



Goel Steel Company

Sanjay Steel Syndicate

Tool Room & Vacuum Heat Treatment Services

SPECIAL STEELS - ENGINEERING SERVICES

Chennai / Mumbai / NCR (Sonapat)

www.goelsteel.com

Competence in Tool Steel

Our Partners for Tool Steels
Authorized Stockist :



GRAPHITE INDIA LIMITED
(Powmex Steel Division)

Hitachi Metals, Ltd.



Schmiedewerke Gröditz
GmbH · seit 1779 · Edelstahl

sij metal
ravne



DEUTSCHE EDELSTAHLWERKE
Providing special steel solutions



- ISO 9001 : 2008 Certified
- **India's Largest Infrastructures for tool and special steels**
- Engineering services
- **Steel/Saw, Machining / Tool room / Gas Nitriding/Vacuum heat treatment**
- Single window for total tool steel solutions
- 7 service centres
- Technical support for steel and Engineering services from the world's best manufacturers
- Technical collaboration from Japan for Heat treatment
- NADCA and NADCAP compliant Vacuum heat treatment facilities
- **Largest vacuum heat treatment facility in South India, maximum load weight 1.8tons**
- Gas Nitriding surface treatment for your dies and components
- Machining/tool room/VMC's to handle upto 2.5tons weight
- **Only company in India to have steel/tool room and vacuum and surface heat treatment services under one roof**

Goel Steel Company

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Special Steels - Engineering Services

Competence in Tool Steels

Stock / Saw, Machining & Vacuum Heat Treatment / Surface Treatment

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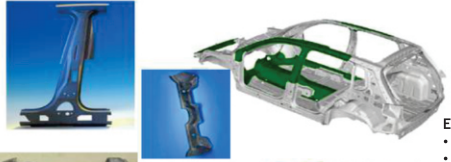
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Tool Room & Vacuum Heat Treatment Services



Standard and Special Tool Steels for hot formed press hardening components

Hot press forming is known as a combination of shaping sheets with a simultaneous thermal treatment of the material in one process step



Press hardened structural components are used today in almost any current vehicle - mainly within the range of the passenger space - Passenger protection (in-/penetration protection).

- Effects with press hardened material
- Heating up:-Decrease of the yield stress
 - Increase of the deformability
 - Thermal treatment/hardening
 - Structural transformation-Trebling the material yield strength

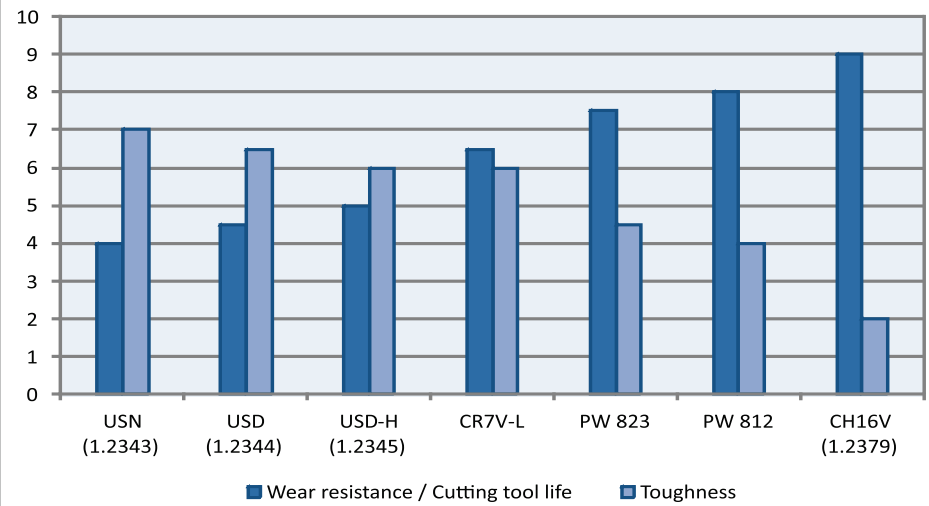
- Important requirement for tool steel
- high mechanical stability at elevated temperatures
 - good heat conductivity (to reduce cycle times)
 - sufficient high hardness (50-52 Hrc)
 - high hot wear resistance exceeding H13 / SKD 61
 - good properties of hot toughness

By using high performance steel grades a reduction of the cycle times and a substantial cost saving be achieved

Dominial CR7V-L Special grade, 50 - 52 Hrc

Our Special Steels for Cold Work Applications

Wear resistance & Toughness of Special steel Grades Cold Work application



LEDEBURITIC COLD-WORK TOOL STEEL - CARBIDE FORMATION

as cast network
Primary carbides appear white

forged / rolled - stretched network
Detail Individual primary carbide

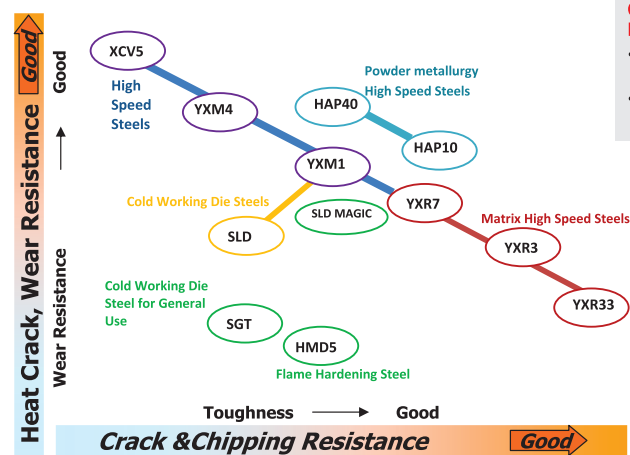
Our Cold Work Steels from Kind & Co-Germany

- For highest toughness - Cr7V7
- For high wear resistance - CH16V / PWM

SLD 30% toughness higher than D2/1.2379



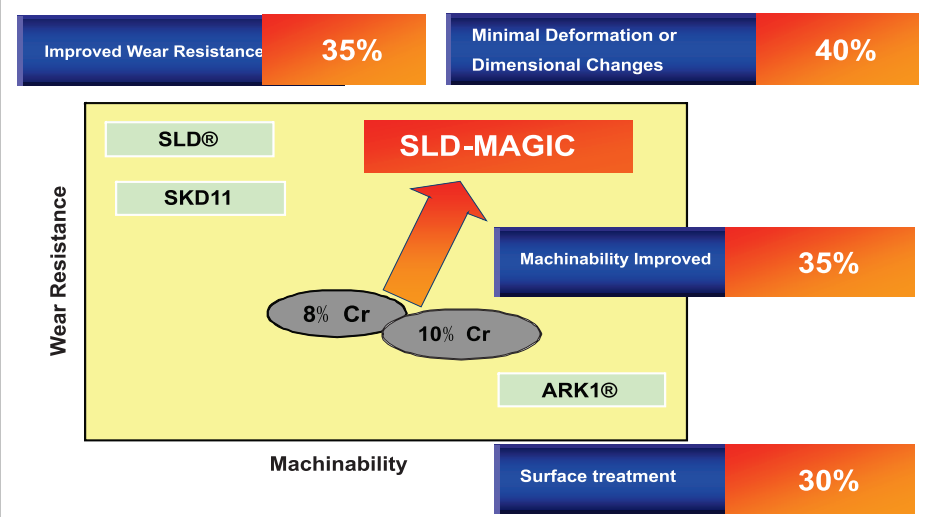
CHARACTERISTICS OF COLD WORK STEEL



Our Cold Work Steels from Hitachi - Japan

- For highest toughness - YXR33
- For higher wear resistance - HAP Series

Relationship of die materials for Cold Press (SLD Magic)



Property of SLD Magic® (Wear Resistance)

Test method (Speed: 40 spm); Load: 2.2 Ton, Stroke:60mm, Lubricant Diamond Pa920, Work Material : 980, 590 Mpa High tensile steel (1.6t) roughness Grind at 1000 # (Ra=0.04μm)

Observed Direction

Galling Start Point

Holding pressure

Punch

Die

Work

Schematic diagram of test condition

SKD11

8%Cr

S-MAGIC

Galling 45%

No Galling 0%

SLD magic: Good galling resistance compared to SKD11 or 8% Cr steel.

SPECIFICATION CHART

AISI/ASTM	MATERIAL (Closest corresponding grades)				CHEMISTRY											APPLICATION	HEAT TREATMENT DETAILS					PROPERTIES					STOCKING PROGRAM					
	EN/DIN	JIS	HITACHI	KIND	C	Si	Mn	S	P	S	Cr	W	Mo	Ni	V		Others	Annealing (Slow Cooling)	Quenchant (Hot Bath)	Quenching	Tempering (Air Cooling)	Annealed (hb)-max	Quenched & (hr) Tempered	Wear Resistance Abrasive	Wear Resistance Adhesive	Toughness	Machinability	Dimensional Stability in HT	Min	Max	Min	Max
D3	X210Cr12/ 1.2080	SKD1	CRD		2	0.25	0.45	0.03	0.01	12							Drawing dies, blanking dies.	830-880	OIL/AIR	930-980	150-200	248	61						6	660	16x10	810x250
D2	X 155CrVMoV12.1/ 1.2379	SKD11	SLD	CH16V	1.55	0.25	0.35	0.03	0.01	12				0.9	0.9	Cold work dies for roll forming, blanking, punches, etc.	800-850	AIR/OIL	980-1030	150-200	248	60						6	1130	16x5	1010x310	
O1	100MnCrW4/ 1.2510	SKS3	SGT		0.95	0.25	1.1	0.03	0.01	0.6		0.6	0.1			For deep drawing gauges	750-780	OIL	800-850	150-200	220	60					16	510	10x10	1010x150		
S1	60WCrV7/ 1.2550				0.6	0.6	0.3	0.06	0.01	1.1		2		0.2		Shear blades, cutting tools for heavy plates, etc	710-750	OIL	780-820	150-200	225	58					6	270		1010x105		
D2	X 165CrMoV12/ 1.2601				1.65	0.25	0.45	0.03	0.01	12				1	0.3	Cold work tools for rolls, blanking tools, punches.	830-880	AIR/OIL	980-1050	150-200	248	58										
			SLD MAGIC	CR7VL												Cold work dies for high tensile steels, mass production	1010-1040	OIL/AIR	830-880	50/180	255	60					10	463	10x6	610x185		
			SKH51	YXM1	0.9	0.3	0.4			5.2			1.3	2		Cold forging dies, cold heading dies, slitter	800-880	AIR/OIL	1160-1220	550-570	255	63					3	317		400x100		
				YXR7	0.8	0.8	0.3			4.7		1.3	5.5	1.3		Rolling dies/punches/blanking punches/rolls/cold forging	800-880	AIR/OIL	1120-1160	560-590	241	62					16	100				
				YXR3	0.6	1.5	0.4	0.3		4.3			2.9	1.8		Dies to be used for cracking or chip breaking resistance	800-880	AIR/OIL	1120-1160	550-580	241	60					20	152				
				YXR33	0.5	0.2	0.5			4.2		1.6	2	1.2		Cold forging dies/warm forging dies with high toughness	800-880	AIR/OIL	1120-1160	560-590	241	56					10	255				
				HAP5R	0.9	0.8	0.3			4.3		2	3	3		Cold forging dies/fine blanking	820-870	AIR/OIL	1120-1160	530-580	269	58										
				HAP10	1.4	0.6	0.3			5		3	6	3.8		Fine blanking dies.	820-870	AIR/OIL	1120-1160	550-580	269	63					14	162		150x50		
				HAP40	1.3	0.3	0.4			4.2		6	5	3.1	Co-8	Press forming dies for mass production / rolls	820-870	AIR/OIL	1170-1210	560-580	277	66					12	102		150x50		
				HAP72	21	0.4	0.3			4.2		9.5	8.3	5	Co-9.5	Cold plastic working dies/IC molds	820-870	AIR/OIL	1170-1210	560-580	352	68										