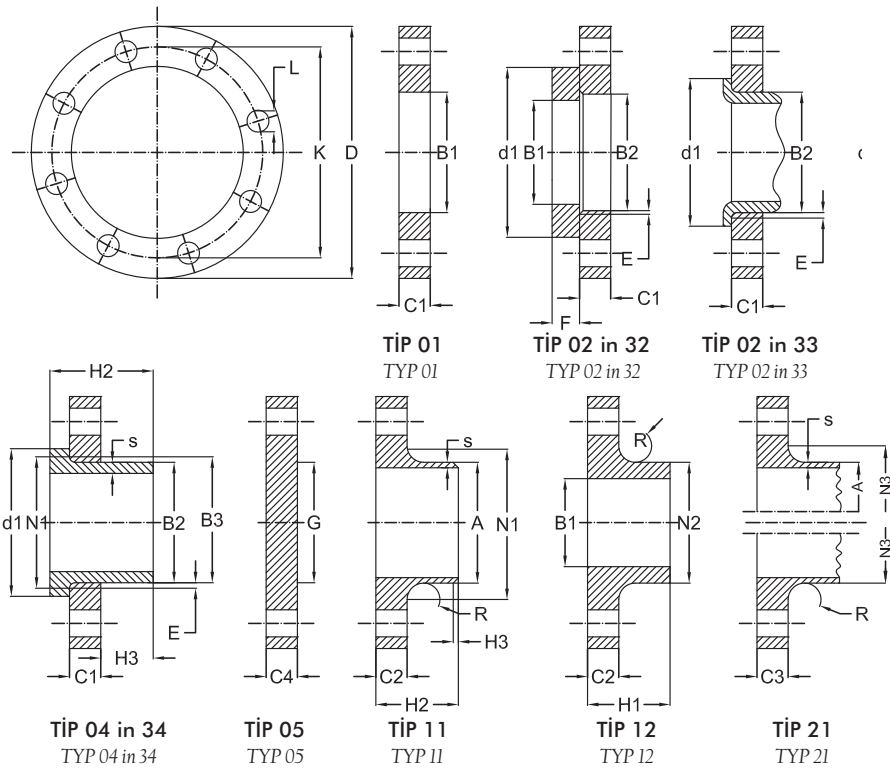


**T**ABLULAR

**T**ABLES

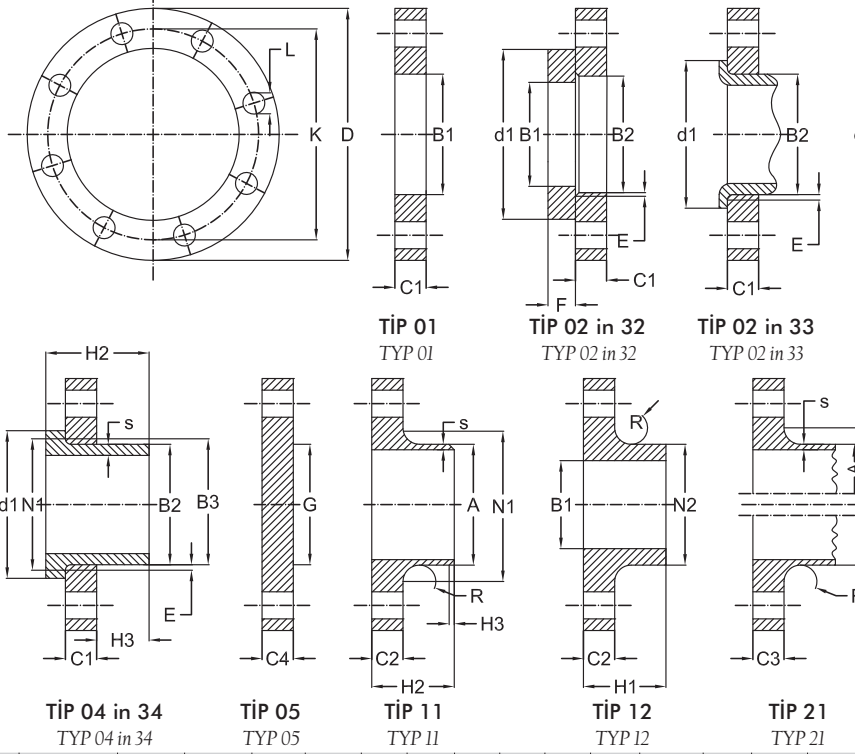
[www.karasus.com](http://www.karasus.com)

## Flange Dimensions



Nominal Çap Nominal Diameter	D	K	L	No / Size	A	B1	B2	C1 *	C2 C3	C4	E	F	G max	H1	H2	H3	N1	N2	N3	R	S
	Flanş Tipi / Flange Type				11 21 **	01 12 32	02	01 02 04	11 12 13 21	05	02	32	05	12 13	11	11	11	12 13	21	11 12 12 21	11
DN	01,02,05,11,12,13,21																				
10	75	50	11	4—M10	17,2	18,0	21	12	12	12	3	10	-	20	28	6	26	25	20	4	1,8
15	80	55	11	4—M10	21,3	22,0	25	12	12	12	3	10	-	20	30	6	30	30	26	4	2,0
20	90	65	11	4—M10	26,9	27,5	31	14	14	14	4	10	-	24	32	6	38	40	34	4	2,3
25	100	75	11	4—M10	33,7	34,5	38	14	14	14	4	10	-	24	35	6	42	50	44	4	2,6
32	120	90	14	4—M12	42,4	43,5	46	16	14	14	5	10	-	26	35	6	55	60	54	6	2,6
40	130	100	14	4—M12	48,3	49,5	53	16	14	14	5	10	-	26	38	7	62	70	64	6	2,6
50	140	110	14	4—M12	60,3	61,5	65	16	14	14	5	12	-	28	38	8	74	80	74	6	2,9
65	160	130	14	4—M12	76,1	77,5	81	16	14	14	6	12	55	32	38	9	88	100	94	6	2,9
80	190	150	18	4—M16	88,9	90,5	94	18	16	16	6	12	70	34	42	10	102	110	110	8	3,2
100	210	170	18	4—M16	114,3	116,0	120	18	16	16	6	14	90	40	45	10	130	130	130	8	3,6
125	240	200	18	8—M16	139,7	141,5	145	20	18	18	6	14	115	44	48	10	155	160	160	8	4,0
150	265	225	18	8—M16	168,3	170,5	174	20	18	18	6	14	140	44	48	12	184	185	182	10	4,5
200	320	280	18	8—M16	219,1	221,5	226	22	20	20	6	16	190	44	55	15	236	240	238	10	5,9
250	375	335	18	12—M16	273,0	276,5	281	24	22	22	8	18	235	44	60	15	290	295	284	12	6,3
300	440	395	22	12—M20	323,9	327,5	333	24	22	22	8	18	285	44	62	15	342	355	342	12	7,1
350	490	445	22	12—M20	355,6	359,5	365	26	22	22	8	18	330	-	62	15	385	-	392	12	7,1
400	540	495	22	16—M20	406,4	411,0	416	28	22	22	8	20	380	-	65	15	438	-	442	12	7,1
450	595	550	22	16—M20	457,0	462,0	467	30	22	24	8	20	425	-	65	15	492	-	494	12	7,1
500	645	600	22	20—M20	508,0	513,5	519	30	24	24	8	22	475	-	68	15	538	-	544	12	7,1
600	755	705	26	20—M24	610,0	616,5	622	32	30	30	8	22	575	-	70	16	640	-	642	12	7,1
700	860	810	26	24—M24	711,0	-	-	-	24	40	-	-	670	-	70	16	740	-	746	12	7,1
800	975	920	30	24—M27	813,0	-	-	-	24	44	-	-	770	-	70	16	842	-	850	12	7,1
900	1075	1020	30	24—M27	914,0	-	-	-	26	48	-	-	860	-	70	16	942	-	950	12	7,1
1000	1175	1120	30	28—M27	1016,0	-	-	-	26	52	-	-	960	-	70	16	1045	-	1050	16	7,1
1200	1405	1340	33	32—M30	1219,0	-	-	-	28	60	-	-	1160	-	90	20	1248	-	1264	16	8,0
1400	1630	1560	36	36—M33	1422,0	-	-	-	32	68	-	-	1346	-	90	20	1452	-	1480	16	8,0
1600	1830	1760	36	40—M33	1626,0	-	-	-	34	76	-	-	1546	-	90	20	1655	-	1680	16	9,0
1800	2045	1970	39	44—M36	1829,0	-	-	-	36	84	-	-	1746	-	100	20	1855	-	1878	16	10,0
2000	2265	2180	42	48—M39	2032,0	-	-	-	38	92	-	-	1950	-	110	25	2058	-	2082	16	11,0
2200	2475	2390	42	52—M39	2035,0	-	-	-	42	-	-	-	-	-	115	25	2260	-	-	18	12,0
2400	2685	2600	42	56—M39	2438,0	-	-	-	44	-	-	-	-	-	125	25	2462	-	-	18	13,0
2600	2905	2710	48	60—M45	2620,0	-	-	-	46	-	-	-	-	-	130	25	2665	-	-	18	14,0
2800	3115	3020	48	64—M45	2820,0	-	-	-	48	-	-	-	-	-	135	30	2865	-	-	18	15,0
3000	3315	3220	48	68—M45	3020,0	-	-	-	50	-	-	-	-	-	140	30	3068	-	-	18	16,0
3200	3525	3430	48	72—M45	3220,0	-	-	-	54	-	-	-	-	-	150	30	3272	-	-	20	16,0
3400	3735	3640	48	76—M45	3420,0	-	-	-	56	-	-	-	-	-	160	35	3475	-	-	20	18,0
3600	3970	3860	56	80—M52	3620,0	-	-	-	60	-	-	-	-	-	165	35	3678	-	-	20	18,0

## Flange Dimensions



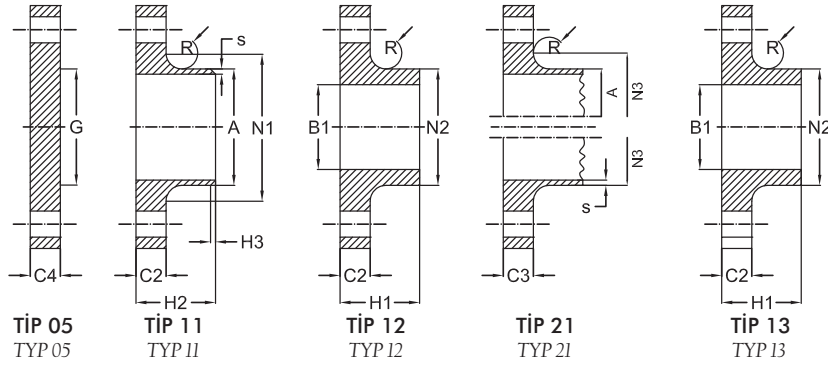
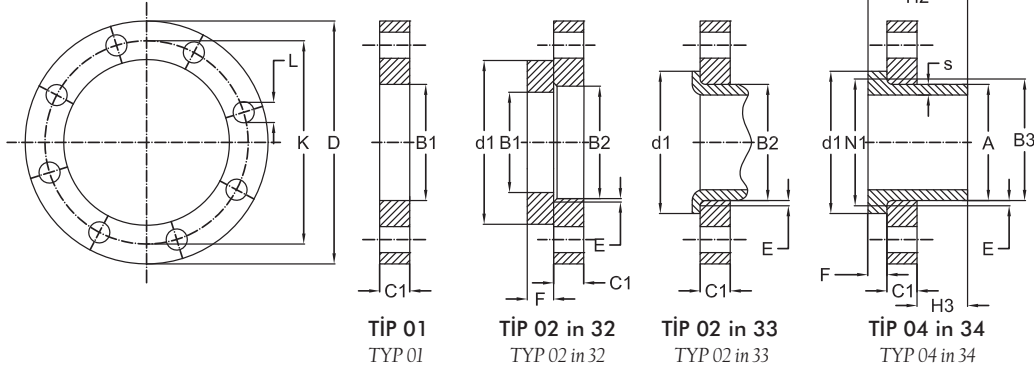
Nominal Çap Nominal Diameter	D	K	L	No / Size	A	B1	B2	B3	C1	C2	C3	C4	E	F	G <sub>max</sub>	H1	H2	H3	N1	N2	N3	R	S
	Flanş Tipi / Flange Type																						
DN	01,02,05,11,12,21				11 21* 34	01 12 32	02	04	01 02 04	11 12	21	05	02 04	32 34	05	12	11 34	11 34	11 34	12	21	11 12 21	11 34

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PN 40 ÇAPLARA BAKINIZ  
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PN 16 ÇAPLARA BAKINIZ  
SEE PN 16 DIMENSIONS

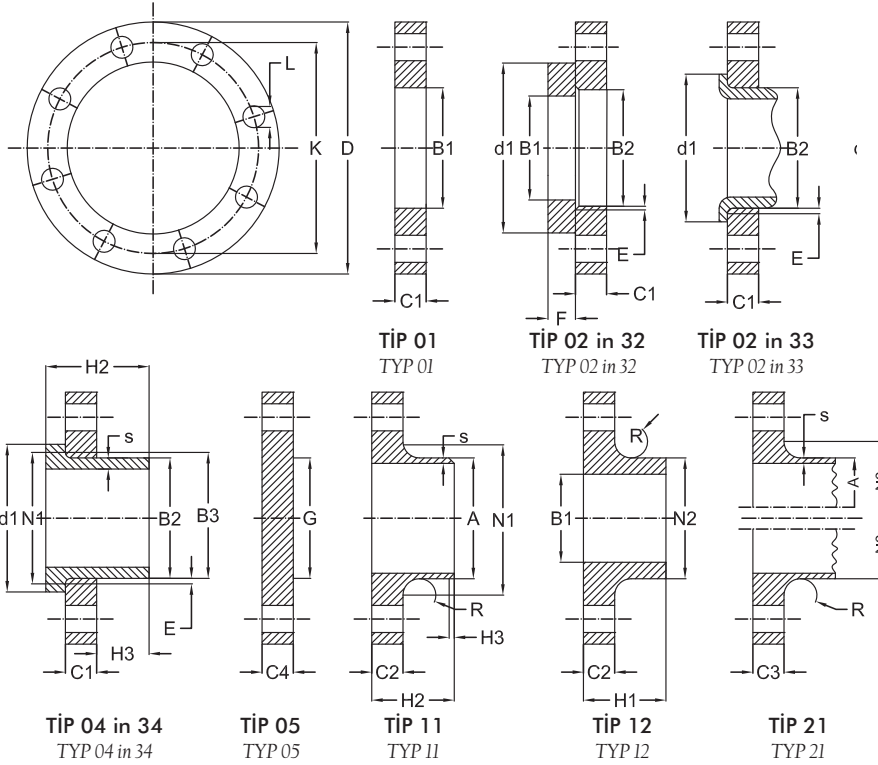
200	340	295	22	8—M20	219,1	221,5	226	240	24	24	24	24	6	20	190	44	62	16	234	246	246	10	5,9
250	395	350	22	12—M20	273,0	276,5	281	294	26	26	26	26	8	22	235	46	68	16	292	298	298	12	6,3
300	445	400	22	12—M20	323,9	327,5	333	348	26	26	26	26	8	22	285	46	68	16	342	350	348	12	7,1
350	505	460	22	16—M20	335,6	359,5	365	400	28	26	26	26	8	22	330	53	68	16	385	400	408	12	7,1
400	565	515	26	16—M24	406,4	411,0	416	450	32	26	26	26	8	24	380	57	72	16	440	456	456	12	7,1
450	615	565	26	20—M24	457,0	462,0	467	498	36	28	28	28	8	24	425	63	72	16	488	502	502	12	7,1
500	670	620	26	20—M24	508,0	513,5	519	550	38	28	28	28	8	26	475	67	75	16	542	559	559	12	7,1
600	780	725	30	20—M27	610,0	616,5	622	650	42	34	34	34	8	26	575	75	80	18	642	658	658	12	7,1
700	895	840	30	24—M27	711,1	-	-	-	30	34	38	-	-	670	-	80	18	746	-	772	12	8,0	
800	1015	950	33	24—M30	813	-	-	-	32	36	42	-	-	770	-	90	18	850	-	876	12	8,0	
900	1115	1050	33	28—M30	914	-	-	-	34	38	46	-	-	860	-	95	20	950	-	976	12	10,0	
1000	1230	1160	36	28—M33	1016	-	-	-	34	38	52	-	-	960	-	95	20	1052	-	1080	16	10,0	
1200	1455	1380	39	32—M36	1219	-	-	-	38	44	60	-	-	1160	-	115	25	1256	-	1292	16	11,0	
1400	1675	1590	42	36—M39	1422	-	-	-	42	48	-	-	-	1346	-	120	25	1460	-	1496	16	12,0	
1600	1915	1820	48	40—M45	1626	-	-	-	46	52	-	-	-	1546	-	130	25	1666	-	1712	16	14,0	
1800	2115	2020	48	44—M45	1829	-	-	-	50	56	-	-	-	1746	-	140	30	1868	-	1910	16	15,0	
2000	2325	2230	48	48—M45	2032	-	-	-	54	60	-	-	-	1950	-	150	30	2072	-	2120	16	16,0	
2200	2550	2440	56	52—M52	2235	-	-	-	58	-	-	-	-	-	-	160	35	2275	-	-	18	18,0	
2400	2760	2650	56	56—M52	2438	-	-	-	62	-	-	-	-	-	-	170	35	2478	-	-	18	20,0	
2600	2960	2850	56	60—M52	2620	-	-	-	66	-	-	-	-	-	-	180	40	2680	-	-	18	22,0	
2800	3180	3070	56	64—M52	2820	-	-	-	70	-	-	-	-	-	-	190	40	2882	-	-	18	22,0	
3000	3405	3290	62	68—M56	3020	-	-	-	75	-	-	-	-	-	-	200	45	3085	-	-	18	24,0	



Nominal Çap Nominal Diameter	D	K	L	No / Size	A	B1	B2	B3	C1	C2	C3	C4	E	F	G max	H1	H2	H3	N1	N2	N3	R	S
	Flanş Tipi / Flange Type																						
DN	01,02,05,11,12,21				11 21* 34	01 12 32	02	04	01 02 04	11 12 13	21	05	02 04	32 34	05	12 13	11 34	11 34	11 34	12 13	21	11 12 13 21	11 34

PN 40 ÇAPLARA BAKINIZ  
SEE PN 40 DIMENSIONS

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50	165	125	18	4—M16	60,3	61,5	65	77	19	18	18	18	5	16	-	28	45	8	74	84	84	5	2,9
65	185	145	18	**—M16	76,1	77,5	81	96	20	18	18	18	6	16	55	32	45	10	92	104	104	6	2,9
80	200	160	18	8—M16	88,9	90,5	94	108	20	20	20	20	6	16	70	34	50	10	105	118	120	8	3,2
100	220	180	18	8—M16	114,3	116,0	120	134	22	20	20	20	6	18	90	40	52	12	131	140	140	8	3,6
125	250	210	18	8—M16	139,7	141,5	145	162	22	22	22	22	6	18	115	44	55	12	156	168	170	8	4,0
150	285	240	22	8—M20	168,3	170,5	174	188	24	22	22	22	6	20	140	44	55	12	184	195	190	10	4,5
200	340	295	22	12—M20	219,1	221,5	226	240	26	24	24	24	6	20	190	44	62	16	235	246	246	10	5,9
250	405	355	26	12—M24	273,0	276,5	281	294	29	26	26	26	8	22	235	46	70	16	292	298	296	12	6,3
300	460	410	26	12—M24	323,9	327,5	333	348	32	28	28	28	8	24	285	46	78	16	344	350	350	12	7,1
350	520	470	26	16—M24	355,6	359,5	365	400	35	30	30	30	8	26	330	57	82	16	390	400	410	12	8,0
400	580	525	30	16—M27	406,4	411,0	416	454	38	32	32	32	8	28	380	63	85	16	445	456	458	12	8,0
450	640	585	30	20—M27	457,0	462,0	467	500	42	40	40	40	8	30	425	68	87	16	490	502	516	12	8,0
500	715	650	33	20—M30	508,0	513,5	510	556	46	44	44	44	8	32	475	73	90	16	548	559	576	12	8,0
600	840	770	36	20—M33	610,0	616,5	622	660	52	54	54	54	8	32	575	83	95	18	652	658	690	12	8,8
700	910	840	36	24—M33	711,0	-	-	-	-	36	42	48	-	-	670	83	100	18	755	760	760	12	8,8
800	1025	950	39	24—M36	813,0	-	-	-	-	38	42	52	-	-	770	90	105	20	855	864	862	12	10,0
900	1125	1050	39	28—M36	914,0	-	-	-	-	40	44	58	-	-	860	94	110	20	955	968	962	12	10,0
1000	1255	1170	42	28—M39	1016,0	-	-	-	-	42	46	64	-	-	960	100	120	22	1058	1072	1076	16	10,0
1200	1485	1390	48	32—M45	1219,0	-	-	-	-	48	52	76	-	-	1160	-	130	30	1262	-	1282	16	12,5
1400	1685	1590	48	36—M45	1422,0	-	-	-	-	52	58	-	-	-	1346	-	145	30	1465	-	1482	16	14,2
1600	1930	1820	56	40—M52	1626,0	-	-	-	-	58	64	-	-	-	1546	-	160	35	1668	-	1696	16	16,0
1800	2130	2020	56	44—M52	1829,0	-	-	-	-	62	68	-	-	-	1746	-	170	35	1870	-	1896	16	17,5
2000	2345	2230	62	48—M56	2032,0	-	-	-	-	66	70	-	-	-	1950	-	180	40	2072	-	2100	16	20,0

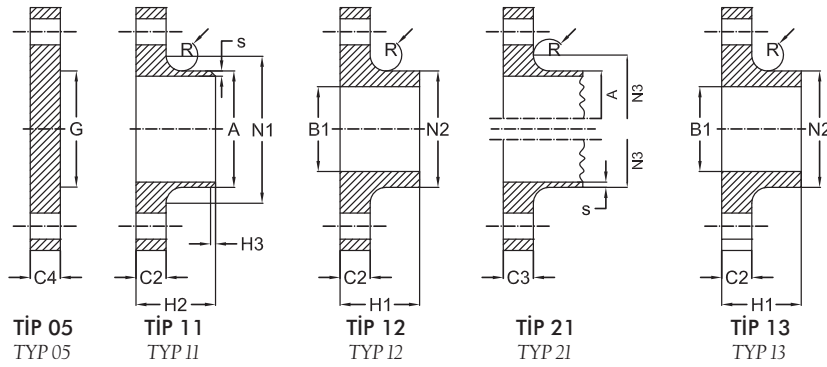
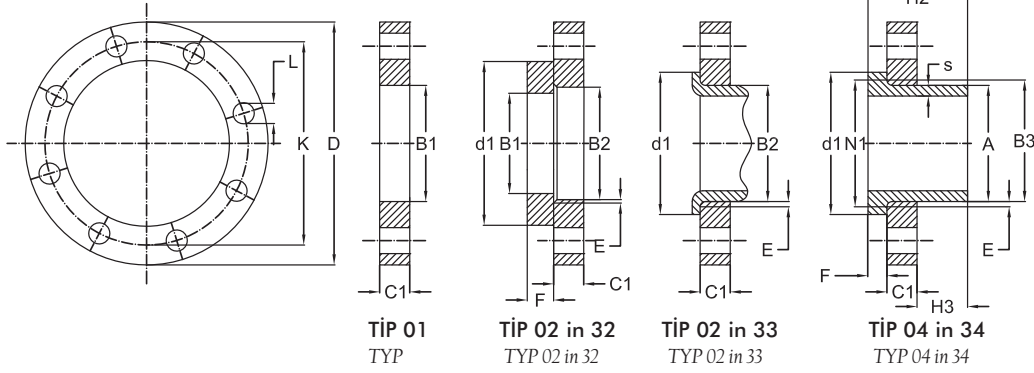


Nominal Çap Nominal Diameter	D	K	L	No / Size	A	B1	B2	B3	C1	C2	C3	C4	E	F	G max	H1	H2	H3	N1	N2	N3	R	S
	Flanş Tipi / Flange Type																						
DN	01,02,05,11,12,21				11 21* 34	01 12 32	02	04	01 02 04	11 12 13	21	05	02 04	32 34	05	12 13	11 34	11 34	11 34	12 13	21	11 12 13 21	11 34

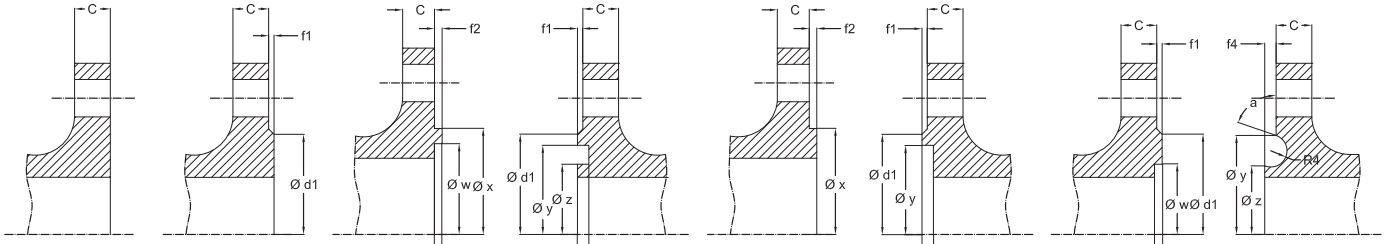
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PN 40 ÇAPLARA BAKINIZ  
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200	360	310	36	12—M24	219,1	221,5	226	250	32	30	30	30	6	26	190	52	80	16	244	256	252	10	6,3
250	425	370	30	12—M27	273,0	276,5	281	302	35	32	32	32	8	26	235	60	88	18	298	310	304	12	7,1
300	485	430	30	16—M27	323,9	327,5	333	356	38	34	34	34	8	28	285	67	92	18	352	364	364	12	8,0
350	555	490	33	16—M30	335,6	359,5	365	408	42	38	38	38	8	32	332	72	100	20	398	418	418	12	8,0
400	620	550	36	16—M33	406,4	411,0	416	462	46	40	40	40	8	34	380	78	110	20	452	472	472	12	8,8
450	670	600	36	20—M33	457,0	462,0	467	510	50	46	46	46	8	36	425	84	110	20	500	520	520	12	8,8
500	730	660	36	20—M33	508,0	513,5	519	568	56	48	48	48	8	38	475	90	125	20	558	580	580	12	10,0
600	845	770	39	20—M36	610,0	616,5	622	670	68	58	58	58	8	40	575	100	125	20	660	684	684	12	11,0
700	960	875	42	24—M39	711,1	-	-	-	46	50	-	-	-	-	-	-	125	20	760	-	780	12	12,5
800	1085	990	48	24—M45	813	-	-	-	50	54	-	-	-	-	-	-	135	22	864	-	882	12	14,2
900	1158	1090	48	28—M45	914	-	-	-	54	58	-	-	-	-	-	-	145	24	968	-	982	12	16,0
1000	1320	1210	56	28—M52	1016	-	-	-	58	62	-	-	-	-	-	-	155	24	1070	-	1086	16	17,5
1200	1530	1420	56	32—M52	1219	-	-	-	-	70	-	-	-	-	-	-	-	-	-	-	1296	18	-
1400	1755	1640	62	36—M56	1422	-	-	-	-	76	-	-	-	-	-	-	-	-	-	-	1508	18	-
1600	1975	1860	62	40—M56	1626	-	-	-	-	84	-	-	-	-	-	-	-	-	-	-	1726	20	-
1800	2195	2070	70	44—M64	1829	-	-	-	-	90	-	-	-	-	-	-	-	-	-	-	1920	20	-
2000	2425	2300	70	48—M64	2032	-	-	-	-	96	-	-	-	-	-	-	-	-	-	-	2150	20	-



Nominal Çap Nominal Diameter	D	K	L	No / Size	A	B1	B2	B3	C1	C2	C3	C4	E	F	G <sub>max</sub>	H1	H2	H3	N1	N2	N3	R	S
	Flanş Tipi / Flange Type																						
DN	01,02,05,11,12,13,21				11 21* 34	01 12 32	02	04	01 02 04	11 12 13	21	05	02 04	32 34	05	12 13	11 34	11 34	11 34	12 13	21	11 12 13 21	11
10	90	60	14	4—M12	17,2	18,0	21	31	14	16	16	16	3	12	-	22	35	6	28	30	28	4	1,8
15	95	65	14	4—M12	21,3	22,0	25	35	14	16	16	16	3	12	-	22	38	6	32	35	32	4	2,0
20	105	75	14	4—M12	26,9	27,5	31	42	16	18	18	18	4	14	-	26	40	6	40	45	40	4	2,3
25	115	85	14	4—M12	33,7	34,5	38	49	16	18	18	18	4	14	-	28	40	6	46	52	52	4	2,6
32	140	100	18	4—M16	42,4	43,5	47	59	18	18	18	18	5	14	-	30	42	6	56	60	60	6	2,6
40	150	110	18	4—M16	48,3	49,5	53	67	18	18	18	18	5	14	-	32	45	7	64	70	70	6	2,6
50	165	125	18	4—M16	60,3	61,5	65	77	20	20	20	20	5	16	-	34	48	8	75	84	84	6	2,9
65	185	145	18	8—M16	76,1	77,5	81	96	22	22	22	22	6	16	55	38	52	10	90	104	104	6	2,9
80	200	160	18	8—M16	88,9	90,5	94	114	24	24	24	24	6	18	70	40	58	12	105	118	120	8	3,2
100	235	190	22	8—M20	114,3	116,0	120	138	26	24	24	24	6	20	90	44	65	12	134	145	142	8	3,6
125	270	220	26	8—M24	139,7	141,5	145	166	28	26	26	26	6	22	115	48	68	12	162	170	162	8	4,0
150	300	250	26	8—M24	168,3	170,5	174	194	30	28	28	28	6	24	140	52	75	12	192	200	192	10	4,5
200	375	320	30	12—M27	219,1	221,5	226	250	36	34	34	36	6	28	190	52	88	16	244	260	254	10	6,3
250	450	385	33	12—M30	273,0	276,5	281	312	42	38	38	38	8	30	235	60	105	18	306	312	312	12	7,1
300	515	450	33	16—M30	323,9	327,5	333	368	48	42	42	42	8	34	285	67	115	18	362	380	378	12	8,0
350	580	510	36	16—M33	355,6	359,5	365	418	54	46	46	46	8	36	330	72	125	20	408	424	432	12	8,8
400	660	585	39	16—M36	406,4	411,0	416	472	60	50	50	50	8	42	380	78	135	20	462	478	498	12	11,0
450	685	610	39	20—M36	457,0	462,0	467	510	66	57	57	57	8	46	425	84	135	20	500	522	522	12	12,5
500	755	670	42	20—M39	508,0	513,5	519	572	71	57	57	57	8	50	475	90	140	20	562	576	576	12	14,2
600	890	795	48	20—M45	610,0	616,5	622	676	84	72	72	72	8	54	575	100	150	20	666	686	686	12	16,0



**TYP A: Düz yüzey** TYP B: Conta Yüzeyi TYP C: Uzanlı TYP D: Kanallı TYP E: Boru ağızlı TYP F: Girintili TYP G: O-ring ağızlı TYP H: O-ring girintili  
 TYP A: Flat face TYP B: Raised Face TYP C: Tongue TYP D: Groove TYP E: Spigot TYP F: Recess TYP G: O-ring spigot TYP H: O-ring groove

DN	d1				f1	f2	f3	f4	w	x	y	z	α	R	
	PN 2,5 mm	PN 6 mm	PN 10 mm	PN 16 mm											
10	PN 6 ÇAPLARA BAKINIZ SEE PN 6 DIMENSIONS	35	PN 100 ÇAPLARA BAKINIZ SEE PN 100 DIMENSIONS		2	4,5	4,0	2,0	24	34	35	23	-	2,5	
15		40							29	39	40	28	-		
20		50							36	50	51	35	41°		
25		60							43	57	58	42			
32		70							51	65	66	50			
40		80							61	75	76	60			
50		90							73	87	88	72			
65		110							95	109	110	94			
80		128							106	120	121	105			
100		148							129	149	150	128			32°
125		178	155	175	176	154									
150		202	183	203	204	182									
200		258	239	259	260	238									
250		312	292	312	313	291									
300		365	343	363	364	342									
350		415	395	421	422	394									
400		465	447	473	474	446									
450		520	497	523	524	496									
500		570	549	575	576	548									
600		670	649	675	676	648	27°								
700	775	751	777	778	750										
800	880	856	882	883	855										
900	980	961	987	988	960										
1000	1080	1062	1092	1094	1060										
1200	1280	1262	1292	1294	1260										
1400	1480	1462	1492	1494	1460										
1600	1690	1662	1692	1694	1660										
1800	1890	1862	1892	1894	1860										
2000	2090	2062	2092	2094	2060										
10	PN 100 ÇAPLARA BAKINIZ SEE PN 100 DIMENSIONS	PN 100 ÇAPLARA BAKINIZ SEE PN 100 DIMENSIONS			2	4,5	4,0	2,0	24	34	35	23	-	2,5	
15									40	29	39	40	28		-
20									58	36	50	51	35		41°
25									68	43	57	58	42		
32									78	51	65	66	50		
40									88	61	75	76	60		
50									102	73	87	88	72		
65									122	95	109	110	94		
80									138	106	120	121	105		
100									162	129	149	150	128		
125		188	155	175	176	154									
150		218	183	203	204	182									
200		278	239	259	260	238									
250		335	292	312	313	291									
300		395	343	363	364	342									
350		450	395	421	422	394									
400		505	447	473	474	446									
450		555	497	523	524	496									
500		615	549	575	576	548									
600		720	649	675	676	648	27°								
700	820	751	777	778	750										
800	930	856	882	883	855										
900	1030	961	987	988	960										
1000	1140	1062	1092	1094	1060										
1200	1350	1262	1292	1294	1260										
1400	1560	1462	1492	1494	1460										
1600	1780	1662	1692	1694	1660										
1800	1985	1862	1892	1894	1860										
2000	2210	2062	2092	2094	2060										

DN	d1				f1	f2	f3	f4	w	x	y	z	α	R	
	PN 25 mm	PN 40 mm	PN 63 mm	PN 100 mm											
10	PN 100 ÇAPLARA BAKINIZ SEE PN 100 DIMENSIONS				2	4,5	4,0	2,0	24	34	35	23	-	2,5	
15									45	29	39	40	28		-
20									58	36	50	51	35		41°
25									68	43	57	58	42		
32									78	51	65	66	50		
40									88	61	75	76	60		
50									102	73	87	88	72		
65									122	95	109	110	94		
80									138	106	120	121	105		
100									162	129	149	150	128		
125	188	155	175	176	154										
150	218	183	203	204	182										
200	278	239	259	260	238										
250	335	292	312	313	291										
300	395	343	363	364	342										
350	450	395	421	422	394										
400	505	447	473	474	446										
450	555	497	523	524	496										
500	615	549	575	576	548	27°									
600	720	649	675	676	648										
700	820	751	777	778	750										
800	930	856	882	883	855										
900	1030	961	987	988	960										
1000	1140	1062	1092	1094	1060										
1200	1350	1262	1292	1294	1260										
1400	1560	1462	1492	1494	1460										
1600	1780	1662	1692	1694	1660										
1800	1985	1862	1892	1894	1860										
2000	2210	2062	2092	2094	2060										

# PASLANMAZ DİKİŞLİ BORU ÖLÇÜ VE AĞIRLIKLARI (ANSI)

## Stainless Steel Seamy Pipe Sizes & Weights (ANSI)

Nominal çap (inç)	Dış çap (mm)	ANSI B 36.19'a göre nominal kalınlık ve ağırlıktan								ANSI B 36.10'a göre nominal kalınlık ve ağırlıktan							
		(kg/mt) Nominal thickness and weight/mt															
		5S		10S		Sched 40 S		Sched 80S		10		20		30		Standard	
Nominal Diameter in	External Diameter in	mm.	Kg/m.	mm.	Kg/m	mm.	Kg/m	mm.	Kg/m	mm.	Kg/m	mm.	Kg/m	mm.	Kg/m	mm.	Kg/m
inches	mm	mm.	Kg/m.	mm.	Kg/m	mm.	Kg/m	mm.	Kg/m	mm.	Kg/m	mm.	Kg/m	mm.	Kg/m	mm.	Kg/m
1/8"	10,29	-	-	1,24	0,281	1,73	0,371	2,,41	0,476	-	-	-	-	-	-	1,73	0,371
1/4"	13,72	-	-	1,65	0,499	2,24	0,644	3,02	0,809	-	-	-	-	-	-	2,24	0,644
3/8"	17,15	-	-	1,65	0,640	2,31	0,858	3,20	1,118	-	-	-	-	-	-	2,31	0,858
1/2"	21,34	1,65	0,814	2,11	1,016	2,77	1,260	3,73	1,620	-	-	-	-	-	-	2,77	1,260
3/4"	26,67	1,65	1,034	2,11	1,298	2,87	1,680	3,91	2,190	-	-	-	-	-	-	2,87	1,680
1"	33,40	1,65	1,312	2,77	2,125	3,38	2,500	4,55	3,230	-	-	-	-	-	-	3,38	2,500
1 1/4"	42,16	1,65	1,674	2,77	2,,732	3,56	3,380	4,85	4,460	-	-	-	-	-	-	3,56	3,380
1 1/2"	48,26	1,65	1,926	2,77	3,155	3,68	4,050	5,08	5,400	-	-	-	-	-	-	3,68	4,050
2"	60,33	1,65	2,424	2,77	0,992	3,91	5,430	5,54	7,470	-	-	-	-	-	-	3,91	5,430
2 2/2"	76,10	2,11	3,747	3,05	5,345	5,16	8,620	7,01	11,400	-	-	-	-	-	-	5,16	8,620
3"	88,90	2,11	4,585	3,05	6,557	5,49	11,280	7,62	15,250	-	-	-	-	-	-	5,49	11,280
3 1/2"	101,60	2,11	5,272	3,05	7,526	5,74	13,560	8,08	18,620	-	-	-	-	-	-	5,74	13,560
4"	114,30	2,11	5,945	3,05	8,496	6,02	16,060	8,56	22,290	-	-	-	-	-	-	6,02	16,060
5"	141,30	2,77	9,639	3,40	11,740	6,55	21,760	9,52	30,920	-	-	-	-	-	-	6,55	21,760
6"	168,28	2,77	11,514	3,40	14,037	7,11	28,230	10,97	42,520	-	-	-	-	-	-	7,11	28,230
8"	219,08	2,77	15,049	3,76	20,334	8,18	42,490	12,70	64,570	-	-	6,35	33,28	7,04	36,8	8,18	42,490
10"	273,05	3,40	23,028	4,19	28,290	9,27	60,240	12,70	81,460	-	-	6,35	41,70	7,8	51	9,27	60,240
12"	323,85	3,96	31,806	4,57	36,633	9,52	73,760	12,70	97,360	-	-	6,35	49,68	8,38	65,14	9,52	73,760
14"	355,60	3,98	34,990	4,78	42,102	9,52	81,210	12,70	107,28	6,35	54,63	7,92	67,98	9,52	81,21	9,52	81,210
16"	406,40	4,19	42,350	4,78	48,220	9,52	93,130	12,70	123,18	6,35	62,58	7,92	77,90	9,52	93,13	9,52	93,130
18"	457,20	4,19	47,700	4,78	54,300	9,52	105,50	12,70	139,07	6,35	70,50	7,92	87,80	11,13	122,12	9,52	105,50
20"	508,00	4,77	60,320	5,53	69,766	9,52	116,97	12,70	154,97	6,35	78,47	9,52	116,97	12,70	155	9,52	116,97
22"	558,80	4,77	66,100	5,53	76,490	9,52	128,89	12,70	170,86	6,35	86,42	9,52	128,89	12,70	170,86	9,52	128,89
24"	609,60	5,54	84,100	6,35	96,215	9,52	140,81	12,70	186,75	6,35	96,216	9,52	140,80	14,70	209,54	9,52	140,81
26"	660,40	-	-	-	-	9,52	152,73	12,70	202,65	7,92	127,58	12,7	202,65	-	-	9,52	152,73
28"	711,60	-	-	-	-	9,52	164,65	12,70	218,54	7,92	137,52	12,7	218,54	15,88	271,94	9,52	164,65
30"	762,00	6,35	120,59	7,92	147,45	9,52	176,57	12,70	234,44	7,92	147,45	12,7	234,44	15,88	291,81	9,52	176,57
32"	812,80	-	-	-	-	9,52	188,50	12,70	250,33	7,92	157,39	12,7	250,33	15,88	311,67	9,52	188,50
34"	863,60	-	-	-	-	9,52	200,42	12,70	266,22	7,92	167,32	12,7	262,22	15,88	331,54	9,52	200,42
36"	914,40	-	-	-	-	9,52	212,34	12,70	282,12	7,92	177,26	12,7	282,12	15,88	351,41	9,52	212,34

ASTM	DIN & TS Material No	DIN	C Carbon		Si Silicon		Mn Manganese		P Phosphor		S Sulphur		Cr Crom		Mo Molybdenum		Ni Nickel		And		
			Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Sementasyon Çelikleri	1.0301	C 10	0,07	0,14	0,17	0,37	0,35	0,65	0,045		0,045		0,15						Pb	0,15	0,30
	1.0302	C 10 Pb	0,06	0,12	0,15	0,35	0,25	0,50	0,045		0,045										
	1.0401	C 15	0,12	0,18	0,15	0,35	0,30	0,60	0,045		0,045								Pb	0,15	0,30
	1.0403	C 15 Pb	0,12	0,18	0,15	0,35	0,25	0,50	0,045		0,045										
	1.1121	Ck 10	0,07	0,14	0,17	0,37	0,35	0,65	0,035		0,035		0,15								
	1.1140	Cm 15	0,12	0,18		0,40	0,30	0,60	0,035		0,020	0,040									
	1.1141	Ck 15	0,12	0,18	0,15	0,35	0,30	0,60	0,035		0,035										
Cementation steels	1.5713	13 NiCr 6	0,10	0,17	0,15	0,35	0,40	0,70	0,035		0,035		0,65	0,85			1,35	0,50			
	1.6523	21 NiCrMo 2	0,17	0,23	0,15	0,40	0,60	0,90	0,035		0,035		0,35	0,65	0,15	0,25					
	1.7015	15 Cr 3	0,12	0,18	0,15	0,40	0,40	0,60	0,035		0,035		0,40	0,70							
	1.7131	16 MnCr 5	0,14	0,19	0,15	0,40	1,00	1,30	0,035		0,035		0,80	1,10							
	1.7139	16 MnCrS 5	0,14	0,19	0,15	0,40	1,00	1,30	0,035		0,020	0,035		0,80	1,10						
	1.7147	20 MnCr 5	0,17	0,22	0,15	0,40	1,10	1,40	0,035		0,035		1,00	1,30							
	1.7149	20 MnCrS 5	0,17	0,22	0,15	0,40	1,10	1,40	0,035		0,020	0,035		1,00	1,30						
Islah Çelikleri	1.0402	C 22	0,17	0,24		0,40	0,40	0,70	0,045		0,045		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.0406	C 25	0,22	0,29		0,40	0,40	0,70	0,045		0,045		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.0501	C 35	0,32	0,40		0,40	0,50	0,80	0,045		0,045		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.0503	C 45	0,42	0,50		0,40	0,50	0,80	0,045		0,045		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.0511	C 40	0,37	0,44		0,40	0,50	0,80	0,045		0,045		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.0528	C 30	0,27	0,34		0,40	0,50	0,80	0,045		0,045		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.0535	C 55	0,52	0,60		0,40	0,60	0,90	0,045		0,045		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.0540	C 50	0,47	0,55		0,40	0,60	0,90	0,045		0,045		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.0601	C 60	0,57	0,65		0,40	0,60	0,90	0,045		0,045		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.1151	Ck 22	0,17	0,24		0,40	0,40	0,70	0,035		0,035		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.1178	Ck 30	0,27	0,34		0,40	0,50	0,80	0,035		0,035		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.1181	Ck 35	0,32	0,40		0,40	0,50	0,80	0,035		0,035		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.1186	Ck 40	0,35	0,44		0,40	0,60	0,90	0,035		0,035		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.1191	Ck 45	0,42	0,50		0,40	0,50	0,80	0,035		0,035		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.1203	Ck 55	0,52	0,60		0,40	0,60	0,90	0,035		0,035		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.1206	Ck 50	0,45	0,54		0,40	0,60	0,90	0,035		0,035		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.1221	Ck 60	0,57	0,65		0,40	0,60	0,90	0,035		0,035		0,40		0,10		0,40		Cr+Mo+Ni<0.63		
	1.3563	43 CrMo 4	0,40	0,46	0,15	0,40	0,60	0,90	0,035		0,035		0,90	1,20	0,15	0,30					
	1.5038	40 Mn 4	0,36	0,44	0,25	0,50	0,80	1,10	0,035		0,035										
	1.5711	40 NiCr 6	0,36	0,44	0,15	0,35	0,40	0,80	0,035		0,035		0,30	0,70			1,25	1,75			
	1.6582	34 CrNiMo 6	0,30	0,38	0,15	0,40	0,50	0,80	0,035		0,035		1,30	1,70	0,15	0,30	1,30	1,70			
1.7034	37 Cr 4	0,34	0,41	0,15	0,40	0,60	0,90	0,035		0,035		0,90	1,20								
1.7035	41 Cr 4	0,35	0,44	0,15	0,40	0,60	0,90	0,035		0,035		0,80	1,10								
1.7039	41 CrS 4	0,35	0,44	0,15	0,35	0,60	0,90	0,035		0,020	0,035		0,80	1,10							
1.7218	25 CrMo 4	0,22	0,29	0,15	0,40	0,50	0,80	0,035		0,035		0,90	1,20	0,15	0,30						
1.7220	34 CrMo 4	0,30	0,37	0,15	0,40	0,50	0,80	0,035		0,035		0,90	1,20	0,15	0,30						
1.7225	42 CrMo 4	0,35	0,44	0,15	0,35	0,60	0,90	0,035		0,035		0,80	1,10	0,15	0,25						
Yapı Çelikleri	1.0037	St 37-2	Max	0,17					0,050		0,050										
	1.0044	St 44-2	Max	0,21					0,050		0,050										
	1.0050	St 50-2	Par	0,30					0,050		0,050										
	1.0060	St 60-2	Par	0,40					0,050		0,050										
	1.0070	St 70-2	Par	0,50					0,050		0,050										
	1.0570	St 52-3	Max	0,20	Max	0,55	Max	1,50	0,040		0,040										
Yay Çelikleri	1.1231	Ck 67	0,65	0,72	0,15	0,35	0,60	0,90	0,035		0,035										
	1.1248	Ck 75	0,70	0,80	0,15	0,35	0,60	0,80	0,035		0,035										
	1.1269	Ck 85	0,80	0,90	0,15	0,35	0,45	0,65	0,035		0,035										
	1.5026	55 Si 7	0,52	0,60	1,50	1,80	0,70	1,00	0,045		0,045										
	1.5028	65 Si 7	0,60	0,70	1,50	1,80	0,70	1,00	0,035		0,035										
	1.5142	60 SiMn 5	0,55	0,65	1,00	1,30	0,90	1,10	0,050		0,050										
	1.7108	60 SiCr 7	0,57	0,65	1,50	1,80	0,70	1,00	0,030		0,030										
	1.7176	55 Cr 3	0,52	0,59	0,25	0,50	0,70	1,00	0,030		0,030		0,70	1,00					V	0,10	0,25
	1.8159	50 CrV 4	0,47	0,55		0,40	0,70	1,10	0,035		0,035								V	0,10	0,20
1.8161	58 CrV 4	0,55	0,62	0,15	0,40	0,70	1,10	0,035		0,035											
Otomat Çelikleri	1.0715	P SMn 28	Max	0,14		0,05	0,90	1,30	0,100		0,240	0,320									
	1.0718	9 SMnPb 28	Max	0,14		0,05	0,90	1,30	0,100		0,240	0,320							Pb	0,15	0,30
	1.0736	9 SMn 36	Max	0,15		0,05	1,00	1,50	0,100		0,320	0,400									
	1.0737	9 SMnPb 36	Max	0,15		0,05	1,00	1,50	0,100		0,320	0,400							Pb	0,15	0,30
Rulman Çelikleri	1.3501	100 Cr 2	0,90	1,05	0,15	0,35	0,25	0,45	0,030		0,025		0,40	0,60			0,30		Cu Max	0,30	
	1.3505	100 Cr 6	0,90	1,05	0,15	0,35	0,25	0,45	0,030		0,025		1,65	1,65			0,30		Cu Max	0,30	
	1.3520	100 CrMn 6	0,90	1,05	0,50	0,70	1,00	1,20	0,030		0,025		1,40	1,65			0,30		Cu Max	0,30	
	1.3536	100 CrMo 7-3	0,90	1,05	0,20	0,40	0,60	0,80	0,030		0,025		1,65	1,95			0,30		Cu Max	0,30	
Soğuk şişirme Çelikleri	1.1132	Cq 15	0,12	0,18		0,40	0,25	0,50	0,035		0,035										
	1.1152	Cq 22	0,18	0,24		0,40	0,30	0,60	0,035		0,035		</								

# DOYMUŞ BUHAR

## Saturated Steam Table

Mutlak Basınç Certain Pressure	Gösterge Basıncı Indicator Pressure	Sıcaklık Temperature	Özgül Hacim		Özgül Kütle		Isı tutumu		Gizli Isı Secret Temperature	Entropi	
			Specific Volume		Specific Mass		Temperature attitude			Entropy	
			Su Water Vs m <sup>3</sup> /kg	Buhar Steam Vb m <sup>3</sup> /kg	Su Water ps kg/m <sup>3</sup>	Buhar Steam pb kg/m <sup>3</sup>	Su Water İs kcal/kg	Buhar Steam İb kcal/kg		Su Water Ss kcal/kg °K	Buhar Steam Sb kcal/kg °K
P bar	Pg bar	T °C							r kcal/kg		
0.01	-0.99	6.70	0.00100	131.70	1000.00	0.0076	6.73	600.1	593.4	0.0243	2.1447
0.02	-0.98	17.20	0.00100	68.270	999.00	0.0146	17.24	604.8	587.6	0.0612	2.0847
0.03	-0.97	23.77	0.00100	45.530	997.01	0.0220	23.79	607.7	583.9	0.0836	2.0499
0.04	-0.96	28.64	0.00100	35.460	996.02	0.0282	28.65	609.8	581.2	0.0998	2.0253
0.05	-0.95	32.55	0.00101	28.730	995.02	0.0348	32.55	611.5	579.0	0.1126	2.0064
0.06	-0.94	35.82	0.00101	24.190	994.04	0.0413	35.81	612.9	577.1	0.1232	1.9908
0.07	-0.93	38.66	0.00101	20.920	993.05	0.0478	38.64	614.1	575.5	0.1324	1.9779
0.08	-0.92	41.16	0.00101	18.450	992.06	0.0542	41.14	615.2	574.1	0.1402	1.9664
0.09	-0.91	43.41	0.00101	16.510	991.08	0.0606	43.38	616.2	572.8	0.1474	1.9564
0.10	-0.90	45.45	0.00101	14.950	990.10	0.0669	45.41	617.0	571.6	0.1538	1.9478
0.12	-0.88	49.06	0.00101	12.600	988.14	0.0794	49.01	618.5	569.5	0.1650	1.9326
0.14	-0.86	52.18	0.00101	10.890	987.17	0.0918	52.13	619.9	567.8	0.1747	1.9197
0.16	-0.84	54.94	0.00101	9.612	986.19	0.1040	54.88	621.1	566.2	0.1831	1.9087
0.18	-0.82	57.41	0.00102	8.605	984.25	0.1162	57.36	622.1	564.7	0.1906	1.8990
0.20	-0.80	59.67	0.00102	7.795	983.28	0.1283	59.61	623.1	563.5	0.1974	1.8903
0.25	-0.75	64.56	0.00102	6.322	980.39	0.1582	64.49	625.1	560.6	0.2120	1.8718
0.30	-0.70	68.68	0.00102	5.328	978.47	0.1877	68.61	626.8	558.2	0.2241	1.8567
0.35	-0.65	72.23	0.00102	4.615	976.56	0.2167	71.68	628.2	556.5	0.2346	1.8448
0.40	-0.60	75.42	0.00103	4.069	974.66	0.2458	75.36	629.5	554.1	0.2437	1.8334
0.45	-0.55	78.27	0.00103	3.643	972.76	0.2745	78.22	630.6	552.4	0.2518	1.8237
0.50	-0.50	80.86	0.00103	3.301	970.87	0.3029	80.81	631.6	550.8	0.2592	1.8150
0.60	-0.40	85.45	0.00103	2.783	968.05	0.3593	85.41	633.4	548.0	0.2721	1.8001
0.70	-0.30	89.45	0.00104	2.409	965.25	0.4151	89.43	634.9	545.5	0.2832	1.7874
0.80	-0.20	92.99	0.00104	2.125	963.39	0.4706	92.99	636.2	543.2	0.2930	1.7767
0.90	-0.10	96.18	0.00104	1.904	961.54	0.5252	96.19	637.4	541.2	0.3018	1.7673
1.00	0.00	99.09	0.00104	1.725	958.77	0.5797	99.12	638.5	539.4	0.3096	1.7587
1.10	0.10	101.76	0.00105	1.578	956.94	0.6337	101.81	639.4	537.6	0.3168	1.7510
1.20	0.20	104.25	0.00105	1.455	955.11	0.6873	104.32	640.3	536.0	0.3235	1.7440
1.40	0.40	108.74	0.00105	1.259	952.38	0.7443	108.85	642.0	533.2	0.3354	1.7315
1.50	0.50	110.74	0.00105	1.185	950.57	0.8472	110.87	642.8	531.9	0.3407	1.7262
1.60	0.60	112.73	0.00105	1.111	948.77	0.9001	112.89	643.5	530.6	0.3459	1.7209
1.80	0.80	116.33	0.00106	0.995	946.07	1.0048	116.54	644.7	528.2	0.3554	1.7115
2.00	1.00	119.62	0.00106	0.902	943.40	1.1091	119.87	645.8	525.9	0.3638	1.7029
2.50	1.50	126.79	0.00107	0.732	937.21	1.3669	127.20	648.3	521.1	0.3820	1.6851
3.00	2.00	132.98	0.00107	0.617	932.84	1.6218	133.40	650.3	516.9	0.3973	1.6703
3.50	2.50	138.19	0.00108	0.534	927.64	1.8744	138.80	651.9	513.1	0.4106	1.6579
4.00	3.00	142.92	0.00108	0.471	923.36	2.1249	143.60	653.4	509.8	0.4221	1.6474
4.50	3.50	147.20	0.00109	0.421	919.96	2.3736	148.00	654.7	506.7	0.4326	1.6380
5.00	4.00	151.11	0.00109	0.382	915.75	2.6205	152.10	655.8	503.7	0.4422	1.6297
5.50	4.50	154.72	0.00110	0.349	912.41	2.8662	155.80	656.9	501.1	0.4510	1.6229
6.00	5.00	158.08	0.00110	0.321	909.09	3.1124	159.30	657.8	498.5	0.4591	1.6151
6.50	5.50	161.22	0.00110	0.293	905.80	3.4130	162.60	658.7	496.1	0.4667	1.6088
7.00	6.00	164.17	0.00111	0.278	903.34	3.5997	165.60	659.1	493.5	0.4737	1.6029
7.50	6.50	166.97	0.00111	0.260	900.09	3.8417	168.50	660.2	491.7	0.4803	1.5974
8.00	7.00	169.61	0.00111	0.245	897.67	4.0850	171.30	660.8	489.5	0.4865	1.5922
8.50	7.50	172.12	0.00112	0.231	894.45	4.3253	173.90	661.4	487.5	0.4928	1.5879
9.00	8.00	174.53	0.00112	0.219	892.86	4.5683	176.40	662.0	485.6	0.4980	1.5827
9.50	8.50	176.83	0.00112	0.208	890.47	4.8077	178.90	662.5	483.6	0.5038	1.5783
10.00	9.00	178.04	0.00113	0.198	888.10	5.0480	181.20	663.8	482.6	0.5085	1.5740
10.50	9.50	180.62	0.00113	0.189	885.74	5.2895	183.40	663.9	480.5	0.5133	1.5701
11.00	10.00	183.20	0.00113	0.181	883.39	5.5310	185.60	663.9	478.3	0.5180	1.5661
11.50	10.50	185.14	0.00113	0.174	881.45	5.7703	187.65	664.3	476.7	0.5220	1.5627
12.00	11.00	187.08	0.00114	0.166	879.51	6.0096	189.70	664.7	475.0	0.5260	1.5592
12.50	11.50	188.90	0.00114	0.160	877.19	6.2495	191.60	665.1	473.5	0.5306	1.5559
13.00	12.00	190.71	0.00114	0.154	874.89	6.4893	193.50	665.4	471.9	0.5352	1.5526
13.50	12.50	192.51	0.00115	0.149	872.98	6.7290	195.30	665.7	470.4	0.5391	1.5495
14.00	13.00	194.30	0.00115	0.144	871.08	6.9686	197.10	666.0	468.9	0.5430	1.5464
14.50	13.50	195.83	0.00115	0.139	869.57	7.2073	198.85	667.3	468.5	0.5467	1.5435
15.00	14.00	197.36	0.00115	0.134	868.06	7.4460	200.60	668.6	468.0	0.5503	1.5406
15.50	14.50	198.90	0.00115	0.130	866.18	7.6850	202.25	667.9	465.6	0.5538	1.5379
16.00	15.00	200.43	0.00116	0.126	864.30	7.9239	203.90	667.1	463.2	0.5572	1.5351
16.50	15.50	201.89	0.00116	0.123	862.44	8.1636	205.50	667.3	461.8	0.5605	1.5326

# DOYMUŞ BUHAR

## Saturated Steam Table

Mutlak Basıncı Certain Pressure	Gösterge Basıncı Indicator Pressure	Sıcaklık Temperature	Özgül Hacim Specific Volume		Özgül Kütle Specific Mass		Isı tutumu Temperature attitude		Gizli Isı Secret Temperature	Entropi Entropy	
			Su Water	Buhar Steam	Su Water	Buhar Steam	Su Water	Buhar Steam		Su Water	Buhar Steam
			Vs	Vb	ρs	ρb	İs	İb		Ss	Sb
P bar	Pg bar	T °C	m³/kg	m³/kg	kg/m³	kg/m³	kcal/kg	kcal/kg	r kcal/kg	kcal/kg °K	kcal/kg °K
17.00	16.00	203.35	0.00116	0.119	860.59	8.4034	207.10	667.5	460.4	0.5638	1.5300
17.50	16.50	204.90	0.00116	0.116	859.11	8.6422	208.60	667.7	459.1	0.5720	1.5276
18.00	17.00	206.44	0.00117	0.113	857.63	8.8810	210.10	667.9	457.8	0.5801	1.5251
18.50	17.50	207.63	0.00117	0.110	856.16	9.1221	211.55	668.1	456.5	0.5781	1.5228
19.00	18.00	208.81	0.00117	0.107	854.70	9.3633	213.00	668.2	455.2	0.5761	1.5205
19.50	18.50	210.10	0.00117	0.104	852.88	9.6029	214.40	668.4	454.0	0.5791	1.5183
20.00	19.00	211.38	0.00118	0.102	851.06	9.8425	215.80	668.5	452.7	0.5820	1.5160
21.00	20.00	231.86	0.00118	0.097	848.18	10.3306	218.50	668.7	450.2	0.5875	1.5118
22.00	21.00	216.23	0.00118	0.093	845.31	10.8108	221.20	668.9	447.7	0.5928	1.5078
23.00	22.00	218.53	0.00119	0.089	842.46	11.2867	223.60	669.1	445.5	0.5978	1.5038
24.00	23.00	220.75	0.00119	0.085	839.63	11.7786	226.10	669.3	443.2	0.6026	1.5000
25.00	24.00	222.90	0.00120	0.082	836.82	12.2699	228.50	669.4	440.9	0.6074	1.4962
26.00	25.00	224.99	0.00120	0.079	834.03	12.7389	230.80	669.5	438.7	0.6120	1.4926
27.00	26.00	226.99	0.00120	0.076	831.26	13.2281	233.00	669.6	436.6	0.6163	1.4892
28.00	27.00	228.98	0.00121	0.073	828.50	13.7174	235.20	669.6	434.4	0.6206	1.4857
29.00	28.00	230.87	0.00121	0.070	826.10	14.2117	237.35	669.7	432.3	0.6248	1.4825
30.00	29.00	232.86	0.00121	0.068	823.72	14.7059	239.50	669.7	430.2	0.6290	1.4793
31.00	30.00	234.56	0.00122	0.066	821.36	15.1899	241.55	669.7	428.2	0.6329	1.4793
32.00	31.00	236.35	0.00122	0.064	819.00	15.6740	243.60	669.7	426.1	0.6368	1.4732
33.00	32.00	238.06	0.00122	0.062	816.66	16.1842	245.55	669.7	424.1	0.6406	1.4703
34.00	33.00	239.77	0.00123	0.060	814.33	16.6945	247.50	669.6	422.1	0.6443	1.4673
35.00	34.00	241.41	0.00123	0.058	812.02	17.1812	249.35	669.6	420.2	0.6479	1.4645
36.00	35.00	243.04	0.00124	0.057	809.72	17.6678	251.20	669.5	418.3	0.6515	1.4617
37.00	36.00	244.61	0.00124	0.055	807.43	18.1797	253.00	669.4	416.4	0.6550	1.4591
38.00	37.00	246.17	0.00124	0.054	805.15	18.6916	254.80	669.3	414.5	0.6584	1.4564
39.00	38.00	247.68	0.00125	0.052	802.89	19.1883	256.50	669.2	412.7	0.6617	1.4564
40.00	39.00	249.18	0.00125	0.051	800.64	19.6850	258.20	669.0	410.8	0.6649	1.4564
41.00	40.00	250.63	0.00125	0.050	798.40	20.1945	259.90	668.9	409.0	0.6681	1.4514
42.00	41.00	252.07	0.00126	0.048	796.18	20.7939	261.60	668.8	407.2	0.6712	1.4463
43.00	42.00	253.47	0.00126	0.047	793.97	21.2215	263.25	668.6	405.4	0.6743	1.4439
44.00	43.00	254.87	0.00126	0.046	791.77	21.7391	264.90	668.4	403.5	0.6773	1.4415
45.00	44.00	256.22	0.00127	0.045	789.89	22.2591	266.45	668.2	401.8	0.6803	1.4392
46.00	45.00	257.56	0.00127	0.044	788.02	22.7790	268.00	668.0	400.0	0.6832	1.4369
47.00	46.00	258.87	0.00127	0.043	785.85	23.2943	269.60	667.9	398.3	0.6861	1.4347
48.00	47.00	260.17	0.00128	0.042	783.70	23.8095	271.20	667.7	396.5	0.6889	1.4324
49.00	48.00	261.44	0.00128	0.041	781.56	24.3426	272.70	667.5	394.8	0.6917	1.4302
50.00	49.00	262.70	0.00128	0.040	779.42	24.8756	274.20	667.3	393.1	0.6944	1.4280
55.00	54.00	268.68	0.00130	0.036	769.82	27.5028	281.40	666.2	384.8	0.7075	1.4176
60.00	59.00	274.29	0.00132	0.033	760.46	30.2115	288.40	665.0	376.6	0.7196	1.4078
65.00	64.00	279.54	0.00133	0.030	751.31	32.9707	294.80	663.6	368.8	0.7311	1.3986
70.00	69.00	284.48	0.00135	0.028	742.39	35.7782	300.90	652.1	361.2	0.7420	1.3897
75.00	74.00	289.17	0.00136	0.026	734.21	38.6548	307.00	660.5	353.5	0.7524	1.3813
80.00	79.00	293.62	0.00138	0.024	726.22	41.5973	312.60	658.9	346.3	0.7623	1.3731
85.00	84.00	292.86	0.00139	0.022	718.91	44.6229	318.20	657.0	338.8	0.7718	1.3654
90.00	89.00	301.92	0.00141	0.021	708.22	47.7099	323.60	655.1	331.5	0.7810	1.3576
95.00	94.00	305.80	0.00143	0.020	700.28	50.9165	328.80	653.2	324.4	0.7898	1.3500
100.00	99.00	309.53	0.00145	0.018	692.04	54.2005	334.00	651.1	317.1	0.7983	1.3424
110.00	109.00	316.58	0.00148	0.016	675.68	61.0874	343.00	646.7	303.7	0.8147	1.3279
120.00	119.00	323.15	0.00158	0.015	632.91	68.3995	353.90	641.9	288.0	0.8306	1.3138
130.00	129.00	329.30	0.00156	0.013	641.85	76.3359	363.00	636.9	273.9	0.8458	1.2998
140.00	139.00	335.09	0.00160	0.012	625.39	84.7458	372.40	631.0	258.6	0.8606	1.2858
150.00	149.00	340.56	0.00165	0.011	607.53	94.3396	381.70	624.9	243.2	0.8749	1.2713
160.00	159.00	345.74	0.00170	0.010	588.58	103.9933	390.80	618.3	227.5	0.8892	1.2564
170.00	169.00	350.66	0.00176	0.009	569.48	115.2074	400.30	610.8	210.5	0.9035	1.2411
180.00	179.00	355.34	0.00182	0.008	549.15	128.0574	410.20	602.5	192.3	0.9186	1.2251
190.00	189.00	359.82	0.00190	0.007	525.76	142.9797	420.40	593.2	172.8	0.9347	1.2081
200.00	199.00	364.08	0.00201	0.006	497.51	161.2903	431.50	582.3	150.8	0.9514	1.1883
210.00	209.00	368.16	0.00214	0.005	467.29	185.5288	444.70	568.1	123.4	0.9714	1.1636
220.00	219.00	372.10	0.00239	0.004	418.41	222.7171	463.40	547.0	83.6	1.0020	1.1310
225.00	224.00	373.60		0.004		253.8071	478.00	532.0	54.0	1.0220	1.1000
225.40	224.40	374.20		0.003		328.9470	505.00	505.0	0.0	1.0600	1.0600

# BİRİMLER ARASI KOLAY ÇEVİRİM TABLOSU

## Easy Cycling Table Between Modules

### BASINÇ / PRESSURE

	psi	Inch Su / Water 60°F	Inch Hg Civa / Mercury 32°F	atm	mm Hg 32°F	bar	Kgf / cm <sup>2</sup>	pascal
psi	1	27.708	2.0360	0.068046	51.715	0.68948	0.070306	6894.8
inç su	0.036091	1	0.073483	2.4559x10 <sup>-3</sup>	1.8665	2.4884x10 <sup>-3</sup>	2.537x10 <sup>-3</sup>	248.84
inç Hg	0.491154	13.609	1	0.33421	25.4	0.33864	0.034532	3386.4
atm	14.6960	407.19	29.921	1	760	1.01325	1.03323	101325
mm Hg	0.019336	0.53578	0.03937	1.31579x10 <sup>-3</sup>	1	1.3332x10 <sup>-3</sup>	1.3595x10 <sup>-3</sup>	133.32
bar	14.5038	401.86	29.53	0.98692	750.062	1	1.01972	100000
kgf/cm <sup>2</sup>	14.223	394.1	28.959	0.96784	735.559	0.980665	1	98066.5
pascal	1.45038x10 <sup>-4</sup>	4.0186x10 <sup>-3</sup>	2.953x10 <sup>-4</sup>	9.8692x10 <sup>-6</sup>	7.50x10 <sup>-6</sup>	10 <sup>-5</sup>	1.01972x10 <sup>-5</sup>	1

### HACİM / VOLUME

	inch <sup>3</sup>	ft <sup>3</sup>	gallon	liter	m <sup>3</sup>
inch <sup>3</sup>	1	0.0005787	0.004329	0.0163871	1.6387x10 <sup>-5</sup>
ft <sup>3</sup>	1728	1	7.48052	28.317	0.028317
gallon	231	0.13368	1	3.7854	0.0037854
liter	61.02374	0.035315	0.264173	1	0.001
m <sup>3</sup>	61023.74	35.315	264.173	1000	1

### ENERJİ / ENERGY

	Btu	ft.lbf	calori	joule	Watt-hour
Btu	1	778.17	251.9958	1055.056	0.293071
ft.lbf	1.2851x10 <sup>-3</sup>	1	0.32383	1.355818	3.7666x10 <sup>-4</sup>
calori	3.9683x10 <sup>-3</sup>	3.08803	1	4.1868	0.00163
joule	9.4782x10 <sup>-4</sup> .9683x10	0.73756	0.23885	1	2.7778x10 <sup>-4</sup>
Watt-hour	3.41214	2655.22	859.85	3600	1

### YOĞUNLUK / DENSITY

	lb/ft <sup>3</sup>	lb/gal	g/cm <sup>3</sup>	kg/m <sup>3</sup>
lb/ft <sup>3</sup>	1	0.133680	0.016018	16.018463
lb/gal	7.48055	1	0.119827	119.827
g/cm <sup>3</sup>	62.428	8.34538	1	1000
kg/m <sup>3</sup>	0.062428	0.008345	0.001	1

### ÖZGÜL HACİM / SPECIFIC VOLUME

	ft <sup>3</sup> /lb	gal/lb	cm <sup>3</sup> /g	m <sup>3</sup> /kg
ft <sup>3</sup> /lb	1	7.48055	62.428	0.062428
gal/lb	0.13368	1	8.34538	0.008345
cm <sup>3</sup> /g	0.016018	0.119827	1	0.001
m <sup>3</sup> /kg	16.018463	119.827	1000	1

# BİRİMLER ARASI KOLAY ÇEVİRİM TABLOSU

## Easy Cycling Table Between Modules

KÜTLE / MASS				
	lb	grain	ons	kg
lb	1	7000	16	0.45359
grain	$1.4286 \times 10^{-4}$	1	$2.2857 \times 10^{-3}$	$6.48 \times 10^{-5}$
ons	0.0625	437.5	1	0.02835
kg	2.20462	15432	35.274	1

ÖZGÜL ISI ( YADA ENTROPİ ) / SPECIFIC TEMPERATURE (OR ENTROPY)			
	Btu/ ( lb.ft.°F )	Cal/ ( g.K )	KJ/ ( kg.K )
Btu/ ( lb.ft.°F )	1	1	4.1868
Cal/ ( g.K )	1	1	4.1868
KJ/ ( kg.K )	0.23885	0.23885	1

ENTALPİ / ENTHALPY			
	Btu/lb	Cal/g	J/g
Btu/lb	1	0.55556	2.326
Cal/g	1.8	1	4.1868
J/g	0.42992	0.23885	1

İLETKENLİK / CONDUCTIVITY			
	Btu/ ( h.ft.°F )	Cal/ ( s.cm.°C )	W/ ( m.K )
Btu/ ( h.ft.°F )	1	0.0041338	1.7307
Cal/ ( s.cm.°C )	241.91	1	418.68
W/ ( m.K )	0.5779	0.002388	1

VİSKOZİTE / VISCOSITY					
	poise	lbf.s/ft <sup>2</sup>	Lbf.h/ft <sup>2</sup>	kg/m.s	Lbm/ft.s
poise	1	0.0020885	$5.8014 \times 10^{-7}$	0.1	0.0671955
lbf.s/ft <sup>2</sup>	487.8026	1	$2.7778 \times 10^{-4}$	47.88026	32.17405
Lbf.h/ft <sup>2</sup>	1723689	3600	1	172369	$1.72369 \times 10^{-6}$
kg/m.s	10	0.020885	$5.8014 \times 10^{-6}$	1	0.0671955
Lbm/ft.s	14.8819	0.031081	$8.6336 \times 10^{-6}$	1.4882	1

ISI TRANSFER KATSAYISI / TEMPERATURE TRANSFER PARAMETER				
	Btu/ ( h.ft <sup>2</sup> .°F )	Cal/ ( s.cm <sup>2</sup> .°C )	Kcal/ ( h.m <sup>2</sup> .°C )	W/ ( m <sup>2</sup> K )
Btu/ ( h.ft <sup>2</sup> .°F )	1	0.00007535	2.712	3.154
Cal/ ( s.cm <sup>2</sup> .°C )	13272	1	36000	41870
Kcal/ ( h.m <sup>2</sup> .°C )	0.3687	0.00002778	1	0.00011163
W/ ( m <sup>2</sup> K )	0.317	0.00002388	0.86	1

# BORU ISIL GENLEŞME TABLOSU

## Thermal Expansion of Pipe Table

Temp. Degrees °C	Temp. Degrees F	Carbon C-Mo 3Cr-Mo Steels	5Cr-Mo through 9Cr- Mo Steels	Austenitic Stainless Steels 18Cr-8Ni	310 SS 25Cr- 20Ni	Alloy 400	Cu30Ni	Copper	Nickel 200	Alloy 800.825	Alloy 600, 625.691	Aluminum
-198	-325	-197,49	-184,99	-320,82	0,00	-218,32	-262,49	0,00	0,00	0,00	0,00	-389,98
-184	-300	-186,66	-174,99	-302,49	0,00	-208,33	-239,16	0,00	-203,33	0,00	0,00	-371,65
-170	-275	-175,83	-164,99	-284,16	0,00	-198,33	-224,99	0,00	-195,83	0,00	0,00	-350,82
-156	-250	-164,99	-154,99	-265,82	0,00	-188,33	-210,82	0,00	-187,49	0,00	-191,66	-330,82
-142	-225	-154,16	-144,99	-246,66	0,00	-178,33	-196,66	0,00	-177,49	0,00	-180,83	-309,15
-128	-200	-142,49	-134,99	-227,49	0,00	-168,33	-182,49	0,00	-167,49	0,00	-169,99	-286,66
-115	-175	-131,66	-125,00	-208,33	0,00	-158,33	-176,66	0,00	-152,49	0,00	-155,83	-263,32
-101	-150	-120,83	-114,16	-189,16	0,00	-149,16	-162,49	0,00	-137,49	0,00	-141,66	-239,99
-87	-125	-108,33	-102,50	-167,49	0,00	-132,49	-144,99	0,00	-122,50	0,00	-128,33	-214,16
-73	-100	-95,83	-90,00	-145,83	0,00	-115,00	-127,49	-152,49	-107,50	0,00	-114,16	-189,16
-59	-75	-83,33	-78,33	-125,00	0,00	-98,33	-110,83	-130,83	-92,50	0,00	-97,50	-164,16
-46	-50	-70,00	-65,83	-103,33	0,00	-81,66	-94,16	-109,16	-77,50	0,00	-80,83	-139,16
-32	-25	-56,66	-52,50	-81,66	0,00	-64,16	-74,16	-87,50	-62,50	0,00	-63,33	-110,00
-18	0	-40,83	-38,33	-60,00	0,00	-47,50	-55,00	-65,83	-46,66	0,00	-46,66	-80,83
-3	25	-26,67	-25,00	-38,33	0,00	-30,83	-35,00	-42,50	-30,00	0,00	-30,00	-52,50
10	50	-11,67	-10,83	-17,50	0,00	-16,67	-15,83	-18,33	-1333,28	0,00	-13,33	-23,33
21	70	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
38	100	19,17	18,33	28,33	26,67	23,33	25,83	28,33	20,83	23,33	21,67	38,33
52	125	35,00	33,33	51,66	48,33	43,33	46,66	51,66	39,17	43,33	40,00	70,83
66	150	50,83	48,33	75,00	70,00	62,50	68,33	75,00	57,50	63,33	58,33	102,50
79	175	66,66	63,33	98,33	91,66	82,50	89,16	98,33	76,66	82,50	76,66	134,99
93	200	82,50	78,33	121,66	114,16	101,66	110,83	123,33	95,83	102,50	95,83	166,66
107	225	100,83	94,16	145,83	136,66	121,66	132,49	147,49	115,00	124,16	115,00	200,83
121	250	116,66	110,83	169,16	159,16	142,49	154,99	170,83	134,16	146,66	134,16	235,82
135	275	134,16	126,66	193,33	181,66	163,33	177,49	194,99	154,16	169,16	154,16	269,99
149	300	151,66	142,49	217,49	204,16	184,16	199,99	218,32	173,33	191,66	174,16	305,82
163	325	169,99	158,33	241,66	226,66	203,33	223,32	242,49	193,33	215,82	193,33	340,82
177	350	188,33	174,99	266,66	249,16	223,32	246,66	265,82	213,32	239,99	213,32	376,65
190	375	206,66	191,66	291,66	271,66	242,49	269,99	289,99	233,32	264,99	233,32	412,48
204	400	224,99	208,33	316,65	294,15	270,82	293,32	323,32	254,16	289,99	254,16	449,15
218	425	244,16	226,66	341,65	316,65	293,32	0,00	347,49	274,99	313,32	274,16	485,81
232	450	263,32	244,16	367,49	339,15	315,82	0,00	372,49	295,82	336,65	294,15	523,31
246	475	282,49	261,66	392,48	361,65	338,32	0,00	396,65	316,65	359,15	314,99	559,98
260	500	301,65	279,16	417,48	384,15	360,82	0,00	421,65	337,49	382,48	334,99	597,48
274	525	321,65	298,32	442,48	406,65	384,15	0,00	445,82	359,15	405,82	355,82	635,81
288	550	342,49	316,65	468,31	429,15	408,32	0,00	469,98	379,98	429,98	376,65	674,97
302	575	362,49	334,99	494,15	451,65	431,65	0,00	0,00	402,48	453,32	397,48	713,30
315	600	383,32	353,32	519,98	474,15	454,98	0,00	0,00	424,15	476,65	418,32	752,47
329	625	404,98	372,49	545,81	496,65	479,15	0,00	0,00	445,82	500,81	439,15	0,00
343	650	425,82	390,82	572,48	519,15	504,15	0,00	0,00	468,31	524,98	460,81	0,00

# BORU ISIL GENLEŞME TABLOSU

## Thermal Expansion of Pipe Table

Temp. Degrees °C	Temp. Degrees F	Carbon C-Mo 3Cr-Mo Steels	5Cr-Mo through 9Cr-Mo Steels	Austenitic Stainless Steels 18Cr-8Ni	310 SS 25Cr-20Ni	Alloy 400	Cu30Ni	Copper	Nickel 200	Alloy 800.825	Alloy 600, 625.691	Aluminum
357	675	447,48	409,98	598,31	541,65	528,31	0,00	0,00	490,81	548,31	482,48	0,00
371	700	469,15	428,32	624,98	564,14	553,31	0,00	0,00	513,31	573,31	504,15	0,00
385	725	491,65	448,32	651,64	586,64	578,31	0,00	0,00	536,65	597,48	525,81	0,00
399	750	513,31	468,31	679,14	609,14	604,14	0,00	0,00	559,14	622,48	547,48	0,00
413	775	535,81	488,31	705,81	631,64	629,14	0,00	0,00	582,48	646,64	569,98	0,00
427	800	558,31	508,31	733,30	654,14	654,14	0,00	0,00	605,81	671,64	591,64	0,00
440	825	580,81	528,31	760,80	679,14	679,97	0,00	0,00	628,31	695,81	614,98	0,00
454	850	604,14	549,14	788,30	704,14	706,64	0,00	0,00	651,64	721,64	639,14	0,00
468	875	627,47	569,14	815,80	729,14	733,30	0,00	0,00	674,14	745,80	662,47	0,00
481	900	650,81	589,14	843,30	754,14	759,97	0,00	0,00	697,47	771,64	685,81	0,00
496	925	673,31	609,14	871,63	779,14	786,64	0,00	0,00	719,97	796,63	709,97	0,00
510	950	695,81	629,97	899,96	804,13	814,13	0,00	0,00	743,30	822,47	733,30	0,00
524	975	718,30	650,81	928,30	829,13	840,80	0,00	0,00	766,64	848,30	757,47	0,00
538	1000	740,80	671,64	956,63	854,13	868,30	0,00	0,00	790,80	874,13	780,80	0,00
552	1025	764,14	691,64	984,96	879,13	895,80	0,00	0,00	814,13	899,96	804,97	0,00
566	1050	788,30	712,47	1013,29	904,13	924,13	0,00	0,00	837,47	925,80	828,30	0,00
579	1075	812,47	733,30	1041,63	929,13	952,46	0,00	0,00	861,63	951,63	852,47	0,00
593	1100	836,63	754,14	1069,96	954,13	980,79	0,00	0,00	885,80	978,29	875,80	0,00
607	1125	859,13	773,30	1098,29	981,63	1009,13	0,00	0,00	909,96	1004,13	899,96	0,00
621	1150	880,80	793,30	1126,62	1009,13	1039,13	0,00	0,00	934,13	1031,63	924,13	0,00
635	1175	902,46	813,30	1154,95	1036,63	1067,46	0,00	0,00	958,30	1057,46	947,46	0,00
649	1200	924,96	833,30	1183,29	1064,12	1095,79	0,00	0,00	983,29	1084,96	971,63	0,00
663	1225	948,30	854,97	1211,62	1091,62	1124,96	0,00	0,00	1007,46	1113,29	998,29	0,00
677	1250	971,63	877,46	1239,95	1119,12	1154,95	0,00	0,00	1032,46	1142,45	1024,13	0,00
690	1275	994,96	899,13	1268,28	1146,62	1184,95	0,00	0,00	1057,46	1169,95	1050,79	0,00
704	1300	1018,29	921,63	1296,61	1174,12	1214,95	0,00	0,00	1082,46	1199,12	1077,46	0,00
718	1325	1041,63	941,63	1324,95	1199,12	1244,95	0,00	0,00	1107,46	1228,28	1104,12	0,00
732	1350	1064,96	962,46	1353,28	1224,12	1274,95	0,00	0,00	1132,45	1258,28	1129,95	0,00
746	1375	1088,29	983,29	1381,61	1249,12	1304,95	0,00	0,00	1158,29	1286,62	1156,62	0,00
760	1400	1111,62	1004,13	1409,94	1274,12	1334,95	0,00	0,00	1183,29	1316,61	1183,29	0,00
774	1425	0,00	0,00	1441,61	0,00	0,00	0,00	0,00	1209,12	1346,61	1209,12	0,00
788	1450	0,00	0,00	1474,11	0,00	0,00	0,00	0,00	1234,95	1377,44	1235,78	0,00
802	1475	0,00	0,00	1506,61	0,00	0,00	0,00	0,00	1260,78	1406,61	1261,62	0,00
816	1500	0,00	0,00	1539,11	0,00	0,00	0,00	0,00	1286,62	1437,44	1287,45	0,00
829	1525	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1313,28	1467,44	1314,11	0,00
843	1550	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1339,11	1498,27	1339,95	0,00
857	1575	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1365,78	1529,11	1366,61	0,00
871	1600	0,00	0,00	0,00	0,00	0,00	0,00	0,00	1392,44	1560,77	1392,44	0,00

# PASLANMAZ ÇELİK CİNSLERİ

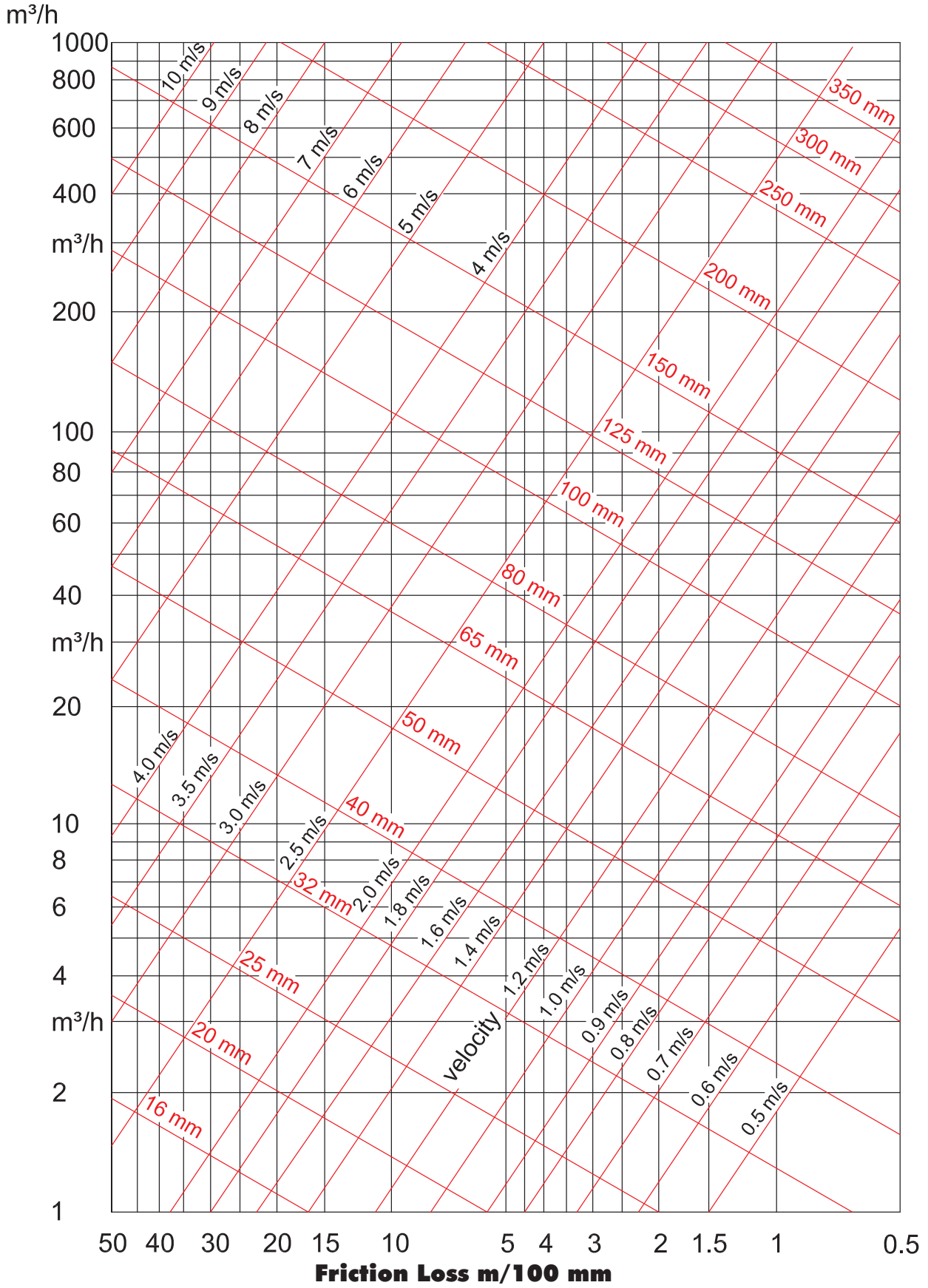
## Stainless Steel Grades

PAS. ÇELİK SEÇENEKLERİ / STAINLESS STEEL OPTIONS					KİMYASAL ALAŞIM / NOMINAL CHEMICAL COMPOSITION					
ASTM	EN	DIN	SS	BS	C	N	Cr	Ni	Mo	Other
201	1.4372	-	-	284S16	0.05	0.15	17	5	-	Mn
S20910	-	-	-	-	0.05	0.30	22	13	2	Mn, Cb, V
301	1.4310	1.4310	2331	301S21	0.10	0.04	17	7	-	-
302	1.4319	1.4319	2332	302S31	0.07	0.06	17	8	-	-
303	1.4305	1.4305	2346	303S31	0.06	0.05	17.5	8.1	-	S
304	1.4301	1.4301	2333	304S31	0.04	0.06	18.2	8.1	-	-
304L	1.4306	1.4306	2352	304S11	0.02	0.06	18.2	8.2	-	-
304LN	1.4311	1.4311	2371	304S61	0.02	0.14	18.2	8.5	-	-
304N	1.6907	1.6907	-	304S71	0.04	0.14	18.5	8.5	-	-
305	1.4303	1.4303	-	305S19	0.02	0.02	18	11.5	-	-
S30880	1.4303	1.4303	-	-	0.08	-	19.5-22.0	9.0-11.0	0.75	0.30-0.65Si
308L	19 9 L	-	-	-	0.02	0.05	20	11	-	-
S30880	19 9LSi	-	-	-	0.03	-	19.5-22.0	9.0-11.0	0.50	0.65-1.00Si
316	1.4401	1.4401	2347	316S31	0.04	0.04	16.8	10.7	2	-
316	1.4436	1.4436	2343	316S33	0.04	0.06	17	11	2.8	-
S31609	1.4401/1.4919	-	-	-	0.04-0.10	-	16.0-18.0	10.0-14.0	2.0-3.0	-
316L	1.4404	1.4404	2348	316S11	0.02	0.06	16.2	10.2	2	-
316L	1.4432	1.4432	2353	316S13	0.02	0.06	16.2	10.2	2.8	-
316LN	1.4406	1.4406	-	316S61	0.02	0.14	16.2	10.2	2	-
316TI	1.4571	1.4571	2350	320S31	0.04	0.01	17	11	2	Ti
317L	1.4438	1.4438	2367	317S12	0.02	0.08	18.3	11.5	3	-
317LM	1.4439	1.4439	-	-	0.02	0.08	19.3	13.7	4.3	-
317LMN	1.4439	1.4439	-	-	0.02	0.14	19.3	13.7	4.3	-
321	1.4541	1.4541	2337	321S31	0.04	0.01	17.3	9.2	-	Ti
347	1.4550	-	2338	347S31	0.04	0.04	17.3	9.1	-	Cb
N08020	-	-	-	-	0.01	0.06	20	33	2	Cu, Cb, Nb
904L	1.4539	1.4539	2562	904S13	0.01	0.06	20	25	4.5	Cu
S31254	1.4547	-	2378	-	0.01	0.20	20	18	6.1	Cu
S34565	1.4565	1.4565	-	-	0.02	0.45	24	17	4.5	Mn
S32101	1.4162	-	-	-	0.03	0.22	21.5	1.5	0.3	Mn
2304	1.4362	1.4362	2327	-	0.02	0.10	23	4.8	0.3	-
2205	1.4462	1.4462	2377	318S13	0.02	0.17	22	5.5	3	-
2507	1.4410	-	2328	-	0.02	0.27	25	7	4	-
410	1.4006	1.4006	2302	410S21	0.12	-	12	-	-	-
410S	1.4000	1.4000	2301	403S17	0.06	-	12	-	-	-
416	1.4005	1.4005	2380	416S21	0.12	-	12	-	-	S
430	1.4016	1.4016	2320	430S17	0.04	-	16.5	-	-	-
S43020	1.4104	1.4104	2383	-	0.12 max	-	16.0-18.0	-	-	0.15min
434	1.4113	-	-	-	0.06	-	17	-	1	-
439	1.4510	-	-	-	0.03	-	18	-	-	Nb, Ti
441	1.4509	1.4509	-	-	0.012	-	18	-	-	Ti
444	1.4521	1.4521	2326	-	0.02	0.02	17.8	-	2.1	Cu, Cb, Nb
630	1.4542	1.4542	-	-	0.04	-	15.3	4.8	-	Al
631	1.4568	1.4568	2388	-	0.05	-	16.3	7.0	-	-
304H	1.4948	1.4948	2333	304S51	0.05	0.06	18.2	8.1	-	Ti
321H	1.4878	1.4878	2337	321S51	0.05	0.01	17.3	9.2	-	Cb, Nb
S34709	1.4961	1.4961	2347	316 Sxx	0.04-0.10	-	17.0-20.0	9.0-13.0	-	-
S30909	-	-	-	-	0.04-0.10	-	22.0-24.0	12.0-16.0	-	-
309S	1.4833	1.4833	-	309S16	0.06	0.08	22.2	12.2	-	-
S31009	-	-	-	-	0.04-0.10	-	24.0-26.0	19.0-22.0	-	-
310S	1.4845	1.4845	2361	310S16	0.05	0.06	25.2	19.2	-	-
S30815	1.4835	1.4835	2368	-	0.09	0.17	21	11	-	Si, Ce



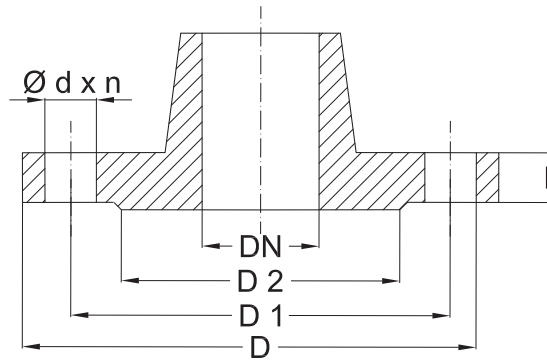
# BORU BASINÇ KAYIPLARI TABLOSU

## Pipe Pressure Loss Table



1. Yukarıdaki tabloyu boru çapı ve basınç kaybı hesabı için kullanabilirsiniz.
2. Bu tablo 15 C sıcaklıkta temiz su için yapılmıştır.
3. Paslanmaz çelik borular için bulunan değer 1.1 ile çarpılmalıdır.
4. Çelik borular için tabloda bulunan değer 1.3 ile çarpılmalıdır.
5. Pük döküm borular için tabloda bulunan değer 1.7 ile çarpılmalıdır.

1. Please use above table for pipe diameter and pressure loss calculation.
2. This table designed for 15 C° clean water.
3. The finding value for stainless steel pipes must be multiplied with 1.1.
4. The finding value for steel pipes must be multiplied with 1.3.
5. The finding value for cast iron pipes must be multiplied with 1.7.

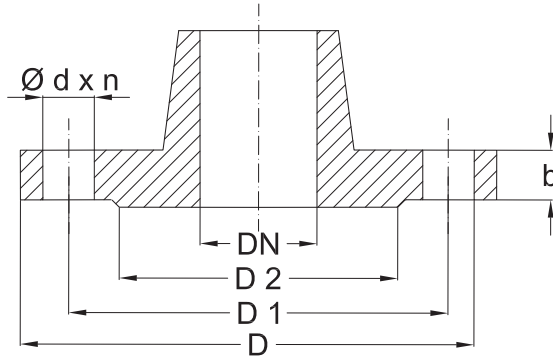


DN	125/150 lbs		300 lbs		400 lbs		600 lbs		900 lbs		1500 lbs		2500 lbs		
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	
1/2"	øD	3 1/2	88.9	3 3/4	95.2	3 3/4	95.2	3 3/4	95.2	4 3/4	121	4 3/4	121	5 1/4	133.4
	b	7/16	11.1	9/16	14.3	9/16	14.3	9/16	14.3	7/8	22.2	7/8	22.2	1 3/16	30.2
	øD2	1 3/8	34.9	1 3/8	34.9	1 3/8	34.9	1 3/8	34.9	1 3/8	34.9	1 3/8	34.9	1 3/8	34.9
	øD1	2 3/8	60.3	2 5/8	66.7	2 5/8	66.7	2 5/8	66.7	3 1/4	82.6	3 1/4	82.6	3 1/2	88.9
	n	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	ød	5/8	15.9	5/8	15.9	5/8	15.9	5/8	15.9	7/8	22.2	7/8	22.2	7/8	22.2
3/4"	øD	3 7/8	98.4	4 5/8	117.5	4 5/8	117.5	4 5/8	117.5	5 1/8	130	5 1/8	130	5 1/2	139.7
	b	1/2	12.7	5/8	15.9	5/8	15.9	5/8	15.9	1	25.4	1	25.4	1 1/4	31.8
	øD2	1 11/16	42.9	1 11/16	42.9	1 11/16	42.9	1 11/16	42.9	1 11/16	42.9	1 11/16	42.9	1 11/16	42.9
	øD1	2 3/4	69.8	3 1/4	82.5	3 1/4	82.5	3 1/4	82.5	3 1/2	88.9	3 1/2	88.9	3 3/4	95.2
	n	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	ød	5/8	15.9	3/4	19	3/4	19	3/4	19	7/8	22.2	7/8	22.2	7/8	22.2
1"	øD	4 1/4	108	4 7/8	123.8	4 7/8	123.8	4 7/8	123.8	5 7/8	149.2	5 7/8	149.2	6 1/4	159
	b	9/16	14.3	11/16	17.5	11/16	17.5	11/16	17.5	1 1/8	28.6	1 1/8	28.6	1 3/8	34.9
	øD2	2	50.8	2	50.8	2	50.8	2	50.8	2	50.8	2	50.8	2	50.8
	øD1	3 1/8	79.4	3 1/2	88.9	3 1/2	88.9	3 1/2	88.9	4	102	4	102	4 1/4	108
	n	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	ød	5/8	15.9	3/4	19	3/4	19	3/4	19	1	25.4	1	25.4	1	25.4
1 1/4"	øD	4 5/8	117.5	5 1/4	133.4	5 1/4	133.4	5 1/4	133.4	6 1/4	159	6 1/4	159	7 1/4	184.2
	b	5/8	15.9	3/4	19	3/4	19	3/4	19	1 1/8	28.6	1 1/8	28.6	1 1/2	38.1
	øD2	2 1/2	63.5	2 1/2	63.5	2 1/2	63.5	2 1/2	63.5	2 1/2	63.5	2 1/2	63.5	2 1/2	63.5
	øD1	3 1/2	88.9	3 7/8	98.4	3 7/8	98.4	3 7/8	98.4	4 3/8	111	4 3/8	111	5 1/8	130
	n	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	ød	5/8	15.9	3/4	19	3/4	19	3/4	19	1	25.4	1	25.4	1 1/8	28.6
1 1/2"	øD	5	127	6 1/8	155.6	6 1/8	155.6	6 1/8	155.6	7	177.8	7	177.8	8	203
	b	11/16	17.5	13/16	20.6	13/16	20.6	13/16	20.6	1 1/4	31.8	1 1/4	31.8	1 3/4	44.5
	øD2	2 7/8	73	2 7/8	73	2 7/8	73	2 7/8	73	2 7/8	73	2 7/8	73	2 7/8	73
	øD1	3 7/8	98.4	4 1/2	114	4 1/2	114	4 1/2	114	4 7/8	124	4 7/8	124	5 3/4	146
	n	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	ød	5/8	15.9	7/8	22.2	7/8	22.2	7/8	22.2	1 1/8	28.6	1 1/8	28.6	1 1/4	31.8
2"	øD	6	152.4	6 1/2	165.1	6 1/2	165.1	6 1/2	165.1	8 1/2	215.9	8 1/2	215.9	9 1/4	234.9
	b	3/4	19	7/8	22.2	7/8	22.2	7/8	22.2	1 1/2	38.1	1 1/2	38.1	2	50.8
	øD2	3 5/8	92.1	3 5/8	92.1	3 5/8	92.1	3 5/8	92.1	3 5/8	92.1	3 5/8	92.1	3 5/8	92.1
	øD1	4 3/4	121	5	127	5	127	5	127	6 1/2	165.1	6 1/2	165.1	6 3/4	171
	n	4	4	8	8	8	8	8	8	8	8	8	8	8	8
	ød	3/4	19	3/4	19	3/4	19	3/4	19	1	25.4	1	25.4	1 1/8	28.6
2 1/2"	øD	7	177.8	7 1/2	190.5	7 1/2	190.5	7 1/2	190.5	9 5/8	244	9 5/8	244	10 1/2	266.7
	b	7/8	22.2	1	25.4	1	25.4	1	25.4	1 5/8	41.3	1 5/8	41.3	2 1/4	57.2
	øD2	4 1/8	104.8	4 1/8	104.8	4 1/8	104.8	4 1/8	104.8	4 1/8	105	4 1/8	105	4 1/8	105
	øD1	5 1/2	139.7	5 7/8	149.2	5 7/8	149.2	5 7/8	149.2	7 1/2	190.5	7 1/2	190.5	7 3/4	197
	n	4	4	8	8	8	8	8	8	8	8	8	8	8	8
	ød	3/4	19	7/8	22.2	7/8	22.2	7/8	22.2	1 1/8	28.6	1 1/8	28.6	1 1/4	31.8
3"	øD	7 1/2	190.5	8 1/4	209.6	8 1/4	209.6	8 1/4	209.6	9 1/2	241	10 1/2	267	12	305
	b	15/16	23.8	1 1/8	28.6	1 1/8	28.6	1 1/8	28.6	1 1/2	38.1	1 7/8	47.6	2 5/8	66.7
	øD2	5	127	5	127	5	127	5	127	5	127	5	127	5	127
	øD1	6	152.4	6 5/8	168.3	6 5/8	168.3	6 5/8	168.3	7 1/2	190.5	8	203	9	228.6
	n	4	4	8	8	8	8	8	8	8	8	8	8	8	8
	ød	3/4	19	7/8	22.2	7/8	22.2	7/8	22.2	1	25.4	1 1/4	31.8	1 3/8	34.9
3 1/2"	øD	8 1/2	215.9	9	228.6	9	228.6	9	228.6						
	b	15/16	23.8	1 3/16	30.2	1 3/16	30.2	1 3/16	30.2						
	øD2	5 1/2	139.7	5 1/2	139.7	5 1/2	139.7	5 1/2	139.7						
	øD1	7	177.8	7 1/4	184.2	7 1/4	184.2	7 1/4	184.2						
	n	8	8	8	8	8	8	8	8						
	ød	3/4	19	7/8	22.2	1	25.4	1	25.4						
4"	øD	9	228.6	10	254	10	254	10 3/4	273	11 1/2	292	12 1/4	311	14	356
	b	15/16	23.8	1 1/4	31.7	1 3/8	34.9	1 1/2	38.1	1 3/4	44.4	2 1/8	54	3	76.2
	øD2	6 3/16	157.2	6 3/16	157.2	6 3/16	157.2	6 3/16	157.2	6 3/16	157.2	6 3/16	157.2	6 3/16	157.2
	øD1	7 1/2	190	7 7/8	200	7 7/8	200	8 1/2	215.9	9 1/4	235	9 1/2	241	10 3/4	273
	n	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	ød	3/4	19	7/8	22.2	1	25.4	1	25.4	1 1/4	31.8	1 3/8	34.9	1 5/8	41.3

# FLANŞ ÖLÇÜ TABLOSU

# ANSI B16.5

## FlangeTable



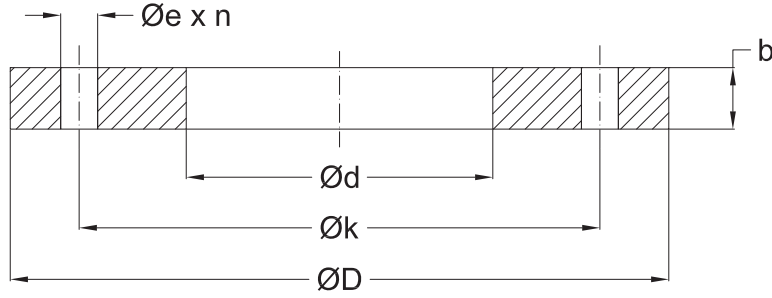
DN	125/150 lbs		300 lbs		400 lbs		600 lbs		900 lbs		1500 lbs		2500 lbs		
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	
5"	øD	10	254	11	279.4	11	279.4	13	330.2	13 3/4	349	14 3/4	375	16 1/2	419
	b	15/16	23.8	1 3/8	34.9	1 1/2	38.1	1 3/4	44.4	2	50.8	2 7/8	73	3 5/8	92.1
	øD2	7 5/16	185.7	7 5/16	185.7	7 5/16	185.7	7 5/16	185.7	7 5/16	185.7	7 5/16	185.7	7 5/16	185.7
	øD1	8 1/2	215.9	9 1/4	234.9	9 1/4	234.9	10 1/2	266.7	11	279	11 1/2	292	12 3/4	324
	n	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	ød	7/8	22.2	7/8	22.2	1	25.4	1 1/8	28.6	1 3/8	34.9	1 5/8	41.3	1 7/8	47.6
6"	øD	11	279	12 1/2	317.5	12 1/2	317.5	14	355.6	15	381	15 1/2	394	19	483
	b	1	25.4	1 7/16	36.5	1 5/8	41.3	1 7/8	47.6	2 3/16	55.6	3 1/4	82.6	4 1/4	108
	øD2	8 1/2	216	8 1/2	215.9	8 1/2	215.9	8 1/2	215.9	8 1/2	215.9	8 1/2	215.9	8 1/2	216
	øD1	9 1/2	241	10 5/8	269.9	10 5/8	269.9	11 1/2	292.1	12 1/2	318	12 1/2	318	14 1/2	368
	n	8	8	12	12	12	12	12	12	12	12	12	12	8	8
	ød	7/8	22.2	7/8	22.2	1	25.4	1 1/8	28.6	1 1/4	31.8	1 1/2	38.1	2 1/8	54
8"	øD	13 1/2	342.9	15	381	15	381	16 1/2	419	18 1/2	470	19	482.6	21 3/4	552
	b	1 1/8	28.6	1 5/8	41.3	1 7/8	47.6	2 3/16	55.6	2 1/2	63.5	3 5/8	92.1	5	127
	øD2	10 5/8	269.9	10 5/8	269.9	10 5/8	269.9	10 5/8	269.9	10 5/8	269.9	10 5/8	269.9	10 5/8	269.9
	øD1	11 3/4	298.4	13	330.2	13	330.2	13 3/4	349.2	15 1/2	394.2	15 1/2	394.2	17 1/4	438
	n	8	8	12	12	12	12	12	12	12	12	12	12	12	12
	ød	7/8	22.2	1	25.4	1 1/8	28.6	1 1/4	31.8	1 1/2	38.1	1 3/4	44.5	2 1/8	54
10"	øD	16	406.4	17 1/2	444.5	17 1/2	444.5	20	508	21 1/2	546	23	584	26 1/2	673
	b	1 3/16	30.2	1 7/8	47.6	2 1/8	54	2 1/2	63.5	2 3/4	69.8	4 1/4	108	6 1/2	165
	øD2	12 3/4	323.8	12 3/4	323.8	12 3/4	323.8	12 3/4	323.8	12 3/4	323.8	12 3/4	323.8	12 3/4	323.8
	øD1	14 1/4	361.9	15 1/4	387.4	15 1/4	387.4	17	431.8	18 1/2	470	19	482.6	21 1/4	540
	n	12	12	16	16	16	16	16	16	16	16	12	12	12	12
	ød	1	25.4	1 1/8	28.6	1 1/4	31.8	1 3/8	34.9	1 1/2	38.1	2	50.8	2 5/8	66.7
12"	øD	19	482.6	20 1/2	520.7	20 1/2	520.7	22	558.8	24	610	26 1/2	673	30	762
	b	1 1/4	31.7	2	50.8	2 1/4	57.2	2 5/8	66.7	3 1/8	79.4	4 7/8	124	7 1/4	184
	øD2	15	381	15	381	15	381	15	381	15	381	15	381	15	381
	øD1	17	431.8	17 3/4	450.9	17 3/4	450.9	19 1/4	488.9	21	533.4	22 1/2	571.5	24 3/8	619
	n	12	12	16	16	16	16	20	20	20	20	16	16	12	12
	ød	1	25.4	1 1/4	31.8	1 3/8	34.9	1 3/8	34.9	1 1/2	38.1	2 1/8	54	2 7/8	73
14"	øD	21	533.4	23	584	23	584	23 3/4	603	25 1/4	641	29 1/2	749		
	b	1 3/8	34.9	2 1/8	54	2 3/8	60.3	2 3/4	69.8	3 3/8	85.7	5 1/4	133		
	øD2	16 1/4	412.7	16 1/4	412.7	16 1/4	412.7	16 1/4	412.7	16 1/4	412.7	16 1/4	412.7		
	øD1	18 3/4	476.2	20 1/4	514.4	20 1/4	514.4	20 3/4	527	22	558.8	25	635		
	n	12	12	20	20	20	20	20	20	20	20	16	16		
	ød	1 1/8	28.6	1 1/4	31.8	1 3/8	34.9	1 1/2	38.1	1 5/8	41.3	2 3/8	60.3		
16"	øD	23 1/2	596.9	25 1/2	647.7	25 1/2	648	27	686	27 3/4	705	32 1/2	826		
	b	1 7/16	36.5	2 1/4	57.2	2 1/2	63.5	3	76.2	3 1/2	88.9	5 3/4	146		
	øD2	18 1/2	470	18 1/2	470	18 1/2	470	18 1/2	470	18 1/2	470	18 1/2	470		
	øD1	21 1/4	539.8	22 1/2	571.5	22 1/2	571.5	23 3/4	603.3	24 1/4	616	27 3/4	705		
	n	16	16	20	20	20	20	20	20	20	20	16	16		
	ød	1 1/8	28.6	1 3/8	34.9	1 1/2	38.1	1 5/8	41.3	1 3/4	44.4	2 5/8	66.7		
18"	øD	25	635	28	711	28	711	29 1/4	743	31	787	36	914		
	b	1 9/16	39.7	2 3/8	60.3	2 5/8	66.7	3 1/4	82.6	4	102	6 3/8	162		
	øD2	21	533.4	21	533.4	21	533.4	21	533.4	21	533.4	21	533.4		
	øD1	22 3/4	577.9	24 3/4	628.7	24 3/4	628.7	25 3/4	654.1	27	685.8	30 1/2	775		
	n	16	16	24	24	24	24	20	20	20	20	16	16		
	ød	1 1/4	31.8	1 3/8	34.9	1 1/2	38.1	1 3/4	44.5	2	50.8	2 7/8	73		
20"	øD	27 1/2	698.5	30 1/2	774.7	30 1/2	774.7	32	813	33 3/4	857	38 3/4	984		
	b	1 11/16	42.9	2 1/2	63.5	2 3/4	69.8	3 1/2	88.9	4 1/4	108	7	178		
	øD2	23	584.2	23	584.2	23	584.2	23	584.2	23	584.2	23	584.2		
	øD1	25	635	27	685.8	27	685.8	28 1/2	724	29 1/2	749.3	32 3/4	832		
	n	20	20	24	24	24	24	24	24	20	20	16	16		
	ød	1 1/4	31.8	1 3/8	34.9	1 5/8	41.3	1 3/4	44.5	2 1/8	54	3 1/8	79.4		
24"	øD	32	812.8	36	914	36	914	37	940	41	1041	46	1168		
	b	1 7/8	47.6	2 3/4	69.8	3	76.2	4	102	5 1/2	140	8	203		
	øD2	24 1/4	692.2	27 1/4	692.2	27 1/4	692.2	27 1/4	692.2	27 1/4	692.2	27 1/4	692.2		
	øD1	29 1/2	749.3	32	812.8	32	812.8	33	838.2	35 1/2	902	39	991		
	n	20	20	24	24	24	24	24	24	20	20	16	16		
	ød	1 3/8	34.9	1 5/8	41.3	1 7/8	47.6	2	50.8	2 5/8	66.7	3 5/8	92.1		

FLUID	KOROZYON DAYANIMI / CORROSION RESISTANCE										METAL				
	CARBON STEEL	CAST IRON	304 STAINLESS STEEL	316 STAINLESS STEEL	BRONZE	DURUMET	MONEL	HASTELOY B	HASTELOY C	TITANILIM	COBALT BASE ALLOY 6	416 STAINLESS STEEL			
Acetaldehyde	1	1	1	1	1	1	1	1	1	1	1	1			
Acetic acid,air free	3	3	2	2	2	1	2	1	1	1	1	3			
Acetic acid,aerated	3	3	1	1	1	1	1	1	1	1	1	3			
Acetic acid,vapors	3	3	1	1	2	2	2	1	1	1	1	3			
Acetone	1	1	1	1	1	1	1	1	1	1	1	1			
Acetylene	1	1	1	1	1	1	1	1	1	1	1	1			
Alcohols	1	1	1	1	1	1	1	1	1	1	1	1			
Aluminium Sulfate	3	3	1	1	1	1	2	1	1	1	1	3			
Ammonia	1	1	1	1	3	1	1	1	1	1	1	1			
Ammonium chloride	3	3	2	2	1	2	2	1	1	2	1	3			
Ammonium nitrate	1	3	1	1	3	1	3	1	1	1	1	3			
Ammonium phosphate	3	3	1	1	2	2	2	1	1	1	1	2			
Ammonium sulfate	3	3	2	1	2	1	1	1	1	1	1	3			
Ammonium sulfite	3	3	1	1	3	1	3	1	1	1	1	2			
Aniline	3	3	1	1	3	1	2	1	1	1	1	3			
Asphalt	1	1	1	1	1	1	1	1	1	1	1	1			
Beer	2	2	1	1	2	1	1	1	1	1	1	2			
Benzene	1	1	1	1	1	1	1	1	1	1	1	1			
Benzoic acid	3	3	1	1	1	1	1	1	1	1	1	1			
Boric acid	3	3	1	1	1	1	1	1	1	1	1	2			
Butane	1	1	1	1	1	1	1	1	1	1	1	1			
Calcium Chloride	2	2	3	2	3	1	1	1	1	1	1	3			
Calcium hypochlorite	3	3	2	2	2	1	2	1	1	1	1	3			
Carbolic acid	2	2	1	1	1	1	1	1	1	1	1	1			
Carbon dioxide, dry	1	1	1	1	1	1	1	1	1	1	1	1			
Carbon dioxide, wet	3	3	1	1	2	1	1	1	1	1	1	1			
Carbon disulfide	1	1	1	1	3	1	2	1	1	1	1	2			
Carbon tetrachloride	2	2	2	2	2	1	1	2	1	1	1	3			
Carbonic acid	3	3	2	2	2	1	1	1	1	1	1	1			
Chlorine gas	1	1	2	2	2	1	1	1	1	2	1	3			
Chlorine gas, wet	3	3	3	3	3	3	3	3	2	2	2	3			
Chlorine, liquid	3	3	3	3	2	2	3	3	1	3	3	3			
Chromic acid	3	3	3	2	3	3	3	3	1	2	2	3			
Citric acid	3	3	2	1	1	1	2	1	1	1	1	2			
Coke oven gas	1	1	1	1	2	1	2	1	1	1	1	1			
Copper sulfate	3	3	2	2	2	1	3	1	1	1	1	1			
Cottonseed oil	1	1	1	1	1	1	1	1	1	1	1	1			
Creosote	1	1	1	1	3	1	1	1	1	1	1	1			
Ethane	1	1	1	1	1	1	1	1	1	1	1	1			
Ether	2	2	1	1	1	1	1	1	1	1	1	1			
Ethyl chloride	3	3	1	1	1	1	1	1	1	1	1	2			
Ethylene	1	1	1	1	1	1	1	1	1	1	1	1			
Ethylene glycol	1	1	1	1	1	1	1	1	1	1	1	1			
Ferric chloride	3	3	3	3	3	3	3	3	2	2	2	3			
Formaldehyde	2	2	1	1	1	1	1	1	1	1	1	1			
Formic acid	3	3	2	2	1	1	1	1	3	2	2	3			
Freon, wet	2	2	1	1	1	1	1	1	1	1	1	1			
Freon, dry	2	2	1	1	1	1	1	1	1	1	1	1			
Furfural	1	1	1	1	1	1	1	1	1	1	1	2			
Gasoline	1	1	1	1	1	1	1	1	1	1	1	1			
Glucose	1	1	1	1	1	1	1	1	1	1	1	1			
Hydrochloric acid, aerated	3	3	3	3	3	3	3	3	2	2	2	3			
Hydrochloric acid, air free	3	3	3	3	3	3	3	3	2	2	2	3			
Hydrofluoric acid, aerated	2	3	3	2	3	2	3	1	1	2	2	3			

# KOROZYON DAYANIM TABLOSU

## Corrossion Resistance Table

FLUID	KOROZYON DAYANIMI / CORROSION RESISTANCE										1 - İYİ / GOOD				2 - DİKKATLİ OL / BE CAREFUL				3 - KULLANIŞI DEĞİL / NOT USEABLE						
	CARBON STEEL	CAST IRON	304 STAINLESS STEEL	316 STAINLESS STEEL	BRONZE	DURİMET	MONEL	HASTELOY B	HASTELOY C	TITANIUM	CORAL BASE ALLOY 6	416 STAINLESS STEEL	CARBON STEEL	CAST IRON	304 STAINLESS STEEL	316 STAINLESS STEEL	BRONZE	DURİMET	MONEL	HASTELOY B	HASTELOY C	TITANIUM	CORAL BASE ALLOY 6	416 STAINLESS STEEL	
Hydrofluoric acid, air free	1	3	3	2	3	2	1	1	1	3	1	3	1	1	1	1	1	1	1	1	1	1	1	1	3
Hydrogen	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Hydrogen peroxide	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Hydrogen sulfide, liquid	3	3	1	1	3	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Magnesium hydroxide	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mercury	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Methanol	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Methyl athyl ketone	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Milk	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Natural gas	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Nitric acid	3	3	1	2	3	1	3	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Oleic acid	3	3	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Oxalic acid	3	3	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Oxygen	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Petroleum oils	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Phosphoric acid, aerated	3	3	1	1	3	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Phosphoric acid, air free	3	3	1	1	3	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Phosphoric acid, vapors	3	3	2	2	3	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Picric acid	3	3	1	1	3	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Potassium chloride	2	2	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Potassium hydroxide	2	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Propane	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Resin	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Silver nitrate	3	3	1	1	3	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Sodium acetate	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sodium carbonate	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Sodium chloride	3	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Sodium chromate	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sodium hydroxide	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Sodium hypochloride	3	3	3	3	3	2	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Sodium thiosulfate	3	3	1	1	3	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Stannous chloride	2	2	3	1	3	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Stearic acid	1	3	1	1	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Sulfate liquor	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sulfur	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sulfur dioxide, dry	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sulfur trioxide, dry	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Sulfuric acid, aerated	3	3	3	3	3	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Sulfuric acid, air free	3	3	3	3	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Sulfurous acid	3	3	2	2	2	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Tar	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Trichloroethylene	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Turpentine	2	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Vinegar	3	3	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Steam boiler feeding system	2	3	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Water, distilled	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Water, sea	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Whiskey	3	3	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Wine	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Zinc chloride	3	3	3	3	3	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Zinc sulfate	3	3	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2



Çap Diameter	İç çap $\varnothing d$ Inner $\varnothing d$	Dış çap $\varnothing D$ Outer $\varnothing D$	Delik Merk. $\varnothing D$ Hole Center $\varnothing D$	Delik çapı $\varnothing e$ H.diameter $\varnothing e$	Delik adedi $n$ Hole quantity $n$	Kalınlık $b$ Thickness $b$	Ağırlık Kg Weight Kg
DN 32	43	140	100	18	4	16	1,75
DN 40	48	150	110	18	4	16	1,99
DN 50	61	165	125	18	4	18	2,61
DN 65	77	185	145	18	4	18	3,14
DN 80	90	200	160	18	8	20	3,93
DN 100	116	220	180	18	8	20	4,31
DN 125	142	250	210	18	8	22	5,76
DN 150	171	285	240	22	8	22	7,07
DN 200	222	320	280	22	8	20	6,03
DN 250	276	375	335	22	12	20	7,31
DN 300	327	440	395	22	12	20	9,83
DN 350	359	490	445	22	12	20	12,61
DN 400	410	540	495	22	16	20	14,01
DN 450	461	595	550	22	16	20	16,05
DN 500	512	645	600	22	20	20	17,45
DN 550	563	703	650	22	20	20	21,86
DN 600	614	754	700	22	20	20	23,62
DN 650	665	805	750	22	20	20	25,38
DN 700	716	856	800	22	24	20	27,14
DN 750	767	907	860	22	24	20	28,90
DN 800	818	958	900	22	24	20	30,66
DN 850	870	1010	950	22	28	20	32,45
DN 900	920	1060	1010	22	28	20	34,18
DN 950	970	1110	1060	22	28	20	35,91
DN 1000	1022	1162	1110	22	32	20	37,70
DN 1100	1126	1266	1210	22	32	20	41,29
DN 1200	1226	1366	1310	22	36	20	44,75
DN 1300	1326	1466	1410	22	40	20	48,20
DN 1400	1426	1566	1510	22	40	20	51,65
DN 1500	1526	1666	1610	22	44	20	55,10
DN 1600	1626	1766	1710	22	48	20	58,56
DN 1700	1726	1866	1810	22	48	20	62,01
DN 1800	1826	1966	1910	22	52	20	65,46
DN 1900	1926	2066	2010	22	56	20	68,91
DN 2000	2026	2166	2110	22	56	20	72,37
DN 2100	2126	2266	2210	22	60	20	75,82
DN 2200	2226	2366	2310	22	64	20	79,27
DN 2300	2326	2466	2410	22	64	20	82,72
DN 2400	2426	2566	2510	22	68	20	86,18
DN 2500	2526	2666	2610	22	72	20	89,63
DN 2600	2626	2766	2710	22	72	20	93,08
DN 2700	2726	2866	2810	22	76	20	96,53
DN 2800	2826	2966	2910	22	80	20	99,99
DN 2900	2926	3066	3010	22	80	20	103,44
DN 3000	3026	3166	3110	22	84	20	106,89

# ALAŞIMSIZ DİKİŞSİZ ÇELİK BORULAR

Non-alloyed Seamless Steel Pipes

DIN 2448 Dikişsiz Çelik Borular

DIN 1629 Dikişsiz Çelik Borular ( Özel )

DIN 2448 Seamless Steel Pipes

DIN 1629 Seamless Steel Pipes ( Special )

## KİMYASAL ÖZELLİKLER / CHEMICAL FEATURES

Kalite Quality	C ( max. )	P ( max. )	S ( max. )	N ( max. )	Si ( max. )	Mn (max.)	Al
St 37	0,170	0,040	0,040	0,009	-	-	-
St 44	0,210	0,040	0,040	0,009	-	-	-
St 52	0,220	0,040	0,035	-	0,550	1,600	0,020(en az )

Çelik Kalitesi Steel Quality	Çekme Mukavemeti Pull Resistance (MPa)	Akma Mukavemeti / Flow Resistance (MPa)		Uzama Extension	
		Et kalınlığı / Thickness ( mm )		Boyuna ( % ) Longitudinal(%)	Enine ( % ) Latitudinal(%)
		16'ya kadar Until 16	16'dan büyük Over 16		
St 37	350-480	En az 235	En az 225	En az 25	En az 23
St 44	420-550	En az 275	En az 265	En az 21	En az 19
St 52	500-650	En az 345	En az 345	En az 21	En az 19

Çelik Kalitesi Steel Quality	Farklı Sıcaklıklardaki ( °C ) Min. Akma Mukavemeti ( MPa )							
	50 °C		200 °C		250 °C		300 °C	
	Et Kalınlığı / Thickness ( mm )							
	16'ya kadar Until 16	16'dan büyük Over 16	16'ya kadar Until 16	16'dan büyük Over 16	16'ya kadar Until 16	16'dan büyük Over 16	16'ya kadar Until 16	16'dan büyük Over 16
St 37	235	225	185	175	165	155	135	135
St 44	275	265	215	215	195	185	160	160
St 52	355	345	245	245	225	215	190	190

## ULUSLAR ARASI BORU STANDARTLARI / INTERNATIONAL PIPE STANDARDS

Malzeme No Material No	Almanya Kalite Germany Quality	Almanya DIN Standardı German DIN Standard	Amerika Kalite American Quality	Amerika ASTM Standardı American ASTM Standard	İngiltere Kalite England Quality	İngiltere BS Standardı England BS Standard	Fransa Kalite France Quality	Fransa NF Standardı French NF Standard
1.0254	St 37	DIN 1629	Gr.A	A 53	S 360	3601	TU E 220 A	A 49-112
1.0256	St 44	DIN 1629	Gr.B	A 53	S 430	3601	TU E 235 A	A 49-112
1.0421	St 52	DIN 1629	Gr.3	A 252	50 B	4360	TU 52-b	A 49-311
1.0581	St 52.4			A 252	HFS 5	6323		A 49-212
1.0305	St 35.8	DIN 17175	Gr.FPA	A 369	S 320	3059/1	TU 37-c	A 49-213
		DIN 17175	Gr.A	A 53+A 106	HFS 360	3602/1		A 49-215
		DIN 17175		A 179	CFS 360	3602/1		A 49-212
		DIN 17175		A 192	360	3059/2		A 49-213
1.0405	St 45.8	DIN 17175	Gr.B	A 106	HFS 430	3602/1	TU 42-c	A 49-215
		DIN 17175	Gr.A-1	A 210	CFS 430	3602/1		A 49-213
		DIN 17175	Gr.FPA	A 369	440	3059/2		A 49-215
1.0481	17 Mn 4	DIN 17175	Gr.C	A 106	440	3059/2	TU 48-c	A 49-213
		DIN 17175	Gr.C	A 210	430	3602/1		A 49-215
1.0482	19 Mn 5	DIN 17175					TU 52-c	A 49-213
1.5415	15 Mo 3	DIN 17175			500 Nb	3602/1		
		DIN 17175			243	3059/2	TU 15 D 3	A 49-213
1.5423	16 Mo 5	VdTUV-Wbl.201	Gr.T1	A 161+A 209	245	3606		
		VdTUV-Wbl.201	Gr. P 1/FP 1	A 335+A 369		3606		
			Gr.P2	A 335			TU 15 CD 2-05	A 49-213
			Gr. FP2	A 369				A 49-215
1.7335	13 CrMo 4 4	DIN 17175	Gr. T 12	A 213	620-440	3606	TU 13 CD 4-04	A 49-213
		DIN 17175	Gr. P 12	A 335	620-460	3606		A 49-213
		DIN 17175	Gr. FP 12	A 369	620	3606		A 49-213
		DIN 17175		A 369		3059/2		A 49-213
1.7380	10 CrMo 9 10	DIN 17175	Gr. T 22	A 199+ A200	622-440	3059/2	TU 10 CD 9-10	A 49-213
		DIN 17175	Gr. T 22	A 213	622-490	3059/2		A 49-213
		DIN 17175	Gr.P 22/FP 22	A 335+A 369	622	3604/3606		A 49-215

# ÇELİK BORU SU DEBİ TABLOSU

## Steel Pipe Water Flowrate Table

Pa / m 43	mbar / m 43	Kg / h (debi) - (Flowrate)								
		15 mm (1/2")	20 mm (3/4")	25 mm (1")	32 mm (1 1/4")	40 mm (1 1/2")	50 mm (2")	65 mm (2 1/2")	80 mm (3")	100 mm (1 1/2")
28	0,28	90	209	380	865	1320	2554	5194	8079	16511
29	0,29	92	214	400	878	1340	2590	5271	8196	16756
30	0,30	93	218	403	890	1361	2631	5348	8314	17000
33	0,33	97	226	414	930	1420	2744	5549	8677	17736
39	0,39	107	249	469	1028	1565	3025	6142	9526	19514
40	0,40	108	253	476	1040	1583	3062	6214	9639	19736
43	0,43	113	263	496	1079	1646	3180	6454	10024	20457
45	0,45	116	270	508	1107	1687	3261	6618	10297	21002
47	0,47	119	277	521	1134	1728	3338	6777	10523	21500
50	0,50	123	286	536	1172	1787	3447	6949	10859	22154
53	0,53	127	296	557	1211	1846	3565	7235	11249	22907
55	0,55	130	302	569	1238	1887	3638	7380	11476	23360
57	0,57	133	308	580	1261	1923	3710	7525	11730	23814
59	0,59	135	314	591	1288	1969	3783	7666	11884	24268
61	0,61	138	320	602	1311	1996	3851	7806	12111	24721
64	0,64	141	327	615	1338	2041	3933	7970	12383	25220
67	0,67	146	337	634	1379	2100	4051	8210	12746	25991
69	0,69	148	343	645	1402	2136	4119	8342	12973	26400
70	0,70	149	345	649	1411	2150	4146	8432	13041	26563
71	0,71	150	348	655	1424	2168	4128	8473	13154	26808
73	0,73	152	354	665	1447	2200	4246	8600	13336	27216
75	0,75	154	358	673	1458	2227	4291	8695	13517	27506
76	0,76	155	359	675	1465	2236	4305	8732	13563	27579
77	0,77	157	365	685	1488	2268	4368	8850	13744	27987
78	0,78	158	366	689	1497	2282	4390	8900	13812	28132
80	0,80	160	370	695	1510	2300	4427	8972	13925	28350
82	0,82	162	375	704	1529	2331	4491	9072	14407	28758
88	0,88	168	391	733	1590	2427	4536	9453	14651	29865
90	0,90	170	395	740	1606	2449	4717	9548	14787	30142
98	0,98	179	414	777	1696	2567	4944	10025	15513	31616
100	1,00	180	418	785	1701	2590	4990	10115	15649	31879
114	1,14	194	450	845	1832	2790	5366	10841	16828	34247
118	1,18	198	457	857	1850	2830	5443	11022	17055	34746
120	1,20	199	462	867	1880	2860	5502	11113	17282	35120
131	1,31	209	484	907	1996	2994	5761	11657	18053	36742
137	1,37	215	497	931	2018	3071	5906	11948	18507	37667
140	1,40	216	502	939	2037	3103	5965	12066	18688	38012
147	1,47	224	516	966	2095	3189	6128	12383	19187	39055
157	1,57	231	534	1002	2168	3298	6337	12814	19822	40361
160	1,60	234	541	1011	2195	3334	6409	12973	20049	40797
163	1,63	237	546	1025	2218	3370	6477	13109	20276	41232
176	1,76	246	570	1066	2309	3511	6740	13608	21092	42938
180	1,80	249	576	1075	2331	2549	6808	13744	21319	43364
196	1,96	261	603	1129	2440	3710	7130	14379	22317	45360
200	2,00	265	611	1143	2472	3760	7221	14560	22589	45931
212	2,12	273	629	1179	2549	3874	7434	15014	23270	47265
216	2,16	275	634	1188	2567	3905	7493	15132	23451	47637
220	2,20	278	641	1200	2595	3942	7570	15277	23678	48104
229	2,29	284	655	1225	2649	4028	7729	15604	24177	49125
235	2,35	288	664	1243	2689	4066	7843	15840	24522	49832
240	2,40	292	672	1256	2719	4129	7929	16017	24780	50363
245	2,45	295	679	1270	2749	4123	8010	16193	25039	50894
255	2,55	301	694	1297	2806	4260	8176	16520	25556	51928
260	2,60	304	701	1311	2834	4304	8260	16683	25814	52445
261	2,61	305	703	1315	2844	4318	8287	16378	25900	52618
274	2,74	313	721	1348	2917	4331	8501	17173	26554	54069
277	2,77	315	727	1356	2935	4459	8555	17282	26717	54432
280	2,80	317	730	1363	2948	4479	8593	17357	26839	54636
294	2,94	625	740	1402	3025	4595	8813	17781	27533	55793
300	3,00	328	757	1414	3055	4641	8900	17956	27803	56428
310	3,10	335	771	1438	3112	4726	9063	18280	28305	57607
314	3,14	336	775	1446	3129	4752	9074	18380	28459	57879
320	3,20	340	784	1462	3163	4825	9204	18579	28767	58424
327	3,27	344	792	1479	3198	4853	9299	18779	29076	58978
333	3,33	348	801	1495	3230	4904	9408	18979	29366	59512