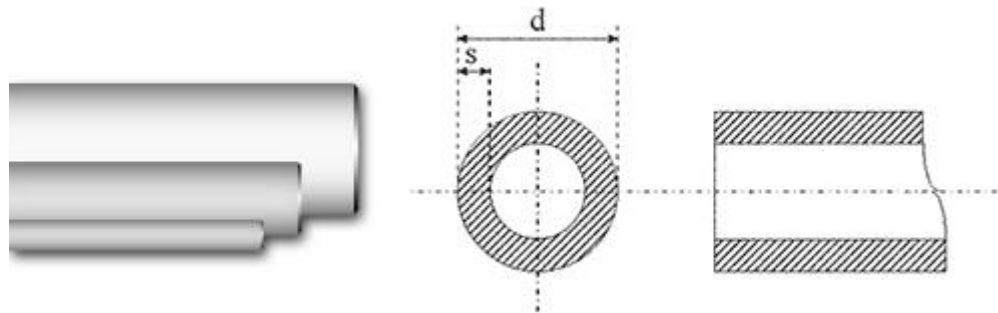


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## EN 10216

EN 10216-2 is a European standard suitable for seamless steel tubes for pressure purposes. Technical delivery conditions-Part 2: Non-alloy and steel tubes with specified elevated temperature properties.(include amendment A1:2004).

This part of EN10216 may also be applied for tubes of non-circular cross section; necessary modification should be agreed a time of enquiry and order.





This part of EN1026 specifies the technical delivery conditions in two test categories for seamless tubes for circular cross section, with specified elevated temperature properties, made of non-alloy and alloy steel. This part of EN10216 may also be applied for tubes of non-circular cross section; necessary modification should be agreed a time of enquiry and order.

This part of EN1026 specifies the technical delivery conditions in two test categories for seamless tubes for circular cross section, with specified elevated temperature properties, made of non-alloy and alloy steel.

Non-alloy and steel tubes with specified elevated temperature properties.(include amendment A1:2004).

This part of EN1026 specifies the technical delivery conditions in two test categories for seamless tubes for circular cross section, with specified elevated temperature properties, made of non-alloy and alloy steel.

**The main steel grade:**

- P195GH , P235GH ,P265GH , 16Mo3 , 14MoV6-3 , 13CrMo4-5 , 10CrMo9-10 ,15NiCuMoNb5-6-4 , X10CrMoVNB9-1,25CrMo4
- Other grades of steel pipe can be provided based on negotiations.

**Application:**

- For producing storage tanks of heat-resistant steels used in boiler-making, tool-making;
- For constructing pressure reservoirs and high pressure are simultaneously used to have summarized load and special conditions.

*View the data of the steel grade as below:*



### Chemical Compositions(%)

Steel grade		C	Si	Mn	p	s	Cr	Mo	Ni	Altot	Cu	Ti max
Steel name	Steel number				max	max						
P195GH	1.0348	0.13	0.35	0.7	0.025	0.02	0.3	0.08	0.3	0.02	0.3	0.04
P235GH	1.0345	0.16	0.35	1.2	0.025	0.02	0.3	0.08	0.3	0.02	0.3	0.04
P265GH	1.0425	0.2	0.4	1.4	0.025	0.02	0.3	0.08	0.3	0.02	0.3	0.04
16Mo3	1.5415	0.12-0.20	0.40-0.90	0.40-0.90	0.025	0.02	0.3	0.25-0.35	0.3	0.04	0.3	
14MoV6-3	1.7715	0.10-0.15	0.15-0.35	0.40-0.70	0.025	0.02	0.30-0.60	0.40-0.50	0.3	0.04	0.3	
13CrMo4-5	1.7335	0.10-0.17	0.15	0.40-0.70	0.025	0.02	0.70-1.15	0.40-0.60	0.3	0.04	0.3	
10CrMo9-10	1.738	0.08-0.14	0.08-0.14	0.30-0.70	0.025	0.02	2.00-2.50	0.90-1.10	0.3	0.04	0.3	
25CrMo4	1.7218	0.22-0.29	0.22-0.29	0.60-0.90	0.025	0.02	0.90-1.20	0.15-0.30	0.3	0.04	0.3	
15NiCuMoNb5-6-4	1.6368	0.17	0.17	0.80-1.20	0.025	0.02	0.3	0.25-0.50	1.00-1.30	0.05	0.50-0.80	
X10CrMoVNb9-1	1.4903	0.08-0.12	0.08-0.12	0.30-0.60	0.025	0.02	8.00-9.50	0.85-1.05	0.4	0.04	0.3	

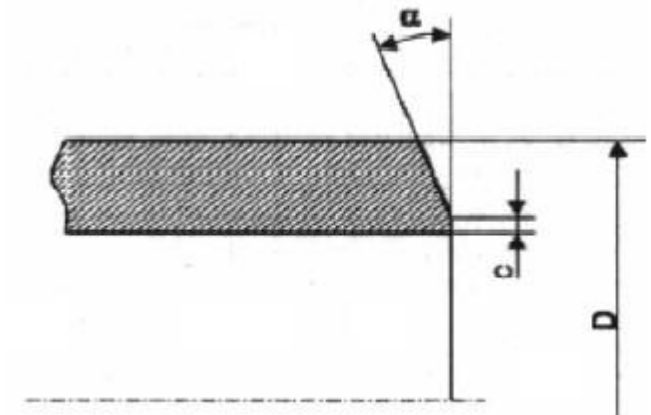
- a. Elements not included in this Table shall not be intentionally added to the steel without the agreement of the purchaser, except for elements which may be added for finishing the cast. All appropriate measures shall be taken to prevent the addition of undesirable elements from scrap or other materials used in the steel making process
- b. This requirement is not applicable provided the steel contains a sufficient amount of other nitrogen binding elements which shall be reported. When using titanium, the producer shall verify that  $(Al+Ti/2)=0,020\%$
- c. Option 2: In order to facilitate subsequent forming operations, an agreed maximum copper content lower than indicated and an agreed specified maximum tin content shall apply
- d. The content of these elements need not to be reported unless intentionally added to the cast
- e. For wall thickness=30 mm the carbon content may be increased by 0.02% for cast and product analysis
- f. The upper carbon value of 0,23 % shall not be exceeded for product analysis

**Pipe beveling**

Pipe beveling is the process where an angle is formed between the edge of the end of a pipe or tube and a plane perpendicular to the surface.

A standard pipe bevel angle for welding is 37.5 degrees.

Other angles and special forms such as J-Bevels can also be produced on the ends of pipe or tube using automatic beveling machines.





## Mechanical Properties:

Steel grade		Tensile properties at room temperature							Impact properties a b				
Steel name	Steel Number	Upper yield strength or proof strength ReH or Rp0.2 for Wall Thickness T Min.				Tensile Strength	Elongation A min. % a		Minimum average absorbed energy KV J at a temperature of ?				
		T=16	16<T=40	40<T=60	60<T=100	Rm	l	t	l			t	
		MPa	MPa	MPa	MPa	MPa			20	0	-10	20	0
P195GH	1.0348	195				320-440	27	25		40 c	28 d		27c
P235GH	1.0345	235	225	215		360-500	25	23		40 c	28 d		27c
P265GH	1.0425	265	255	245		410-570	23	21		40 c	2s d		27C
16Mo3	1.5415	280	270	260		450-600	22	20	40 c			27 c	
14MoV6-3	1.7715	320	320	310		460-610	20	18	40 c f			27 c	
13CrMo4-5	1.7335	290	290	280		440-590	22	20	40 c			27 c	
10CrMo9-10	1.738	280	280	270		480-630	22	20	40 c			27 c	
25CrMo4	1.7218	345	345	345		540-690	18	15	40 c f			27 c	
15NiCuMoNb 5-6-4	1.6368	440	440	440	440e	610-780	19	17	40 c f			27 c	
X10CrMoVNb 9-1	1.4903	450	450	450	450	630-830	19	17	40 c f			27 c	

1. l = longitudinal t = transverse
2. To be verified when options 4 and/or 5 are/is specified, unless footnote f) applies
3. Option 4: Impact energy shall be verified.
4. Option 5: Longitudinal impact energy shall be verified.
5. For wall thickness 60 mm < T = 80mm
6. Impact test mandatory for wall thickness T = 16mm



## EN 10216-2 boiler tube Heat Treatment

Steel grade		Heat treatment a	Austenizing		Tempering	
Steel name	Steel number		Temperature °C	Cooling Medium	Temperature °C	Cooling medium
P195GH	1.0348	+N b	880 to 940	Air	-	-
P235GH	1.0345	+N b	880 to 940	Air	-	-
P265GH	1.0425	+N b	880 to 940	Air	-	-
16Mo3	1.5415	+N b	890 to 950	Air	-	-
14MoV6-3	1.7715	+NT b c	930 to 990	Air	680 to 730	air
13CrMo4-5	1.7335	+NT b c	900 to 960	Air	660 to 730	air
10CrMo9-10	1.738	+NT b c	900 to 960	Air	680 to 750	air
25CrMo4	1.7218	+QT	860 to 900	Air or Liquid	620 to 680	air
15NiCuMoNb5-6-4	1.6368	+NT c	880 to 980	Air	580 to 680	air
X10CrMoVNb9-1	1.4903	+NT c	1040 to 1090	air	730 to 780	air

- +N = Normalising, +NT = Normalising + Tempering, +QT = Quenching + Tempering (air or liquid), +I = Isothermal Annealing.
- Normalising includes Normalising Forming.
- For these steel grades it may be necessary in the case of wall thickness T above 25 mm or T/D >0,15 to apply quenching and tempering in order to achieve the intended structure and material properties. The decision shall be left to the discretion of the manufacturer but shall be stated to the customer at the time of enquiry and order. Steel tubes treated in such a way shall be designated by the steel name supplemented by the symbol





## Read more...

### DIN EN 10216-1

Seamless steel tubes for pressure purposes – Technical delivery conditions – Part 1: Non-alloy steel tubes with specified room temperature properties  
Specifies the technical delivery conditions for two qualities, T1 and T2, of seamless tubes of circular cross section, with specified room temperature properties, made of non-alloy quality steel...

### DIN EN 10216-2

Seamless steel tubes for pressure purposes – Technical delivery conditions – Part 2: Non alloy and alloy steel tubes with specified elevated temperature properties; German version EN 10216-2:2002+A2:2007. The document specifies the technical delivery conditions in two test categories for seamless tubes of circular cross section, with specified elevated temperature properties, made of non-alloy and alloy steel.

### DIN EN 10216-3

Seamless steel tubes for pressure purposes – Technical delivery conditions – Part 3: Alloy fine grain steel tubes. Specifies the technical delivery conditions in two categories for seamless tubes of circular cross section, made of weldable alloy fine grain steel...

### DIN EN 10216-4

Seamless steel tubes for pressure purposes – Technical delivery conditions – Part 4: Non-alloy and alloy steel tubes with specified low temperature properties  
Specifies the technical delivery conditions in two categories for seamless tubes of circular cross section, made with specified low temperature properties, made of non-alloy and alloy steel...

### DIN EN 10216-5



Seamless steel tubes for pressure purposes – Technical delivery conditions – Part 5: Stainless steel tubes; German version EN 10216-5:2004, Corrigendum to DIN EN 10216-5:2004-11; German version EN 10216-5:2004/AC:2008

This Part of this European Standard specifies the technical delivery conditions in two test categories for seamless tubes of circular cross-section made of austenitic (including creep resisting steels) and austenitic-ferritic stainless steel which are applied for pressure and corrosion resisting purposes at room temperature, at low temperatures or at elevated temperatures.

It is important that the purchaser, at the time of enquiry and order, takes in account the requirements of the relevant national legal regulations for the intended application.

Description of DIN EN 10217 (7 parts)

#### DIN EN 10217-1

Welded steel tubes for pressure purposes – Technical delivery conditions – Part 1: Non-alloy steel tubes with specified room temperature properties

This Part of EN 10217 specifies the technical delivery conditions for two qualities TR1 and TR2 of welded tubes of circular cross section, made of non-alloy quality steel and with specified room tempe...

#### DIN EN 10217-2

Welded steel tubes for pressure purposes – Technical delivery conditions – Part 2: Electric welded non-alloy and alloy steel tubes with specified elevated temperature properties

Specifies the technical delivery conditions in two test categories of electric welded tubes of circular cross section, with specified elevated temperature properties, made of non-alloy and alloy steel...

#### DIN EN 10217-3





Welded steel tubes for pressure purposes – Technical delivery conditions – Part 3: Alloy fine grain steel tubes  
Specifies the technical delivery conditions for welded tubes of circular cross section, made of weldable non-alloy fine grain steel...

#### DIN EN 10217-4

Welded steel tubes for pressure purposes – Technical delivery conditions – Part 4: Electric welded non-alloy steel tubes with specified low temperature properties  
Specifies the technical delivery conditions in two test categories of electric welded tubes of circular cross section, with specified low temperature properties, made of non-alloy steel...

#### DIN EN 10217-5

Welded steel tubes for pressure purposes – Technical delivery conditions – Part 5: Submerged arc welded non-alloy and alloy steel tubes with specified elevated temperature properties  
Specifies the technical delivery conditions in two test categories of submerged arc welded tubes of circular cross section, with specified elevated temperature properties, made of non-alloy and alloy...

#### DIN EN 10217-6

Welded steel tubes for pressure purposes – Technical delivery conditions – Part 6: Submerged arc welded non-alloy steel tubes with specified low temperature properties  
Specifies the technical delivery conditions in two test categories of submerged arc welded tubes of circular cross section, with specified low temperature properties, made of non-alloy steel...

#### DIN EN 10217-7

Welded steel tubes for pressure purposes – Technical delivery conditions – Part 7: Stainless steel tubes. Specifies the technical delivery conditions in two test categories for welded tubes of circular cross-section made of austenitic and austenitic-ferritic stainless steel which are applied for pressure...



## Pipes for construction applications

Old:

Execution	Norm	Steel grade
Welded	DIN 17120	St. 37. 2
Welded	DIN 17120	St. 52. 3
Seamless	DIN 17121	St. 37. 2
Seamless	DIN 17121	St. 52. 3

NEW:

Execution	Norm	Steel grade
Welded	DIN EN 10219-1/2	S235JRH
Welded	DIN EN 10219-1/2	S355J2H
Seamless	DIN EN 10210-1/2	S235JRH
Seamless	DIN EN 10210-1/2	S355J2H

## Flattening test- constant factor of deformation C

Steel grade		
Steel name	Steel number	C
P195GH	1.0348	0,09
P235GH	1.0345	0,09
P265GH	1.0425	0,07
20MnNb6	1.0471	0,07
16Mo3	1.5415	0,07
8MoB5-4	1.5450	0,05
14MoV63	1.7715	0,05
10CrMo5-5	1.7338	0,08
13CrMo4-5	1.7335	0,07
10CrMo9-10	1.7380	0,07
11CrMo9-10	1.7383	0,07

Steel grade		
Steel name	Steel number	C
25CrMo4	1.7218	0,06
20CrMoV13-5-5	1.7779	0,05
15NiCuMoNb5-6-4	1.6368	0,05
X11CrMo5+I	1.7362+I	0,05
X11CrMo5+NT1	1.7362+NT1	0,05
X11CrMo5+NT2	1.7362+NT2	0,05
X11CrMo9-1+I	1.7386+I	0,05
X11CrMo9-1+NT	1.7386+NT	0,05
X10CrMoVNb9-1	1.4903	0,05
X20CrMoV11-1	1.4922	0,05

After testing, the test piece shall be free from cracks or breaks. However, slight incipient cracks at its edges shall not be regarded as justification for rejection.



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## Get in Touch

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