

Machinery Steels

Grade	C	Si	Mn	P	S	Cr	Mo	Ni	HB as Supplied	Tensile Strength (KgF/mm ²)	Heat Treatment (°C)				Hardness (Hrc)	Application
											Normalizing	Annealing	Quenching	Tempering		
S 45 C	0.42 - 0.48	0.15 - 0.35	0.60 - 0.90	Max. 0.030	Max. 0.035				170 - 200	59 - 65	820 - 870	810	820 - 870	180 - 200	52 - 60	Mechanical Parts : Gears, shafts, Sprockets, pins,flanges, Bolt & Nuts, Etc.
											Air Cooling		Water Cooling			
													180 - 200	550 - 650		
S 50 C	0.47 - 0.53	0.15 - 0.35	0.60 - 0.90	Max. 0.030	Max. 0.035				190 - 210	60 - 74	810 - 860	800	810 - 860	180 - 200	58 - 62	Mechanical Parts : Gears, shafts, Sprockets, pins,flanges, Bolt & Nuts, Moulds Etc.
											Air Cooling		Water Cooling			
													180 - 200	550 - 650		
SCM 415	0.13 - 0.18	0.15 - 0.35	0.60 - 0.85	Max. 0.030	Max. 0.030	0.90 - 1.20	0.15 - 0.30		130 - 150		850 - 900	850	850 - 900	150 - 200	55 - 60	Mechanical Parts : High Stressed Gears, shafts, pins,flanges, Special Bolt & Nuts, Etc.
SCM 440	0.38 - 0.43	0.15 - 0.35	0.60 - 0.85	Max. 0.030	Max. 0.030	0.90 - 1.20	0.15 - 0.30		220 - 250	78 - 85	760 - 880	830 - 880	810 - 860	180 - 200	58 - 62	Mechanical Parts : Gears, shafts, Sprockets, pins,flanges, Special Bolt & Nuts, Etc.
											Air Cooling		Water Cooling			
													180 - 200	550 - 650		
SCM 439	0.36 - 0.43	0.15 - 0.35	0.60 - 0.90	Max. 0.030	Max. 0.030	0.60 - 1.00	0.15 - 0.30	1.60 - 2.00	280 - 300	95 - 102	820 - 870	820 - 870	810 - 860	180 - 200	45 - 55	Mechanical Parts : Highly Stressed Gears, shafts, pins, flanges, Special Bolt & Nuts, Etc.

Tool & Die Steels

Grade	C	Si	Mn	P,S	Cr	Mo	V	W	HB as Supplied	Tensile Strength (KgF/mm ²)	Heat Treatment (°C)				Hardness (Hrc)	Application
											Normalizing	Annealing	Quenching	Tempering		
SKD 61	0.32 - 0.42	0.80 - 1.20	Max. 0.50	Max. 0.030	4.50 - 5.50	1.00 - 1.50	0.80 - 1.20		Max. 229	Max. 80	820 - 870	820 - 870	1000 - 1050	550 - 650	53 - 55	Hot work dies, Suitable for Aluminium and Magnesium dies, Pressing Mould, Die casting Frame, Etc.

Plastic Mould Steels

Grade	C	Si	Mn	P	S	Cr	Mo	Ni	HB as Supplied	Tensile Strength (KgF/mm ²)	Heat Treatment (°C)				Hardness (Hrc)	Application
											Normalizing	Annealing	Quenching	Tempering		
SUS420 J2	0.26 - 0.40	Max. 1.00	Max. 1.00	Max. 0.040	Max. 0.030	12.00 - 14.00		Max. 0.60	Max. 235	Min. 740	760 - 800	760 - 800	1020 - 1050	400 - 750	52 - 58	Plastic Moulds, Pressure Casting Dies, Die Holder for Metal Extrusion, Knives, injection moulds, Glass mould, Nozzles, Slide, etc.

CHEMICAL COMPOSITION

Symbol of class	HB as Supplied	Tensile Strength (KgF/mm ²)	CHEMICAL COMPOSITION (%)								
			C	Cr	Mo	Mn	Si	Ni	V	W	
S 45 C	170 - 200	56 - 66	0.42 - 0.48			0.60 - 0.90	0.15 - 0.35				
S 55C	200 - 230	66 - 75	0.52 - 0.58			0.60 - 0.90	0.15 - 0.35				
SCM 415	130 - 150		0.12 - 0.18	0.85 - 1.25	0.15 - 0.35	0.55 - 0.90	0.15 - 0.35				
SCM 440	220 - 250	78 - 85	0.38 - 0.43	0.90 - 1.20	0.15 - 0.30	0.60 - 0.85	0.15 - 0.35				
SNCM 439	280 - 300	95 - 102	0.36 - 0.43	0.60 - 1.00	0.15 - 0.30	0.60 - 0.90	0.15 - 0.35	1.60 - 2.00			
SKD61	229 Max	78 Max	0.32 - 0.42	4.50 - 5.50	1.00 - 1.50	0.50 Max	0.80 - 1.20		0.80 - 1.20		
SUS420 J2	235 Max	740 Min	0.26 - 0.40	12.00 - 14.00		1.00 Max	1.00 Max	0.60 Max			

NEAREST COMPARISON TABLE

		JIS	AISI / SAE	DIN	ASSAB	BOHLER	DAIDO	HITACHI	KRUPP	NIPPON KOSHUHA	SANYO	THYSSEN / EWK
Machinery Steel	Carbon Steel	S45C	1045	C45	760	EMS45	DAKS-45	NS 1045	1191		S45C	THY1730
		S50C	1050	C50							S50C	THY1740
	Alloy Steel	SCM415	3115	15CrMo5	7210	ECN-150			5919		SCM415	
		SCM440	4140	42CrMo4	709	VCL-140	PDS-3	NS 4140	7225		SCM440	TEW7225
	SNCM439	4340	40NiCrMo6	705	VON-150		NS 4340			SNCM439	TEW6582	
Tool Steel	Cold Work Tool Steel	SKD11	D2	X155CeVMo 121	XW41	Special KNL	DC11 (DC53)	SLD	2379	KD11S	QCM8 (QC11)	THY2379
		SKS3				Amutit	SGT			KKS3	SKS3	
	Hot Work Steel	SKD61	H13	X40CDV5	8407	US ULTRA2	DAC	DAC	2344	KDA-1	QD61	THY2344
	Plastic Mould Steel	SUS420J2	P20	42CrMoV5-1						SF-420		
		P20								FINKL		THY2311