

Paslanmaz çeliklerin kimyasal özellikleri *Chemical properties of stainless steel grades*

ASTM	C	N	CR	Nİ	MO	OTHERS
201	0.05	0.15	17	5	--	Mn
301	0.10	0.04	17	7	--	--
304L	0.02	0.06	18.3	9.2	--	--
304L	0.02	0.06	18.3	10.2	--	--
304	0.04	0.06	18.3	8.7	--	--
304LN	0.02	0.14	18.3	8.7	--	--
321	0.04	0.01	17.3	9.2	--	Ti
305	0.04	0.04	18.5	11.5	--	--
316L	0.02	0.06	17.3	11	2.2	--
316	0.04	0.04	16.8	10.7	2.2	--
316LN	0.02	0.14	17.5	11	2.2	--
316Ti	0.04	0.01	17	11	2.2	Ti
316L	0.02	0.08	18.3	12.2	3.2	--
316L	0.02	0.06	17.3	12.7	2.7	--
316	0.04	0.06	17	11	2.7	--
317L	0.02	0.08	18.3	12.2	3.2	--
317LN	0.02	0.10	17	11	3.2	--
S31726	0.02	0.14	17.3	12.7	4.2	--
N08904	0.01	0.06	20	25	4.5	Cu
S31254	0.01	0.20	20	18	6.1	Cu
S32750	0.01	0.50	24	22	7.3	Mn, Cu
S32304	0.02	0.10	23	4.5	--	--
S31803	0.02	0.17	22	5.5	3	--
S32750	0.02	0.27	25	7	4	--
409	0.02	--	12	--	--	Ti
410S	0.04	--	12	--	--	--
430	0.04	--	16.5	--	--	--
S42010	0.20	--	13	--	--	--
420	0.30	--	12.5	--	--	--
--	0.03	0.04	16	5	1	--
304H	0.05	0.06	18.3	8.7	--	--
321H	0.05	0.01	17.3	9.2	--	Ti
309S	0.06	0.08	22.5	12.5	--	--
--	0.04	0.04	20	12	--	Si
310S	0.05	0.06	25	20	--	--
S30415	0.05	0.15	18.5	9.5	--	Si, Ce
S30815	0.09	0.17	21	11	--	Si, Ce
S35315	0.05	0.15	25	35	--	Si, Ce

**Paslanmaz çelik mekanik özellikleri**  
*Mechanical properties of stainless steel*

**Paslanmaz çelik fiziksel özellikleri**  
*Physical properties of stainless steel*

	EN	Density	Modulus of elasticity		Thermal expansion RT to		
		ρKg/dm <sup>3</sup> RT	EKN/mm <sup>2</sup> RT	400°C	αx10 <sup>-6</sup> 100°C	C° 400°C	
Ferritic	1.4512	7.7	220	195	10.5	12.0	
	1.4000	-	-	-	10.5	12.0	
	1.4016	-	-	-	10.5	10.5	
	1.4510	-	-	-	10.5	10.5	
Mart.	1.4021	7.7	215	190	10.5	12.0	
	1.4028	-	215	190	10.5	12.0	
	1.4018	-	200	170	10.3	11.6	
Duplex	1.4362	7.8	200	172	16.0	17.5	
	1.4460	-	-	-	-	-	
	1.4462	-	-	-	-	-	
	1.4410	-	-	-	-	-	
Austenitic	1.4372	7.8	200	172	16.0	17.5	
	1.4310	7.9	-	-	-	-	
	1.4307	7.9	200	172	16.0	17.5	
	1.4301	-	-	-	-	-	
	1.4311	-	-	-	-	-	
	1.4541	-	-	-	-	-	
	1.4306	7.9	200	172	16.0	17.5	
	1.4303	-	-	-	-	-	
	1.4404	8.0	200	172	16.0	17.5	
	1.4401	-	-	-	-	-	
	1.4406	-	-	-	-	-	
	1.4571	-	-	-	-	-	
	1.4432	8.0	200	172	16.0	17.5	
	1.4436	-	-	-	-	-	
	1.4435	-	-	-	-	-	
	1.4438	8.0	200	172	16.0	17.5	
	1.4434	-	-	-	-	-	
	1.4439	8.0	200	172	16.0	17.5	
	1.4539	-	195	166	16.0	17.0	
	1.4547	-	195	166	16.0	18.0	
	1.4652	-	190	163	15.0	16.2	
			Density	500	1000°C	500	1000°C
	1.4948	7.9	160	125	18.2	-	
1.4878	7.9	-	-	18.2	-		
1.4818	7.8	-	-	18.2	20.0		
1.4833	7.9	160	125	17.8	19.5		
1.4828	7.9	-	-	17.8	19.5		
1.4835	7.8	-	-	18.2	19.5		
1.4845	7.9	-	-	17.3	19.0		
1.4854	7.9	-	-	16.5	18.0		

	EN	Rp0.2	Rp1.0	Rm	ASTM	Rp0.2	Rm
		N/mm <sup>2</sup>	N/mm <sup>2</sup>	N/mm <sup>2</sup>		N/mm <sup>2</sup>	N/mm <sup>2</sup>
Ferritic	1.4512	220	-	380	S40910	170	380
	1.4000	230	-	400	S41008	205	415
	1.4016	260	-	430	S43000	205	450
	1.4510	240	-	420	S43035	205	415
Mart.	1.4021	-	-	-	S42010	-	-
	1.4028	-	-	-	S42000	-	-
	1.4018	680	-	840	-	-	-
Duplex	1.4362	400	-	630	S32304	400	600
	1.4460	460	-	620	S31200	485	620
	1.4462	460	-	640	S31803	450	620
	1.4410	530	-	730	S32750	550	795
Austenitic	1.4372	350	380	750	S20100	260	655
	1.4310	250	280	600	S30100	205	515
	1.4307	200	240	500	S30403	170	485
	1.4301	210	250	520	S30400	205	515
	1.4311	270	310	550	S30453	205	515
	1.4541	200	240	500	S32100	205	515
	1.4306	200	240	500	S30403	170	485
	1.4303	220	250	500	S30500	205	515
	1.4404	220	260	520	S31603	170	485
	1.4401	220	260	520	S31600	205	515
	1.4406	280	320	580	S31653	205	515
	1.4571	220	260	520	S31603	205	515
	1.4432	220	260	520	S31603	170	485
	1.4436	220	260	530	S31600	205	515
	1.4435	220	260	520	S31603	170	485
	1.4438	220	260	520	S31703	205	515
	1.4434	270	310	540	S31753	240	550
	1.4439	270	310	580	S31726	240	550
	1.4539	220	260	520	N08904	215	490
	1.4547	300	340	650	S31254	300	650
	1.4652	430	470	750	S32654	430	750
	1.4948	190	230	510	S30409	205	515
	1.4878	190	230	500	S32109	205	515
1.4818	290	330	600	S30415	290	600	
1.4833	210	250	500	S30908	205	515	
1.4828	230	270	550	-	-	-	
1.4835	310	350	650	S30815	310	600	
1.4845	210	250	500	S31008	205	515	
1.4854	300	340	650	S35315	270	650	



	International standards	Finland	Sweden	Country specific standards				Chemical values (%)					
				ASTM	EN	Polarit	Avesta Sheffield	DIN	BS	NF	SS	C	Cr
Ferritic	409	1.4512		409HyForm	1.4512	409S19	Z3CT12	-	0.02	12	-	-	Ti
	S41050	1.4003	853	3/12HyFab	1.4003	-	-	-	0.02	11.5	0.4	-	-
	410S	1.4000		410S	1.4000	403S17	Z8C12	2301	0.04	12	-	-	-
	430	1.4016		430	1.4016	430S17	Z8C17	2320	0.04	16.5	-	-	-
Martensitic	S42010	1.4021		420L	1.4021	420S29	Z20C13	2303	0.20	13	-	-	-
	420	1.4028		420M	1.4028	420S45	Z33C13	2304	0.30	12.5	-	-	-
	-	1.4418		248SV	1.4418	-	Z6CND16-05-01	2387	0.03	16	5	1	-
Duplex	S32304	1.4362		SAF2304	1.4362	-	Z3CND23-04Az	2327	0.02	23	4.5	-	-
	329	1.4460		329	1.4460	-	Z5CND27-05-A2	2324	0.02	25	5	1.5	-
	S31803	1.4462		S31803	1.4462	318S13	Z3CND22-05Az	2377	0.02	22	5.5	3	-
	S32750	1.4410		S32750	-	-	Z3CND25-06Az	2328	0.02	25	7	4	-
Austenitic	201	1.4372	710	17-5Mn	-	-	Z12CMN17-07Az	-	0.05	17	5	-	Mn
	301	1.4310		17-7	1.4310	301S21	Z11CN18-08	2331	0.10	17	7	-	-
	304L	1.4307	710	18-8L	-	304S11	Z3CN18-10	2352	0.02	18.3	9.2	-	-
	304	1.4301	725	18-8	1.4301	304S31	Z7CN18-09	2333	0.04	18.3	8.7	-	-
	304LN	1.4311	721	18-8LN	1.4311	304S61	Z3CN18-10Az	2371	0.02	18.3	8.7	-	-
	321	1.4541	731	18-10Ti	1.4571	321S31	Z6CNT18-10	2337	0.04	17.3	9.2	-	Ti
	S30430	1.4567		18-8Cu	1.4567	-	Z3CND18-09FF	-	0.01	18	9	-	Cu
	304L	1.4306	720	19-11L	1.4306	304S11	Z3CN18-10	2352	0.02	18.3	10.2	-	-
	305	1.4303		18-12	1.4303	305S19	Z1CN18-10	-	0.02	18	11.5	-	-
	316L	1.4404	750	17-11-2L	1.4404	316S11	Z3CND17-11-02	2348	0.02	17.3	11	2.2	-
316	1.4401	755	17-11-2	1.4401	316S31	Z7CND17-11-02	2347	0.04	16.8	10.7	2.2	-	
316LN	1.4406	751	17-11-2LN	1.4406	316S61	Z3CND17-11Az	-	0.02	17.5	11	2.2	-	
316Ti	1.4571	761	17-11-2Ti	1.4571	320S31	Z6CNDT17-12	2350	0.04	17	11	2.2	Ti	
316L	1.4432	752	17-12-2.5L	-	316S13	Z3CND17-12-03	2353	0.02	17	11.7	2.7	-	
316	1.4436	757	17-12-2.5	1.4436	316S33	Z7CND18-12-03	2343	0.04	17	11	2.7	-	
316L	1.4435	752	17-14-2.5L	1.4435	316S13	Z3CND18-14-03	2353	0.02	17.3	12.7	2.7	-	
317L	1.4438	770	18-14-3L	1.4438	317S12	Z3CND19-15-04	2367	0.02	18.3	12.2	3.2	-	
317LN	1.4434		17-11-3NL	-	-	Z3CND19-14Az	2373	0.02	17	11	3.2	-	
S31726	1.4439	772	17-14-4LN	1.4439	-	Z3CND18-14-05Az	-	0.02	17.3	12.7	4.2	-	
	1.4539	774	904L	1.4539	904S13			2562	0.01	20	25	4.5	Cu

Paslanmaz çelik teknik özellikleri *Stainless steel technical properties*

GRADE	304/S11	304/S15	304/S16	304/S31	316/S11	316/S31	316/S33
Proof stress 0.2% (N/mm <sup>2</sup> )	180	195	195	195	190	205	205
Tensile strength Rp1.0 (N/mm <sup>2</sup> )	480	500	500	500	490	510	510
Elongation A Min. a/o	40	40	40	40	40	40	40
Hardness HV, Max.	185	190	190	190	195	205	205
Condition	Softened	Softened	Softened	Softened	Softened	Softened	Softened
<b>MAX. WORKING STRESSES</b>							
Tension or Compression (N/mm <sup>2</sup> )	120	130	130	130	127	137	137
Shear (N/mm <sup>2</sup> )	80	87	87	87	85	91	91

**INTERNATIONAL STANDARDS ON CALCULATION PRINCIPLES**

*BS 970 Part 3 1991 Mechanical properties for stainless steel*

*ASTM A 276 Standard specification for stainless steel bars and shapes*

*AISI 304 (A2) AISI 304 grade stainless steel*

*AISI 316 (A4) AISI 316 grade stainless steel*

**Notes:**

*All information provided herein are for informative purposes only. While this document gives guidance relating to the use and nature of the documents and applications, the ultimate responsibility for correct selection of a product finish for a specific application must lie with the customer.*





GERPA ELEKTRIK TEKSTIL SAN.TIC.A.S



GERPA ELEKTRIK TEKSTIL SAN.TI.C.A.S

**Use of area:** Solar energy heating systems, HVAC systems, Under floor heating systems, electronic components, kitchenware, roof cladding, air conditioners (AC), cables, rack cabinets, earthing systems and more.

**Advantages:** Copper is a superior conductor. Due to this property Copper, (Cu) is a preferred raw material where conductivity is of great importance.

**RODS**

Nom. Dia 22,20,16,11 mm.  
 Material Oxygen Free Electrolytic Copper Cu-OF  
 Production Methode Outokumpu/upcast continuous casting  
 Chemical Composition - Copper / Cu : 99.98%  
 - Oxygen / O2: max 10 ppm  
 - Sulphur / S : max 18 ppm  
 Physical - Specific Gravity: 8.94 gr/cm3  
 - Electrical Conductivity: min. 58m/ohm mm2  
 Standard - DIN : 1787 ( 2.0040 )  
 - BSA : OF ( Cu No 102 )  
 - BS : C 103 - 1861  
 - NF : Cu C1 - A53/100  
 - ASTM: B1,B3  
 - UNI : Cu - OF 5649

**WIRE RODS**

Material: Oxygen Free and Tough Pitch Electrolytic Copper ( Cu OF / Cu-ETP )  
 Production Method: Southwire, Controd and Outokumpu (upcast) continuous casting.  
 Chemical Composition: Copper / Cu : 99.95%  
 Phys. & Electr. Conductivity: 58m/ohm mm2  
 Specific Gravity: 8.9 gr/cm3  
 Standards: DIN1787 / 2.0060, 2.0065) - ASTM: B49 / 1036  
 BS: C 101 1433 - CSA ETP ( Cu No 110 )

**FLAT BARS (BUS BARS)**

RECTANGULAR SHAPED ETP COPPER BUSBARS				
Size	a(mm)	b(mm)	X-Section(mm <sup>2</sup> )	Weight (kg/m)*
12x120	12	120	1.439	12.81
12x100	12	100	1.199	10.67
12x90	12	90	1.079	9.60
12x80	12	80	959	8.54
12x70	12	70	839	7.47
12x60	12	60	719	6.40
12x50	12	50	599	5.33
12x40	12	40	479	4.26
12x30	12	30	359	3.20
10x120	10	120	1.199	10.67
10x100	10	100	999	8.89
10x90	10	90	099	0.00
10x80	10	80	799	7.11
10x70	10	70	699	6.22
10x60	10	60	599	5.33
10x50	10	50	499	4.44
10x40	10	40	399	3.55
8x120	8	120	959	8.54
8x100	8	100	799	7.11
8x90	8	90	719	6.40
8x80	8	80	639	5.69
8x70	8	70	559	4.98
8x60	8	60	479	4.26
8x50	8	50	399	3.55
8x40	8	40	319	2.84
6x100	6	100	599	5.33
6x90	6	90	539	4.80
6x80	6	80	479	4.26
6x70	6	70	419	3.73
6x60	6	60	359	3.20
6x50	6	50	299	2.66
5x100	5	100	499	4.44
5x90	5	90	449	4.00
5x80	5	80	399	3.55
5x70	5	70	349	3.11
5x60	5	60	299	2.66
5x50	5	50	249	2.22

\* Source: Sarkuysan A.S. web site.

**TUBES**

Material: Cu-DHP / C 12 200 / SF-Cu  
 Chemical Composition : Copper / Cu : min. % 99.9  
 Phosphorus / P : % 0,015-0,040  
 Standards: DIN 1786 / DIN EN 1057 / ASTM B 280 / ASTM B 68 ASTM B 75

O.D.		Wall Thickness (mm)		Weight		Production		
inch	mm	min	max	g/m	g/m	LWC	Pancake (m)	Hard (m)
-	6	0,50	1	77	140	125 kg each	15-100	2,0-6,0
1/4	6,35	0,48	1	79	150	125 kg each	15-100	2,0-6,0
-	7	0,50	1	91	168	125 kg each	-	-
5/16	7,93	0,48	1	100	194	125 kg each	15-100	2,0-6,0
-	8	0,5	1	105	196	125 kg each	15-100	2,0-6,0
3/8	9,52	0,48	1	121	238	125 kg each	15-100	2,0-6,0
-	10	0,50	1	133	252	125 kg each	15-100	2,0-6,0
-	11	0,50	1	147	280	125 kg each	15-100	2,0-6,0
-	12	0,50	1	161	308	-	15-50	2,0-6,0
1/2	12,70	0,48	1	164	327	125 kg each	15-50	2,0-6,0
-	13	0,50	1	175	336	125 kg each	15-50	2,0-6,0
-	13,5	0,50	1	182	350	125 kg each	15-50	2,0-6,0
-	14	0,50	1	189	363	125 kg each	15-50	2,0-6,0
-	15	0,50	1	203	391	125 kg each	15-50	2,0-6,0
5/8	15,87	0,48	1	207	416	125 kg each	15-50	2,0-6,0
-	16	0,50	1	217	419	125 kg each	15-50	2,0-6,0
-	17	0,50	1	231	447	125 kg each	15-50	2,0-6,0
-	18	0,50	1	245	475	125 kg each	15-50	2,0-6,0
-	19	0,50	1,5	259	734	125 kg each	15-25	2,0-6,0
3/4	19,05	0,48	1,5	249	736	125 kg each	15-25	2,0-6,0
-	20	1	1,5	531	776	125 kg each	15-25	2,0-6,0
-	22	1	1,5	587	860	125 kg each	15-25	2,0-6,0
7/8	22,22	1	1,5	593	869	125 kg each	-	-
-	22,70	1	1,5	607	889	125 kg each	-	-



GERPA ELEKTRİK TEKSTİL SAN.TİC.A.Ş

### Threaded copperbond earth rods

Nominal diameter	Length	Thread diameter 'B'	Shank diameter 'A'	Weight each
1/2"	1200mm	9/16"	12.7mm	1.18kg
1/2"	1500mm	9/16"	12.7mm	1.55kg
1/2"	1800mm	9/16"	12.7mm	1.76kg
1/2"	2400mm	9/16"	12.7mm	2.36kg
5/8"	1200mm	5/8"	14.2mm	1.53kg
5/8"	1500mm	5/8"	14.2mm	1.88kg
5/8"	1800mm	5/8"	14.2mm	2.29kg
5/8"	2100mm	5/8"	14.2mm	2.51kg
5/8"	2400mm	5/8"	14.2mm	3.00kg
5/8"	3000mm	5/8"	14.2mm	3.79kg
3/4"	1200mm	3/4"	17.2mm	2.19kg
3/4"	1500mm	3/4"	17.2mm	2.73kg
3/4"	1800mm	3/4"	17.2mm	3.27kg
3/4"	2400mm	3/4"	17.2mm	4.35kg
3/4"	3000mm	3/4"	17.2mm	5.44kg

### Weight of 1000 m. Length

<i>Kesit</i> Section mm <sup>2</sup>	<i>Tel</i> <i>adedi</i> No of. Cores	<i>Tel çapı</i> VireØ mm	<i>Standart</i> Standard kg	<i>Asgari</i> Minimum kg.	<i>Azami</i> Maximum kg.
10	7	1.32	89.5	84	99
16	7	1.70	142.5	136	155
25	7	2.12	218	208	236
35	7	2.50	309	298	332
50	7	3.00	440	428	467
60	19	1.80	440	416	471
70	19	2.12	600	565	642
95	19	2.50	850	808	902
120	19	2.80	1050	1019	1126