www.poscoss.com

Main Products

Cold Work Tool Steel · Hot Work Tool Steel · Plastic Mold Steel · Flame Hardening Tool Steel · Pre-harden Tool Steel · Forged Roll

POSCO Specialty Steel Co., Ltd.

Head Office & Changwon Plant : 65 Shinchon-Dong, Changwon, Kyongnam, 641-370 Korea TEL : 82-55-269-6263, 6255 / FAX: 82-55-269-6907
Seoul Office : POSCO SS&CC Tower 748-4 Banpo-Dong, SeoCho-Gu, Seoul 137-810 Korea TEL : 82-2-3469-6823, 6827 / FAX: 82-2-3469-6676~7
China Office : Rm.2804(B), B Dawning Center, No. 500 Hongbaoshi Rd., Shanghai, 201103 China TEL : 86-21-6091-3688(101) / FAX : 86-21-6091-2645
Thailand Office : Wellgrow Industrial Estate, 128/1 Moo 5 T. Bangsamak, A. Bangpakong, Chachoengsao. 24180 Thailand TEL : 66-38-545-365/370 / FAX : 66-38-545-386
Japan Office : POSCO Osaka Bldg. 9F 3-7-2Chome Namba, Chuo-ku Osaka, 542-0076, Japan TEL : 81-3-3546-1212

posco ss

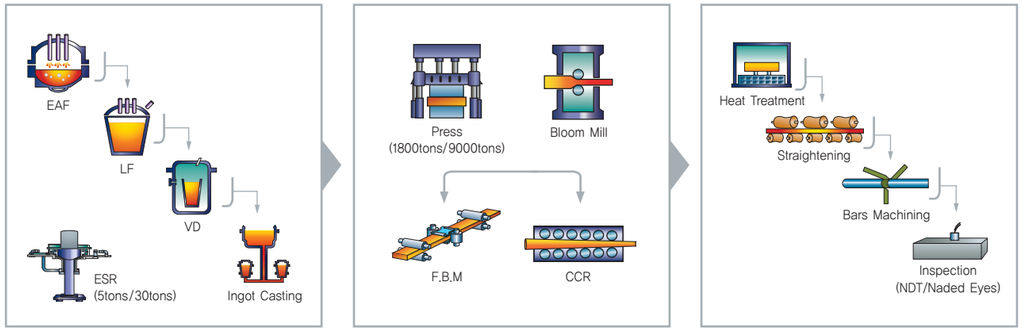
GLOBAL POSCO WAY

CREATE THE BEST SPECIALTY STEEL

TOOL STEEL

POSCO Specialty Steel Co., Ltd.

Manufacturing Process



Major Facilities for High-quality Tool Steel

• Ultra Clean Steel • Carbide Homogenization • Excellent Surface Quality

ESR (Electro Slag Remelting)

FBM (Flat Block Mill)

CCR (Compact Casset Rolling Mill)

Major Facilities for Mold Steel

• High-quality Ingot • Dimensional Accuracy • Uniform Hardness

Ingot Casting (11~80tons)

Press (9000tons)

Heat Treatment (50~200tons)

Coding Tank

Production Range

Round Bar : • Rolled (6~215mm ø) • Forged (205.1~850mm ø)

Rolled Flat Bar

(unit : mm)

T \ W	150≤W≤170	170<W≤220	220<W≤250	250<W≤320	320<W≤420	420<W≤517	517<W≤610
10≤T≤13							
13<T≤16							
16<T≤22							
22<T≤65							(★)
65<T≤110							
110<T≤120							
120<T≤130							
130<T≤158							

(★) Supply Range of Milled Surface

Forged Square Bar

(unit : mm)

T \ W	200≤W≤300	300<W≤350	350<W≤405	405<W≤450	450<W≤505	505<W≤600	600<W≤650	650<W≤850	850<W≤950	950<W≤1000	1000<W≤1100	1100<W≤1250
150<T≤200												
200<T≤250												
250<T≤305												
305<T≤350												
350<T≤400												
400<T≤500												
500<T≤550												
550<T≤600												
600<T≤650												
650<T≤700												

Plastic Mold Steel (Forged Square Bar)

(unit : mm)

T \ W	500≤W<600	600.1≤W<800	800≤W<1000	1000≤W<1100	1100≤W<1200	1200≤W<1300	1300≤W<1400	1400≤W<1600	1600≤W<1700	1700≤W≤1900
200≤T≤300										
300<T≤500										
500<T≤600										
600<T≤800										
800<T≤1000										
1000<T≤1100										

※ Customized production to be negotiated

[T : Thickness , W : Width]

Specification

Division	Standards	Material	Chemical Composition (Wt, %)										Annealing Temperature(℃)	Annealing Hardness	Heat Treatment Temperature(℃)		Hardness	Applications
			C	Si	Mn	P	S	Ni	Cr	Mo	V	Others			Quenching	Tempering		
Carbon Tool Steel	KS	STC3	1.00 1.10	0.10 0.35	0.10 0.50	0.03	0.03						750~780 Slow Cooling	HB 212 Max	780 Water Cooling	180 Air Cooling	HRC Min 63	Press Frame, Dental Tool, Chisel, Drill, Hammer
	JIS	SK3, SK105	1.00 1.10	0.10 0.35	0.10 0.50	0.03	0.03						750~780 Slow Cooling	HB 212 Max	780 Water Cooling	180 Air Cooling	HRC Min 63	
	ASTM	W1	0.95 1.05	0.10 0.40	0.10 0.40	0.03	0.03	0.20	0.15	0.10	0.10	Cu : Max 0.20 W : Max 0.15	730~760 Slow Cooling	HB 202 Max	760~820 Water Cooling	150~200 Air Cooling	HRC Min 61	
Cold Work Tool Steel	KS	STD11	1.40 1.60	0.40	0.60	0.03	0.03	0.50	11.00 13.00	0.80 1.20	0.20 0.50		830~880 Slow Cooling	HB 255 MAX	1030 Air Cooling	180 Air Cooling	HRC Min 58	Cold dies, Press, Roll, Pressing Dies
	JIS	SKD11	1.40 1.60	0.40	0.60	0.03	0.03		11.00 13.00	0.80 1.20	0.20 0.50		830~880 Slow Cooling	HB 255 Max	1030 Air Cooling	180 Air Cooling	HRC Min 58	
	ASTM	D2	1.40 1.60	0.10 0.60	0.10 0.60	0.03	0.03	0.40	11.00 13.00	0.70 1.20	0.50 1.10		830~880 Slow Cooling	HB 255 Max	1010 Air Cooling	204 Air Cooling	HRC Min 59	
		D3	2.00 2.35	0.10 0.60	0.10 0.60	0.03	0.03	0.50	11.00 13.50		1.00	W : Max 1.0	830~880 Slow Cooling	HB 255 Max	968 Oil Cooling	204 Air Cooling	HRC Min 61	
		D4	2.05 2.40	0.10 0.60	0.60	0.03	0.03		11.00 13.00	0.70 1.20	0.15 1.00		830~880 Slow Cooling	HB 255 Max	996 Air Cooling	204 Air Cooling	HRC Min 62	
	DIN	WNR1.2379	1.50 1.60	0.10 0.40	0.15 0.45	0.03	0.03		11.00 12.00	0.60 0.80	0.90 1.10		830~880 Slow Cooling	HB 255 Max	1010 Air Cooling	204 Air Cooling	HRC Min 58	
		WNR1.2080	1.90 2.20	0.10 0.40	0.15 0.45	0.03	0.03		11.00 12.00				830~880 Slow Cooling	HB 248 Max	996 Air Cooling	204 Air Cooling	HRC Min 60	
Hot Work Tool Steel	KS	STF4	0.50 0.60	0.10 0.40	0.60 0.90	0.030	0.02	1.50 1.80	0.80 1.20	0.35 0.55	0.05 0.15		740~800 Slow Cooling	HB 241 Max	820~880 Oil Cooling	–	–	
		STD61	0.32 0.42	0.80 1.20	0.50	0.03	0.03	0.25	4.50 5.50	1.00 1.50	0.80 1.20		820~870 Slow Cooling	HB 229 Max	1000~1050 Air Cooling	550~650 Air Cooling	HRC Max 53	
		STD62	0.32 0.40	0.80 1.00	0.20 0.50	0.03	0.03		4.75 5.50	1.00 1.50	0.20 0.60	W : 1.0~1.5	820~870 Slow Cooling	HB 229 Max	1000~1050 Air Cooling	550~650 Air Cooling	HRC Max 53	
		STD6	0.33 0.43	0.80 1.25	0.20 0.60	0.03	0.03		4.75 5.50	1.10 1.60	0.30 0.60		820~870 Slow Cooling	HB 229 Max	1000~1050 Air Cooling	550~650 Air Cooling	HRC Max 53	
	JIS	SKT4	0.50 0.60	0.10 0.40	0.60 0.90	0.03	0.02	1.50 1.80	0.80 1.20	0.35 0.55	0.05 0.15		740~800 Slow Cooling	HB 248 Max	850 Oil Cooling	500 Air Cooling	HRC Min 42	
		SKD61	0.35 0.42	0.80 1.20	0.25 0.50	0.03	0.02		4.80 5.50	1.00 1.50	0.80 1.15	W : 1.0~1.5	820~870 Slow Cooling	HB 229 Max	1020 Air Cooling	550 Air Cooling	HRC Min 50	
		SKD62	0.32 0.40	0.80 1.00	0.20 0.50	0.03	0.03		4.75 5.50	1.00 1.50	0.20 0.60	W : 1.0~1.5	820~870 Slow Cooling	HB 229 Max	1020 Air Cooling	550 Air Cooling	HRC Min 48	Pressing Dies, Die Casting Dies, Forging Dies, Header Dies, Knife
		SKD6	0.33 0.43	0.80 1.25	0.20 0.60	0.03	0.03		4.75 5.50	1.10 1.60	0.30 0.60		820~870 Slow Cooling	HB 229 Max	1050 Air Cooling	550 Air Cooling	HRC Min 48	
	ASTM	H13	0.32 0.45	0.80 1.25	0.20 0.60	0.03	0.03		4.75 5.50	1.10 1.75	0.80 1.20		820~870 Slow Cooling	HB 235 Max	1010 Air Cooling	552 Air Cooling	HRC Min 52	
		H12	0.32 0.40	0.80 1.00	0.20 0.50	0.03	0.03		4.75 5.50	1.00 1.50		W : 1.0~1.5	820~870 Slow Cooling	HB 235 Max	1010 Air Cooling	552 Air Cooling	HRC Min 53	
		H11	0.33 0.43	0.80 1.25	0.20 0.60	0.03	0.03		4.75 5.50	1.10 1.60	0.30 0.60		820~870 Slow Cooling	HB 235 Max	1010 Air Cooling	552 Air Cooling	HRC Min 53	
	DIN	WNR1.2344	0.37 0.43	0.90 1.20	0.30 0.50	0.03	0.03		4.80 5.50	1.20 1.50	0.90 1.10		750~780 Slow Cooling	HB 229 Max	1010~1030 Oil Cooling	540~560 Air Cooling	HRC Min 50	
		WNR1.2343	0.36 0.42	0.90 1.20	0.30 0.50	0.03	0.03		4.80 5.50	1.10 1.40	0.25 0.50		760~780 Slow Cooling	HB 229 Max	1010~1030 Oil Cooling	540~560 Air Cooling	HRC Min 48	
		WNR1.2767	0.40 0.50	0.10 0.40	0.15 0.45	0.03	0.03	3.80 4.30	1.20 1.50	0.15 0.35			610~650 Slow Cooling	HB 285 Max	840~860 Oil Cooling	170~190 Air Cooling	HRC Min 52	
	POSCO SS	SKT4V	0.50 0.60	0.35	0.70 1.00	0.025	0.020	1.30 2.00	1.00 1.40	0.25 0.50	0.10 0.30	Al : 0.02~0.03 NB : 0.03~0.04	760~780 Slow Cooling	HB 241 Max	850 Oil Cooling	550 Air Cooling	HRC Min 40	
		PST27K57V	0.55 0.60	1.00 1.20	0.50	0.03	0.03	0.80 1.20	4.50 5.50	1.40 1.60	0.80 1.20	Cu : Max 0.25	860~870 Slow Cooling	HB 241 Max	1010 Oil Cooling	550 Air Cooling	HRC Min 55	
Plastic Mold Steel	POSCO SS	PSTP1	0.50 0.55	0.35	0.90	0.03	0.02						850~890 Air Cooling	HB 230 Max		540~590 Air Cooling	HB Max 215	General Frame, Base for Precision Parts
		PSTP4	0.26 0.43	0.35	1.15	0.03	0.02	0.45	1.50				850~890 Air Cooling	HB 210 Max	850~890 Oil Cooling	540~620 Air Cooling	HS Min 38	Mold for Motor Bumper, O/A Machine and TV/PC Back Cover
		PSTP4M	0.26 0.43	0.35	1.00	0.03	0.02	0.55	2.10				850~890 Air Cooling	HB 230 Max	850~890 Oil Cooling	540~620 Air Cooling	HS Min 40	

Specification

Division	Standards	Material	Chemical Composition (Wt, %)										Annealing Temperature(℃)	Annealing Hardness	Heat Treatment Temperature(℃)		Hardness	Applications
			C	Si	Mn	P	S	Ni	Cr	Mo	V	Others			Quenching	Tempering		
Plastic Mold Steel	DIN	WNR1.2311	0.35 0.45	0.20 0.40	1.30 1.60	0.04	0.04		1.80 2.10	0.15 0.25			850~890 Air Cooling	HB 230 Max	850~890 Oil Cooling	540~620 Air Cooling	HS Min 38	Mold for High Quality Motor Bumper and Electronic Product Covers
		WNR1.2312	0.35 0.45	0.30 0.50	1.40 1.60	0.03	0.05 0.10		1.80 2.00	0.15 0.25			850~890 Air Cooling	HB 230 Max	850~890 Oil Cooling	540~620 Air Cooling	HS Min 38	
		WNR1.2714	0.50 0.60	0.10 0.40	0.65 0.90	0.03	0.03	1.50 1.80	1.00 1.20	0.45 0.55	0.07 0.12		850~890 Air Cooling	HB 245 Max	850~890 Oil Cooling	540~620 Air Cooling	HS Min 38	
		WNR1.2738	0.35 0.45	0.20 0.40	1.30 1.60	0.04	0.04	0.90 1.20	1.80 2.10	0.15 0.25			850~890 Air Cooling	HB 240 Max	850~890 Oil Cooling	540~620 Air Cooling	HS Min 42	
Air Hardening Tool Steel	ASTM	A2	0.95 1.05	0.10 0.50	0.40 1.00	0.03	0.03		4.75 5.50	0.90 1.40	0.15 0.50		830~880 Air Cooling	HB 255 Max	954 Air Cooling	204 Air Cooling	HRC Min 60	Forming Dies, Punch
		A6	0.65 0.75	0.10 0.70	1.80 2.50	0.03	0.03		0.90 1.40	0.90 1.40	0.15 0.50		770~790 Slow Cooling	HB 248 Max	843 Air Cooling	204 Air Cooling	HRC Min 58	
		A8	0.50 0.60	0.75 1.10	0.20 0.50	0.03	0.3		4.75 5.50	1.15 1.65		W : 1.0~1.5	770~790 Slow Cooling	HB 241 Max	1010 Air Cooling	510 Air Cooling	HRC Min 56	
	DIN	WNR1.2363	0.90 1.05	0.20 0.40	0.40 0.70	0.035	0.035		4.80 5.50	0.90 1.20	0.10 0.30		770~790 Slow Cooling	HB 230 Max	950 Air Cooling	180 Air Cooling	HRC Min 60	
Oil Hardening Tool Steel	KS	STS95	1.25 1.55	0.55 1.50	0.30 1.10	0.03	0.03		0.30	0.20 0.30			730~760 Slow Cooling	HB 212 Max	820 Oil Cooling	180 Air Cooling	HRC Min 59	Ring Gage, Wire Dies
		STS3	0.90 1.00	0.35	0.90 1.20	0.03	0.03		0.50 1.00			W : 0.5~1.0	750~800 Slow Cooling	HB 217 Max	830 Oil Cooling	180 Air Cooling	HRC Min 60	Screw Cutter, Cutting Knife
		STS93	1.00 1.10	0.50	0.80 1.10	0.03	0.03		0.20 0.60				750~780 Slow Cooling	HB 217 Max	820 Oil Cooling	180 Air Cooling	HRC Min 63	Knife Blade, Press Mold
	JIS	SKS95	1.25 1.55	0.55 1.50	0.30 1.10	0.03	0.03		0.30	0.20 0.30			730~760 Slow Cooling	HB 212 Max	820 Oil Cooling	180 Air Cooling	HRC Min 59	Ring Gage, Wire Dies
		SKS3	0.90 1.00	0.35	0.90 1.20	0.03	0.03		0.50 1.00			W : 0.5~1.0	750~800 Slow Cooling	HB 217 Max	830 Oil Cooling	180 Air Cooling	HRC Min 60	Screw Cutter, Cutting Knife
		SKS93	1.00 1.10	0.50	0.80 1.10	0.03	0.03		0.20 0.60				750~780 Slow Cooling	HB 217 Max	820 Oil Cooling	180 Air Cooling	HRC Min 63	Knife Blade, Press Mold
	ASTM	O1	0.85 1.00	0.10 0.50	1.00 1.40	0.03	0.03		0.40 0.70		0.30	W : 0.4~0.6	750~800 Slow Cooling	HB 212 Max	802 Oil Cooling	204 Air Cooling	HRC Min 59	Cold Molding Dies, Forming Roll
		O6	1.25 1.55	0.55 1.50	0.30 1.10	0.03	0.03		0.30	0.20 0.30			730~760 Slow Cooling	HB 212 Max	802 Oil Cooling	204 Air Cooling	HRC Min 59	Ring Gage, Wire Dies
		O2	0.85 0.95	0.50	1.40 1.80	0.03	0.03		0.50	0.30	0.30		750~770 Slow Cooling	HB 217 Max	802 Oil Cooling	204 Air Cooling	HRC Min 59	Cold Molding Dies, Forming Roll
	DIN	WNR1.2510	0.90 1.05	0.15 0.35	1.00 1.20	0.035	0.035		0.50 0.70		0.05 0.15	W : 0.5~0.7	770~790 Slow Cooling	HB 229 Max	780~820 Oil Cooling	180~220 Air Cooling	HRC Min 61	
		WNR1.2842	0.85 0.95	0.10 0.40	1.90 2.10	0.030	0.03		0.20 0.50		0.05 0.15		750~770 Slow Cooling	HB 229 Max	790~820 Oil Cooling	150~250 Air Cooling	HRC Min 60	
Shock Resisting Tool Steel	KS	STS41	0.40 0.55	0.15 1.20	0.10 0.40	0.03	0.03		1.00 1.80	0.50	0.15 0.30	W : 1.5 ~ 3.0	760~820 Slow Cooling	HB 217 Max	880 Oil Cooling	180 Air Cooling	HRC Min 53	Heat Forged Dies
	JIS	SKS41	0.40 0.55	0.15 1.20	0.10 0.40	0.03	0.03		1.00 1.80	0.50	0.15 0.30	W : 1.5 ~ 3.0	760~820 Slow Cooling	HB 217 Max	880 Oil Cooling	180 Air Cooling	HRC Min 53	
	ASTM	S1	0.40 0.55	0.15 1.20	0.10 0.40	0.03	0.03		1.00 1.80	0.50	0.15 0.30	W : 1.5 ~ 3.0	760~820 Slow Cooling	HB 217 Max	954 Oil Cooling	204 Air Cooling	HRC Min 56	
		S5	0.50 0.65	1.75 2.25	0.60 1.00	0.03	0.03		0.10 0.50	0.20 1.35	0.15 0.35		830~850 Slow Cooling	HB 229 Max	899 Oil Cooling	204 Air Cooling	HRC Min 58	Cutting Blade Punch
		S7	0.45 0.55	0.20 1.00	0.20 0.90	0.03	0.03		3.00 3.50	1.30 1.80	0.35		830~850 Slow Cooling	HB 229 Max	954 Air Cooling	204 Air Cooling	HRC Min 56	
Forged Roll	POSCO SS	PSTR-1	1.30 1.70	0.70	0.70	0.03	0.03	0.50	11.00 13.00	0.70 1.30	0.50 1.00	Co : 0.2~0.5	860~880 Slow Cooling	HB 225 Max	High, Medium, Low Frequency Heat Treating *) According to customer's demand		HS Min 90	Z-Mill and Cold Roll
		PST23R11	1.40 1.55	0.40	0.60	0.03	0.03	0.50	11.00 12.50	1.55 1.70	0.70 0.95	Co : 0.3~0.5	860~880 Slow Cooling	HB 225 Max			HS Min 90	
		PSTR-2	0.30 0.60	1.30	0.70	0.03	0.03	0.50	4.00 6.00	0.80 1.70	0.82	W : Max 1.5	860~880 Slow Cooling	HB 229 Max			HS Min 90	
		PSTR-12	1.30 1.70	0.70	0.70	0.03	0.03	0.5	11.00 13.00	0.70 1.30	0.50 1.00	Co : 0.2~0.5 Cu : Max 0.30	860~880 Slow Cooling	HB 245 Max			HS Min 90	
Flame Hardening Tool Steel		PST23F85	0.80 0.90	0.80 1.20	0.70 1.10	0.025	0.025		1.80 2.20	0.20 0.30	0.05 0.10		810~830 Slow Cooling	HB 235 Max	900~1000℃ Flame		HRC Min 60	Cold Molding

Label Specification

Packing

Bare Packing

Hessian Packing

Wooden Slate Packing

Wooden Box Packing

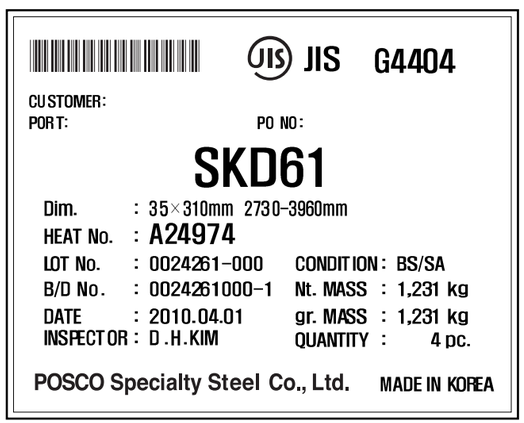
Label

[Domestic]

[Export]

TAG

[Domestic]



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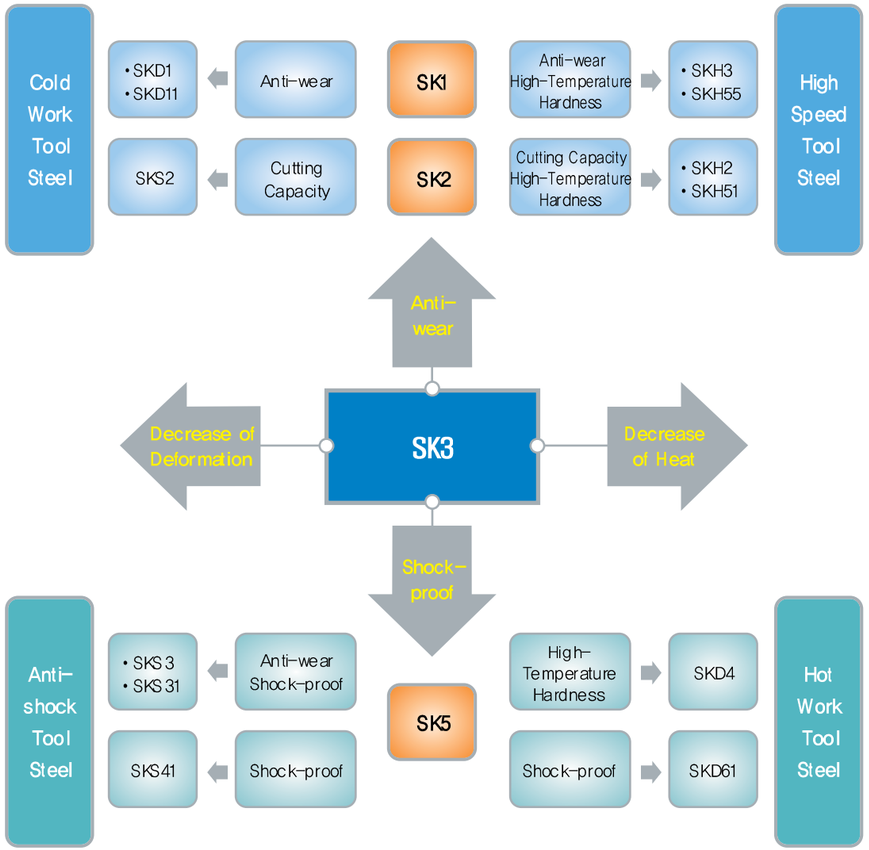
Selection of Tool Steel



Requirement	Influential Alloy Elements
Hot Hardness	W, Mo, Co(Combined with W or Mo), V, Cr, Mn
Anti-wear	V, W, Mo, Cr, Mn
Hardenability	Mn, Mo, Cr, Si, Ni, V
Deformation Inhibition	Mo(Combined with Cr), Cr, Mn
Tenacity by Crystallized Particles	V, W, Mo, Mn, Cr(for Others, Adjusted with Al)
Hot Molding with Aanti-oxidation	Cr, Si, Al

Certification of Approval


DET NORSKE VERITAS
MANAGEMENT SYSTEM CERTIFICATE
Certificate No. 1130-2007-AQ-KOR-RvA

This is to certify that the Management System of

POSCO SPECIALITY STEEL CO., LTD.

Head Office & Plant : #65, Sinchon-Dong, Changwon-Si, Gyeongsangnam-Do, Korea
Seoul Office : POSCO S&CC Tower, #746-4, Bonpo-Dong, Seocho-Gu, Seoul, Korea

has been found to conform to the Management System Standard:
ISO 9001:2008, KS Q ISO 9001:2009

This Certificate is valid for the following product or service ranges:
Design and Production of Special Steel and Super Alloy of Bars, Seamless Tubes, Pipes and Wire Rods

Original Certification date: May 8th, 2007
Place and date: Seoul, December 29th, 2009
This Certificate is valid until: May 8th, 2010
for the accredited Unit: DNV CERTIFICATION B.V., THE NETHERLANDS
Compliance to the Standard in respect to the indicated scope is certified by the DNV registered Team Leader
In-Kyeom Ahn, Management Representative
Seung-Yeol Lee, Lead Auditor

Lack of fulfilment of conditions as set out in the Appendix may render this Certificate invalid.
DNV CERTIFICATION B.V. Zwolseweg 1, 6994 LB Rheenendaal, The Netherlands

ISO 9001


DET NORSKE VERITAS
MANAGEMENT SYSTEM CERTIFICATE
Certificate No. CERT-12196-2007-AQ-HOU-IATF Rev. 2
IATF Certificate No. 0054700
Page 1 of 1

This is to certify that the Management System of

POSCO SPECIALTY STEEL CO., LTD.
at
#65, Sinchon-Dong, Changwon-Si, Gyeongsangnam-Do, Korea

Remote Supporting Functions:

Site Name	Site Address	Site City	Site State	Site Main Activities
Seoul Office	Posco S&CC Tower, 746-4 Bonpo-Dong, Seocho-Gu	Seoul	Korea	Marketing, Low Material Purchasing

has been found to conform to Technical Specification:
ISO/TS 16949:2002

having been audited in accordance with the:
Rules for the registration scheme for ISO/TS 16949:2002 – 2nd Edition.
This Certificate is valid for the following products/service ranges:
PRODUCTION OF SPECIAL STEEL AND SUPER ALLOY OF BARS, SEAMLESS TUBES AND WIRE RODS
EXCLUSION: 7.3 PRODUCT DESIGN

Initial Certification date: 26 July 2007
Place and date: Katy, Texas, 26 July 2007
This Certificate is valid until: 25 July 2010
for the accredited Unit: DET NORSKE VERITAS CERTIFICATION INC., KATY, TX, USA
Seung Yeol Lee, Lead auditor
Robert Kosik, Management Representative
Audit Conducted by DNV Office located in Seoul, Korea

HEAD OFFICE: DET NORSKE VERITAS CERTIFICATION INC. 1400 RANKIN DRIVE, KATY, TEXAS 77493, TEL: (281) 396-1000, FAX: (281) 396-1001

ISO/TS 16949


DET NORSKE VERITAS
MANAGEMENT SYSTEM CERTIFICATE
Certificate No. 1130-2007-AQ-KOR-RvA

This is to certify that the Management System of

POSCO SPECIALITY STEEL CO., LTD.

Head Office & Plant : #65, Sinchon-Dong, Changwon-Si, Gyeongsangnam-Do, Korea
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DNV CERTIFICATION B.V. Zwolseweg 1, 6994 LB Rheenendaal, The Netherlands

ISO 14001

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Cold Work Tool Steel
(SKD11)

Create the Best Specialty Steel

POSCO Specialty Steel Co., Ltd.

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TEL : 81-3-3546-1212

POSCO Specialty Steel Co., Ltd.

Cold Work Tool Steel (SKD11)

Product Characteristics

High Cleanliness and Quality → Excellent Anti-wear → Uniform Structure → Uniform Hardness → High Strength

Features

As a high C (H-Carbon), high Cr (H-C) steel, insists a higher level of hardness after QT heat treating, has a lower rate of deformation, and excellent anti-wear in cold conditions.

Chemical Composition

Division	Chemical Composition (Wt, %)								
	C	Si	Mn	P	S	Ni	Cr	Mo	V
SKD11	1.40 1.60	≤0.40	≤0.60	≤0.030	≤0.030	≤0.5	11.00 13.00	0.80 1.20	0.20 0.50

Applications

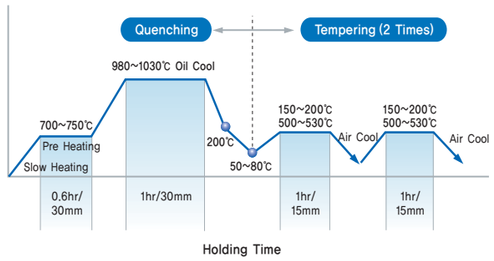
Used for tool steel manufacturing materials in cold-rolled state.

Shear Knives

Press Mold Plates

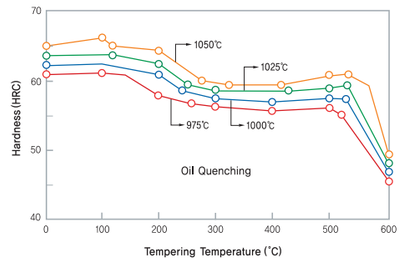
Standard Heat Treatment Conditions

• Quenching & Tempering Cycle



– In general, tempering temperature is set +20~50℃ compared to final operation temperature.

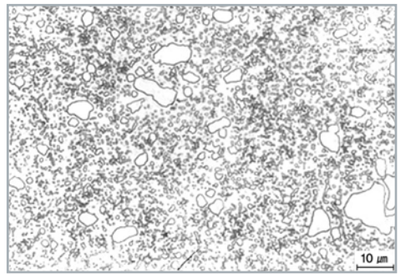
• Hardness Distribution of Heat Treating



– Quenching Hardness : HRC 61~65
– Second hardening occurr in the range of 400~530℃

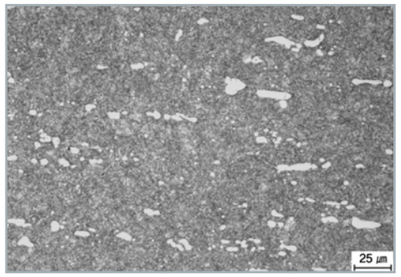
Heat Treated Structures

• Spheroidizing Annealing



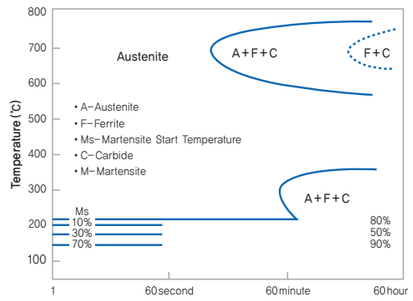
– Spherical cementites and eutectic carbides in ferrite matrix

• Quenching & Tempering



– Tempered martensites and carbides

TTT Curve



Distribution of Carbide

– Micro and uniform distribution of carbide

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Hot Work Tool Steel
(SKD61)

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POSCO Specialty Steel Co., Ltd.

Hot Work Tool Steel (SKD61)

Product Characteristics

- Excellent Tenacity and Red Hardness
- Heat Check Resistance and Anti-wear
- Minimum Heat Treatment Variation
- Appropriateness in Hot Dies Steel as Contained Large Quantity of "V"
- Appropriateness in Magnesium and Aluminum Pressing Dies

Features

Hot work tool steel with enhanced thermal balance resistance, and a combination of L-carbon and H-Cr compositions.

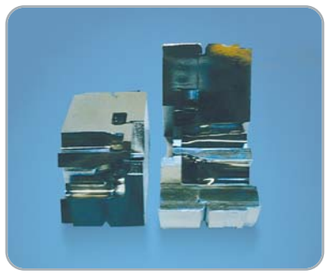
Chemical Composition

Division	Chemical Composition (Wt, %)								
	C	Si	Mn	P	S	Ni	Cr	Mo	V
SKD61	0.32 0.42	0.80 1.20	≤0.50	≤0.030	≤0.030	≤0.25	4.50 5.50	1.00 1.50	0.80 1.20

Applications

Used for tool hot-rolled steel manufacturing materials.

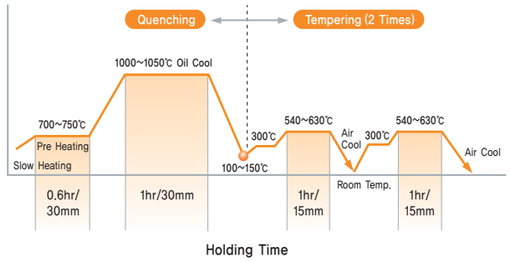
Extrusion Die



Die Casting Die

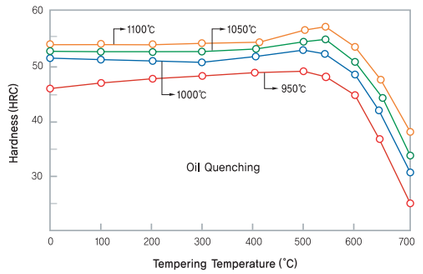
Standard Heat Treatment Conditions

• Quenching & Tempering Cycle



– In general, tempering temperature is set at +20~50℃ compared to operation temperature.

• Hardness Distribution of Heat Treating

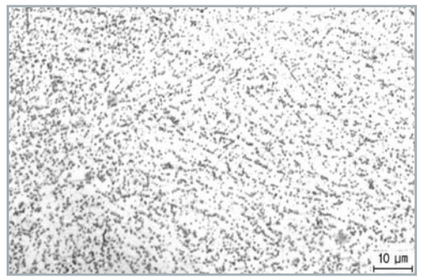


– Stronger level of hardness the higher the melting point

– Second hardening occurs in the range of 400~530℃

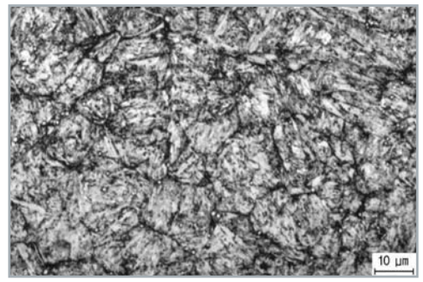
Heat Treated Structures

• Spheroidizing Annealing



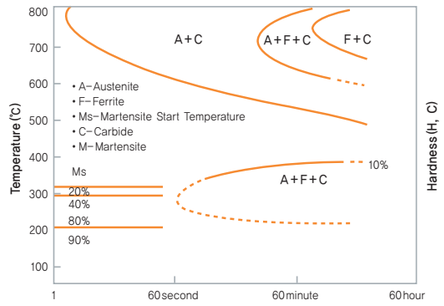
– Spherical cementites in ferrite matrix

• Quenching & Tempering

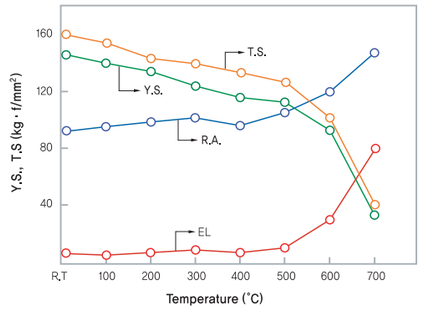


– Tempered martensites

TTT Curve



High Temperature Mechanical Properties



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Plastic Mold Steel
(PSTP4M, WNR1.2738)

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TEL : 81-3-3546-1212

POSCO Specialty Steel Co., Ltd.

Plastic Mold Steel (PSTP4M, WNR1.2738)

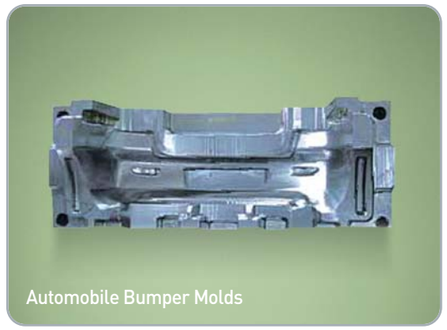
Features

Used for metal mould that injecting molding plastic materials

Chemical Composition

POSCO SS	JIS	AISI	DIN	Chemical Composition (Wt, %)								Applications
				C	Si	Mn	P	S	Ni	Cr	Mo	
PSTP1	S55C improved	1050 improved	1.1210 improved	0.53	0.25	0.80	0.025	–	0.20	0.20	–	General Frame Base for Precision Parts
PSTP4	SCM improved	4140 improved	1.2311 improved	0.30	0.25	1.05	0.025	0.02	0.30	1.40	0.30	TV/PC Back Cover and O/A Machine
PSTP4M	SNCM improved	P20 improved	1.2738 improved	0.30	0.25	0.90	0.025	0.02	0.50	1.90	0.45	Mold for High Quality Motor Bumper and Electronic Product Covers
Special Elements Added			1.2311	0.40	0.30	1.40	0.035	0.035	–	2.00	0.20	
			1.2738	0.40	0.30	1.40	0.035	0.035	1.00	2.00	0.20	
			1.2312	0.40	0.40	1.50	0.020	0.080	–	1.90	0.20	
			1.2714	0.55	0.30	1.80	0.030	0.030	1.70	1.10	0.50	

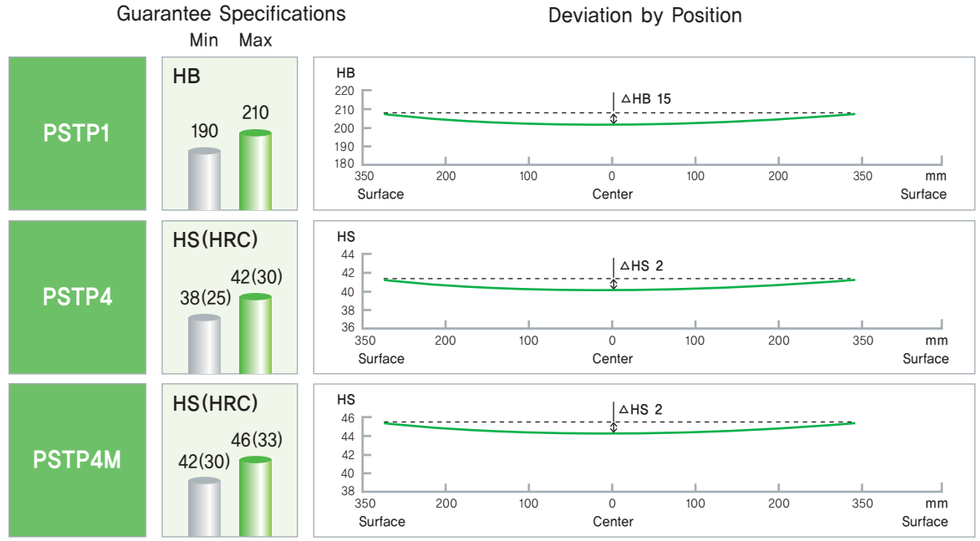
Applications



Automobile Bumper Molds

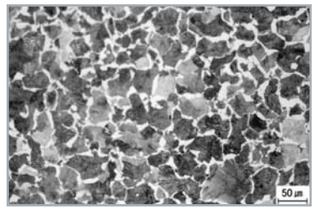
Automobile Head Lamp Molds

Distribution of Hardness



Heat Treated Structures

• PSTP1



[Nor. + Temp.]

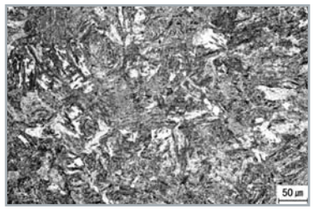
Homogeneous Bainite-Ferrite

• PSTP4

[Nor. + Qu. + Double Temp.]

Tempered Martensite

• PSTP4M



[Nor. + Qu. + Double Temp.]

More Tempered Martensite

Thermal Expansion Coefficient

(Unit : 10^{-6}/℃)

Tempering	PSTP1	PSTP4	PSTP4M
20~100℃	7.4	11.2	11.8
20~200℃	10.9	11.8	12.3
20~300℃	12.1	12.4	12.9
20~400℃	13.0	13.0	13.4
20~500℃	13.7	13.6	14.0
20~600℃	14.3	13.8	14.2

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Flame Hardening Tool Steel
(PST23F85)

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TEL : 81-3-3546-1212

POSCO Specialty Steel Co., Ltd.

Flame Hardening Tool Steel (PST23F85)

Product Characteristics

Heat treatment cost saving through flamesurface heat treating

High-strength & anti-wear surface

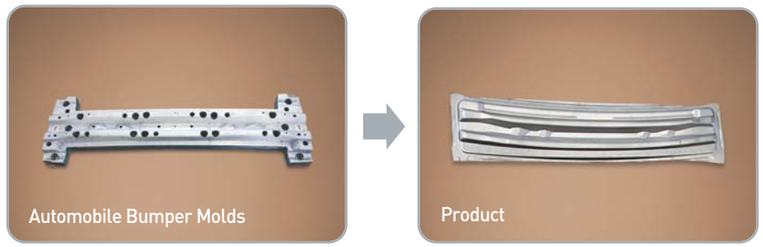
Features

Cold work tool steel that makes surface hardening heat treatment available with flame.
Enhancing hardenability by adding Cr, Mn, and Si, while the amount C influences hardness.

Chemical Composition

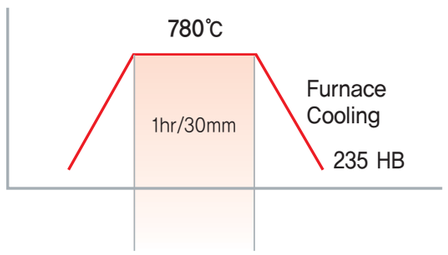
Division	Chemical Composition (Wt, %)				
	C	Si	Mn	Cr	Mo
PST23F85	0.80 0.90	0.80 1.20	0.70 1.10	1.80 2.20	0.20 0.30

Applications

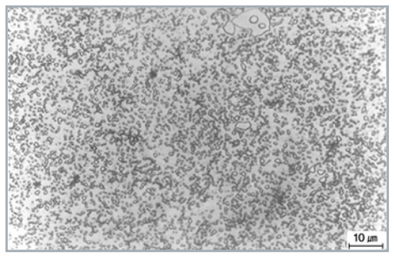


- Automobile Bumper Molds
- Blanking Dies
- Forming Dies
- Trimming Dies
- Shear Blades

Spheroidizing Annealing

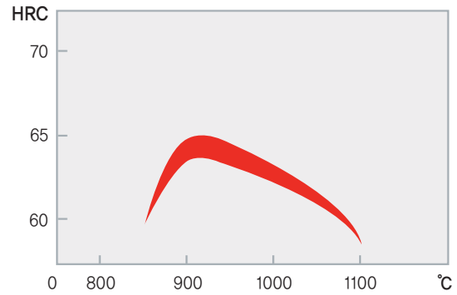


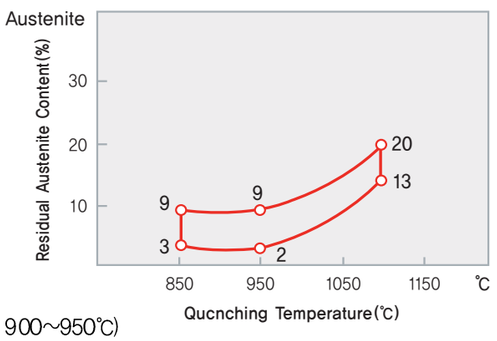
• Side Way



- Spherical cementites in ferrite matrix

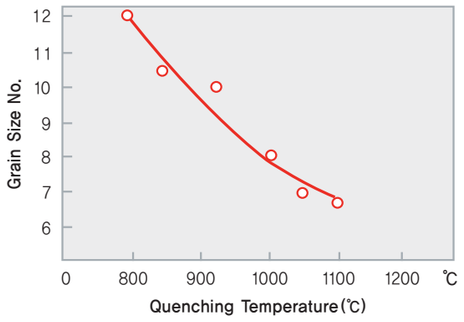
Distribution of hardness and remnant austenites based on the flame temperature



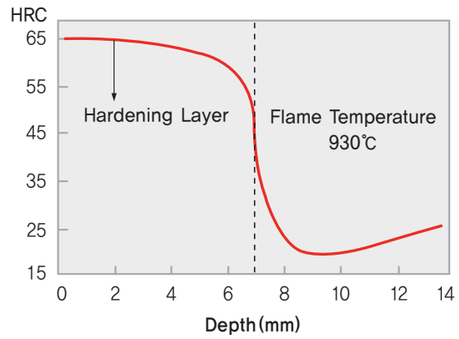


- HRC Distribution : 62~52 (in the temperature of 900~950℃)
- Hardness lowered between 1000~1100℃ due to increased residual austenite content.

Grain size based on frame temperature

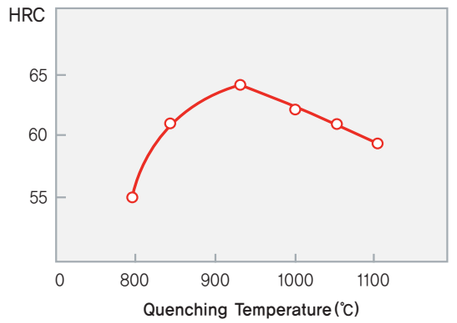


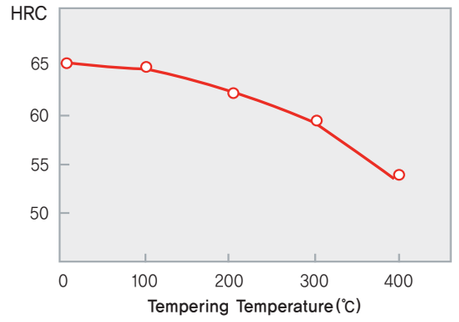
Hardening Depth



- Hardening Depth treated by flame heat treatment 5~6mm HRC Min 58

Features of whole materials after quenching & tempering process





* 925℃×30minutes of quenching+1hour of tempering

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Pre-harden Tool Steel
(SKT4(V))

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POSCO Specialty Steel Co., Ltd.

Pre-harden Tool Steel [SKT4(V)]

Product Characteristics

High Machinability → Excellent Thermal Shock Resistance → Excellent Anti-wear → Guarantee Homogeneous Hardness

Features

Provided in quenched and tempered form from the materials maker, and customers can use as molding without additional heat treatment.

Chemical Composition

Division	Chemical Composition (Wt, %)						
	C	Si	Mn	Ni	Cr	Mo	V
SKT4	0.50 0.60	0.40	0.60 0.90	1.50 1.80	0.80 1.20	0.35 0.55	0.05 0.15
SKT4V★	0.55	0.35	0.80	SKT4 improved			

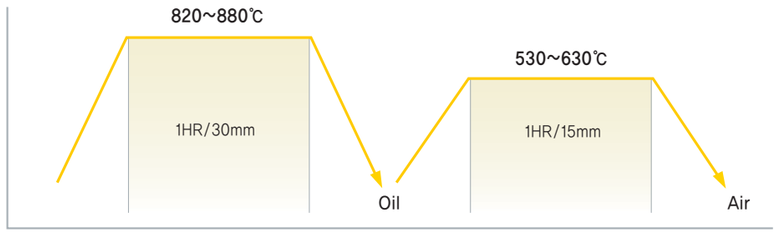
(★)Quality upgraded product compared to SKT4 : Reinforcement of anti-wear and heat resisting properties

Applications : Tool steel to form hot-rolled materials

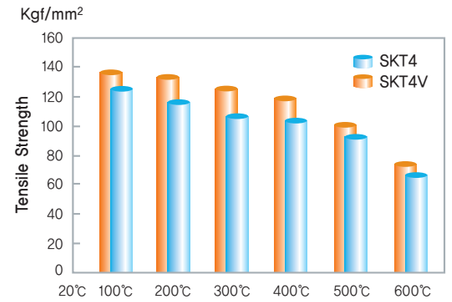
Hot Pressing Dies

- Die Forging Dies
- Pressing Dies
- Pressing Molding
- Pressing Molding

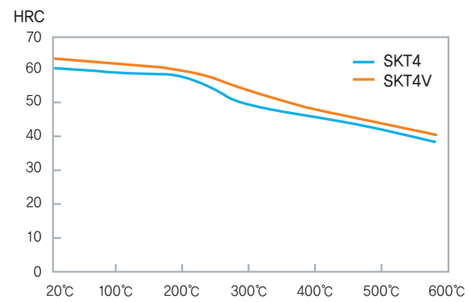
Quenching and Tempering Heat Treatment Condition



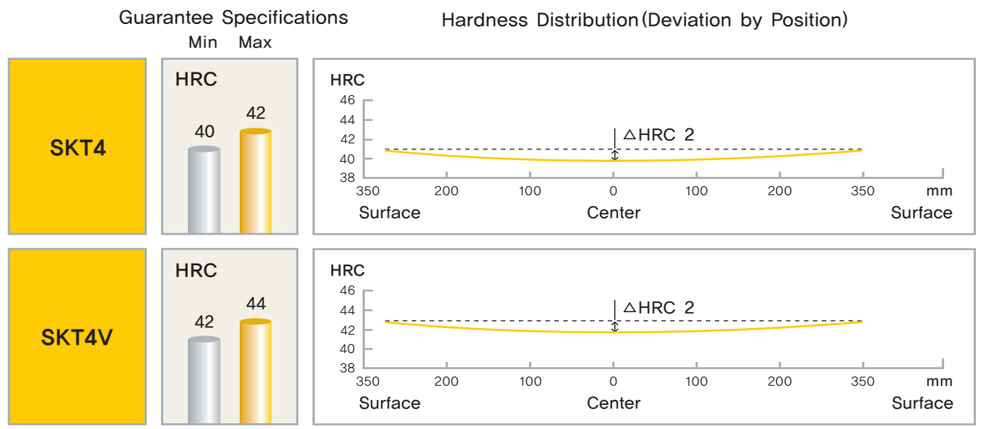
Tensile strength along tempering temperatures



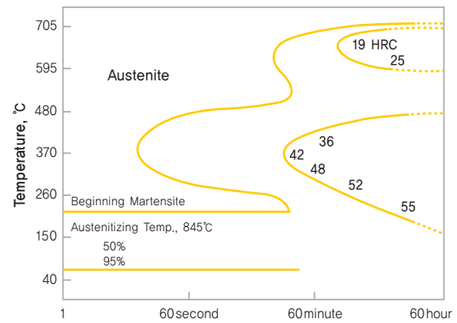
High-Temperature Hardness



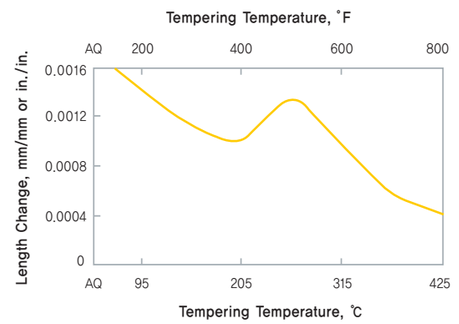
Hardness Distribution



TTT Curve



Length Change at Tempering Temperature



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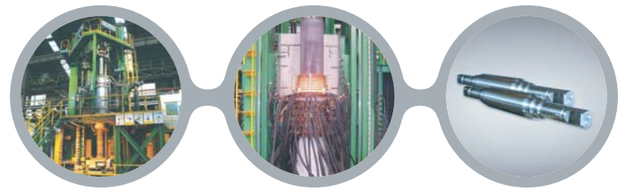
Forged Roll



Create the Best Specialty Steel

POSCO Specialty Steel Co., Ltd.

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POSCO Specialty Steel Co., Ltd.

Forged Roll

Features

Work roll used for cold rolling mill that rolls steel plates for cars and electronics.

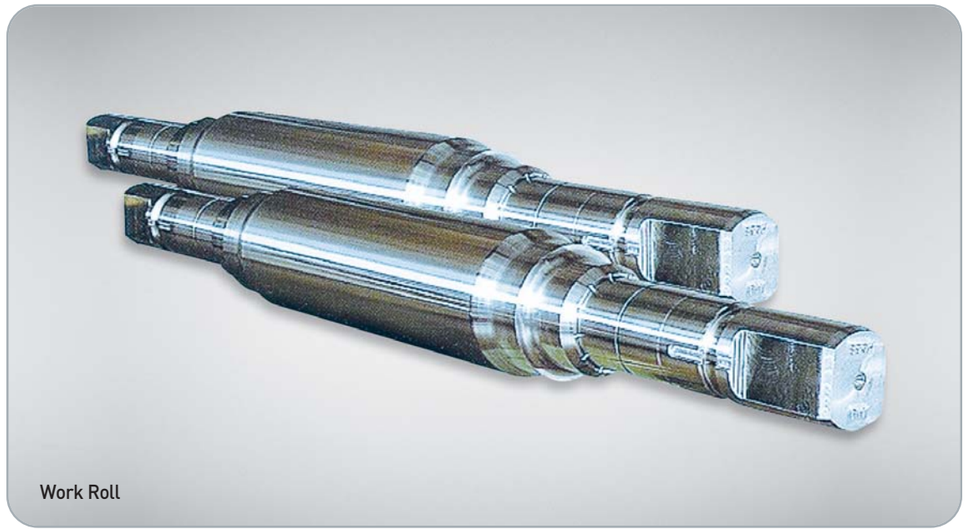
Chemical Composition

Division	Chemical Composition (Wt, %)						
	C	Si	Mn	Ni	Cr	Mo	V
PSTR-12	1.50	0.50	0.50	0.20	12.0	1.00	0.80
PSTR-2	0.50	1.10	0.40	0.20	5.00	1.30	0.60
PSTR3505C	0.90	0.65	0.35	–	3.20	0.20	–
PSTR-5	0.90	0.30	0.45	Add	5.00	0.45	Add

Applications

- PSTR-12 (SKD11 Modify) : Z/Mill Work Roll
- PSTR-2 (SKD62 Modify) : Z/Mill 1st/2nd Roll
- PSTR3505C : 3% Cr Steel (General)
- PSTR-5 : 5% Cr Steel (Electrical Plate Mill WR, Cold Rolled Mill WR/IMR)

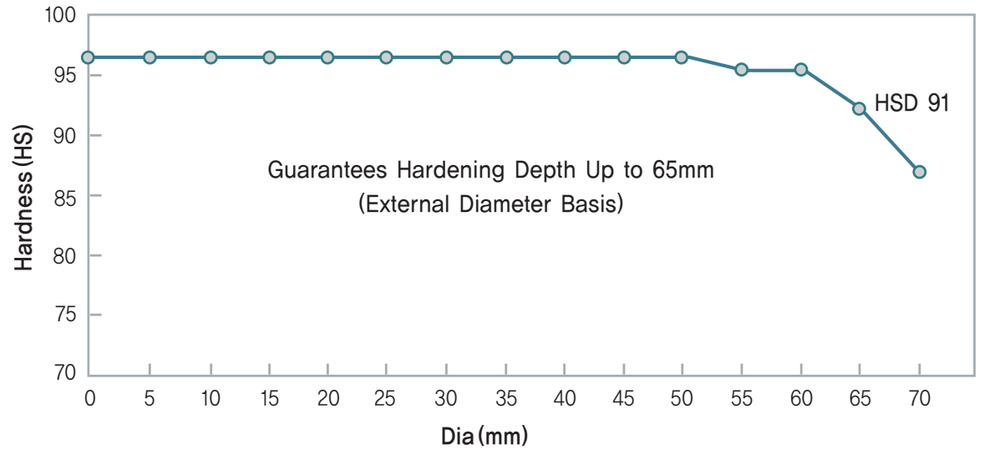
*WR: Work Roll, IMR: Intermediate Roll



Work Roll

Distibution of Depth Hardness

※ Work Roll Hardness for Cold Rolling Car Steel Sheet : HSD 96±1(HSD 91Up)



Supply Performance

POSCO	No 1 CR W/R (Stand 1, 2) 5% Cr Steel (ESR)	• Ø440BD × 1390BL × 3540TL • Barrel : HsD 96±1 (Ø40/HsD 90 Up)
	No 1 CR W/R (Stand 5) 5% Cr Steel (ESR)	• Ø460BD × 1410BL × 4140TL • Barrel : HsD 91~97 (Ø50/HsD 91 Up)
	No 1 CR W/R (Stand 3, 4) 5% Cr Steel (ESR)	• Ø525BD × 1410BL × 3986TL • Barrel : HsD 91~97 (Ø60/HsD 91 Up)
	No 2 CR W/R (Stand 2~4) 5% Cr Steel (ESR)	• Ø450BD × 1740BL × 4010TL • Barrel : HsD 96±1 (Ø50/HsD 91 Up)
	Electrical Plate Shop W/R 5% Cr Steel (ESR)	• Ø245BD × 1380BL × 2534TL • Barrel : HsD 92±1 (Ø30/HsD 91 Up)
	STS CR Shop Z/Mill Electrical Plate Shop Z/Mii	• PSTR-12 (Ø96), PSTR-2 (144~240Ø) • PSTR-12 (Ø82.5/HsD 89~91)