

MATERIAL CROSS REFERENCE TABLE

N. AMERICA AISI/AMS	TRADE NAME	GERMANY DIN CODE	DINN*	SWEDEN SS	FRANCE AFNOR
318		X10CrNiMoNb18 12	1.458	-	Z6CNDNb1713 B
202		X12CrMnNi 18 8 5	1.437	2357	Z8CMN 18-08-05
631	17-7PH	X7CrNiAl 17.7	1.457	2388	Z8CNA 17-07
660	Z8NCTV25-15BFF	X5NiCrTi 2615	1.498	2570	E-Z 6 NCTDV 25.15
CAST IRON					
		GGG 40.3		0717-12	FGS370-17
		GGG 35.3	0.703	0717-15	FGS370-17
60-40-18		GGG 40.3	0.704	0717-02	FGS400-12
80-55-06		GGG-50	0.705	0727-02	FGS500-7
		GGG 60	0.706	0732-03	FGS600-3
100-70-03		GGG 70	0.707	0737-01	FGS700-2
No 20 B		GG 10		110	Ft10D
No 25 B		GG 15	0.602	115	Ft15D
No 30 B		GG 20	0.602	120	Ft20D
No 35 B		GG 25	0.603	125	Ft25D
No 35 B		GG 25	0.603	125	Ft25D
No 45 B		GG 30	0.603	130	Ft30D
No 50 B		GG 35	0.604	135	Ft35D
No 55 B		GG 40	0.604	140	Ft40D
A436 Type 2		GGG-NiCr202	0.666	523	L-NC202
32510		GTS-35		815	MN35-10
40010		GTS-45	0.815	852	Mn450
A220-50005		GTS-55-04	0.816	854	Mn550-4
A220-70003		GTS-65-02	0.817	856	Mn650-3
A220-80002		GTS-70-02	0.817	862	Mn700-2
A220-90001		GTS-70-02	0.817	864	Mn700-2
50005		GTS-55	0.816	854	MP50-5
70003		GTS-65		858	MP60-3
-		GGG-NiMn137	0.077	772	S-Mn 137
A43D2		GGG-NiCr202	0.766	776	S-NC202
REFRACTORY ALLOYS					
AMS 5397	IN-100				
	Nimonic 90		2.497		NCK 20 TA
	Nimonic 90	NiCr20Co18Ti	2.463		Nc20ATV
	Nimonic C-263		2.465		
	Ren'e 95				NC14K8
AMS 5731	A-285				
AMS 5732	A-286				
AMS 5734	A-286				
	Astroloy				
AMS 5396	Hastelloy B	S-NiMo30	2.480		ND37FeV
5390A	Hastelloy X		2.460		NC22FeD
AMS 5772	Haynes 188	CoCr22W14Ni			KC22WN
AMS 5759	Haynes 25	CoCr20W15Ni	LW2.4964		KC20WN
	Incoloy 825	NiCr21Mo	2.486		NC21FeDU
AMS 5661 A	Incoloy 901 Mod				
	Incoloy 903				
	Incoloy 925				
AMS 5580	Inconel 600	NiCr15Fe	2.482		NC15Fe
5666	Inconel 625	NiCr22Mo9Nb	2.486		NC22FeDNB
	Inconel 700	NiCo29Cr15MoAlTi			NK27CADT
AMS 5702	Inconel 706				38C16NBT
AMS 5391	Inconel 713	S-NiCr13Al6MoNb	LW2.4670		NC12AD
AMS 5589	Inconel 718	NiCr19Fe19NbMo	LW2.4668		NC19FeNB
AMS 5541	Inconel 722	NiCr16FeTi			NC16FeTi
AMS 5582	Inconel X-750	NiCr16FeTi	2.467		NC16FeTNb
AMS 5667	Inconel X-750				NC15FeTNbA
AMS 5668	Inconel X-750				
AMS 5660	Inconel X-750				
AMS 5670	Inconel X-750				
AMS 5671	Inconel X-750				
AMS 4574	Monel 400	NiCu30Fe	2.436		NU30
AMS 5758	Mp-35-N				
SAE 5391 A	Nimocast 842	S-NiCr13Al6MoNb	LW2.4670		NC13AD
AMS 5397	Nimocast PD 16		LW2.4674		NK15CAT
	Nimonic 105	NiCo20C15MoAlTi	2.463		NCKD20ATV
	Nimonic 115	NiCo15Cr15MoAlTi	2.464		NCK15AITD
	Nimonic 263/C263	NiCr15Co19MoTi	2.465		NCK20D
	Nimonic 75	NiCr20Ti	2.463		NC20T
	Nimonic 80A	NiCr20TiAK	2.463		NC20TA
AMS 5661 A	Nimonic 901	NiCr15MoTi	2.466		ZSNCDT42
AMS 5754 E	Nimonic PE 13	NiCr22Fe18Mo	2.467		NC22FeD
	Nimonic PE 16	NiFe33Cr17Mo			NW11AC
AMS 5753	Nimonic PK 25	NiCr18CoMo	2.467		NKOD20ATU
	Nimonic PK33	NiCr20Co16MoTi			NC19KDUV
	Nitralloy 135 Mod				
AMS 5399	Ren'e 41	NiCr19Co11MoTi	2.497		NC19KDT
AMS 5712	Ren'e 41		2.497		

MATERIAL CROSS REFERENCE TABLE (continued)

N. AMERICA		GERMANY		SWEDEN	FRANCE	GREAT BRITAIN
AISI/AMS	TRADE NAME	DIN CODE	DINN'	SS	AFNOR	BS
HEAT RESISTANT SUPER ALLOYS COBALT BASE						
AMS 5702	iNCONEL 706				38C16NBT	
AMS 5759	Haynes 25	CoCr20W15Ni	LW2.4964		KC20WVN	
AMS 5772	Haybnes 188	CoCr22W14Ni	1.457	2388	KC22WVN	
AMS 5391	Inconel 713	S-NiCr13Al16MoNb	LW2.4670	2570	NC12AD	
SAE 5391 A	Nimocast 842	S-NiCr13Al16MoNb	LW2, 4670	0717-12	NC13AD	
AMS 5580	Inconel 600	NiCr15Fe	2.4816		NC15Fe	
AMS 5667	Inconel X-750				NC15FeTnBa	
AMS 5541	Inconel 722	NiCr16FeTi			NC16FeTi	
AMS 5582	Inconel X-750	NiCr16FeTi	2.4669		NC16FeTnB	
	Udimet 720				NC18K15TDA	
5383	Udimet 718	NiCr19Fe19NbMo	LW2, 4668		NC 19FeN	
AMS 5589	Inconel 718	NiCr19Fe19NbMo	LW2.4668		NC19FeNB	HR8
AMS 5399	Ren'e 41	NiCr19Co11MoTi	2.4973		NC19KDT	
	Nimonic PK33	NiCr20Co16MoTi			NC19KDUV	
AMS 5544	Waspaloy	NiCr19Fe19NbMo	LW2,4668		NC20K14	
	Nimonic 75	NiCr20Ti	2.4630		NC20T	HR5,203-4
	Nimonic 80A	NiCr20TiAk	2.4631		NC20TA	HR401,601
	Incoloy 825	NiCr21Mo	2.4858		NC21FeDU	
5390A	Hastelloy X		2.4603		NC22FeD	
AMS 5754 E	Nimonic PE 13	NiCr22Fe18Mo	2.4665		NC22FeD	
5666	Inconel 625	NiCr22Mo9Nb	2.4856		NC22FeDNB	
	Nimonic 115	NiCo15Cr15MoAlTi	2.4636		NCK15ATD	
	Udimet 710				NCK18TDA	
AMS 5751	Udimet 500	NiCr18Co18MoTi	2.4983		NCK19DAT	
	Udimet 700	NiCo15CrMoAlTi	2.4636		NCK20AT	
	Nimonic 263/C263	NiCr15Co19MoTi	2.4650		NCK20D	
	Nimonic 105	NiCo20C15MoAlTi	2.4634		NCKD20ATV	
AMS 5396	Hastelloy B	S-NiMo30	2.4800		ND37FeV	
AMS 5397	Nimocast PD 16		LW2.4674		NK15CAT	
	Inconel 700	NiCo29Cr15MoAlTi			NK27CADT	
AMS 5753	Nimonic PK 25	NiCr18CoMo	2.4666		NKOD20ATU	
AMS 4574	Monel 400	NiCu30Fe	2.4360		NU30	
	Nimonic PE 16	NiFe33Cr17Mo			NW11AC	
AMS 5661 A	Nimonic 901	NiCr15MoTi	2.4662		ZSNCDT42	
AMS 5731	A-285					
AMS 5732	A-286					
AMS 5734	A-286					
	Astroloy					
AMS 5661 A	Incoloy 901 Mod					
	Incoloy 903					
	Incoloy 925					
AMS 5668	Inconel X-750					
AMS 5660	Inconel X-750					
AMS 5670	Inconel X-750					
AMS 5671	Inconel X-750					
AMS 5758	Mp-35-n					
	Nitralloy 135 Mod					
AMS 5712	Ren'e 41		2.4973			
	Ren'e 88					
AMS 5659	Stainless Steel 15-5 PH	15Cr4Ni0,5Mo3,25Cu	1.4545			
AMS 5622	Stainless Steel 17-5 PH					
AMS 5382	Stainless Steel 410					
AMS 5618	Stainless Steel 410					
AMS 5619	Stainless Steel 410					
	Toolsteel D 2					
	Toolsteel H 13					
AMS 5753	Udimet 500					
AMS 5384	Udimet 500					
AMS 5704	Waspaloy		2.4654			
AMS 5706	Waspaloy					
AMS 5707	Waspaloy					
AMS 5708	Waspaloy					
AMS 5709	Waspaloy					
HEAT RESISTANT SUPER ALLOYS						
AMS 5617	Custom 455					
AMS 5750	Hastilloy C & C 276		2.4819		ND16C15	
AMS 5771	Hastelloy N					
AMS 5711	Hastelloy S					
AMS 5755	Hastelloy W					
AMS 5754	Hastelloy X		2.4603			
AMS 5660	Incoloy 901	NiFe35Cr14MoTi	LW2.4662		ZSNCDT42	
AMS 5665	Inconel 600		2.4816		NC15Fe	
AMS 5715	Inconel 601		2.4851			
	Inconel 901				Z8NCDT42	
TITANIUM ALLOYS						
	Ti4Al4Mo2Sn0,5Si	TiAl4Mo4Sn2Si0,5			T-A4DE	
AMS R54520	Ti5Al2.5Sn	TiAl5Sn2.5	3.7115		T-A5E	TA14/17
AMS R56400	Ti6Al4V	TiAl6V4	3.7165		T-A6V	TA10-13/TA28
AMS R56401		TiAl6V4EU				TA11

1 TURNING - BORING
2 GROOVING - THREADING
3 GROOVING - THREADING
4 ROTARY - CONNECTION
5 DRILLING
6 ADVANCED MATERIALS
7 MODCO
8 GAUGING SYSTEMS
9 VALCOOL®
10 SPARE PARTS
11 MISCELLANEOUS

MATERIAL CROSS REFERENCE TABLE (continued)

NORTH AMERICA AISI/AMS	TRADE NAMES	GERMANY		SWEDEN	FRANCE	GREAT BRITAIN		SPAIN
		DIN CODE	DINN°	SS	AFNOR	BS	EN	UNE
UNALLOYED STEEL								
-		10 SPb 20	1.0722	.	10PbF2	.	.	10SPb20
1022		20 Mn 5	1.1133	1410	20M5			
-		GS-38	1.0416	1306	230-400M			
A51565		H 1	1.0345	1330	A37CP			
-		H II	1.0425	1432	A42CP			
1015		C 15	1.0401	1350	CC12	080M15	-	F.111
1020		C 22	1.0402	1450	CC20	050A20	2C/2D	F.112
A 27 65-35		GS-45	1.0443	1305	E23-45M			
A570 36		RSt 37-2	1.0038	1311	E24-2Ne	4360 40 C		
A573-81 65		St 37-3	1.0116	1312	E24-U	4360 40 B		
A573-81		St 44-3	1.0144	1412	E28-3	4360 43 C		
1006		St 36-1	1.0201	1160	Fd5			
A36		St 44-2	1.0044	1411	NFA35-501 E28			
A572-60		17 MnV 6	-	2142	NFA35-501E36	4360 55 E		
1010		Ck 10	1.1121	1265	XC10			
1015		Ck 15	1.1141	1370	XC12	080M15	32C	C15K
1330		28 Mn 6	1.1170	.	20M5	150M28	14A	
1330	28Mn6		1.1170	.	20M5	150M28	14A	
1039		40 Mn 4	1.1157	-	35M5	150M36	15	
1140		35 S 20	1.0726	1957	35MF4	212M36	8M	F210G
1151		45 S 20	1.0727	1973	45MF4			
1213		9 SMn 28	1.0715	1912	S250	230M07		11SMn28
12L13		9 MnPb 28	1.0718	1914	S250Pb	-		11SMnPb28
1215		9 SMn36	1.0736	-	S300	240M07	1B	12SMn35
12L14		9 SMnPb 36	1.0737	1926	S300Pb	-	-	12SMnPb35
1050		Cf 53	1.1213	1674	XC48TS	060A52	-	-
1055		Ck 55	1.1203	-	XC55	070M55	-	C.55K
1060		Ck 60	1.1221	1678	XC60	080A62	43D	-
LOW-ALLOY STEEL								
1010	C10		1.0301		AF34C10/XC10			
1035		C 35	1.0501	1550	CC35	060A35	-	F.113
1045		C 45	1.0503	1650	CC45	080M46	.	F.114
1060		C 60	1.0601	1655	CC55	080A62	43D	
A573-81		St 44-2	1.0144	1412	E28-3	4360 43C		
-		St 52-3	1.0570	2132	E36-3	4360 50B		
1035		Cf 35	1.1183	1572	XC38TS	065A35	-	-
1045		Ck 45	1.1191	1672	XC42	080M46	.	C45K
W1		C 105 W1	1.1545	1880	Y105	BW 1A		F-5118
W210		C 105 W1	1.1545	2900	Y105V			
52100		100 Cr 6	1.3505	2258	100C6			
-		105 WCr 6	1.2419	2140	105WC13	-	-	105WCr5
5015		15 Cr 3	1.7015	-	12C3	523M15	-	-
ASTM A182		10 CrMo 9,10	1.7380	2218	12CD 9,10	1501-622	-	TU.H
-		15CrMo5	1.7262	2216	12CD4	-	-	12CrMo4
3415;3310		14NiCr14	1.5752	-	12NC15	655M13;A12	36A	
3415		14NiCr 10	1.5732	-	14NC1	-	-	15NiCr11
ASTM A182		13 CrMo 4.4	1.7335	-	15CD 3.5	1501-620Gr27	-	14CrMo45
AS204GrA		15 Mo 3	1.5415	2912	15D3	1501-240	-	16Mo3
5115		16MnCr5	1.7131	2511	16MC5	(527M20)	-	16MnCr5
A350LF5		14 Ni 6	1.5622	-	16N6	-	-	15Ni6
-	12NiCrMo134		1.6657		16NCD13			
-		17 CrNiMo6	1.6587	-	18NCD6	820A16	-	14NiCrMo13
5120		St 52-3	1.0841	2172	20MC5	150 M 19		F-431
8620		21 NiCrMo2	1.6523	2506	20NCD2	805M20	362	20NiCrMo2
4130		25 CrMo 4	1.7218	2225	25CD4	1717CDS110	-	55Cr3
4130	GS25CrMo4		1.7218		25CD4S			
-		32 CrMo 12	1.8515	2240	30CD12	722 M 24		F-1712
-	32CrMo12		1.7361	2240	30CD12	722 M 24	40B	F.124.A
5132		34 Cr 4	1.7033	-	32C4	530A32	18B	35Cr4
4137;4135		34 CrMo 4	1.7220	2234	35CD4	708A37	19B	34CrMo4
3135		36 NiCr 6	1.5710	-	35NC6	640A35	111A	-
300M/4340M	34NiCrMo6		1.6582	2541	35NCD6	817M40	24	-
-		41 CrAlMo 7	1.8509	2940	40CAD612	905M39	41B	41CrAlMo7
1335		36 Mn5	1.1167	2120	40M5			
9840		36 NiCrMo 4	1.6511	-	40NCD3	816M40	110	35NiCrMo4
5140	41Cr4		1.7035	-	42C4	530A40	18	42Cr4
4140	GS42CrMo4		1.7225	2244	42CD4	708M40	19A	42CrMo4
4140:4142		41 CrMo 4	1.7223	2244	42CD4TS	708M40	19A	42CrMo4
6150		50 Cr V4	1.8159	2230	50CV4	735A50	47	51CrV4
5155		55 Cr3	1.7176	-	55C3	527A60	48	-
L6		55 NiCrMoV 6	1.2713	-	55NCDV 7	-	-	F.520.S
L6		50 NiCr 13	1.2721	2550	55NCV6	-	-	F-528
9255		55 Si 7	1.0904	2090	55S7	250A53	45	56Si7
9262		60 SiCr7	1.0961	-	60SC7	-	-	60SiCr8
1070		Ck 67	1.1231	1770	XC 68			
1095		Ck 101	1.1274	1870	XC100	060 A 96		F-5117
1064		Ck 60	1.1221	1678	XC65			

MATERIAL CROSS REFERENCE TABLE (continued)

N. AMERICA	TRADE NAMES	GERMANY		SWEDEN	FRANCE	GREAT BRITAIN		SPAIN
		DIN CODE	DINN°	SS	AFNOR	BS	EN	UNE
1080		Ck 75	1.1248	1774	XC75			
L3		100 Cr 6	1.2067	-	Y100C6	BL3	-	100Cr6
MIGHT ALLOY STEEL								
	30NiCrMo16 6		1,6747		35NCD16			
L6		50 NiCr 13	1.2721	2550	55NCV6			
M 35		S6/5/2/5	1.3243	2723	6-5-2-5	BM 35		F-5613
440 C		X105 CrMo 17	1.4125		Z100CD17			
A2		X100 CrMoV5 1	1.2363	2260	Z100CDV5	BA2	-	X100CrMoV5
446		X18CrM 28	1.4749	2322	Z10C24			
D2		X155 CrVMo 12 1	1.2379	2310	Z160CDV12			
2515		12Ni 19	1.5680	-	Z18N 5	-	-	-
D3		X210 Cr 12	1.2080		Z200CD12	BD3	-	X210Cr12
H21		X30WCrV9 3	1.2581	-	Z30WCV 9	BH21	-	X30WCrV9
H 13		X40 CrMoV5 1	1.2344	2242	Z40CDV5	BH13	-	X40CrMoV5
D3		S6-5-2	1.3343	2715	Z40CSD10	4959BA2	-	-
HNV3		X45CrSi 93	1.4718	-	Z45CS9	401S45	52	F322
611	Z 85 WDCV 06.05.04.02	S6/5/2	1.3343	2722	Z85WDCV	BM2		F-5603
		G-X120 Mn 12	1.3401	2183	Z120M12 (acier coul'e)	Z120M12	-	X120Mn12
STAINLESS STEELS TERRIFIC - MARTENSITIC MATERIALS								
S1		45 WCrV 7	1.2542	2710	55WC20			
	Z 2 NKDT 18-08-05	X2NiCoMoTi 18 8.5	1.6359		E-Z 2 NKD 18-8			
403 / 410 S	Uginox F 13 S	X 6Cr 13	1.4000	2301	Z 6C13	403S17	-	F.3110
430	Uginox F 17 (Soleil B4)	X 8Cr 17	1.4016	2320	Z 8C17	430S15	960	F.3113
430	Uginox F 17 (Soleil B4)	X 8Cr 17	-	2320	Z 8C17	430S17	60	F.3113
410 M	MA1	GX 12Cr13	1.4006		Z10C13			
405		X10CrA113	1.4724	-	Z10C13	403S37	-	F.311
410	Uginox MA 1 (Soleil A2)	X10Cr13	1.4006	2302	Z10C14	410S21	56A	F.3401
430		X10CrA118	1.4742	-	Z10CAS18	430S15	60	F.3113
446		X10CrA124	1.4762	2322	Z10CAS24	-	-	-
430	Soleil B4U	X 12CrMoS 17.	1.4104	2383	Z10CF17	-	-	F.311 7
348	X5CrNiNb1810	X5CrNiNb18-10	1.4546		Z10CHNb1810			
416	15,5Cr (Soleil AzU)	X12CrS 13	1.4005	2380	Z12CF13			
431		X17CrNi16 22	1.4057	2321	Z15CNI602	431S29	57	F.3427
420	Uginox MA 2	X20 Cr 13	1.4021	2303	Z20C13	420S37	-	-
420	Soleil AS	X20 Cr 13	1.4021	2303	Z20C13			
420	Uginox MA 3	X30 Cr 13	1.4028	2304	Z30C13			
420	Uginox MA 4	X 46Cr 13	1.4034	2304	Z38C13M/Z44C14			
420		X38 Cr13	1.4031	2304	Z40C14			
CA6-NM		X 5CrNi 13 4	1.4313	2384	Z4CND134M	425C11	-	-
EV8		X53CrMnNiN219	1.4871	-	Z52CMN2109	349S54	-	-
HNV6		X 80CrNiSi 20	1.4747	-	Z80CSN2002	443S65	59	F.320B
405	Soleil B3	X6CrAi 13	1.4002	-	Z8CA12	405S17	-	-
434	Uginox F 17 M	X6CrMo 17 1	1.4113	2325	Z8CD1701	343S17	-	-
STAINLESS STEELS AUSTENITIC MATERIALS								
302		X12 CrNi 18 8	1.4300	2332-02	Z10CN18-09			
303	18Cr9Ni2Mn (ICL 472 U)	X8CrNiS 18 8	1.4305	2346	Z10CNF 18-09	303S21	58M	F.3508
301	Uginox 17-7 B	X10CrNi 18 8	1.4310	2331	Z11CN17-08			
301 / 302	Uginox 17-7C	X12CrNi 18 7	1.4310	2331	Z12CN 18-09			
431	15Cr7,1Ni2,5Mo	X22CrNi 17	1.4057	2321	Z15CN1703			
304 L	Uginox 18-10 L (ICL 472 BC)	X2CrNi19 11	1.4306	2352	Z2CN18-10	304S11	-	-
304 LN		X2CrNiN18 10	1.4311	2371	Z2CN 18-10	304S62	-	-
			1.4504		Z2CND1712			
316 L 17-7PH	16,5Cr7Ni1,5Al		1.4504		Z2CND1813			
316	Uginox 17-10 M	X4CrNiMo17 12 2	1.4401	2347	Z3CND17-11-02			
304 C 12			1.4504		Z3CND1910			
304 H	18Cr11Ni0,5Mo		1.4948		Z5CN 18-09			
630 17.4 (PH)	X5CrNiCuNb 16 4		1.4542	-	Z5CNU1604			
CF-8		GX5CrNi19-10	1.4308	2333	Z6CN 8-10			
304	Uginox 18-9E(ICL472)	X5 CrNi18 10	1.4301	2332	Z6CN 18-09	304S31	58E	F.3551
304		X5CrNi18 9	1.4350	2332/33	Z6CN 18-09	304S15	58E	F.3551
347	19Cr9,5Ni	X6CrNiNb 18 10	1.4550	2338	Z6CNI18-10	347S17	58 F	F.3552
321	Uginox 18-10 T (ICL 472 T)	X6CrNiTi 18 10	1.4541	2337	Z6CNT18-10	321S12	58B	F.3553
AMS 350	16,5Cr4Ni4Cu0,3Cb+Ta		1.4542	-	Z6CNU1704			
	17Cr7,1Ni2,5Mo		1.4564		Z8CNA1707			
316 L	Uginox 18-13 MS	X2CrNiMo18 14 3	1.4435	2353	E-Z2CND17-13			
310 S	Uginox R 25-20	X12CrNi 25 21	1.4845	2361	Z12CN25 20	310S24	-	F.331
316 L	Uginox 18-11 ML(ICL 164 BC)	X2CrNiMo17 12 2	1.4404	2348	Z2CND17-12	316S13	-	-
317 L		X2CrNiMo18 15 4	1.4438	2367	Z2CND19-15	317S12	-	-
316LN		X2CrNiMoN 18 13	1.4429	2375	Z3CND17-13Az			
S31803	Uranus 45 N (46)	X2CrNiMoN 22 5 3	1.4462	2377	Z3CND22-05AZ			
-		X4CrNiMo16 5	1.4418	2387	Z6CND1 6-04-01	-	-	-
316 Hmo		X3CrNiMo17-13-3	1.4436	2343	Z6CND 18-12-03	316S33	-	-
316Ti	Uginox 17-11 MT (ICL 164 T)	X6CrNiMoTi 17 12 2	1.4571	2350	Z6CNDT17-12	320S17	58J	F.3535
316	Uginox 17-10 M (ICL 164)	X5CrNiMo18 10	1.4401	2347	Z7CND17-11-02			

MATERIAL HARDNESS RATINGS

New Terminology and Explanation of Hardness Test Methods

HBN: Brinell Hardness Number. Determined by applying a known load for a given length of time, indenting the test surface with a hardened steel or carbide ball of known diameter. The diameter of the indentation is microscopically measured and converted to the BHN by standard tables.

DPN: Vickers Diamond Pyramid Number. Similar to the Brinell test, except the load is applied to the test surface for a specific time through a square base pyramid with 136° between opposing faces. The number, DPN, is in kilograms divided by the square millimeters of the indentation area.

Rockwell Hardness Test: The test measures the depth of residual penetration by a steel ball or a diamond cone under given conditions of load.

The **"C" scale**, HRC, is utilized for hardened steels and some case-hardened parts.

The **"B" scale**, HRB, is used for medium-hard and/or some annealed metals such as medium carbon steel or cast iron.

Scleroscope Hardness Test: A diamond-tipped hammer falls from a specific height through a glass tube with a graduated scale of 140. The distance of rebound is observed visually or recorded by indicator. The Scleroscope is portable and easy to apply on large heavy parts.

HARDNESS CONVERSION TABLE

BHN Hardness Number	Diamond Pyramid Number (Vickers)	Rockwell Number		Scleroscope Number	Equivalent Tensile Strength for Steel Tons/sq. in.
		C. Scale	B. Scale		
		150kg Diamond Cone	100kg 1/16 in. Ball		
896	—	—	—	—	196
856	—	—	—	—	187
817	—	—	—	—	178
780	1150	70	—	106	171
745	1050	68	—	100	163
712	960	66	—	95	158
682	885	64	—	91	148
653	820	62	—	87	142
627	765	60	—	84	137
601	717	58	—	81	131
578	675	57	—	78	126
555	633	55	120	75	121
534	598	53	119	72	110
514	567	52	119	70	112
495	540	50	117	67	108
477	515	49	117	65	104
461	494	47	116	63	100
444	472	46	115	61	97
429	451	45	115	59	94
419	437	44	114	57	91
401	426	42	113	55	88
388	404	41	112	54	84
375	389	40	112	52	82
363	375	38	110	51	79
352	363	37	110	49	76
341	350	36	109	48	74
331	339	35	109	46	72

HARDNESS CONVERSION TABLE
(continued)

BHN Hardness Number	Diamond Pyramid Number (Vickers)	Rockwell Number		Scleroscope Number	Equivalent Tensile Strength for Steel Tons/sq. in.
		C. Scale	B. Scale		
		150kg Diamond Cone	100kg 1/16 in. Ball		
321	327	34	108	45	70
311	316	33	108	44	68
302	305	32	107	43	66
293	296	31	106	42	64
285	287	30	105	40	62
277	270	29	104	39	60
269	270	28	104	38	59
262	263	26	103	37	57
255	256	25	102	37	55
248	248	24	102	36	54
241	241	23	100	35	52
235	235	22	99	34	51
229	229	21	98	33	50
223	223	20	97	32	49
217	217	18	96	31	47
212	212	17	96	31	46
207	207	16	95	30	45
201	202	15	94	30	44
197	197	13	93	29	43
192	192	12	92	28	42
187	187	10	91	28	41
183	183	9	90	27	40
179	179	8	89	27	39.5
174	174	7	88	26	39
170	170	6	87	26	38.5
167	166	4	86	25	38
163	163	3	85	25	37.5
159	159	2	84	24	36.5
156	156	1	83	24	36
152	153	0	82	23	35
149	149	-1	81	23	34
146	146	-2	80	22	33.5
143	143	-3	79	22	33
140	140	-4	78	21	32
137	137	-6	77	21	31.5
134	134	-7	76	21	31
131	131	-9	74	20	30
128	128	-11	73	20	29.5
126	126	-12	72	19	29
123	124	-14	71	19	28.5
121	121	-16	70	19	28
118	118	-17	69	19	27
116	116	-19	68	19	26.5
114	114	-20	67	19	26
111	112	—	66	19	25.5
109	109	—	65	18	25
107	107	—	64	18	24.5
105	105	—	62	18	24
103	103	—	61	18	23.5
101	101	—	60	18	23
99.2	99	—	59	18	22.75
97.3	97	—	57	17	22.5
95.5	95	—	56	17	22

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