

COMPARISON OF DIE STEEL BY MANUFACTURER

HARDNESS OF PRIMARY STEEL MATERIALS AND THE CORRESPONDING TOOLS

COMPARISON OF DIE STEEL BY MANUFACTURERS

Type	Symbols in foreign standards				ISO
	JIS	AISI	DIN	DIN	
Carbon tool steels	SK105 (former SK3)	W1-10			TC105
	SKS93				
	SKS3				
Alloy tool steel	SKD1	D3			X210Cr12
	SKD11	D2			X210Cr12M12
	SKD11 (modified)				
	Matrix group O/SKD				
	SKD12				X100CrMoV5
	Pre-hardened 40 HRC				
	Pre-hardened 50 HRC/60 HRC	A2			
	Flame-hardened steel				
	Low temperature cryogenic steel				
	Impact resistant steel				
High-speed tool steel	SKH51	M2	H6.5.2		HS6-5-2
	SKH55 group		S6.2.5		HS6-5-2-5
	SKH57 group		S10-4-3-10		HS10-4-3-10
Powdered high-speed tool steel	Matrix group				
	SKH40				HS6-5-3-8
	Matrix group				
Others					

Reference material: Special Steels Nov. 2001 edition

Hitachi Metals	Aichi Steel	Kobe Steel	Spring Special Steel	Daido Steel	Nippon Koshuha Steel Group	Nachi-Fujikoshi Corp	Riken Seiko	Uddeholm (Sweden)	Bohler (Germany)
YCS3	SK3		QK3	YK3	K3				K990
YCS3	SK301		QKSM	YK30	K3M	SK3M			
SGT	SKS3		QKS3	GDA	K3	SKS3	RS3	ARNE	K460
GRD	SKD1		QC1	DC1	KD1			SVERKER3	K100
SLD	SKD11		QC11	DC11	KD11	CDS11	RD11	SVERKER21	K105
SLD8	AUD15		OCM8	DC53	KD11S	MDS9		SLEIPNER	K340
SLD10	AUD15		OCM10	DC53	KD21				
ARK1	SXACE		OCM7	DCX	KD12			RIGOR	K305
SCD	SKD12		GO40F	DC12	KAP65			IMPAX	
HPM2T			CX1	GO40F	RC55				
PRE2			QF3	G05	FH5			FERNO	
HMD5	SX105V		QF1	G04	KSM				
HMD1	SX4			G04	KTV5			PREGA	K630
ACB37	AKS3			G55		SRS6		COMPAX	
YSM	AKS4							CALMAX	
ACD8	AUD11					ICS22		VIKING	
	SX5					MCR1		ELMAX	K190
	SX44							VANADIS4	
								VANADIS6	
								VANADIS10	
YXM1	YXM1		QH51	MH51	H51	SKH9	RHM1		S600
YXM4	YXM4			MH55	HM35	HM35	RHM5		S705
XVC5	XVC5		QHZ	MH8	MV10	HS99R	RHM7		S700
						FM38V			
YXR33	YXR3			MH85	KXM	MDS1			
YXR7	YXR7			MH88	KMX2	MDS3			
					KMX3	MDS7			
						MATRIX2			
						ATM3			
HAP40	HAP40	KHA30		DEX40		FAX38		ASP30	S590
HAP5R	HAP5R	KHA3VN		DEX-M1					
HAP10	HAP10			DEX-M3					
HAP50	HAP50	KHA32	SPM23	DEX21		FAX31		ASP23	S690
				DEX60					S390
				DEX61		FAX55			
HAP72	HAP72	KHA60	SPM60	DEX80		FAXG1		ASP60	
		KHA77				FAX18			
						FAXG2			
		KHA30N							
		KHA33N							
		KHA3NH							
		KHA5NH							

Matrix group: Tool steels which reduce the amount of large carbides, a cause of accelerated tool wear and reduced toughness during cutting, in order to improve cutting performance and increase tool toughness

Machining method	Equipment name	Tools required
Cutting	General purpose milling cutter	Drills Reamers End mills Cutting tools
	NC milling cutter	Drills Reamers End mills Cutting tools
	Machining center	Drills Reamers End mills Cutting tools
	Drilling machine	Drills Reamers End mills Cutting tools
	Boring machine	Drills Reamers End mills Cutting tools
Machining	Boring machine	Drills Reamers End mills Cutting tools
	Jig borer	Drills Reamers End mills Cutting tools
	General purpose lathe	Drills Reamers End mills Cutting tools
Grinding	NC lathe	Drills Reamers End mills Cutting tools
	Turning center	Drills Reamers End mills Cutting tools
	Surface grinder	Grindstones
	Cylindrical grinder	Grindstones
	Jlg grinder	Grindstones
Electric discharge	Profile grinder	Grindstones
	Forming grinder	Grindstones
	EDM	Electrode master
WEDM	WEDM	Wire

Parts material	Machined material										
	Non-ferrous metal	Untreated	Heat treated	Hardened/tempered							
Plastic mold material	(Al)	(Al-alloy) SS400 (SS41)	SCM435	S45C	S45C	DC53	DC53	DC53	DC53	DC53	DC53 (Carbide)
	CU	S45C S50C	HPM7	HPM2T	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11
Tool material	CU	STAVAX ESR	HPM7	HPM2T	S45C	SKS3	SKS3	SKS3	SKS3	SKS3	SKS3
	BsBM2	RIGOR (SKD12 group)	HPM7	HPM2T	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11
		STAVAX ESR	HPM7	HPM2T	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11
		RIGOR (SKD12 group)	HPM7	HPM2T	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11
		STAVAX ESR	HPM7	HPM2T	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11
		RIGOR (SKD12 group)	HPM7	HPM2T	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11
		STAVAX ESR	HPM7	HPM2T	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11
		RIGOR (SKD12 group)	HPM7	HPM2T	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11
		STAVAX ESR	HPM7	HPM2T	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11
		RIGOR (SKD12 group)	HPM7	HPM2T	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11	SKD11
HRC											
High-speed steel	SKH-										
	Wn-Co										
	SKH-										
	Wn-Co										
	SKH-										
	Wn-Co										
	CBN										
	D										
	WA										
	A										
Grindstones	PA										
	GC										
	C										
	CBN										
Electrode master	CU-										
	Wn										
	CU-Zn										
Wire	Wn										
	Tungsten										