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LUNG KEE STEEL

LKM Steel Rainbow Chart

11-2012

Manufacturer	Material Grade	Comparable Standard AISI / JIS / DIN / UNS	Delivered Hardness (At Original Surface)	Typical Analysis on Major Chemical Content C	Si	Cr	Ni	Mn	Mo	V	W	Characteristics	Austenitizing Temperature / °C	Quenching Method	Tempering Temp. and Hardness Cross Reference 180°C	225°C	300°C	570°C	Applications
	Aubert & Duval																		
AUBERT&DUVAL	MEK4	DIN 1.8523	Prehardened to HB 350 - 400	0.4	-	3.0	-	-	1.0	0.2	-	High hardness and toughness. With nitriding process, surface hardness can be attained to 800HV or above	Prehardened Condition						Plastics mould with the requirement of high hardness, toughness and wear resistance. Surface hardness can be increased to 800 HV by nitriding
	ADC3	H11 Mod. / 1.2343 Mod. (High Purity Process)	Annealed to HB 235 (max.)	0.35	-	5.0	-	-	1.3	0.4	-	Strict and tight control on chemical composition and metallurgical grain structure, excellent toughness, excellent resistance to heat checking	Please refer to the corresponding product catalog for the details of heat treatment parameters						Suitable for large Al die casting moulds, Mg die casting moulds with excellent fatigue life
	SMV3W	H11 ESR / 1.2343 ESR	Annealed to HB 235 (max.)	0.4	1.0	5.0	-	0.4	1.3	0.5	-	Strict and tight control on chemical composition and metallurgical grain structure, homogeneous and stable quality, high material cleanliness, better toughness comparing to AISI H13, good resistance to heat fatigue							Suitable for small to medium Al die casting mould, Zn die casting mould; and hard injection moulds for PA,POM,PS, PE, EP plastics including glass fibres
	ASSAB Steel																		
ASSAB	IMPAX 718H	P20 Modified	Prehardened to HB 330 - 380	0.38	0.3	2.0	1.0	1.4	0.2	-	-	Pre-hardened type, high purity with isotropic microstructure contains 1.0% Ni	Prehardened Condition						High quality mould inserts, best suitable for plastic moulding of PS, PE, PP, ABS
	NIMAX	Special Steel	Prehardened to HB 360 - 400	0.1	-	3.0	1.0	2.5	-	-	-	Good polishability and texturability. Superior EDMing property and machiniability. High toughness, Very good weldability	Prehardened Condition						Plastic injection moulds like LCD TV, automobile, packaging. Holder material for forging and die-casting dies. Machine parts
	STAVAX S136	420 Mod., ESR	Annealed to HB 200 (approx.)	0.38	0.8	13.6	-	0.5	-	0.3	-	High purity, high polishability to mirror finish, with good corrosion resistance and low distortion after heat treatment	1025	Oil / Air	54	53	-	-	High quality mould inserts with mirror surface finish and good corrosion resistance, anti-corrosive cooling channel, best suitable for plastic moulding of PVC, PP, EP,PC, PMMA, machine parts for food processing machinery
	STAVAX S136H		Prehardened to HB 290 - 330										Prehardened Condition						
	MIRRAX S136 SUP	420 Mod., ESR	Annealed to HB 250 Max.	0.24	-	13.3	1.4	0.5	0.35	0.35	-	Corrosion resistance and toughness are better than S136	1020	Air	-	50	49	-	Suitable for big plastic mould with high precision requirement
	MIRRAX S136H SUP		Prehardened to HB 290 - 330									Corrosion resistance and toughness are better than S136H	Prehardened Condition						
	POLMAX	420 Mod. (ESR+VAR), Optical Grade	Annealed to HB 200 (approx.)	0.38	0.9	13.6	-	0.5	-	0.3	-	Ultra-high purity and extremely low segregation by double remelting process (ESR+VAR). Excellent polishability to attain optical requirement. Good corrosion resistance and low distortion after heat treatment	1025	Oil / Air	54	53	-	-	High quality moulds for lens, optical products, compact discs and medical applications
	ROYALLOY	Special Stainless Steel	Prehardened to HB 290-330	0.05	0.4	12.6	-	1.2	-	-	-	Superior machinability, excellent corrosion resistance, uniform and consistent hardness in all dimensions, excellent weldability	Prehardened Condition						Plastic mould bases with requirement of long run, corrosion resistance and high precision. Suitable for plastic and rubber moulds, machine parts that does not require high surface quality
	DIEVAR 8418	Special steel	Annealed to HB 160 (Max)	0.35	0.2	5.0	-	0.75	2.3	0.8	-	Good high tempering strength and high toughness, good high temperature strength, excellent hardenability and good temper resistance	Please refer to corresponding product catalogues for the detail of heat treatment procedures						Al, Mg die casting mould, die casting parts, Al extrustion molds, plastic hard tooling
	ORVAR 8407	H13, MICRODIZED + ESR	Annealed to HB 185 (approx.)	0.38	1.0	5.3	-	0.4	1.3	0.9	-	Hot work tool steel with high toughness and good high temperature strength	1020	Oil / Air	-	52	52	52	Die casting, extrusion, cold hobbing, mould for PA, POM,PS, PE, EP plastics
	CALMAX 635	High wear resistance multi-functional tool steel	Annealed to HB 200 (approx.)	0.6	0.35	4.5	-	0.8	0.5	0.2	-	Extremely high toughness and high wear resistance, good hardenability and weldability, good flame and induction hardenability to HRC56-60, with harden layer up to 5mm thickness	960	Air	60	58	55	-	High strength plastic mould and compacting die, suitable for molding fibre-reinforced plastics
	DAIDO Steel																		
DAIDO	PX88	P20 Modified	Prehardened to HB 280-310	Patent Pending								Good weldability, special alloying composition to reduce sensitivity due to weld crack	Prehardened Condition						Medium production run plastic mould with good surface finishing
	PAC5000	Special Steel (PX88/PX4 Mod.)	Prehardened to HB 336-362									Homogenous structure and hardness. Polishing up to #5000. Good weldability, special alloying composition to reduce sensitivity due to weld crack							Suitable for plastic moulds requiring high hardness without heat treatment
	NAK80	P21 Mod., VAR	Prehardened to HB 344-400	0.15	0.3	-	3.0	1.5	0.3	-	-	Pre-hardened type with high hardness, good polishability,excellent photo-etchability, good EDM machining and weldability							Moulds require high wear resistance and excellent surface finishing
	NAK-PRM	Special Steel	Prehardened to HB 344-400	Patent Pending								Newly developed from the concept of NAK80 with improvement on toughness, polishability and corrosion resistance	Prehardened Condition						Moulds with requirement of mix of toughness, polishability, corrosion resistance, e.g. rapid heat and cool technology. Suitable for making LCD TV/Monitor, Plasma TV housing
	PAT 868	Special Steel	Annealed to HB 229 (max.)	Patent Pending								Special alloying design and steel making process to provide the material with integrated properties of high toughness, anti-corrosion and good polishability	Please refer to the corresponding product catalog for the details of heat treatment parameters						Suitable for making plastic moulds with the adoption of rapid heat and cool technology. Good for plastic moulds with the requirement of high toughness, anti-corrosion and high polishability
	S-STAR	SUS 420 J2 Mod., ESR	Prehardened to HB 300-330	0.38	0.9	13.5	-	0.1	0.3	-	-	High mirror surface polishability with corrosion resistance.	Prehardened Condition						High precision plastic moulds with high mirror surface finishing
	S-STAR-A	SUS 420 J2 Mod., ESR	Annealed to HB 229 (max.)									High mirror surface polishability with corrosion resistance. Hardness can be obtained up to 50 - 52 HRC with proper heat treatment in order to obtain better polishability, wear resistance and/or corrosion resistance	Please refer to the corresponding product catalog for the details of heat treatment parameters						
	DH31-S	SKD61Modified	Annealed to HB 235 (max.)	Patent Pending								Good through-hardening properties especially for large moulds, excellent resistance to thermal shock and to thermal fatigue, excellent resistance to heat erosion	Please refer to the corresponding product catalog for the details of heat treatment parameters						Al, Mg Die casting moulds, Parts for die casting moulds, Al die extrusion moulds, Hard plastics molds
	DHA1	SKD61	Annealed to HB 229 (max.)	0.38	0.9	5.0	-	0.4	1.3	1.0	-	Good through-hardening properties, good resistance to thermal shock and thermal fatigue, good resistance to heat erosion	1030	Oil / Air	-	51	51	52	Zn, small size Al die casting moulds, Parts for die casting moulds, Al die extrusion moulds, Hard plastics moulds
	DHA-WORLD	Special Steel	Annealed to HB 229 (max.)	Patent Pending								Good through-hardening properties, good resistance to thermal shock and thermal fatigue, good resistance to heat erosion	Please refer to the corresponding product catalog for the details of heat treatment parameters						Medium to big size Al, Mg Diecasting mould with prolong tool life
	DC53	SKD11 Modified	Annealed to HB 255 (approx.)	Patent Pending								High toughness chromium cold work tool steel, high temperature tempering after the heat treatment can reach the high hardness of 62 HRC, especial good for much EDM wire cut works to reduce the breakage	Please refer to the corresponding product catalog for the details of heat treatment parameters						Suitable for stamping die, cold forming, deep drawing, thread rolling, punches for high speed blanking, stainless steels materials
	Finkl																		
Finkl	P20 HH	P20 Modified	Prehardened to HB 320-370	0.33	0.3	1.85	0.6	0.9	0.5	-	-	With special chemical composition adjustment and good forging process/forging ratio, mechanical properties are better than normal AISI P20 tool steels	Prehardened Condition						High quality mould inserts, best suitable for plastic molding of PA,POM, PS, PE, PP, ABS
	DRX (S7)	S7	Annealed to HB200 (Max)	0.5	0.3	3.25	-	0.7	1.4	-	-	High strength and high toughness. wear resistance with good shock resistance	940	Oil / Air	58	56	55	49	Suitable for plastic moulds that require higher wear resistance & toughness., e.g. thin wall, high GF (30-50%) plastic mould, hot foring, puching die., also the heavy duty (10mm thick material) cold shear, forming and bending tools
	Gröditz																		
Gröditz	XPM	P20 Modified	Prehardened to HRC 38-42 (HB 352-390)	0.26	-	1.50	1.05	-	0.5	-	-	Homogenous hardness. Improved properties such as machinability, heat conductivity, polishability, etchability and weldability which are better than AISI P20 tool steels	Prehardened Condition						Large plastic moulds such as car bumper, dashboard and housing for photocopier and printer
	XPM V ESR	P20 Modified	Prehardened to HRC 38-42 (HB 352-390)	0.26	-	1.50	1.05	-	0.5	-	-	ESR version of XPM. Reduction of anisotropy, impurities and segregation to provide better polishability							Suitable for large plastic moulds that require high surface quality, such as automobile headlights, rear view mirror, docerative parts, housing for lighting, LCD/LED TV, photocopier and printer
	LKM also provides SWG738, SWG738H, SWG2711, SWG2083, SWG2083H, SWG2316, SWG2083mod V ESR, SWG2316H, SWG2316H ESR, SWG2344, SWG2344 ESR, SWG2343, SWG2343 ESR and SWG2767 on stock. For inquiry, please contact our Sales or Steel Marketing departments.																		
	Lung Kee Special Steel																		
LKM SPECIAL STEEL	LKM P20 MOD	P20 Mod.	Prehardened to HB 250-330	Proprietory Chemical Composition								Pre-hardened type tool steel for plastic mould	Prehardened Condition						Suitable for core parts of plastic moulds and mould base
	LKM 2311	P20 / DIN 1.2311	Prehardened to HB 280-325	0.37	-	1.9	-	1.45	0.2	-	-	Pre-hardened type tool steel for plastic mould							High quality plastic mould with medium run production
	LKM 2312	P20 + S / DIN 1.2312	Prehardened to HB 280-325	0.37	-	1.9	-	1.45	0.2	-	-	Excellent machinability							High strength plastic mould base plates or core parts without surface requirements
	LKM 738	P20 + Ni / DIN 1.2738	Prehardened to HB 290-330	0.37	-	2.0	1.0	1.1	0.4	-	-	High quality pre-hardened type tool steel, uniform in hardness and high machinability							Mould with high toughness and good finishing
	LKM 738H		Prehardened to HB 330-370																
	LKM 838HS	P20 Mod.	Prehardened to HB 330-360	Patent Pending								With special adjustment to the chemical composition and steel making process, LKM838HS possesses a better polishability than LKM738H and LKM838H. Good EDM-ability							Suitable for plastic moulds requiring high hardness, good polishability and wear resistance
	LKM 818H	P20 Modified	Prehardened to HB 330-370	0.38	0.3	2.0	1.0	1.4	0.2	-	-	Pre-hardened type, high purity with isotropic microstructure contains 1.0% Ni							High quality mould inserts, suitable for plastic moulding of PA,POM, PS, PE, PP, ABS
	LKM 2711	DIN 1.2711	Prehardened to HB 335-380	0.55	-	0.7	1.7	0.8	0.25	-	-	High hardness and high toughness							Suitable for medium plastic moulds requiring high hardness with good toughness
	LKM 808E	P21 Mod., ESR	Prehardened to HB 360-415	0.1	-	-	3.0	1.5	0.35	-	-	High hardness, good polishability and etching properties							Plastic moulds with requirement of high hardness, good polishing and texturing
	LKM 420	420	Annealed to HB 240 (max.)	0.38	-	13.0	-	0.5	-	-	-	Good anti-rusting property. Hardness can be increased up to HRC 50 - 52 for plastic mould application	Please refer to the corresponding product catalog for the details of heat treatment parameters						Plastic mould with requirement of anti-rusting
	LKM 420H	420	Prehardened to HB 280-330	0.38	-	13.0	-	0.5	-	-	-	Good anti-rusting property	Prehardened Condition						Plastic mould or mould base with requirement of anti-rusting
	LKM 420HM	420, Modified	Prehardened to HB 260-320	0.38	-	12.0	Some	0.5	-	-	-	High Anti-rusting							Suitable for mould base that requires anti-rusting
	LKM 2083	420	Annealed to HB 240 (max.)	0.43	-	13.0	-	0.3	Some	-	-	Hardness can be obtained up to 50 - 52 HRC with proper heat treatment in order to obtain better polishability, wear resistance and/or corrosion resistance	1020	Oil / Air	56	56	55	52	Corrosion resistance plastic moulds
	LKM 2083H		Prehardened to HB 280-320									Pre-hardened type, corrosion resistance, high polishabity	Prehardened Condition						
	LKM 2316(Annealed) (Old Name: LKM2316A)	DIN 1.2316	Annealed to HB 250 max.	0.4	-	16.0	Some	0.5	1.0	-	-	Hardness can be obtained up to 47 HRC with proper heat treatment in order to obtain the better wear resistance and corrosion resistance than pre-hardened condition	1030	Oil / Air	47	46	45	-	High corrosion resistance plastic moulds
	LKM 2316H(Prehardened) (Old Name: LKM2316)		Prehardened to HB 265-320									Pre-hardened type, high corrosion resistance	Prehardened Condition						
	LKM 2316H ESR(Prehardened) (Old Name: LKM2316 ESR)	DIN 1.2316 ESR	Prehardened to HB 265-320	0.4	-	16.0	Some	0.5	1.0	-	-	High cleanliness, high corrosion resistance							High corrosion resistance moulds with good polishability
	LKM H13	H13	Annealed to HB 225 (max.)	0.38	1.0	5.0	-	0.4	1.3	1.0	-	Good hardenability and toughness	1030	Oil / Air	-	51	51	52	Suitable for through hardened plastic moulds,sliders, zinc die casting dies
	LKM 2343	H11	Annealed to HB 225 (max.)	0.36	1.0	5.0	-	0.4	1.2	0.35	-	Good high tempering strength and high toughness, good resistance to heat checking	1010	Oil / Air	-	51	51	52	Suitable for die casting moulds for Aluminium & Zinc alloys, plastic moulds
	LKM 2343 ESR	H11,ESR	Annealed to HB 225 (max.)	0.36	1.0	5.0	-	0.4	1.2	0.35	-	Excellent toughness and ductility in all directions, good strength	1010	Oil / Air	-	51	51	52	Suitable for die casting moulds for Magnesium, Aluminium & Zinc alloys, plastic molds, high polishing required plastic moulds
	LKM 2344	H13	Annealed to HB 225 (max.)	0.38	1.0	5.0	-	0.4	1.3	1.0	-	Good high temperature strength, suitable for die casting mould	1030	Oil / Air	-	51	51	52	Suitable for die casting for aluminium and zinc alloys,through hardened plastic moulds
	LKM 2344 ESR	H13 ESR	Annealed to HB 225 (max.)									Homogenous structure and good isotropic property. Good plastic mould with high polishing requirement	1030	Oil / Air	-	51	51	52	
	LKM 2344 SUPER	H13, MICRODIZED + ESR	Annealed to HB 225 (max.)									High toughness and good high temperature strength, with high impact strength exceeding 300J	1030	Oil / Air	-	51	51	52	
	LKM 2510	O1	Annealed to HB 230 (approx.)	0.93	-	0.6	-	1.1	-	0.1	0.6	Low alloy cold work tool steel with good hardenability and wear resistance	820	Oil	62	60	56	-	Shearing blades, cold forming, blanking and punching dies
	LKM 2379	D2	Annealed to HB 255 (approx.)	1.55	-	12.0	-	-	0.7	1.0	-	High Chromium cold work tool steel with good wear resistance	1020	Oil / Air	62	61	59	-	Suitable for cold extrusion and forming, cold drawn, punching and blanking of high hardness metal sheet and stainless sheet
	LKM 2767	6F7 (High toughness multi-purpose tool steel)	Annealed to HB 262 (max.)	0.45	-	1.4	4.1	-	0.3	-	-	High strength and toughness, can be hardened to HRC 50~54	840-870	Oil / Air	54	52	50	-	Suitable for shearing and blanking of sheet metal with 10mm thick or above
	Sinto																		
sinto	PORCERAX II PM-35	Sintering Powder metallurgical porous material	Prehardened to HV 350-400	0.012	0.07	16.5	1.2	0.17	1.9	-	-	High quality pre-hardened type permeable porous material with high corrosion resistance, high machinability and EDM machinability (Supplied with 7 and 20 μm pore sizes)	Prehardened Condition						Moulds for high quality plastic or die-casting parts with thin wall or intricated structure. Remedy for quality and productivity problems due to gas trapping during injection moulding.
	USA Brush Wellman Beryllium Copper Alloy																		
BRUSH	MOLDMAX HH (MM 40)	UNS C17200	Solution and aged to HRC 36 - 42	Be 1.9		Co + Ni 0.25			Cu 97.85			High strength beryllium copper alloy, very high thermal conductivity, shorten moulding cycle effectively	-	-	-	-	-	-	Best suitable for mould core and insert which require rapid cooling
	EDM Copper																		
LKM 優質電蝕純紅銅	C1100P	JIS H3100	-	Cu 99.95								Extremely high purity, good electrical conductivity, high machinability, low thermal deformation	-	-	-	-	-	-	EDM copper electrode
	USA ALCOA Aluminium Alloy																		
ALCOA	6061-T6/651/6511	-	Age Hardening to HB 95	Chemical Analysis can be referred to relevant infomation								Aluminium alloy with good corrosion resistance, excellent joining characteristics and anodizing	-	-	-	-	-	-	Thermoforming, blow moulding, ultrasonic welding and machine parts
	SWISS ALCAN high hardness Aluminium Alloy																		
ALCAN	CERTAL 7022-T651	AlZnMgCu0.5	Age Hardening to HB 160 - 170	Chemical Analysis can be referred to relevant infomation								High Strength, high hardness, good machinability	-	-	-	-	-	-	Plastic injection moulding, blow moulding, ultrasonic welding and machine parts
	China high quality plastic mold steel																		
W	WY718	P20 + Ni	Prehardened to HB 290-340	0.37	-	1.8	1.0	1.1	0.25	-	-	Prehardened plastic mould steel	Prehardened Condition						Mould base and core part of plastic mould
	WY2311	P20	Prehardened to HB 290-340	0.37	-	1.7	-	1.1	0.25	-	-	Prehardened plastic mould steel	Prehardened Condition						Mould base and core part of plastic mould
	High Quality plain carbon steel																		
	S50C - S55C	1050 - 1055	HB 170-220 (approx.)	0.5	0.35	-	-	0.8	-	-	-	High machinability	800 - 860	water	56	52	49	24	Suitable for plastic mould base and machinery parts

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The information of different materials shown above is for reference only. The actual value should be referred to the corresponding manufacturing record.

ISO 9001 Approval Certificate No: HKG0991050

LUNG KEE METAL LTD

Head Office
20/F., Crocodile Center, 79 Hoi Yuen Road
Kwun Tong, Kowloon, Hong Kong
Tel : (852) 2342 2248, 2341 2321
Fax :(852) 2343 0990, 2341 8544

Southern China
Tel : (86) 0762-321 0502
Fax : (86) 0762-321 0501

Eastern China
Tel : (86) 0571-8213 3281
Fax : (86) 0571-8213 3280

Northern China
Tel : (86) 022-5881 8255
Fax : (86) 022-5881 8257

Overseas Department
Tel : (86) 020-8222 2895 Ext.240
Fax : (86) 020-8222 2897

Website : www.lkm.com.cn
E-mail : steelsales@lkm.com.hk