

# GRADE CLASSIFICATION

MATERIALS TO BE MACHINED	CODE		GRADE														
			Uncoated		Micrograin Uncoated	Cermet		Coated CVD			Coated PVD						
			SF30	X44	GH1	CN25	CN35	MP91M	PFZ	X500	SP1032	SP1064	SP4036	SP6564	SFZ		
Unalloyed and Alloyed Steel	C8	P01															
		P05															
		P10															
		P15															
		P20															
C7	P25																
	P30																
C6	P35																
	P40																
C5	P50																
	M05																
	M10																
Stainless Steel	M15	M20															
		M30															
		M35															
		M40															
		K01															
Cast Iron	C4	K05															
		K10															
		K15															
		K20															
		K25															
C2	K30																
	K35																
	K40																
Nonferrous materials	N01	N05															
		N10															
		N15															
		N20															
		N25															
		N30															
High temperature alloys	S01	S05															
		S10															
		S15															
		S20															
		S25															
		S30															
		H01															
Hard materials: Hardened steel, hardened cast iron materials, chilled cast iron.	H05	H10															
		H15															
		H20															
		H25															
		H30															
		H30															

## Star Guide Key to Recommended Tools

Material Designations				
	<b>P</b> ◆ Unalloyed Steels	<b>M</b> ◆ Stainless Steels	<b>K</b> ◆ Cast Irons	<b>S</b> ◆ High Temp. Alloys
	<b>P</b> ◆ Alloyed Steels	<b>M</b> ◆ PH Stainless	<b>N</b> ◆ Aluminum & Alloys	<b>H</b> ◆ Hard Materials

# MATERIALS CROSS REFERENCE CHART

Material Group	Country/Standard							
	HBN	Allvac Designation	Allegheny Ludlum Designation	USA	GERMANY/ITALY		U.K.	FRANCE
				AIS/SAE	W.-Nr.	DIN	BS	AFNOR
Free cutting steel	120-220				1.0722	10SPb20		10PbF2
Free cutting steel	130-220			1213	1.0715	9SMn28	230M07	S250
Free cutting steel	130-220			12L13	1.0718	9SMnPb28		S250Pb
Free cutting steel	130-230			1215	1.0736	9SMn36	240M07	S300
Free cutting steel	130-230			12L14	1.0737	9SMnPb36		S300Pb
Heat treatable steel	150-200			1020	1.0402	C22	050A20	CC20
Heat treatable steel	150-200			1025	1.1158	Ck25		
Free cutting steel	160-230			1140	1.0726	35S20	212M36	35MF4
Superficial hardening steel	170-220			1035	1.1183	Cf35	060A35	XC38TS
Heat treatable steel	170-230			1035	1.0501	C35	060A35	CC35
Case hardening steel	170-230			1015	1.0401	C15	080M15	CC12
Case hardening steel	180-240			1015	1.1141	Ck15	080M15	XC12
Heat treatable steel	190-240			1045	1.0503	C45	080M46	CC45
Heat treatable steel	190-240			1045	1.1191	Ck45	080M46	XC42
Superficial hardening steel	200-250			1050	1.1213	Cf53	060A52	XC48TS
Carbon tool steel	200-250			W.110	1.1545	C105W1		Y1105
Heat treatable steel	200-260			1330	1.1170	28Mn6	160M28	20M5
Heat treatable steel	200-270			1335	1.1167	36Mn5		40M5
Heat treatable steel	210-280			1039	1.1157	40Mn4	150M36	35M5
Carbon tool steel	200-230			W.112	1.1663	C125W		Y2120
Heat treatable steel	210-270			1055	1.0535	C55	070M55	
Heat treatable steel	210-270			1055	1.1203	Ck55	070M55	XC55
Heat treatable steel	230-270			1060	1.0601	C60	080A62	CC55
Heat treatable steel	230-290			1060	1.1221	Ck60	080A62	XC60
Spring steel	300-330			1095	1.1274	Ck101	060A96	
High Temp. constructional steel	140-170			ASTM A20Gr.A	1.5415	15Mo3	1501-240	15D3
High Temp. constructional steel	140-180			ASTM A182	1.7335	13CrMo4 4	1501-620Gr.27	15CD3.5
High Temp. constructional steel	140-180			ASTM A182	1.7380	10CrMo9 10	1501-622	12CD9;10
High Temp. constructional steel	140-180			4520	1.5423	16Mo5	1503-245-420	
Tough at sub zero	150-200			ASTM A350LF5	1.5622	14Ni6		16N6
High Temp. constructional steel	150-200				1.7715	14MoV6 3	1503-660-440	
Tough at sub zero	160-220			2515	1.5680	12Ni19		Z18N5
Case hardening steel	200-330			5115	1.7131	16MnCr5	(527M20)	16MC5
Case hardening steel	200-330				1.7262	15CrMo5		12CD4
Cold work tool steel	200-210		O1	O1				
Hot / cold tool steel	200-220		S7	S7				
Tough at sub zero	200-260			ASTM A353	1.5662	X8Ni9	1501-509;510	
Ball and roller bearing steel	200-230			52100	1.3505	100Cr6	534A99	100C6
Heat treatable steel	200-290			4130	1.7218	25CrMo4	1717CDS 110	25CD4
Case hardening steel	210-330			8620	1.6523	21NiCrMo2	805M20	20NCD2
Case hardening steel	210-270			5015	1.7015	15Cr3	523M15	12C3
Heat treatable steel	210-280			3135	1.5710	36NiCr6	640A35	35NC6
Superficial hardening steel	210-230			5140	1.7045	42Cr4		

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Material Designations			
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 N	Aluminum & Alloys	 H	Hard Materials

# MATERIALS CROSS REFERENCE CHART

Material Group	HBN	Allvac Designation	Allegheny Ludlum Designation	Country/Standard				
				USA	GERMANY/ITALY		U.K.	FRANCE
				AIS/SAE	W.-Nr.	DIN	BS	AFNOR
Heat treatable steel	210-290			5132	1.7033	34Cr4	530A32	32C4
Cold work tool steel	220-240		A6	A6				
Superficial hardening steel	230-330			4140;4142	1.7223	41CrMo4	708M40	42CD4TS
Heat treatable steel	230-330			4137;4135	1.7220	34CrMo4	708A37	35CD4
Cold work tool steel	230-240		O7	O7				
Cold work tool steel	230-240			S1	1.2542	45WScrV7	BS1	
Cold work tool steel	230-260			L3	1.2067	100Cr6	BL3	Y100C6
Cold work tool steel	230-260		A2	A2	1.2363	X100CrMoV51	BA2	Z100CDV5
Cold work tool steel	230-260				1.2419	105WCr6		105WC13
Cold work tool steel	230-260			W210	1.2833	100V1	BW2	Y1105V
High speed steel	240-300		M2	M2	1.3343	S 6-5-2	BM2	Z85WDCV 06-05-04-02
High speed steel	240-300			M7	1.3348	S 2-9-2		Z100WCWV 09-04-02-02
Heat treatable steel	240-330				1.3401	X120Mn12	Z120M12	Z120M12
Superficial hardening steel	240-360			6150	1.8159	50CrV4	735A50	50CV4
High speed steel	240-260		M3	M3				
Cold work tool steel	240-280		A7	A7				
High speed steel	240-320			T1	1.3355	S 18-0-1	BT1	Z80WCV 18-04-01
Heat treatable steel	240-330			9840	1.6511	36CrNiMo4	816M40	40NCD3
Heat treatable steel	240-330			5140	1.7035	41Cr4	530M40	42C4
Heat treatable steel	240-360			4140	1.7225	42CrMo4	708M40	42CD4
Cold work tool steel	240-260			L6	1.2713	55NiCrMoV6		55NCDV7
High speed steel	250-320				1.3243	S 6-5-2-5		Z85WDKCV 06-05-05-04-02
High speed steel	250-320			T4	1.3255	S 18-1-2-5	BT4	Z80WKC 18-05-04-01
Case hardening steel	270-370			3415	1.5732	14NiCr10		14NC11
Cold work tool steel	260-270		D2	D2	1.2379	X155CrVMo12-1	BD2	Z160CDV12
Cold work tool steel	260-270			D3	1.2080	X210Cr12	BD3	Z200Cr12
Cold work tool steel	260-270				1.2436	X210CrW12		
Cold work tool steel	260-270				1.2601	X165CrMoV12		
Case hardening steel	250-360			3415	1.5752	14NiCr14	655M13	12NC15
Heat treatable steel	270-360	Nickelvac 4340		4340	1.6582	34CrNiMo6	817M40	35NCD6
Nitriding steel	290-300				1.8509	41CrAlMo7	905M39	40CAD6, 12
Spring steel	290-320			9255	1.0904	55Si7	250A53	55S7
Case hardening steel	300-400				1.6587	17CrNiMo6	820A16	18NCD6
Heat treatable steel	300-430				1.7361	32CrMo12	722M24	30CD12
Spring steel	320-330			5155	1.7176	55Cr3	527A60	55C3
Spring steel	320-330			9262	1.0961	60SiCr7		60SC7
Nitriding steel	330-380			H12	1.2606	39CrMoV13 9	BH12	
Hot work tool steel	360-470			H11	1.2343		BH11	
Hot work tool steel	360-500			H10	1.2365		BH10	
Hot work tool steel	360-530		H13	H13	1.2344	X40CrMoV51	BH13	Z40CDV5
Hot work tool steel	360-530			H21	1.2581	X30WCrV9 3	BH21	Z30WCV9
Hot work tool steel	380-500			H19	1.2678		BH19	









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	<b>P</b>	Alloyed Steels	<b>M</b>	PH Stainless	<b>N</b>	Aluminum & Alloys	<b>H</b>	Hard Materials

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	HBN	Allvac Designation	Allegheny Ludlum Designation	USA	GERMANY/ITALY		U.K.	FRANCE
				AMS	W.-Nr.	DIN		
Stainless steel	120-180	Nickelvac 410 / 403	AL 403	403	1.4000	X6Cr13	403S17	Z6C13
Heat resistant steel casting	120-180				1.4865	G-X40NiCrSi38 18	330C11	
Stainless steel casting	140-200				1.4308	G-X6CrNi18 9	304C15	Z6CN18.10M
Stainless steel casting	140-200				1.4408	G-X6CrNiMo18 10	316C16	
Stainless steel casting	140-200				1.4581	G-X7CrNiMoNb18 10	318C17	Z4CNNDNb18 12M
Heat resistant steel	140-200		AL 405	405	1.4724	X10CrAl13	403S17	Z10C13
Stainless steel	140-200	Nickelvac 410 / 403	AL 410	410	1.4006	X10Cr13	410S21	Z10C14
Stainless steel	140-200		AL 430	430	1.4016	X6Cr17	430S15	Z8C17
Stainless steel	140-200		AL 434	434	1.4113	X6CrMo17	434S17	Z8CD17.01
Stainless steel	140-210		AL 304L	304L	1.4306	X2CrNi19 11	304S12	Z3CN18.10
Stainless steel	150-210		AL 305	305	1.4303	X5CrNi18 12		
Stainless steel	150-210	Allvac 316 L	AL 316L	316L	1.4435	X2CrNiMo18 12	316S12	Z2CND17.13
Stainless steel	150-210		AL 317L	317L	1.4438	X2CrNiMo18 16	317S12	Z2CND19.15
Stainless steel	150-230			318	1.4583	X10CrNiMoNb18 12		Z6CNDNb17 13B
Stainless steel	150-170		E-Brite Alloy	ASTM A240				
Stainless steel	150-210		AL 303	303	1.4305	X10CrNiS18 9	303S21	Z10CNF 18.09
Stainless steel	150-210		AL 304	304	1.4301	X5CrNi18 10	304S15	Z6CN18.09
Stainless steel	150-220		AL 321	321	1.4541	X6CrNiTi18 10	2337	Z6CNT18.10
Stainless steel	150-220			316Ti	1.4571	X6CrNiMoTi17 12 2	320S17	Z6NDT17.12
Heat resistant steel	150-230		AL 309	309	1.4828	X15CrNiSi20 12	309S24	Z15CNS20.12
Heat resistant steel	150-230		AL 310S	310S	1.4845	X12CrNi25 21	310S24	Z12CN25 20
Stainless steel	150-230		AL 904L	ASTM B625	1.4539			
Heat resistant steel	150-230				1.4878	X12CrNiTi18 9	321S320	Z6CNT18.12B
Stainless steel	160-220		AL 316	316	1.4401	X5CrNiMo18 10	316S16	Z6CND17.11
Stainless steel	160-230		AL 347	347	1.4550	X6CrNiNb18 10	347S17	Z6CNNb18.10
Heat resistant steel	160-220			446	1.4762	X10CrAl 24		Z10CAS24
Stainless steel	170-230			304LN	1.4311	X2CrNiN18 10	304S62	Z2CN18.10
Heat resistant steel	170-240			310	1.4841	X15CrNiSi25 20		
Heat resistant steel	170-240			330	1.4864	X12NiCrSi36 16		Z12NCS35.16
Stainless steel	180-240		AL 316LXN	316LN	1.4429	X2CrNiMoN17 13 3		Z2CND17.13
Stainless steel	180-240		AL 416	416	1.4005	X12CrS13		
Stainless steel	200-260			430F	1.4104	X12CrMoS17		Z10CF17
Stainless steel	200-270			329	1.4460	X8CrNiMo27 5		
Stainless steel	210-240				1.4034	X45Cr13	420S45	Z40CM Z38C13M
Stainless steel	210-290		AL 301	301	1.4310	X12CrNi17 7		Z12CN17.07
Stainless steel	230-240				1.4027	G-X20Cr14	420C29	Z20C13M
Stainless steel	230-290		AL 420	420	1.4021	X20Cr13		
Stainless steel casting	230-290				1.4313	X5CrNi13 4	425C11	Z4CND13.4M
Stainless steel	240-270		AL 2205	ASTM A240				
Stainless steel	260-290			431	1.4057	X20CrNi172	431S29	Z15CNI6.02
Stainless steel	330-360		AM 350	ASTM A693				
Precipitation hardening stainless			AL 13-8	13-8 PH				
Precipitation hardening stainless		Nickelvac 15-5 PH	AL 15-5	15-5 PH	1.4540	X4CrNiCuNb164		Z6CNU15.05
Precipitation hardening stainless			AL 15-7	15-7 PH	1.4532	X7CrNiMoAl157		Z8CNDA15.07
Precipitation hardening stainless		Nickelvac 17-4 PH	AL 17-4	17-4 PH	1.4542	X5CrNiCuNb174		Z6CNU17.04
Precipitation hardening stainless			AL 17-7	17-7 PH	1.4568	X7CrNiAl177		Z8CNA17.07

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				USA	GERMANY/ITALY		U.K.	FRANCE
				ASTM/SAE	W.-Nr.	DIN	BS	AFNOR
Grey cast iron	175			No 20 B	0.6010	GG 10	Grade 100	Ft 10 D
Grey cast iron	185			No 25 B	0.6015	GG 15	Grade 150	Ft 15 D
Grey cast iron	205			No 30 B	0.6020	GG 20	Grade 220	Ft 20 D
Grey cast iron	220			No 35 B	0.6025	GG 25	Grade 260	Ft 25 D
Grey cast iron	230			No 45 B	0.6030	GG 30	Grade 300	R 30 D
Grey cast iron	235			No 50 B	0.6035	GG 35	Grade 350	Ft 35 D
Grey cast iron	250			No 55 B	0.6040	GG 40	Grade 400	Ft 40 D
Spheroidal / nodular / ductile cast iron	150-180			60-40-18		GGG 35.3	350/22	FGS 350-22
Spheroidal / nodular / ductile cast iron	155-220			65-45-12	0717-02	GGG 40	420/12	
Spheroidal / nodular / ductile cast iron	190-255			80-55-06	0727-02	GGG 50	500/7	FGS 500-7
Spheroidal / nodular / ductile cast iron	200-260			80-60-03	0732-03	GGG 60	600/3	FGS 600-3
Spheroidal / nodular / ductile cast iron	240-300			100-70-03	0737-01	GGG 70	700/2	FGS 700-2
Spheroidal / nodular / ductile cast iron	265-300			120-90-02		GGG 80	900/2	FGS 900-2
Malleable cast iron	150			32510		GTS-35-10	B 340/12	MN 35-10
Malleable cast iron	175			40010	0.8145	GTS-45-06	P 440/7	
Malleable cast iron	205			50005	0.8155	GTS-55-04	P 510/4	MP 50-5
Malleable cast iron	230			A220-70003	0.8165	GTS-65-02	P 570/3	Mn 650-3
Malleable cast iron	265			A220-80002	0.8170	GTS-70-02	P 690/2	Mn 700-2
Aluminium alloys				1050	3.0255	Al99,9	1B	A5
Aluminium alloys					3.0515	AlMn	N3	
Aluminium alloys					3.0615	AlMgSiPb		
Aluminium alloys				2017	3.1325	AlCuMg1		A-U4G
Aluminium alloys				2024	3.1355	AlCuMg2	L97	A-U4G1
Aluminium alloys					3.1645	AlCuMgPb		
Aluminium alloys				2011	3.1655	AlCuBiPb	FC1	A-U5PbBi
Aluminium alloys					3.2245	AlSi5		
Aluminium alloys					3.2305	AlRMgSi		
Aluminium alloys				6351	3.2315	AlMgSi1	H30	
Aluminium alloys				6063	3.3206	AlMgSi0,5	H9	
Aluminium alloys					3.3309	AlRMg0,5		
Aluminium alloys				5005	3.3315	AlMg1	N41	A-G0,6
Aluminium alloys				5050	3.3316	AlMg1,5	3L44	A-G1,5
Aluminium alloys					3.3319	AlRMg1		
Aluminium alloys				5052	3.3523	AlMg2,5	2L56	A-G2,5C
Aluminium alloys				5754	3.3535	AlMg3	N5	A-G3M
Aluminium alloys				5086	3.3545	AlMg4Mn		A-G4MC
Aluminium alloys				5083	3.3547	AlSiMg4,5Mn	N8	A-G4,5MC
Aluminium alloys				5056	3.3549	AlMg5	N6	
Aluminium alloys				7075	3.4365	AlZnMgCu1,5	DTD5074	A-Z5GU
Aluminium alloys				7005		AlZnMg1		
Aluminium alloys				5454		AlMg2,5Mn	N51	A-G2,5MC
Aluminium alloys						AlSi3,5		

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Material Group	Commercial Designation	Allvac Designation	Allegheny Ludlum Designation	Country/Standard				
				USA	GERMANY/ITALY		U.K.	FRANCE
				AMS	W.-Nr.	DIN		AFNOR
Iron based alloys	VascoMax C-250	VascoMax C-250		6501, 6512, 6520				
Iron based alloys	VascoMax C-350	VascoMax C-350						
Iron based alloys	VascoMax C-200	VascoMax C-200						
Iron based alloys	VascoMax C-300	VascoMax C-300		6514				
Iron based alloys	VascoMax T-200	VascoMax T-200						
Iron based alloys	VascoMax T-250	VascoMax T-250		6518, 6519, 6591				
Iron based alloys	Greek Ascology		AL 418	5508				
Iron based alloys	Jethete M-152			5718, 5719				Z12 CND 12
Iron based alloys	Haynes 556			5768		X12CrCoNi2120		
Iron based alloys	N 155			5768				Z12 CNKDW 20
Iron based alloys	S 590			5533		X40CoCrNi2020		Z42 CKNDW
Iron based alloys	Crucible A286		ALTEMP A 286	ASTM 368	1.4980		HR 5152	Z06 NCT 25
Iron based alloys	Disaloy 16/25/6			5725				Z3 NCT 25
Iron based alloys	AL-6XN Alloy		AL-6XN Alloy	ASTM SB688				
Iron based alloys	Disaloy 24			ASTM A638				Z3 NCT 25
Iron based alloys	Armco 18							
Iron based alloys	Incoloy 801			5552		G-X50CrNi3030		
Iron based alloys	Incoloy 800	Nickelvac 800	AL 800	ASME SB 409		X10NiCrAlTi3220	3082-76	25 NC 3520
Iron based alloys	Incoloy 802							
Iron based alloys	N 156							
Iron based alloys	20CB-3		AL 20	ASTM B463				
Iron based alloys	Sanicro 30					X2NiCrAlTi3220		
Iron based alloys	Incoloy 803							
Iron based alloys	Allvac 330	Allvac 330		5592, 5716				
Iron based alloys	AL 36		AL 36	ASTM F1684				
Iron based alloys	Incoloy DS					X12NiCrSi3616	3072-76	
Iron based alloys	AL 42		AL 42	ASTM F30				
Iron based alloys	Armco 20-45-5							
Iron based alloys	AL 4750		AL 4750	ASTM B753				
Iron based alloys	ALLOY 21-6-9		ALLOY 21-6-9	ASTM A666				
Iron based alloys	Vasco 13-8 Mo	Vasco 13-8 Mo		5629				

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				USA	GERMANY/ITALY		U.K.	FRANCE
				AMS	W.-Nr.	DIN		AFNOR
Cobalt based alloys	MP35N	Allvac 35N						
Cobalt based alloys	L 605	Nickelvac L-605		5759		CoCr20W15Ni		KC 20 WN
Cobalt based alloys	Nickelvac TJA-1537	Nickelvac TJA-1537		ASTM F1537				
Cobalt based alloys	Altemp S 816			5534		CoCr20Ni20W		
Cobalt based alloys	HS 21			ASTM F-75		CoCr28Mo	3531	
Cobalt based alloys	HS 25			AISI 670		CoCr20W15Ni		KC 20 WN
Cobalt based alloys	HS 30					CoCr26Ni14Mo		
Cobalt based alloys	HS 31			ASTM A567		CoCr25NiW	3146	KC 25 NW
Cobalt based alloys	HS 36					CoCr19W14NiB		
Cobalt based alloys	Jetalloy 209							
Cobalt based alloys	L 251							
Cobalt based alloys	M 203							

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Material Designations							
	Unalloyed Steels		Stainless Steels		Cast Irons		High Temp. Alloys
	Alloyed Steels		PH Stainless		Aluminum & Alloys		Hard Materials

# MATERIALS CROSS REFERENCE CHART

Ni	Co	Cr	Mo	W	Si	Mn	C	Al	Ti	P	S	Others	Cutting speed range Vc ft./min.						
													25	50	75	100	125		
18.5	7.8		4.8		0.05	0.05	0.02	0.1	0.4	0.005	0.005								
18.5	12.0		4.8		0.05	0.05	0.02	0.1	1.4	0.005	0.005								
18.5	8.5		3.25		0.05	0.05	0.01		0.2	0.005	0.005								
18.5	8.8		4.8		0.05	0.05	0.02	0.1	0.73	0.005	0.005								
18.5			3.0		0.05	0.05	0.01		0.7	0.005	0.005								
18.5			3.0		0.03	0.05	0.02	0.1	1.4	0.005	0.005								
2		12		2.5			0.19												
2.5		12	1.7				0.15					V 0.3							
20	20	21	3	2.5			0.1					Nb + Ta							
20	20	21	3	2.5	0.5	1.5	0.15					Nb 1.0							
20	20	21	4	4			0.43												
25		14	1.3		0.5	1.3	0.05	0.2	2.1										
25		16	6		0.7	1.35	0.12		0.3			Nb 0.4							
25		20.5	6.5				0.02					N 0.2							
26		13.5	2.7		0.8	0.9	0.04	0.1	1.7										
3.7		17.2			0.47	12.5	0.06												
32		20.5			0.5	0.8	0.05		1.1										
32.5		21.0			0.5	0.75	0.05	0.37	0.37		0.007	Cu 0.37							
32.5		21.5			0.4	0.8	0.4												
33	24	17	3	2			0.33												
33		20	2.2									Cu 3.3							
34		22			0.55	0.55	0.03	0.3	0.5			Cu 0.1							
35		25					0.08	0.15	0.15										
35.5		18.5			1.13	1.0	0.04			0.01	0.01	Cu 0.5							
36																			
37		18			2.3	1.0	0.06												
41																			
46		20	2.3		1.0	5	0.08					Nb 0.4							
49																			
6.5		21				6.0						No 0.3							
8.0		12.8	2.3		0.05	0.10	0.03	1.05		0.005	0.004								

Ni	Fe	Cr	Mo	W	Si	Mn	C	Al	Ti	P	S	Others	Cutting speed range Vc ft./min.						
													25	50	75	100	125		
35		20	9.8				0.013												
10	0.5	20		15		1.7	0.1												
0.2	0.25	28	6		0.5	0.5	0.06					N 0.2							
20	4	20	4	4	0.4	1.2			0.38										
3	1	27	5		0.6	0.6			0.25										
10	3	20		15	2	1.5			0.1										
16	1	24	6		0.6	0.6			0.4										
10	1.5	25		8	0.75	0.6			0.4										
10	2	18		15		1.5			0.4										
10	1	20		15				2.0	0.02										
10	1	19		14					0.4										
24.5	1	19.5		12	1	0.8	2.15	24.5	0.07										

## Star Guide Key to Recommended Tools

Material Designations	
 Unalloyed Steels	 Stainless Steels
 Cast Irons	 High Temp. Alloys
 Alloyed Steels	 PH Stainless
 Aluminum & Alloys	 Hard Materials










NEXT ▶

# MATERIALS CROSS REFERENCE CHART

Material Group	Country/Standard							
	Commercial Designation	Allvac Designation	Allegheny Ludlum Designation	USA	GERMANY/ITALY		U.K.	FRANCE
				AMS	W.-Nr.	DIN		AFNOR
Cobalt based alloys	M 204							
Cobalt based alloys	M 205							
Cobalt based alloys	MAR-M 302					CoCrW10TaZrB		
Cobalt based alloys	MAR-M 322					CoCr22W9TaZrNb		
Cobalt based alloys	MAR-M 509					CoCr24Ni10WtaZrB	3146-3	
Cobalt based alloys	MAR-M 905							
Cobalt based alloys	MAR-M 918					CoCr20Ni20Ta		
Cobalt based alloys	Stellite 1							KC 33 W13
Cobalt based alloys	Stellite 6							KC 26 NW
Cobalt based alloys	Stellite 12							KC 28 W8
Cobalt based alloys	V-36					CoCr25Ni20M0WNb		
Cobalt based alloys	WI-52					CoCr21Mo11W		
Cobalt based alloys	X 40			ASTM A567		CoCr25NiW	3146-2	
Cobalt based alloys	X 45							
Cobalt based alloys	X 50							

Material Group	Country/Standard							
	Commercial Designation	Allvac Designation	Allegheny Ludlum Designation	USA	GERMANY/ITALY		U.K.	FRANCE
				AMS	W.-Nr.	DIN		AFNOR
Nickel based alloys	AL 22		AL 22	ASME SB575				
Nickel based alloys	Allcor	Allvac Allcorr						
Nickel based alloys	Astroloy	Allvac Astroloy						
Nickel based alloys	Duranickel 310							
Nickel based alloys	GMR 235			AISI:686				
Nickel based alloys	GMR 235-D					NiCr16MoAl		
Nickel based alloys	Hastelloy B	Nickelvac H-B		5396A		S-NiMo30		ND27FeV
Nickel based alloys	Hastelloy B-2	Nickelvac H-B-2						
Nickel based alloys	Hastelloy C			5388C		NiCr17Mo17FeW		NC17DWY
Nickel based alloys	Hastelloy D							
Nickel based alloys	Hastelloy N	Nickelvac H-N						
Nickel based alloys	Hastelloy R235							
Nickel based alloys	Hastelloy W	Nickelvac H-W						
Nickel based alloys	Hastelloy X	Nickelvac H-X	ALTEMP HX	5536	2.4665	NiCr22FeMo	HR6,204	NC22FeD
Nickel based alloys	Haynes 75							
Nickel based alloys	HS 27					NiCo32Cr26Mo		KC20WN
Nickel based alloys	IN 100			5397		NiCo15Cr10MoAlTi		NK15CAT
Nickel based alloys	IN 713							
Nickel based alloys	Incoloy 020			ASME SB463	2.4660			
Nickel based alloys	Incoloy 804							
Nickel based alloys	Incoloy 825	Nickelvac 825	AL 825	ASME SB424	2.4858	NiCr21Mo	3072-76	NC21FeDU
Nickel based alloys	Incoloy 901			5660		NiFe35Cr14MoTi		Z8NCDT42
Nickel based alloys	Incoloy 903							
Nickel based alloys	Incoloy 925							
Nickel based alloys	Inconel 600	Nickelvac 600	AL 600	5540	2.4816	NiCr15Fe	3072-76	NC15Fe
Nickel based alloys	Inconel 601	Nickelvac 601	AL 601	5715	2.4851			
Nickel based alloys	Inconel 617	Nickelvac 617			2.4663			
Nickel based alloys	Inconel 622				2.4602			
Nickel based alloys	Inconel 625	Nickelvac 625	ALTEMP 625	ASME SB443	2.4856	NiCr22Mo9Nb		NC22FeDNB

## Star Guide Key to Recommended Tools

Material Designations					
	<b>P</b>  Unalloyed Steels	<b>M</b>  Stainless Steels	<b>K</b>  Cast Irons	<b>S</b>  High Temp. Alloys	
	<b>P</b>  Alloyed Steels	<b>M</b>  PH Stainless	<b>N</b>  Aluminum & Alloys	<b>H</b>  Hard Materials	

# MATERIALS CROSS REFERENCE CHART

Ni	Fe	Cr	Mo	W	Si	Mn	C	Al	Ti	P	S	Others	Cutting speed range Vc ft./min.						
													25	50	75	100	125		
24.5		18.5		12	1	1			0.07										
24.5		18.5		12			2.75		0.07										
		21.5		10					0.85			Ta 9.0							
		21.5		9	0.1	0.1		0.75	1.0			Ta 4.5, Zr 2.25							
10	1	23.5		7	0.1	0.1		0.2	0.6			Ta 3.5, Zr 0.5							
20		20						0.5	0.05			Ta 7.5, Zr 0.1							
20	0.4	20			0.1	0.1			0.05			Ta 7.5, Zr 0.1							
		33		13			2.5												
		26		5			1.0					Nb 6.0							
		29		9			1.8												
20	3	25	4	2	0.4	1			0.26			Nb 2.0							
1	2	21		11	0.25				0.45			Nb 2.0							
10.5	1.5	25.5		7.5	0.75	0.75			0.5										
10.5	2	25.5		7		0.7			0.25			B 0.01							
20.5	4	22.5		12					0.75										

Fe	Co	Cr	Mo	W	Si	Mn	C	Al	Ti	P	S	Others	Cutting speed range Vc ft./min.						
													25	50	75	100	125		
2.5		20.6	13.9	2.65															
		31.0	10.0	2.0			0.02	0.25	0.25			Nb 0.4							
	17.0	15.0	5.0				0.04	4.0	3.5			B 0.025							
0.6			0.5		1.0	0.5		4.4	0.6										
10.0		15.5	5.2		0.4	0.2	0.15	3.0	2.0										
4.5		15.5	5.0				0.15	3.5	2.5			B0.05							
5.0	2.0	1.5	28.0		0.05	0.5	0.02					V 0.4							
1.0	0.5	0.5	16.0		0.05	0.5	0.01			0.02	0.015								
6.0	2.0	15.0	17.0	5			0.04												
2.0		1.0			9.0	1.0	0.1					Cu 3.0							
4.0		7.0	16.5				0.02												
10.0	2.5	15.5	5.5				0.15	2	2.5										
4.0		5.0	24.5				0.02												
18	1.5	22	9.0	0.6			0.1												
5.0		20.0					0.12	0.25	0.4			Cu 0.5							
2.0	31.5	26.0	6.0				0.4												
	15.0	10.0	3.0				0.18	5.5	4.7			V 1.0							
2.5		13.0	4.6		0.4	0.2	0.18	6.0	0.8			Nb 2.6							
37		20	2.5									Nb 0.6 Cu 3.5							
25.4		29.5			0.5	0.75	0.06	0.25	0.6			Cu 0.4							
30		21.5		3.0	0.5	0.65	0.03	0.2	0.9			Cu 2.25							
35.3		13.45	6.20		0.22	0.48	0.05		2.5										
42.0	15.0							0.7	1.4			Nb3.0							
28		21	3					0.3	2.1			Cu 1.8							
8.0		15.5					0.075												
14.0		23.0			0.2	0.5	0.05	1.3			0.008	Cu 0.5							
	12.5	22	9.0				0.07	1.0											
2.3		20.5	14.2	3.2															
2.5		21.5	9.0				0.05	0.3	0.3			Cb 3.7							









## Star Guide Key to Recommended Tools

Material Designations						
	<b>P</b>  Unalloyed Steels	<b>M</b>  Stainless Steels	<b>K</b>  Cast Irons	<b>S</b>  High Temp. Alloys		
	<b>P</b>  Alloyed Steels	<b>M</b>  PH Stainless	<b>N</b>  Aluminum & Alloys	<b>H</b>  Hard Materials		

# MATERIALS CROSS REFERENCE CHART

Material Group	Country/Standard							
	Commercial Designation	Allvac Designation	Allegheny Ludlum Designation	USA	GERMANY/ITALY		U.K.	FRANCE
				AMS	W.-Nr.	DIN	AFNOR	
Nickel based alloys	Inconel 690	Nickelvac 690			2.4642			
Nickel based alloys	Inconel 700					NiCo28Cr15MoAlTi		NK27CADT
Nickel based alloys	Inconel 702			5550				
Nickel based alloys	Inconel 706	Allvac 706		57-2				
Nickel based alloys	Inconel 713			5391		G-NiCr13Al16MoNb	3146.3	NC13AD
Nickel based alloys	Inconel 718	Allvac 718	ALTEMP 718	5383	2.4668	NiCr19Fe19NbMo	HR8	NC19FeNb
Nickel based alloys	Inconel 718-OP	Allvac 718-OP						
Nickel based alloys	Inconel 720	Allvac 720						
Nickel based alloys	Inconel 721							
Nickel based alloys	Inconel 722	Nickelvac W-722		5541		NiCr16FeTi		NC16Feti
Nickel based alloys	Inconel 725							
Nickel based alloys	Inconel 751	Nickelvac X-751			2.4694			
Nickel based alloys	Inconel X-750	Nickelvac X-750	ALTEMP 750	5542	2.4669	NiCr16FetTi		NC15FeTNb
Nickel based alloys	Jessop G 81					NiCr20Co18Ti		
Nickel based alloys	Jethete M-252	Allvac M-252		5551		G-NiCr19Co		
Nickel based alloys	MAR-M 200					NiW13Co10Cr9AlTi		NKW10CATaHf
Nickel based alloys	MAR-M 246					NiCo10W10Cr9AlTi		
Nickel based alloys	MAR-M 421					NiCr16Co10WAlTi		
Nickel based alloys	MAR-M 432					NiCo20Cr16WAlTi		
Nickel based alloys	Monel 400	Nickelvac 400	AL 400	4544	2.4360	NiCu30Fe	3072-76	NU30
Nickel based alloys	Monel K 500	Nickelvac K-500		4676	2.4375	NiCu30Al	3072-76	
Nickel based alloys	Monel R 405			4674				
Nickel based alloys	Nimocast 713			5391A		G-NiCr13Al16MoNb	HC203	NC13AD
Nickel based alloys	Nimocast PD 16					NiFe33Cr17Mo		
Nickel based alloys	Nimocast PE 10						HC202	NC20N13
Nickel based alloys	Nimonic 105				2.4634	NiCo20Cr15MoAlTi	HR3	NCKD20ATV
Nickel based alloys	Nimonic 115				2.4636	NiCo15Cr15MoAlTi	HR401, 601	NCVK15ATD
Nickel based alloys	Nimonic 75				2.4630	NiCr20Ti	HR5, 203-4	NC20T
Nickel based alloys	Nimonic 80A	Nickelvac 80 A			2.4631	NiCr20TiAl	HR401, 601	NC20TA
Nickel based alloys	Nimonic 86							
Nickel based alloys	Nimonic 90	Nickelvac N-90			2.4632	NiCr20Co18Ti	HR2,202	NCK20TA
Nickel based alloys	Nimonic 901	Nickelvac 901		5660, 5661	2.4662	NiCr15MoTi		Z8NCDT42
Nickel based alloys	Nimonic 95							
Nickel based alloys	Nimonic C-22	Nickelvac C-22						
Nickel based alloys	Nimonic C-263	Nickelvac C-263	ALTEMP 263		2.4650	NiCr20CoMoTi	HR10	NCK20D
Nickel based alloys	Nimonic C-276	Nickelvac C-276	AL 276	ASME SB575	2.4819			
Nickel based alloys	Nimonic PE 13			5536E		NiCr22Fe18Mo	HR6,204	NC22FeD
Nickel based alloys	Nimonic PE 16					NiFe33Cr17Mo	HR207	NW11AC
Nickel based alloys	Nimonic PK 25			5751A				NKCD20ATU
Nickel based alloys	Nimonic PK 31							
Nickel based alloys	Nimonic PK 33					NiCr20Co16MoTi	5057	NC19KDU/V
Nickel based alloys	R-235							
Nickel based alloys	Refractaloy 26			AISI:690				Z6NKCDT38
Nickel based alloys	René 100					NiCo15Cr10MoAlTi		
Nickel based alloys	René 125							
Nickel based alloys	René 41	Rene 41		5712, 5713		NiCr19Co11MoTi	NC19KDT	
Nickel based alloys	René 63							

## Star Guide Key to Recommended Tools

Material Designations			
 P	Unalloyed Steels	 M	Stainless Steels
 K	Cast Irons	 S	High Temp. Alloys
 P	Alloyed Steels	 M	PH Stainless
 N	Aluminum & Alloys	 H	Hard Materials

# MATERIALS CROSS REFERENCE CHART

Fe	Co	Cr	Mo	W	Si	Mn	C	Al	Ti	P	S	Others	Cutting speed range Vc ft./min.					
													25	50	75	100	125	
9.0		29.0			0.2	0.2	0.25				0.007	Cu 0.2	25-50					
0.7	28.5	15	3.7		0.3	0.1	0.12	3.0	2.2					25-50				
0.4		15.6			0.2	0.05	0.04	3.4	0.7					25-50				
		16.0					0.03		1.8			Cb 2.9	25-50					
		12	4.5				0.13	6	0.6				25-50					
17.2		19.0	3.1				0.02	0.5	0.9			Cb 5.2	25-50					
17.2		19.0	3.1				0.02	0.5	0.9			Cb 5.2	25-50					
	14.7	18	3	1.25				2.5	5				25-50					
8.0		16			0.15	2.25	0.07	0.1	3.0			Cu0.2	25-50					
7.0		15.5					0.04	0.7	2.4				25-50					
7.5		21	8					0.3	1.5			Nb 3.5	50-75					
7.0		15.5			0.2	0.5	0.05	1.2	2.3		0.005	Cb 1.1, Cu 0.2	25-50					
7.0		15.5					0.04	0.7	2.5			Cb 0.95	25-50					
0.5	16.9	20.6			0.2	0.5	0.08	1.5	2.5				25-50					
2.5	10.0	19.0	9.75				0.15	1.0	2.5			B 0.007	25-50					
	10.0	9.0		12.5			0.15	5.0	2.0			Nb1.0	25-50					
	10.0	9.0	2.5	10.0			0.15	5.5	1.5			Ta1.5	25-50					
	10.0	15.5	1.7	3.5			0.15	4.25	1.75			Nb1.75	25-50					
	20.0	15.5		3			0.15	2.5	4.3			Nb2.0	25-50					
1.2					0.25		0.15				0.01		50-75					
1.0					0.25	0.7	0.1	2.7	0.6		0.01		50-75					
1.25					0.25	1.0	0.15					Cu31.5	50-75					
		13.5	4.5				0.12	6.0	0.9				25-50					
34.0		16.5	3.3				0.06	1.2	1.2				25-50					
3.0		20.0	6.0	2.5			0.03						50-75					
0.5	20	14.75	5		0.5	0.5	0.1	4.7	1.2			Cu	25-50					
	13.2	14.2	4				0.16	5	4			Zr	25-50					
4		20			0.45	0.45	0.45	0.1	0.35			Cu+S	25-50					
0.55		19.5			0.2	0.55	0.08	1.4	2.4			Cu+S	25-50					
		25	10									Ce 0.03	50-75					
0.3	18.0	19.5					0.065	1.4	2.4				25-50					
35.0		12.5	6.0				0.05		2.8			B 0.015	25-50					
5.0	18.0	19.5			1.0	1.0	0.1	2.0	3.5				25-50					
4.0	1.2	21.2	13.5	3.0	0.04	0.2	0.07			0.01		V 0.17	25-50					
	20.0	20.0	5.85				0.06	0.45	2.15				25-50					
5.0	0.5	15.5	16.0	3.5			0.01						25-50					
18.5	1.5	21.75	9	0.6	0.5	0.5	0.1						25-50					
1.2		16.5	3.5				0.05	1.2	1.2				50-75					
	19.5	19	4		0.75	0.75	0.08	2.9	2.9			B 0.01	25-50					
	14	20	4.5					0.4	2.3			Nb5	25-50					
0.5	14	18	7		0.25	0.25	0.05	2.1	2				50-75					
10.0	1.15	15.0	5.5		0.3	0.1	0.12	20	2.5				25-50					
16.0	20.0	18.0	3.2		1.0	0.8	0.03	0.2	2.8				25-50					
	15.0	10.0	3.0				0.18	5.5	4.7			V1.0	25-50					
	10.0	8.9	2.0	7.0			0.1	4.7	2.5			Hf1.05, Ta3.0	25-50					
3.0	11.0	19.0	9.75				0.06	1.6	2.5			B 0.007	25-50					
3.5	15.0	14.0	6.0	3.5	0.2	0.1	0.05	3.8	2.5				25-50					

## Star Guide Key to Recommended Tools





Material Designations						
	<b>P</b>  Unalloyed Steels	<b>M</b>  Stainless Steels	<b>K</b>  Cast Irons	<b>S</b>  High Temp. Alloys		
	<b>P</b>  Alloyed Steels	<b>M</b>  PH Stainless	<b>N</b>  Aluminum & Alloys	<b>H</b>  Hard Materials		

# MATERIALS CROSS REFERENCE CHART

Material Group	Country/Standard							
	Commercial Designation	Allvac Designation	Allegheny Ludlum Designation	USA	GERMANY/ITALY		U.K.	FRANCE
				AMS	W.-Nr.	DIN		AFNOR
Nickel based alloys	René 77							
Nickel based alloys	René 80							
Nickel based alloys	René 95							NC14K8
Nickel based alloys	TRW VIA					NiTa9Co8W6CrAl		
Nickel based alloys	Udimet 500			AMS:684		NiCr18CoMoAlTi		NCK19DAT
Nickel based alloys	Udimet 520	Allvac 520						
Nickel based alloys	Udimet 630					NiCr19NbMo		
Nickel based alloys	Udimet 700			AMS:687		NiCo15Cr15MoAlTi		NCKD20AT
Nickel based alloys	Udimet 710							NCK18TDA
Nickel based alloys	Udimet 718			5583		NiCr19Fe19NbMo	HR8	NC19FeNb
Nickel based alloys	Waspaloy	Allvac Waspaloy		5544	2.4654	NiCr20Co14MoTi		NC20K14

Material Group	Country/Standard							
	Commercial Designation	Allvac Designation	Allegheny Ludlum Designation	USA	GERMANY/ITALY		U.K.	FRANCE
				AMS	W.-Nr.	DIN		AFNOR
Alpha Titanium alloys	Ti-5Al-2.5Sn	Allvac 5-2.5		ASTM: B 265		TiAl5Sn2	TA 14,17	T-A5E
Alpha Titanium alloys	Ti-7Al-4Mo			ASTM: B 381		TiAl7Mo4		
Alpha Titanium alloys	Ti-8Al-1Mo-1V	Allvac 8-1-1		4915, 4933, 4972		TiAl8Mo1V1		
Alpha Titanium alloys	Ti-6Al-4Zr-2Mo-2Sn	Allvac 6-2-4-2		4919, 4975, 4976		TiAl6Zr4Mo2Sn2		
Alpha Beta Titanuim alloys	Ti-6Al-4V	Allvac 6-4		4906, 4920,4928, 4965, 4967		TiAl6V4	TA 10-13; TA 28	T-A6V
Alpha Beta Titanuim alloys	Ti-6Al-6V-2Sn	Allvac 6-6-2		4971		TiAl6V6Sn2		
Alpha Beta Titanuim alloys	Ti-4Al-4Mo-2Sn-0.5Si	Allvac 4-4-2				TiAl4Mo4Sn2Si0.5	5103	T-A4DE
Alpha Beta Titanuim alloys	Ti-4Al-4Mo-4Sn-0.5Si					TiAl4Mo4Sn4Si0.5	5203	
Alpha Beta Titanuim alloys	Ti-7Al-4Mo			ASTM: B 381		TiAl7Mo4		
Alpha Beta Titanuim alloys	Ti-6Al-5Zr-0.5Mo-0.25Si					TiA6Zr5Mo0.5Si0.25		T-AGZ-50
Alpha Beta Titanuim alloys	Ti-6Al-5Zr-4Mo-Cu-0.2Si					TiAl6Zr5Mo4CuSi0.2	M201	
Alpha Beta Titanuim alloys	Allvac 3-2.5	Allvac 3-2.5		4943, 4944				
Alpha Beta Titanuim alloys	Allvac 6-4ELI	Allvac 6-4ELI		4907, 4930, 4931				
Alpha Beta Titanuim alloys	Allvac 6-2-4-6	Allvac 6-2-4-6		4981				
Alpha Beta Titanuim alloys	Allvac Ti-17	Allvac Ti-17		4995				
Beta Titanuim alloys	Ti-13V-11Cr-3Al	Allvac 13-11-3		4917		TiV13Cr11Al3		
Beta Titanuim alloys	Ti-8Mo-8V-2Fe-3Al							
Beta Titanuim alloys	Ti-3Al-8V-6Cr-4Mo-4Zr	Allvac 38-644						
Beta Titanuim alloys	Ti-11.5Mo-6Zr-4.5Sn							
Pure Titanium	Ti 99.5	Allvac 70, Ti CP-4		ASTM: B381F4		Ti 99.5	TA 6	AIR: 9182 T60
Pure Titanium	Ti 99.6	Allvac 55, Ti CP-3		ASTM: B381F3		Ti 99.6		AIR: 9182 T50
Pure Titanium	Ti 99.7	Allvac 40, Ti CP-2		ASTM: B381F2		Ti 99.7a	TA 2-5	AIR: 9182 T40
Pure Titanium	Ti 99.8	Allvac 30, Ti CP-1		ASTM: B381F1		Ti 99.8	TA 1	AIR: 9182 T35
Austempered ductile iron	269-321			125/80/10 (grade 1)		EN-GJS-800-8		
Austempered ductile iron	269-321			850/550/10 (grade 1)		EN-JS1100		
Austempered ductile iron	302-363			150/100/7 (grade 2)		EN-GJS-1000-5		
Austempered ductile iron	302-363			1050/700/7 (grade 2)		EN-JS1110		
Austempered ductile iron	341-444			175/125/4 (grade 3)		EN-GJS-1200-2		
Austempered ductile iron	341-444			1200/850/4 (grade 4)		EN-JS1120		
Austempered ductile iron	444-555			230/185/--- (grade 5)		EN-GJS-1400-1		
Austempered ductile iron.	444-555			1600/1300/-- (grade 5)		EN-JS-1130		

## Star Guide Key to Recommended Tools

Material Designations			
 P	Unalloyed Steels	 M	Stainless Steels
 K	Cast Irons	 S	High Temp. Alloys
 P	Alloyed Steels	 M	PH Stainless
 N	Aluminum & Alloys	 H	Hard Materials

# MATERIALS CROSS REFERENCE CHART

Fe	Co	Cr	Mo	W	Si	Mn	C	Al	Ti	P	S	Others	Cutting speed range Vc ft./min.						
													25	50	75	100	125		
0.4	15.0	15.0	4.2		0.1	0.1	0.07	4.3	3.3										
	9.5	14.0	4.0	4.0			0.17	3.0	5.0										
	8.0	14.0	3.5	3.5			0.15	3.5	2.5			Nb3.5							
	7.5	6.0	2.0	5.8			0.13	5.4	1.0			Nb0.5, Ta9.0							
	19.0		4.0		0.1	0.1	0.07	3.0	3.0										
	12	19	6	1				2	3										
18.0	18.0		3.0				0.03	0.5	1.0			Nb6.5							
	16.5	15.0	5.0				0.07	4.4	3.4										
	15.0	18.0	3.0	1.5			0.07	2.5	5.0										
18.0		18.0	3.0				0.05	0.6	1.0			Nb+Ta5.2							
	13.0	19.5	4.3				0.05	1.40	3.0			Zr .07							

Al	Sn	Mo	V	Zr	Si	Others	Cutting speed range Vc ft./min.												
							25	50	75	100	125								
5.0	2.5																		
7.0		4.0																	
8.0		1.0	1.0																
6.0	2.0	2.0		4.0															
6.0			4.0																
5.5	2.0		5.5																
4.0	2.0	4.0			0.55														
4.0	4.0	4.0			0.5														
7.0		4.0										Fe 0.3							
6.0		0.5		5.0	0.25														
6.0		4.0		5.0	0.2							Cu 1.0							
3.0			2.5									Fe 0.13							
6.0												Fe 0.2							
6.0	2.0	6.0		4.0								Fe 0.10							
5.0	2.0	4.0		2.0								Cr 4.0							
3.0			13.0									Cr 11.0							
3.0		8.0	8.0																
3.0		4.0	8.0	4.0								Cr 6.0							
	4.5	11.5		6.0															

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 d.b.a. Allvac.

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Material Designations							
	<b>P</b>	Unalloyed Steels	<b>M</b>	Stainless Steels	<b>K</b>	Cast Irons	
	<b>P</b>	Alloyed Steels	<b>M</b>	PH Stainless	<b>N</b>	Aluminum & Alloys	<b>S</b>
					<b>H</b>	Hard Materials	