL2 (EStE 285) P355NL2 (EStE 355) P460NL2 (EStE 460)	
	SAWL with longitudinal seam/ SAWL with spiral seam		low temperature quality	P275NL1 (TStE 285) P355NL1 (TStE 355) P460NL1 (TStE 460)	
			elevated temperature quality	P355NH (WStE 355) P460NH (WStE 460)	

Electric welded non-alloy steel tubes with specified low temperature properties

Submerged arc welded non-alloy steel tubes with specified low temperature properties

Application: General pipeline engineering, pressure vessel, apparatus and refrigeration system

Standards (DIN)	Welding Techniques	Size Range	EN Materials (DIN)	Scope of Testing
EN 10217-4 (DIN 17174)	Electric welded (HFW = high frequency welding)	10,2–508,0 mm	P215NL1 (TTSt 35 N) P265NL1	AD 2000 Data Sheet W4/W10
EN 10217-6 (DIN 17174)	Submerged arc welded (SAW = submerged arc welded) SAWL with longitudinal seam/ SAWH spiral welded seam	406,4–2,540 mm		

Stainless steel tubes

Application: Chemical system, pressure vessel and apparatus engineering, pipelines (transport of corrosive media), water and wastewater technology

Standards (DIN)	Test Classes / Test Scope per 100 Pipes	Size range	EN Materials (comparable to ASTM A312)		Delivery Conditions
EN 10217-7 (DIN 17457)	TC1 1 Tensile test / 1 Ring tension test TC2 2 Tensile tests / 1 Ring tension test	6,0–1.016 mm	V2A-Series	TP 304 (1.4301) TP 304L (1.4306) TP 304L (1.4307)	W1 = hot rolled strip, unannealed W2 = cold rolled, unannealed W1A / W2A = hear-treated, descaled W1R/ W2R = bright annealed
				TP 321 (1.4541)	
			V4A-Series	TP 316 (1.4401) TP 316L (1.4404) TP 316Ti (1.4471)	
			Super-Duplex Duplex	1.4410 1.4462 TP 904L (1.4539)	

DIN EN 10305 Precision Steel Pipes

Cold Drawn Seamless Tubes

Application: Automotive, mechanical engineering

Standards (DIN)	State As Delivered	Size Range	EN Materials (DIN)	Notes
EN 10305-3 (DIN 2391-1/-2)	+C Cold finished, hard +LC Cold finished, soft +SR Cold finished and stress-relieved +A Annealed +N Normalised	4,0–260 mm	E215 (St 30 Al) E235 (St 35) E355 (St 52)	- Precisely defined tolerances - Specified surface roughness

Cold drawn welded tubes

Application: Automotive, mechanical engineering

Standards (DIN)	State As Delivered	Size Range	EN Materials (DIN)	Notes
EN 10305-2 (DIN 2393-1/-2)	+C Cold finished, hard +LC Cold finished, soft +SR Cold finished and stress-relieved +A Annealed +N Normalized	4,0–150 mm	E195 (St 34-2) E235 (St 37-2) E275 (St 44-2) E355 (St 52-3)	- Precisely defined tolerances - Specified surface roughness

Cold sized welded tubes

Application: Automotive, mechanical and plant engineering

Standards (DIN)	State As Delivered	Size Range	EN Materials (DIN)	Insert Strip
EN 10305-3 (DIN 2394-1/-2)	+CR1 Usually not heat-treated, but suitable for final annealing +CR2 After welding heat treatment and sizing is not provided +A After welding and sizing the pipes are annealed +N After welding and sizing the pipes are normalized	6,0–193.7	E155 E195 (St 34-2) E235 (St 37-2) E275 (St 44-2) E355 (St 52-3) Additional for + CR2: E190, E220, E260, E320, E370, E420	S1 (black) S2 (black) S3 (Cold rolled) S4 (Coated)

Cold drawn seamless tubes for hydraulic and pneumatic power systems

Application: Hydraulic and pneumatic power systems

Standards (DIN)	Surface Finish	Size Range	EN Materials (DIN)	Notes
EN 10305-4 (DIN 2391-1/-2 in connection with DIN 1630)	- Phosphate-treated (bonderized) - Galvanized – chromate: with Cr6: olive-green/yellow - Cr6-free: blue/white	4,0–80.0	E215 E235 (St 37.4) E355 (St 52.4)	- Precisely defined tolerances - Specified surface roughness - Suitable for conveying pressurized fluids

Precisions Steel Tubes With Threaded Ends

Welded and cold sized square tubes & rectangular tubes

Application : Mechanical Engineering & Automotive Industries.

Standards / (DIN)	State As Delivered (Designation)	Size Range	EN Materials / (DIN)	Strip
EN 10305-5 DIN 2395-1 DIN 2395-2	+CR1 Usually not heat-treated, but suitable for final annealing +CR2 Heat treatment after welding, and sizing is not provided +A After welding and sizing the pipes are annealed +N After welding and sizing the pipes are normalized	120/60 mm	E155 E195 (St 33/S185) E235 (RSt 37-2/S235JRG2) E275 E355 (St 52-3/S355J2G3) Additional for + CR2: E190, E220, E260, E320, E370, E420	S1 (black) S2 (pickled) S3 (Cold rolled) S4 (Coated)

DIN EN 10255 – Non alloy steel Tubes are suitable for welding & threading

Application : Transferring of Fluids (up to 25 bar) and gaseous media (up to 10 bar)

Standards / (DIN)	Types	Size Range	EN Materials / (DIN)	Notes
EN 10255 DIN 2440 EN 10255 DIN 2441	M: Medium H: Heavy L, L1, L2 (ISO-Light series)	1/8" – Dia to 6" Dia.	S195T (St 33)	- Galvanized acc. to DIN EN 10240 (DIN 2444) - Pipe ends threaded/ non-threaded - Pipe ends with/without couplings

DIN EN 10220 Seamless Steel Pipes

Dimensions and masses for seamless pipes

Outer Dia (OD) in mm			Weight per unit lengths in kg/m for wall thicknesses in mm																	
Series 1	series 2	series 3	1,6	1,8	2,0	2,3	2,6	2,9	3,2	3,6	4,0	4,5	5,0	5,6	6,3	7,1	8,0	8,8	10	
10,2	–	–	0,339	0,373	0,404	0,448	0,487	–	–	–	–	–	–	–	–	–	–	–	–	
	12,0	–	–	0,453	0,493	0,550	0,603	0,651	0,694	–	–	–	–	–	–	–	–	–	–	
	12,7	–	–	0,484	0,528	0,590	0,648	0,701	0,750	–	–	–	–	–	–	–	–	–	–	
13,5	–	–	–	0,519	0,567	0,636	0,699	0,758	0,813	0,879	–	–	–	–	–	–	–	–	–	
		14,0	–	0,542	0,592	0,664	0,731	0,794	0,852	0,923	–	–	–	–	–	–	–	–	–	
	16,0	–	–	0,630	0,691	0,777	0,859	0,937	1,01	1,10	1,18	–	–	–	–	–	–	–	–	
17,2	–	–	–	0,684	0,750	0,845	0,936	1,02	1,10	1,21	1,30	1,41	–	–	–	–	–	–	–	
		18,0	–	–	0,789	0,891	0,987	1,08	1,17	1,28	1,38	1,50	–	–	–	–	–	–	–	
	19,0	–	–	–	0,838	0,947	1,05	1,15	1,25	1,37	1,48	1,61	1,73	–	–	–	–	–	–	
	20,0	–	–	–	0,888	1,00	1,12	1,22	1,33	1,46	1,58	1,72	1,85	–	–	–	–	–	–	
21,3	–	–	–	–	0,952	1,08	1,20	1,32	1,43	1,57	1,71	1,86	2,01	–	–	–	–	–	–	
		22,0	–	–	0,996	1,12	1,24	1,37	1,48	1,63	1,78	1,94	2,10	–	–	–	–	–	–	
	25,0	–	–	–	1,13	1,29	1,44	1,58	1,72	1,90	2,07	2,28	2,47	2,68	2,91	–	–	–	–	
		25,4	–	–	1,15	1,31	1,46	1,61	1,75	1,94	2,11	2,32	2,52	2,73	2,97	–	–	–	–	
26,9	–	–	–	–	1,23	1,40	1,56	1,72	1,87	2,07	2,26	2,49	2,70	2,94	3,20	3,47	3,73	–	–	
		30,0	–	–	–	1,57	1,76	1,94	2,11	2,34	2,56	2,83	3,08	3,27	3,68	4,01	4,34	–	–	
	31,8	–	–	–	–	1,67	1,87	2,07	2,26	2,50	2,74	3,03	3,30	3,62	3,96	4,32	4,70	–	–	
	32,0	–	–	–	–	1,68	1,89	2,08	2,27	2,52	2,76	3,05	3,33	3,65	3,99	4,36	4,74	–	–	
33,7	–	–	–	–	–	1,78	1,99	2,20	2,41	2,67	2,93	3,24	3,54	3,88	4,26	4,66	5,07	5,40	–	
		35,0	–	–	–	–	2,08	2,30	2,51	2,79	3,06	3,38	3,70	4,06	4,46	4,89	5,33	5,69	–	
	38,0	–	–	–	–	–	2,27	2,51	2,75	3,05	3,35	3,72	4,07	4,47	4,93	5,41	5,92	6,34	6,91	
	40,0	–	–	–	–	–	2,40	2,65	2,90	3,23	3,55	3,94	4,32	4,75	5,24	5,76	6,31	6,77	7,40	
42,4	–	–	–	–	–	–	2,55	2,82	3,09	3,44	3,79	4,21	4,61	5,08	5,61	6,18	6,79	7,29	7,99	
		44,5	–	–	–	–	2,69	2,98	3,26	3,63	4,00	4,44	4,87	5,37	5,94	6,55	7,20	7,75	8,51	
48,3	–	–	–	–	–	–	2,93	3,25	3,56	3,97	4,37	4,86	5,34	5,90	6,53	7,21	7,95	8,57	9,45	
	51,0	–	–	–	–	–	3,10	3,44	3,77	4,21	4,64	5,16	5,67	6,27	6,94	7,69	8,48	9,16	10,1	
		54,0	–	–	–	–	3,30	3,65	4,01	4,47	4,93	5,49	6,04	6,68	7,41	8,21	9,08	9,81	10,9	
	57,0	–	–	–	–	–	–	3,87	4,25	4,74	5,23	5,83	6,41	7,10	7,88	8,74	9,67	10,5	11,6	
60,3	–	–	–	–	–	–	–	4,11	4,51	5,03	5,55	6,19	6,82	7,55	8,39	9,32	10,3	11,2	12,4	
	63,5	–	–	–	–	–	–	4,33	4,76	5,32	5,87	6,55	7,21	8,00	8,89	9,88	10,9	11,9	13,2	
	70,0	–	–	–	–	–	–	4,80	5,27	5,90	6,51	7,27	8,01	8,89	9,90	11,0	12,2	13,3	14,8	
		73,0	–	–	–	–	–	5,01	5,51	6,16	6,81	7,60	8,38	9,31	10,4	11,5	12,8	13,9	15,5	
76,1	–	–	–	–	–	–	–	5,24	5,75	6,44	7,11	7,95	8,77	9,74	10,8	12,1	13,4	14,6	16,3	
		82,5	–	–	–	–	–	–	6,26	7,00	7,74	8,66	9,56	10,6	11,8	13,2	14,7	16,0	17,9	
88,9	–	–	–	–	–	–	–	–	6,76	7,57	8,38	9,37	10,3	11,5	12,8	14,3	16,0	17,4	19,5	
	101,6	–	–	–	–	–	–	–	–	8,70	9,63	10,8	11,9	13,3	14,8	16,5	18,5	20,1	22,6	
		108,0	–	–	–	–	–	–	–	9,27	10,3	11,5	12,7	14,1	15,8	17,7	19,7	21,5	24,2	
114,3	–	–	–	–	–	–	–	–	–	9,83	10,9	12,2	13,5	15,0	16,8	18,8	21,0	22,9	25,7	
	127,0	–	–	–	–	–	–	–	–	–	12,1	13,6	15,0	16,8	18,8	21,0	23,5	25,7	28,9	
	133,0	–	–	–	–	–	–	–	–	–	12,7	14,3	15,8	17,6	19,7	22,0	24,7	27,0	30,3	
139,7	–	–	–	–	–	–	–	–	–	–	13,4	15,0	16,6	18,5	20,7	23,2	26,0	28,4	32,0	
		141,3	–	–	–	–	–	–	–	–	–	15,2	16,8	18,7	21,0	23,5	26,3	28,8	32,4	
		152,4	–	–	–	–	–	–	–	–	–	16,4	18,2	20,3	22,7	25,4	28,5	31,2	35,1	
		159,0	–	–	–	–	–	–	–	–	–	–	17,1	19,0	21,2	23,7	26,6	29,8	32,6	36,7
168,3	–	–	–	–	–	–	–	–	–	–	–	18,2	20,1	22,5	25,2	28,2	31,6	34,6	39,0	
		177,8	–	–	–	–	–	–	–	–	–	–	–	21,3	23,8	26,6	29,9	33,5	36,7	41,4
		193,7	–	–	–	–	–	–	–	–	–	–	–	–	26,0	29,1	32,7	36,6	40,1	45,3
219,1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	33,1	37,1	41,6	45,6	51,6
		244,5	–	–	–	–	–	–	–	–	–	–	–	–	–	37,0	41,6	46,7	51,2	57,8

Tolerance of the outer dia and wall thickness					
Outer dia D mm	Tolerances for T in a T/D ratio of				Tolerances for D
	≤ 0,025	> 0,025 to 0,050	> 0,050 to 0,10	> 0,10	
± 12,5% or ± 0,4 mm, the larger value applies in each case					± 1% or ± 0,5 mm, the larger value applies in each case
D > 219,1	± 20%	± 15%	± 12,5%	± 10% ¹⁾	
¹⁾ For OD D ≥ 355,6 mm the upper limit of the local wall thickness may be exceeded by a further 5% of the wall thickness T.					

A1 Outer Dia (OD) of Pipe for all equipment required in pipe system construction are standard.

A2 Outer Dia (OD) of Pipe for not all equipment are standard.

A3 Outer Dia (OD) of Pipe there are few conventional equipment

High-performance Welded Steel Pipe

Dimensions and masses for DIN EN 10220, DIN 1630 pipes.

Outer Dia (OD) in mm			Weight per unit lengths in kg/m for wall thicknesses in mm																
Series 1	series 2	series 3	1,6	1,8	2,0	2,3	2,6	2,9	3,2	3,6	4,0	4,5	5,0	5,6	6,3	7,1	8,0	8,8	10
10,2	–	–	0,304	0,339	0,373	0,404	0,448	0,487	–	–	–	–	–	–	–	–	–	–	–
13,2	–	–	0,418	0,470	0,519	0,567	0,635	0,699	0,758	0,813	0,879	–	–	–	–	–	–	–	–
	16,0	–	0,504	0,568	0,630	0,691	0,777	0,859	0,937	1,01	1,10	–	–	–	–	–	–	–	–
17,2	–	–	0,546	0,616	0,684	0,750	0,845	0,936	1,02	1,10	1,21	1,30	–	–	–	–	–	–	–
	19,0	–	0,608	0,687	0,764	0,838	0,947	1,05	1,15	1,25	1,37	1,48	–	–	–	–	–	–	–
	20,0	–	0,642	0,726	0,808	0,888	1,00	1,12	1,22	1,33	1,46	1,58	–	–	–	–	–	–	–
21,3	–	–	0,687	0,777	0,866	0,952	1,08	1,20	1,32	1,43	1,57	1,71	1,86	–	–	–	–	–	–
	25,0	–	0,815	0,923	1,03	1,13	1,29	1,44	1,58	1,72	1,90	2,07	2,28	2,47	–	–	–	–	–
		25,4	0,829	0,939	1,05	1,15	1,31	1,46	1,61	1,75	1,94	2,11	2,32	2,52	–	–	–	–	–
26,9	–	–	0,880	0,998	1,11	1,23	1,40	1,56	1,72	1,87	2,07	2,26	2,49	2,70	–	–	–	–	–
		30,0	0,987	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	–	–	–
	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	–	–
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	–
	38,0	–	1,26	1,44	1,61	1,78	2,02	2,27	2,51	2,75	3,05	3,35	3,72	4,07	4,47	4,93	5,41	5,92	6,34
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
		44,5	1,49	1,69	1,90	2,10	2,39	2,69	2,98	3,26	3,63	4,00	4,44	4,87	5,37	5,94	6,55	7,20	7,75
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
	51,0	–	1,71	1,95	2,18	2,42	2,76	3,10	3,44	3,77	4,21	4,64	5,16	5,67	6,27	6,94	7,69	8,48	9,16
		54,0	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	9,08	9,81
	57,0	–	1,92	2,19	2,45	2,71	3,10	3,49	3,87	4,25	4,74	5,23	5,83	6,41	7,10	7,88	8,74	9,67	10,5
60,3	–	–	2,03	2,32	2,60	2,88	3,29	3,70	4,11	4,51	5,03	5,55	6,19	6,82	7,55	8,39	9,32	10,3	11,2
	63,5	–	–	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	9,88	10,9	11,9
	70,0	–	–	2,70	3,03	3,35	3,84	4,32	4,80	5,27	5,90	6,51	7,27	8,01	8,89	9,90	11,0	12,2	13,3
		73,0	–	2,82	3,16	3,50	4,01	4,51	5,01	5,51	6,16	6,81	7,60	8,38	9,31	10,4	11,5	12,8	13,9
76,1	–	–	–	2,94	3,30	3,65	4,19	4,71	5,24	5,75	6,44	7,11	7,95	8,77	9,74	10,8	12,1	13,4	14,6
		82,5	–	3,19	3,58	3,97	4,55	5,12	5,69	6,26	7,00	7,74	8,66	9,56	10,6	11,8	13,2	14,7	16,0
88,9	–	–	–	3,44	3,87	4,29	4,91	5,53	6,15	6,76	7,57	8,38	9,37	10,3	11,5	12,8	14,3	16,0	17,4
	101,6	–	–	–	–	4,91	5,63	6,35	7,06	7,77	8,70	9,63	10,8	11,9	13,3	14,8	16,5	18,5	20,1
		108,0	–	–	–	5,23	6,00	6,76	7,52	8,27	9,27	10,3	11,5	12,7	14,1	15,8	17,7	19,7	21,5
114,3	–	–	–	–	–	5,54	6,35	7,16	7,97	8,77	9,83	10,9	12,2	13,5	15,0	16,8	18,8	21,0	22,9
	127,0	–	–	–	–	6,17	7,07	7,98	8,88	9,77	11,0	12,1	13,6	15,0	16,8	18,8	21,0	23,5	25,7
	133,0	–	–	–	–	6,46	7,41	8,36	9,30	10,2	11,5	12,7	14,3	15,8	17,6	19,7	22,0	24,7	27,0
139,7	–	–	–	–	–	6,79	7,79	8,79	9,78	10,8	12,1	13,4	15,0	16,6	18,5	20,7	23,2	26,0	28,4
		152,4	–	–	–	7,42	8,51	9,61	10,7	11,8	13,2	14,6	16,4	18,2	20,3	22,7	25,4	28,5	31,2
		159,0	–	–	–	7,74	8,89	10,0	11,2	12,3	13,8	15,3	17,1	19,0	21,2	23,7	26,6	29,8	32,6
168,3	–	–	–	–	–	–	–	–	11,8	13,0	14,6	16,2	18,2	20,1	22,5	25,2	28,2	31,6	34,6
		177,8	–	–	–	–	–	–	12,5	13,8	15,5	17,1	19,2	21,3	23,8	26,6	29,9	33,5	36,7
		159,0	–	–	–	–	–	–	13,6	15,0	16,9	18,7	21,0	23,3	26,0	29,1	32,7	36,6	40,1
219,1	–	–	–	–	–	–	–	–	–	17,0	19,1	21,2	23,8	26,4	29,5	33,1	37,1	41,6	45,6
		244,5	–	–	–	–	–	–	–	19,0	21,4	23,7	26,6	29,5	33,0	37,0	41,6	46,7	51,2
273,0	–	–	–	–	–	–	–	–	–	21,3	23,9	26,5	29,8	33,0	36,9	41,4	46,6	52,3	57,3
323,9	–	–	–	–	–	–	–	–	–	25,3	28,4	31,6	35,4	39,3	44,0	49,3	55,5	62,3	68,4
355,6	–	–	–	–	–	–	–	–	–	27,8	31,3	34,7	39,0	43,2	48,3	54,3	61,0	68,6	75,3
406,4	–	–	–	–	–	–	–	–	–	–	35,8	39,7	44,6	49,5	55,4	62,2	69,9	78,6	86,3
457,0	–	–	–	–	–	–	–	–	–	–	40,3	44,7	50,2	55,7	62,3	70,0	78,8	88,6	97,3
508,0	–	–	–	–	–	–	–	–	–	–	44,8	49,5	55,9	62,0	69,4	77,9	87,7	98,6	108
		559,0	–	–	–	–	–	–	–	–	–	–	61,5	68,3	76,4	85,9	96,6	109	119
610,0	–	–	–	–	–	–	–	–	–	–	–	–	67,2	74,6	83,5	93,8	106	119	130
		660,0	–	–	–	–	–	–	–	–	–	–	72,7	80,8	90,4	102	114	129	141
711,0	–	–	–	–	–	–	–	–	–	–	–	–	78,4	87,1	97,4	109	123	139	152
	762,0	–	–	–	–	–	–	–	–	–	–	–	84,1	93,3	104	117	132	149	163
813,0	–	–	–	–	–	–	–	–	–	–	–	–	89,7	99,6	112	125	141	159	175
		864,0	–	–	–	–	–	–	–	–	–	–	95,4	106	119	133	150	169	186
914,0	–	–	–	–	–	–	–	–	–	–	–	–	101	112	125	141	159	179	196
1016	–	–	–	–	–	–	–	–	–	–	–	–	112	125	140	157	177	199	219
1220	–	–	–	–	–	–	–	–	–	–	–	–	–	–	168	182	212	239	263
1420	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	220	247	279	306
1620	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	282	318	350
1820	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	393
2020	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
2220	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

DIN EN 10217-2 – Tolerances of the outer dia and wall thickness for electric welded pipes

Outer Dia (OD)	Tolerances dimensions in mm		
	Tolerances of Outer Dia (OD) D	Tolerances of wall thickness T ¹⁾ for	
		T ≤ 5	5 < T ≤ 16
D ≤ 219,1	± 1% or ± 0,5 mm, the larger value applies in each case	± 10% or ± 0,3 mm, the larger value applies in each case	± 8%
D > 219,1	± 0,75%		

¹⁾ The upper limit tolerance does not apply to the weld seam area (see DIN EN 10217-2/section 8.7.4.2)

DIN EN 10217-5 – Tolerances of the outer dia and wall thickness for submerged arc welded pipes

Outer Dia (OD)	Tolerances dimensions in mm		
	Tolerances of outside diameter D	Tolerances of wall thickness T ¹⁾ for	
		T ≤ 5	5 < T ≤ 40
D ≤ 219,1	± 1% or ± 0,5 mm, the larger value applies in each case	± 10% or ± 0,3 mm, the larger value applies in each case	± 8% or ± 2 mm, the smaller value applies in each case

¹⁾The upper limit tolerance does not apply to the weld seam area (see DIN EN 10217-5/section 8.7.4.2)

A1 Outer Dia (OD) for which all equipment required for pipe system construction are standard.

A2 Outer Dia (OD) for which not all equipment are standard.

A3 Outer Dia (OD) for which there are few standard equipment

Austenitic Stainless Steel Pipes

Dimensions and masses weight per unit lengths of pipes according to DIN EN ISO 1127

Outer Dia (OD) in mm			Weight per unit lengths in kg/m for wall thicknesses in mm																
Series 1	series 2	series 3	1,0	1,2	1,6	2,0	2,3	2,6	2,9	3,2	3,6	4,0	4,5	5,0	5,6	6,3	7,1	8,0	8,8
	6,0	—	0,125	0,144	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	8,0	—	0,176	0,204	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	10,0	—	0,225	0,264	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10,2	—	—	0,230	0,270	0,344	0,410	—	—	—	—	—	—	—	—	—	—	—	—	—
	12,0	—	0,275	—	0,416	0,500	—	—	—	—	—	—	—	—	—	—	—	—	—
	12,7	—	0,293	0,345	0,445	0,536	0,599	0,658	0,711	0,761	—	—	—	—	—	—	—	—	—
13,5	—	—	0,313	0,369	0,477	0,576	0,645	—	0,789	—	—	—	—	—	—	—	—	—	—
	14,0	—	0,326	—	0,496	0,604	—	—	—	—	—	—	—	—	—	—	—	—	—
	16,0	—	0,376	0,445	0,577	0,577	0,701	—	—	—	—	—	—	—	—	—	—	—	—
17,2	—	—	0,406	—	0,625	0,761	0,858	—	—	1,12	—	—	—	—	—	—	—	—	—
	18,0	—	0,425	—	0,657	0,801	—	—	—	—	—	—	—	—	—	—	—	—	—
	19,0	—	0,451	0,535	0,697	0,851	—	—	—	—	—	—	—	—	—	—	—	—	—
	20,0	—	0,476	0,564	0,737	0,901	—	—	—	—	—	—	—	—	—	—	—	—	—
21,3	—	—	0,509	—	0,789	0,966	—	1,22	—	1,45	—	1,74	—	—	—	—	—	—	—
	22,0	—	0,526	—	—	1,00	—	—	—	—	—	—	—	—	—	—	—	—	—
	25,0	—	0,601	0,715	0,937	1,15	—	1,46	—	—	—	—	—	—	—	—	—	—	—
	25,4	—	—	0,727	0,953	1,17	—	1,48	—	—	—	—	—	—	—	—	—	—	—
26,9	—	—	0,649	—	1,01	1,25	—	1,58	1,75	1,90	—	2,29	—	—	—	—	—	—	—
	30,0	—	—	—	1,14	1,40	—	—	—	—	—	—	—	—	—	—	—	—	—
	31,8	—	—	0,920	1,21	1,49	—	1,90	—	2,29	—	2,78	—	—	—	—	—	—	—
	32,0	—	—	0,925	—	1,50	—	—	—	—	—	—	—	—	—	—	—	—	—
33,7	—	—	0,818	0,976	1,29	1,58	1,81	2,02	—	2,45	—	—	3,29	—	—	—	—	—	—
	35,0	—	—	1,02	—	1,65	—	—	—	—	—	—	—	—	—	—	—	—	—
	38,0	—	—	1,11	1,46	1,81	—	2,30	—	2,79	—	—	—	—	—	—	—	—	—
	40,0	—	—	1,17	1,54	—	—	2,44	—	—	—	—	—	—	—	—	—	—	—
42,4	—	—	—	—	1,63	2,02	—	2,59	—	3,14	3,49	—	—	4,68	—	—	—	—	—
	44,5	—	—	—	—	2,13	—	2,73	3,02	—	—	—	—	—	—	—	—	—	—
48,3	—	—	—	—	1,87	2,31	—	2,97	—	3,61	4,03	—	—	5,42	—	—	—	—	—
	51,0	—	1,25	1,49	1,98	2,46	—	3,15	—	3,83	—	—	—	—	—	—	—	—	—
	54,0	—	—	—	2,10	2,60	—	3,35	—	—	—	—	—	—	—	—	—	—	—
	57,0	—	—	—	2,22	2,75	—	—	3,39	—	—	—	—	—	—	—	—	—	—
60,3	—	—	—	—	2,35	2,92	3,34	3,76	4,17	4,58	5,11	5,83	—	—	7,66	—	—	—	—
	63,5	—	—	—	2,48	3,08	—	3,96	—	4,83	—	—	—	—	—	—	—	—	—
	70,0	—	—	—	2,74	3,40	—	—	4,87	—	—	—	—	—	—	—	—	—	—
76,1	—	—	—	—	2,98	3,70	4,25	4,78	5,32	—	6,54	7,22	—	8,90	—	—	12,3	—	—
	82,0	—	—	—	—	4,03	—	—	—	6,35	—	—	—	—	—	—	—	—	—
88,9	—	—	—	—	3,49	4,35	4,98	5,61	6,24	6,86	7,68	8,51	—	—	11,7	—	—	16,2	—
	101,6	—	—	—	—	4,98	—	—	7,17	—	—	9,77	—	—	13,5	—	—	18,8	—
114,3	—	—	—	—	4,52	5,62	—	7,27	8,09	—	9,98	—	12,4	—	—	17,1	—	—	23,2
139,7	—	—	—	—	5,53	6,89	—	8,92	—	11,0	—	13,6	—	16,8	—	21,0	23,5	—	—
168,3	—	—	—	—	6,68	8,32	—	10,8	—	13,2	—	16,4	18,5	20,4	—	—	28,6	—	—
219,1	—	—	—	—	—	10,9	—	41,1	—	17,3	19,4	21,5	—	—	—	33,6	—	42,2	—
273,0	—	—	—	—	—	13,6	—	17,6	—	21,6	24,3	26,9	—	—	—	42,0	—	—	—
323,9	—	—	—	—	—	—	—	20,9	—	25,7	—	32,1	35,9	39,9	—	—	56,3	—	—
355,6	—	—	—	—	—	—	—	22,9	—	28,2	—	35,2	—	43,8	—	—	—	—	—
406,4	—	—	—	—	—	—	—	26,3	—	32,3	—	40,3	—	50,2	—	—	—	—	—

Outer dia (OD) tolerances	
Tolerance	Outside diameter tolerances
D1	$\pm 1,50 \%$ / min. $\pm 0,75$ mm
D2	$\pm 1,00 \%$ / min. $\pm 0,50$ mm
D3	$\pm 0,75 \%$ / min. $\pm 0,30$ mm
D4	$\pm 0,50 \%$ / min. $\pm 0,10$ mm

Wall thickness tolerances	
Tolerance	Wall thickness tolerances
T1	$\pm 15,0 \%$ / min. $\pm 0,60$ mm
T2	$\pm 12,5 \%$ / min. $\pm 0,40$ mm
T3	$\pm 10,0 \%$ / min. $\pm 0,20$ mm
T4	$\pm 7,50 \%$ / min. $\pm 0,15$ mm
T5	$\pm 5,00 \%$ / min. $\pm 0,10$ mm

Factor is based on an average density of these pipes of 7.97 kg/dm^3 .

EN 10305-1 to 10305-4 – Precisions Steel Pipes & Tubes

Weight and Dimensions of circular pipes

Outer Dia (OD) in mm	Part 1 2 3 4				Masses weight in kg/m for wall thickness T in mm ¹⁾																
					1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
					0,5	0,6	0,75	0,8	1,0	1,2	1,5	1,8	2,0	2,2	2,5	2,8	3,0	3,5	4,0	4,5	
4,0	•	•	–	•	0,04	–	–	0,06	0,07	0,08	–	–	–	–	–	–	–	–	–	–	–
5,0	•	•	–	•	0,06	–	0,08	0,08	0,10	0,11	–	–	–	–	–	–	–	–	–	–	–
6,0	•	•	•	•	0,07	0,08	–	0,10	0,12	0,14	0,17	0,19	0,20	–	–	–	–	–	–	–	–
7,0	•	•	–	•	0,08	–	–	0,12	0,15	0,17	0,20	0,23	0,25	–	–	–	–	–	–	–	–
8,0	•	•	•	•	0,09	0,11	–	0,14	0,17	0,20	0,24	0,28	0,30	0,31	0,34	–	–	–	–	–	–
9,0	•	•	–	–	0,10	–	–	0,16	0,20	0,23	0,28	0,32	0,35	0,37	0,40	0,43	–	–	–	–	–
10,0	•	•	•	•	0,12	0,14	–	0,18	0,22	0,26	0,31	0,36	0,39	0,42	0,46	0,50	0,52	–	–	–	–
12,0	•	•	•	•	0,14	0,17	–	0,22	0,27	0,32	0,39	0,45	0,49	0,53	0,59	0,64	0,67	0,73	0,79	–	–
14,0	•	•	–	•	0,17	–	–	0,26	0,32	0,38	0,46	0,54	0,59	0,64	0,71	0,77	0,81	0,91	0,99	1,05	–
15,0	•	•	•	•	0,18	0,21	–	0,28	0,35	0,41	0,50	0,59	0,64	0,69	0,77	0,84	0,89	0,99	1,09	1,17	–
16,0	•	•	•	•	0,19	0,23	–	0,30	0,37	0,44	0,54	0,63	0,69	0,75	0,83	0,91	0,96	1,08	1,18	1,28	–
18,0	•	•	•	•	0,22	0,26	–	0,34	0,42	0,50	0,61	0,72	0,79	0,86	0,96	1,05	1,11	1,25	1,38	1,50	–
19,0	–	–	•	–	–	0,27	–	0,36	0,44	0,53	0,65	0,76	0,84	0,91	1,02	–	1,18	–	–	–	–
20,0	•	•	•	•	0,24	–	–	0,38	0,47	0,56	0,68	0,81	0,89	0,97	1,08	1,19	1,26	1,42	1,58	1,72	–
22,0	•	•	•	•	0,27	–	–	0,42	0,52	0,62	0,76	0,90	0,99	1,07	1,20	1,33	1,41	1,60	1,78	1,94	–
25,0	•	•	•	•	0,30	–	–	0,48	0,59	0,70	0,87	1,03	1,13	1,24	1,39	1,53	1,63	1,86	2,07	2,27	–
26,0	•	•	–	–	0,31	–	–	0,50	0,62	0,73	0,91	1,07	1,18	1,29	1,45	1,60	1,70	1,94	2,17	2,39	–
28,0	•	•	•	•	0,34	–	–	0,54	0,67	0,79	0,98	1,16	1,28	1,40	1,57	1,74	1,85	2,11	2,37	2,61	–
30,0	•	•	•	•	0,36	–	–	0,58	0,72	0,85	1,05	1,25	1,38	1,51	1,70	1,88	2,00	2,29	2,56	2,83	–
32,0	•	•	•	–	0,39	–	–	0,62	0,76	0,91	1,13	1,34	1,48	1,62	1,82	2,02	2,15	2,46	2,70	3,05	–
35,0	•	•	•	•	0,43	–	–	0,67	0,84	1,00	1,24	1,47	1,63	1,78	2,00	2,22	2,37	2,72	3,06	3,38	–
38,0	•	•	•	•	0,46	–	–	0,73	0,91	1,09	1,35	1,61	1,78	1,94	2,19	2,43	2,59	2,98	3,35	3,72	–
40,0	•	•	•	–	0,49	–	–	0,77	1,01	1,15	1,42	1,70	1,87	2,05	2,31	2,57	2,74	3,15	3,55	3,94	–
42,0	•	•	•	•	–	–	–	–	1,02	1,21	1,50	1,78	1,97	2,16	2,44	2,71	2,89	3,32	3,75	4,16	–
42,4	–	–	•	–	–	–	–	–	1,06	1,22	1,51	1,80	1,99	2,18	2,46	–	2,91	3,36	3,79	–	–
44,0	–	–	•	–	–	–	–	–	1,06	1,27	1,57	1,87	2,07	2,27	2,56	–	3,03	3,50	3,95	–	–
45,0	•	•	•	–	–	–	–	–	1,09	1,30	1,61	1,92	2,12	2,32	2,62	2,91	3,11	3,58	4,04	4,49	–
48,0	•	•	•	–	–	–	–	–	1,16	1,38	1,72	2,05	2,27	2,48	2,81	3,12	3,33	3,84	4,34	4,83	–
48,3	–	–	•	–	–	–	–	–	1,17	1,39	1,73	2,06	2,28	2,50	2,82	–	3,35	3,87	4,37	4,86	–
50,0	•	•	•	•	–	–	–	–	1,21	1,44	1,79	2,14	2,37	2,59	2,93	3,26	3,48	4,01	4,54	5,05	–
51,0	–	–	•	–	–	–	–	–	–	1,47	1,83	2,18	2,42	2,65	2,99	–	3,55	4,10	4,64	5,16	–
55,0	•	•	•	•	–	–	–	–	1,33	1,59	1,98	2,36	2,61	2,86	3,24	3,60	3,85	4,44	5,03	5,60	–
57,0	–	–	•	–	–	–	–	–	–	1,65	2,05	2,45	2,71	2,97	3,36	–	3,99	4,62	5,23	5,83	–
60,0	•	•	•	•	–	–	–	–	1,45	1,74	2,16	2,58	2,86	3,14	3,54	3,95	4,22	4,88	5,52	6,16	–
63,5	–	–	•	–	–	–	–	–	–	1,84	2,29	2,74	3,03	3,33	3,76	–	4,48	5,18	5,87	6,55	–
65,0	•	•	–	–	–	–	–	–	1,58	1,89	2,35	2,81	3,11	3,41	3,85	4,29	4,59	5,31	6,02	6,71	–
70,0	•	•	•	•	–	–	–	–	1,70	2,04	2,53	3,03	3,35	3,68	4,16	4,64	4,96	5,74	6,51	7,27	–
75,0	•	•	–	–	–	–	–	–	1,82	2,18	2,72	3,25	3,60	3,95	4,47	4,99	5,33	6,17	7,00	7,82	–
76,0	–	–	•	–	–	–	–	–	–	2,21	2,76	3,29	3,65	4,00	4,53	–	5,40	6,26	7,10	7,93	–
80,0	•	•	•	•	–	–	–	–	1,95	2,33	2,90	3,47	3,85	4,22	4,78	5,33	5,70	6,60	7,50	8,38	–
85,0	•	•	–	–	–	–	–	–	–	–	3,09	3,69	4,09	4,49	5,09	5,68	6,07	7,03	7,99	8,93	–
89,0	–	–	•	–	–	–	–	–	–	2,60	3,24	3,87	4,29	4,71	5,33	–	6,36	7,38	8,38	9,38	–
90,0	•	•	•	–	–	–	–	–	–	–	3,27	3,92	4,34	4,76	5,39	6,02	6,44	7,47	8,48	9,49	–
95,0	•	•	–	–	–	–	–	–	–	–	–	–	4,59	5,03	5,70	6,37	6,81	7,90	8,98	10,0	–
100,0	•	•	•	–	–	–	–	–	–	–	–	–	4,83	5,31	6,01	6,71	7,18	8,33	9,47	10,6	–
101,6	–	–	•	–	–	–	–	–	–	2,97	3,70	4,43	4,91	5,39	6,11	–	7,29	8,47	9,63	10,8	–
108,0	–	–	•	–	–	–	–	–	–	3,16	3,94	4,71	5,23	5,74	6,50	–	7,77	9,02	10,3	11,5	–
110,0	•	•	–	–	–	–	–	–	–	–	–	–	5,33	5,85	6,63	7,40	7,92	9,19	10,5	11,7	–
114,0	–	–	•	–	–	–	–	–	–	3,34	4,16	4,98	5,52	6,07	6,87	–	8,21	9,54	10,9	12,2	–
120,0	•	•	•	–	–	–	–	–	–	–	–	–	5,82	6,39	7,24	8,09	8,66	10,1	11,4	12,8	–
127,0	–	–	•	–	–	–	–	–	–	3,72	4,64	5,56	6,17	6,77	7,68	–	9,17	10,7	12,1	13,6	–
130,0	•	•	–	–	–	–	–	–	–	–	–	–	–	–	7,86	8,78	9,40	10,9	12,4	13,9	–
133,0	–	–	•	–	–	–	–	–	–	3,90	4,86	5,82	6,46	7,10	8,05	–	9,62	11,2	12,7	14,3	–
139,7	–	–	•	–	–	–	–	–	–	4,10	5,11	6,12	6,79	7,46	8,46	–	10,1	11,8	13,4	15,0	–
140,0	•	•	–	–	–	–	–	–	–	–	–	–	–	–	–	8,48	9,47	10,1	11,8	13,4	–
150,0	•	•	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	10,9	12,6	14,4	–
159,0	–	–	•	–	–	–	–	–	–	4,67	5,83	6,98	7,74	8,51	9,65	–	11,5	13,4	15,3	17,1	–
160,0	•	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	11,6	13,5	15,4	–
168,0	–	–	•	–																	

¹⁾ The wall thickness is standardized acc. to this part of DIN EN 10305.

Masses weight in kg/m for wall thickness T in mm ¹⁾															
1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
5,0	5,5	6,0	7,0	8,0	9,0	10,0	12,0	12,5	14,0	16,0	18,0	20,0	22,0	25,0	
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1,23	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1,36	1,42	1,48	–	–	–	–	–	–	–	–	–	–	–	–	–
1,60	1,70	1,78	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1,85	1,97	2,07	2,24	–	–	–	–	–	–	–	–	–	–	–	–
2,10	2,24	2,37	2,59	–	–	–	–	–	–	–	–	–	–	–	–
2,47	2,64	2,81	3,11	3,35	–	–	–	–	–	–	–	–	–	–	–
2,59	2,78	2,96	3,28	3,55	–	–	–	–	–	–	–	–	–	–	–
2,84	3,05	3,26	3,63	3,95	–	–	–	–	–	–	–	–	–	–	–
3,08	3,22	3,55	3,97	4,34	4,66	4,93	–	–	–	–	–	–	–	–	–
3,33	3,59	3,85	4,32	4,73	5,10	5,43	–	–	–	–	–	–	–	–	–
3,70	4,00	4,29	4,83	5,33	5,77	6,17	–	–	–	–	–	–	–	–	–
4,07	4,41	4,73	5,35	5,92	6,44	6,90	–	–	–	–	–	–	–	–	–
4,32	4,68	5,03	5,70	6,31	6,88	7,40	–	–	–	–	–	–	–	–	–
4,56	4,95	5,33	6,04	6,71	7,32	7,89	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
4,93	5,36	5,77	6,56	7,30	7,99	8,63	–	–	–	–	–	–	–	–	–
5,30	5,76	6,21	7,08	7,89	8,66	9,37	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
5,55	6,04	6,51	7,42	8,29	9,20	9,86	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
6,17	6,71	7,25	8,29	9,27	10,2	11,1	12,7	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
6,78	7,39	7,99	9,15	10,3	11,3	12,3	14,2	14,7	–	–	–	–	–	–	–
7,21	7,87	–	–	–	–	–	–	–	–	–	–	–	–	–	–
7,40	8,07	8,73	10,0	11,2	12,4	13,6	15,7	–	17,6	–	–	–	–	–	–
8,01	8,75	9,47	10,9	12,2	13,5	14,8	17,2	17,7	19,3	–	–	–	–	–	–
8,63	9,43	10,2	11,7	13,2	14,7	16,0	18,6	–	21,1	23,3	–	–	–	–	–
8,75	9,56	–	–	–	–	–	–	–	–	–	–	–	–	–	–
9,25	10,1	11,0	12,6	14,2	15,8	17,3	20,1	20,8	22,8	25,3	–	–	–	–	–
9,86	10,8	11,7	13,5	15,2	16,9	18,5	21,6	–	24,5	27,2	–	–	–	–	–
10,4	11,3	12,3	–	–	–	–	–	–	–	–	–	–	–	–	–
10,5	11,5	12,4	14,3	16,2	18,0	19,7	23,1	–	26,2	29,2	–	–	–	–	–
11,1	12,1	13,2	15,2	17,2	–	–	–	–	–	–	–	–	–	–	–
11,7	12,8	13,9	16,1	18,2	20,2	22,2	26,0	–	29,7	33,1	36,4	–	–	–	–
11,9	13,0	14,1	–	–	–	–	–	–	–	–	–	–	–	–	–
12,7	13,9	15,1	–	–	–	–	–	–	–	–	–	–	–	–	–
13,0	14,2	15,4	17,8	20,1	22,4	24,7	29,0	–	33,1	37,1	40,8	–	–	–	–
13,4	14,7	16,0	–	–	–	–	–	–	–	–	–	–	–	–	–
14,2	15,5	17,9	19,5	22,1	24,6	27,1	32,0	–	33,6	41,0	45,3	–	–	–	–
15,0	16,5	18,4	–	–	–	–	–	–	–	–	–	–	–	–	–
15,4	16,9	18,8	21,2	24,1	26,9	29,6	34,9	–	40,1	45,0	49,7	–	–	–	–
15,8	17,3	19,8	–	–	–	–	–	–	–	–	–	–	–	–	–
16,6	18,2	19,8	–	–	–	–	–	–	–	–	–	–	–	–	–
16,7	18,2	18,2	23,0	26,0	29,1	32,1	37,9	–	43,5	48,9	54,2	–	–	–	–
17,9	19,6	21,3	24,7	28,0	31,3	34,5	40,8	–	47,9	52,9	58,6	64,1	–	–	–
19,0	20,8	22,6	–	–	–	–	–	–	–	–	–	–	–	–	–
19,1	21,0	22,8	26,4	30,0	33,5	37,0	43,8	–	50,4	56,8	63,0	69,0	–	–	–
20,1	22,0	24,0	–	–	–	–	–	–	–	–	–	–	–	–	–
20,3	22,3	24,3	28,1	32,0	35,7	39,5	46,8	–	53,9	60,8	67,5	74,0	–	–	–
21,6	23,7	25,7	29,9	33,9	38,0	41,9	49,7	–	57,3	64,7	71,9	78,9	–	–	–
22,8	25,0	27,2	31,6	33,9	40,2	44,4	52,7	–	60,8	68,7	79,3	83,8	–	–	–
23,3	25,5	27,8	–	–	–	–	–	–	–	–	–	–	–	–	–
24,0	26,4	28,7	33,3	33,3	42,4	46,9	55,6	–	64,2	72,6	80,8	88,8	96,6	–	–
26,5	29,1	31,7	36,8	41,8	46,8	51,8	61,6	–	71,1	80,5	89,7	98,6	107	120	–
29,0	31,8	34,6	40,2	45,8	51,3	56,7	67,5	–	78,0	88,4	98,5	109	118	133	–
31,4	34,5	37,6	43,7	49,7	55,7	61,7	73,4	–	84,9	96,3	107	118	129	145	–

DIN EN 10305-5 – Precisions Steel Tubes

Weight and Dimensions for square and rectangular steel Tubes.

Welded pipes, square Tubes & rectangular tubes

Side Length / mm			Weight in kg/m ¹⁾ for wall Thickness T/mm						
H	B (or H)	Tolerance	1,00	1,25	1,50	2,00	2,50	3,00	4,00
15	15	± 0,20	0,438	0,537	0,632	0,810	–	–	–
20	10	± 0,20	0,438	0,537	0,632	0,810	–	–	–
	15		0,516	0,635	0,750	0,967	–	–	–
	20		0,595	0,733	0,868	1,12	–	–	–
25	15	± 0,25	0,595	0,733	0,868	1,12	–	–	–
	25		0,752	0,930	1,10	1,44	–	–	–
30	10	± 0,25	0,595	0,733	0,868	1,12	–	–	–
	15		0,673	0,831	0,985	1,28	–	–	–
	20		0,752	0,930	1,10	1,44	–	–	–
	30		0,909	1,13	1,34	1,75	2,15	2,39	–
34	20	± 0,25	0,815	1,01	1,20	1,56	–	–	–
35	20	± 0,25	0,830	1,03	1,22	1,59	1,95	–	–
	25		0,909	1,13	1,34	1,75	2,15	2,39	–
	35		1,07	1,32	1,57	2,07	2,54	2,86	–
40	20	± 0,30	–	–	1,34	1,75	2,15	2,39	–
	25		–	–	1,46	1,91	2,34	2,63	–
	30		–	–	1,57	2,07	2,54	2,86	–
	40		–	–	1,81	2,38	2,93	3,33	4,25
45	45	± 0,30	–	–	2,05	2,69	3,33	3,80	4,88
50	20	± 0,30	–	–	1,57	2,07	2,54	2,86	–
	25		–	–	1,69	2,22	2,74	3,10	–
	30		–	–	1,81	2,38	2,93	3,33	4,25
	40		–	–	2,05	2,69	3,33	3,80	4,88
	50		–	–	2,28	3,01	3,72	4,28	5,51
60	20	± 0,35	–	–	–	2,38	2,93	3,33	–
	30		–	–	–	2,69	3,33	3,80	4,88
	40		–	–	–	3,01	3,72	4,28	5,51
	50		–	–	–	3,32	4,44	4,75	6,14
	60		–	–	–	3,64	4,50	5,22	6,76
70	40	± 0,40	–	–	–	3,32	4,11	4,75	6,14
	70		–	–	–	4,26	5,29	6,16	8,02
80	20	± 0,50	–	–	–	3,01	3,72	4,28	–
	30		–	–	–	3,32	4,11	4,75	–
	40		–	–	–	3,64	4,50	5,22	6,76
	50		–	–	–	3,95	4,90	5,69	7,39
	60		–	–	–	4,26	5,29	6,16	8,02
	80		–	–	–	4,89	6,07	7,10	9,28
90	90	± 0,60	–	–	–	5,52	6,86	8,04	10,50
100	40	± 0,65	–	–	–	4,26	5,29	6,16	8,02
	50		–	–	–	4,58	5,68	6,63	8,65
	60		–	–	–	4,89	6,07	7,10	9,28
	80		–	–	–	5,52	6,86	8,04	10,50
	100		–	–	–	6,15	7,64	8,99	11,80
120	40	± 0,70	–	–	–	4,89	6,07	7,10	9,28
	60		–	–	–	5,52	6,86	8,04	10,50

¹⁾ Weight based on an average density of 7,85 kg /dm³ as per DIN EN 10305-5 table 6.

ASME B 36.10 / 36.19 Pipes

Weights and Dimensions

Nominal Pipe Size			Wall thickness / Schedule in mm Weights in kg/m																	
			ASME B 36.10 ¹⁾														ASME B 36.19			
			S5	S10	S20	S30	STD	S40	S60	XS	S80	S100	S120	S140	S160	XXS	5S	10S	40S	80S
⅛"	10,3	–	–	1,24	–	1,45	173	–	2,41	–	–	–	–	–	–	–	1,24	1,73	2,41	
			–	0,28	–	0,32	0,37	–	0,47	–	–	–	–	–	–	–	0,29	0,38	0,48	
¼"	13,7	–	–	1,65	–	1,85	2,24	–	3,02	–	–	–	–	–	–	–	1,65	2,24	3,02	
			–	0,49	–	0,54	0,63	–	0,80	–	–	–	–	–	–	–	0,50	0,64	0,82	
⅜"	17,2	10	–	1,65	–	1,85	2,31	–	3,20	–	–	–	–	–	–	–	1,65	2,31	3,20	
			–	0,63	–	0,70	0,84	–	1,10	–	–	–	–	–	–	–	0,67	0,86	1,12	
½"	21,3	15	1,65	2,11	–	2,41	2,77	–	3,73	–	–	–	–	4,78	7,47	1,65	2,11	2,77	3,73	
			0,80	1,00	–	1,12	1,27	–	1,62	–	–	–	–	1,95	2,55	0,82	1,02	1,30	1,65	
¾"	26,7	20	1,65	2,11	–	2,41	2,87	–	3,91	–	–	–	–	5,56	7,82	1,65	2,11	2,87	3,91	
			1,03	1,28	–	1,44	1,69	–	2,20	–	–	–	–	2,90	3,64	1,05	1,31	1,72	2,24	
1"	33,4	25	1,65	2,77	–	2,90	3,38	–	4,55	–	–	–	–	6,35	9,09	1,65	2,77	3,38	4,55	
			1,30	2,09	–	2,18	2,50	–	3,24	–	–	–	–	4,24	5,45	1,33	2,13	2,55	3,30	
1¼"	42,2	32	1,65	2,77	–	2,97	3,56	–	4,48	–	–	–	–	6,35	9,70	1,65	2,77	3,56	4,85	
			1,65	2,70	–	2,87	3,39	–	4,47	–	–	–	–	5,61	7,77	1,68	2,75	3,46	4,56	
1½"	48,3	40	1,65	2,77	–	3,18	3,68	–	5,08	–	–	–	–	7,14	10,15	1,65	2,77	3,68	5,08	
			1,91	3,11	–	3,53	4,05	–	5,41	–	–	–	–	7,25	9,56	1,95	3,17	4,13	5,52	
2"	60,3	50	1,65	2,77	–	3,18	3,91	–	5,54	–	–	–	–	8,74	11,07	1,65	2,77	3,91	5,54	
			2,40	3,93	–	4,48	5,44	–	7,48	–	–	–	–	11,1	13,4	2,45	4,01	5,55	7,63	
2½"	73,0	–	2,11	3,05	–	4,78	5,16	–	7,01	–	–	–	–	9,53	14,02	2,11	3,05	5,16	7,01	
			3,69	5,26	–	8,04	8,63	–	11,4	–	–	–	–	14,9	20,4	3,76	5,37	8,80	11,6	
3"	88,9	80	2,11	3,05	–	4,78	5,49	–	7,62	–	–	–	–	11,13	15,24	2,11	3,05	5,49	7,62	
			4,51	6,45	–	9,92	11,3	–	15,3	–	–	–	–	21,4	27,7	4,60	6,58	11,5	15,6	
3½"	101,6	–	2,11	3,05	–	4,78	5,74	–	8,08	–	–	–	–	–	–	2,11	3,05	5,74	8,08	
			5,18	7,40	–	11,4	13,6	–	18,6	–	–	–	–	–	–	5,28	7,55	13,9	19,0	
4"	114,3	100	2,11	3,05	–	4,78	6,02	–	8,56	–	–	11,13	–	13,49	17,12	2,11	3,05	6,02	8,56	
			5,84	8,36	–	12,9	16,1	–	22,3	–	–	28,3	–	33,5	41,0	5,96	8,53	16,4	22,7	
5"	141,3	–	2,77	3,40	–	–	6,55	–	9,53	–	–	12,70	–	15,88	19,05	2,77	3,40	6,55	9,53	
			9,47	11,6	–	–	21,8	–	31,0	–	–	40,3	–	49,1	57,4	9,66	11,8	22,2	31,6	
6"	168,3	150	2,77	3,40	–	–	7,11	–	10,97	–	–	14,27	–	18,26	21,95	2,77	3,40	7,11	10,97	
			11,3	13,8	–	–	28,3	–	42,6	–	–	54,2	–	67,6	79,2	11,5	14,1	28,9	43,5	
8"	219,1	200	2,77	3,76	6,35	7,04	8,18	10,31	12,70	15,09	18,26	20,62	22,23	23,01	2,77	3,76	8,18	12,70		
			14,8	20,0	33,3	36,8	42,6	53,0	64,6	75,9	90,4	101	108	111	15,1	20,4	43,5	65,9		
10"	273,0	250	3,40	4,19	6,35	7,80	9,27	12,70	15,09	18,26	21,44	25,44	28,58	25,40	3,40	4,19	9,27	12,70		
			22,6	27,8	41,8	51,0	60,3	81,6	96,0	115	133	155	172	155	23,1	28,4	61,5	83,2		
12"	323,8	300	3,96	4,57	6,35	8,38	9,53	10,31	14,27	17,48	21,44	25,40	28,58	33,32	3,96	4,57	9,53	12,70		
			31,3	36,0	49,7	65,2	73,9	79,7	109	132	160	187	208	239	31,9	44,6	75,4	99,5		

NPS = Nominal Pipe Size

Ø = Outer Dia (OD) in mm

DN = Diameter Nominal

¹⁾ All details does apply to carbon steel pipes.

All weights from the stainless steel pipes arising from multiplications from values with the factor 1,015.

Nominal Pipe Size			Wall thickness / Schedule in mm Weights in kg/m																	
			ASME B 36.10 ¹⁾														ASME B 36.19			
			S5	S10	S20	S30	STD	S40	S60	XS	S80	S100	S120	S140	S160	XXS	5S	10S	40S	80S
14"	355,6	350	3,96	6,35	7,92	953		11,13	15,09	12,70	19,05	23,83	27,79	31,75	35,71	–	3,96	4,78	9,53	12,70
			34,4	54,7	67,9	81,3		94,6	127	107	158	195	225	254	282	–	35,1	42,2	82,9	109
16"	406,4	400	4,19	6,35	7,92	9,53		12,70	16,66	12,70	21,44	26,19	30,96	36,53	40,49	–	4,19	4,78	9,53	12,70
			41,6	62,6	77,8	93,3		123	160	123	203	246	287	333	365	–	42,4	48,2	95,2	126
18"	457,2	450	4,19	6,35	7,92	11,3	9,53	14,27	19,05	12,70	23,83	29,36	34,93	39,67	45,24	–	4,19	4,78	9,53	12,70
			46,8	70,6	87,7	122	105	156	206	139	255	310	364	408	459	–	47,3	54,5	107	142
20"	508,0	500	4,78	6,35	9,53	12,70	9,53	15,09	20,62	12,70	26,19	32,54	38,10	44,45	50,01	–	4,78	5,54	9,53	12,70
			59,3	78,6	117	155	117	183	248	155	311	381	441	508	565	–	60,5	70,3	119	158
22"	558,8	550	4,78	6,35	9,53	12,70	9,53	15,88	22,23	12,70	28,58	34,93	41,28	47,63	53,98	–	4,78	5,54	9,53	12,70
			65,2	86,5	129	171	129	213	294	171	374	451	527	601	672	–	66,5	77,4	132	174
24"	609,6	600	5,54	6,35	9,53	14,27	9,53	17,48	24,61	12,70	30,96	38,89	46,02	52,37	59,54	–	5,54	6,35	9,53	12,70
			82,5	94,5	141	210	141	255	355	187	442	548	640	720	808	–	84,2	96,4	144	191
26"	660,4	650	–	7,92	12,70	–	9,53	–	–	12,70	–	–	–	–	–	–	–	–	–	–
			–	127	203	–	153	–	–	203	–	–	–	–	–	–	–	–	–	–
28"	711,2	700	–	7,92	12,70	15,88	9,53	–	–	12,70	–	–	–	–	–	–	–	–	–	–
			–	137	219	271	165	–	–	219	–	–	–	–	–	–	–	–	–	–
30"	762,0	750	6,35	7,92	12,70	15,88	9,53	–	–	12,70	–	–	–	–	–	–	6,35	7,92	–	–
			118	147	235	292	177	–	–	235	–	–	–	–	–	–	121	150	–	–
32"	812,8	800	–	7,92	12,70	15,88	9,53	17,48	–	12,70	–	–	–	–	–	–	–	–	–	–
			–	157	257	312	189	343	–	215	–	–	–	–	–	–	–	–	–	–
34"	863,6	850	–	7,92	12,70	15,88	9,53	17,48	–	12,70	–	–	–	–	–	–	–	–	–	–
			–	167	267	332	200	365	–	267	–	–	–	–	–	–	–	–	–	–
36"	914,4	900	–	7,92	12,70	15,88	9,53	19,05	–	12,70	–	–	–	–	–	–	–	–	–	–
			–	177	177	352	213	420	–	282	–	–	–	–	–	–	–	–	–	–
38"	965,2	950	–	–	–	–	9,53	–	–	12,70	–	–	–	–	–	–	–	–	–	–
			–	–	–	–	224	–	–	298	–	–	–	–	–	–	–	–	–	–
40"	1016,0	1000	–	–	–	–	9,53	–	–	12,70	–	–	–	–	–	–	–	–	–	–
			–	–	–	–	236	–	–	314	–	–	–	–	–	–	–	–	–	–
42"	1066,8	1050	–	–	–	–	9,53	–	–	12,70	–	–	–	–	–	–	–	–	–	–
			–	–	–	–	248	–	–	330	–	–	–	–	–	–	–	–	–	–
44"	1117,6	1100	–	–	–	–	9,53	–	–	12,70	–	–	–	–	–	–	–	–	–	–
			–	–	–	–	260	–	–	346	–	–	–	–	–	–	–	–	–	–
46"	1168,4	1150	–	–	–	–	9,53	–	–	12,70	–	–	–	–	–	–	–	–	–	–
			–	–	–	–	272	–	–	352	–	–	–	–	–	–	–	–	–	–
48"	1219,2	1200	–	–	–	–	9,53	–	–	12,70	–	–	–	–	–	–	–	–	–	–
			–	–	–	–	284	–	–	378	–	–	–	–	–	–	–	–	–	–

NPS = Nominal Pipe Size
 Ø = Outer Dia (OD) in mm
 DN = Diameter Nominal

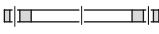
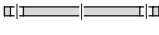
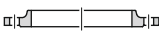
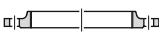
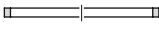
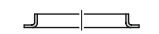
¹⁾ All details does apply to carbon steel pipes.
 All weights from the stainless steel pipes arising from multiplications
 from values with the factor 1,015.

Flanges with Dimension



DIN EN 1092-1 – Types of Flanges

Flanges as per BS DIN EN 1092-1

Identification		PN EN Type	2.5	6	10	16	25	40	63	100	160	250	320	400
			FLAT FLANGES											
Flat Flanges for welding		01	•	2573	2576	•	•	•	•	•	–	–	–	–
Loose Flanges Flat Collars ¹⁾ see also type 37		02	•	2641	2642	•	2655	2656	–	–	–	–	–	–
		32	•	2641	2642	•	2655	2656	–	–	–	–	–	–
Loose Flanges fit type 34		04	–	–	2673	2674	2674	2676	–	–	–	–	–	–
Blind Flanges		05	•	2527	2527	2527	2527	2527	2527	2527	–	–	–	–
NECK FLANGES														
Weld-Neck Flanges		11	2630	2631	2632	2633	2634	2635	2636	2637	2638	2628	2629	2627
Weld-Neck Collars ²⁾ fit type 04		34	–	–	2673	2674	2675	2676	–	–	–	–	–	–
Slip-on Flanges		12	–	–	86029	86030	•	•	•	•	–	–	–	–
Threaded Flanges		13	–	2565	•	2566	•	2567	2568	2569	–	–	–	–
COLLARS AND FLANGING														
Flat Collars fit type 02		32	•	2641	2642	•	2655	2656	–	–	–	–	–	–
Pipe Ends, flanged fit type 02		33	•	•	•	•	–	–	–	–	–	–	–	–
Weld-Neck Collars fit type 04		34	–	–	2673	2674	2675	2676	–	–	–	–	–	–
Weld-Neck Rings fit type 02		35	•	•	•	•	•	•	–	–	–	–	–	–
Pressed Collars, long fit type 02		36	•	•	•	•	–	–	–	–	–	–	–	–
Pressed Collars fit type 02		37	•	2641	2642	•	–	–	–	–	–	–	–	–

¹⁾ and ²⁾ also see under Collars and Flanging

Notes

- The following DIN standards are not included in DIN EN 1092-1 and, if required, can be acc. to the relevant DIN standards ordered :
- DIN 2558 Oval threaded flanges.
- Flange joints for vessels and process apparatus DIN 28030, 28031, 28032, 28034, 28036, 28038, 86041, 86044 , 28117.
- DIN 2695 Flanges with chamfering for membrane seal welds.
- Slip-on flanges are available in type 12, PN 10 and 16 as per DIN EN 1092-1, or DIN 86029/86030.

DIN EN 1092-1 – Materials for Flanges

Group	Forgings			Flat Forgings		
	Material	Material No	DIN EN	Material	Material No	DIN EN
2E0	–	–	–	–	–	–
3E0	–	–	–	P235GH	1.0345	10028-2
	P245GH	1.0352	10222-2	P265GH	1.0425	10028-2
3E1	P280GH	1.0426	10222-2	P295GH	1.0481	10028-2
4E0	16Mo3	1.5415	10222-2	16Mo3	1.5415	10028-2
5E0	13CrMo4-5	1.7335	10222-2	13CrMo4-5	1.7335	10028-2
6E0	11CrMo9-10	1.7385	10222-2	12CrMo9-10	1.7375	10028-2
	–	–	–	10CrMo9-10	1.7380	10028-2
6E1	X16CrMo5-1+NT	1.7385	10222-2	–	–	–
7E0	–	–	–	P275NL1	1.0488	10028-3
	–	–	–	P275NL2	1.1104	10028-3
7E1	–	–	–	P355NL1	1.0566	10028-3
	–	–	–	P355NL2	1.1106	10028-3
7E2	15NiMn6	1.6228	10222-3	15NiMn6	1.6228	10028-4
	–	–	–	11MnNi5-3	1.6212	10028-4
	13NiMn6-3	1.6217	10222-3	13MnNi6-3	1.6217	10028-4
7E3	12Ni14	1.5637	10222-3	12Ni14	1.5637	10028-4
	X12Ni5	1.5680	10222-3	X12N5	1.5680	10028-4
	X8Ni9	1.5662	10222-3	X8Ni9	1.5662	10028-4
8E0	–	–	–	–	–	–
8E2	P285NH	1.0477	10222-4	P275NH	1.0487	10028-3
	P285QH	1.0478	10222-4	–	–	–
8E3	P355NH	1.0565	10222-4	P355N	1.0562	10028-3
	P355QH1	1.0571	10222-4	P355NH	1.0565	10028-3
9E0	X20CrMoV11-1	1.4922	10222-2	–	–	–
9E1	X10CrMoVNb9-1	1.4903	10222-2	X10CrMoVNb9-1	1.4903	10028-2
10E0	X2CrNi18-9	1.4307	10222-5	X2CrNi18-9	1.4307	10028-7
	–	–	–	X2CrNi19-11	1.4306	10028-7
	–	–	–	X1CrNi25-21	1.4335	10028-7
10E1	X2CrNi18-10	1.4311	10222-5	X2CrNi18-10	1.4311	10028-7
11E0	X5CrNi18-10	1.4301	10222-5	X5CrNi18-10	1.4301	10028-7
	X6CrNi18-10	1.4948	10222-5	X6CrNi18-10	1.4948	10028-7
12E0	X6CrNiTi18-10	1.4541	10222-5	X6CrNiTi18-10	1.4541	10028-7
	X6CrNiNb18-10	1.4550	10222-5	X6CrNiNb18-10	1.4550	10028-7
	X6CrNiTiB18-10	1.4941	10222-5	X6CrNiTiB18-10	1.4941	10028-7
13E0	X2CrNiMo18-12-2	1.4404	10222-5	X2CrNiMo17-12-2	1.4404	10028-7
	X2CrNiMo18-12-3	1.4432	10222-5	X2CrNiMo17-12-3	1.4432	10028-7
	X2CrNiMo18-14-3	1.4435	10222-5	X2CrNiMo18-14-3	1.4435	10028-7
	X1CrNiMoCu25-20-5	1.4439	10222-5	X1NiCrMoCu25-20-5	1.4539	10028-7
	–	–	–	X1CrNiMoCu31-27-4	1.4563	10028-7
13E1	X2CrNiMoN17-11-2	1.4406	10222-5	X2CrNiMoN17-11-2	1.4406	10028-7
	X2CrNiMoN17-13-3	1.4429	10222-5	X2CrNiMoN17-13-3	1.4429	10028-7
	–	–	–	X2CrNiMoN17-13-5	1.4439	10028-7
	–	–	–	X1NiCrMoCuN25-20-7	1.4529	10028-7
	–	–	–	X1CrNiMoCuN20-18-7	1.4547	10028-7
14E0	X5CrNiMoN17-12-2	1.4401	10222-5	X5CrNiMo17-12-2	1.4401	10028-7
	X2CrNiMoN17-13-3	1.4436	10222-5	X3CrNiMo17-13-3	1.4436	10028-7
15E0	X6CrNiMoTi17-12-2	1.4571	10222-5	X6CrNiMoTi17-12-2	1.4571	10028-7
	–	–	–	X6CrNiMoNb17-12-2	1.4580	10028-7
16E0	–	–	–	X2CrNiN23-4	1.4362	10028-7
	X2CrNiMoN22-5-3	1.4462	10222-5	X2CrNiMoN22-5-3	1.4462	10028-7
	X2CrNiMoN25-7-4	1.4410	10222-5	X2CrNiMoN25-7-4	1.4410	10028-7

BS EN 1092-1 Flanges For Pipes, Fittings and Accessories

If they are according to the PED or they are used in pressure equipment or they shall have either

- Particular Material Appraisal
- European Approval of Material

Specification, Grade, Symbol and Material Number ¹⁾						
Material Group ²⁾	Flat Steel Products ^{3) 5)}		Forgings ^{3) 5)}		Castings ³⁾ Seamless Pipes ³⁾ Welded Pipes ^{3) 4)}	
	Standard	Material Number	Standard	Material Number	Standard	Material Number
1E0	VdTÜV 399/1 ⁶⁾	C21/1.0432	VdTÜV 399/3 ⁶⁾	C 21/1.0432	DIN 1681	GS-38
1E1	EN 10025-2	S235JR/1.0038	EN 10025-2 ⁸⁾	S235JR/1.0038	–	–
3E0	VdTÜV 350/1 ⁶⁾	C 22.8/1.0460	VdTÜV 350/3 ⁶⁾	C 22.8/1.0460	–	–
	–	–	EN 10222-2	P250GH/1.0460	–	–
7E0	DIN 17102 ⁷⁾	TSTE 285/1.0488	DIN 17103 ⁷⁾	TSTE 285/1.0488	–	–
7E1	DIN 17102 ⁷⁾	TSTE 355/1.0566	DIN 17103 ⁷⁾	TSTE 355/1.0566	DIN 17245	GS-10 Ni 19
	DIN 17102 ⁷⁾	TSTE 420/1.8912	DIN 17103 ⁷⁾	TSTE 420/1.8912	–	–
1E0	–	–	–	–	ASME SA 106	B
3E0	–	–	ASME SA 105	–	–	–
3E1	ASME SA 515	70	–	–	ASME SA 216	WCB
	ASME SA 516	70	–	–	ASME SA 216	WCC
	ASME SA 537	CL 1	–	–	ASME SA 333	6
4E0	ASME SA 204	A	ASME SA 182	F 1	ASME SA 217	WC 1
	ASME SA 204	B	ASME SA 182	F 1	ASME SA 217	WC 1
5E0	ASME SA 387	11	ASME SA 182	F 11, CI 1, 2 & CI 3	ASME SA 217	WC 6
	ASME SA 387	11	ASME SA 182	F 11, CI 1, 2 & CI 3	ASME SA 217	C 5
	ASME SA 387	12	ASME SA 182	F 12, CI 1 & 2	ASME SA 355	P 12
6E0	ASME SA 387	5	ASME SA 182	F 5	ASME SA 217	C 12
	ASME SA 387	9	ASME SA 182	F 9	ASME SA 335	P 5, P 9
	ASME SA 387	22	ASME SA 182	F 22, CI 1 and 3	ASME SA 335	P 22
7E3	ASME SA 203	A	ASME SA 182	LF 3	ASME SA 352	LC 2, LC 3, LC 8
	ASME SA 203	E	ASME SA 182	LF 3	ASME SA 352	LC 2, LC 3, LC 8
8E2	–	–	ASME SA 182	LF 2 CI 1 / CI 2	–	–
10E0	ASME SA 240	304	ASME SA 182	F304	ASME SA 351	CF 8
	ASME SA 240	304	ASME SA 182	F304	ASME SA 312	TP304L
	ASME SA 240	304L	ASME SA 182	F304L	ASME SA 312	TP304
	ASME SA 240	304H	ASME SA 182	F304H	ASME SA 312	TP304H
12E0	ASME SA 240	–	ASME SA 182	F321, F321H	ASME SA 312	TP321
	ASME SA 240	–	ASME SA 182	F321, F321H	ASME SA 312	TP321H
14E0	ASME SA 240	316	ASME SA 182	F316	ASME SA 351	CF 8 M
	ASME SA 240	316	ASME SA 182	F316	ASME SA 312	TP316
	ASME SA 240	316L	ASME SA 182	F316L	ASME SA 312	TP316L
	ASME SA 240	316H	ASME SA 182	F316H	ASME SA 312	TP316H
15E0	ASME SA 240	316Ti	–	–	–	–
16E0	–	–	ASME SA 182	F51	–	–

BS DIN EN 1092-1 Comparison with DIN 2526

Acc. to DIN EN 1092-1 The mechanical process “turning” contains all machining procedure that make either spiral or concentric grooves. The radius of the round steel chisel drill for types A, B1, E, and F must be at least 1 mm.

Flange	Identification acc. to DIN 2526			Identification acc. to DIN EN 1092-1			Drawing
	Standard	Note	Facing	Facing	Ra in μm ⁴⁾	Rz in μm ⁴⁾	
Flat Face	DIN 2641 / 2642 DIN 2655 / 2656 DIN 2673	No requirements	Type A	Type A	3,2–12,5	12,5–50	
	DIN 2527 ≤ PN 40 DIN 2573 / 2576	Rz = 160, turned ¹⁾	Type B				
Raised Face	DIN 2630 to DIN 2635	Rz = 160, turned ¹⁾ Rz = 40, turned	Type C Type D	Type B1 ²⁾	3,2–12,5	12,5–50	
	from DIN 2636 DIN 2527 ≥ PN 63	Rz = 16, turned	Type E	Type B2 ³⁾	0,8–3,2	3,2–12,5	
Tongue	DIN 2512	PN 10 - PN 160	Type F	Type C	0,8–3,2	3,2–12,5	
Groove	DIN 2512	PN 10 - PN 160	Type N	Type D	0,8–3,2	3,2–12,5	
Male	DIN 2513	PN 10 - PN 100	Type V13	Type E	3,2–12,5	12,5–50	
Female	DIN 2513	PN 10 - PN 100	Type R13	Type F	3,2–12,5	12,5–50	
O-Ring	DIN 2514	PN 10 - PN 40	Type R14	Type G	0,8–3,2	3,2–12,5	
O-Ring Groove	DIN 2514	PN 10 - PN 40	Type V14	Type H	0,8–3,2	3,2–12,5	
Counter Bore For Ovale Seal	DIN 2696	PN 63 - PN 400	Type L	–	–	–	
Bevel For Diaphragm Welding Seal	DIN 2695	PN 63 - PN 400	Type M	–	–	–	

¹⁾ No finer than 40 μm .

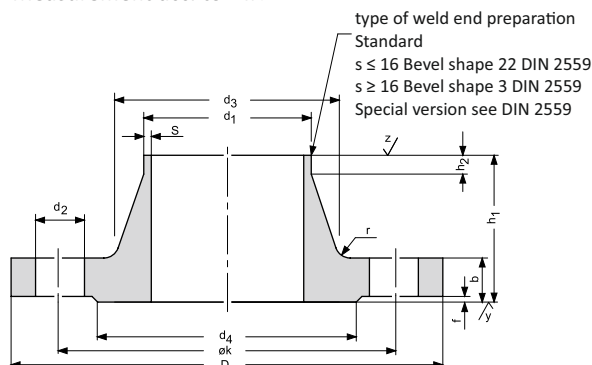
²⁾ B1 general applications PN 2,5 – PN 40.

³⁾ B2 general applications PN 63 – PN 400.

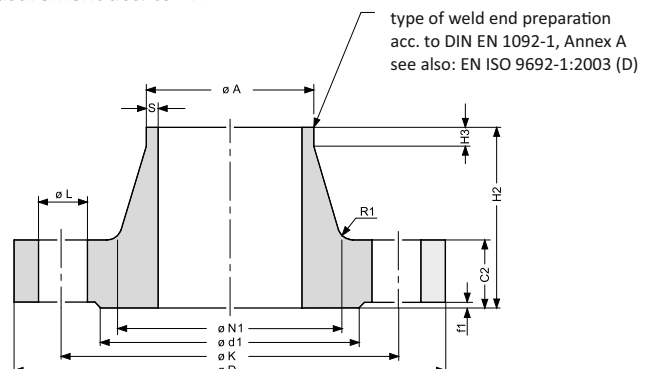
⁴⁾ Ra = arithmetical mean deviation.

⁵⁾ Rz = average surface roughness.

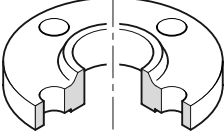
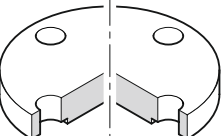
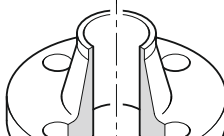
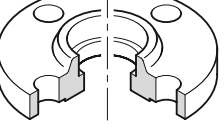
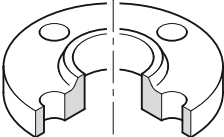
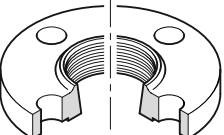
Measurement acc. to DIN



Measurement acc. to EN



ASME B 16.5 Flange

Flange Types	Dimensions																				
	Class	½"	¾"	1"	1¼"	1½"	2"	2½"	3"	3½"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
Slip-on Flanges 	150	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	300	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	400	Dimension as Class 600										•	•	•	•	•	•	•	•	•	•
	600	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	900	Dimension as Class 1500								•	–	•	•	•	•	•	•	•	•	•	•
	1500	•	•	•	•	•	•	•	•	–	–	–	–	–	–	–	–	–	–	–	–
Blind Flanges 	150 ¹⁾	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	300 ¹⁾	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	400 ¹⁾	Dimension as Class 600										•	•	•	•	•	•	•	•	•	•
	600 ¹⁾	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	900 ¹⁾	Dimension as Class 1500								•	–	•	•	•	•	•	•	•	•	•	•
	1500	•	•	•	•	•	•	•	•	–	•	•	•	•	•	•	•	•	•	•	•
Weld Neck Flanges 	300 ¹⁾	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	400 ¹⁾	Dimension as Class 600										•	•	•	•	•	•	•	•	•	•
	600 ¹⁾	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	900 ¹⁾	Dimension as Class 1500								•	–	•	•	•	•	•	•	•	•	•	•
	1500	•	•	•	•	•	•	•	•	–	•	•	•	•	•	•	•	•	•	•	•
	2500	•	•	•	•	•	•	•	•	–	•	•	•	•	•	•	•	–	–	–	–
Socket Welding Flanges 	150	•	•	•	•	•	•	•	•	–	–	–	–	–	–	–	–	–	–	–	–
	300	•	•	•	•	•	•	•	•	–	–	–	–	–	–	–	–	–	–	–	–
	600	•	•	•	•	•	•	•	•	–	–	–	–	–	–	–	–	–	–	–	–
	1500	•	•	•	•	•	•	•	•	–	–	–	–	–	–	–	–	–	–	–	–
		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Lap Joint Flanges 	150	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	300	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	400	Dimension as Class 600										•	•	•	•	•	•	•	•	•	•
	600	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	900	Dimension as Class 1500								•	–	•	•	•	•	•	•	•	•	•	•
	1500	•	•	•	•	•	•	•	•	–	•	•	•	•	•	•	•	•	•	•	•
Threaded Flanges 	150	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	300	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	400	Dimension as Class 600										•	•	•	•	•	•	•	•	•	•
	600									•	•	•	•	•	•	•	•	•	•	•	•
	900	Dimension as Class 1500								•	–	•	•	•	•	•	•	•	•	•	•
	1500	•	•	•	•	•	•	•	•	–	–	–	–	–	–	–	–	–	–	–	–
2500	2500	•	•	•	•	•	•	•	•	–	–	–	–	–	–	–	–	–	–	–	–

¹⁾ Dimensions ≥ 26" see ASME B 16.47 Series A and B.

Pressure Ratings, Facings and Dimensions

Nominal pressure comparison Class / bar / psi / API psi

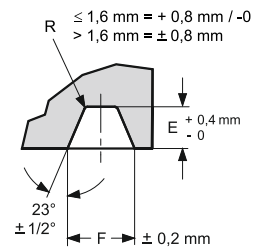
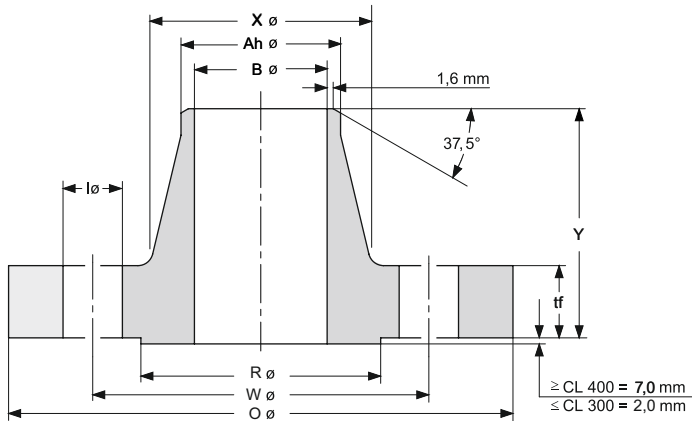
ASME Class	150	300	400	600		900		1500		2500			
bar –	20	51	68	102	140	153	210	233	350	422	700	1050	1400
psi –	285	740	990	1480		2220		3380		6120			
API psi					2000		3000		5000		10000	15000	20000

Bar Greek barys, hard
Psi Pounds per square inch

Conversion: 1 bar ~ 14,29 psi / 1 psi ~ 0,07 bar

ASME B 16.5 Dimensions

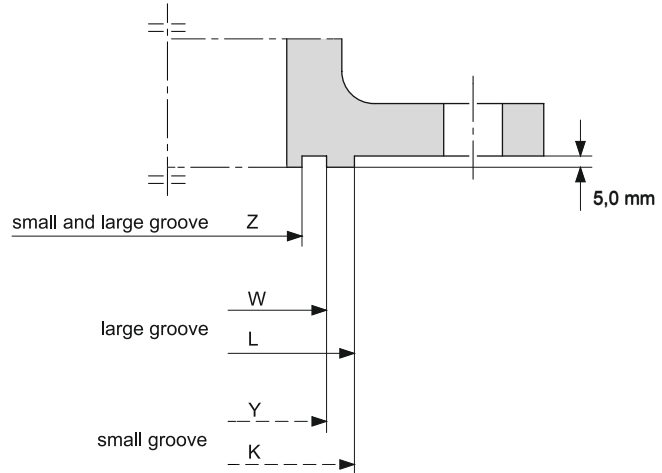
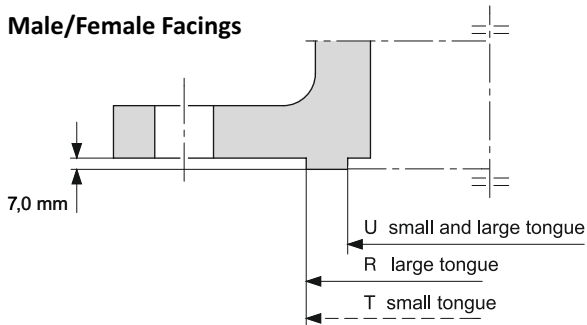
Ring Type Joint (RTJ)



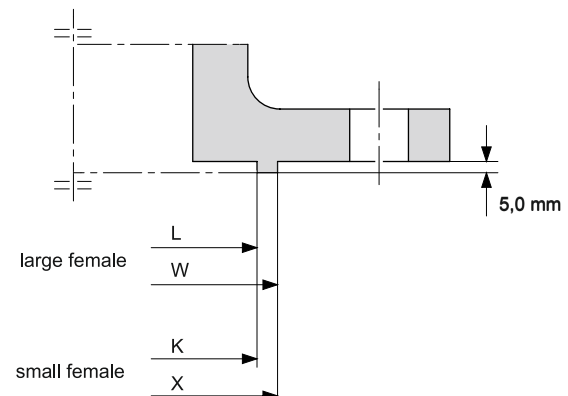
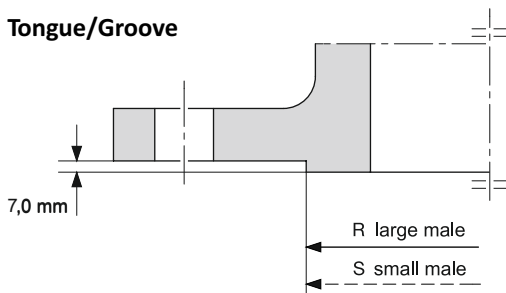
Facing

The facing is made by mechanical turning, resulting in the following surface conditions:

Male/Female Facings



Tongue/Groove



Butt-weld Fittings Materials



DIN EN 10253 – Butt-weld Fittings

1. Brief Description and Comparison

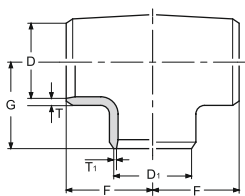
Butt-weld Fittings	
DIN EN 10253 - 1	Non-alloy steel for general applications and without special test requirements
DIN EN 10253 - 2	Non-alloy and alloy ferritic steels with special test requirements
DIN EN 10253 - 3	Wrought austenitic and austenitic-ferritic (duplex) stainless steels without special test requirements
DIN EN 10253 - 4	Wrought austenitic and austenitic-ferritic (duplex) stainless steels with special test requirements

Earlier Issues	
DIN 2609	Butt-welding fittings – Technical delivery conditions
DIN 2605-1/ -2	Elbows, reduced and full pressure factor
DIN 2615-1/ -2	Tees, reduced and full pressure factor
DIN 2616-1/-2	Reducers, reduced and full pressure factor
DIN 2617	Caps

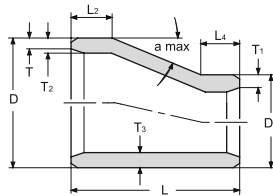
DIN EN 10253 establishes – in addition to the steel grades, mechanical properties, dimensions and tolerances, test requirements, test reports and identification – two types of fittings:

- **Type A Fittings** : Same wall thickness as the subsequent pipe (DIN 2605-1, DIN 2615-1, DIN 2616-1 und DIN 2617).
- **Type B Fittings** : With higher wall thickness of the fitting body are designed for the same internal pressure as for a straight pipe with the same dimensions (DIN 2605-2, DIN 2615-2 und DIN 2616-2).

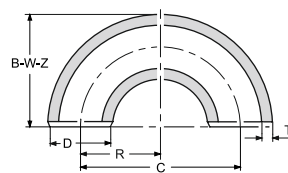
According to the calculation rules of DIN EN 13480-3, is also, opposed to DIN, caps of type A and B, in which, at a reduced utilization factor (Type A), the values lie in 94 to 100%, as far as it can be calculated as per standard.



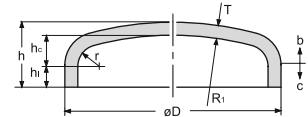
DIN EN 10253 Type A Tees



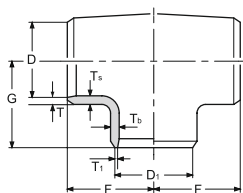
DIN EN 10253 Type A/B Eccentric Reducers



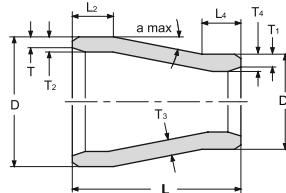
DIN EN 10253 Type A Elbows



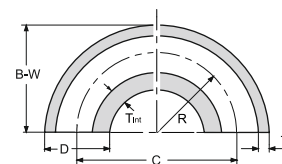
DIN EN 10253 Caps



DIN EN 10253 Type B Tees



DIN EN 10253 Type B Concentric Reducers



DIN EN 10253 Type B Elbows

2. Welding Ends Types

Ends Implementation as per to DIN EN 120253			Ends Implementation as per DIN 2559		
≤ 3 mm wall thk	Plain or slightly beveled ends		DIN 2559-1	≤ 3 mm wall thk	
> 3 mm to ≤ 22 mm	30° bevel +5 /-0° with a root face of 1,6 mm ± 0,8 mm	∇	DIN 2559-22	> 3 mm to ≤ 16 mm	∇
> 22 mm wall thk	to be agreed		DIN 2559-3	> 16 mm wall thk	⌋

3. Dimension Standards and Tolerances Comparison

Weld end tolerances			
DIN EN 1053-2	DIN EN 1053-4		DIN 2609
	Tolerances	Admitted Difference ¹⁾	
± 1% of the theoretical inside diameter or ± 0,5 mm, whichever is greater, but not more than ± 5 mm. If the tolerance for the OD applies, Option 9 must be ordered.	D2	± 1% oder 5 mm	± 1% of the theoretical OD (≤ 100 mm da as max. ± 5 mm is allowed.)
	D3	± 0,75% oder 0,3 mm ²⁾	
	D4	± 0,50% oder 0,1 mm ²⁾	

¹⁾ Acc. to outer Dia (OD): the major value is applicable.

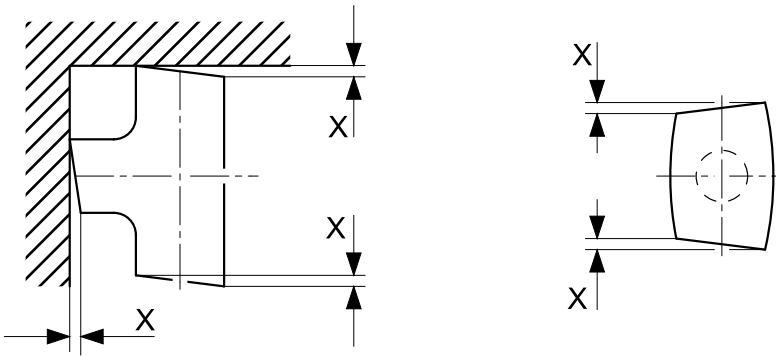
²⁾ Option 13: Fittings can be ordered in tolerances D3 or D4.

Welding Ends Wall Thickness Tolerances							
Diameter	Wall Thickness	DIN EN 1053-2		DIN EN 1053-2		DIN EN 1053-2	
		-	+	-	+	-	+
All	All					2605-1 12,5%	2609 15%
D ≤ 610	All	12,5%	20%	12,5%	15%	2605-2/2615/2616/2617 12,5%	
D > 610		Seamless 12,5%	20%				
D > 610	≤ 10 ≤ 10	Welded 0,35 mm 0,50 mm	20%	0,35 mm 0,50 mm	15%	2605-2/ 2615/ 2616/ 2617 0,35 mm 0,50 mm	

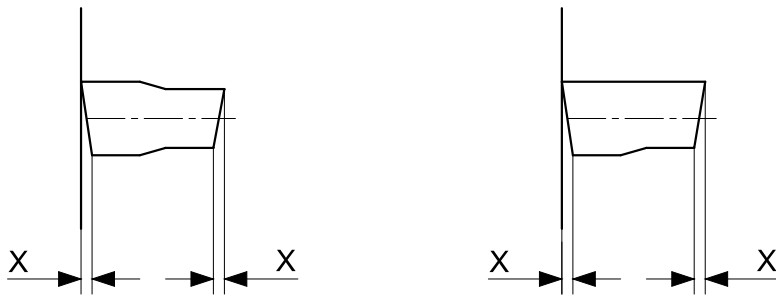
Fitting Geometry Tolerances		
DIN EN 10253-2	DIN EN 10253-4	DIN EN 2609
± 1% diameter at measuring point, min. 1 mm		
For 180° elbows, a tolerance P was created.		

Tolerances of the Fitting Geometry

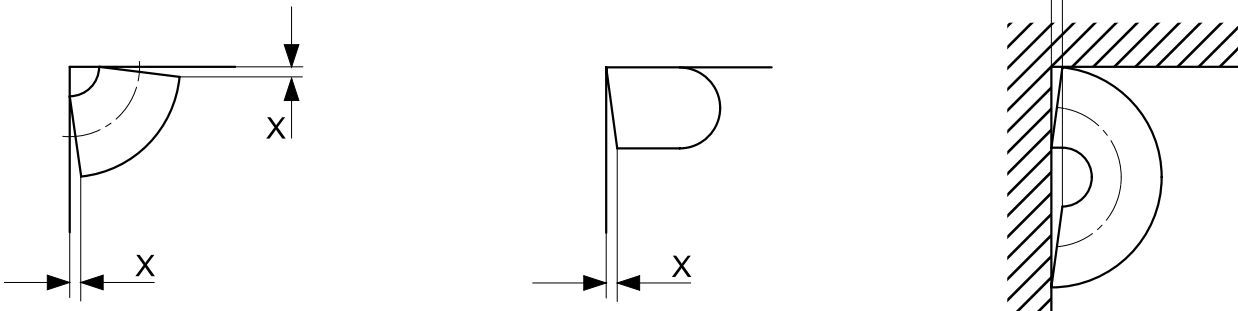
Tee



Reducer



Elbow



4. Elbows Radius

Size in mm	Type 2D / 2			Type 3D / 3			Type 5D / 5		
	DIN EN 10253		DIN 2605	DIN EN 10253		DIN 2605	DIN EN 10253		DIN 2605
	Part 2	Part 4		Part 2	Part 4		Part 2	Part 4	
21,3	25,0	17,5	17,5	38,0	28,0	28,0	–	–	–
26,9	–	–	–	38,0	29,0	29,0	–	–	–
48,3	–	–	–	–	–	–	109,5	108,0	107,5
51,0	–	–	–	63,0	63,0	63,5	122,5	115,0	115,0
57,0	–	–	–	–	–	–	130,0	127,5	127,5
60,3	–	–	–	–	–	–	137,5	135,0	135,0
88,9	–	–	–	–	–	–	207,5	205,0	205,0
101,6	–	–	–	133,0	133,5	133,5	235,0	237,5	237,5
108,0	–	–	–	–	–	–	253,0	252,5	252,5
133,0	–	–	–	–	–	–	311,5	312,5	312,5
219,1	–	–	–	–	–	–	515,0	510,0	510,0
323,9	–	–	–	–	–	–	770,0	775,0	775,0

5. Material Grade & Standard Comparison

Designation	Material Grade	DIN Material	Material Grade	ASME
P235TR2	1.0255	St 37.4	1.0255	–
P265TR2	1.0259	St 44.4	1.0257	–
P235GH	1.0345	St 35.8 / St 37.8	1.0305 / 1.0315	–
P265GH	1.0425	St 45.8 / St 42.8	1.5405 / 1.0498	WPB
16Mo3	1.5415	15 Mo 3	1.5415	–
10CrMo5-5	1.7338	–	–	WP11
13CrMo4-5	1.7335	13 CrMo 4 4	1.7335	WP12
10CrMo9-10	1.7380	10 CrMo 9 10	1.7380	WP22
X11CrMo5	1.7362	12 CrMo 19 5	1.7362	WP5
X11CrMo5	1.7386	X 12 CrMo 9 1	1.7386	WP9
X10CrMoVNb9-1	1.4903	–	–	WP91
P355N	1.0562	StE 355	1.0562	–
P355NH	1.0565	WStE 355	1.0565	–
P355NL1	1.0566	TStE 355	1.0566	–
P215NL	1.0451	TT St 35 N	1.0356	–
P265NL	1.0453	–	–	–
12Ni14	1.5637	10 Ni 14	1.5637	WPL3
X10Ni9	1.5682	X 8 Ni 9	1.5662	–
L290NB	1.0484	StE 290.7	1.0484	WPHY42
L360NB	1.0582	StE 360.7	1.0582	WPHY52
L360QB	1.8948	–	–	–
L415NB	1.8972	StE 415.7	1.8972	WPHY60
L415QB	1.8947	–	–	–
L450QB	1.8952	–	–	–

DIN 2609 – Materials for Butt-weld Fittings

Materials Group		Base Material	Material Number	Product Form of Base Materials ¹⁾						Application Temperature in °C
Index	Short Name			1	2	3	4	5	DIN	
A	St 37.0	St 37.0	1.0254	•	–	–	–	–	1629	–10 to 300
		St 37.0	1.0254	–	•	–	–	–	1626	–10 to 300
		St 37-2	1.0028	–	–	•	•	•	17 100	–10 to 300
B	St 44.0	St 44.0	1.0256	•	–	–	–	–	1629	–10 to 300
		St 44.0	1.0256	–	•	–	–	–	1626	–10 to 300
		St 44-2	1.0044	–	–	•	•	•	17 100	–10 to 300
C	St 52.0	St 52.0	1.0421	•	–	–	–	–	1629	–10 to 300
		St 52.0	1.0421	–	•	–	–	–	1626	–10 to 300
		St 52-3	1.0570	–	–	•	•	•	17 100	–10 to 300
D	St 290.7	St 290.7	1.0484	•	•	–	–	–	17 172	–10 to 50
E	StE 360.7	StE 360.7	1.0582	•	•	–	–	–	17 172	–10 to 50
F	St 35.8 I	St 35.8 I	1.0305	•	–	–	–	–	17 175	–10 to 420
		St 35.8 I	1.0315	–	•	–	–	–	17 177	–10 to 420
		HI	1.0345	–	–	•	–	–	17 155	–10 to 420
		HII	1.0425	–	–	•	–	–	17 155	–10 to 420
		C 22.8	1.0460	–	–	–	•	•	17 243	–10 to 420
G	St 35.8 III	St 35.8 III	1.0305	•	–	–	–	–	17 175	–10 to 420
		St 35.8 III	1.0315	–	•	–	–	–	17 177	–10 to 420
		HII	1.0425	–	–	•	–	–	17 155	–10 to 420
		C 22.8	1.0460	–	–	–	•	•	17 243	–10 to 420
H	15 Mo 3	15 Mo 3	1.5415	•	–	–	–	–	17 175	–10 to 530
		15 Mo 3	1.5415	–	•	–	–	–	17 177	–10 to 530
		15 Mo 3	1.5415	–	–	•	–	–	17 155	–10 to 530
		15 Mo 3	1.5415	–	–	–	•	•	17 243	–10 to 530
J	13 CrMo 4 4	13 CrMo 4 4	1.7335	•	–	–	–	–	17 175	–10 to 570
		13 CrMo 4 4	1.7335	–	–	•	–	–	17 155	–10 to 570
		13 CrMo 4 4	1.7335	–	–	–	•	•	17 243	–10 to 570
K	10 CrMo 9 10	10 CrMo 9 10	1.7380	•	–	–	–	–	17 175	–10 to 600
		10 CrMo 9 10	1.7380	–	–	•	–	–	17 155	–10 to 600
		10 CrMo 9 10	1.7380	–	–	–	•	•	17 243	–10 to 600
L	X 5 CrNi 18 10	X 5 CrNi 18 10	1.4301	•	–	–	–	–	17 458	–200 to 550
		X 5 CrNi 18 10	1.4301	–	•	–	–	–	17 457	–200 to 550
		X 5 CrNi 18 10	1.4301	–	–	•	•	•	17 440	–200 to 550
M	X 2 CrNi 19 11	X 2 CrNi 19 11	1.4306	•	–	–	–	–	17 458	–200 to 550
		X 2 CrNi 19 11	1.4306	–	•	–	–	–	17 457	–200 to 550
		X 2 CrNi 19 11	1.4306	–	–	•	•	•	17 440	–200 to 550
N	X 6 CrNiTi 18 10	X 6 CrNiTi 18 10	1.4541	•	–	–	–	–	17 458	–200 to 550
		X 6 CrNiTi 18 10	1.4541	–	•	–	–	–	17 457	–200 to 550
		X 6 CrNiTi 18 10	1.4541	–	–	•	•	•	17 440	–200 to 550
O	X 5 CrNiMo 17 12 2	X 5 CrNiMo 17 12 2	1.4401	•	–	–	–	–	17 458	–200 to 550
		X 5 CrNiMo 17 12 2	1.4401	–	•	–	–	–	17 457	–200 to 550
		X 5 CrNiMo 17 12 2	1.4401	–	–	•	•	•	17 440	–200 to 550
P	X 2 CrNiMo 17 13 2	X 2 CrNiMo 17 13 2	1.4404	•	–	–	–	–	17 458	–200 to 550
		X 2 CrNiMo 17 13 2	1.4404	–	•	–	–	–	17 457	–200 to 550
		X 2 CrNiMo 17 13 2	1.4404	–	–	•	•	•	17 440	–200 to 550
Q	X 6 CrNiMoTi 17 12 2	X 6 CrNiMoTi 17 12 2	1.4571	–	–	–	–	–	17 458	–200 to 550
		X 6 CrNiMoTi 17 12 2	1.4571	–	–	–	–	–	17 457	–200 to 550
		X 6 CrNiMoTi 17 12 2	1.4571	–	–	–	–	–	17 440	–200 to 550
R	WStE 355	WStE 355	1.0565	•	–	–	–	–	17 179	–20 to 400
		WStE 355	1.0565	–	•	–	–	–	17 178	–20 to 400
		WStE 355	1.0565	–	–	•	–	•	17 102	–20 to 400
		WStE 355	1.0565	–	–	–	•	–	17 103	–20 to 400
S	TStE 355	TStE 355	1.0566	•	–	–	–	–	17 179	–60 to 50
		TStE 355	1.0566	–	•	–	–	–	17 178	–60 to 50
		TStE 355	1.0566	–	–	•	–	•	17 102	–60 to 50
		TStE 355	1.0566	–	–	–	•	–	17 103	–60 to 50
T	TStE 285	TStE 285	1.0488	•	–	–	–	–	17 179	–50 to 50
		TStE 285	1.0488	–	•	–	–	–	17 178	–50 to 50
		TStE 285	1.0488	–	–	•	–	•	17 102	–50 to 50
		TStE 285	1.0488	–	–	–	•	–	17 103	–50 to 50
U	10 Ni 14	10 Ni 14	1.5637	•	–	–	–	–	17 173	–105 to 50
		10 Ni 14	1.5637	–	•	–	–	–	17 174	–105 to 50
		10 Ni 14	1.5637	–	–	•	•	•	17 280	–105 to 50

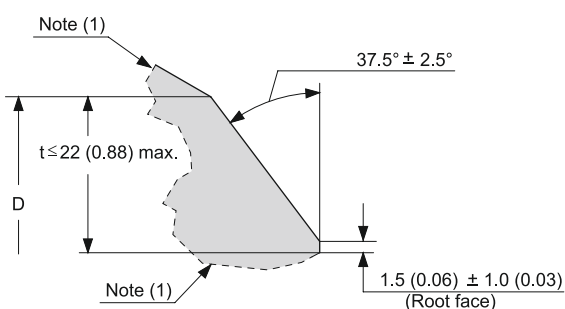
¹⁾ 1 Seamless pipe/ Tubes 2 Welded pipe / Tubes 3 Plate metal 4 Forging 5 bar steel 6 Fittings

ASME B 16.9 – Butt-weld Fittings General Standard

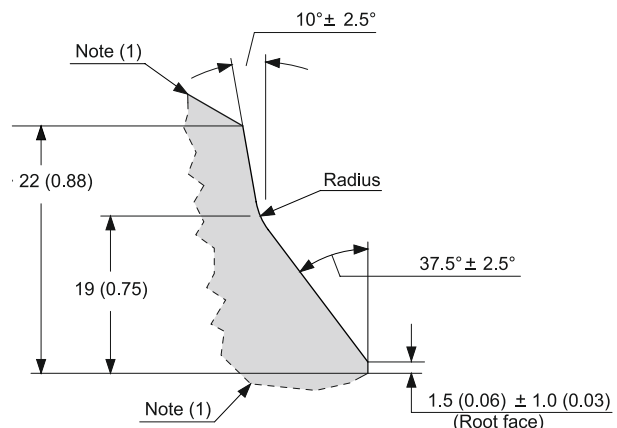
Types																												
		Elbows			Tees																Reducers Concentric/ Eccentric						Caps	Stub Ends
OD 1	LR	SR	3D	Outside Diameter 2														OD 1	Outside Diameter 2									
½"	●	—	—	½"	⅜"	¼"	—	—	—	—	—	—	—	—	—	—	½"	—	—	—	—	—	—	—	●	●		
¾"	●	—	●	¾"	½"	⅜"	—	—	—	—	—	—	—	—	—	—	¾"	½"	⅜"	—	—	—	—	—	●	●		
1"	●	●	●	1"	¾"	½"	—	—	—	—	—	—	—	—	—	—	1"	¾"	½"	—	—	—	—	—	●	●		
1¼"	●	●	●	1¼"	1"	¾"	½"	—	—	—	—	—	—	—	—	—	1¼"	1"	¾"	½"	—	—	—	—	●	●		
1½"	●	●	●	1½"	1¼"	1"	¾"	½"	—	—	—	—	—	—	—	—	1½"	1¼"	1"	¾"	½"	—	—	—	●	●		
2"	●	●	●	2"	1½"	1¼"	1"	¾"	—	—	—	—	—	—	—	—	2"	1½"	1¼"	1"	¾"	—	—	—	●	●		
2½"	●	●	●	2½"	2"	1½"	1¼"	1"	—	—	—	—	—	—	—	—	2½"	2"	1½"	1¼"	1"	—	—	—	●	●		
3"	●	●	●	3"	2½"	2"	1½"	1¼"	—	—	—	—	—	—	—	—	3"	2½"	2"	1½"	1¼"	—	—	—	●	●		
3½"	●	●	—	3½"	3"	2½"	2"	1½"	—	—	—	—	—	—	—	—	3½"	3"	2½"	2"	1½"	1¼"	—	—	●	●		
4"	●	●	●	4"	3½"	3"	2½"	2"	1½"	—	—	—	—	—	—	—	4"	3½"	3"	2½"	2"	1½"	—	—	●	●		
5"	●	●	●	5"	4"	3½"	3"	2½"	2"	—	—	—	—	—	—	—	5"	4"	3½"	3"	2½"	2"	—	—	●	●		
6"	●	●	●	6"	5"	4"	3½"	3"	2½"	—	—	—	—	—	—	—	6"	5"	4"	3½"	3"	2½"	—	—	●	●		
8"	●	●	●	8"	6"	5"	4"	3½"	—	—	—	—	—	—	—	—	8"	6"	5"	4"	3½"	—	—	—	●	●		
10"	●	●	●	10"	8"	6"	5"	4"	—	—	—	—	—	—	—	—	10"	8"	6"	5"	4"	—	—	—	●	●		
12"	●	●	●	12"	10"	8"	6"	5"	—	—	—	—	—	—	—	—	12"	10"	8"	6"	5"	—	—	—	●	●		
14"	●	●	●	14"	12"	10"	8"	6"	—	—	—	—	—	—	—	—	14"	12"	10"	8"	6"	—	—	—	●	●		
16"	●	●	●	16"	14"	12"	10"	8"	6"	—	—	—	—	—	—	—	16"	14"	12"	10"	8"	—	—	—	●	●		
18"	●	●	●	18"	16"	14"	12"	10"	8"	—	—	—	—	—	—	—	18"	16"	14"	12"	10"	—	—	—	●	●		
20"	●	●	●	20"	18"	16"	14"	12"	10"	8"	—	—	—	—	—	—	20"	18"	16"	14"	12"	—	—	—	●	●		
22"	●	●	●	22"	20"	18"	16"	14"	12"	10"	—	—	—	—	—	—	22"	20"	18"	16"	14"	—	—	—	●	●		
24"	●	●	●	24"	22"	20"	18"	16"	14"	12"	10"	—	—	—	—	—	24"	22"	20"	18"	16"	—	—	—	●	●		
26"	●	—	●	26"	24"	22"	20"	18"	16"	14"	12"	—	—	—	—	—	26"	24"	22"	20"	18"	—	—	—	●	—		
28"	●	—	●	28"	26"	24"	22"	20"	18"	16"	14"	12"	—	—	—	—	28"	26"	24"	22"	20"	—	—	—	●	—		
30"	●	—	●	30"	28"	26"	24"	22"	20"	18"	16"	14"	12"	10"	—	—	30"	28"	26"	24"	22"	—	—	—	●	—		
32"	●	—	●	32"	30"	28"	26"	24"	22"	20"	18"	16"	14"	—	—	—	32"	30"	28"	26"	24"	—	—	—	●	—		
34"	●	—	●	34"	32"	30"	28"	26"	24"	22"	20"	18"	16"	—	—	—	34"	32"	30"	28"	26"	24"	—	—	●	—		
36"	●	—	●	36"	34"	32"	30"	28"	26"	24"	22"	20"	18"	16"	—	—	36"	34"	32"	30"	28"	26"	—	—	●	—		
38"	●	—	●	38"	36"	34"	32"	30"	28"	26"	24"	22"	20"	18"	—	—	38"	36"	34"	32"	30"	28"	26"	—	●	—		
40"	●	—	●	40"	38"	36"	34"	32"	30"	28"	26"	24"	22"	20"	18"	—	40"	38"	36"	34"	32"	30"	—	—	●	—		
42"	●	—	●	42"	40"	38"	36"	34"	32"	30"	28"	26"	24"	22"	20"	18"	42"	40"	38"	36"	34"	32"	30"	—	●	—		
44"	●	—	●	44"	42"	40"	38"	36"	34"	32"	30"	28"	26"	24"	22"	20"	44"	42"	40"	38"	36"	—	—	—	●	—		
46"	●	—	●	46"	44"	42"	40"	38"	36"	34"	32"	30"	28"	26"	24"	22"	46"	44"	42"	40"	38"	—	—	—	●	—		
48"	●	—	●	48"	46"	44"	42"	40"	38"	36"	34"	32"	30"	28"	26"	24"	48"	46"	44"	42"	40"	—	—	—	●	—		

Weld seam preparations	
Nominal wall thickness T	Type of preparation
T < 5 mm (for austenitic steels ≤ 3 mm)	Cut square or slightly chamfered, at manufacturer's discretion
5 < T < 22 mm (for austenitic steels > 3 mm)	Plain bevel as in sketch 1 (s.b.)
T > 22 mm	Compound bevel as in sketch 2 (s.b.)

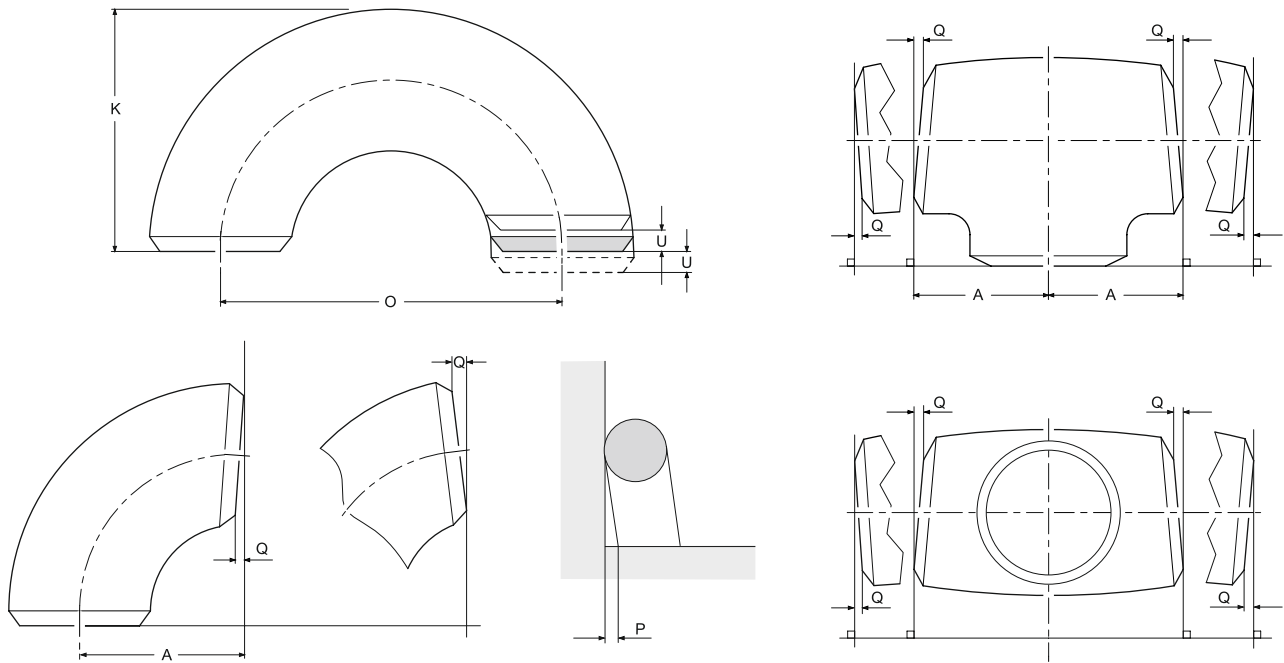
Sketch 1: Plain bevel



Sketch 2: Compound bevel



ASME B 16.9 Tolerances



	All Fittings			Elbows 90°/45° and Tees	Reducers / Lap Joint Stub Ends	Elbows 180°			Elbows 3D	Caps
Nominal Pipe Size	Outside Diameter At Bevel	Inside Diameter At End	Wall Thickness	Center to End	length	Center to Center	Back to Face	Ends Alignment	Center to End	Length
	D		T	A, B, C, M	F, H	O	K	U	A, B	E
½–2½"	+1,6/–0,8	± 0,8	No Smaller than 87,5% of the nominal wall thickness	± 2	± 2	± 6	± 6	± 1	± 3	± 3
3"–3½"	± 1,6	± 1,6		± 2	± 2	± 6	± 6	± 1	± 3	± 3
4"	± 1,6	± 1,6		± 2	± 2	± 6	± 6	± 1	± 3	± 3
5"–8"	+2,4/–1,6	± 1,6		± 2	± 2	± 6	± 6	± 1	± 3	± 6
10"–18"	+4,0/–3,2	± 3,2		± 2	± 2	± 10	± 6	± 2	± 3	± 6
20"–24"	+6,4/–4,8	± 4,8		± 2	± 2	± 10	± 6	± 2	± 3	± 6
26"–30"	+6,4/–4,8	± 4,8		± 3	± 5	–	–	–	± 6	± 10
32"–48"	+6,4/–4,8	± 4,8		± 5	± 5	–	–	–	± 6	± 10

All data in mm

Round Angularity Tolerances		
NPS	Off Angle	Off Plane
	D	P
½–2½"	+1,6/–0,8	± 0,8
3"–3½"	± 1,6	± 1,6
4"	± 1,6	± 1,6
5"–8"	+2,4/–1,6	± 1,6
10"–18"	+4,0/–3,2	± 3,2
20"–24"	+6,4/–4,8	± 4,8
26"–30"	+6,4/–4,8	± 4,8
32"–48"	+6,4/–4,8	± 4,8

All data in mm

Lap Joint Stub Ends			
NPS	OD of Lap	Fillet	Thickness
	D	R	T
½–2½"	+0/–1	+0/–1	± 1,6/–0
3"–3½"	+0/–1	+0/–1	± 1,6/–0
4"	+0/–1	+0/–1	± 1,6/–0
5"–8"	+0/–1	+0/–1	± 1,6/–0
10"–18"	+0/–2	+0/–2	± 3,2/–0
20"–24"	+0/–2	+0/–2	± 3,2/–0
26"–30"	–	–	–
32"–48"	–	–	–

Quality System

We offer our customers

- Sourcing of raw materials and finished products from a qualified and audited vendor company.
- Continuous update of our logistics support and dispatch system to provide an up to date and reliable execution policy. class service
- Essential in-house material inspection using spectrometer for PMI analysis.
Also outsource the inspectors through reputed inspection agencies such as Bureau Veritas, Lloyd's, Applus, SGS. etc.
- Compare & analyze the inspection results in accordance with the advanced and updated specification standards and tolerances, Aesteiron is capable of manufacturing and conforming the products as per the latest standards used in the oil & gas industry.
- Our employees and technicians are regularly trained and equipped with the latest industry standards so as to help the customers with the appropriate technical demands of their requirements & also suggest them the suitable products as per their need.

Approval / Certificate	Area of Application	Certification Authority
QM System in Acc. with DIN EN ISO : 9001 - 2015 No : 85 100 001 18175	Manufacturing and Supply of Stainless Steel, Duplex Steel, Carbon Steel and High Nickel Based Alloys, Quenched and Tempered Plate, Line Pipes, Tubings, Butt and Socket Weld Fittings, Forged Flanges and Bars in International and Domestic Market.	TÜVRheinland
QM System in Acc. with DIN EN ISO : 9001 - 2008 No : IND11.7124/A	Procurement and Sales of Ferrous and Non Ferrous Pipes, Sheets, Plates, Tubes, Coils, Bars, Flanges, Fittings and Customized Engineering Items for Domestic and Export Market.	Bureau veritas
QM System in Acc. with DIN EN ISO : 9001 - 2008 No : NAQC/IND/20160	Importer, Exporter and Stockiest of Stainless Steel, Carbon Steel, Mild Steel & Alloy Steel.	NQAC International
QM System in Acc. with EN : 764-5 No : 01 202 IND/Q-18 0058	Certificate for the transfer of making (re-stamping) of metallic material article 4.2 and AD 2000 - Mark blatt wo.	TÜVRheinland

Technical Segment



Flange Surface

General

While using the surface marks acc. to the following table, each underlying Series – 1, 2, 3 or 4 – and a reference to DIN 3141 must be stated on the drawing.

Symbols	R _t max. µm Series 1	R _t max. µm Series 2	R _t max. µm Series 3	R _t max. µm Series 4	Requirements
	Optional	Optional	Optional	Optional	None
	Optional	Optional	Optional	Optional	Clean and evenly
	160	100	63	25	Values may not be exceeded
	40	25	16	10	Values may not be exceeded
	16	6	4	2,5	Values may not be exceeded
		1	1	0,4	Values may not be exceeded

Rugosity Comparison

Exact comparison is not possible since the following table has been drawn, up to allow the acceptable roughness to be observed.

Roughness	Comparison												
R _t in µm	160	100	63	50	40	32	25	16	10	8	6,3	4	2,5
R _a in µm	40	25	16	12,5	10	6,3	4,8	3,2	2,5	1,6	1,2	0,8	0,4
R _a in µinch	1500	1000	630	500	350	250	190	125	80	63	48	32	16
R _p in µm	80	50	32	25	20	12,5	10	6,3	4,8	3,2	2,5	1,6	0,8

Values for the rotation

Radius	Roughness R _t in mm												
	160	100	63	50	40	32	25	16	10	8	6,3	4	2,5
1 mm	1,13	0,89	0,69	0,63	0,57	0,50	0,48	0,36	0,28	0,25	0,22	0,18	0,13
1,6 mm	1,40	1,12	0,90	0,80	0,72	0,65	0,57	0,46	0,36	0,32	0,28	0,23	0,18

Roughness Conversion Table

N values	R _a μm	R _t μm approx.	R _z μm approx.	AARH/CLA	RMS	Ration R _t to R _a
N1	0,025	0,24 to 0,40	0,22 to 0,30	1	1,1	9:1 to 12:1
N2	0,050	0,49 to 0,80	0,45 to 0,60	2	2,2	8:1 to 12:1
N3	0,100	0,85 to 1,15	0,80 to 1,10	4	4,4	8:1 to 11:1
N4	0,200	1,10 to 2,40	1,00 to 1,80	8	8,8	5:1 to 8:1
N5	0,400	1,75 to 3,60	1,60 to 2,80	16	17,6	4:1 to 7:1
N6	0,800	3,20 to 6,00	3,00 to 4,80	32	35,2	3,8:1 to 6:1
N7	1,600	6,30 to 10,00	5,90 to 16,00	63	64,3	3,7:1 to 5:1
N8	3,200	13,00 to 19,50	12,00 to 16,00	125	137,5	3,7:1 to 5:1
N9	6,300	25,00 to 38,00	23,00 to 38,00	250	275,0	3,7:1 to 5:1
N10	12,500	48,00 to 68,00	46,00 to 57,00	500	550,0	3,7:1 to 4,6:1
N11	25,000	95,00 to 130,00	90,00 to 110,00	1000	1100	3,6:1 to 4,4:1
N12	50,000	190,00 to 250,00	180,00 to 220,00	2000	2200	3,6:1 to 4,4:1
N13	100,000	380,00 to 500,00	360,00 to 430,00	4000	4400	3,6:1 to 4,3:1



N5
R_a 0,4 μm – AARH / CL 16
R_t 1,92 μm



N6
R_a 0,8 μm – AARH / CL 32
R_t 3,20 μm



N7
R_a 1,6 μm – AARH / CL 63
R_t 6,15 μm



N8
R_a 3,2 μm – AARH / CL 125
R_t 12,5 μm



N9
R_a 6,3 μm – AARH / CL 250
R_t 25,7 μm



N10
R_a 12,5 μm – AARH / CL 500
R_t 48,7 μm



N11
R_a 25 μm – AARH / CL 100
R_t 102 μm



N12
R_a 50 μm – AARH / CL 2000
R_t 185 μm

DIN / EN / ASTM – Materials Comparison

Pipes / Tubes			
ASTM	EN	DIN	Material Number
STAINLESS STEEL			
A 312 Grade TP304L	X2CrNi18-9	–	1.4307
A 312 Grade TP304L	X2CrNi19-11	X 2 CrNi 19 11	1.4306
A 312 Grade TP304	X5CrNi18-10	X 5 CrNi 18 10	1.4301
A 312 Grade TP321	X6CrNiTi18-10	X 6 CrNiTi 18 10	1.4541
A 312 Grade TP347	X6CrNiNb18-10	X 6 CrNiNb 18-10	1.4550
A 312 Grade TP316L	X2CrNiMo17-12-2	X 2 CrNiMo 17 13 2	1.4404
A 312 Grade TP316	X5CrNiMo17-12-2	X 5 CrNiMo 17 12 2	1.4401
A 312 Grade TP316Ti	X6CrNiMoTi17-12-2	X 6 CrNiMoTi 17 12 2	1.4571
A 312 Grade TP316LN	X2CrNiMoN17-13-3	X 2 CrNiMoN 17 13 3	1.4429
A 312 Grade TP316	X3CrNiMo17-13-3	X 5 CrNiMo 17 13 3	1.4436
A 312 Grade TP316L	X2CrNiMoN18-14-3	X 2 CrNiMoN 18 14 3	1.4435
UNS S 31726	X2NiCrMoN17-13-5	X 2 CrNiMoN 17 13 5	1.4439
UNS N 08904 (904L)	X1NiCrMoCuN25-20-5	X 1 NiCrMoCuN 25 20 5	1.4539
UNS S 31254	X1CrNiMoCuN20-18-7	–	1.4547
UNS N 08926	X1NiCrMoCuN25-20-7	X 1 NiCrMoCuN 25 20 6	1.4529
UNS S 31803 (Duplex)	X2CrNiMoN22-5-3	X 2 CrMoN 22 5 3	1.4462
UNS S 32750 (Superduplex)	X2CrNiMoN25-7-4	–	1.4410
ALLOYED HEAT-RESISTANT			
	16Mo3	15 Mo 3	1.5415
A 335 Grade P11, P12	13CrMo4-4	13 CrMo 4 4	1.7335
A 335 Grade P22	10CrMo9-10	10 CrMo 9 10	1.7380
A 335 Grade P5	X11CrMo5	12 CrMo 19 5	1.7362
A 335 Grade P9	–	–	–
A 335 Grade P91	X10CrMoVNb9-1	–	1.4903
NON-ALLOY			
A 53 Grade A	P234TR1	St 37.0	1.0254
	S355J2H (1.0576)	St 52.3	1.0570
A 106 Grade A	P235GH TC1 (1.0345)	St 35.8/I	1.0305
	P235GH TC2 (1.0345)	St 35.8/III	1.0305
A 106 Grade B	P265GH TC1 (1.0425)	St 45.8/I	1.0405
	P265GH TC2 (1.0425)	St 45.8/III	1.0405
LOW TEMPERATURE			
A 333 Grade 3	X12Ni14	10 Ni 14	1.5637
A 333 Grade 1	P215NL (1.0451)	TTSt 35 N	1.0356
	P255QL (1.0452)	TTSt 35 V	1.0356
A 333 Grade 6	P265NL (1.0453)	–	–
HIGH YIELD STEELS			
API 5L Grade B	L245NB/L245NE	StE 240.7	1.0457
API 5L Grade X42	L290NB/L290NE	StE 290.7	1.0484
API 5L Grade X54	L360NB/L360NE	StE 360.7	1.0582
API 5L Grade X60	L415NB/L415NE	StE 415.7	1.8972
FINE GRAIN STEELS			
API 5L Grade X42	–	StE 285	1.0486
API 5L Grade X52	P355N	StE 355	1.0562
API 5L Grade X60	P420N	StE 420	1.8902
API 5L Grade X70	P460N	StE 460	1.8905

DIN / EN / ASTM – Materials Comparison

Flanges			
ASTM	EN	DIN	Material Number
STAINLESS STEEL			
A 182 Grade F304L	X2CrNi18-9	–	1.4307
–	–	–	1.4306
A 182 Grade F304	X5CrNi18-10	X 5 CrNi 18 10	1.4301
A 182 Grade F321	X6CrNiTi18-10	X 6 CrNiTi 18 10	1.4541
A 182 Grade F347	X6CrNiNb18-10	X 6 CrNiNb 18-10	1.4550
A 182 Grade F316L	X2CrNiMo17-12-2	X 2 CrNiMo 17 13 2	1.4404
A 182 Grade F316	X5CrNiMo17-12-2	X 5 CrNiMo 17 12 2	1.4401
A 182 Grade F316Ti	X6CrNiMoTi17-12-2	X 6 CrNiMoTi 17 12 2	1.4571
A 182 Grade F316LN	X2CrNiMoN17-13-3	X 2 CrNiMoN 17 13 3	1.4429
A 182 Grade F316	X3CrNiMo17-13-3	X 5 CrNiMo 17 13 3	1.4436
A 182 Grade F316L	X2CrNiMo18-14-3	X 2 CrNiMoN 18 14 3	1.4435
A 182 Grade F48	X2CrNiMoN17-13-5	X 2 CrNiMoN 17 13 5	1.4439
A 182 Grade F904L	X1NiCrMoCu25-20-7	X 1 NiCrMoCuN 25 20 5	1.4539
UNS S 31254	X1CrNiMoCuN20-18-7	–	1.4547
UNS N 08926	X1NiCrMoCuN25-20-7	X 1 NiCrMoCuN 25 20 6	1.4529
A 182 Grade F51 (Duplex)	X2CrNiMoN22-5-3	X 2 CrMoN 22 5 3	1.4462
A 182 Grade F53 (Superduplex)	X2CrNiMoN25-7-4	–	1.4410
ALLOYED HEAT-RESISTANT			
–	16Mo3	15 Mo 3	1.5415
A 182 Grade F11, F12	13CrMo4-5	13 CrMo 4 4	1.7335
A 182 Grade F22	11CrMo9-10(1.7383)	10 CrMo 9 10	1.7380
A 182 Grade F5	–	12 CrMo19 5	1.7362
A 182 Grade F9	–	–	–
A 182 Grade F91	X10CrMoVNb9-1	–	1.4903
NON-ALLOY			
–	S235JR	RSt 37-2	1.0038
–	S235J2 (1.0577)	St 52-3	1.0570
–	P250GH	C 22.8	1.0460
A 105	–	C 21	1.0432
–	P245GH	–	1.0352
LOW TEMPERATURE			
A 350 Grade LF3	12Ni14	10 Ni 14	1.5637
A 350 Grade LF2	P355QH1	TStE 355	1.0566
FINE GRAIN STEELS			
A 694 Grade F42	–	StE 285	1.0486
A 694 Grade F52	P355N	StE 355	1.0562
A 694 Grade F60	P420N	StE 420	1.8902
A 694 Grade F70	P460N	StE 460	1.8905

DIN / EN / ASTM – Materials Comparison

Butt-weld Fittings			
ASTM	EN	DIN	Material Number
STAINLESS STEEL			
A 182 Grade WP304L	X2CrNi18-8	–	1.4307
A 403 Grade WP304L	X2CrNi19-11	X 2 CrNi 19 11	1.4306
A 403 Grade WP304	X5CrNi18-10	X 5 CrNi 18 10	1.4301
A 403 Grade WP321	X6CrNiTi18-10	X 6 CrNiTi 18 10	1.4541
A 403 Grade WP347	X6CrNiNb18-10	X 6 CrNiNb 18-10	1.4550
A 403 Grade WP316L	X2CrNiMo17-12-2	X 2 CrNiMo 17 13 2	1.4404
A 403 Grade WP316	X5CrNiMo17-12-2	X 5 CrNiMo 17 12 2	1.4401
UNS S 31635	X6CrNiTi18-10	X 6 CrNiMoTi 17 12 2	1.4571
A 403 Grade WP316LN	X2CrNiMoN17-13-3	X 2 CrNiMoN 17 13 3	1.4429
A 403 Grade WP316	X3CrNiMo17-13-3	X 5 CrNiMo 17 13 3	1.4436
A 403 Grade WP316LN	X2CrNiMo18-14-3	X 2 CrNiMo 18 14 3	1.4435
UNS S 31726	X2CrNiMoN17-13-5	X 2 CrNiMoN 17 13 5	1.4439
UNS N 08904 (904L)	X1NiCrMoCu25-20-5	X 1 NiCrMoCuN 25 20 5	1.4539
UNS S 31254	X1CrNiMoCu20-18-7	–	1.4547
UNS N 08926	X1CrNiMoCuN25-20-7	X 1 NiCrMoCuN 25 20 6	1.4529
UNS S 31803 (Duplex)	X2CrNiMoN22-5-3	X2 CrNiMoN 22 5 3	1.4462
UNS S 32750 (Superduplex)	X2CrNiMoN25-7-4	–	1.4410
ALLOYED HEAT-RESISTANT			
–	16Mo3	15 Mo 3	1.5415
A 234 Grade WP11, WP12	13CrMo4-5	13 CrMo 4 4	1.7335
A 234 Grade WP22	10CrMo9-10	10 CrMo 9 10	1.7380
A 234 Grade WP5	X11CrMo5	12 CrMo 19 5	1.7362
A 234 Grade WP9	–	–	–
A 234 Grade WP91	X10CrMoVNb9-1	–	1.4903
NON-ALLOY			
–	S235	St 37.0	1.0254
–	–	–	–
A 234 Grade WPA	P235GH (1.0345)	St 35.8/I	1.0305
	P235GH (1.0345)	St 35.8/III	1.0305
A 234 Grade WPB	P265GH (1.0425)	St 45.8/I	1.0405
	P265GH (1.0425)	St 45.8/III	1.0405
LOW TEMPERATURE			
A 420 Grade WPL3	21Ni14	10 Ni 14	1.5637
	P215NL (1.0451)	TTSt 35 N	1.0356
		TTSt 35 V	1.0356
A 420 Grade WPL6	P265NL (1.0453)	–	–
HIGH YIELD STEELS			
–	–	StE 240.7	1.0457
A 860 Grade WPHY42	L290NB/L290NE	StE 290.7	1.0484
A 860 Grade WPHY52	L360NB/L360NE	StE 360.7	1.0582
A 860 Grade WPHY60	L415NB/L415NE	StE 415.7	1.8972
FINE GRAIN STEELS			
A 860 Grade WPHY42	–	StE 285	1.0486
A 860 Grade WPHY52	P355N	StE 355	1.0562
A 860 Grade WPHY60	–	StE 420	1.8902
A 860 Grade WPHY70	–	StE 460	1.8905

DIN / EN / ASTM – Materials Comparison

Forged Materials

	ASTM		DIN			EN		
	A	Grade	Material Number	Material	Technical Delivery Conditions	Number	Material	Technical Delivery Conditions
Stainless Steel	182	F304	1.4301	X 5 CrNi 18 10	17440	1.4301	X5CrNi18-10	10222-5
	182	F304L	1.4306	X 2 CrNi 19 11	17440	1.4307	X2CrNi18-9	10222-5
	182	F321	1.4541	X 6 CrNiTi 18 10	17440	1.4541	X6CrNiTi18-10	10222-5
	182	F316	1.4401	X 5 CrNi 17 12 2	17440	1.4401	X5CrNiMo17-12-2	10222-5
	182	F316L	1.4404	X 2 CrNiMo 17 13 2	17440	1.4404	X2CrNiMo17-12-2	10222-5
	182	F316Ti	1.4571	X 6 CrNiMoTi 17 12 2	17440	1.4571	X6CrNiMoTi17-12-2	10222-5
	–	–	1.4529	X 1 NiCrMoCuN 25 20 6	VdTÜV WB 502	1.4529	X1NiCrMoCuN25-20-7	10222-5
	182	F904L	1.4539	X 1 NiCrMoCuN 25 20 5	VdTÜV WB 421	1.4539	X1NiCrMoCu25-20-5	10222-5
	182	F51	1.4462	X 2 CrNiMoN 22 5 3	VdTÜV WB 418	1.4462	X2CrNiMoN22-5-3	10222-5
Alloyed heat-resistant	182	F1	1.5415	15 Mo 3	17243	1.5415	16Mo3	10222-2
	182	F12	1.7335	13 CrMo 44	17243	1.7335	13CrMo4-5	10222-2
	182	F22	1.7380	10 CrMo 9 10	17243	–	–	–
Non-alloy	–	–	1.0038	RSt 37-2	17100	1.0038	S235JR	10025-2
	–	–	1.0570	St 52-0	17100	1.0577	S355J2	10025-2
Low temperature	350	LF3	1.5637	10 Ni 14	17280	1.5637	12Ni14	10222-3
	350	LF2	1.0566	TStE 355	17103	–	–	–
Non-alloy heat-resistant	–	–	–	–	–	1.0352	P245GH	10222-2
	–	–	1.0460	C 22.8	17243	1.0460	P250GH	10222-2 NB ¹⁾
	105	–	1.0432	C 21	VdTÜV WB399/3	–	–	–
Fine grained steel	694	F42	1.0477	WStE 285	17103	1.0477	P285NH	10222-4
	694	F52	1.0565	WStE 355	17103	1.0565	P355NH	10222-4
	964	F60	1.8932	WStE 420	17103	1.8932	P420NH	10222-4

Seamless Pipes

	ASTM		DIN			EN		
	ASTM	Grade	Material Number	Material	Technical Delivery Conditions	Material Number	Material	Technical Delivery Conditions
Stainless Steel	A 312	TP304	1.4301	X 5 CrNi 18 10	17458	1.4301	X5CrNi18-10	10216-5
	A 312	TP304L	1.4306	X 2 CrNi 19 11	17458	1.4307	X2CrNi18-9	10216-5
	182	TP321	1.4541	X 6 CrNiTi 18 10	17440	1.4541	X6CrNiTi18-10	10222-5
	182	TP316	1.4401	X 5 CrNi 17 12 2	17440	1.4401	X5CrNiMo17-12-2	10222-5
	182	TP316L	1.4404	X 2 CrNiMo 17 13 2	17440	1.4404	X2CrNiMo17-12-2	10222-5
	A 312	TP316Ti	1.4571	X 6 CrNiMoTi 17 12 2	17458	1.4571	X6CrNiMoTi17-12-2	10216-5
	A 312	N 08926	1.4529	X 1 NiCrMoCuN 25 20 6	VdTÜV WB 502	1.4529	X1NiCrMoCuN25-20-7	10216-5
	A 312	N 08904	1.4539	X 1 NiCrMoCu 25 20 5	VdTÜV WB 421	1.4539	X1NiCrMoCu25-20-5	10216-5
	–	–	1.4462	X 2 CrNiMoN 22 5 3	VdTÜV WB 418	1.4462	X2CrNiMoN22-5-3	10216-5
Alloyed heat-resistant	A 335	P 1	1.5415	15 Mo 3	17175	1.5415	16Mo3	10216-2
	A 335	P 11	1.7335	13 CrMo 4 4	17175	1.7335	13CrMo4-5	10216-2
	A 335	P 22	1.7380	10 CrMo 9 10	17175	1.7380	10CrMo9-10	10216-2
Non-alloy	–	–	1.0254	St 37.0	1629	1.0254	P235TR1	10216-1
	–	–	1.0256	St 44.0	1629	1.0258	P265TR1	10216-1
	–	–	1.0421	St 52.0	1629	–	–	–
Low temperature	A 333	1	1.0356	TTSt 35 N	17173	1.0451	P215NL	10216-4
	–	–	1.0356	TTSt 35 V	17173	1.0452	P255QL	10216-4
	A 333	3	1.5637	10 Ni 14	17173	1.5637	12Ni14	10216-4
	–	–	1.5680	12 Ni 19	17173	1.5680	X12Ni5	10216-4
High yield steels	API 5L	B	1.0457	St 240.7	17172	1.0457	L245NB	10208-2
	API 5L	X42	1.0484	St 290.7	17172	1.0484	L290NB	10208-2
	API 5L	X52	1.0582	StE 360.7	17172	1.0582	L360NB	10208-2
	API 5L	X60	1.8972	StE 415.7	17172	1.8972	L415NB	10208-2
Fine grained steel	–	–	1.0562	StE 355	17179	1.0562	P355N	10216-3
	–	–	1.0565	WStE 355	17179	1.0565	P355NH	10216-3
	–	–	1.0566	TStE 355	17179	1.0566	P355NL1	10216-3
	–	–	1.1106	EStE 355	17179	1.1106	P355NL2	10216-3
Non-alloy heat-resistant	A 106	A	1.0305	St 35.8	17175	1.0345	P235GH	10216-2
	A 106	B	1.0405	St 45.8	17175	1.0425	P265GH	10216-2

DIN / EN / ASTM - Materials Comparison

Sheet Metals

	ASTM		DIN			EN		
	A	Grade	Material Number	Material	Technical Delivery Conditions	Material Number	Material	Technical Delivery Conditions
Stainless Steel	240	304	1.4301	X 5 CrNi 18 10	17440	1.4301	X5CrNi18-10	10028-7
	240	304L	1.4306	X 2 CrNi 19 11	17440	1.4307	X2CrNi18-9	10022-7
	182	321	1.4541	X 6 CrNiTi 18 10	17440	1.4541	X6CrNiTi18-10	10022-5
	182	316	1.4401	X 5 CrNi 17 12 2	17440	1.4401	X5CrNiMo17-12-2	10022-5
	182	316L	1.4404	X 2 CrNiMo 17 13 2	17440	1.4404	X2CrNiMo17-12-2	10028-5
	240	F316Ti	1.4571	X 6 CrNiMoTi 17 12 2	17440	1.4571	X6CrNiMoTi17-12-2	10028-7
	–	–	1.4529	X 1 NiCrMoCuN 25 20 6	VdTÜV WB 502	1.4529	X1NiCrMoCuN25-20-7	10028-7
	240	904L	1.4539	X 1 NiCrMoCu 25 20 5	VdTÜV WB 421	1.4539	X1NiCrMoCu25-20-5	10028-7
	240	S 31803	1.4462	X 2 CrNiMoN 22 5 3	VdTÜV WB 418	1.4462	X2CrNiMoN22-5-3	10028-7
Alloyed heat-resistant	204	A	1.5415	15 Mo 3	17155	1.5415	16Mo3	10028-2
	387	11	1.7335	13 CrMo 44	17155	1.7335	13CrMo4-5	10028-2
	387	22	1.7380	10 CrMo 9 10	17155	1.7380	10CrMo9-10	10028-2
Non-alloy	–	–	1.0038	St 37-2	17100	1.0038	S235JR	10025-2
	–	–	1.0570	St 52-3	17100	1.0577	S355J2	10025-2
Low temperature	203	D	1.5637	10 Ni 14	17280	1.5637	12Ni14	10028-4
	–	–	1.5680	12 Ni 19	17280	1.7380	X12Ni5	10028-4
Fine grained steel	515	60	1.0487	WStE 285	17102	1.0487	P275NH	10028-3
	516	60	1.0488	TStE 285	17102	1.0488	P275NL1	10028-3
	–	–	1.1104	EStE 285	17102	1.1104	P275NL2	10028-3
	–	–	1.0562	StE 355	17102	1.0562	P355N	10028-3
	515	70	1.0565	WStE 355	17102	1.0565	P355NH	10028-3
	516	70	1.0566	TStE 355	17102	1.0566	P355NL1	10028-3
	–	–	1.1106	EStE 355	17102	1.1106	P355NL2	10028-3
	–	–	1.8935	WStE 460	17102	1.8935	P460NH	10028-3
	–	–	1.8915	TStE 460	17102	1.8915	P460NH1	10028-3
	–	–	1.8918	EStE 460	17102	1.8918	P460NH2	10028-3
Non-alloy heat-resistant	–	–	1.0460	C 22.8	VdTÜV WB350/1	–	–	10028-2
	515	55	1.0425	H II	17155	1.0425	P265GH	10028-2

Welded Pipes

	ASTM		DIN			EN		
	A	Grade	Material Number	Material	Technical Delivery Conditions	Material Number	Material	Technical Delivery Conditions
Stainless Steel	A 312	TP304	1.4301	X 5 CrNi 18 10	17457	1.4301	X5CrNi18-10	10217-7
	A 312	TP304L	1.4306	X 2 CrNi 19 11	17457	1.4307	X2CrNi18-9	10217-7
	182	TP321	1.4541	X 6 CrNiTi 18 10	17440	1.4541	X6CrNiTi18-10	10222-5
	182	TP316	1.4401	X 5 CrNi 17 12 2	17440	1.4401	X5CrNiMo17-12-2	10222-5
	182	TP316L	1.4404	X 2 CrNiMo 17 13 2	17440	1.4404	X2CrNiMo17-12-2	10222-5
	A 312	TP316Ti	1.4571	X 6 CrNiMoTi 17 12 2	17457	1.4471	X6CrNiMoTi17-12-2	10217-7
	A 312	N 08926	1.4529	X 1 NiCrMoCuN 25 20 6	VdTÜV WB 502	1.4529	X1NiCrMoCuN25-20-7	10217-7
	A 312	N 08904	1.4539	X 1 NiCrMoCu 25 20 5	VdTÜV WB 421	1.4539	X1NiCrMoCu25-20-5	10217-7
	–	–	1.4462	X 2 CrNiMoN 22 5 3	VdTÜV WB 418	1.4462	X2CrNiMoN22-5-3	10217-7
Alloyed heat-resistant	–	–	1.5415	15 Mo 3	17177	1.5415	16Mo3	10217-2/5
Non-alloy	–	–	1.0254	St 37.0	1626	1.0254	P235TR1	10217-1
	–	–	1.0256	St 44.0	1626	1.0258	P265TR1	10217-1
	–	–	1.0421	St 52.0	1626	–	–	–
Non-alloy heat-resistant	–	–	1.0315	St 35.8	17177	1.0345	P235GH	10217-2/5
	–	–	1.0498	St 45.8	17177	1.0425	P265GH	10217-2/5
Low temperature	A 333	1	1.0356	TtSt 35 N	17174	1.0451	P215NL	10217-4/6
	–	–	1.0356	TtSt 35 V	17174	1.0452	P255QL	10217-4/6
	A 333	3	1.5637	10 Ni 14	17174	1.5637	12Ni14	10217-4/6
	–	–	1.5680	12 Ni 19	17174	1.5680	X12Ni5	10217-4/6
High yield steels	API 5L	B	1.0457	St 240.7	17172	1.0457	L245NB	10208-2
	API 5L	X42	1.0484	St 290.7	17172	1.0484	L290NB	10208-2
	API 5L	X52	1.0582	StE 360.7	17172	1.0582	L360NB	10208-2
	API 5L	X60	1.8972	StE 415.7	17172	1.8972	L415NB	10208-2
Fine grained steel	–	–	1.0562	StE 355	17178	1.0562	P355N	10217-3
	–	–	1.0565	WStE 355	17178	1.0565	P355NH	10217-3
	–	–	1.0566	TStE 355	17178	1.0566	P355NL1	10217-3
	–	–	1.1106	ESTe 355	17178	1.1106	P355NL2	10217-3

Pipe Construction Standards

Standard		Directives, Rules, Regulations	
PED 97/23/EC	Pressure equipment	Directives for pressure equipment Pressure Equipment Regulation (14.Change of the GPSG)	
Standard		Publicly Available Specifications	
		Pipe classes for process plants	
PAS 1057-1		Basic requirements for the development of pipe classes EN 13480	
PAS 1057-5		Special Pipe Fittings	
PAS 1057-6		Automated Welding Processes Flanges	
PAS 1057-10		Technical delivery conditions for pipe components made from non-alloy & alloy steels with identified elevated temperature properties.	
PAS 1057-11		Technical delivery conditions for austenitic stainless steels, pipe components.	
PAS 1057-101		Standard pipe classes PN 10 to PN 100 - Pipe components made from non-alloy and alloy steels with identified elevated temperature properties.	
Standard		Pressure Purpose Seamless Steel Tubes	
DIN EN 10216-1		Non-alloy steel tubes with identified room temperature properties	
DIN EN 10216-2		Non-alloy and alloy steel tubes with identified elevated temperature properties	
DIN EN 10216-3		Alloy fine grain steel tubes	
DIN EN 10216-4		Non-alloy and alloy steel tubes with identified temperature properties	
DIN EN 10216-5		Stainless steel tubes	
Standard		Pressure Purposes Welded Steel Tubes	
DIN EN 10217-1		Non-alloy steel tubes with identified room temperature properties	
DIN EN 10217-2		Electric welded alloy & non-alloy steel tubes with specified elevated temperature properties	
DIN EN 10217-3		Alloy fine grain steel tubes	
DIN EN 10217-4		Electric welded non-alloy tubes with specified low temperature properties	
DIN EN 10217-5		Submerged arc welded non-alloy steel tubes with specified elevated temperature properties	
DIN EN 10217-6		Submerged arc welded non-alloy tubes with specified low temperature properties	
DIN EN 10217-7		Stainless steel tubes	
Standard		Technical Basics	
		Symbolic representation for use engineering drawings	
DIN 2429-1		Basic requirements	
DIN 2429-2		Functional representation	
		Procurement guide of power station plant, equipment and systems	
DIN EN 45510-7-1		High pressure piping systems	
DIN EN 45510-7-2		Boiler and high pressure piping valves	
DIN EN ISO 6708		Pipeline components-Definition and selection for nominal diameter.	
ISO 2944		Components-Nominal pressures and Fluid power systems	
DIN 2403		Pipelines identification according to the fluid conveyed	
Standard		Technical Rules	
DIN EN 764-1 to 7		Pressure tools	
DIN EN 12952-1 to 16		Water tube boilers and auxiliary installations	
DIN EN 12953-1 to 12		Shell boilers	
DIN EN 13445-1 to 8		Unfired pressure vessels	
DIN EN 13480-1 to 8		Metallic industrial piping	
DIN EN 14276-1 to 2		Heat pumps and refrigerating system for pressure equipment.	
Standard		Technical Basic Standards	
DIN EN 10020		Definition and classification of steel grades	
DIN EN 10027-1		Steels Designation Systems	Steel names
DIN EN 10027-2			Numerical systems
CR 10260		Steels Designation Systems	Additional symbols
DIN EN 10220		Seamless and welded steel tubes - Dimensions and masses per unit length	
DIN EN 10204		Metallic products - Types of inspection documents	
DIN EN ISO 1127		Stainless steel tubes - dimensions, tolerances and conventional masses per unit length	

Standard		Steel Pipes for Pipelines for Combustible Fluids	
DIN EN 10208-1	Pipes for pipelines for combustible fluids	Requirement class A	
DIN EN 10208-2		Requirement class B	
DIN EN ISO 3183	Petroleum and natural gas industries - Steel pipe for pipeline transportation systems		
Standard		Flat Products and Forgings	
DIN EN 10222-1 to 5	Steel forgings for pressure purposes		
DIN EN 10228-1 to 6	Steels flat products for pressure purposes		
Standard		Flanges and Joints	
DIN EN 1092-1	PN designated Circular flanges	Steel flanges	
DIN EN 1092-2		Cast iron flanges	
DIN EN 1092-3		Copper alloy flanges	
DIN EN 1092-4		Aluminium alloy flanges	
	Gaskets for PN-designated Flanges		
DIN EN 1514-1	Non-metallic flat gaskets with or without inserts		
DIN EN 1514-2	Spiral wound gaskets for use with steel flanges		
DIN EN 1514-3	Non-metallic PTFE envelope gaskets		
DIN EN 1514-4	Corrugated flat or grooved metallic and filled metallic gaskets for use with steel flanges		
DIN EN 1514-6	Covered serrated metal gaskets for use with steel flanges		
DIN EN 1514-7	Covered metal jacketed gaskets for se with steel flanges		
DIN EN 1514-8	Polymeric O-Ring gaskets for grooved flanges		
	Circular Flanges for Pipes, Valves, Fittings and Equipment, Class Designated		
DIN EN 1759-1	Steel flanges, NPS 1/2 to 24		
DIN EN 1759-3	Copper alloy flanges		
DIN EN 1759-4	Aluminium alloy flanges		
	Gaskets for Class-designated Flanges		
DIN EN 12560-1	Non-metallic flat gaskets with or without inserts		
DIN EN 12560-2	Spiral wound gaskets		
DIN EN 12560-3	Non-metallic PTFE envelope gaskets		
DIN EN 12560-4	Corrugated flat or grooved metallic and filled metallic gaskets		
DIN EN 12560-5	Metallic ring-joint gaskets (RTJ)		
DIN EN 12560-6	Covered serrated metal gaskets		
DIN EN 12560-7	Covered metal jacketed gaskets		
DIN EN 14772	Quality assurance testing and inspection of gaskets in accordance with the standards series EN 1514 and EN 12560		
	Bolts and Nuts		
DIN EN 1515-1	Bolts and nuts selection		
DIN EN 1515-2	Bolt materials classification for steel flanges, PN designated		
DIN EN 1515-3	Bolt materials Classification for steel flanges, Class designated		
DIN EN 1515-4	Bolting selection for equipment subject to the Pressure Equipment Directive 97/23/EC		
Standard		Design Rules for Gasketed Circular Flanges Connections	
DIN EN 1591-1	Method of calculation		
DIN EN 1591-1 Bbl1	Background information		
DIN EN 1591-2	Parameters of gasket		
DIN CEN/TS 1591-3	Metal to metal contact type flanged join calculation method		
DIN CEN/TS 1591-4	Qualification of personnel competency in the assembly of bolted joints fitted to equipment subject to the PED		
DIN CEN/TS 1591-5	Full face gasketed joints calculation method		
Standard		AD 2000	
	Group W - Pressure vessel made from steel material		
W0	General materials principles		
W1	Non-alloy and alloy steel plates		
W2	Austenitic stainless steels		
W4	Non-alloy and alloy steel tubes		
W7	Ferritic steel-Bolts and nuts		
W9	Steel flanges		
W10	Materials for low temperature		
W13	Non-alloy and steel forgings		

Standard	Piping Equipment
DIN EN 10241	Threaded steel pipe fittings
DIN EN 10242	Malleable iron fittings
DIN EN 10253-2	Butt-weld pipe fittings – Non-alloy and ferritic alloy steels with specific inspection requirements
DIN EN 10253-4	Butt-weld pipe fittings – Austenitic and austenitic- ferritic (duplex) stainless steels with specific inspection requirements
Standard	Guideline for Manufacturing and Ordering of Pressure Equipment According to PED 97/23/EC
PAS 1010-1	General requirement
PAS 1010-2	Unfired pressure vessels
PAS 1010-3	Industrial piping
PAS 1010-4	Equipment of pressure
PAS 1010-5	Equipment with safety function
PAS 1010-6	Package units

DIN / EN Standards Comparing

Product and quality standards			
Flanges		DIN Standard	DIN EN 1029-1
Blind flanges	PN 6–100	2527	Type 05, PN 2.5 –100
Oval screwed flanges	PN 6	2558	
Screwed flanges	PN 10 / 16	2566	Type 13, PN 10 / 16
	PN 25 / 40	2567	Type 13, PN 25 / 40
	PN 64	2568	Type 13, PN 63
	PN 100	2569	Type 13, PN 100
Flanges for welding	PN 6	2573	Type 01, PN 6
	PN 10	2576	Type 01, PN 10
Welding neck flanges	PN 1–2.5	2630	Type 11, PN 2.5
	PN 6	2631	Type 11, PN 6
	PN 10	2632	Type 11, PN 10
	PN 16	2633	Type 11, PN 16
	PN 25	2634	Type 11, PN 25
	PN 40	2635	Type 11, PN 40
	PN 64	2636	Type 11, PN 63
	PN 100	2637	Type 11, PN 100
	PN 160	2638	Type 11, PN 160
	PN 250	2628	Type 11, PN 250
	PN 320	2629	Type 11, PN 320
	PN 400	2627	Type 11, PN 400
Loose flanges for type 32	PN 6	2641	Type 01, PN 6
Weld-on collar	PN 6	2641	Type 32, PN 6
Pressed collar	PN 6	2641	Type 37, PN 6
Loose flanges for type 32	PN 10	2642	Type 02, PN 10
Weld-on collar	PN 10	2642	Type 32, PN 10
Pressed collar	PN 10	2642	Type 37, PN 10
Loose flanges for type 32	PN 25	2655	Type 02, PN 25
Weld-on collar	PN 25	2655	Type 32, PN 25
Loose flanges for type 32	PN 40	2656	Type 02, PN 40
Weld-on collar	PN 40	2676	Type 32, PN 40
Loose flanges for type 34	PN 10	2673	Type 04, PN 10
Welding neck collar	PN 10	2673	Type 34, PN 10
Loose flanges for type 34	PN 16	2674	Type 04, PN 16
Welding neck collar	PN 16	2674	Type 34, PN 16
Loose flanges for type 34	PN 25	2675	Type 04, PN 25
Welding neck collar	PN 25	2675	Type 34, PN 25
Slip-on welding flanges	PN 10	86 029 ¹⁾	Type 12, PN 10
	PN 16	86 030 ¹⁾	Type 12, PN 16
Welding flanges for tanks and sea boxes		86 041	
Exhaust flanges		86 044	
Welding on flanges		86 057	
Flanged joint for vessels and process apparatus		28 030	
Non-alloy and stainless steel Weld flanges for non-pressure vessels and process apparatus		28 031	
Non-alloy steel weld flanges for pressure vessels and process apparatus		28 032	
Welding neck flanges for process apparatus and pressure vessels		28 034	
Stainless steel weld flanges for pressure vessels and process apparatus		28 036	
Stainless steels weld flanges with cylindrical hub for pressure vessels and process apparatus		28 038	

¹⁾ EN 1092-1 includes the slip-on flanges (type 12), but the DIN standards continue to be valid.

Product and quality standards		
Pipes / Machine Pipes, Seamless	DIN Standard	DIN EN Standard
Pressure purposes seamless circular steel tubes	1629	10 297-1
Seamless steel tubes dimensions and conventional masses per unit length of	2448	10 297-1
Seamless circular fine grain steel tubes for structural steelwork	17 124	10 297-1
Austenitic seamless circular tubes for general requirements	17 456	10 297-2
Gaskets	DIN Standard	DIN EN Standard
Flat gaskets for flanges with / without raised face	2690	1514-1
Flat gaskets for flanges with tongue / groove	2691	1514-1
Flat gaskets for flanges male / female facing	2692	1514-1
Spiral wound gaskets	–	1514-2
PTFE envelope gaskets	–	1514-3
Grooved seals	2697	1514-4
Screws	DIN Standard	DIN EN Standard
Hexagonal head bolts	601	ISO 4016
Hexagonal nuts	555	ISO 4034
Hexagon head bolts	931	ISO 4014
Hexagon head screws	933	ISO 4017
Hexagon nuts	934	ISO 4032
Pipe Clamps	DIN Standard	
Pipe clamps, galvanized an black	3567/A	
Tori spherical Heads, Semi-ellipsoidal Heads	DIN Standard	
Tori spherical heads	28 011	
Ellipsoidal heads	28 013	
U-bolts	DIN Standard	
U-bolts, galvanized	3570	

ASME / ASTM / API Standard Overview

ASME		Flange & Fitting Products
B 16.5		Flanged Fittings and Pipe Flanges ≤ NPS 24
B 16.47 Series A		Flanged Fittings and Pipe Flanges > NPS 24 (prior MSS-SP44)
B 16.47 Series A		Flanged Fittings and Pipe Flanges > NPS 24 (prior API 605)
B 16.36		Orifice Flanges
B 16.48		Line Blanks
B 16.9		Butt-welding Fittings
B 16.11		Forged Steel Fittings
B 36.10		Seamless and Welded wrought steel pipes / Dimensions and masses
B 36.19		Seamless and Welded stainless steel pipes / Dimensions and masses
B 16.20		Pipe Flanges Metallic Gaskets
B 16.21		Pipe Flanges Nonmetallic Flat Gaskets
B 16.25		Butt-welding Ends
B 1.20.1		General purpose pipe threads
ASTM/ASME		Sheets, Strips, Flat Products
SA 179		Stainless and Heat-Resisting Chromium steels plates
SA 203		Pressure vessel alloy steel, nickel plates
SA 204		Pressure vessel alloy steel, molybdenum plates
SA 240		Chromium and chromium-nickel stainless steel plates and stripes
SA 285		Pressure vessel carbon steel, low- and intermediate-tensile strength plates
SA 387		Pressure vessel alloy steel, chromium-molybdenum plates
SA 515		Pressure vessel carbon steel, for intermediate- and higher-temperature service plates
SA 516		Pressure vessel carbon steel, for moderate- and lower-temperature service plates
ASTM/ASME		Seamless and Welded Steel Pipes
SA 53		Black and hot-dipped, zinc-coated steel pipes
SA 312		Cold worked austenitic stainless steel pipes
SA 333		Low temperature service steel pipes
SA 334		Low-temperature service Alloy- and non-alloy steel tubes
SA 335		Steel pipes forgings for pressure and high-temperature service
ASTM/ASME		Butt-weld Fittings
SA 234		Alloy and Carbon steel piping fittings for high-temperature service
SA 403		Austenitic stainless steel piping fittings
SA 420		Wrought carbon steel and alloy steel Pipe fittings for low-temperature service
SA 815		Wrought ferritic, ferritic/austenitic, and martensitic stainless steels pipe fitting
SA 860		Wrought high-strength ferritic steel Butt-welding Fittings
ASTM/ASME		Seamless Steel Pipes and Tubes
SA 106		Carbon steel high-temperature service pipes
SA 179		Cold-drawn low-carbon steel heat-exchanger and condenser tubes
SA 209		Carbon-molybdenum alloy steel boiler and super-heater tubes
SA 210		Carbon steel boiler and super-heater tubes
SA 213		Austenitic and Ferritic alloy steel boiler, super-heater and exchanger tubes
SA 335		Ferritic alloy steel high-temperature service pipes
ASTM/ASME		Welded Steel Tubes and Pipes
SA 178		Carbon steel and carbon-manganese steel boiler and super-heater electric-resistance-welded tubes
SA 214		Carbon steel heat-exchanger condenser, ERW tubes
SA 249		Austenitic steel boiler, heat-exchanger, super heater and condenser tubes
SA 250		Ferritic alloy steel boiler and super-heater ERW tubes
SA 358		Chromium-nickel stainless steel high-temperature service pipes
SA 381		With high-pressure transmission systems, metal-arc-welded pipes

ASTM/ASME	Forged Material
SA 105	Carbon steel forgings for piping applications
SA 181	Carbon steel forgings, for general purpose piping
SA 182	Stainless steel forged and rolled alloy for high-temperature service
SA 266	Carbon steel forgings for pressure vessel components
SA 336	Alloy steel forgings for high-temperature service and pressure
SA 350	Low alloy and carbon steel forgings, requiring attain toughness testing
SA 369	Ferritic alloy and carbon steel forged and bored pipe for high-temperature service
SA 372	Alloy and steel carbon forgings for thick-walled pressure vessels
SA 694	Alloy and Carbon steel forging pipe flange for high-pressure transmission service
ASTM/ASME	Fastenings, Bolts, Nuts, Screws
SA 193	Stainless steel and alloy steel and bolt materials for high-pressure service
SA 194	Alloy and carbon steel nuts, bolts for high pressure and temperature
SA 320	Stainless steel and alloy steel bolting materials for low-temperature service
ASTM/ASME	API Steels
API 5 CT	Casting and tubing specification
API 5 D	Drill pipe specification
API L	Line pipe specification



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