



DONGGUAN CITY
OTAI
SPECIAL STEEL CO.,LTD



DONGGUAN CITY OTAI SPECIAL STEEL CO.,LTD

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DONGGUAN CITY OTAI SPECIAL STEEL CO.,LTD

Otai Special Steel began back in 1999 on June 23rd, registered in Dongguan under the name Alltech Steel. Our goal was to supply molds steel to the factories in Dongguan city.

Due to rapid growth and development, we moved from just the retail market, to serving the wholesale market as well, and led to us purchasing several new and high tech pieces of machinery, such as:

- Horizontal Saw
- Vertical Sewing Machine
- CNC Flame Cutting Machines
- Surface Milling
- Face Milling
- Plane Milling
- End Milling
- Grinding Equipment
- Plasma cutting machines
- Lathes

This helped us to serve a wider market, meet customer demand and expand our operations even further, which only led to more growth and development.

Rapid Growth, New Name

On November 20th, 2007 'Alltech Steel' was renamed 'Yao Teng Steel Trading Company Ltd.' and we registered the comprehensive steel company-Otai Special Steel Co. Ltd.

In addition to the original mold steel, we were now also dealing in high-speed steel and carbon alloy steel and competing with the largest players in the industry, working alongside several high-quality steel mills such as:

- Baosteel,
- Wuyang Iron and Steel,
- Northeast Special Steel,
- Wuhan Iron and Steel,
- Changcheng Special Steel,
- Valin Iron & Steel,
- Xinyu Steel,
- Xingcheng Special Steel,
- Xiwang Special Steel,
- Shougang,
- and other mills.

We found ourselves in a very competitive position, able to leverage our relationships with other suppliers to provide solutions to most customer requests in reasonable price.

We were now fully operational, with advanced machinery for and high competence in:

- hot rolling,
- forging,
- cold drawing hot die steel,
- cold die steel,
- plastic mold steel,
- carbon steel machinery,
- mechanical alloy steel,
- high speed tool steel,
- and more.

It was an exciting time, and we had only just begun our expansion.

Gaining confidence, going global

On April 12, 2009 we took our company international. After gaining such momentum, solid relationships and a reputation to be proud of in the domestic market, we knew the time was right to take our services and products to the rest of the world.

We have customers worldwide, such as from Mexico, Colombia, Brazil, Turkey, Argentina, Dubai, Saudi Arabia, Algeria, Syria, Iran, Egypt, the Philippines, Indonesia, Malaysia, Singapore, Vietnam, India etc. And our main customers are from South East Asian, Latin American and Middle Eastern markets.

Our Success Formula

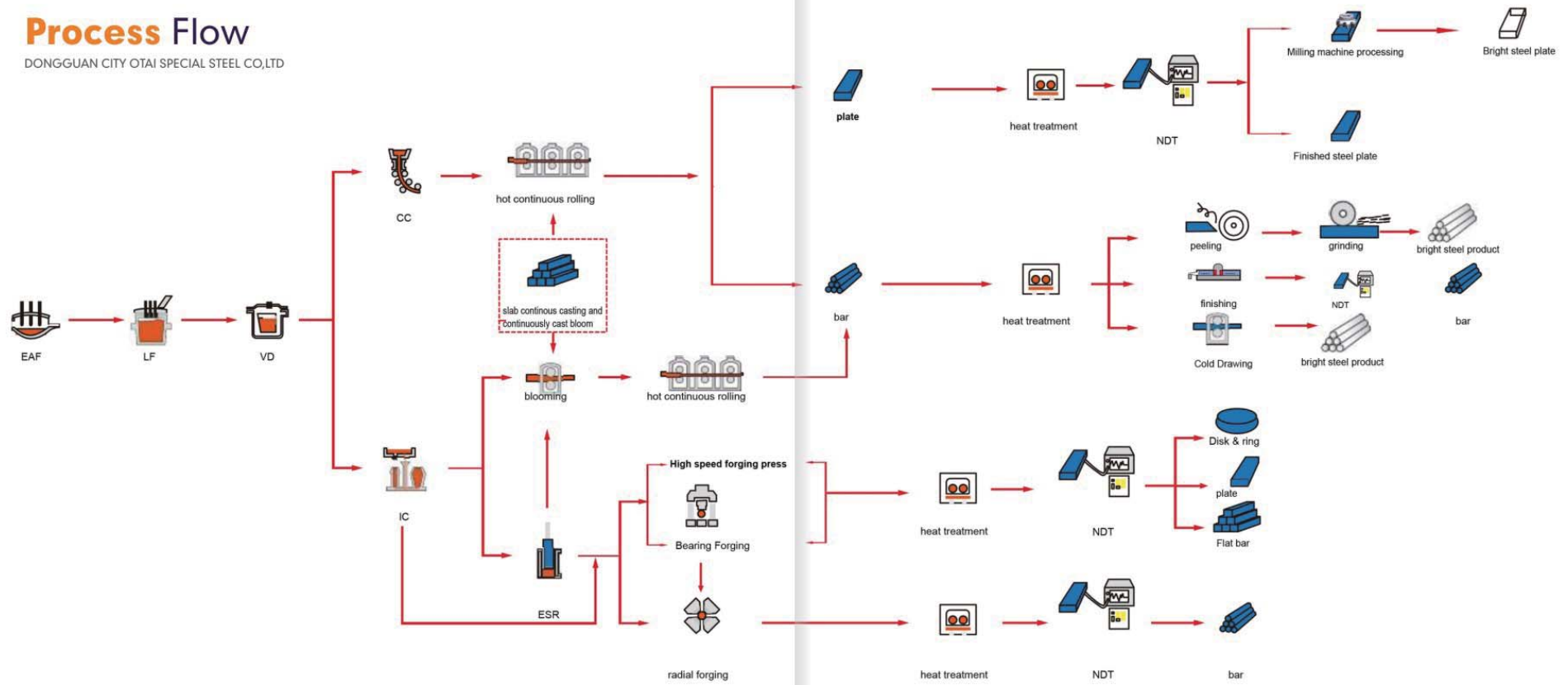
We are not the biggest company in China, and we firmly believe this is our advantage. By maintaining our original roots as a family-run business, we pay attention to every single customer's desires and requirements and make sure they are met with precision and speed every time.

Our network is wide, and we are able to choose the right mills at the right time for our customers. We can make decisions quickly and pride ourselves on the high standard of our customer service, service delivery and customer satisfaction!



Process Flow

DONGGUAN CITY OTAI SPECIAL STEEL CO.,LTD



1



2



3



4



5



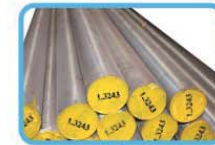
6



7



8



9



10

Product display



High speed tool steel
DIN 1.3243



Hot work tool steel
ASTM H11



Hot work tool steel
JIS SKD61



High speed tool steel
ASTM M2



Carbon steel
ASTM 1020



Cold work tool steel
ASTM D2

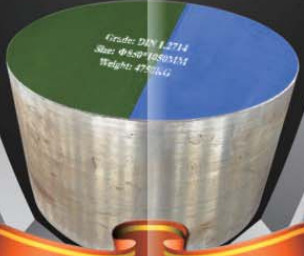


Alloy steel DIN
18NiCrMo5

Cold work tool
steel ASTM A2



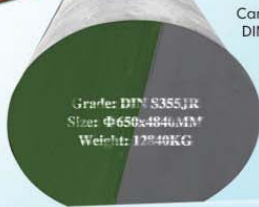
Plastic mould steel
DIN 1.2738



Hot work tool steel
DIN 1.2714

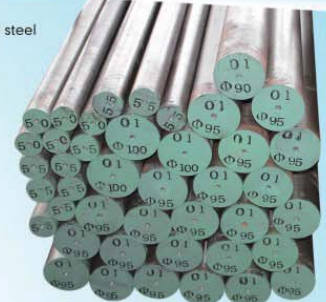


Steel Grade: 4140
Diameter: 20inch
Length: 220inch
Weight: 9000KG



Carbon steel
DIN S355JR

Cold work tool steel
ASTM 01



Stainless steel
DIN X20Cr13



Carbon steel
DIN C45



Alloy steel
ASTM 4140



Cold work tool steel
DIN 1.2080



Alloy steel
ASTM 4340



Cold work tool steel
DIN 1.2436



Plastic mould steel
DIN 1.2083

Different Steel Grades and Equivalents

DONGGUAN CITY OTAI SPECIAL STEEL CO.,LTD

GB	DIN	W-Nr.	NF	ISO	JIS	ROCT	SS	BS	ASTM	UNS	KS
Q235A	S235JR	1.0037	S235JR	Fe 360A	Ss400	Ct.3mm-2	1311	S235JR	A570 Gr.A	K02501	K02501
Q235B	S235JRC1	1.0036	S235JRG1	Fe 360D	(SS 41)	Ct.3mm-3	1312	S235JRG1	A570 Gr.D	K02502	K02502
20	C22E/Ck22	1.1151	C22E/XC18	...	S20C	20	1435	C22E/070M20	1020	G10200	G10200
45	C45E/Ck45	1.1191	C45E/XC48	C45E4	S45C	45	1660	C45E/080M46	1045	G10450	G10450
50	C50E/Ck53	1.1206	C50E	C50E4	S50C	50	1674	C50E/080M50	1050	G10500	G10500
55	C55E/Ck55	1.1203	C55E/XC55	C55E4	S55C	55	1665	C55E/070M55	1050	G10550	G10550
T10	C105W2	1.1645	(C105E2U)	TC105	SK3/SK4	y10	1880	BW1B	W1A-9½	T72301	STC3
GCr15	100Cr6/(W3)	1.3505	100C6	1	SUJ2	IIIX15	SKF3	535A99	E52100	G52986	STB3
G20CrNiMo	21NiCrMo2	1.6523	20NCD2	12	SNCM220		SKF152	805A20	A534 8620H		SNCM220
9Cr18Mo	X102CrMo17	1.3543	Z100CD17	21	SUS440C		SKF577 STORA577		A756 440C		STS440C
20Mn2	20Mn6	1.1169	20M5	22Mn6	Smn420	20r2		150M19	1320		SMn420
15Cr	15Cr3	1.7015	12C3		SCr415	15X		523A14 523M15	5115	G51150	SCr415
20Cr	20Cr4	1.7027	18C3	20Cr4	SCr420	20X		527A20	5120	G51200	SCR420
30Cr	28Cr4	1.7030	32C4		SCr430	30X		530A30	5130	G51300	SCR430
35Cr	34Cr4	1.7033	38C4	34Cr4	SCr435	35X		530A36	5135	G51350	SCR435
40Cr	41Cr4	1.7035	42C4	41Cr4	SCr440	40X	2245	530A40 530M40	5140	G51400	SCR440
20CrMo	20CrMo5	1.7264	18CD4	18CrMo4	SCM420	20XM		CDS12	4118	G41180	SCM420
35CrMo	34CrMo4	1.7220	35CD4	34CrMo4	SCM435	35XM	2234	708A37	4135	G41350	SCM435
42CrMo	42CrMo4	1.7225	42CD4	42CrMo4	SCM440	35XMΦ	2244	708M40	4140	G41400	SCM440
50CrVA	51CrV4 50CrV4	1.8159	50CV4	13	SUP10	50XΦA	2230	735A50	6150	G61500	SPS6
12CrNi2	14NiCr10	1.5732	14NC11		SNC415	12XH2A			3415		SNC415
12CrNi3	14NiCr14	1.5752	14NC12	15NiCr13	SNC815	12XH3A		665A12 665M13	3310	G33106	SNC815
30CrNi3	31NiCr14	1.5755	30NC11		SNC836	30XH3A		656M31	3435		SNC836
20CrNiMo	21NiCrMo2	1.6523	20NCD2	20NiCrMo2	SNCM220	20XHM	2506	805M20	8620	G86200	SNCM220
40CrNiMo4	36CrNiMo4	1.6511	40NCD3		SNCM439	40XHM		816M40	4340	G43400	SNCM439

Different Steel Grades and Equivalents

DONGGUAN CITY OTAI SPECIAL STEEL CO.,LTD



GB	DIN	W-Nr.	NF	ISO	JIS	ROCT	SS	BS	ASTM	UNS	KS
2Cr13	X20Cr13	1.4021	Z20C13	X20Cr13	SUS420J1	12X12	2303	420S37	420	S42000	STS420J1
3Cr13	X30Cr13	1.4028	Z30C13	X30Cr13	SUS420J2	30X13	2304	420S45			STS420J2
4Cr13	X38Cr13		Z40C14	X39Cr13		40X13					
5CrW2Si	≈45WCrV7	1.2542	≈45WCrV8	≈45WCrV2		5XB2C	≈2710	BS1	S1	T41901	
6CrW2Si	≈60WCrV7	1.2550	(≈55WC20)	≈60WCrV2		6XB2C					
Cr12	X210Cr12	1.2080	X200Cr12	210Cr12	SKD1	X12		BD3	D3	T30403	STD1
Cr12MoV	X165CrMoV12	1.2601			SKD11	X12M	2310				STD11
Cr12MoV1	X155CrMoV12-1	1.2379	X160CrMoV12	X160CrMoV12				BD2	D2	T30402	
Cr5Mo1V	X100CrMoV5-1	1.2363	X100CrMoV5	X100CrMoV5	SKD12		2260	BA2	A2	T30102	STS12
9Mn2V	90MnCrV8	1.2842	90MnV8	90MnV2				BO2	O2	T31502	
CrWMn	105WCr6	1.2419	105WCr5	105WCr1	SKS31	XBr					STS31
9CrWMn	100MnCrW4	1.2510	90MnWCrV5	95MnWCr1	SKS3	9XBr	2140	B01	01	T31501	STS3
5CrMnMo	≈40CrMnMo7	1.2311				5XrM					
5CrNiMo	55NiCrMoV6	1.2713	55NiCrMoV7	55NiCrMoV2	SKT4	5XHM	≈2550	BH224/5	L6	T61206	STT4
3Cr2W8V	X30WCrV9-3	1.2581	X30WCrV9	30WCrV9	SKD5	3X2B8Φ	2730	BH21	H21	T20821	STD5
4Cr3Mo3SiV	≈X32CrMoV3-3	1.2365	≈32CrMoV12-28			3X3M3Φ		BH10	H10	T20810	
4Cr5MoSiV	X38CrMoV5-1	1.2343	X38CrMoV5	35CrMoV5	SKD6	4X5MΦC		BH11	H11	T20811	STD6
4Cr5MoSiV	X40CrMoV5-1	1.2344	X40CrMoV5	40CrMoV5	SKD61	4X5MΦC		BH13	H13	T20813	STD61
W18Cr4V	S18-0-1	1.3355	HS18-0-1	HS18-0-1	SKH2	P18	2750	BT1	T1	T12001	SKH2
W18Gr4VCo5	S18-1-2-5	1.3255	HS18-1-1-5	HS18-1-1-15	SKH3	≈P18K5Φ2	2754	BT4	T4	T12004	SKH3
W18Cr4V2Co8	≈S18-1-2-10	1.3265	HS18-0-2-9		≈SKH4		2756	BT5	T5	T12005	≈SKH4
W12Cr4V5Co5	S12-1-4-5	1.3202	HS12-1-5-5	HS12-1-5-5	SKH10	P10K5Φ5		BT15	T15	T12015	SKH10
W6Mo5Cr4V2	S6-5-2	1.3343		HS6-5-2	SKH9	P6M5	2722	BM2	M2	T11302	SKH9
W6Mo5Cr4V2Co5	S6-5-2-5	1.3243	HS6-5-2-5	HS6-5-2-5	SKH55	P6M5K5	2723				SKH55
W7Mo4Cr4V2Co5	S7-4-2-5	1.3246	HS7-4-2-5	HS7-4-2-5					M41	T11341	
W2Mo9Cr4VCo8	S2-10-1-8	1.3247	HS2-9-1-8	HS2-9-1-8	SKH59		2716	BM42	M42	T11342	SKH59

American Standard high speed steel

Chemical Requirements

DONGGUAN CITY OTAI SPECIAL STEEL CO.,LTD

Heat-Treating Requirements



Type	Carbon		Manganese		Phosphorus	Sulfur	Silicon		Chromium		Vanadium		Tungsten		Molybdenum		Cobalt		Annealed BHN	Austenitizing Temperature, (°C)		Tempering Temperature, (°C)	Minimum Hardness, Rockwell C	
	min	max	min	max	max	max	min	max	min	max	min	max	min	max	min	max	min	max		Salt Bath	Controlled Atmosphere Furnace			
Tungsten-Type High-Speed Steels											Tungsten-Type High-Speed Steels													
T1	0.65	0.80	0.10	0.40	0.03	0.03	0.20	0.40	3.75	4.50	0.90	1.30	17.25	18.75	...	...	...	...	255	1277	1288	552	63
T2	0.80	0.90	0.20	0.40	0.03	0.03	0.20	0.40	3.75	4.50	1.80	2.40	17.50	19.00	...	1.00	...	...	255	1277	1288	552	63
T4	0.70	0.80	0.10	0.40	0.03	0.03	0.20	0.40	3.75	4.50	0.80	1.20	17.50	19.00	0.40	1.00	4.25	5.75	269	1277	1288	552	63	
T5	0.75	0.85	0.20	0.40	0.03	0.03	0.20	0.40	3.75	5.00	1.80	2.40	17.50	19.00	0.50	1.25	7.00	9.50	285	1277	1288	552	63	
T6	0.75	0.85	0.20	0.40	0.03	0.03	0.20	0.40	4.00	4.75	1.50	2.10	18.50	21.00	0.40	1.00	11.00	13.00	302	1277	1288	552	63	
T8	0.75	0.85	0.20	0.40	0.03	0.03	0.20	0.40	3.75	4.50	1.80	2.40	13.25	14.75	0.40	1.00	4.25	5.75	255	1277	1288	552	63	
T15	1.50	1.60	0.15	0.40	0.03	0.03	0.15	0.40	3.75	5.00	4.50	5.25	11.75	13.00	...	1.00	4.75	5.25	277	1227	1238	538	65	
Molybdenum-Type High-Speed Steels											Molybdenum-Type High-Speed Steels													
M1	0.78	0.88	0.15	0.40	0.03	0.03	0.20	0.50	3.50	4.00	1.00	1.35	1.40	2.10	8.20	9.20	...	...	248	1196	1207	552	64
M2	regular C	0.78	0.88	0.15	0.40	0.03	0.03	0.20	0.45	3.75	4.50	1.75	2.20	5.50	6.75	4.50	5.50	248	1216	1227	552	64
	high C	0.95	1.05	0.15	0.40	0.03	0.03	0.20	0.45	3.75	4.50	1.75	2.20	5.50	6.75	4.50	5.50	255	1204	1216	552	65
M3	Class 1	1.00	1.10	0.15	0.40	0.03	0.03	0.20	0.45	3.75	4.50	2.25	2.75	5.00	6.75	4.75	6.50	255	1204	1216	552	64
	Class 2	1.15	1.25	0.15	0.40	0.03	0.03	0.20	0.45	3.75	4.50	2.75	3.25	5.00	6.75	4.75	6.50	1204	1216	552	64
M4	1.25	1.40	0.15	0.40	0.03	0.03	0.20	0.45	3.75	4.75	3.75	4.50	5.25	6.50	4.25	5.50	...	...	255	1204	1216	552	64
M6	0.75	0.85	0.15	0.40	0.03	0.03	0.20	0.45	3.75	4.50	1.30	1.70	3.75	4.75	4.50	5.50	11.00	13.00	277	1188	1199	552	64	
M7	0.97	1.05	0.15	0.40	0.03	0.03	0.20	0.55	3.50	4.00	1.75	2.25	1.40	2.10	8.20	9.20	...	...	255	1204	1216	552	65
M10	regular C	0.84	0.94	0.10	0.40	0.03	0.03	0.20	0.45	3.75	4.50	1.80	2.20	7.75	8.50	248	1196	1207	552	63
	high C	0.95	1.05	0.10	0.40	0.03	0.03	0.20	0.45	3.75	4.50	1.80	2.20	7.75	8.50	255	1196	1207	552	64
M30	0.75	0.85	0.15	0.40	0.03	0.03	0.20	0.45	3.50	4.25	1.00	1.40	1.30	2.30	7.75	9.00	4.50	5.50	269	1204	1216	552	64	
M33	0.85	0.92	0.15	0.40	0.03	0.03	0.15	0.50	3.50	4.00	1.00	1.35	1.30	2.10	9.00	10.00	7.75	8.75	269	1204	1216	552	65	
M34	0.85	0.92	0.15	0.40	0.03	0.03	0.20	0.45	3.50	4.00	1.90	2.30	1.40	2.10	7.75	9.20	7.75	8.75	269	1204	1216	552	64	
M36	0.80	0.90	0.15	0.40	0.03	0.03	0.20	0.45	3.75	4.50	1.75	2.25	5.50	6.50	4.50	5.50	7.75	8.75	269	1204	1216	552	64	
M41	1.05	1.15	0.20	0.60	0.03	0.03	0.15	0.50	3.75	4.50	1.75	2.25	6.25	7.00	3.25	4.25	4.75	5.75	269	1190	1202	538	66	
M42	1.05	1.15	0.15	0.40	0.03	0.03	0.15	0.65	3.50	4.25	0.95	1.35	1.15	1.85	9.00	10.00	7.75	8.75	269	1177	1188	538	66	
M43	1.15	1.25	0.20	0.40	0.03	0.03	0.15	0.65	3.50	4.25	1.50	1.75	2.25	3.00	7.50	8.50	7.75	8.75	269	1177	1188	538	66	
M44	1.10	1.20	0.20	0.40	0.03	0.03	0.30	0.55	4.00	4.75	1.85	2.20	5.00	5.75	6.00	7.00	11.00	12.25	285	1188	1199	538	66	
M46	1.22	1.30	0.20	0.40	0.03	0.03	0.40	0.65	3.70	4.20	3.00	3.30	1.90	2.20	8.00	8.50	7.80	8.80	269	1204	1216	538	66	
M47	1.05	1.15	0.15	0.40	0.03	0.03	0.20	0.45	3.50	4.00	1.15	1.35	1.30	1.80	9.25	10.00	4.75	5.25	269	1190	1202	538	66	
M48	1.42	1.52	0.15	0.40	0.03	0.07	0.15	0.40	3.50	4.00	2.75	3.25	9.50	10.50	4.75	5.50	8.00	10.00	311	1190	1202	538	66	
M62	1.25	1.35	0.15	0.40	0.03	0.07	0.15	0.40	3.50	4.00	1.80	2.10	5.75	6.50	10.00	11.00	...	...	285	1190	1202	538	66
Intermediate High Speed Steels											Intermediate High Speed Steels													
M50	0.78	0.88	0.15	0.45	0.03	0.03	0.20	0.60	3.75	4.50	0.80	1.25	...	...	3.90	4.75	...	...	248	1104	1116	538	61
M52	0.85	0.95	0.15	0.45	0.03	0.03	0.20	0.60	3.50	4.30	1.65	2.25	0.75	1.50	4.00	4.90	...	...	248	1163	1174	538	63

American Standard alloy steel

Chemical Requirements

DONGGUAN CITY OTAI SPECIAL STEEL CO.,LTD



Grade Designation	Heat Chemical Ranges and Limits, %							
	Carbon	Manganese	Phosphorus, max	Sulfur, max	Silicon ^a	Nickel	Chromium	Molybdenum
4028	0.25-0.30	0.70-0.90	0.035	0.035-0.050	0.15 to 0.35	...	...	0.20-0.30
4032	0.30-0.35	0.70-0.90	0.035	0.040	0.15 to 0.35	...	...	0.20-0.30
4037	0.35-0.40	0.70-0.90	0.035	0.040	0.15 to 0.35	...	...	0.20-0.30
4042	0.40-0.45	0.70-0.90	0.035	0.040	0.15 to 0.35	...	...	0.20-0.30
4047	0.45-0.50	0.70-0.90	0.035	0.040	0.15 to 0.35	...	...	0.20-0.30
4118	0.18-0.23	0.70-0.90	0.035	0.040	0.15 to 0.35	...	0.40-0.60	0.08-0.15
4120	0.18-0.23	0.90-1.20	0.035	0.040	0.15 to 0.35	...	0.40-0.60	0.13-0.20
4121	0.18-0.23	0.75-1.00	0.035	0.040	0.15 to 0.35	...	0.45-0.65	0.20-0.30
4130	0.28-0.33	0.40-0.60	0.035	0.040	0.15 to 0.35	...	0.80-1.10	0.15-0.25
4135	0.33-0.38	0.70-0.90	0.035	0.040	0.15 to 0.35	...	0.80-1.10	0.15-0.25
4137	0.35-0.40	0.70-0.90	0.035	0.040	0.15 to 0.35	...	0.80-1.10	0.15-0.25
4140	0.38-0.43	0.75-1.00	0.035	0.040	0.15 to 0.35	...	0.80-1.10	0.15-0.25
4142	0.40-0.45	0.75-1.00	0.035	0.040	0.15 to 0.35	...	0.80-1.10	0.15-0.25
4145	0.43-0.48	0.75-1.00	0.035	0.040	0.15 to 0.35	...	0.80-1.10	0.15-0.25
4147	0.45-0.50	0.75-1.00	0.035	0.040	0.15 to 0.35	...	0.80-1.10	0.15-0.25
4150	0.48-0.53	0.75-1.00	0.035	0.040	0.15 to 0.35	...	0.80-1.10	0.15-0.25
4161	0.56-0.64	0.75-1.00	0.035	0.040	0.15 to 0.35	...	0.70-0.90	0.25-0.35
4320	0.17-0.22	0.45-0.65	0.035	0.040	0.15 to 0.35	1.65-2.00	0.40-0.60	0.20-0.30
4340	0.38-0.43	0.60-0.80	0.035	0.040	0.15 to 0.35	1.65-2.00	0.70-0.90	0.20-0.30
E4340	0.38-0.43	0.65-0.85	0.025	0.025	0.15 to 0.35	1.65-2.00	0.70-0.90	0.20-0.30
4419	0.18-0.23	0.45-0.65	0.035	0.040	0.15 to 0.35	...	...	0.45-0.60
4422	0.20-0.25	0.70-0.90	0.035	0.040	0.15 to 0.35	...	...	0.35-0.45
4427	0.24-0.29	0.70-0.90	0.035	0.040	0.15 to 0.35	...	...	0.35-0.45
4615	0.13-0.18	0.45-0.65	0.035	0.040	0.15 to 0.35	1.65-2.00	...	0.20-0.30
4620	0.17-0.22	0.45-0.65	0.035	0.040	0.15 to 0.35	1.65-2.00	...	0.20-0.30
4621	0.18-0.23	0.70-0.90	0.035	0.040	0.15 to 0.35	1.65-2.00	...	0.20-0.30
4626	0.24-0.29	0.45-0.65	0.035	0.040	0.15 to 0.35	0.70-1.00	...	0.15-0.25
4715	0.13-0.18	0.70-0.90	0.035	0.040	0.15 to 0.35	0.70-1.00	0.45-0.65	0.45-0.60
4718	0.16-0.21	0.70-0.90	0.035	0.040	0.15 to 0.35	0.90-1.20	0.35-0.55	0.30-0.40
4720	0.17-0.22	0.50-0.70	0.035	0.040	0.15 to 0.35	0.90-1.20	0.35-0.55	0.15-0.25
4815	0.13-0.18	0.40-0.60	0.035	0.040	0.15 to 0.35	3.25-3.75	...	0.20-0.30
4817	0.15-0.20	0.40-0.60	0.035	0.040	0.15 to 0.35	3.25-3.75	...	0.20-0.30
4820	0.18-0.23	0.50-0.70	0.035	0.040	0.15 to 0.35	3.25-3.75	...	0.20-0.30
5015	0.12-0.17	0.30-0.50	0.035	0.040	0.15 to 0.35	...	0.30-0.50	...
5046	0.43-0.48	0.75-1.00	0.035	0.040	0.15 to 0.35	...	0.20-0.35	...
5115	0.13-0.18	0.70-0.90	0.035	0.040	0.15 to 0.35	...	0.70-0.90	...
5120	0.17-0.22	0.70-0.90	0.035	0.040	0.15 to 0.35	...	0.70-0.90	...
5130	0.28-0.33	0.70-0.90	0.035	0.040	0.15 to 0.35	...	0.80-1.10	...

Grade Designation	Heat Chemical Ranges and Limits, %							
	Carbon	Manganese	Phosphorus, max	Sulfur, max	Silicon ^a	Nickel	Chromium	Molybdenum
5132	0.30-0.35	0.60-0.80	0.035	0.040	0.15 to 0.35	...	0.75-1.00	...
5135	0.33-0.38	0.60-0.80	0.035	0.040	0.15 to 0.35	...	0.80-1.05	...
5140	0.38-0.43	0.70-0.90	0.035	0.040	0.15 to 0.35	...	0.70-0.90	...
5145	0.43-0.48	0.70-0.90	0.035	0.040	0.15 to 0.35	...	0.70-0.90	...
5147	0.46-0.51	0.70-0.95	0.035	0.040	0.15 to 0.35	...	0.85-1.15	...
5150	0.48-0.53	0.70-0.90	0.035	0.040	0.15 to 0.35	...	0.70-0.90	...
5155	0.51-0.59	0.70-0.90	0.035	0.040	0.15 to 0.35	...	0.70-0.90	...
5160	0.56-0.61	0.75-1.00	0.035	0.040	0.15 to 0.35	...	0.70-0.90	...
E50100	0.98-1.10	0.25-0.45	0.025	0.025	0.15 to 0.35	...	0.40-0.60	...
E51100	0.98-1.10	0.25-0.45	0.025	0.025	0.15 to 0.35	...	0.90-1.15	...
E52100	0.98-1.10	0.25-0.45	0.025	0.025	0.15 to 0.35	...	1.30-1.60	...
52100 ^b	0.93-1.05	0.25-0.45	0.025	0.015	0.15 to 0.35	...	1.35-1.60	...
6118	0.16-0.21	0.50-0.70	0.035	0.040	0.15 to 0.35	...	0.50-0.70	(0.10-0.15 V)
6150	0.48-0.53	0.70-0.90	0.035	0.040	0.15 to 0.35	...	0.80-1.10	(0.15 min V)
8115	0.13-0.18	0.70-0.90	0.035	0.040	0.15 to 0.35	0.20-0.40	0.30-0.50	0.08-0.15
8615	0.13-0.18	0.70-0.90	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.15-0.25
8617	0.15-0.20	0.70-0.90	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.15-0.25
8620	0.18-0.23	0.70-0.90	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.15-0.25
8622	0.20-0.25	0.70-0.90	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.15-0.25
8625	0.23-0.28	0.70-0.90	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.15-0.25
8627	0.25-0.30	0.70-0.90	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.15-0.25
8630	0.28-0.33	0.70-0.90	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.15-0.25
8637	0.35-0.40	0.75-1.00	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.15-0.25
8640	0.38-0.43	0.75-1.00	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.15-0.25
8642	0.40-0.45	0.75-1.00	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.15-0.25
8645	0.43-0.48	0.75-1.00	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.15-0.25
8650	0.48-0.53	0.75-1.00	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.15-0.25
8655	0.51-0.59	0.75-1.00	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.15-0.25
8660	0.56-0.64	0.75-1.00	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.15-0.25
8720	0.18-0.23	0.70-0.90	0.035	0.040	0.15 to 0.35	0.40-0.7	0.40-0.60	0.20-0.30
8740	0.38-0.43	0.75-1.00	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.20-0.30
8822	0.20-0.25†	0.75-1.00	0.035	0.040	0.15 to 0.35	0.40-0.70	0.40-0.60	0.30-0.40
9254	0.51-0.59	0.60-0.80	0.035	0.040	1.20-1.60	...	0.60-0.80	...
9255	0.51-0.59	0.70-0.95	0.035	0.040	1.80-2.20	...	...	...
9259	0.56-0.64	0.75-1.00	0.035	0.040	0.70-1.10	...	0.45-0.65	...
9260	0.56-0.64	0.75-1.00	0.035	0.040	1.80-2.20	...	...	...
E9310	0.08-0.13	0.45-0.65	0.025	0.025	0.15 to 0.30	3.00-3.50	1.00-1.40	0.08-0.15

German standard tool steel

Chemical Requirements

Heat-Treating Requirements



DONGGUAN CITY OTAI SPECIAL STEEL CO.,LTD

Steel name	W-Nr.	Chemical composition										Hardness (annealed) +A HB max	Hardening test					
		C	Si	Mn	Cr	Mo	Ni	V	W	Co	Hardening temperature °C (±10°C)		Quenching medium	Tempering temperature °C (±10°C)	Hardness HRC min.			
Alloy cold-work tool steels																		
105V	1.2834	1.00 to 1.10	0.10 to 0.30	0.10 to 0.40	—	—	—	—	—	—	—	0.10 to 0.20	—	212				61
50WCrV8	1.2549	0.45 to 0.55	0.70 to 1.00	0.15 to 0.45	0.90 to 1.20	—	—	—	—	—	—	0.10 to 0.20	1.70 to 2.20	229	790	W	180	56
60WCrV8	1.2550	0.55 to 0.65	0.70 to 1.00	0.15 to 0.45	0.90 to 1.20	—	—	—	—	—	—	0.10 to 0.20	1.70 to 2.20	229	920	O	180	58
102Cr6	1.2067	0.95 to 1.10	0.15 to 0.35	0.25 to 0.45	1.35 to 1.65	—	—	—	—	—	—	—	—	223	910	O	180	60
21MnCr5	1.2162	0.18 to 0.24	0.15 to 0.35	0.10 to 1.40	1.00 to 1.30	—	—	—	—	—	—	—	—	217	840	O	180	e
70MnMoCr8	1.2824	0.65 to 0.75	0.10 to 0.50	1.80 to 2.50	0.90 to 1.20	0.90 to 1.40	—	—	—	—	—	—	—	248	e	e	e	58
90MnCrV8	1.2842	0.85 to 0.95	0.10 to 0.40	1.80 to 2.20	0.20 to 0.50	—	—	—	—	—	—	0.05 to 0.20	—	229	835	A	180	60
95MnWCr5	1.2825	0.90 to 1.00	0.10 to 0.40	1.05 to 1.35	0.40 to 0.65	—	—	—	—	—	—	0.05 to 0.20	0.40 to 0.70	229	790	O	180	60
X100CrMoV5	1.2363	0.95 to 1.05	0.10 to 0.40	0.40 to 0.80	4.80 to 5.50	0.90 to 1.20	—	—	—	—	—	0.15 to 0.35	—	241	800	O	180	60
X153CrMoV12	1.2379	1.45 to 1.60	0.10 to 0.60	0.20 to 0.60	11.00 to 13.00	0.70 to 1.00	—	—	—	—	—	0.70 to 1.00	—	255	970	A	180	61
X210Cr12	1.2080	1.90 to 2.20	0.10 to 0.60	0.20 to 0.60	11.00 to 13.00	—	—	—	—	—	—	—	—	248	1020	A	180	62
X210CrW12	1.2436	2.00 to 2.30	0.10 to 0.40	0.30 to 0.60	11.00 to 13.00	—	—	—	—	—	—	—	0.60 to 0.80	255	970	O	180	62
35CrMo7	1.2302	0.30 to 0.40	0.30 to 0.70	0.60 to 1.00	1.50 to 2.00	0.35 to 0.55	—	—	—	—	—	—	—	/	970	O	180	/
40CrMnNiMo8-6-4	1.2738	0.35 to 0.45	0.20 to 0.40	1.30 to 1.60	1.80 to 2.10	0.15 to 0.25	0.90 to 1.20g	—	—	—	—	—	—	/	/	/	/	/
45NiCrMo16	1.2767	0.40 to 0.50	0.10 to 0.40	0.20 to 0.50	1.20 to 1.50	0.15 to 0.35	3.80 to 4.30	—	—	—	—	—	—	285				52
X40Cr14	1.2083	0.36 to 0.42	≤1.00	≤1.00	12.50 to 14.50	—	—	—	—	—	—	—	—	241	850	O	180	52
X38CrMo16	1.2316	0.33 to 0.45	≤1.00	≤1.00	15.50 to 17.50	0.80 to 1.30	—	≤1.00	—	—	—	—	—	/	1010	O	180	/
Hot-work tool steels																		
55NiCrMoV7	1.2714	0.50 to 0.60	0.10 to 0.40	0.60 to 0.90	0.80 to 1.20	0.35 to 0.55	1.50 to 1.80	—	0.05 to 0.15	—	—	—	—	248	850	O	500	42G
32CrMoV12-28	1.2365	0.28 to 0.35	0.10 to 0.40	0.15 to 0.45	2.70 to 3.20	—	—	—	0.40 to 0.70	—	—	—	—	229	1040	O	550	46
X37CrMoV5-1	1.2343	0.33 to 0.41	0.80 to 1.20	0.25 to 0.50	4.80 to 5.50	1.10 to 1.50	—	—	0.30 to 0.50	—	—	—	—	229	1020	O	550	48
X38CrMoV5-3	1.2367	0.35 to 0.40	0.30 to 0.50	0.30 to 0.50	4.80 to 5.20	2.70 to 3.20	—	—	0.40 to 0.60	—	—	—	—	229	1040	O	550	50
X40CrMoV5-1	1.2344	0.35 to 0.42	0.80 to 1.20	0.25 to 0.50	4.80 to 5.20	1.20 to 1.50	—	—	0.85 to 1.15	—	—	—	—	229	1020	O	550	50
50CrMoV13-15	1.2355	0.45 to 0.55	0.20 to 0.80	0.50 to 0.90	3.00 to 3.50	1.30 to 1.70	—	—	0.15 to 0.35	—	—	—	—	248	1010	O	510	56
X30WCrV9-3	1.2581	0.25 to 0.35	0.10 to 0.40	0.15 to 0.45	2.50 to 3.20	—	—	—	0.30 to 0.50	8.50 to 9.50	—	—	—	241	1150	O	600	48
X35CrWMoV5	1.2605	0.32 to 0.40	0.80 to 1.20	0.20 to 0.50	4.75 to 5.50	1.25 to 1.60	—	—	0.20 to 0.50	1.10 to 1.60	—	—	—	229	1020	O	550	48
38CrWV18-17-17	1.2661	0.35 to 0.45	0.15 to 0.50	0.20 to 0.50	4.00 to 4.70	0.30 to 0.50	—	—	1.70 to 2.10	3.80 to 4.50	—	—	—	260	1120	O	600	48
Alloy cold-work tool steels																		
HS0-4-1	1.3325	0.77 to 0.85	≤0.65	—	3.90 to 4.40	4.00 to 4.50	—	—	0.90 to 1.10	—	—	—	—	262	1120		560	60
HS1-4-2	1.3326	0.85 to 0.95	≤0.65	—	3.60 to 4.30	4.10 to 4.80	—	—	1.70 to 2.20	0.80 to 1.40	—	—	—	269	1180		560	63
HS18-0-1	1.3355	0.73 to 0.83	≤0.45	—	3.80 to 4.50	—	—	—	1.00 to 1.20	17.20 to 18.70	—	—	—	269	1260		560	63
HS2-9-2	1.3348	0.95 to 1.05	≤0.70	—	3.50 to 4.50	8.20 to 9.20	—	—	1.70 to 2.20	1.50 to 2.10	—	—	—	269	1200		560	64
HS1-8-1	1.3327	0.77 to 0.87	≤0.70	—	3.50 to 4.50	8.00 to 9.00	—	—	1.00 to 1.40	1.40 to 2.00	—	—	—	262	1190		560	63
HS3-3-2	1.3333	0.95 to 1.03	≤0.45	—	3.80 to 4.50	2.50 to 2.90	—	—	2.20 to 2.50	2.70 to 3.00	—	—	—	255	1190		560	62
HS6-5-2	1.3339	0.80 to 0.88	≤0.45	—	3.80 to 4.50	4.70 to 5.20	—	—	1.70 to 2.10	5.90 to 6.70	—	—	—	262	1220		560	64
HS6-5-2C	1.3343	0.86 to 0.94	≤0.45	—	3.80 to 4.50	4.70 to 5.20	—	—	1.70 to 2.10	5.90 to 6.70	—	—	—	269	1210		560	64
HS6-5-3	1.3344	1.15 to 1.25	≤0.45	—	3.80 to 4.50	4.70 to 5.20	—	—	2.70 to 3.20	5.90 to 6.70	—	—	—	269	1200		560	64
HS6-5-3C	1.3345	1.25 to 1.32	≤0.70	—	3.80 to 4.50	4.70 to 5.20	—	—	2.70 to 3.20	5.90 to 6.70	—	—	—	269	1180		560	64
HS6-6-2	1.3350	1.00 to 1.10	≤0.45	—	3.80 to 4.50	5.50 to 6.50	—	—	2.30 to 2.60	5.90 to 6.70	—	—	—	262	1200		560	64
HS6-5-4	1.3351	1.25 to 1.40	≤0.45	—	3.80 to 4.50	4.20 to 5.00	—	—	3.70 to 4.20	5.20 to 6.00	—	—	—	269	1210		560	64
HS6-5-2-5	1.3243	0.87 to 0.95	≤0.45	—	3.80 to 4.50	4.70 to 5.20	—	—	1.70 to 2.10	5.90 to 6.70	—	—	4.50 to 5.00	269	1210		560	64
HS6-5-3-8	1.3244	1.23 to 1.33	≤0.70	—	3.80 to 4.50	4.70 to 5.30	—	—	2.70 to 3.20	5.90 to 6.70	—	—	8.00 to 8.80	302	1180		560	65
HS10-4-3-10	1.3207	1.20 to 1.35	≤0.45	—	3.80 to 4.50	3.20 to 3.90	—	—	3.00 to 3.50	9.00 to 10.00	—	—	9.50 to 10.50	302	1230		560	66
HS2-9-1-8	1.3247	1.05 to 1.15	≤0.70	—	3.50 to 4.50	9.00 to 10.00	—	—	0.90 to 1.30	1.20 to 1.90	—	—	7.50 to 8.50	277	1190		550	66

German standard Alloy steel

Chemical Requirements

DONGGUAN CITY OTAI SPECIAL STEEL CO.,LTD



Chemical Requirements

Steel designation		Chemical composition									Quenching °C	Quenching agent	Tempering °C	Maximum HB in condition
Name	Number	C	Si max.	Mn	P max.	S	Cr	Mo	Ni	V				
28Mn6	1.1170										830 to 870	Water or oil	540 to 680	
38Cr2	1.7003										830 to 870	Oil or water	540 to 680	
38CrS2	1.7023													
46Cr2	1.7006										820 to 860	Oil or water	540 to 680	
46CrS2	1.7025													
34Cr4	1.7033	0.30 to 0.37	0.40	0.60 to 0.90	0.035	max. 0.035	0.90 to 1.20	...	...	...	830 to 870	Water or oil	540 to 680	223
34CrS4	1.7037					0.020 to 0.040								223
37Cr4	1.7034	0.34 to 0.41	0.40	0.60 to 0.90	0.035	max. 0.035	0.90 to 1.20	...	...	...	825 to 865	Oil or water	540 to 680	235
37CrS4	1.7038					0.020 to 0.040								235
41Cr4	1.7035	0.38 to 0.45	0.40	0.60 to 0.90	0.035	max. 0.035	0.90 to 1.20	...	...	...	820 to 860	Oil or water	540 to 680	241
41CrS4	1.7039					0.020 to 0.040								241
25CrMo4	1.7218	0.22 to 0.29	0.40	0.60 to 0.90	0.035	max. 0.035	0.90 to 1.20	0.15 to 0.30	...	...	840 to 880	Water or oil	540 to 680	212
25CrMoS4	1.7213					0.020 to 0.040								212
34CrMo4	1.7220	0.30 to 0.37	0.40	0.60 to 0.90	0.035	max. 0.035	0.90 to 1.20	0.15 to 0.30	...	...	830 to 870	Oil or water	540 to 680	223
34CrMoS4	1.7226					0.020 to 0.040								223
42CrMo4	1.7225	0.38 to 0.45	0.40	0.60 to 0.90	0.035	max. 0.035	0.90 to 1.20	0.15 to 0.30	...	...	820 to 860	Oil or water	540 to 680	241
42CrMoS4	1.7227					0.020 to 0.040								241
50CrMo4	1.7228	0.46 to 0.54	0.40	0.50 to 0.80	0.035	max. 0.035	0.90 to 1.20	0.15 to 0.30	...	...	820 to 860	Oil	540 to 680	248
36CrNiMo4	1.6511	0.32 to 0.40	0.40	0.50 to 0.80	0.035	max. 0.035	0.90 to 1.20	0.15 to 0.30	0.90 to 1.20	...	820 to 850	Oil or water	540 to 680	248
34CrNiMo6	1.6582	0.30 to 0.38	0.40	0.50 to 0.80	0.035	max. 0.035	1.30 to 1.70	0.15 to 0.30	1.30 to 1.70	...	830 to 860	Oil	540 to 680	248
30CrNiMo8	1.6580	0.26 to 0.34	0.40	0.30 to 0.60	0.035	max. 0.035	1.80 to 2.20	0.30 to 0.50	1.80 to 2.20	...	830 to 860	Oil	540 to 680	248
36NiCrMo16	1.6773	0.32 to 0.39	0.40	0.30 to 0.60	0.030	max. 0.025	1.60 to 2.00	0.25 to 0.45	3.60 to 4.10	...	865 to 885	Air or oil	540 to 680	269
51CrV4	1.8159	0.47 to 0.55	0.40	0.70 to 1.10	0.035	max. 0.035	0.90 to 1.20	...	...	0.10 to 0.25	820 to 860	Oil	540 to 680	248