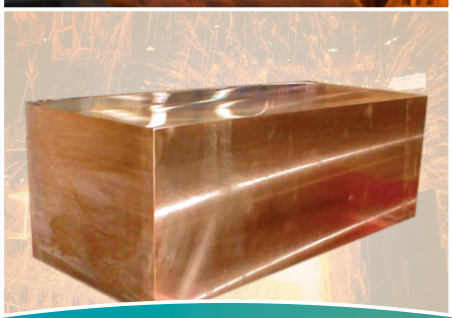
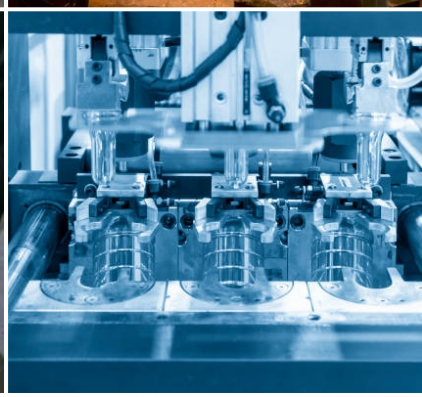
Kushal Metal & Steel Industries Pvt. Ltd.







Success comes from Harmony.....
and win comes from Innovation

Scan Me

CATALOGUE
2022

www.berylliumcopper.in

www.kushalmetal.net

Introduction

Dinesh Hardware Mart was established in the year 1968, followed by establishment of KMSI in 1987. KMSI is a steel trading & stock holding company dealing in all kinds of High Speed Steel, Cold Work Tool Steel, Hot Work Tool Steel , Plastic Mould Steel, Corrosion Resistant Steel, Nitrating Steel, 2% Berylium Copper, Ec copper, in form of Flat bars, Round bars, Sheets, Heavy blocks, Tool blanks, Finished tools & additionally its tailored products to suit any costumers special cutting & machining requirement. Our sole aim is to serve tool room with quality tool steel at very reasonable price. Being in this business for almost half century our basic aim is to keep our customer on leading edge now and in future.

We are committed to established the name of Kushal Metal & Steel Industries as an origination of trust providing cost effective special steel to establish brand equity of Kushal Metal & Steel Industries and meeting all said & implied need of costumer to create total satisfaction trough highly motivated employees involvement & continuous quality & service improvement. Today we are glad to have achieved a fair degree success in just 45 years with numbers of satisfied customers both new and old.

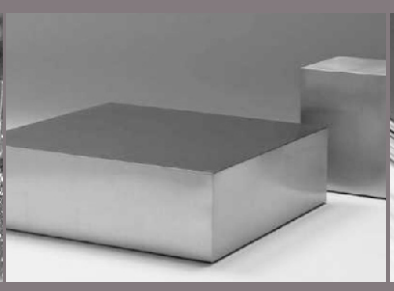
In the year of 2012 KMSI made a successful joint venture with the global major in the manufacturing of steel TG International, China with Kushal Metal & Steel Industries, India. Company Was formed TGK Special steel focuses on HIGH SPEED STEEL, HOT WORK STEEL, COLD WORK STEEL OF ESR HIGHER PROCESS MATERIAL.

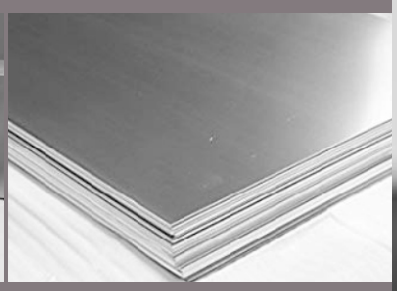
Tool & Alloy Steel is mainly used for tools & different type of dies and mould making.

We have constantly strived to improve tool life by adopting cost effective technology and holding the best quality of steel in our stock. We keep pace with new developments and have added these upgraded steel in our stock list to serve our high quality demand customers with quick deliveries.

We assist our customers, by providing quality material as and when required; from deliveries and cut to size; meeting all quality parameters. We have a very sound infrastructure to help us in our endeavor to serve our valued users helping them to reduce their inventory. Also we have start our own laboratory with different type of testing facilities like Chemical, Ultra, Hardness testing etc.

1. We are committed to continuously improve and upgrade our infrastructure to world class standards.
2. Our material stocking capacity in our 3 yards together is over 3000 tons and have over 10 cutting machines running at these centers to serve the ever increasing delivery requirement of our esteemed clients.
3. We have our own machining shop which can help our customers with some value addition and also save their downtime with regards to Raw Material.
4. With overall staff strength of over 40 dedicated people we can also claim to have one of the fastest responding people to the queries of our end users.
5. We plan to open warehouses in Delhi, Bangalore & Chennai within a short time.





Sole Distributor

GMTC GLORIA MATERIAL TECHNOLOGY CORP.

Nippon Koshuha Steel Co., Ltd.

sij | acroni

NGK INSULATORS, LTD.
NEW METALS DIVISION

MC METALCAM s.p.a.

Authorised Dealer

SSAB TOOLOX®
ENGINEERING & TOOL STEEL

DONGBEI SPECIAL STEEL GROUP CO., LTD.

BGH
Excellence in Specialty Steel

SANYO SPECIAL STEEL

OUR VISION

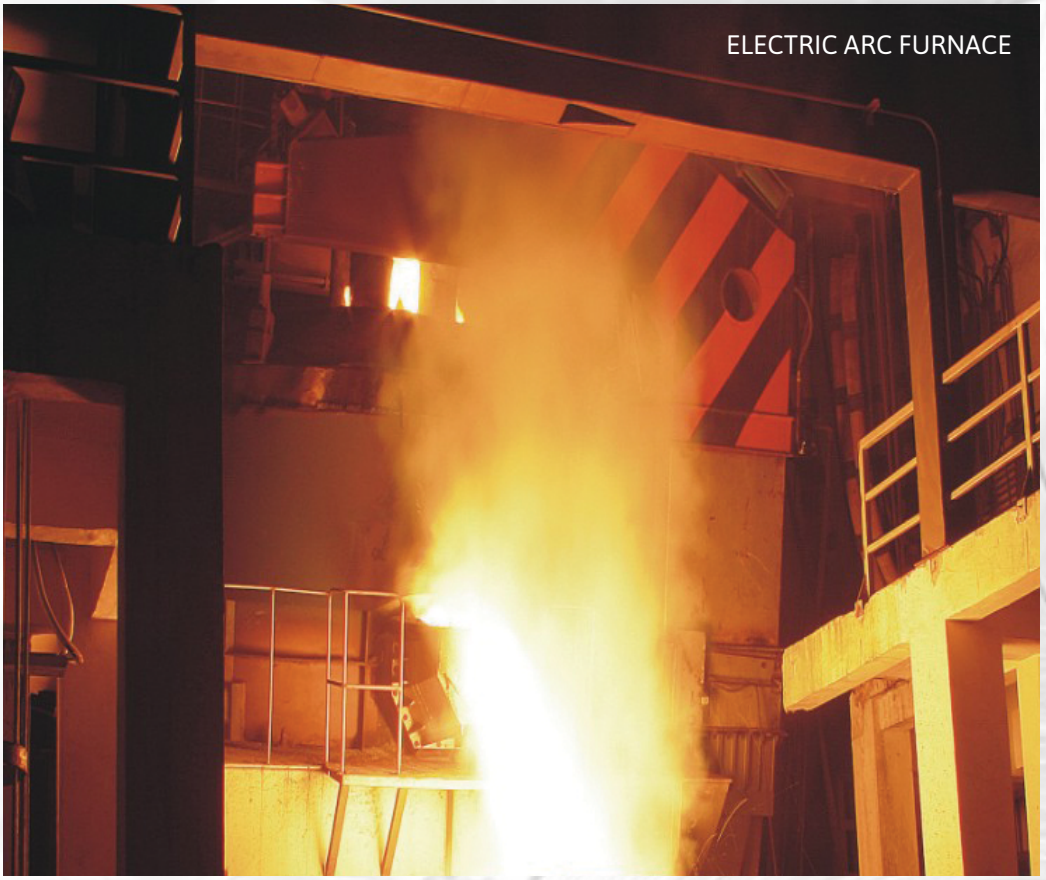
- Innovate and provide Best Steel Grades from reputed manufacturers around world
- Open up branches across India
- Contribute to India's Growth
- Provide value added services – material machining, cut pieces & tailor made material

OUR MISSION

- Our main aim is to provide quality tool steel for manufacturing units/tool rooms across India
- Provide service & material to take our clients into a non inventory module
- Being the first choice for our customers

CORE VALUES

- **Accountability:** We accept our individual and team responsibilities and we meet our commitments. We take responsibility for our performance in all of our decisions and actions.
- **Co-operation:** Good mutual cooperation across positions and departments is the basis for a pleasant working atmosphere in which employees feel good about themselves and what they are doing. The outmoded oppositions between production and maintenance, factory and administration, production and sales no longer have any places. A modern company must be based on teamwork and mutual trust, on striving together for continuous improvement.
- **Empowerment:** To empower our talented people to take the initiative and to do what's right.
- **Innovation:** We are creative in delivering value to our fellow associates, customers, shareowners, manufacturers and the community. We anticipate change and capitalize on the many opportunities that arise.
- **Leadership:** We encourage leadership among employees to develop and maintain a talent pool.
- **Life, Health and Environment:** We seek to improve our wellbeing, our working conditions and the surroundings in which we live in.
- **Open communication:** All team members are encouraged to openly share their opinions and views.
- **Positive Change:** Embracing and capitalizing on change, recognizing that every employee must be empowered to stimulate continuous improvement in all aspects of our business.
- **Professionalism:** We strive to fulfill our responsibilities to the highest possible standards throughout.
- **Teamwork:** Our team is supportive of each other's efforts, loyal to one another, and care for each other both personally and professionally.


ELECTRIC ARC FURNACE


Ladle Finery


Electric Arc Furnace


VOD


Electric Annealing Furnace


Electroslag Remelting


HSS Ingot Casting

Radial Forging

Powder Metallurgy High Speed Steel

Chemical Analysis

Grade	C	Cr	Mo	V	W
TPMM4	1.33	4.15	4.60	3.95	5.60
TPM330	1.28	4.10	5.00	3.00	6.40
TPM558	1.65	4.82	2.10	10.50	8.10
TPM638	1.28	4.2	5.0	3.1	8.5
TPM6711	2.30	4.2	7.0	6.5	6.5

Grade Equivalent

TIANGONG	US Standard	ERASTEEL	BOHLER
TPMM4	M4	ASP2004	S690
TPM330	M3-2	ASP2023	5790
TPM558	S390	ASP2052	--
TPM638	SS590	ASP2030	--
TPM6711	--	ASP2060	--

High Speed Steel

Chemical Analysis

Germany DIN	USA AISI	Chemical Analysis (typical value) % Min - Max										Delivery Conditions		Applications
Grade		C	S	P	Si	Mn	Cr	Mo	V	W	Co	Heat Treatment	Hardness (HB)	
1.3343	M-2	0.86-0.94	≤ 0.003	≤ 0.026	0.20-0.45	0.20-0.40	3.75-4.50	4.50-5.50	1.60-2.20	5.90-6.75	–	Annealed	≤255	Standard high-speed steel grade. High toughness and good cutting power owing to its well-balanced alloy composition; thus suitable for a wide variety to applications. It is used to manufacture knives, thread cutting & twist drills, sendizimer rolls, taps, broaches & milling tools, reamers, metal/circular saws, wood working & cold forming tools.
TG M2A Sp. grade for taps		0.83-0.85	MAX 0.010	MAX 0.030	0.30-0.40	0.20-0.40	3.90-4.20	4.80-4.85	1.80-1.90	6.00-6.20	Nb 0.10-0.12	Annealed	≤255	TGM2A is a special grade containing low percentage of carbon to increase toughness & added Niobium to find crystal grains of steel to obtain high strength & toughness specially suited for taps & tabs of thread tools.
TG M2B Sp. for Hobs & Broches		0.89	≤ 0.003	≤ 0.026	0.30-0.40	0.20-0.40	3.90-4.20	4.80-4.85	1.80-1.90	6.00-6.20	Nb 0.10-0.12	Annealed	≤255	Due to favorable hardness and abrasion resistance, it's mainly used to fabricate tools to cut materials which are difficult to be cut. It's mainly used as various cutting tools, for example, drilling bits, screw taps, milling cutters, drawing tools, roller cutters, etc.
1.3243	M-35	0.88-0.95	≤ 0.030	≤ 0.030	0.20-0.40	0.20-0.45	3.80-4.50	4.75-5.50	1.75-2.15	6.00-6.75	4.55-5.50	Annealed	≤255	It is one of the W-Mo Co hss grade with good cutting character. The res hardness, hot hardness and wearing resistance are all better than W6M05Cr4V2.
1.3247	M-42	1.05-1.15	–	–	0.15-0.65	0.15-0.40	3.50-4.25	9.00-10.00	0.95-1.35	1.15-1.85	7.75-8.75	Annealed	≤285	Milling Cutters, Twist Drills, Taps, Broaching Tools, Cold Work Tools.
1.3207	T-42	1.25-1.40	–	–	0.20-0.30	0.20-0.30	3.80-4.30	3.20-3.80	3.00-3.50	9.00-9.80	9.80-10.80	Annealed	≤285	Turning and Milling tools for roughing and finishing works, wood working tools highly stressed cold works tools, tool bits.
TG 4241		0.90-0.95	≤0.020	≤0.030	0.80-1.20	0.25-0.40	4.00-4.50	2.00-2.50	1.00-1.30	4.00-4.50	–	Annealed	≤285	It is an economical low alloy high-speed steel with good red hardness, good toughness and thermal plasticity. It is generally used soft and moderate intensity metal.
TG 4341		0.83-0.93	≤0.020	≤0.030	0.70-1.20	0.20-0.40	4.00-4.50	3.00-3.50	1.20-1.80	4.00-4.50	–	Annealed	≤285	

Grade Equivalent

DIN STANDARD	BRAZIL	AUSTRIA	SLOVANIA	JIS	AMERICAN
1.3343	VWM2	S600	BRM2	SKH51	M-2
1.3243	VK5E	S705	BRCMO	SKH55	M-35
1.3247	VKM42	S500	BRCMO2	SKH59	M-42
1.3207	VK10E	S700	BRU	SKH57	T-42

Production Process:

EAF → LF → VD → ESR → BLOOM IN FOLLOWING MACHINE : QUICK FORGING (12.5MN), HAMMER, PRECISION FORGING →

- Precision Forging : Φ 81-300mm
- Hot Rolled Annealed Peeled : Φ 14.5-80.0mm
- Hot Rolled Sand Blasted : Φ 1.0 -13.5mm (Coil)
- Cold Drawn or Centreless Ground : Φ 1.0-14.4mm

REDUCTION RATIO : As 1:4 or 1:5 | **UNDER ANNEALED CONDITION :** Hardness : HB205-255
DELIVERY STATUS : As Cold drawn / Hot rolled / forged, in annealed condition.

SIZE : ROUNDS

Cold Drawn/ Ground Bar	Hot Rolled Annealed Peeled Bar	Forged Annealed Turned Bar
Φ 1.0 - 14.4mm	Φ 14.5 - 80.0mm	Φ 81.0 - 300.0mm

SIZE : HOT ROLLED FLAT BARS / SAND BLASTED MACHINED STRAIGHT

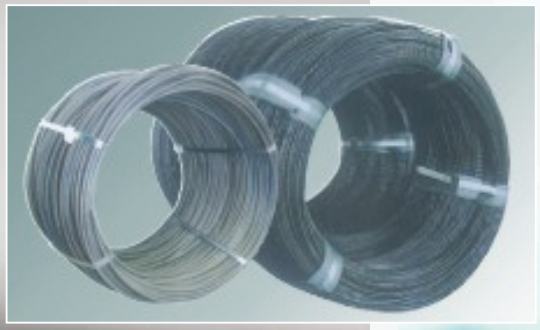
Thickness	Width
4mm - 205mm	4mm - 810mm

SIZE : SQUARE

4mm to 80mm

SIZE : SHEET/STRIPS

0.5mm - 12mm



Premium Hot Work Steel

Chemical Analysis

TG Grade	Equ. Grade ASSAB / BOHLER	Production Technology	Chemical Analysis (typical value) % Min - Max								Applications
			C	Mn	Si	S	P	Cr	Mo	V	
TGE13	W302 ISOBLOC	EAF+LF+VD+ESR, structure refining process	0.38	0.35	0.90	≤ 0.002	≤ 0.015	5.0	1.35	0.95	• For various metal pressure casting molds, for example: automobile engine cylinder body, cylinder cover, gearbox shell molds. • Hot extrusion molds, mainly for hot extrusion of aluminium profiles. • High-quality plastic molds, for example, high abrasion resistance plastic molds for automobiles.
TGGP13	ORVAR SUPREME	EAF+LF+VD+ESR, special smelting + special forging+ structure refining process	0.38	1.45	1.1	≤ 0.001	≤ 0.009	5.3	1.45	1.0	• Long-life Al, Mg and Zn alloy pressure casting molds, for example: automobile engine cylinder body, cylinder cover, gearbox shell molds. • Long-scale hot extrusion molds: for example, aluminium alloy hot extrusion molds for high-speed rails and metros. • Precise hot forging molds: for example, automobile engine crankshaft and connecting rod molds; gear molds of gear boxes.
TGE23	DIEVAR	EAF+LF+VD+ESR, special smelting + special forging+structure refining process	0.37	0.4	0.3	≤ 0.001	≤ 0.015	5.0	2.2	0.45	• Mainly used for processing of light alloy-metal pipes, rods, extruded carrier rods, molds, and extruded molds, etc. • Pressure casting equipment, molded trimming die, compression moulding inserts, etc. • Hot shearing blades, plastic molds, etc.
TGGP11	W400VMR	EAF+LF+VD+ESR, special smelting + special forging+structure refining process	0.37	0.37	1..0	≤ 0.001	≤ 0.009	5.2	1.3	0.45	• Pressure casting molds. • Hot extrusion molds of aluminium, copper and magnesium ally. • High-polishing plastic injection molds.

Hot Work Steel

Chemical Analysis

Germany DIN	USA AISI	Chemical Analysis (typical value) % Min - Max										Delivery Conditions		Applications
Grade		C	S	P	Si	Mn	Ni	Cr	Mo	V	W	Heat Treatment	Hardness (HB)	
1.2344	H-13	035-042	≤0.030	≤0.030	0.80-1.20	0.25-0.50	--	4.80-5.50	1.20-1.50	0.85-1.15	--	Annealed	≤ HB235	Hot-work tool steel for universal use. Pressure casting dies and metal extrusion tools for processing light metals, forging dies, moulds, screws and barrels for plastic processing, nitrided ejectors, hot-shear blades. Suitable for Aluminium Extrusion Die & Aluminium Copper Forging Dies.
1.2345	H-13 M	047-052	≤0.030	≤0.030	0.80-1.20	0.25-0.50	--	4.80 5.50	1.20-1.50	0.85-1.15	--	Annealed	≤ HB235	
1.2343	H-11	033-041	≤0.030	≤0.030	0.80-1.20	0.20-0.50	--	4.80-5.50	4.70-5.20	1.10-1.50	--	Annealed	≤ HB235	Hot-work tool steel for universal use. Pressure casting dies and metal extrusion tools for processing light metals, forging dies, moulds, screws and barrels for plastic processing, shrink rings, hot-shear blades.
1.2343M	H-11 M	047-052	≤0.030	≤0.030	0.80-1.20	0.20-0.50	--	4.80 5.50	4.70-5.20	1.10-1.50	--	Annealed	≤ HB235	
1.2365	H-10	0.28-0.35	≤0.02	≤0.03	0.10-0.40	0.15-0.45	--	2.70-3.20	2.70-3.20	0.40-0.70	--	Annealed	≤ HB230	Heavy-metal linings, extrusion rams, piercing mandrels, die inserts, heavy-metal diecasting tools. Good Tempering resistance Thermal conductivity and Hardness as compare with H13. Suitable for Aluminium Extrusion Die, and Aluminium Copper forging die.
1.2581	H21	0.26-0.36	--	--	0.15-0.50	0.15-0.40	--	3.00-3.75	--	0.30-0.60	9.00-9.50	Annealed	≤ HB240	The H21 tungsten hot-work tool steels are mainly used for hot-working dies and toolings, e.g., die casting, extrusion and hot-forming of parts.
1.2367 SUP	--	0.37	≤0.001	≤0.015	0.4	0.45	--	5.0	2.8	0.55	--	Annealed	≤ HB240	Life pressure casting molds; Forged molds and inserts; Hot extrusion molds.
1.2714	L6	0.50-0.65	MAX 0.005	MAX 0.025	0.10-0.40	0.65-0.95	1.60-1.80	1.00-1.20	0.45-0.55	0.07-0.15	--	Q & T	HB 360/400	Forging dyes of all types, hammer forging dyes upto largest dimensions, tools for tube & rod extrusions such as bolsters, mandrels, plungers etc.

Grade Equivalent

STANDARD	BRAZIL	AUSTRIA	EN	SLOVANIA	ITALY	JIS	TAIWAN	AMERICAN	Swiden
1.2344	VM13IM	W302	X40CrMoV5-1	UTOP M02-EFS	ESKY0S2	SKD61	GMH13 (ESR)	H-13	--
1.2343	TENAX300	W300	X38CrMoV5-1	UTOP M01-EFS	--	--	GMH11	H-11	--
1.2365	VCM	W320	32CrMoV12-28	UTOP 33-EFS	--	SKD7	GMH10 (ESR)	H-10	--
1.2714	VMO	W500	56NiCrMoV7	UTOP EX2	ESKY0S2 73	SKT4	GMKT4	L6	--
1.2367	--	W360	--	--	--	--	--	--	--

STANDARD	AISI	DIN	JISS	SWIDEN	AUSTRIA	DAIDO
TGGP11	H11	1.2343	--	VIDAR SUPEIOP	W400VMR	--

Production Process:

Round Bar : EAF → LF → VD → ESR → (5TONS HAMMER) → Forged Annealed Turned : Φ 81.0-810.0mm; Hot Rolled Annealed Peeled : Φ 14.5-80.0mm; Cold Drawn or Centreless Ground : Φ 2.0-14.4mm → ANNEALED CONDITION

Flat Bar : EAF → LF → VD → ESR → FORGED → HOT ROLLED (850) → ANNEALED CONDITION

SIZE : ROUNDS					
Cold Drawn/ Ground Bar	Φ 2.0 - 14.4mm	Hot Rolled Annealed Peeled Bar	Φ 14.5 - 80.0mm	Forged Annealed Turned Bar	Φ 81.0 - 810mm

SIZE : HOT ROLLED FLAT BARS / SAND BLASTED MACHINED STRAIGHT		
	Thickness: 5mm - 410mm	Width: 10mm - 810mm

REDUCTION RATIO:
As 1:6 or 1:7

UT STANDARD:
SEP 1921, (DEC.84)E/e

DELIVERY STATUS:
In Annealed Condition

Premium Cold Work Steel

Chemical Analysis

GERMANY DIN	USA AISI	Chemical Analysis (typical value) % Min - Max									Delivery Conditions	
Grade		C	S	P	Si	Mn	Cr	Mo	V	W	Heat Treatment	Hardness (HB)
TSFD2	D2	1.5	≤ 0.015	≤ 0.03	0.35	0.4	7.8	1.90	0.25	–	Annealed	<255
TSFDC53	DC53	0.93	≤ 0.010	≤ 0.03	0.95	0.40	7.8	1.90	0.25	--	Annealed	<248

Cold Work Steel

Chemical Analysis

GERMANY DIN	USA AISI	Chemical Analysis (typical value) % Min - Max									Delivery Conditions	
Grade		C	S	P	Si	Mn	Cr	Mo	V	W	Heat Treatment	Hardness (HB)
1.2379	D2	1.50-1.60	≤ 0.030	≤ 0.030	0.10-0.40	0.15-0.45	11.00-12.00	0.70-0.90	0.90-1.10	–	Annealed	<255
1.2080	D3	1.90-2.20	≤ 0.030	≤ 0.030	0.10-0.40	0.15-0.45	11.00-12.00	--	0.20-0.20	–	Annealed	<248
1.2510	O1	0.85-0.95	--	--	0.20-0.40	1.00-1.30	0.40-0.60	--	0.10	0.40-0.60	Annealed	<212
TSFDC53	DC53	0.90-1.05	≤ 0.020	≤ 0.025	0.80-1.10	1.10-0.45	7.50-8.50	1.80-2.10	0.20-0.35	–	Annealed	<248
1.2357	S7	0.45-0.60	–	–	0.45-0.55	0.65-0.80	3.20-3.40	–	0.20-0.35	--	Annealed	<229
1.2550	S1	0.55-0.70	–	–	0.60-0.80	0.25-0.35	–	–	0.10-0.20	1.90-2.20	Annealed	<255
1.2363	A2	1.0	≤ 0.010	≤ 0.030	--	0.7	5.1	1.15	0.3	--	Annealed	<255
1.2379	TSFD2	1.45-1.60	≤ 0.03	≤ 0.03	0.10-0.60	0.20-0.60	11.0-13.0	0.70-1.0	--	--	Annealed	<255
1.2767	-	0.45	≤ 0.03	≤ 0.03	0.35	0.25	1.35	0.25	≤ 0.1	--	Annealed	<255

Applications :

1.2379 Used for long run tooling application where wear resistance is important, such as blanking or forming dies and thread rolling rolls and thread rolling dies, cold extrusion tools, woodworking, cutting and stamping tools for sheet thicknesses up to 6mm, precision cutting tools up to 12 mm. Cold pilger mandrels, circular-shear blades, deep-drawing tools. Pressure pads and highly resistant plastic moulds. Toughness better than D3.possibility of nitrating.

1.2080 Tools for cutting sheets up to 4mm thickness, trimming dies, blanking dies for paper and plastics, long and round-section shear blades for sheet thicknesses up to 2 mm, drawing and deep drawing tools. Woodworking tools, stone pressing tools, pressure pads and highly wear-resistant plastic moulds, profile rolls.

1.2510 Application include short run tooling for blanking dies, cold forming dies and cutting tools operating at ambient temperature. For working tools, cutting blazes, sizing and stamping tools.

1.2363 Blanking dies, rolls, shear blades, cold pilger mandrels, cold coining dies. Moulds for the processing of plastics.

DC53 One fold toughness than SKD11, 520-530 C with 61-63 HRC to get rid of risk about cracking when processing, very suitable for surface hardening treatment to improve the longevity of moulds.

1.2357 Chisels, rivet sets, punches, driver bolts. Hot punching & shearing.

1.2550 For cutting tools(dyes, punches) for plate, wood working tools, blanking dyes for cutting sheet metals upto 12mm thickness., trimming & splitting dyes, shear blades, chipping knives, pneumatic chisels, coining tools, cold shear blades, ejectors.

Grade Equivalent

DIN STANDARD	BRAZIL	AUSTRIA	EN	SLOVANIA	ITALY	JIS	AMERICAN
1.2379	VD2	K110	X155CrVMo12-1	OCR12VM	DUYO S2379	SKD11	D-2
1.2080	--	K100	X210Cr12	OCR12VM	--	SKD1	D-3
1.2510	VND	K460	100MnCrW4	OW4	--	SKS3	O-1

Production process:

Round Bar :

EAF → LF → VD → ESR → BLOOM FORGED (5TONS HAMMER) → [Forged Annealed Turned : Φ 81.0-1500mm; Hot Rolled Annealed Peeled : Φ 14.5-80.0mm; Centreless Ground : Φ 2.0-14.4mm] → ANNEALED CONDITION

Flat Bar :

EAF → LF → VD → [FORGED (5TONS HAMMER) HOT ROLLED (910)] → HOT ROLLED (850) → ANNEALED CONDITION

REDUCTION RATIO : As 1:4 or 1:5 | **UT STANDARD :** SEP 1921, (DEC.84)E/e | **DELIVERY STATUS :** As Hot Rolled & Forged, Delivery Condition : Annealed

SIZE : ROUNDS

Cold Drawn/ Ground Bar	Hot Rolled Annealed Peeled Bar	Forged Annealed Turned Bar
Φ 2.0 - 14.4mm	Φ 14.5 - 80.0mm	Φ 81.0 - 1500mm

SIZE : HOT ROLLED FLAT BARS / SAND BLASTED MACHINED STRAIGHT

Thickness	Width
5mm - 410mm	10mm - 810mm

SIZE : SHEET

0.5mm to 12mm

Plastic Mould Steel

Chemical Analysis

Germany DIN	Chemical Analysis (typical value) % Min - Max											Delivery Conditions		Applications
Grade	C	S	P	Si	Mn	Ni	Cr	Mo	V	Cu	Others	Heat Treatment	Hardness (HB)	
1.2311	0.35-0.45	MAX 0.030	MAX 0.030	0.20-0.40	1.30-1.60	–	1.80-2.10	0.15-0.25	–	–	–	Q & T	280/325	Injection moulds of medium & large size, high deformation resistance with good polishability. Suitable for bottle crates, T.V housing, fridge door, buckets etc.
1.2312	0.35-0.45	0.05-0.10	MAX 0.030	0.20-0.40	1.30-1.60	–	1.80-2.10	0.15-0.25	–	–	–	Q & T	280/325	Tools for plastic & synthetic plastic processing, moulds for pressure diecasting recepient sleeves, brake dies. Also used for large moulds(truck bumpers for instance).
1.2738 1.2738 HH	0.35-0.45	MAX 0.030	MAX 0.030	0.20-0.40	0.30-0.60	0.90-1.20	1.80-2.10	0.15-0.25	–	–	–	Q & T	280/320 Or 380/420	Synthetic plastic moulding dyes for large moulds for bigger diameters & blow moulds. Better through hardening properties for cross section of 400mm & more.
1.2714	0.50-0.65	MAX 0.005	MAX 0.025	0.10-0.40	0.65-0.95	0.60-0.80	1.80-1.20	0.45-0.55	0.07-0.15	–	–	Q & T	360/400	Forging dyes of all types, hammer forging dyes upto largest dimensions, tools for tube & rod extrusions such as bolsters, mandrels, plungers etc.
1.7225	0.38-0.45	MAX 0.035	MAX 0.035	0.30-0.40	0.75-1.00	0.15-0.25	0.80-1.10	–	–	–	–	As Rolled/ Forged	MAX 295	Statically & dynamically stressed components for vehicles, engines & machines. For parts of larger cross-sections, crankshafts, gears.
1.6582	0.38-0.45	MAX 0.035	MAX 0.040	0.15-0.35	0.60-0.80	1.65-2.00	0.70-0.90	0.20-0.30	–	–	–	Black Forged & Annealed	MAX 230	Permanently stressed machine, engine & vehicle parts when high strength & toughness are required.
1.2327	0.83-0.90	MAX 0.030	MAX 0.030	0.15-0.35	0.30-0.45	–	1.60-2.90	0.20-0.35	0.05-0.15	–	–	Black Forged & Spl. Annealed	180.220	Cold rolls, back up rolls, straightening rolls, non ferrous 2 & 4 high roll mills.

Corrosion Resistance

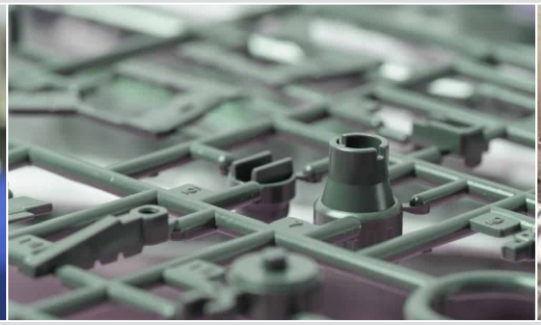
Chemical Analysis

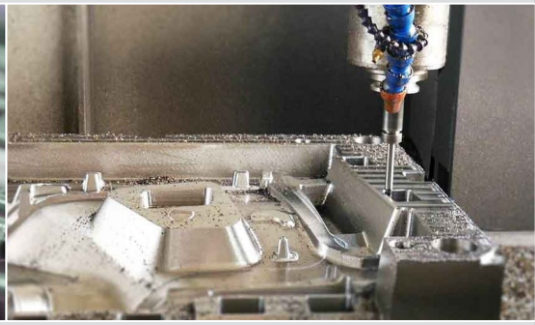
Germany DIN	USA AISI	INDIAN IS	Chemical Analysis (typical value) % Min - Max								Delivery Conditions		Applications
Grade			C	S	P	Si	Mn	Ni	Cr	Mo	Heat Treatment	Hardness (HB)	
1.2083 ESR	420 SS	XY2Cr13	0.38-0.45	MAX 0.030	MAX 0.030	0.95-1.00	0.95-1.00	–	12.50-14.50	–	Q&T	280/320	Moulds for processing plastics with corrosive acting synthetic & abbrassive filters, dies for artificial resins. Cutting tools, all types of knives, shears & surgical instruments.
1.2316	420 FMOD	X36CrMo17	0.33-0.43	MAX 0.030	MAX 0.030	0.95-1.00	1.00-1.30	0.90-1.00	15.00-17.00	1.00-1.30	Q&T	280/320 OR 380/420	Dies for pressing chemically aggressive compounds. Spindles, belt, pulp engines, cutters, valves, components for fittings for temperature upto 600 degrees.
GEST80	NAK 80		0.10-0.15	≤0.015	≤0.005	0.10-0.40	0.30-0.50	2.80-3.00	0.20-0.50	0.20-0.30	Q&T	380/420	Transparent products & others for which mirror finished surface are particularly important. Products for which electrical discharge machined surfaces are very important. It can be used in place of Aventurine-etching due to better EDM surface. It does not need stress relieving even after heavy machining. also has uniform hardness.
174PH	PHX SUPRA	--	0.05	CU 3.50	--	--	--	4.50	15	--	Q&T	380/420	PHX Supra is used for tools/ moulds for the proccessing of corrosive plastics. Also used for plastic piping & plumbing injection moulds. moulds with strong corrupt resisting used for camera lens, dies for pressing chemically aggressive compounds. high polished tools and moulds for processing of high corrosive plastics, tools for plastic extrusion. Aircraft component.

Mould Base Steel

Chemical Analysis

Germany DIN	USA AISI	INDIAN IS	Chemical Analysis (typical value) % Min - Max					Delivery Conditions		Applications
Grade			C	S	P	Si	Mn	Heat Treatment	Hardness (HB)	
1.1730	1045	C-45	0.45-0.50	MAX 0.030	MAX 0.030	0.30-0.35	0.70-0.75	As Rolled/ Forged	MAX 207	Cold heading dies, top & bottom plates for plastic die casting, die casting tools, hand tools, tongs, agricultural tools & blanking tools.





The NGK Ultra Supra II Plus enable high-cycle plastic forming, improves quality, and ensure a long life for casting mols.

NGK Ultra Supra II Plus Features

---------- thermal conductivity and ----- temperature hardness, the ---------- beryllium-copper alloy ------ the following features as casting mold material used for plastic forming

1. **Accelorates the cooling of casting molds and shoriens the forming cycle.**
2. **Improves the quality of formed products**
3. **Ensure a long life for casting molds**

Machinability

While this material offers cutting performance
Similar to steel of quality hardness, even behalf performance can be achieved by slightly changing the maching conditions.

Weldanbility

Because this copper alloys has excellent thermal conductivity use a TIG welder in this following manner:
Use high welding amperage, approximately 3 times that for steel
Use a welding 3 rod made of a compatible.

Standard Plates in Stock

Plates with various sizes are available.

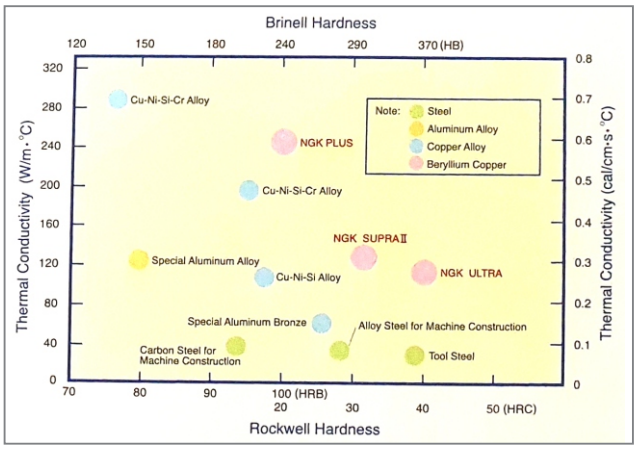
Thickness (mm)	Tolerance	Length
T12~350	+1-0	1000~2000

Standard Round Bars in Stock

Round Bars with various sizes are available

Diameter (mm)	Tolerance	Length
Ø 20~55	±0-25	1000~2000
Ø 55~120	+1-0	

Casting Mold Material Chart



Physical and Mechanical Features

	Thermal Conductivity (w/m°C)	Thermal Expansion Coefficient (/°C)	Elasticity Coefficient (KN/mm²)	Hardness (Rockwell)
NGK PLUS	245	$17.6x10^{-6}$	132	B92-105
NGK SUPRA II	145	$17.8x10^{-6}$	127	C30-34
NGK ULTRA	130	$17.8x10^{-6}$	127	C36-42

Other than the hardness, it is a representative figure.

Rods

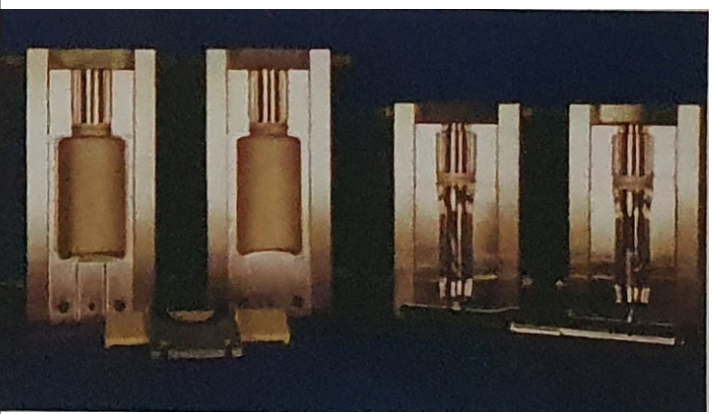
- SPECIFICATIONS
  - AMS 4533 (AT)
  - AMS 4534 (HT)
  - AMS 4650 (A)
  - AMS 4651 (H)
  - ASTM B196

Plate

- C17200/17510
- 0.75□ - 8□ THICK

Size Ranges

- 0.062□ - 8□



General Advantages of Beryllium Copper

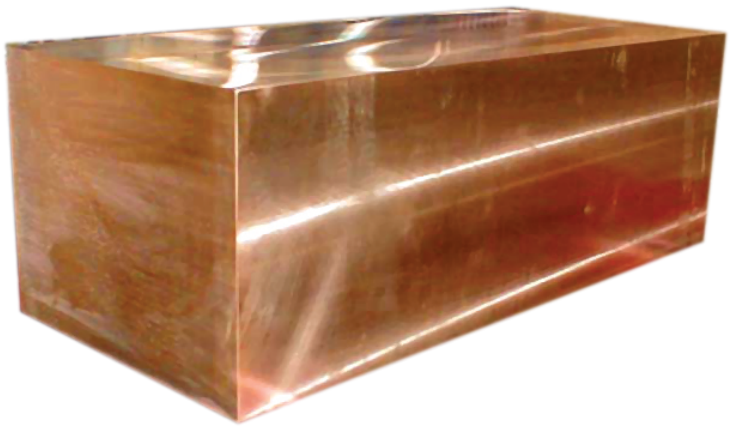
- TREMENDOUS STRENGTH
- EXCELLENT TOUGHNESS AND DUCTILITY
- EXCELLENT FATIGUE STRENGTH
- EXCELLENT CORROSION RESISTANCE
- VERY GOOD CONDUCTIVITY
- NON-SPARKING ; NON-MAGNETIC
- EXCELLENT WEAR RESISTANCE

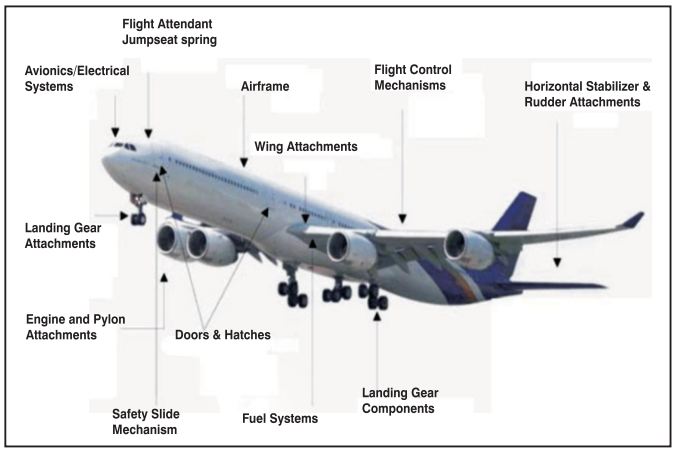
ULTRA, SUPRA, PLUS

Plate : t20-300 x w500 x L1000-2000
Rod : Ø20-300 x L1000 - 1500

MP15

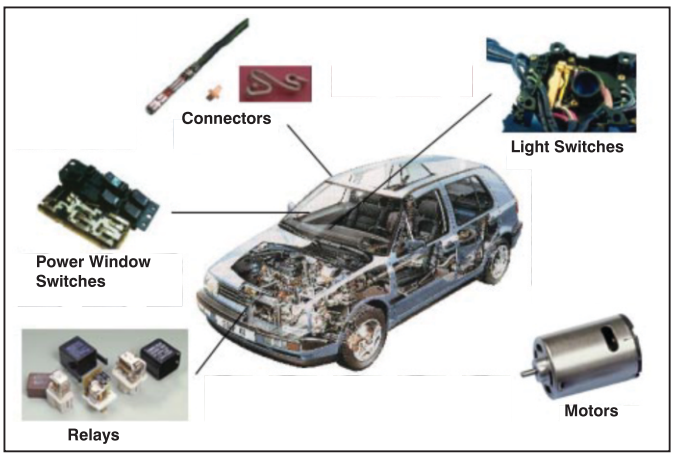
Plate : t60-240 x w450-500 x L800-1500
Rod : Ø25-200 x L1000





Aerospace Applications

- Commercial and Military Aircraft Bushings
- Landing Gear • Nose to Tail • Aircraft Connectors



Automotive Applications

- RWMA Electrodes
- Gun Arms, Shanks, Adapters, Tips and Caps.
- High Temperature and Vibration.
- Beryllium Copper maintains high performance even under harsh conditions.

Plastic Mould Steel

GMTC	AISI	DIN	Size (mm): 5 ≦ ϕ ≦ 600
420Mod	420	1.2083	
1.2738	-	1.2738	
P20	P20	1.2311	
1.2316	-	1.2316	
630(17-4PH)	S17400	AMS 5622, AMS 5643	

Above steel grades are available in ESR

Cold Work Tool Steel

GMTC	AISI	DIN	Size (mm): 5 ≦ ϕ ≦ 410/
D2	D2	1.2379	
1.2080	D3	1.2080	
A2	A2	1.2363	

Above steel grades are available in ESR

GMTC	AISI	DIN	Size (mm): 5 ≦ ϕ ≦ 600
S1	S1	1.2542	
S7	S7	1.2355	
1.2767		1.2767	

1. Above steel grades are available in ESR
2. Also supply flat bars, square bars, & mold blocks

Hot Work Tool Steel

GMTC	AISI	DIN	Size (mm): 5 ≦ ϕ ≦ 650
H11	H11	1.2343	
H13	H13	1.2344	
1.2365		1.2365	
L6	L6	1.2714	

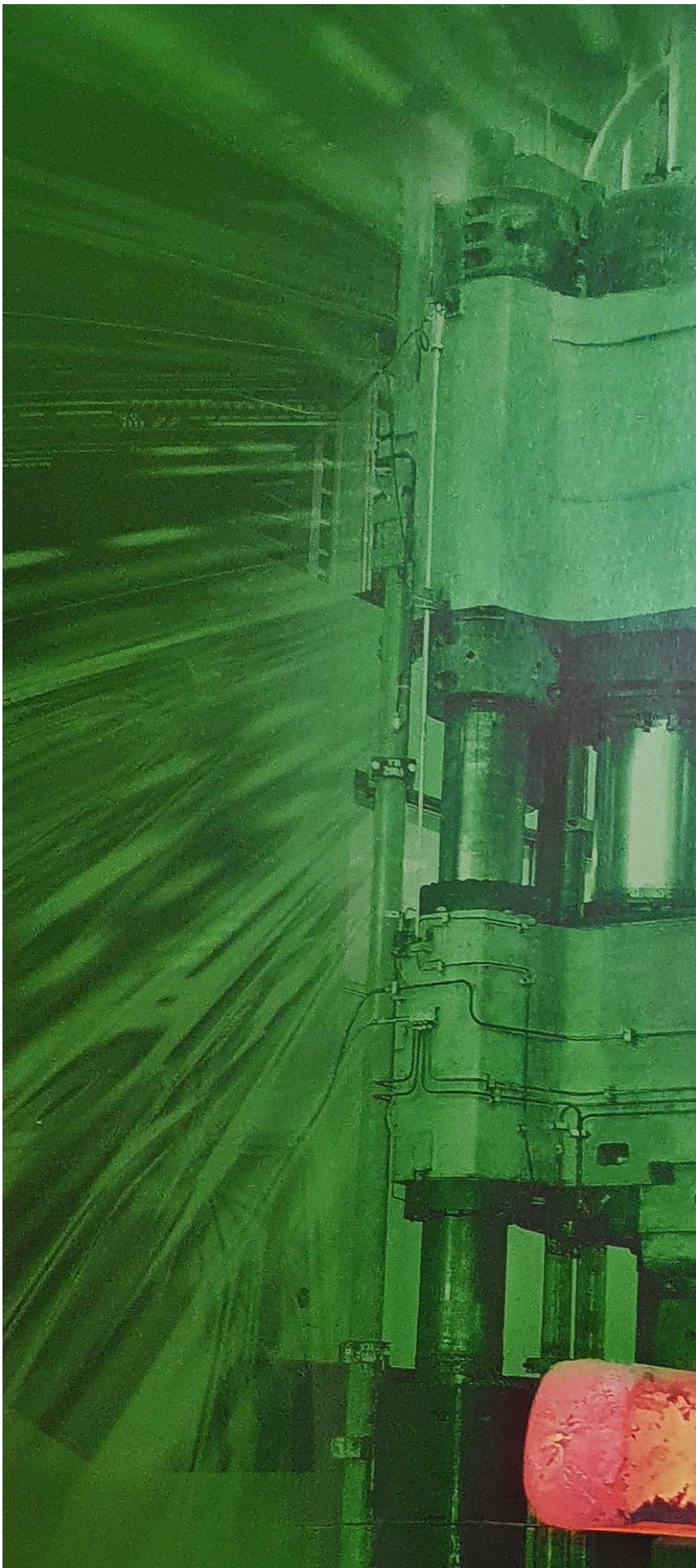
1. Above steel grades are available in ESR & VAR
2. Also supply flat bars, square bars & mold blocks

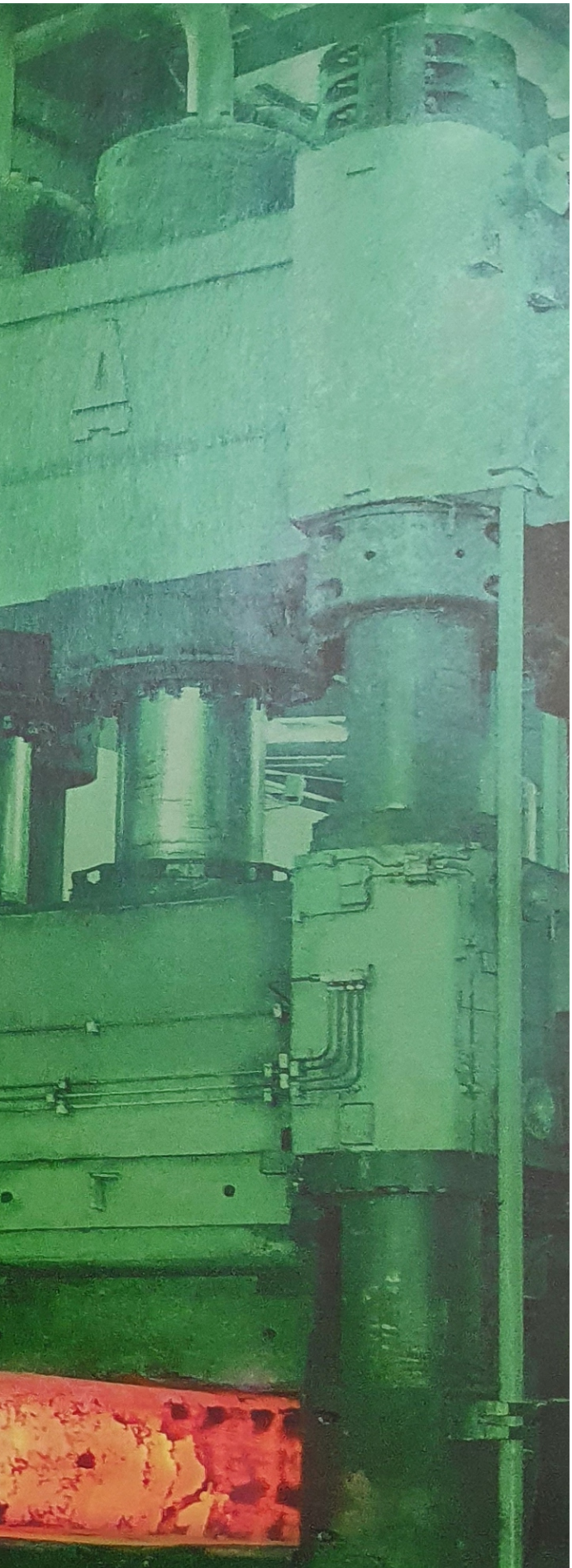
High Speed Steel Series

GMTC	AISI	DIN	Size (mm): 5 ≦ ϕ ≦ 233
M2	M2	1.3343	
M35	M35	1.3243	
M42	M42	1.3245	

Above steel grades are available in ESR & VAR

Application:
Cutting Tools, Shaving cutter, Punches, Mould & Dies.





Titanium Alloy Series

Ti-Bar	Size (mm): 5 ≦ ϕ ≦ 350

Grade:

Commercial : ASTM B348/B381, Gr.1, Gr.2, Gr.3, Gr.5, Gr.12, β-Ti(1023), AMS 4921

Medical Implants : ASTM F136, ISO5832.3, ASTM B348, Gr.23(ELI), ASTM F67 & ISO5832.2 (pure titanium), AMS 4930, ASTM F1472.

Aerospace : AMS 4928Q, AMS MIL-T9047, AMS 6931, AMS 6930, AMS 4965, AMS 4967.

Stainless Steel Series

400 Series

GMTC	AISI	DIN	Related Specs	Size (mm): 5 ≦ ϕ ≦ 600
403	403	1.4006	ASTM A182, ASTM A276, ASTM A473, ASTM A479 AMS-QQS-763, JIS G4303, NAC MR 0175/ISO 15156	
410	410	1.4006	AMS 5612, AMS 5613, AMS-QQS-763 ASTM A182, ASTM A193, ASTM A276, ASTM A314, ASTM A473, ASTM A479 JIS G4303, NORSOK-M-CR-701 NACE MR 0175/ISO 15156, EN 10088-3	
416	416	1.4005	AMS 5610 TYPE II, EN 10088-3, ASTM A314, ASTM A473, ASTM A582, JIS G4303	
420	420	1.4021 1.4028 1.2083	AMS 5621, AMS-QQS-763, ASTM A276, EN10088-3 JIS G4303, NACE MR 0175/ISO 15156	
F6NM	F6NM		ASTM A182, NACE MR 0175/ISO 15156	
430	430	1.4016	ASTM A276, ASTM A314, ASTM A473, ASTM A479 AMS 5627, AMS-QQS-763	
430F	430F	1.4014	ASTM A314, ASTM A581, ASTM A582, ASTM A473 JIS G4303	
431	431	1.4057	ASTM A276, ASTM A473, ASTM A479 AMS 5628, JIS 4303	
1.2316		1.2316	ISO 4957	

1. Above steel grades are available in ESR and heat treated by quenching-tempering.
2. Above steel grades in flat bars, square bars & mold blocks.

GMTC	AISI	DIN	Related Specs	Size (mm): 5 ≦ ϕ ≦ 410
4408	4408	1.4112	ASTM A276, ASTM A314, ASTM A473, AMS-QQS-763, EN 10088-3, JIS G4303, SEW 400	
440C	440C	1.4125	ASTM A276, ASTM A314, ASTM A473, ASTM A756 AMS 5630, AMS 5618, AMS 5880, AMS-QQ-763 EN 10088-3, JIS G4303, SEW 400	

Above steel grades are available in ESR & VAR

Duplex (Ferritic-Austentic Series)

Size (mm): 5 ≦ ϕ ≦ 315

GMTC	AISI	UNS	DIN	Related Specs
1.4462	F51	S31803 S32205	1.4462	ASTM A182, ASTM A276, EN 10088-3 NACE MR 0175/ISO 15156, NORSOK M-630

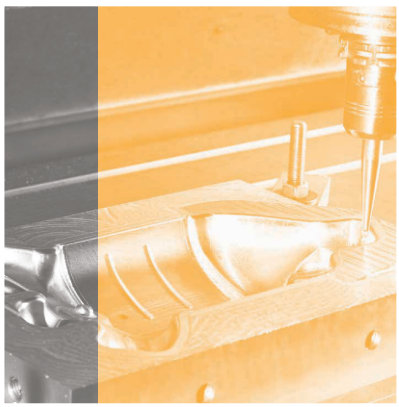
Above steel grades are available in ESR

Fe Based Super Alloy

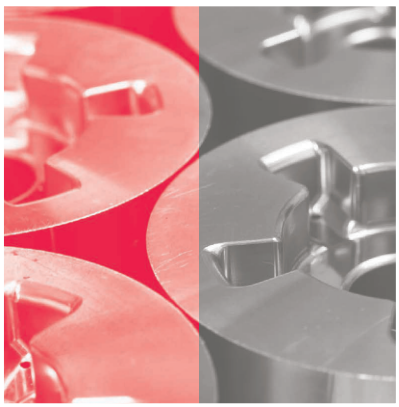
GMTC	UNS	Related Specs	Size (mm): 5 ≦ ϕ ≦ 200
A286	S66286	AMS 5731, AMS 5732, AMS 5734, AMS 5737, ASTM A453, ASTM B637	

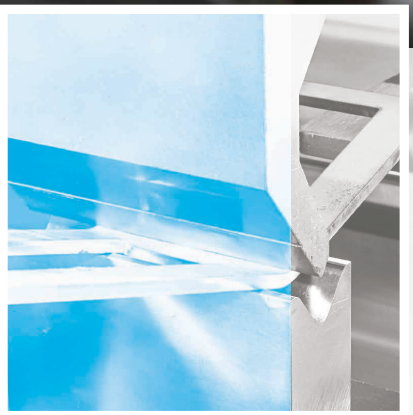
Above steel grades are available in ESR

SIMOLD



SITHERM





SIHARD

SIMOLD

CHEMICAL COMPOSITION

SIJ GRADE	CHEMICAL COMPOSITION (MAS.%)										ACHIEVED
	W. NR.	C	Si	Mn	Cr	Mo	Ni	V	W	Others	HARDNESS
SIMOLD 2083	1.2083	0,46	max 1,0	max 1,0	13,5	/	/	/	/	/	55 - 57 HRC
SIMOLD 2085	1.2085	0,35	0,4	0,45	16	/	/	/	/	S 0,070	45 - 51 HRC
SIMOLD 2311	1.2311	0,4	0,3	1,45	1,95	0,2	/	/	/	/	52 HRC
SIMOLD 2738	1.2738	0,4	0,3	1,4	1,9	0,2	1	/	/	/	52 HRC
SIMOLD 2316	1.2316	0.39	max 1,0	max 1,50	17	1,05	/	/	/	/	49 HRC

SIHARD

CHEMICAL COMPOSITION

SIJ GRADE	CHEMICAL COMPOSITION (MAS.%)									ACHIEVED
	W. NR.	C	Si	Mn	Cr	Mo	Ni	V	W	HARDNESS
SIHARD 2379	1.2379	1,55	0,25	0,3	11,5	0,7	/	1	/	62-64 HRC
SIHARD 2767	1.2767	0,45	0,25	0,3	1,35	0,25	4	/	/	56 RC
SIHARD 2357	1.2357	0,5	0,3	0,6	3,3 0,2	1,5	/		/	59-61 HRC
SIHARD 2510	1.2510	0,95	0,25	0,3	11.5	0,7	/	1	/	62-64 HRC
SIHARD 2842	1.2842	0,9	0,25	2	0.35	/	/	0,1	/	63-65 HRC

SITHERM

CHEMICAL COMPOSITION

SIJ GRADE	CHEMICAL COMPOSITION (MAS.%)							ACHIEVED
	W. NR.	C	Si	Mn	Cr	Mo	V	HARDNESS
SITHERM 2343	1.2343	0,38	1	0,4	5,1	1,25	0,4	50 - 56 HRC
SITHERM 2344	1.2344	0,4	1,05	0,4	5,15	1,35	1	52 - 56 HRC
SITHERM 2365	1.2365	0,32	0,25	0,3	2,95	2,8	0,55	44 - 54 HRC
SITHERM 2367	1.2367	0,38	0,4	0,4	5	3	0,6	55 HRC

"ONCE TOOLOX® ALWAYS TOOLOX®"

SSAB TOOLOX® ENGINEERING & TOOL STEEL

"Too good to be true"

TOOLOX® 33 | TOOLOX® 40 | TOOLOX® 44 | TOOLOX® 46

ENGINEERING & TOOL STEEL

Toolox® Advantages — **The statement on the front page comes from many users worldwide after they tried Toolox for the first time.**

Why? What are the advantages with Toolox?

- **Toolox is a pre-hardened engineering and tool steel:**
  You do not need to send your component away for heat treatment after machining. It is already done!
- **Toolox is designed to be shoped:**
  The steel is extremely clean, has a homogeneous microstructure and excellent dimensional stability when machining, which provides you with an outstanding material also very suitable for surface engineering such as polishing, texturing and nitriting.
- **Toolox has excellent properties at elevated temperatures:**
  It is excellent for tools and components working of elevated (up to 590°C) temperatures.
- **Toolox is available in different formats:**
  The properties are wrapped up in either plates or rounds, you choose the best dimension for you.

Toolox® 33

Plate thickness (mm)	Round bars diameter (mm)	Hardness (HBW)
6-350	21-400	275-325

Impact toughness Test temerature	Impact energy, Charpy-V, min)
20°C	35

Toolox® 40

Plate thickness (mm)	Hardness (HBW)
6-130	360-420

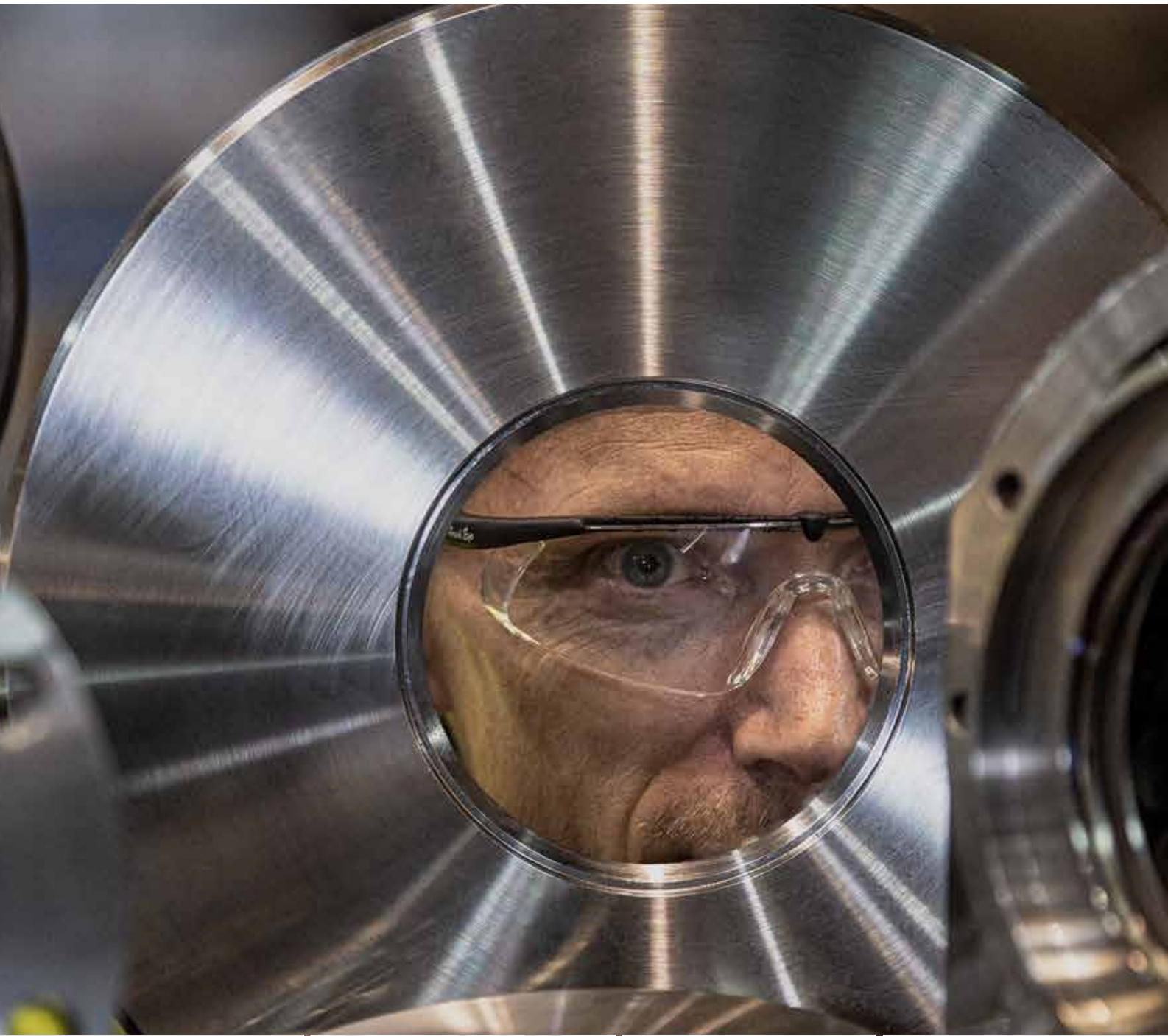
Impact toughness Test temerature	Impact energy, Charpy-V, min)
20°C	20

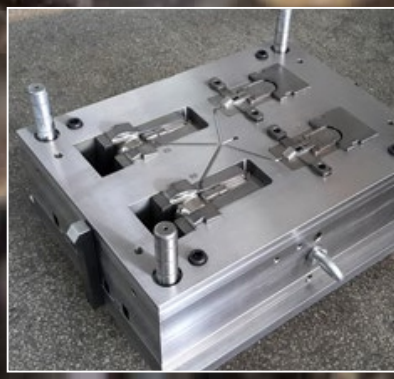
Toolox® 44

Plate thickness (mm)	Round bars diameter (mm)	Hardness (HBW)
6-400	21-400	410-475

Impact toughness Test temerature	Impact energy, Charpy-V, min)
20°C	18

Typical chemical composition	Toolox® 33	Toolox® 40	Toolox® 44
C	0.23%	0.28%	0.32%
Si	1.1%	1.1%	0.9%
Mn	0.8%	0.6%	0.8%
P	Max 0.011%	Max 0.011%	Max 0.011%
S	Max 0.003%	Max 0.002%	Max 0.003%
Cr	Max 1.60%	Max 1.30%	Max 1.70%
Mo	Max 0.80%	Max 1.10%	Max 1.40%
V	Max 0.12%	Max 0.12%	Max 0.17%
Ni	Max 1.0%	Max 1.4%	Max 1.4%
CEIIW	0.65 (Max 0.69)	0.80 (Max 0.84)	0.96 (Max 1.00)
CET	0.39 (Max 0.42)	0.47 (Max 0.50)	0.57 (Max 0.60)





Toolox® Applications
▶ Mouldng ▶ Hot forming ▶ Applications working at elevated temperatures ▶ Stamping, punching ▶ Machine components

Inclusions	Toolox® 33	Toolox® 40	Toolox® 44
Inclusion size (equiv. diam.)	6 micron	6 micron	6 micron
Area fraction	0.015%	0.015%	0.015%
Aspect Ratio	1.2	1.2	1.2

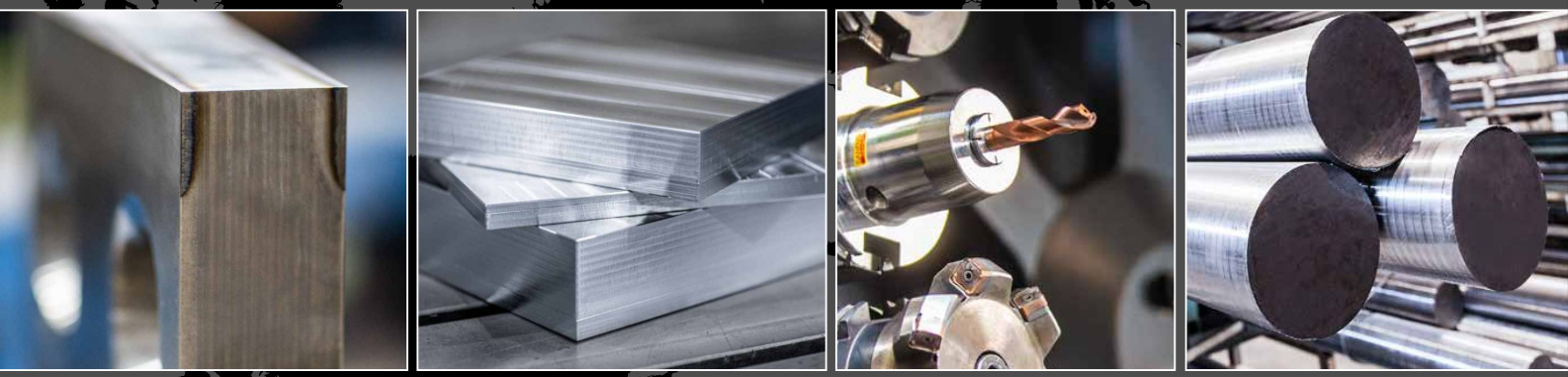
TYPICAL VALUES

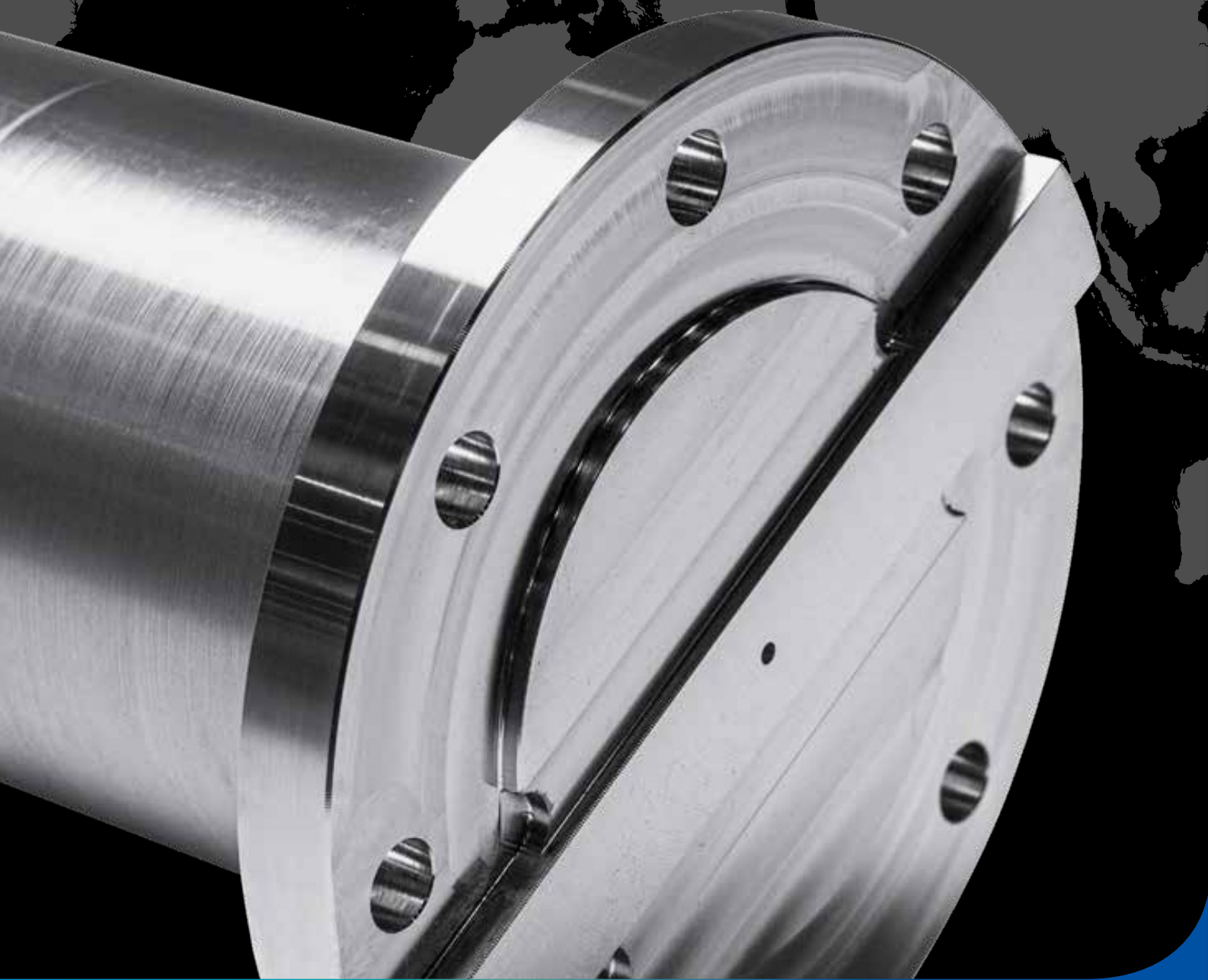
Toolox® 33 - Mechanical Properties	-20°C	+20°C	+200°C	+300°C	+400°C	+500°C
Hardness (HBW)		300	305	290	270	
Hardness (HRC)		~29	~30	~29	~26	
Yield strength $R_{p0.2}$ (MPa)		850	690	680	590	560
Tensile strength R_m (MPa)		980	900			
Elongation, A5, (%)		16	12			
Reduction of Area Z (%)		55				
Impact toughness, Charpy-V (J)	41	100	170	180	180	

Toolox® 40 - Mechanical Properties	-20°C	+20°C	+200°C	+300°C	+400°C	+500°C
Hardness (HBW)		400				
Hardness (HRC)		~40				
Yield strength $R_{p0.2}$ (MPa)		1150	1010	990	900	780
Tensile strength R_m (MPa)		1260	1170	1160	1060	900
Elongation, A5, (%)		14	14	14	15	16
Impact toughness, Charpy-V (J)	18	38				

Toolox® 44 - Mechanical Properties	-20°C	+20°C	+200°C	+300°C	+400°C	+500°C
Hardness (HBW)		450	440	415	380	345
Hardness (HRC)		~45	~44	~42	~38	~35
Yield strength $R_{p0.2}$ (MPa)		1300	1150	1040	980	825
Tensile strength R_m (MPa)		1450	1340	1270	1190	1010
Elongation, A5, (%)		13	10	12	14	19
Reduction of Area Z (%)		35				
Impact toughness, Charpy-V (J)	13	30	60	80	80	

Physical Properties	+20°C		+200°C		+400°C	
	Toolox® 33	Toolox® 44	Toolox® 33	Toolox® 44	Toolox® 33	Toolox® 44
Heat conductivity (W/m*K)	35	34	35	32	30	31
Thermal expansion coefficient (10^{-6}/K)	13.1	13.5	13.1	13.5	13.1	13.5





APPLICATIONS WHERE TOOLOX® SAVES TIME AND IMPROVES PERFORMANCE

MACHINE COMPONENTS

Workshop machinery

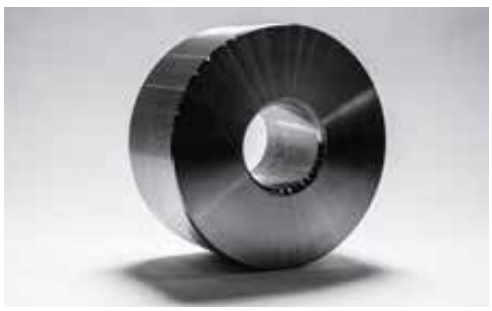
Gears and gear racks

Tool holders

Guideways

Process industry

Chain wheels



Steering wheels

Coke wagons

Recycling

Hammer pins

Knives

Shafts

These are some common applications for Toolox® engineering and tool steel. Visit toolox.com for more in-depth presentations of where Toolox® is used for machine components, molds and dies.

Scan the QR code to learn more

MOLDS AND DIES

Cold work

Cold forming tools

Punching tools

Hot work

Die casting dies

Forging dies

Plastic

Injection molds

Plastic molds

HARDNESS AND TOUGHNESS

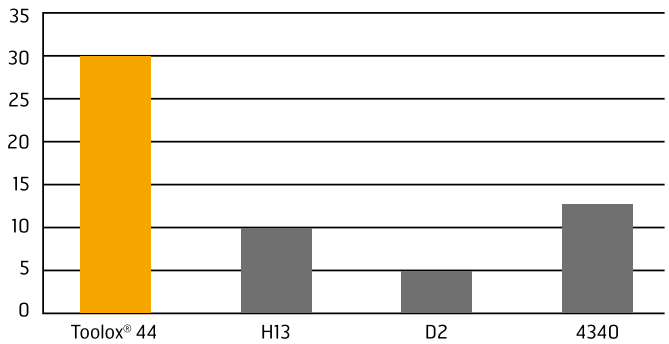
THE BEST OF BOTH WORLDS

Making a hard steel is easy, if you're only looking for hardness. The tricky part is to make a steel that is both hard and tough. A steel such as Toolox®. With hardness that gives a long life time even with highly abrasive applications, and toughness that enables it to withstand cracks and fatigue.

Hard to the core

All Toolox® grades have the same hardness all the way through. You can machine Toolox® plates and round bars to any complex shape, knowing that all surfaces are equally hard.

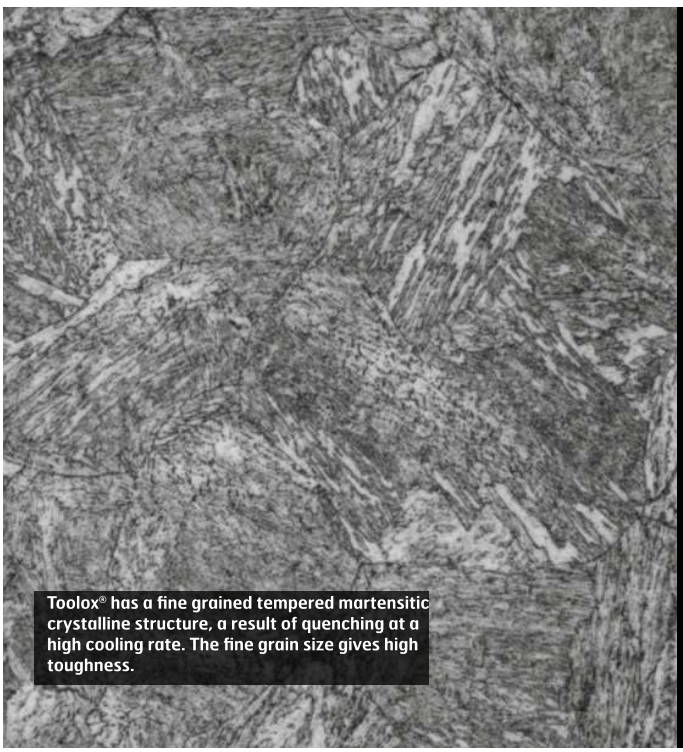
Impact toughness, Charpy-V (J) at 20°C



The table shows the toughness of Toolox® 44 compared to some standard steels that are heat treated to 45–55 HRC. Toughness values for Toolox® at -20°C are stated in the product certificates.

Grade	Hardness (HB)	Yield strength (MPa)	Tensile strength (MPa)	Elongation A_5 (%)	Toughness at +20°C (J)
Toolox® 33	275-325	850	980	14	100
Toolox® 44	410-475	1300	1450	13	30

Toolox® 33 has a nominal hardness of 300 HBW. Toolox® 44 has a nominal hardness of 45 HRC, making it the world's hardest fully prehardened tool steel. Datasheets for all Toolox® grades are available at toolox.com.



Toolox® has a fine grained tempered martensitic crystalline structure, a result of quenching at a high cooling rate. The fine grain size gives high toughness.

"We switched from 1.2379 with 56 HRC to Toolox® 44. Instead of cracking after 5,000 pieces the work piece in Toolox® 44 shows no wear after more than 40,000 pieces."

Ulus Metal, Istanbul

PLASTIC MOLD STEEL

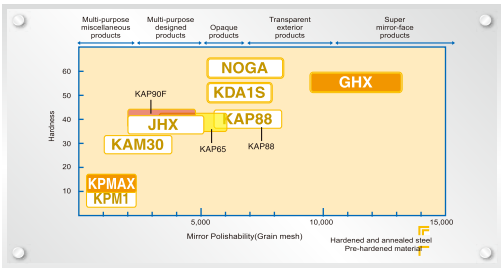
Grade	Equivalent to JIS	Hardness	Features	Example of application
KPM1	S55C	27~32HS	Multi-Purpose Plastic Mold Steel	Molding for Large Size
KPMAX	-patent-	27~32HS	High-Machinability Multi-Purpose Plastic Mold Steel	Molding for Large Size; Automotive, Electric Appliances
KPM30		27~33HRC	Superior-Hardness & High Machinability Multi-Purpose Plastic Mold Steel	Molding for Large Size
JHX		33~39HRC	Superior-Hardness Multi-Purpose Plastic Mold Steel	Molding for Large Size
KAP90F	SKD61	38~42HRC	Pre-Hardening Steel(Free Cutting)	Ejector Pin, Mold Parts
KAP65		38~42HRC	High-Grade & Free-Cutting Plastic Mold Steel	Precision Mold
KAP88		38~42HRC	High-Grade & Superior Mirror-Face Plastic Mold Steel	Precision Mold
GHX	SUS420J2	48~52HRC	Excellent Mirror-Face, High-Corrosion Resistance & Superior-Hardness Plastic Mold Steel	High-Grade Precision Mold
NOGA	-patent-	50~61HRC	Superior-Hardness & Superior Mirror-Face Plastic Mold Steel	High-Grade Precision Mold
SM3	SUS440C	55~60HRC	Corrosion- & Wear-Resistance Plastic Mold Steel	Molding of High-Grade Engineering Plastics, Roll

Recommendation!

KPMAX KPMAX is a 30HS type of multi-purpose plastic mold steel that exceeds in heat conductivity.

GHX GHX is a high grade mold steel that combines superior specularity with high corrosion resistance.

Resin Mold Steel Characteristic



TOOL STEEL FOR COLD WORK

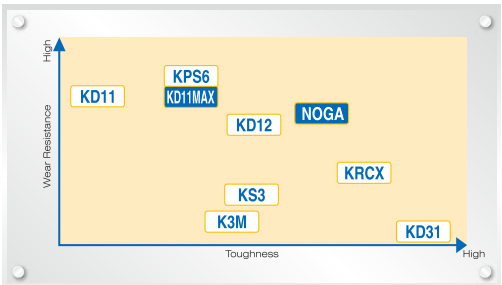
Grade	Equivalent to JIS	Hardness	Features	Example of application
K3M	SKS93	58~63HRC	Carbon Tool Steel	Press Die, Shear blade, Gauge
KS3	SKS3	58~63HRC	Multi-Purpose Tool Steel for Cold Work	Press Die, Shear blade, Gauge
KRCX	-patent-	50~60HRC	High-Machinability Multi-Purpose Tool Steel for Cold Work Flame Hardening Steel	Press Die, Shear blade, Gauge
KD12	SKD12	58~61HRC	Good-Toughness Tool Steel for Cold Work	Plastic Mold, Shear Blade
NOGA	-patent-	58~61HRC	Good-Toughness, Free-Cutting Tool Steel for Cold Work	Press Die, Forming Roll, Shear blade
KD11MAX	-patent-	58~62HRC	Good-Toughness, Superior-Hardness, Free-Cutting Multi-Purpose Tool Steel for Cold Work	Press Die, Forming Roll, Gauge
KD11	SKD11	58~60HRC	Multi-Purpose Tool Steel for Cold Work	Press Die, Forming Roll, Gauge
KPS6		58~62HRC	Corrosion- & Wear-Resistance Tool Steel for Cold Work	Resin injection parts
KD31		58~61HRC	Impact Resistance, High-Grade Tool Steel for Cold Work	Shear blade

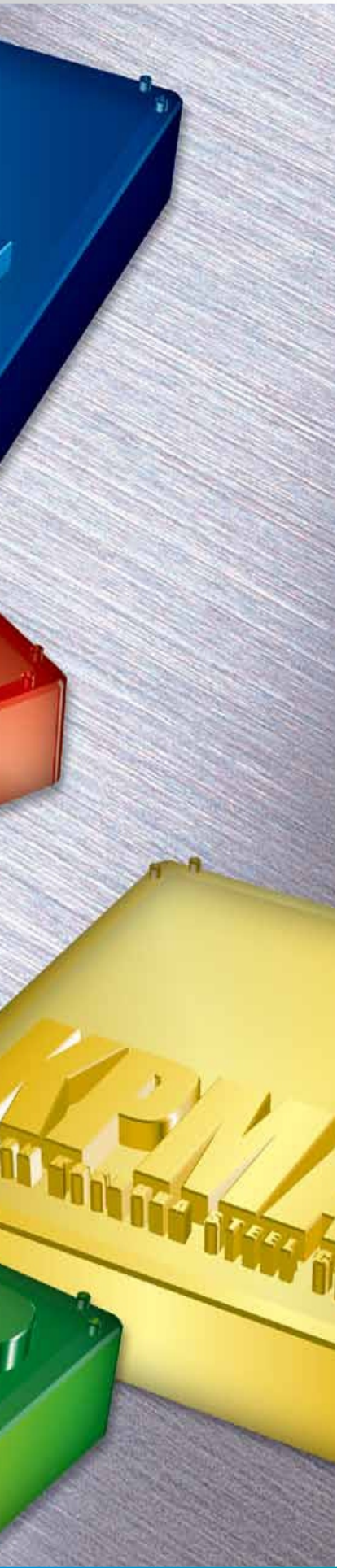
Recommendation!

KD11MAX KD11MAX is a multi-purpose tool steel for cold work which vastly improves upon the hardness, toughness, dimensional stability characteristics in heat treatment and machinability of SKD11.

NOGA NOGA has achieved the highest level of toughness, dimensional stability characteristics in heat treatment and machinability among tool steel for cold work.
NOGA has the optimal steel material structure for PVD coating, and demonstrates its performance like molding dies for high tensile strength steel and cutting blades.

Position of Cold Work Tool Steel Characteristic





TOOL STEEL FOR HOT WORK

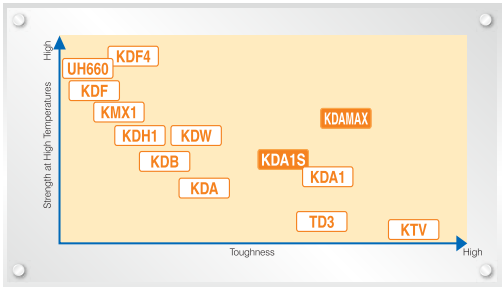
Grade	Equivalent to JIS	Hardness	Features	Example of application
KTV	SKT4	35~45HRC	Multi-Purpose Tool Steel for Die Block	Die Block, Press Die, Extrusion Tool
TD3		40~50HRC	Multi-Purpose Tool Steel for Hot Work	Extrusion Tool
KDA	SKD61	42~52HRC	Multi-Purpose Tool Steel for Hot Work	Die for Diecasting, Press Die, Extrusion Tool
KDB	SKD62	42~52HRC	Multi-Purpose Tool Steel for Hot Work	Extrusion Tool
KDA1		42~52HRC	Good-Toughness Tool Steel for Hot Work	Extrusion Tool, Die Block
KDA1S	-patent-	42~52HRC	High-Strength Multi-Purpose Tool Steel for Hot Work	Die for Diecasting, Press Die
KDAMAX	-patent-	42~52HRC	High-Strength & -Performance Tool Steel for Hot Work	Die for Diecasting, Press Die, Extrusion Tool
KDH1	SKD7	45~52HRC	High-StrengthTool Steel for Hot Work	Extrusion Tool, Press Die
KDF	SKD8	45~52HRC	High-StrengthTool Steel for Hot Work	Extrusion Tool, Press Die
KDW		45~52HRC	Tool Steel for Die Block	Die Block
UH660	SUH660	30~40HRC	Heat-Resistance Tool Steel for Hot Work	Extrusion Tool

Recommendation!

KDA1S KDA1S is our multi-purpose product that has improved machinability, keeping the same high performance as KDA1. It impressive resistance against heat cracks and aluminium erosion have attracted a great deal of attention in the world of diecasting metallic molds and press dies for hot forging industries.

KDAMAX KDAMAX is a material, which remarkably improved that resistance for occurring linear heat cracks in the sharp bottom corner and heavy breakage from the coolant holes of die-casting die.

Position of Hot Work Tool Steel Characteristic



HIGH SPEED TOOL STEEL

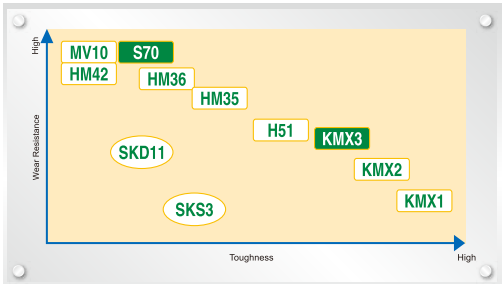
Grade	Equivalent to JIS	Hardness	Features	Example of application
KMX1		45~55HRC	Good-Toughness Matrix High Speed Tool Steel	Press Die for Warm Forging
KMX2		57~62HRC	Multi-Purpose Matrix High Speed Tool Steel	Press Die for Cold Forging
KMX3	-patent-	60~65HRC	High-Wear Resistance Matrix High Speed Tool Steel	Press Die, Thread Rolling Die, Roll
H51	SKH51	60~65HRC	Multi-Purpose High Speed Tool Steel	Drill, End Mill, Press Die
HM35	SKH55	60~66HRC	Heat- & Wear-Resistance High Speed Tool Steel	End Mill, Hob, Press Die
HM36	SKH56	60~66HRC	Heat- & Wear-Resistance High Speed Tool Steel	End Mill, Hob, Press Die
MV10	SKH57	52~67HRC	Heat- & Wear-Resistance High Speed Tool Steel	Turning Tool, End Mill, Hob
HM42	SKH59	62~67HRC	Heat- & Wear-Resistance High Speed Tool Steel	Turning Tool, End Mill, Hob
S70	-patent-	65~70HRC	Superior-Hardness & Wear-Resistance High Speed Tool Steel	Drill, End Mill, Turning Tool

Recommendation!

KMX3 KMX3 has an excellent cost effectiveness in addition to the same characteristics as JIS SKH51.
Optimum for metallic forms and wear-resistant components

S70 S70 is a type of steel created out of know-how in high speed tool steels accumulated over many years by Nippon Koshuha Steel.
S70 has the highest hardness of 70HRC as a dissolution high speed steel.

High Speed Tool Steel Characteristic



NEW HOT WORK DIE STEEL
KDA1ESD
NIPPON KOSHUHA STEEL CO., LTD.

NEW HOT WORK DIE STEEL KDA1ESD

Characteristics of KDA1ESD

Excellent high temperature property/softening resistance
It has better high temperature property than H13/having good softening resistance

High hardenability
High property can be obtained under the same heat treatment condition as H13

Excellent toughness
It has good hardenability and no harmful primary carbide, so it has excellent toughness.

Main Component of KDA1ESD unit wt%

	C	Si	Mn	Cr	Mo	W	V
KDA1ESD	0.4	0.3	0.6	4.4	2.0	0.5	0.6
KDA1S	0.4	0.6	0.4	4.8	1.7	--	0.5
H13	0.35	--	--	5.0	1.5	---	1.0

*The numbers above is central value, the actual products may differ slightly from the numbers shown.

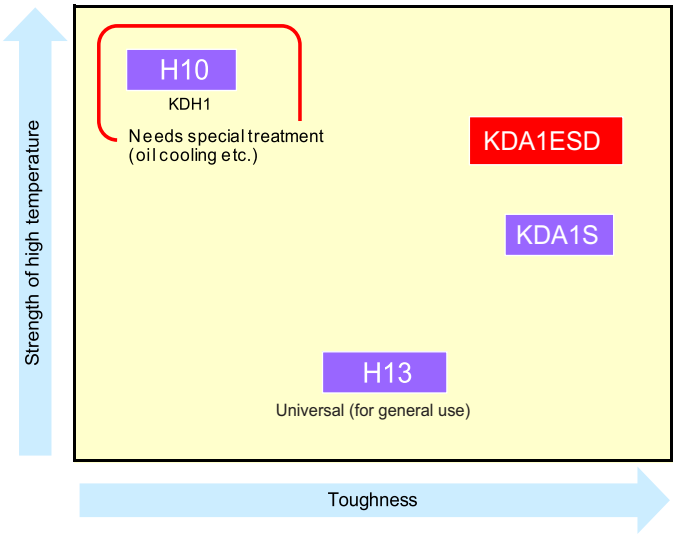
Comparison of Characteristics of KDA1ESD

	High temperature property	Hardenability	Toughness	Abrasion	Heat check*	Machinability*
KDA1ESD	◎	○	○	◎	(○)	(△)
KDA1S	○	○	○	○	○	◎
H13	x	○	△	△	x	○

*Characteristics in parentheses are estimated values from chemical components.

Positioning of KDA1ESD

KDA1ESD has toughness which is equal or better than H13 also has better high temperature strength than H13
Same heat treatment condition as H13



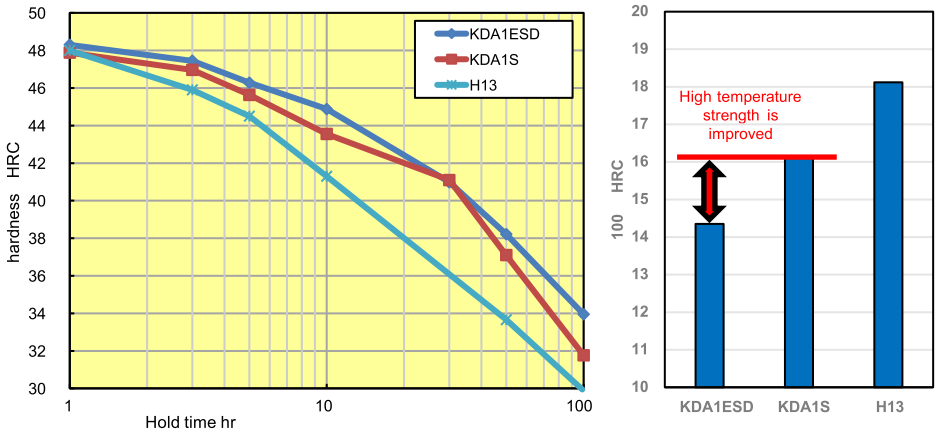
NIPPON KOSHUHA'S HOT DIECAST STEEL

Heat treatment condition for each steel

	Heat treatment		
	Quenching temperature °C	Tempering °C	Hardness of tempering, hardening
KDA1ESD	1010 ~ 1040 Pressurized cooling or oil quenching	550 ~ 610	42 ~ 52HRC
KDA1S	1010 ~ 1040 Pressurized cooling or oil quenching	550 ~ 610	42 ~ 52HRC
H13	1010 ~ 1040 Pressurized cooling or oil quenching	550 ~ 610	42 ~ 52HRC
H10	1010 ~ 1040 Oil quenching	550 ~ 610	42 ~ 52HRC
H10 (improved steel)	1010 ~ 1040 Oil quenching	--	--

Comparison of Characteristics of KDA1ESD High Temperature Property/Softening Resistance

KDA1ESD has good softening resistance which prevent from the hardness decrease that can be caused by being exposed to high temperatures.



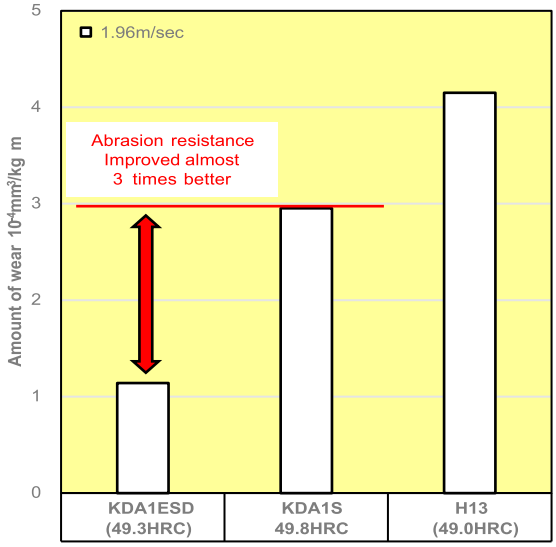
(Softening resistance comparing result holding 600°C)

Test condition	
Test machine	: Ohkoshi system abrasion test machine
Work material	: SUJ2(45HRC)
Oil	: Dry
Abrasion speed	: 0.94, 1.96 m/s
Abrasion distance	: 400m
Final weight	: 6.3kgf

Ohkoshi system of abrasion test compering result

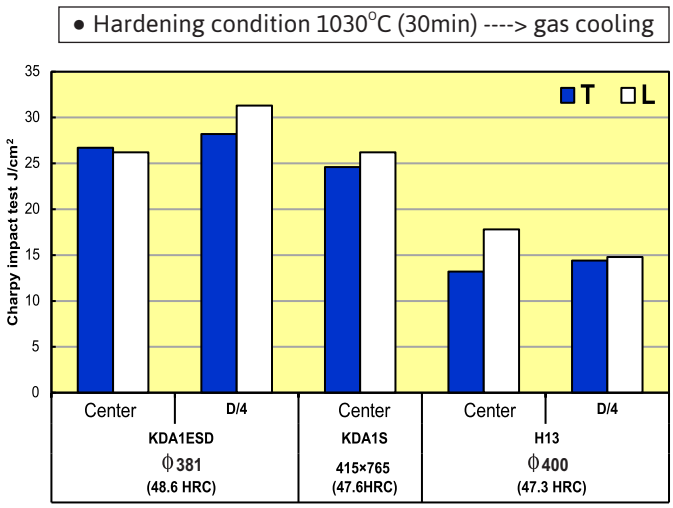
Comparision of Characteristics of KDA1ESD Abrasion Resistance

KDA1ESD has good abrasion resistance, reducing wear of Dies



Comparision of Characteristics of KDA1ESD Charpy Impact Test

Toughness of the KDA1ESD is equal to that of KDA1S.



Charpy impact test compering result (normal temperature • 2mm U notch)

Characteristics value of KDA1ESD

Thermal conductivity and Thermal expansion coefficient of KDA1ESD is equal to that of H13

Thermal Conductivity J/(g • K)

temperature	KDA1ESD	H13
26	23.7	24.4
100	27.5	26.3
200	27.6	27.8
400	27.8	27.6
600	25.1	26.5

Thermal Expansion coefficient (X 10^{-5}/°C)

temperature	KDA1ESD	H13
100	11	-
200	11.7	-
400	12.4	12.5
600	13.1	13.6

Young's modulus - Poisson's ratio

temperature	MODULUS	RATIO
23	225GPa	0.28
500	164GPa	0.33

MICRO FINE KMX1

NIPPON KOSHUHA STEEL CO., LTD.

CHARACTERISTICS OF KMX1

KMX1 is high speed tool steel for hot and warm work with the hardness (50HRC and more). It has excellent high temperature strength, good toughness and thermal shock resistance.

1. ***Excellent high temperature strength***
   Harder than that of SKD61, SKD62 and SKD7.

2. ***Exceptional toughness and thermal shock resistance***
   Excellent in toughness and thermal shock resistance compared to SKH51 and SKD7

3. ***Stable nitriding characteristics***
   Stable n tr dec layer with high softening resistance is obtained excellent in thermal fatigue life.

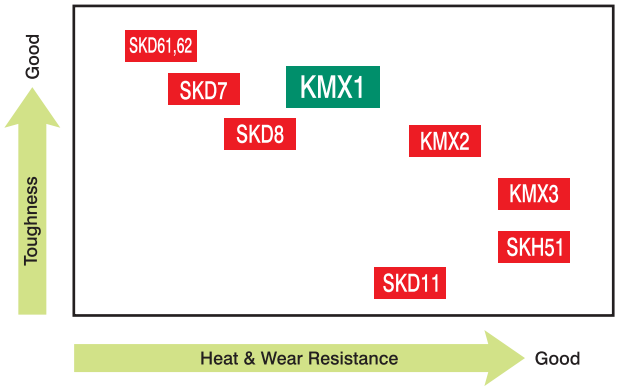
APPLICATION OF KMX1

KMX1 is suitable for the hot forming mold which needs intensity and toughness at high temperature.

Example

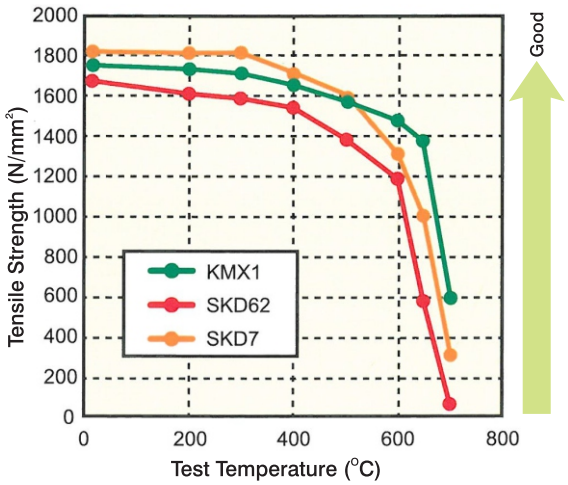
Die, Punch, Insert, Hot extrusion stem, Shear Blades, Tool steel for hot warm forging that needs toughness, Tool steel for hot work that needs heat resistance

POSITION OF KMX1



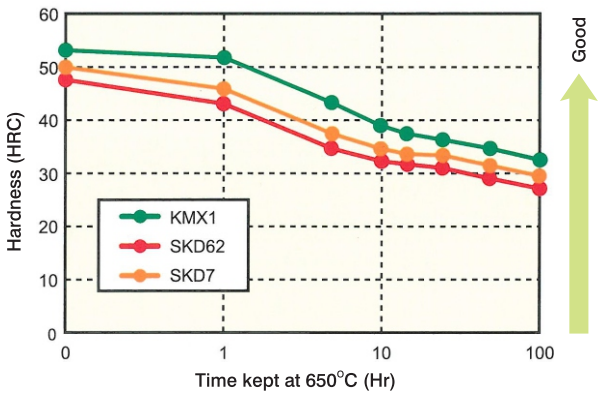
HIGH TEMPERATURE STRENGTH

2 times or more of tensile strength than SKDC62 and 1.4 times or more than SKD7 in a temperature region of 650°C or more.



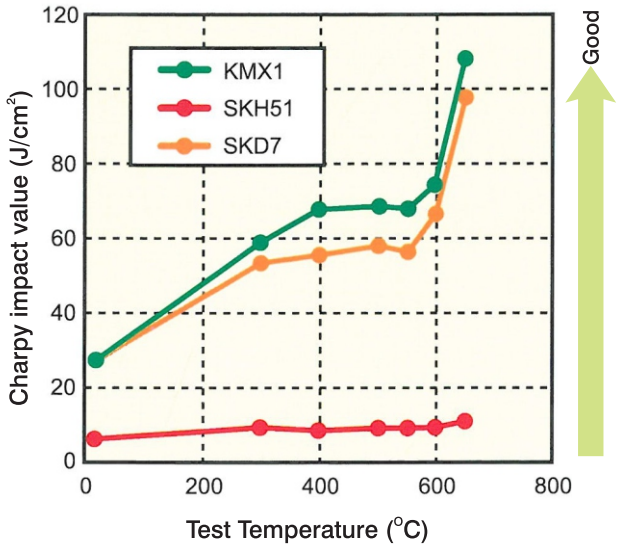
SOFTENING RESISTANCE

Higher hardness than that of SKD62 and SKD7 even after being held at 650°C for 100 hours.



TOUGHNESS

The impact value at room and high temperature is higher than that of SKH51 and SKD7. Excellent in thermal shock resistance and toughness.

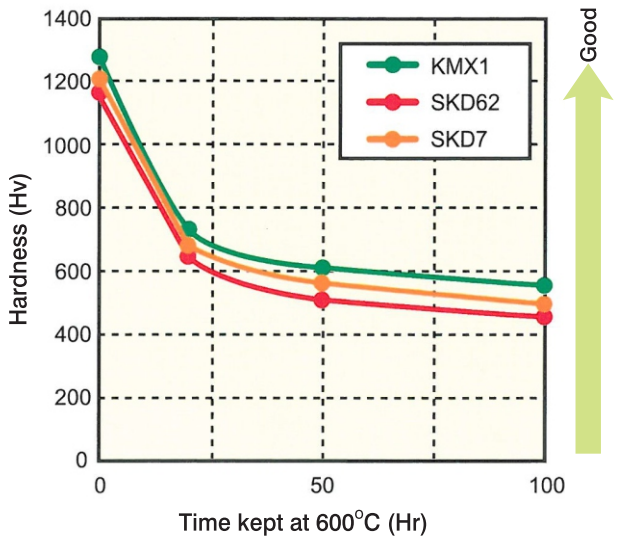


Test Condition

- T.P, Size
  10 angle x 55mm
  2U Notch

SOFTENING RESISTANCE OF SURFACE OF NITRIDED LAYER

Superior in softening resistance compared to SKD62 and SKD7 after nitriding (tuffriding) and being held 600°C for 100 hours.

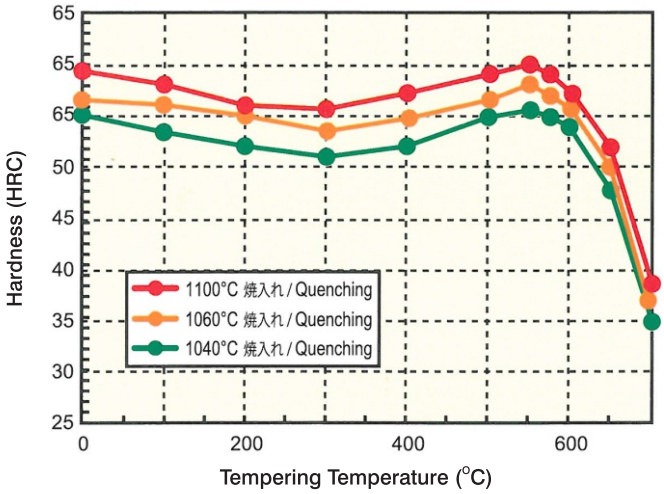


STANDARD HEAT TREATMENT

Recommended Condition

Quenching	Tempering	Hardness
1040~1100°C Oil, Pressurized gas cooling	540~650°C Air cooling x 2 times	45~55 (HRC)

HARDNESS CURVE BY QUENCHING & TEMPERING



A Global End-to-End Leader, from Steel Mill to Forge

HOT WORK STEEL

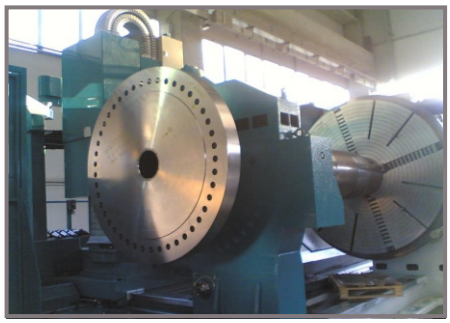
1.2343	1.2344	1.2345	1.2367	1.2714+A
1.2343 ESR	1.2344 ESR	1.2365	1.2367 ESR	1.2714+QT

COLD WORK STEEL

1.2767	1.2842

PLASTIC MOULD STEEL

1.1730	1.2083	1.2311+QT	1.2312+QT	1.2738+QT



Raw Material

Key Products

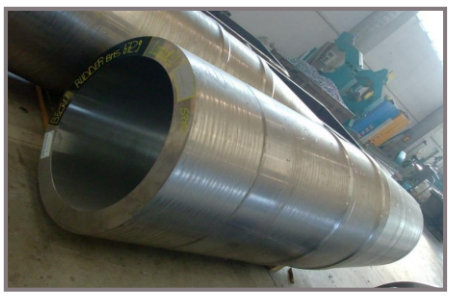
- Polygonal Ingots
- Round Ingots
- Round/Square pre-forged blooms
- Round/Square pre-forged bars

Steel Grades

- Carbon Steel
- Low Alloyed Steel
- Medium Alloyed Steel
- High Alloyed Steel
- Stainless Steel

Major Clients

- Forge Fedriga
- Forgital Group
- Manoir Industries



Production Size Limits

Hot Forged Flat Bar / Block		
	minimum	maximum
Thickness (mm)	350	900
Width (mm)	1000	1500
Length (mm)	5500	5500

Hot Rolled Sheet / Plate		
	minimum	maximum
Thickness (mm)	10	180
Width (mm)	n.a.	2000
Length (mm)	1000	5500

Hot Forged Round Bar		
	minimum	maximum
Diameter (mm)	300	800

Major Clients

- ABB Oy Marine
- Becker Marine
- Fincantieri
- Kongsberg Maritime
- Rolls Royce
- Compes
- Kind & Co
- Presezzi Extrusion

Quality Assurance

- Metalcam is qualified ISO 9001:2015 (Lloud's Register)
- Metalcam works with the most important 3rd Party inspection bodies such as ABS, TUV, BV, Lloyds Register, DNV-GL and RINA

Quality Control

- Chemical analysis on melted material
- Non Destructive testing:
  - Ultrasonic, Hardness, Magnetic Particle, Liquid Penetrant, Visual and Dimensinal
- Destructive testing:
  - Tensile, Impact, Bend, Creep tests ISO 17025 accrediation
- Micro and micro-graphic examination

Lloyd's Register

Certificate of Approval

This is to certify that the Management System of:

METALCAM S.p.A.

Via L. da Vinci 3, 25043 Breno - BS, Italy

has been approved by Lloyd's Register to the following standards:

ISO 9001:2015

Approval number(s): ISO 9001 – 0030047

The scope of this approval is applicable to:
Manufacture of ingots, raw and finished forging and shapes in carbon, alloy and stainless steel.

Daniel Oliva Marcilio de Souza
Area Operations Manager - South Europe
Issued by: Lloyd's Register Quality Assurance Italy Srl
for and on behalf of: Lloyd's Register Quality Assurance Limited

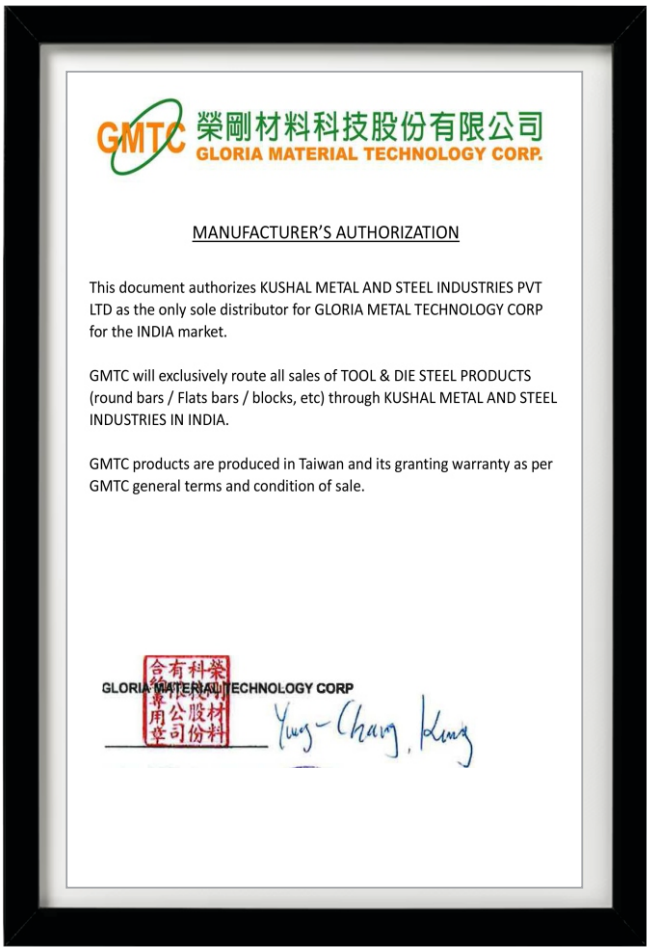
Chemical Compositions

Category	Sanyo grade	JIS Compatible JIS grade	Chemical Composition (%)										
			C	Si	Mn	P	S	Ni	Cr	Mo	W	V	Others
Cold working die steel	QK3M	SKS93	1.00	0.35	1.10	≦0.030	≦0.020	–	0.50	–	–	–	–
	QKS3	SKS3	0.95	0.25	1.05	≦0.030	≦0.020	–	0.75	–	0.75	–	–
	QC1	SKD1	2.10	0.25	0.40	≦0.030	≦0.010	–	13.50	–	–	–	–
	QC11	SKD11	1.50	0.20	0.40	≦0.030	≦0.010	–	11.30	0.90	–	0.25	–
	QCM8	–	Not disclosed										
	QCM7	–	Not disclosed										
	QF3	–	Not disclosed										
Hot working die steel	QD61	SKD61	0.37	1.00	0.40	≦0.030	≦0.010	–	5.00	1.20	–	0.85	–
	QDA61	–	0.37	1.00	0.40	≦0.030	≦0.010	–	5.00	1.20	–	0.50	–
	QD62	SKD62	0.38	1.00	0.40	≦0.030	≦0.010	–	5.00	1.25	1.25	0.40	–
	QD62HC	–	0.48	1.00	0.45	≦0.030	≦0.010	–	4.80	0.90	0.90	0.40	–
	QDT	–	Not disclosed										
	QT41-HARMOTEX	–	Not disclosed										
	QDN	–	Not disclosed										
	QDX-HARMOTEX	–	Not disclosed										
	QDH	–	Not disclosed										
	QF5	–	Not disclosed										
Plastic mold steel	PCM40	–	Not disclosed										
	PCM40S	–	Not disclosed										
High speed steel	QHZ	Matrix type	Not disclosed										
	QH51	SKH51	0.85	≦0.40	≦0.40	≦0.030	≦0.010	–	4.15	5.00	6.10	1.90	–
P/M high speed steel	SPM23	–	1.30	–	–	–	–	–	4.20	5.00	6.00	3.00	–
	SPMR8	–	Not disclosed										
	SPM30	–	1.30	–	–	–	–	–	4.00	5.00	6.00	3.00	Co 8.00
	SPM60	–	2.30	–	–	–	–	–	4.00	7.00	6.50	6.50	Co 10.00

Effect of alloy elements			
C, V, Nb, W, Mo, Cr	Improvement of hardness and wear resistance	Cr, Si, Al	Improvement of oxidation resistance
W, Mo, Co, V, Cr, Si	Improvement of heat resistance	Mo	Prevention of temper brittleness
Nb, V, Mo	Structure refining	Mn, Cr, Mo, Si, Ni	Improvement of hardenability

(℃) Heat treatment conditions			(HRC) Hardness	Remarks	JIS Compatible JIS grade	Sanyo grade	Category
Annealing	Quenching	Tempering					
750~780 Slow cooling	790~850 Oil quenching	150~200 Air cooling	55~60		SKS93	QK3M	Cold working die steel
750~800 Slow cooling	800~850 Oil quenching	150~200 Air cooling	55~62		SKS3	QKS3	
830~880 Slow cooling	930~980 Oil quenching	150~200 Air cooling	55~62		SKD1	QC1	
830~880 Slow cooling	1000~1050 Air cooling	150~250 500~530 Air cooling 2 times	55~62		SKD11	QC11	
830~880 Slow cooling	1020~1050 Air cooling	500~550 Air cooling 2 times	55~62		–	QCM8	
830~880 Slow cooling	1020~1050 Air cooling	500~550 Air cooling 2 times	55~62		–	QCM7	
820~870 Slow cooling	900~1000 Air cooling	–	(62~65)	Flame hardenable	–	QF3	
820~870 Slow cooling	1000~1050 Air cooling	550~650 Air cooling 2 times	40~52		SKD61	QD61	Hot working die steel
820~870 Slow cooling	1000~1050 Air cooling	550~650 Air cooling 2 times	40~52		–	QDA61	
820~870 Slow cooling	1000~1050 Oil quenching	550~650 Air cooling 2 times	40~50		SKD62	QD62	
820~870 Slow cooling	1000~1050 Oil quenching	550~650 Air cooling 2 times	45~60		–	QD62HC	
740~800 Slow cooling	930~980 Oil quenching	550~650 Air cooling 2 times	35~44	Pre-hardened	–	QDT	
740~800 Slow cooling	820~880 Oil quenching	500~650 Air cooling 2 times	34~42	Pre-hardened	–	QT41-HARMOTEX	
820~870 Slow cooling	1020~1050 Air cooling	550~650 Air cooling 2 times	40~52		–	QDN	
820~870 Slow cooling	1000~1050 Oil quenching/Air cooling	550~650 Air cooling 2 times	40~52		–	QDX-HARMOTEX	
820~870 Slow cooling	1020~1050 Oil quenching/Air cooling	500~650 Air cooling 2 times	40~55	For dia. ≧150, Oil quenching is recommended	–	QDH	
830~880 Slow cooling	1000~1050 Air cooling	500~650 Air cooling 2 times	40~55		–	QF5	
–	–	–	35~45	Pre-hardened	–	PCM40	Plastic mold steel
–	–	–	35~45	Pre-hardened	–	PCM40S	
830~880 Slow cooling	1130~1150 Oil quenching/Salt bath	530~650 Air cooling 2~3 times	55~60		Matrix-type	QHZ	High speed steel
800~880 Slow cooling	1200~1250 Oil quenching/Salt bath	540~600 Air cooling 3 times	55~63		SKH51	QH51	
860~880 Slow cooling	1050~1200 Oil quenching/Salt bath	500~580 Air cooling 3 times	55~65		–	SPM23	P/M high speed steel
860~880 Slow cooling	1050~1200 Oil quenching/Salt bath	500~580 Air cooling 3 times	55~65		–	SPMR8	
860~880 Slow cooling	1050~1200 Oil quenching/Salt bath	540~600 Air cooling 3 times	60~68		–	SPM30	
860~880 Slow cooling	1130~1200 Oil quenching/Salt bath	500~600 Air cooling 3 times	65~70		–	SPM60	

CERTIFICATES



GMTC 榮剛材料科技股份有限公司
GLORIA MATERIAL TECHNOLOGY CORP.

MANUFACTURER'S AUTHORIZATION

This document authorizes KUSHAL METAL AND STEEL INDUSTRIES PVT LTD as the only sole distributor for GLORIA METAL TECHNOLOGY CORP for the INDIA market.

GMTC will exclusively route all sales of TOOL & DIE STEEL PRODUCTS (round bars / Flats bars / blocks, etc) through KUSHAL METAL AND STEEL INDUSTRIES IN INDIA.

GMTC products are produced in Taiwan and its granting warranty as per GMTC general terms and condition of sale.

GLORIA MATERIAL TECHNOLOGY CORP

SSAB

Your name will be included in the list of Approved TOOLOX Dealers that SSAB EMEA AB will regularly publish. No Approved TOOLOX Dealer will have exclusivity with respect to any particular territory or customer segment. SSAB EMEA AB will endeavour to appoint Approved TOOLOX Dealers or locations as to achieve optimized market coverage.

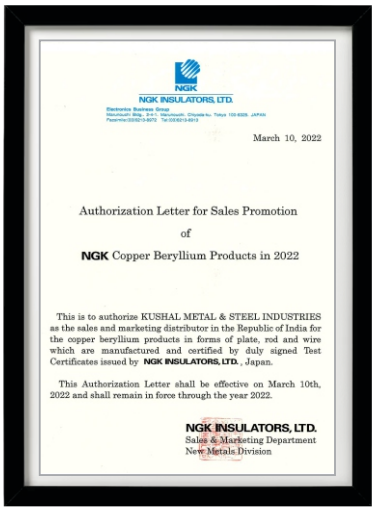
As an Approved TOOLOX Dealer you will work to quality standards established by SSAB EMEA AB. You will agree to allow SSAB EMEA AB to perform Quality Audits of your workshop and your procedures. Such Quality Audits will be performed by SSAB EMEA AB in-house quality auditors on reasonable prior notice.

This appointment may be terminated automatically twelve months after the date of signature by SSAB EMEA AB, or by either side subject to six months prior notice. The appointment may also be withdrawn with immediate effect by SSAB EMEA AB if you fail a Quality Audit or in cases of inadvertency or serious misconduct and also if there is a change of effective control over your company. When the appointment expires for whatever reason, the mentioned sign and any publicity material in your possession shall be returned and all use and references to trademarks of SSAB EMEA AB shall cease.

Please indicate your approval hereof by signing and returning the enclosed copy of this letter.

KUSHAL DOSHI
NITIN DOSHI
Location: MUMBAI/INDIA
DATE: 13/12/2019
Title: PROPRIETOR

For SSAB EMEA AB
Oxelösund, Sweden
DATE: 2019/12/08 – 2020/01/03
Pär Åkerbäck
Sales Director Tooling
SSAB EMEA AB



NGK INSULATORS, LTD.

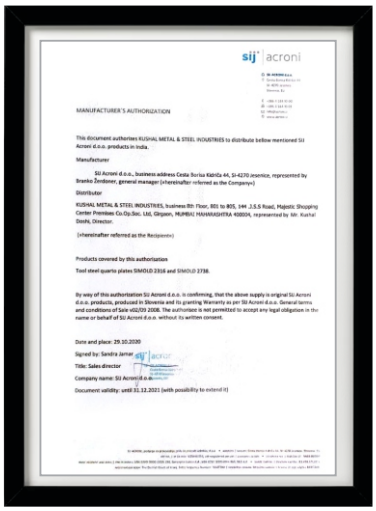
March 10, 2022

Authorization Letter for Sales Promotion
of
NGK Copper Beryllium Products in 2022

This is to authorize KUSHAL METAL & STEEL INDUSTRIES as the sales and marketing distributor in the Republic of India for the copper beryllium products in forms of plate, rod and wire which are manufactured and certified by duly signed Test Certificates issued by NGK INSULATORS, LTD., Japan.

This Authorization Letter shall be effective on March 10th, 2022 and shall remain in force through the year 2022.

NGK INSULATORS, LTD.
Sales & Marketing Department
New Metals Division



sij acroni

MANUFACTURER'S AUTHORIZATION

This document authorizes KUSHAL METAL & STEEL INDUSTRIES to distribute bellow mentioned SIJ Acroni d.o.o. products in India.

Manufacturer

SIJ Acroni d.o.o., business address Cesta Borisa Kidriča 44, SI-4270 Jesenice, represented by Branko Žerdoner, general manager (whereinafter referred as the Company)

Distributor

KUSHAL METAL & STEEL INDUSTRIES, business 8th Floor, 801 to 805, 144 ,J.S.S Road, Majestic Shopping Center Premises Co.Op.Soc. Ltd, Girgaon, MUMBAI MAHARASHTRA 400004, represented by Mr. Kushal Doshi, Director.

(whereinafter referred as the Recipients)

Products covered by this authorization

Tool steel quarto plates SIMOLD 2316 and SIMOLD 2738.

By way of this authorization SIJ Acroni d.o.o. is confirming, that the above supply is original SIJ Acroni d.o.o. products, produced in Slovenia and its granting Warranty as per SIJ Acroni d.o.o. General terms and conditions of Sale v02/09 2008. The authorizee is not permitted to accept any legal obligation in the name or behalf of SIJ Acroni d.o.o. without its written consent.

Date and place: 29.10.2020
Signed by: Sandra Jamar
Title: Sales director
Company name: SIJ Acroni d.o.o.
Document validity: until 31.12.2021 (with possibility to extend it)

METALCAM S.p.A.

DISTRIBUTIONSHIP LETTER FOR INDIA

Manufacturer Authorization certificate

This document authorises KUSHAL METAL AND STEEL INDUSTRIES PVT LTD to distribute below mentioned Metalcam products in India.

Manufacturer

METALCAM S.p.A.
Via Leonardo da Vinci, 3
25043 Breno (BS) - Italy

Designated Person

Massimo Cocchi
Sales Manager
+39 0364 258289
massimo.cocchi@metalcam.it

Distributor

KUSHAL METAL AND STEEL INDUSTRIES PVT LTD, business 8th floor, 801-805, 144 J.S.S. Road, Majestic shopping centre co.Op. society ltd, Girgaon, MUMBAI- MAHARSTRA 400004. Represented by Mr Kushal Doshi, MD.

Products covered by this authorization

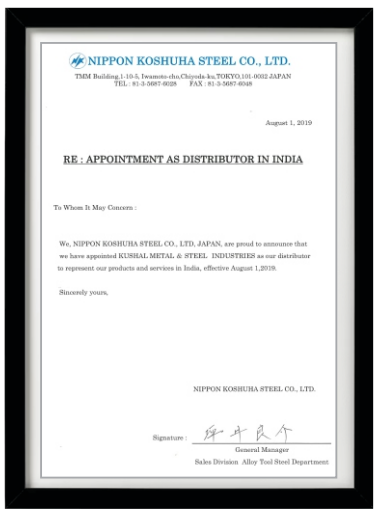
Tool steel Hot work/ Cold work and plastic mould grades.

By this way of this Authorization Metalcam is confirming, that the above supply is original Metalcam products, produced in Italy and its granting warranty as per Metalcam general terms and conditions of sale.

Breno, 22nd April 2022

Massimo Cocchi
Sales Manager

METALCAM S.p.A.



NIPPON KOSHUHA STEEL CO., LTD.
TMM Building,1-10-5, Iwamoto-cho,Chiyoda-ku,TOKYO,101-0032-JAPAN
TEL. 81-3-5687-6028 FAX. 81-3-5687-6048

August 1, 2019

RE : APPOINTMENT AS DISTRIBUTOR IN INDIA

To Whom It May Concern :

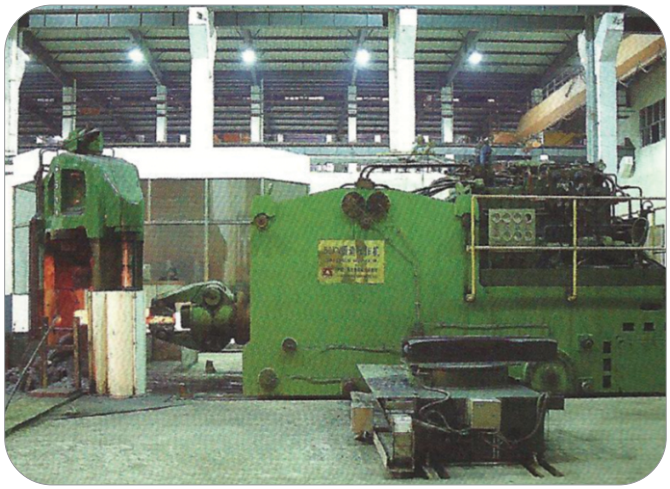
We, NIPPON KOSHUHA STEEL CO., LTD, JAPAN, are proud to announce that we have appointed KUSHAL METAL & STEEL INDUSTRIES as our distributor to represent our products and services in India, effective August 1,2019.

Sincerely yours,

NIPPON KOSHUHA STEEL CO., LTD.

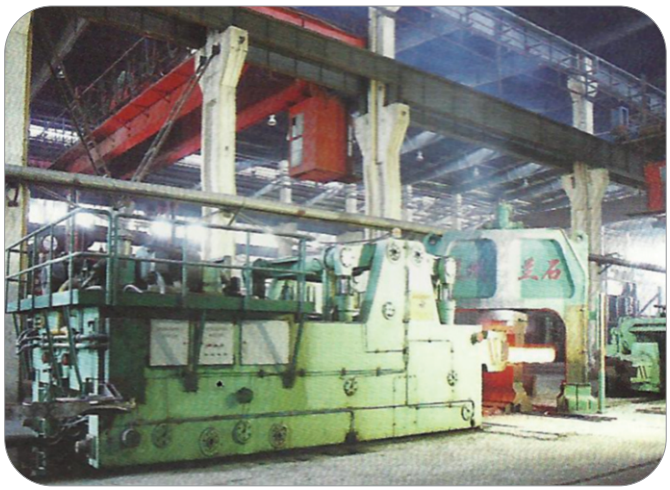
Signature :
General Manager
Sales Division Alloy Tool Steel Department


SX32 - 500T Precision Forging Machine

1250 Ton Quick Foring Machine

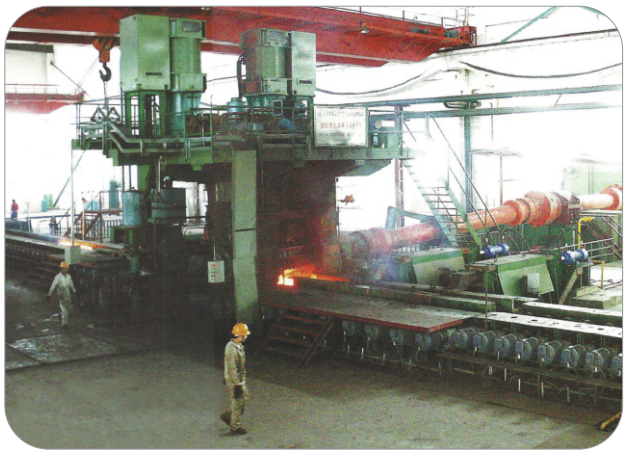
1250Ton Quick Forging Machine



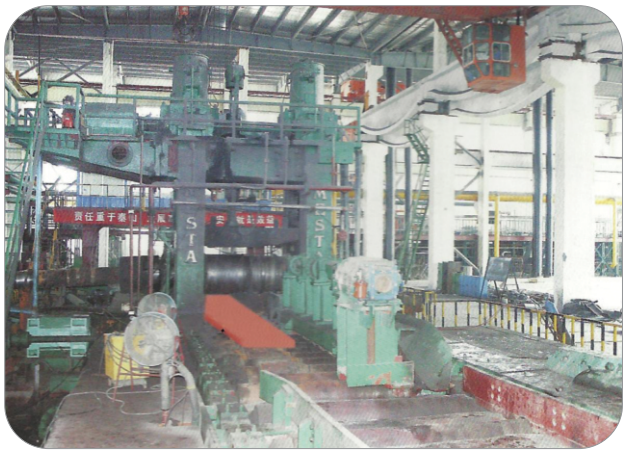
2000 Ton Quick Forging Machine

FLAT BAR ROLLING



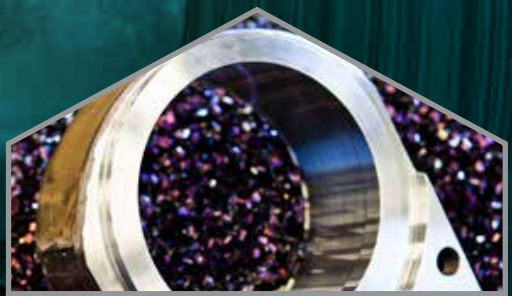


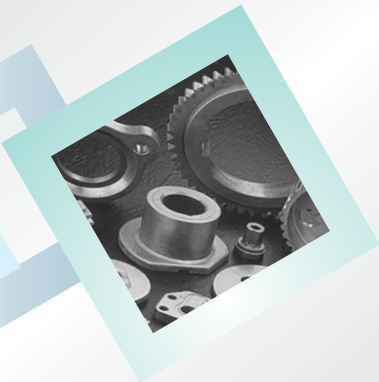


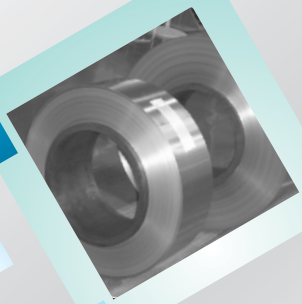



Kushal Metal & Steel Industries Pvt. Ltd.

High Speed Steel | Hot Work Steel | Cold Work Steel | Plastic Mould Steel







Kushal Metal & Steel Industries Pvt. Ltd.

Mr. NITIN DOSHI
Managing Director
kushal@kushalmetal.net
kushalmetal09@gmail.com

Mr. KUSHAL DOSHI
Director
Cell.: +91-99204 75123
kushal@kushalmetal.net

Mr. L K PANDEY
Sales Representative
Cell.: +91 93216 04504/00
E-mail: kushalmetal09@gmail.com

Mr. SAHIL SHAH
Cell.: +91-99200 38787
E-mail: spshah44@gmail.com

REGD. OFFICE :
Majestic Shopping Centre,
8th Floor, Office No-801/02/03/04/05,
144 JSS Road, Girgoan,
Mumbai-400 004.
Tel.: +91-22 6852 0014-39
Mob.: 77009 29091

UNIT - I
Plot No-13-A, Gala No - 3/4/5,
Oza Market & Ware House,
Magazine Street,
Near Devidayal Compound,
Darukhana, Reay Road [E],
Mumbai-400 010. Maharashtra, INDIA.

UNIT - II
Gala No. 3A/3B, Build 188, Gala No. 3,
Build No. 183, C/o. Indian Corporation,
Mouje Gundavli (Mankholi Phata),
Taluka Bhiwandi, Dist: Thane. (Maharashtra)

UNIT - III
Mr. KEVAL SHAH
H-21/P, Nr. New Water Tank,
Next to R. Kumar And Metals Road No. 32,
Odhav GIDC, Odhav, Ahmedabad - 382 415.
Tel.: +91-92246 40506
E-mail: kushalmetal07@gmail.com
kushalmetal09@gmail.com

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