

Material & Manufacturing Technology

FUJILLOY™ Line Up*

Grade Type	Grade	HIP	Density	Hardness		TRS MPa	Tensile Strength MPa	Compressive Strength MPa	K _{IC} MPa· m ^{1/2}	Young's Modulus of Elasticity GPa	Poisson ratio	Thermal Conductivity W/m·K	Mean thermal Expansion Coefficient MK ⁻¹ (×10 ⁻⁶)			*2 Wear Resistance X10 ⁻⁵ cm ³ /rev	*3 Rcorr 24hr /m ²	*4 CIS Coad
													RT- 400	RT- 600	RT- 800			
Super & Ultra Fine Grade	TFS06	HIP	14.55	95.0	HRA	4200	2220	6880	4.9	575	0.20	42	5.3	5.6	5.9	0.10	1.0	VF-10
	TF05	HIP	14.60	95.1	HRA	1470	810	6660	3.3	610	0.21	25	5.0	5.2	5.5	0.04	6.8	VF-10
	F08	HIP	14.30	93.5	HRA	3920	2140	6280	5.2	560	0.22	29	5.5	5.7	6.0	1.1	2.6	VF-10
	F09	HIP	14.00	93.0	HRA	4410	2450	6080	6.5	540	0.22	42	5.7	6.1	6.4	2.1	1.0	VF-10
	F10	HIP	14.40	92.5	HRA	3820	2110	5880	5.4	560	0.22	42	5.1	5.5	5.8	2.6	0.8	VF-20
Fine Grade	F20	HIP	13.90	91.0	HRA	3480	1910	5390	6.5	520	0.23	42	5.8	6.2	6.6	6.1	1.1	VF-30
	N05	HIP	14.95	93.5	HRA	2700	1480	5880	6.0	620	0.21	50	4.6	4.9	5.2	0.2	89	VM-10
Medium Grade	N10	HIP	14.95	92.5	HRA	3240	1770	5690	5.1	620	0.22	80	4.6	5.1	5.3	1.5	0.3	VM-20
	D10	HIP	15.20	92.0	HRA	2940	1620	5690	4.5	640	0.21	97	4.6	4.9	5.1	1.6	0.8	VM-20
	D20		14.95	91.5	HRA	2890	1570	5400	6.7	620	0.21	95	4.7	5.0	5.2	2.4	1.3	VM-30
	D40		14.55	90.0	HRA	3290	1810	4900	8.9	560	0.22	90	5.1	5.5	5.8	5.8	0.5	VM-40
	D50		14.35	89.0	HRA	3330	1810	4610	11	540	0.22	88	5.4	5.8	6.1	7.8	0.6	VM-40
Medium Coarse Grade	D60		14.05	88.0	HRA	3430	1860	4310	(15)	520	0.23	82	5.7	6.1	6.5	14	1.1	VM-50
	G55		14.50	88.5	HRA	3140	1720	4610	12	560	0.22	105	5.1	5.5	5.8	12	0.6	VC-50
	G65		14.05	86.5	HRA	3040	1670	3920	(18)	520	0.23	97	5.7	6.1	6.5	18	1.8	VC-60
	G70		13.70	85.0	HRA	2940	1620	3530	(24)	490	0.23	94	6.0	6.5	6.9	21	0.9	VC-60
	G85		13.35	84.0	HRA	3090	1720	3330	(33)	460	0.24	87	6.5	7.0	7.4	23	0.3	VC-70
Coarse Grade	C50		14.85	88.5	HRA	2600	1420	4610	10	590	0.21	120	4.8	5.2	5.4	5.1	0.6	VC-50
	C60		14.45	87.0	HRA	2840	1570	4210	(18)	550	0.22	109	5.3	5.7	6.0	13	2.5	VC-50
	C70		14.00	85.5	HRA	2750	1520	3730	(22)	520	0.23	103	5.7	6.1	6.5	20	1.0	VC-60
	TC79		13.60	84.0	HRA	2550	1470	3330	(25)	490	0.23	96	6.2	6.7	7.2	24	0.3	VC-70
	C89		13.30	82.5	HRA	2550	1470	3140	(40)	470	0.24	90	6.6	7.0	7.6	28	0.4	VC-70
Super Coarse Grade for rolls for hot rolling mill	C95		13.00	81.5	HRA	2500	1370	2940	(52)	420	0.24	78	7.2	7.6	8.1	27	0.4	VC-80
	U61	HIP	14.40	85.5	HRA	2060	1130	3430	(19)	580	0.22	105	5.4	5.8	6.1	12	5.9	RC-60
	TUC72	HIP	14.15	86.0	HRA	2500	1180	3530	(25)	560	0.22	96	5.6	5.9	6.4	15	7.1	RC-60
	UC73	HIP	14.25	85.5	HRA	2450	1370	3430	(26)	560	0.22	96	5.7	6.1	6.4	10	1.6	RU-60
	U77	HIP	14.00	83.0	HRA	2110	1180	2550	(30)	530	0.23	96	5.9	6.4	6.8	16	9.2	RU-70
Nonmagnetic Nickel Binder Grade	U83	HIP	13.80	82.0	HRA	2260	1230	2260	(35)	510	0.23	88	6.2	6.7	7.1	17	1.6	RU-70
	U89	HIP	13.40	80.5	HRA	2260	1230	1860	(55)	480	0.24	71	6.7	7.2	7.7	19	2.9	RU-80
	MF10	HIP	14.25	92.5	HRA	3240	1770	4510	5.0	510	0.22	29	5.7	6.1	6.5	2.9	95	NF-20
	M45	HIP	14.40	89.5	HRA	3240	1770	3330	7.6	500	0.22	42	5.5	5.9	6.2	6.4	36	NM-40
	M50		14.10	87.0	HRA	3290	1810	3040	(14)	480	0.23	42	5.5	6.0	6.4	15	2.2	NM-50
Suitable grade (improved toughness and corrosion) for W-EDM process	M70	HIP	13.80	88.0	HRA	3430	1860	2940	7.4	470	0.23	42	6.3	6.6	7.1	13	188	NM-50
	MG95		13.60	82.5	HRA	2940	1570	1860	(40)	440	0.24	38	6.4	6.8	7.2	26	1.5	NC-70
	VF12	HIP	14.45	91.5	HRA	3600	1960	5390	7.6	560	0.22	72	5.4	5.6	5.9	4.3	1.6	VF-30
	TVD15	HIP	14.90	92.0	HRA	3230	1720	5490	6.4	620	0.21	89	4.7	5.0	5.3	1.9	1.2	VM-20
	VD45	HIP	14.20	90.0	HRA	3530	2160	4900	9.7	540	0.22	78	5.5	5.8	6.2	6.4	0.7	VM-40
Special Grade	TVG60	HIP	13.85	88.0	HRA	3400	1860	4410	(18)	520	0.23	90	5.9	6.2	6.6	16	1.6	VC-50
	VG86	HIP	13.25	85.0	HRA	2940	1670	3530	(28)	460	0.23	84	6.5	7.1	7.5	21	1.2	VC-60
	T15	HIP	7.05	91.0	HRA	2010	1080	3140	4.1	410	0.21	8	7.6	8.2	8.6	11	0.8	-
	BD20		12.50	91.5	HRA	1960	1080	4120	4.9	510	0.25	34	5.7	6.2	6.5	5.2	0.7	(P20)
	UN45	HIP	13.70	90.0	HRA	3240	1770	4000	9.1	490	0.23	42	6.2	6.7	7.0	6.4	202	-
Heavy alloy	TJF03	HIP	15.40	2400	Hv	2000	800	4000	2.2	670	0.17	43	4.5	4.6	4.8	1.4	169	VF-10
	J05	HIP	14.65	93.5	HRA	1320	740	3830	2.1	650	0.20	63	4.6	4.8	5.1	3.4	148	VM-10
Cu-W alloy	FHR96		17.6	34.5	HRC	1500	880	2400		350	0.28	54	5.4	5.5	5.7		80	-
Cera- mics	CE-08		14.0	93.5	HRB	1225	588					180	9.0	9.8	10.1			-
	Al ₂ O ₃	FCA10		3.93	1850	HV	440	2060	3.1	363	0.23	30	7.2	7.7	8.1			-
	ZrO ₂ -Al ₂ O ₃	FCY40A	HIP	5.00	1560	HV	1670	3630	5.3	294	0.28	8.4	8.7	9.1	9.4			-
	ZrO ₂ -Al ₂ O ₃	FCY20A	HIP	5.48	1410	HV	1860	4120	6.2	248	0.29	5.0	9.7	10.0	10.2			-
	Y-TZP	FCY0M		6.07	1270	HV	880	3730	7.1	200	0.31	4.6	10.7	11.1	11.3			-
	Mg-PSZ	FCZ10		5.72	890	HV	540	1370	12	180	0.33	1.7	8.8	8.4	8.3			-
Porous C.C.	Si ₃ N ₄	FCS60		3.20	1380	HV	880	2630	5.0	291	0.27	15	1.8	2.1	2.3			-
	PC20	-	10.9	(91.5)	HRA	190	-	990	-	-	-	47	4.8	5.1	5.4	-	-	-
KF2- alloy	SKH57+VC	KF235ME	HIP	7.8	68	HRC	2740	1770	3680	(26)	215	0.24	18	9.0	9.7	-		-
	SKH57+VC.TiN	KF261ME	HIP	7.6	70	HRC	2260	1670	3920	(19)	222	0.24	19	9.4	9.9	-		-
	SKH57+VC.TiN	KF263ME	HIP	7.3	72	HRC	1960	1570	3380	(6.6)	230	0.23	20	8.8	9.4	-		-

*1 Vickers indentation method on Nihara's formula.

*2 Wear resistance testing by ASTM B611-76. Load 10kg Wheel FC20 Aluminum oxide Slurry

*3 Corrosion resistance As for the usual solution test, Cl⁻ is 3000ppm, pH3 with sodium citrate solution.

*4 CIS019D of Japan Cemented Carbide Tool Manufacturers' Association Standard

* We might not produce due to form and dimension. We would appreciate that you would ask the inquiry every time.
And about the grade whose name starts with T except T15, we would need that you would discuss with you
about the delivery date and etc. before acceptance of orders.

* Up to 10/10/2008 This document does not show standard values, but shows representative examples. We would change them without notice.

Fuji Die Co., Ltd

2-17-10 Shimomaruko, Ota-ku, Tokyo TEL +81-3-3759-7181 FAX +81-3-3756-0290

URL <http://www.fujidie.co.jp>

E-mail export.kyoyu@fujidie.co.jp (Export Division)

10/10/2008