

Technical Data Sheet

AISI-304

General Presentation

AISI-304 is a common "18/8" stainless steel. Despite a wide range of alternatives, it is the most versatile and widely used stainless steel available, and it has excellent forming and welding characteristics. Because of its balanced austenitic structure, AISI-304 can be severely deep drawn without intermediate annealing. This means that this steel is commonly used in the production of drawn stainless parts such as sinks, hollowware, and saucepans. Special "304DDQ" (Deep Drawing Quality) variants are commonly used for these applications. AISI-304 can be easily braked or roll-formed into a variety of components for industrial, architectural, and transportation applications. It also has excellent welding properties. When welding thin sections, no post-weld annealing is required.

Classification

Austenitic stainless steel

Application

AISI-304 stainless steel is used in food processing equipment, particularly in beer brewing, milk processing & winemaking, kitchen benches, sinks, trough, equipment and appliances, architectural panelin, railings & trim, chemical containers, including for transport, heat exchangers, woven or welded screens for mining, quarrying & water filtration, threaded fasteners, springs.

Processing

AISI-304 stainless steel cannot be hardened by heat treatment. Solution treatment or annealing can be done by rapid cooling after heating to 1010- 1120°C. It can only be hardened by cold working.

Forming

The grade has exceptional forming properties. It can be drawn without the need for any intermediate heat-softening stages.

Weldability

Both with and without fillers, the fusion welding performance of AISI-304 stainless steel is excellent. AISI-308 stainless steel is recommended for filler rods and electrodes in AISI-304. The recommended filler for AISI-304L is AISI-308L. Post-weld annealing may be required for heavy welded sections. For AISI-304L, this step is not required. If post-weld heat treatment is not possible, AISI-321 may be used.

Corrosion

In many environments and when in contact with various corrosive media, AISI-304 has excellent corrosion resistance. Pitting and crevice corrosion can occur in chloride-containing environments. Above 60°C, stress corrosion cracking can occur.

Technical Data Sheet

AISI-304

Chemical Properties

Chemical properties of the alloy is given below (maximum values unless indicated otherwise).

Name	Number	C (%)	Si (%)	Mn (%)	P (%)	S (%)	Cr (%)	Ni (%)	N (%)
X5CrNi18-10	1.4301	0,07	1,00	2,00	0045	0,015	17,5 to 19,5	8,0 to 10,5	0,10

Mechanical Properties

The following table summarizes the mechanical properties at room temperature (minimum values).

Tensile S. (MPa), Rm	Yield S. (MPa), Rp 0,2	Elongation (%)	Elastic Modulus (GPa)
540-750	230	45	193

Some Physical Properties

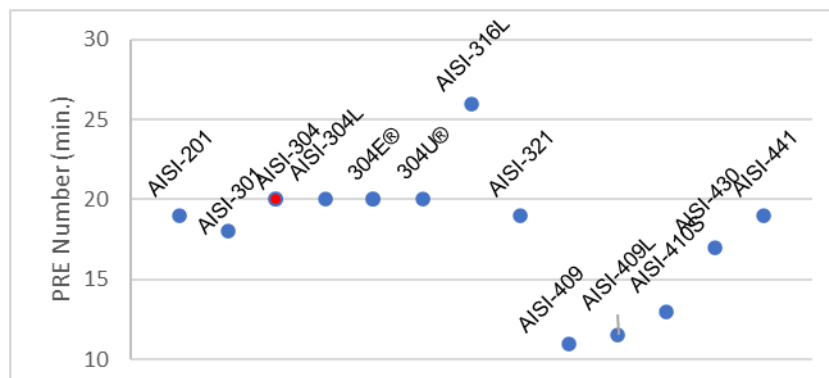
Thermal conductivity at 20 °C (W/(m.K))	Specific thermal capacity at 20 C° J/(kg.K)	Electrical resistivity at 20 °C (Ω.mm ² /m)
15	500	0,73

Comparison With Different Stainless Steel Grades

	AISI-301	AISI-304	AISI-316L
% C + N	0.15 / 0.25	0.17	0.13
% Ni min. / max.	6.0 / 9.5	8.0 / 10.5	10.0 / 13.0
% Cr min. / max.	16.0 / 19.0	17.5 / 19.5	16.5 / 18.5
% Mo min. / max.	0.8	-	2.0 / 2.5

Corrosion Resistance

PRE value of each alloy is given on the graph below. AISI-304 is indicated with red dot on graph.



Technical Data Sheet

AISI-304

Available Products

Process	Alloy Type	Alloy (AISI)	EN No.	Surface	Product Type	Range		
						thickness (mm)	width (mm)	length (cm)
Cold rolled + Solution annealed	Austenitic	201	1.4372	2B, 2D, 2H, 2J, 2C, NO:4, SB	Coil, strip, sheet, plate, disc	0,25-3	50-1300	20-600 or coil
		301	1.4310					
		304/304L	1.4301/1.4307					
		304E@/304U@	-					
		316L	1.4404					
	321	1.4541						
	Ferritic	409/409L	1.4512					
		410S	1.4000					
		430	1.4016					
		441	1.4509					

Geometrical Properties

The tolerances of thickness according to TS EN ISO 9445-2 Standard is given below (dimensions in millimeters).

Specified thickness (t)	Special tolerances for a specified width of	
	$w \leq 1000$	$1000 < w \leq 1300$
$t < 0,30$	$\pm 0,030$	-
$0,30 \leq t < 0,40$	$\pm 0,030$	$\pm 0,035$
$0,40 \leq t < 0,50$	$\pm 0,035$	$\pm 0,035$
$0,50 \leq t < 0,60$	$\pm 0,035$	$\pm 0,035$
$0,60 \leq t < 0,80$	$\pm 0,040$	$\pm 0,040$
$0,80 \leq t < 1,00$	$\pm 0,040$	$\pm 0,050$
$1,00 \leq t < 1,20$	$\pm 0,050$	$\pm 0,055$
$1,20 \leq t < 1,50$	$\pm 0,055$	$\pm 0,060$
$1,50 \leq t < 2,00$	$\pm 0,065$	$\pm 0,070$
$2,00 \leq t < 2,50$	-	-
$2,50 \leq t < 3,00$	-	-

The tolerances on width for cold-rolled wide strip and sheet/plate cut from cold-rolled wide strip mill edges is given below (dimensions in millimeters).

Tolerances for a specified width of	
$600 \leq w < 1000$	$1000 \leq w \leq 2100$
+25 0	+30 0

The tolerances on sheet-plate cut from cold-rolled wide strip mill edges is given below (dimensions in millimeters).

Tolerance	
Length	Normal
≤ 1500	+5 /0

Technical Data Sheet

AISI-304

- For thickness tolerances, EN/2 is in our productibility.
- The width tolerances are for slit edge materials.

Edge Wave, Flatness Tolerances

- According to standard h/l rate is 0.03 max.
- For clients with special requests on flatness we can produce EN/2.

Sheet/plate

- Minimum sheet length is 200 mm, maximum sheet length is 6000 mm.
- Minimum width is 425 mm, maximum width is 1300 (1500 mm is available for contract manufacturing).
- Producibile thicknesses are between 0,3 – 3 mm.
- The above mentioned min. and max. Values are machine manufacturability. Information should be obtained from planning for plate combinations.
- Sheets can be filmed.
- Sheets can be labeled.

Mandrel Dia. (mm)	Thickness (mm)		Width (mm)		Length (cm)		Mandrel Tonnage	Packet Tonnage
	Min.	Max.	Min.	Max.	Min.	Max.	Max.	Max.
503	0,5	3	425	1500	20	600	10	2,5

Strip

- Strip inner diameter is 508 mm.
- For thicknesses of 0.90 mm and above, the slitting process is combined as 50 mm*15mm. The strip outer diameter is a maximum of 1750 mm.
- For thicknesses below 0.90 mm, the slitting process is combined as 50 mm * 15 mm. Maximum roll weight should be 10 tons.
- Slitting is not performed in thicknesses below 0.30 mm thickness.
- Paper wrapping is not possible for strips under 350 mm width.
- For thicknesses over 1.80 mm, the slitting process should be asked to the planning department.
- Thin film coating can be done on the edge cutting.
- It is possible to label on the edge cut rolls.

Cutting Type	Mandrel Dia. (mm)		Thickness (mm)		Width (mm)	
	Entry	Exit	Min.	Max.	Min.	Max.
Edge Cutting	508 - 610	508 - 610	0,3	3	300	1280
Multi Slitting	508 - 610	508 - 610	0,6	3	40	-

Technical Data Sheet
AISI-304
Subjected Certificates and Standards

Certificates:

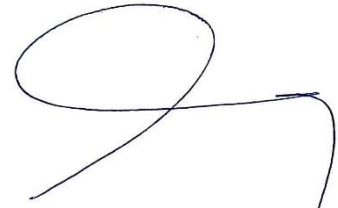
- TS EN ISO 9001:2015
- TS EN ISO/IEC 17025:2017
- TS EN ISO 9001:2015 EN AS 9100:2018
- IATF 16949:2016
- TS ISO 10002:2018
- 2014/68/EU: EN 764-5, section 4.2 and AD 2000-Merkblatt W0
- TS EN 10088-2:2014,
- 2001/95/EC General Product Safety Directive
- 1935/2004 EU Food Contact Regulations (EC)
- 98/79/EC In Vitro Diagnostics Medical Devices and Repealing Directive
- EU 2017/745 Medical Devices
- EU NO 305/2011 Construction Products Regulation
- 2011/65/EU Restriction of Hazardous Substances Directive ROHS
- 2016/26/EU, 2017/225/EU, 2018/35/EU REACH
- 2014/34/EU ATEX

Standards:

- TS EN 10088-2:2014,
- TS EN 10088-4:2013,
- TS EN 9445-2:2010,
- TS EN 10028-7:2016,
- TS 3157 EN ISO 3651-2:2000,
- ASTM A240/A240M-22b-2022,
- ASTM A480/A480M-22a-2022,
- ASME SA 240/SA 240M-2021,
- ASME SA 480/SA 480M-2021,
- ASTM A262,
- EN 764-5 Section 4.2,
- ISPM 15:2019 Fumigation



İrfan Can DİNÇER, B.Sc.
Metallurgical & Materials Engineer
Quality and R&D Engineer



Eur. Ing. Hamdi EKİCİ, Ph.D.
Metallurgical & Materials Engineer
Quality and R&D Manager