

(Technical Data)
Examples of Applicable Steels for Typical Products · Properties of Die Materials

Typical resins		Typical use	Required characteristics of mold materials	Suitable steels			
				Hitachi Metals, Ltd.	Daido Steel Co., Ltd.	Uddeholm Tool Co.	
General thermoplastic resins and thermosetting resins	General	Polyacetal Polypropylene Polystyrene Polyamide (nylon) ABS	Bumpers Radiator gullies Tail lamps Inner panels OA equipment Vacuum cleaners Gears	Machinability Abrasion resistance	HPM2 PX5 HPM7 NAK55 HPM1 DH2F FDAC PD613 HPM31	HOLDAX IMPAX RIGOR	
	Semigloss finished	ABS	Panels, Interior parts Top covers	Semigloss processability	CENA1	NAK80 IMPAX	
	Clear articles	Methacryl resin (acryl) Polystyrene	Dust covers Audio tape containers Cosmetic cases	Gloss processability	HPM38 CENA1	S - STAR NAK80 STAVAX IMPAX	
Glass fiber reinforced plastics	Thermoplastic	Polycarbonate Polyamide (nylon) ABS AS	Electronic parts Camera bodies Keyboards Electric tool housings Video tape housings	Ultra abrasion resistance	HPM1 } + Surface treatment FDAC } HPM31	NAK55 } + Surface treatment DH2F } PD613	IMPAX + Surface treatment RIGOR ELMAX
	Thermosetting	Phenol Epoxy Polyester	Gears Breakers IC Transister parts		HPM31 DAC HAP10 HAP40 HAP72	PD613 DHA1 DEX20 DEX40 DEX80	RIGOR ORVAR ASP - 23 ASP - 30 ASP - 60
Flame proof resins (UL standard)		ABS Polystyrene AS	TV cabinets CRT covers Hair driers	Corrosion resistance	HPM38 HPM77 (bass)	S - STAR PD742 STAVAX ELMAX RAMAX (bass)	
PVC		Vinyl chloride	Telephone casings, Pipes Eaves and downspouts, Containers	Ultra corrosion resistance	PSL	NAK101 STAVAX	
Ultra glossy finished goods		Methacryl resin (acryl) Polycarbonate	Lenses, Optical discs	Ultra gloss processability Anti-stain	HPM38S HPM38 YAG	S - STAR MAS1C STAVAX	
Plastic magnet		Ferrite resin	Magnet	Nonmagnetic, super hard	HPM75	—	

Classification	Hardness (HRC)	Property Steel type	Machinability	Ability to be mirror-finished	Semigloss processability	Electric discharge machinability, laser cuttable	Weldability	Toughness	Heat treatment deformability	Corrosion resistance	Wear resistance	Non-magnetic property	Thermal conduction	Remarks	
															As rolled steel
Prehardened steel	13 28	SCgroup SCMgroup							- -			- -	- -	S50C , S55Cgroup SCM440group	
	33 35	SCM (revised) SUSgroup							- -			- -	- -	AISI P20group 13Cr (revised), etc. SUS630group	
	40	SNCMgroup SKD61group AISI P21group							-			-	-	SNCMgroup SKD61group AISI P21group	
	60	SKD11group										-	-	Same machinability as in annealed state.	
Quenched/tempered steel	57	SUSgroup										-	-	Ditto. SUS440Cgroup	
	52	SUSgroup										-	-	Ditto. SUS420J2group	
	53 43	Maraging steel Non-magnetic steel										- -	- -	18Nigroup Hi - Mngroup	
Aluminum alloy tool die material	-	Alqueen 300							-			-	-	High strength Ar group	
Copper alloy	-	Beryllium copper								-			-	-	CUgroup
	-	Tellurium copper								-			-	-	
Nickel alloy	-	Solid lubricant-containing nickel alloy								-			-	-	Nigroup
	-	Hard nickel alloy								-			-	-	

Note: :Excellent, :Moderate, :Slightly poor.
The above table is prepared based on accepted opinions, and is not based on quantitative comparative values.

References : Die Technique Table 2, p. 51, August, 1995
Die Technique p. 45, October, 1993
Alqueen is a registered trademark of the Furukawa Electric Co., Ltd.