■COMPARISON OF DIE STEEL BY MANUFACTURERS

Category	International Standards related symbols					Hitachi Metals, Ltd.	Aichi Steel Works., Ltd.	Kobe Steel Co., Ltd.	Sanyo Special Steel Co., Ltd.	Daido Steel Co., Ltd.	Nippon Koshuha Steel Co., Ltd.	Nachi-Fujikoshi Corp.	Riken Seiko Co., Ltd.	Uddeholm (Sweden)	Bohler (Germany)
	JIS	AISI	DIN		ISO										
Carbon tool steel	SK105 (Previous select SK3)	W1-10			TC105	YC3	SK3		QK3	YK3	K3				K990
Alloy tool steel	SKS93					YCS3	SK301		QKSM	YK30	K3M	SK3M			
	SKS3					SGT	SKS3		QKS3	GOA	KS3	SKS3	RS3	ARNE	K460
	SKD1	D3		1.2080	X210Cr12	CRD	SKD1		QC1	DC1	KD1			SVERKER3	K100 K107
	SKD11	D2	X210Cr12	1.2379	X210Cr12W12	SLD	SKD11		QC11	DC11	KD11	CDS11	RD11	SVERKER21	K105 K110
	SKD11 (Modification)					SLD8 SLD10	AUD15		QCM8 QCM10	DC53	KD11S KD21	MDS9		SLEIPNER	K340
	CrSKD in matrix group					ARK1	SXACE		QCM7	DCX					
	SKD12			1.2363	X100CrMoV5	SCD	SKD12			DC12	KD12			RIGOR	K305
	Preharden 40HRC	A2				HPM2T				GO40F	KAP65			IMPAX	
	Preharden 50HRC or more					PRE2				CX1	RC55				
	Flame-hardened steel					HMD5 HMD1	SX105V SX4		QF3	GO5	FH5			FERNO	
	Low temperature air-cooled steel					ACD37	AKS3			GO4	KSM				
	High-impact steel					YSM	AKS4		QF1	GS5	KTV5	SRS6		PREGA COMPAX	K630
	Others					ACD8	AUD11 SX5 SX44					ICS22 MCR1		CALMAX VIKING ELMAX VANADIS4 VANADIS6 VANADIS10	K190
High-speed tool steel	SKH51	M2	H6.5.2	1.3343	HS6—5—2	YXM1			QH51	MH51	H51	SKH9	RHM1		S600
	SKH55 group		S6.2.5	1.3243	HS6—5—2—5	YXM4				MH55	HM35	HM35 HS53M	RHM5		S705
	SKH57 group		S10—4—3—10	1.3207	HS10—4—3—10	XVC5				MH8	MV10	HS93R HS98M FM38V	RHM7		S700
	Matrix group					YXR33 YXR3 YXR7			QHZ	MH85 MH88	KXM KMX2 KMX3	MDS1 MDS3 MDS7 MATRIX2 ATM3			
Powdered high-speed tool steel	SKH40				HS6—5—3—8	HAP40		KHA30		DEX40		FAX38		ASP30	S590
	Matrix group					HAP5R		KHA3VN		DEX—M1 DEX—M3					
	Others					HAP10									S690
								KHA32	SPM23	DEX21		FAX31		ASP23	S790
						HAP50				DEX60					S390
										DEX61		FAX55			
						HAP72		KHA60	SPM60	DEX80		FAXG1		ASP60	
								KHA77				FAX18			
												FAXG2			
								KHA30N							
								KHA33N							
								KHA3NH							
								KHA5NH							

Reference material："Special steel" November 2001

Matrix group：The tool steel type that accelerates tool wear at cutting and enhances its toughness

Processing method		Equipment	Required tools
Cutting	Boring on flanks and bottom	General purpose milling cutter NC milling cutter Machining center	Drills Reamers End mills Cutting tools
	Boring	Drilling machine Drill press Boring machine Jig borer	Drills Taps Reamers Cutting tools
	Machining cylinder	General purpose lathe NC lathe Turning center	Drills Reamers Taps Cutting tools
Grinding		Surface grinder Cylindrical grinder Jig grinder Profile grinder Forming grinder	Magnets grindstone
Electroerosion		E D M	Electrode master
		W E D M	Wire

Materials	Tool materials: Parts materials / Tools materials		Machined materials: Nonferrous metal	Untreated	Hardened materials	Quenched/Tempered
	For press die		(Al)	(Al—alloi) SS400(SS41) SKD11 S45C S50C DC53	(Be—Cu) SCM435 HPM2T	DC53 (Carbide) SKD11 SUJ2 SKH51 S45C SKS3
	For plastic mold		CU BsBM2	SKD61 STAVAX ESR RIGOR (SKD12group)	HPM7 PX5 HPM38 S—STAR STAVAX ESR NAK55 HPM1 NAK80 HPM50 FDAC DH2F	(Electroforming/outside) ORAVAR (Ade-hardened) HPM38 S—STAR SKD61 STAVAX ESR (Electroforming/inside) SUPREME MAS1C RIGOR (SKD12group)
		HRC	10	20	30	40 50 60 70
Drills Reamers	High-speed steel	SKH—				
	Carbide	Wn—Co				
Taps	High-speed steel	SKH—				
	Carbide	Wn—Co				
End mills	High-speed steel	SKH—				
	Carbide	Wn—Co				
Cutting tools	Boron	CBN				
	Diamond	D	(Nonferrous metal)			(Carbide)
Magnets grindstone	White fused alumina	WA				
	Brown fused alumina	A				
	Pink fused alumina	PA				
	Green silicon carbide	GC				
	Black silicon carbide	C	(Nonferrous metal)			
	Electrodeposited boron	CBN				
	Electrodeposited diamond	D	(Nonferrous metal)			(Carbide)
Electrode master	Electrolytic copper, Brass	CU—				
	Copper tungsten, Silver tungsten	—Wn				
Wire	Brass	CU—Zn				
	Tungsten	Wn				