



## 热连轧产品目录

CATALOGUE OF TISCO HOT ROLLED PRODUCTS

高强度、高韧性结构钢  
HIGH STRENGTH AND TOUGHNESS STRUCTURE STEEL



地址: 山西太原尖草坪2号

Add: No. 2 Jiancaoping street, Taiyuan, Shanxi

邮编(Post code): 030003

电话(Tel): (0351) 3131541 3131542

传真(Fax): (0351) 3130793

网址: [Http://www.tisco.com.cn](http://www.tisco.com.cn)

服务热线(Service line): 400-653-1998

800-806-1998



太原钢铁(集团)有限公司  
Taiyuan Iron and Steel (Group) Co., Ltd.



Printed on recycled paper  
2010年11月印制

# 目录

## CONTENTS

- 1 太钢简介  
Brief on TISCO
- 2 1549mm与2250mm热连轧生产线简介  
Introduction of 1549 mm and 2250 mm HSM
- 3 1549mm与2250mm热连轧碳钢生产工艺流程图  
Process flow chart of 1549mm and 2250mm HSM production
- 5 主要装备介绍  
Main equipment introduction
- 7 研发能力与质量检测  
R&D capacity and Quality Inspection
- 8 质量保证体系  
Quality system
- 9 高强度、高韧性结构钢产品介绍  
Introduction of high strength and toughness structure steel
- 10 高强度、高韧性结构钢技术标准  
The standard applied of high strength and toughness structure steel
- 19 产品标识与包装  
Product mark and package
- 21 产品应用  
Product application
- 23 服务承诺  
Service promise
- 24 太钢主要业务部门及外设销售公司通讯录  
Communication directory for TISCO marketing & sales departments and sales branches

## 企业使命

为全球消费者提供最精美的不锈钢产品

### ENTERPRISE MISSION

Providing the excellent stainless steel products to consumers

## 战略目标

建设全球最具竞争力的不锈钢企业

### STRATEGIC TARGET

To build TISCO into the most competitive stainless steel producer around the world

## 核心价值观

以人为本 用户至上 质量兴企 全面开放 不断创新

### CORE VALUES

Relying on the people, putting customer's needs first, rejuvenating enterprise through quality, opening fully to the world, making constant innovation.

## 营销理念

为用户提供更全、更好、更快的解决方案  
在长期合作中实现共赢

### MANAGEMENT CONCEPT

win-win is sought through long-term cooperation with and availability of better and quicker solution package to customers

## 太钢简介

brief on tisco

太原钢铁(集团)有限公司(简称太钢)是中国特大型钢铁联合企业和全球产销量最大、工艺技术装备水平最高、品种规格最全的不锈钢企业。经过70余年发展,已具备1000万吨以上钢、铁、材的生产能力,其中不锈钢产能达300万吨。2009年生产不锈钢248万吨,产量世界第一!

太钢是中国第一炉不锈钢、第一炉硅钢、第一张硅钢片的诞生地。拥有铁矿石等钢铁冶炼原料的采掘与加工、钢铁冶炼、钢铁材料压力加工、冶金设备及备品备件制造等方面先进技术和装备,主要产品有不锈钢、冷轧硅钢片(卷)、热连轧卷板、车轴钢、合金模具钢、军工钢等。产品广泛应用于石油化工、交通运输、建筑装饰、家用电器、医疗食品等行业及神舟系列飞船、嫦娥一号、“东风”系列火箭及核电站等高端领域,进入三峡水利、西气东输、奥运场馆及世博场馆等国家重点工程。2009年在国家认定的575所企业技术中心中,太钢技术中心排名第二,位钢铁行业首位。太钢拥有以不锈钢为核心的745项具有自主知识产权的核心技术,其中100多项达到国际先进水平。

太钢的发展战略是,加快建设全球最具竞争力的不锈钢企业,实现以不锈钢为主的品种、质量、成本、研发、节能、环保、效率、服务等各项指标达到国际一流水平,进而建设具有国际竞争力的大企业集团。

Taiyuan Iron and Steel (Group) Co. Ltd. (TISCO) is one of the steel giants in China and, the largest stainless producer in the world in term of output and sales equipped with the most advanced facilities covering pretty wide product range. After over 70 years development TISCO has the capacity of 10 million tons of steel, which includes 3 million tons of stainless. The year of 2009 saw TISCO become No.1 stainless producer in the world with production of 2.48 million tons of stainless.

In TISCO came out the first heat of stainless steel and first heat of silicon steel as well as the first sheet of silicon in the history of China steel industry. TISCO is well equipped for mining and iron ore refining, iron and steel making, rolling and forging, metallurgical equipment and spare parts manufacturing. TISCO's products cover stainless steel of cold and hot rolling, cold rolled silicon, hot rolled coil, axle steel, die steel and steel for military purpose etc. TISCO's products are widely used in petrochemical industry, transportation, construction decoration, home appliance, medical and food industry. TISCO's products can be also found in the national key projects such as Shenzhou spaceship, Chang'e-1 Moon Detector, Dongfeng rocket series and nuclear power, Three Gorges, West-East natural gas transmission, and Olympic game facility as well as Shanghai world expos. In 2009 TISCO technology centre ranked No.2 among the 575 state acknowledged enterprise technology institutions, and No.1 among the steel industry. TISCO owns 745 core patents in the field of stainless and over 100 patents are taken as the world class.

TISCO is aiming to become the most competitive stainless producer in the world, and achieve the first class stainless product in terms of product range, quality, cost, R&D, energy saving, environment protection, efficiency and service. For this goal TISCO is trying the first world class level and build itself into the world competitive large group company.

## 1549mm与2250mm热连轧生产线简介

Introduction of 1549 mm and 2250 mm HSM

太钢热连轧厂于1994年8月8日投产,现拥有1549mm和2250mm两条热连轧生产线,具备800万吨以上年生产能力。主要生产品种有:碳结钢、优碳钢、低合金钢、不锈钢、硅钢等五大类产品。

1549mm热连轧是华北地区第一条热轧生产线,1994年8月8日全线过钢成功,2002年9月进行了全面技术改造。

2250mm热连轧项目是太钢新建150万吨不锈钢系统工程的关键项目与效益工程,工程建设周期21个月,于2006年6月29日一次过钢成功,轧制出第一卷钢。该项目包括一条热连轧生产线、一条平整生产线和一条横切生产线。主轧线及电气设备、平整线、横切线均从国外先进制造企业引进。2250mm主轧线由四座步进式加热炉,一台可逆式粗轧机和带边部绝热装置的热卷箱、七架精轧机、层流冷却(预留快速冷却装置)、三台卷取机组成,年设计能力400万吨,其中碳钢200万吨,不锈钢200万吨。成品规格:厚度1.2~25.4mm,宽度900~2130mm;最大卷重40吨。横切线成品厚度5.0~25.4mm,宽度1000~2130mm,长度2000~16000mm。

2250mm热轧装备和控制系统代表了当今世界热连轧机组的最高技术水平,板形控制系统采用了最新的CVC'技术,装备有带边部绝热装置的热卷箱和预留有快速冷却装置,确保薄规格产品的良好板形和带钢性能的均匀性,同时满足多相、TRIP等特殊钢种的生产 and 开发需要。生产工艺上采用不锈钢和碳钢的混合轧制技术。2250mm热连轧生产线已成为世界上不锈钢产能最大、技术装备最先进的热轧生产线。

2250mm与1549mm两条热轧生产线通过品种组合、规格互补,不仅可生产冷成型用钢、结构钢、低合金钢、石油天然气管线输送用钢、造船用钢、汽车结构钢、锅炉与压力容器用钢、集装箱用钢、细晶粒用钢,而且可生产TRIP钢、双相钢、工程机械用钢、建筑结构用钢等高强度钢种,具有宽、厚、专、特、薄、全、广、优的产品竞争优势,可充分满足各行业用户的更高要求。

The Hot Strip Mill of TISCO was put into operation on Aug. 8, 1994. There are two hot rolling production lines—1549mm HSM and 2250mm HSM—with total capacity of 8 million tons / per year. The main products are carbon structure steel, quality carbon steel, low alloy steel, stainless steel and silicon steel.

1549 mm HSM is the first HSM in North China. It was put into operation in Aug. 8, 1994 and revamped in Sept. 2002.

2250 mm HSM is the key project in the 1.5 million tons new stainless steel production line project in TISCO. The first coil was successfully produced at June, 29, 2006. The main equipment of 2250 mm HSM includes one hot rolling production line, one skin pass mill and one cutting line. The designed annual capacity is 4 million tons, among it, 2 million tons of stainless steel and 2 million tons of carbon steel. The specification of the products are: thickness range 2.0~20.0 mm and width range 1000~2100mm for stainless steel; thickness range 1.2~25.4 mm and width range 1000~2130 mm for carbon steel, the maximum coil weight 40 tons. The product specification of the cutting line is thickness range 5.0~25.4mm, width range 1000~2130mm, length 2000~16000mm.

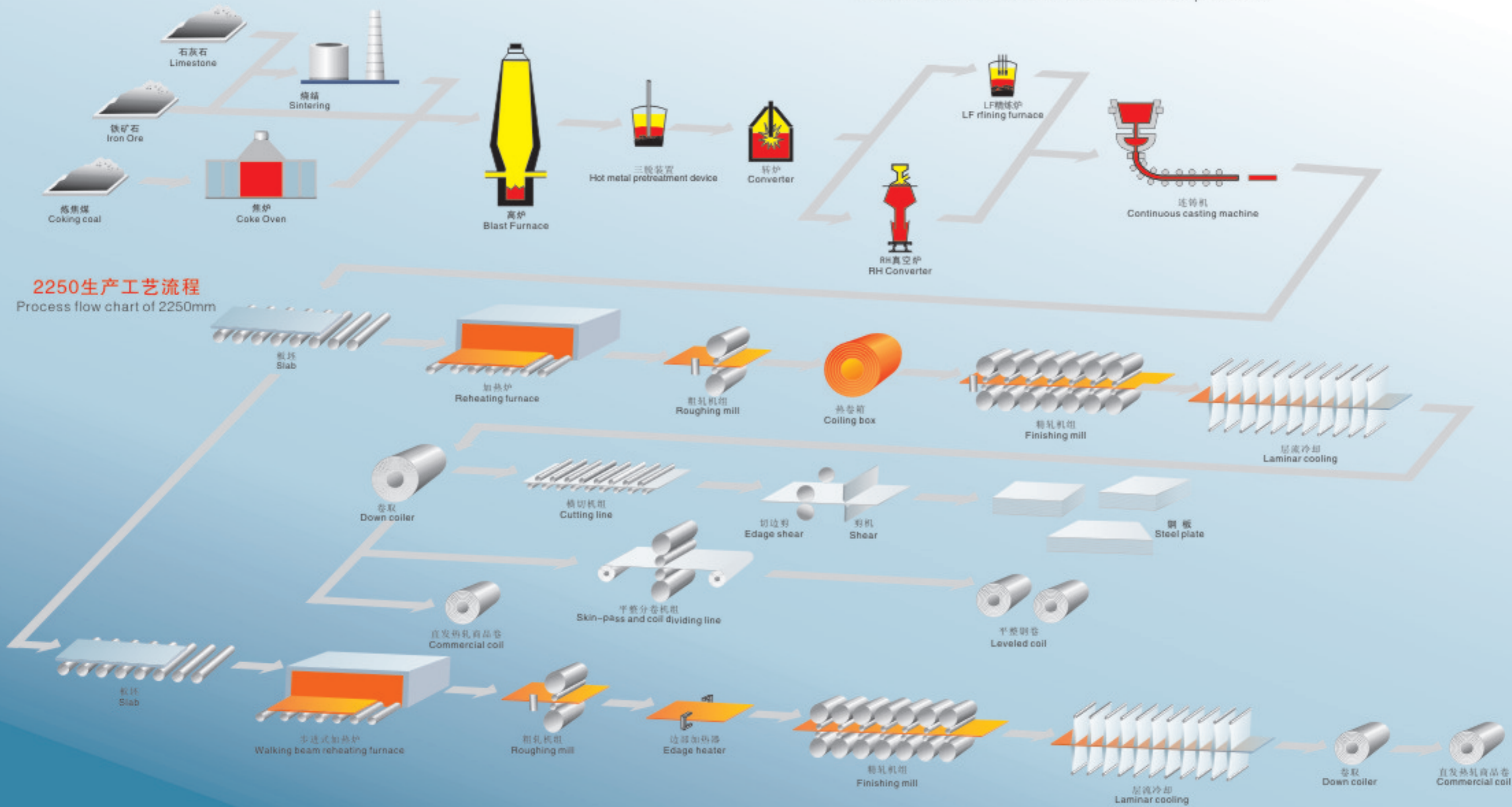
The equipment and control system of 2250mm HSM represents the most advanced world technological levels. The shape control system adopts the CVC' technology. It equips with coil box with edge heater, the location for quick cooling device is reserved, which can ensure good strip shape properties and uniform strip properties and meet the requirements for production and development of duplex steel and TRIP steel. The production process adopts mixed rolling of carbon steel and stainless steel. The 2250mm hot rolling production line became the most advanced technology and equipment in the world.

The product mix and specification of 2250mm HSM are widened. In order to further exploit its advantages, the wide, thick, special, many and best hot rolled products, it can produce wide range of steel grades such as high strength steel, cold forming steel, structure steel, low alloy steel, steel for transportation of oil and gas, shipbuilding steel, automobile steel, pressurized vessel steel, container steel, duplex steel, TRIP steel, ultra fine grained structural steel, weather proof steel for high buildings, and steel for construction machinery and equipment will be produced by the 2250mm HSM to fully meet the requirements of the customers.



### 1549mm与2250mm热连轧碳钢生产工艺流程图

Process flow chart of 1549mm and 2250mm HSM production



## 主要装备介绍

### Main Equipment Introduction

#### 炼钢系统 Steel making system



4350高炉  
4350 blast furnace



180吨顶底复吹转炉  
180 ton top and bottom  
combined blown converter



RH精炼炉  
RH



一机双流连铸机  
Two-strand CCM

#### 180吨顶底复吹转炉

- ▶ 采用顶底复吹方式，脱碳效率高；
- ▶ 钢质纯净，残余元素低，夹杂物含量少；
- ▶ 成分控制精确。

#### 立式板坯连铸机

- ▶ 采用立式板坯连铸机，可实现夹杂物充分上浮，钢质纯净；
- ▶ 铸坯不经弯曲矫直，内部缺陷少；
- ▶ 结晶器配有非正弦液压振动和电磁涡流式液面控制装置及二冷采用自动配水等技术，铸坯组织均一、致密。

#### RH 真空处理炉

- ▶ 具有良好的循环脱气，去除夹杂的效果

#### LF 精炼炉

- ▶ 具有脱硫、脱氧及微调成分的作用

#### 180t K-OBM converter

- ▶ Combined top and bottom blowing is adopted. The efficiency of decarbonization is high.
- ▶ The steel is cleaner, the residual element and inclusion in the steel is lower.
- ▶ The analysis of steel is accurate.

#### Vertical Continuous Casting Machine

- ▶ The slab is produced by vertical continuous casting machine which benefits the floatation of the inclusion and makes the steel cleaner.
- ▶ The strand does not pass through bending zone, which eliminates the internal defects.
- ▶ The mold is equipped with non-sinusoidal hydraulic vibrator, electromagnetic eddy current mold level control device and secondary cooling with automatic water control. The structure of the slab is uniform and dense.

#### RH Converter

- ▶ Degassing and removing inclusions

#### LF Refining Furnace

- ▶ With the role of desulphur and deoxidizing as well as element tracing.

#### 轧钢系统 Rolling system



步进式加热炉  
Walking beam  
reheating furnace



粗轧机  
Roughing mill



热卷箱  
Coiling box



精轧机 Finishing mill

#### 1549mm热连轧机机组

- ▶ 采用先进AWC、AGC控制系统，控制水平高；
- ▶ 采用先进液压弯辊、窜辊技术，配备有边部加热装置。

#### 1549mm Hot Strip Mill

- ▶ Advanced AWC and AGC control system is adopted. High accuracy of product sizes has been achieved.
- ▶ Advanced hydraulic roll bending and roll shifting is adopted. Edge heater is equipped with.

#### 2250mm热连轧机机组

- ▶ 2250mm生产线装备和控制系统水平属于当今世界传统热连轧机组的最高水平；
- ▶ 板形控制系统采用了最新的CVC<sup>+</sup>技术，压下系统采用液压AGC控制技术；
- ▶ 中间还保温采用带边部绝热装置的热卷箱；
- ▶ 高效冷却装置，有效保证钢板性能。

#### 2250mm Hot Strip Mill

- ▶ The equipment and control system of 2250 mm HSM represents the most advanced international technical level of the hot strip mill.
- ▶ The shape control system adopts the newest CVC<sup>+</sup> technology, screw down system adopts the hydraulic AGC system.
- ▶ The heat retention of the transfer bar adopts the coil box with edge heat shield.
- ▶ High efficiency cooling device and steel plate property can be ensured.



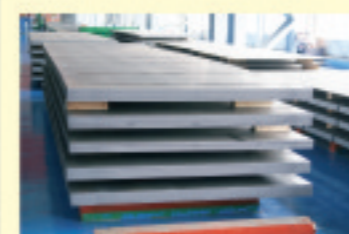
层流冷却 Laminar cooling



卷取机 Down coiler



平整机组 Skin-pass mill



横切板 Plate



横切机组 Cross-cutting line



成品 Finished products

## 研发能力 R&D Capacity



太钢技术中心  
TISCO Technology Centre



在国家认定的575家企业技术中心中，  
太钢技术中心排名第2位。

TISCO Technology Centre ranks the 2th place out of 575  
enterprise-based technology centres accredited nationwide.



## 认证证书 Certificate



## 质量检测 Quality Inspection



透射电镜  
Transmission Electronic Microscope



电子拉伸试验机  
Electronic Tensile Tester



电液伺服疲劳试验机  
Electrohydraulic Servo Fatigue  
Testing Machine



热模拟试验机  
Thermal Simulator



太钢产品实物质量达到国际水平  
全面贯彻ISO9000标准 精心打造质量品牌

The physical quality of TISCO product is up to the international level  
Fully ISO9000-based practice and resolute determination and efforts for ever-improving quality

## 高强度、高韧性结构钢产品介绍

### Introduction of high strength and toughness structure steel

太钢2250热轧装备和控制系统属于当今世界热连轧机组的最高水平，特别适合生产高性能工程机械用钢和高韧性结构钢。可生产屈服强度460MPa-960MPa的高强度结构钢及低碳贝氏体钢和高韧性的桥梁钢、电力塔架用钢及抗震管桩用钢等品种。

TISCO's 2250 HSM and its control system represent highest level of current world's HSM, which are quite suitable to produce high performance engineering machine steel and high toughness structure steel. The equipments are available to the production of grades as high strength structure steel with yield strength of 460MPa-960MPa, low carbon bainite steel, high toughness bridge steel, steel for power transmission pillar&tower and vibration-resistant piling tube, etc..

#### 太钢高强度结构钢、高韧性钢主要产品供货标准 Standards

品种 Type	牌号 Steel grade	标准 Standard applied	规格 Specification		用途 Purpose
			厚度 Thickness	宽度 Width	
工程机械用钢	T700	Q/TX3257-2007	6.0-16.0	1350-1800	银行ATM柜员机、汽车改装行业 ATM, automobile refitting
	TH800		3.0-6.0	1350-1550	
			6.0-16.0	1350-1800	
	TQ460MC-TQ550MC	Q/太新011-2008	4.0-20.0	1250-2130	工程机械、集装箱、起重机、煤矿液压支架等 焊接结构用钢 Structural welding steel for engineering machine, container, crane, and hydraulic supportive pillar in coal mine
	TQ600MC-TQ960MC		4.0-12.0	1250-1800	
	S355MC-S600MC	EN10149-2:1995	3.0-16.0	870-2130	供出口用焊接结构钢 Structural welding steel supplied for export
	S700MC	EN10149-2:1995	3.0-5.0	1350-1600	工程机械(起重机、混凝土泵车) Engineering machine, crane and concrete pump truck
5.0-16.0			1350-2000		
T520JJ	Q/TB3081-2010	4.0-6.0	870-2130	混凝土搅拌车 Commercial concrete mixer truck	
低碳贝氏体钢	DB685, DB785	Q/太新019-2008	3.0-14.0	1250-2000	工程机械制造 Engineering machine manufacturing
结构钢	Q390C-Q460C	GB/T1591-1994	3.0-25.4	1000-2130	厂房、建筑等钢结构 Steel structure as workshop, building, etc..
	SN400B	Q/TX3329-2007	9.0-22.0	1000-2130	抗震管桩用钢 Tube steel for vibration-resistant piling
	SN490B	Q/太新041-2008	8.0-22.0		
ASTM A572 GR65	Q/太新080-2008	3.0-19.0	870-2130	电力桅杆、塔架 Power transmission pillar and tower	
桥梁钢	Q345qC-Q420qE	GB/T714-2000	≤16.0	1500-2050	桥梁 Bridge

## 高强度、高韧性结构钢技术标准

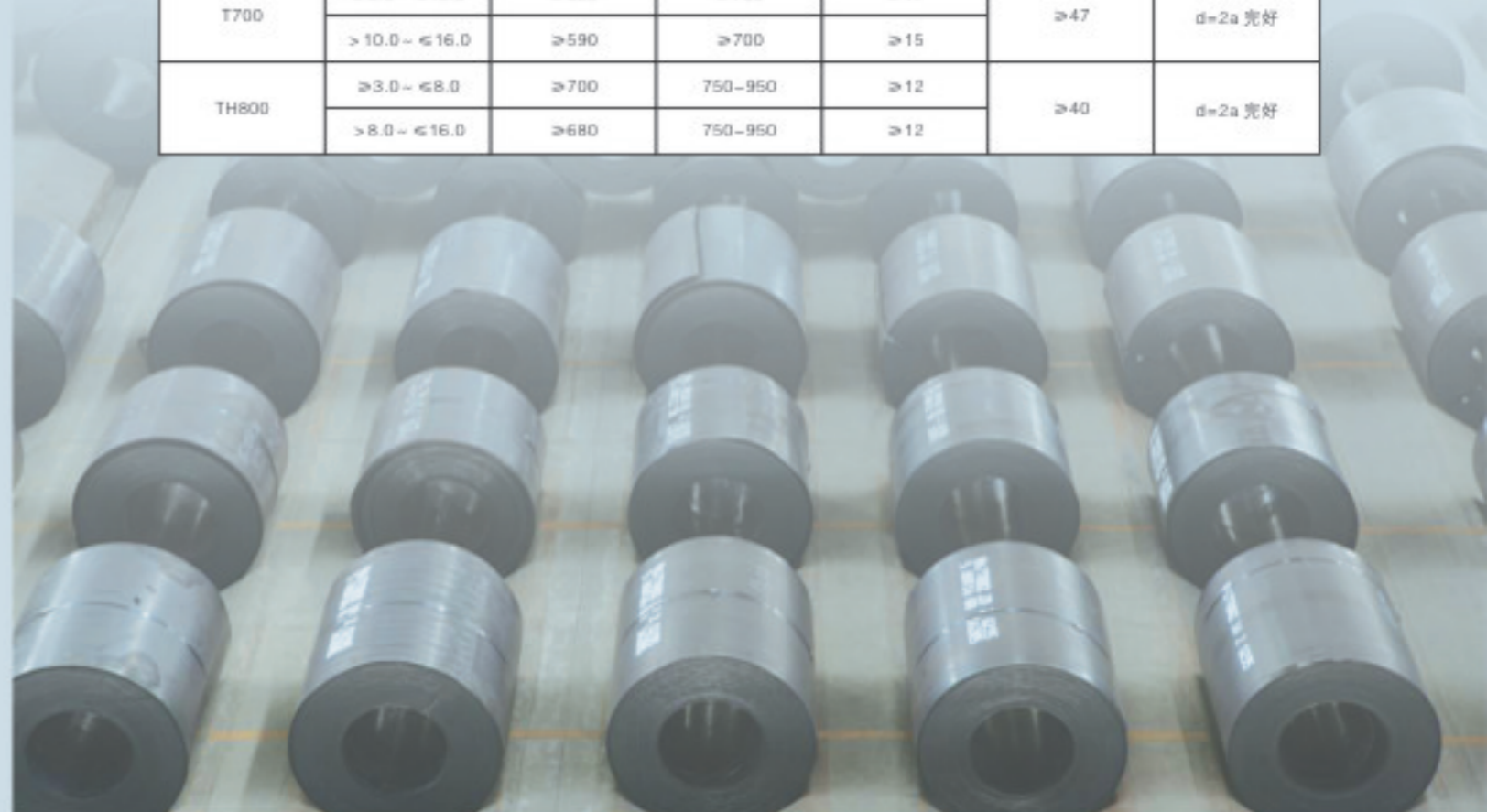
### The standard applied of high strength and toughness structure steel

#### 银行柜员机、汽车改装等行业用高强度钢牌号及化学成分 Chemical composition

牌号 Steel grade	化学成分(%) Chemical Composition %									
	C	Si	Mn	P	S	Nb	V	Ti	Mo	Al
T700	≤0.12	≤0.50	≤2.0	≤0.020	≤0.010	≤0.09	≤0.20	≤0.15	≤0.50	≥0.015
TH800	≤0.12	≤0.40	≤2.1	≤0.020	≤0.010	≤0.09	≤0.20	≤0.15	≤0.50	≥0.015

#### 银行柜员机、汽车改装等行业用高强度钢产品机械性能 Mechanical property

牌号 Steel grade	规格范围(mm) Specification	力学性能 Mechanical property				180° 纵向 冷弯试验 Transverse cold bending test
		Rel, MPa	Rm, MPa	A, %	纵向-20℃AKV(J) Longitudinal	
T700	≥6.0-≤10.0	≥625	≥700	≥17	≥47	d=2a 完好
	>10.0-≤16.0	≥590	≥700	≥15		
TH800	≥3.0-≤8.0	≥700	750-950	≥12	≥40	d=2a 完好
	>8.0-≤16.0	≥680	750-950	≥12		



## 高强度、高韧性结构钢技术标准

The standard applied of high strength and toughness structure steel

### ● 工程机械系列 The series of engineering machine

高强度工程机械用钢牌号及化学成分  
Chemical Composition

牌号 Steel grade	化学成份 % Chemical Composition %												
	最大含量 Max												最小含量 Min
	C	Si	Mn	P	S	Nb	V	Ti	Cr	Ni	Mo	B	
TQ460MC[C/D/E]	0.10	0.30	1.60	0.020	0.010	0.07	0.09	0.12	--	--	--	--	0.015
TQ500MC[C/D/E]	0.10	0.30	1.70	0.020	0.010	0.07	0.09	0.12	--	--	--	--	0.015
TQ550MC[C/D/E]	0.10	0.30	1.80	0.020	0.010	0.07	0.09	0.12	--	--	--	--	0.015
TQ600MC[C/D/E]	0.10	0.30	1.80	0.020	0.010	0.07	0.09	0.12	--	--	--	--	0.015
TQ650MC[C/D/E]	0.12	0.30	1.80	0.020	0.010	0.07	0.09	0.12	--	--	--	--	0.015
TQ700MC[C/D/E]	0.12	0.30	1.90	0.020	0.010	0.07	0.09	0.12	--	--	--	--	0.015
TQ900MC[C/D/E]	0.17	0.50	2.00	0.020	0.010	0.07	0.09	0.12	0.9	1.0	0.6	0.005	0.015
TQ960MC[C/D/E]	0.17	0.50	2.10	0.020	0.010	0.07	0.09	0.12	0.9	1.0	0.6	0.005	0.015

## 高强度、高韧性结构钢技术标准

The standard applied of high strength and toughness structure steel

高强度工程机械用钢产品机械性能  
Mechanical property

牌号 Steel grade	质量等级 Quality grade	机械性能 Machinical property			其它性能 Other property				
		屈服强度 Yield strength	抗拉强度 Tensile strength	延伸率 $\geq\%$ Enlogation	180°C 弯曲试验 Bending test		冲击功 AKV, J		布氏硬度 HB
					A $\leq$ 6mm	A > 6mm			
TQ460MC	C	$\geq 460$	590~750	18	d=1.5a	d=2a	0°C	$\geq 40$	
	D						-20°C	$\geq 40$	
	E						-40°C	$\geq 27$	
TQ500MC	C	$\geq 500$	610~770	17	d=1.5a	d=2a	0°C	$\geq 40$	
	D						-20°C	$\geq 40$	
	E						-40°C	$\geq 27$	
TQ550MC	C	$\geq 550$	670~830	16	d=1.5a	d=2a	0°C	$\geq 40$	
	D						-20°C	$\geq 40$	
	E						-40°C	$\geq 27$	
TQ600MC	C	$\geq 600$	690~850	17	d=1.5a	d=2a	0°C	$\geq 40$	
	D						-20°C	$\geq 40$	
	E						-40°C	$\geq 27$	
TQ650MC	C	$\geq 650$	700~880	15	d=1.5a	d=2a	0°C	$\geq 40$	250
	D						-20°C	$\geq 40$	
	E						-40°C	$\geq 27$	
TQ700MC	C	$\geq 700$	780~930	15	d=1.5a	d=2a	0°C	$\geq 40$	260
	D						-20°C	$\geq 40$	
	E						-40°C	$\geq 27$	
TQ900MC	C	$\geq 900$	940~1100	12	d=3a	d=4a	0°C	$\geq 40$	310
	D						-20°C	$\geq 40$	
	E						-40°C	$\geq 27$	
TQ960MC	C	$\geq 960$	980~1150	12	d=3a	d=4a	0°C	$\geq 40$	320
	D						-20°C	$\geq 40$	
	E						-40°C	$\geq 27$	



## 高强度、高韧性结构钢技术标准

The standard applied of high strength and toughness structure steel

欧标高强钢牌号及化学成分

Chemical composition

牌号 Steel grade	化学成分 (%) Chemical Composition %									
	C	Si	Mn	P	S	Nb	V	Ti	N	AL
S355MC	≤0.12	≤0.50	≤1.50	≤0.025	≤0.020	≤0.09	≤0.20	≤0.15	≤0.010	≥0.015
S420MC	≤0.12	≤0.50	≤1.60	≤0.025	≤0.015	≤0.09		≤0.15		≥0.015
S460MC	≤0.12	≤0.50	≤1.60	≤0.025	≤0.015	≤0.09		≤0.15		≥0.015
S500MC	≤0.12	≤0.50	≤1.70	≤0.025	≤0.015	≤0.09		≤0.15		≥0.015
S550MC	≤0.12	≤0.50	≤1.80	≤0.025	≤0.015	≤0.09		≤0.15		≥0.015
S600MC	≤0.12	≤0.50	≤1.90	≤0.025	≤0.015	≤0.09		≤0.15		≥0.015
S700MC	≤0.12	≤0.50	≥1.65	≤0.020	≤0.015	≤0.09		≤0.22		≥0.015

欧标高强钢产品机械性能

Mechanical property

牌号 Steel grade	机械性能 Mechanical property				其它性能 Other property	
	屈服强度 Yield strength	抗拉强度 Tensile strength	延伸率 ≥% Elongation		180° 弯由试验 Bending test	冲击功 -20°C AKV, J
			L <sub>0</sub> =80mm	L <sub>0</sub> =5.65√F <sub>0</sub>		
S355MC	≥355	430-550	19	20	d=0.5a	≥27
S420MC	≥420	480-620	16	19	d=0.5a	≥27
S460MC	≥460	520-670	14	17	d=1a	≥27
S500MC	≥500	550-700	12	14	d=1a	≥27
S550MC	≥550	600-760	12	14	d=1.5a	≥27
S600MC	≥600	650-820	11	13	d=1.5a	≥27
S700MC	≥650	700-950		12	d=2a	≥40

## 高强度、高韧性结构钢技术标准

The standard applied of high strength and toughness structure steel

混凝土搅拌罐用钢牌号及化学成分

Chemical composition

牌号 Steel grade	化学成分 (%) Chemical Composition %					
	C	Si	Mn	P	S	Cu
T520JJ	≤0.20	≤0.55	≤1.60	≤0.030	≤0.020	0.20-0.45

混凝土搅拌罐用钢机械性能

Mechanical property

牌号 Steel grade	规格范围 (mm) Specification	力学性能 Mechanical property			180° 横向冷弯试验 Transverse cold bending test
		Rel, MPa	Rm, MPa	A, %	
T520JJ	4.0-6.0	≥365	≥520	≥20	d=2a

### 低碳贝氏体钢系列 Low carbon bainite steel

低碳贝氏体钢牌号及化学成分

Chemical composition

牌号 Steel grade	化学成分 (%) Chemical Composition %									
	C	Si	Mn	P	S	Cu	Nb	Ni	Mo	B
DB685	≤0.08	≤0.50	1.2-1.6	≤0.020	≤0.01	≤0.35	≤0.10	≤0.3	≤0.35	≤0.0030
DB785	≤0.10	≤0.50	1.2-1.6	≤0.020	≤0.01	≤0.50	0.025-0.06	≤1.0	≤0.60	≤0.0030

低碳贝氏体钢机械性能

Mechanical property

牌号 Steel grade	规格 (mm) Specification	Rel, MPa	Rm, MPa	A, %	冷弯180° d=2a b=35mm Bending test	冲击功AKV Impact energy		
						试验温度0°C Test temperature	冲击值不小于J	
							纵向 Longitudinal	横向 Transverse
DB685	≤6	≥570	670-860	≥15	完好	—	—	—
	6.0-16.0					-40	47	—
DB785	3.0-6.0	≥700	750-950	≥12	完好	不进行冲击试验		
	≥6.0-14.0					≥680	750-950	≥12

## 高强度、高韧性结构钢技术标准

The standard applied of high strength and toughness structure steel

### ○ 钢结构系列 The series of structure steel

电力桅杆、塔架用钢牌号及化学成份  
Chemical composition

牌号 Steel grade	化学成份 (%) Chemical Composition %						
	C	Si	Mn	P	S	Al	Nb
ASTM A572 GR65	≤0.23	≤0.04	≤1.65	≤0.020	≤0.020	≥0.015	≤0.090

注：1、生产厂根据需要，还可加入V、Ti、Mo等微量合金元素。

电力桅杆、塔架用钢机械性能  
Mechanical property

牌号 Steel grade	力学性能 Mechanical property				180° 弯曲d=弯心直径, a=试样厚度(直径) Bend d=bending diameter a=sample thickness (diameter)
	Rel, MPa	Rm, MPa	A, % (Lo=50mm)	纵向V型冲击试验 (-30) J Longitudinal v type impact test	
ASTM A572 GR65	≥450	≥550	≥19	≥34	d=2a

抗地震管桩用钢牌号及化学成份  
Chemical composition

牌号 Steel grade	化学成份 (%) Chemical Composition %							
	C	Si	Mn	P	S	Ti	N	Ceq
SN400B	≤0.20	≤0.35	0.6~1.4	≤0.030	≤0.015		≤0.006	≤0.36
SN490B	≤0.18	≤0.55	≤1.5	≤0.030	≤0.020	≤0.15	≤0.006	≤0.44

抗地震管桩用钢机械性能  
Mechanical property

牌号 Steel grade	规格范围 (mm) Specification	力学性能 Mechanical property				180° 冷弯试验 Cold bending test
		Rel, MPa	Rm, MPa	A, % (Lo=200mm bo=40mm)	屈服比 Yield strength	
SN400B	9≤t≤16	255~355	420~510	≥19	≤0.8	d=2a
	16<t≤22			≥23		
SN490B	8.0~22	≥315	490~637	A, % Lo=50mm bo=25mm ≥23		d=1.5a

## 高强度、高韧性结构钢技术标准

The standard applied of high strength and toughness structure steel

### ○ 桥梁钢系列 The series of bridge steel

桥梁钢牌号及化学成份  
Chemical composition

牌号 Steel grade	等级 Grade	统一数字 代号 Unity figure code	化学成份 (%) Chemical Composition %					
			C	Si	Mn	最大含量 Max		最小含量 Min
						P	S	Al
Q345q	C	L13453	≤0.20	≤0.60	1.00~1.60	0.035	0.035	0.015
	D	L13454	≤0.18	≤0.60	1.10~1.60			0.015
	E	L13455	≤0.17	≤0.50	1.20~1.60			0.015
Q370q	C	L13703	≤0.18	≤0.50	1.20~1.60			0.015
	D	L13704	≤0.17	≤0.50	1.20~1.60			0.015
	E	L13705	≤0.17	≤0.50	1.20~1.60			0.015
Q420q	C	L14203	≤0.18	≤0.50	1.20~1.60			0.015
	D	L14204	≤0.17	≤0.60	1.30~1.70			0.015
	E	L14205	≤0.17	≤0.60	1.30~1.70			0.015

注：为改善钢材性能，可加入Nb、V、Ti、N等微量元素，其含量符合下表，并应在质量证明书中注明。

桥梁钢主要性能指标  
Standards

牌号 Steel grade	质量等级 Quality grade	机械性能 Mechanical property								
		厚度 mm Thickness	屈服强度 MPa Yield strength	抗拉强度 MPa Tensile strength	延伸率 ≥% Elongation	180°弯曲试验试样厚度(mm) Bending test steel thickness		冲击功 (纵向) J impact power (longitudinal)		时效冲击功 (纵向), J
						≤16	>16	0°C	-40°C	
Q345q	C	≤16	≥345	≥510	≥21	d=2a	d=3a	0°C		
	-20°C							≥34	≥34	
	-40°C							≥34	≥34	
Q370q	C	≤16	≥370	≥530	≥21	d=2a	d=3a	0°C		
	-20°C							≥41	≥41	
	-40°C							≥41	≥41	
Q420q	C	≤16	≥420	≥530	≥20	d=2a	d=3a	0°C	≥47	
	-20°C									
	-40°C								≥47	

## 高强度、高韧性结构钢技术标准

### The standard applied of high strength and toughness structure steel

#### 产品优势 Product superiority

##### 热卷规格和尺寸精度

Dimensional accuracy and product specification

厚度精度	Thickness accuracy	±30 μm
宽度精度	Width accuracy	0~6.5mm
平直度	Flatness	<5mm/m
凸度精度	Profile accuracy	±20 μm
开平板不平度	Roughness open flat	≤5mm/m

太钢高强度、高韧性结构用钢突出宽、厚、特的产品优势，通过采用控轧控冷手段，将产品的晶粒尺寸降低到10 μm的水平，在强度提高数十到数百兆帕(MPa)的同时，具有良好的塑、韧性；通过降低钢的碳当量提高焊接性能。采用炉外精炼技术，大幅降低钢中的杂质元素含量，特别是S含量达到小于0.003%的水平，提高钢的低温冲击韧性。代表钢种详述：

太钢700MPa级高强度钢从2007年开发以来，截止2008年已累计开发量达到8万吨，产品广泛应用于银行柜员机、汽车改装、工程机械制造等行业。

1、太钢生产的厚度8mm 700MPa级产品的铁素体晶粒组织。



图1 厚度8 mm 700MPa级产品显微图

从上图可以看出，太钢700MPa级产品的晶粒细小，而且更均匀。

TISCO's high strength, high toughness structure steel push forward its advantages in its width, thickness and specialty. Via the measures of rolling control and cooling control, the size of crystal grains are reduced to as small as ten μm. While the strength increased to dozens or hundreds of MPa, it still has excellent plasticity and toughness; the weldability is also improved by reducing C-equivalence. By external furnace refining technology, impurity elements content have been reduced to a great extent, while the low temperature impact toughness has been improved. With typical grades as following.

Eighty thousand tons of 700MPa-level high strength steel has been produced since its launch during 2007-2008. the product has been widely used in the industries at ATM, automobile refitting and engineering machine manufacturing, etc..

1. The ferritic crystal grain organization of 8mm thk 700MPa strip produced by TISCO.

The above figure indicates that TISCO's 700MPa-level product has finer and uniform crystal grains.

## 高强度、高韧性结构钢技术标准

### The standard applied of high strength and toughness structure steel

#### 2、成份设计的优势

The advantages of composition designing

屈服强度700 Mpa级热轧高强度带钢的化学成分  
Chemical Composition

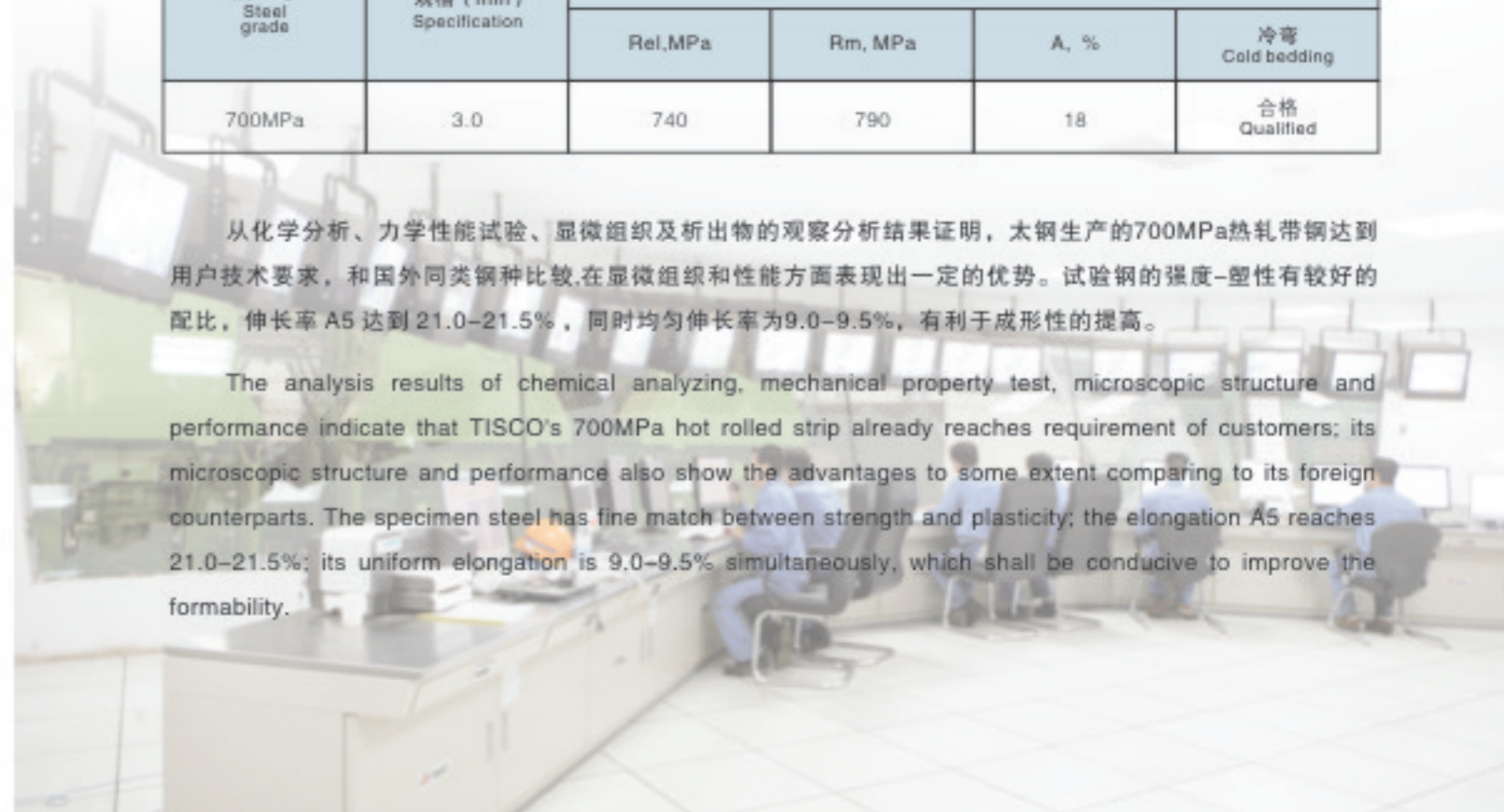
钢号 Steel grade	化学成分 (%) Chemical Composition %									
	C Max	Si Max	Mn Max	P Max	S Max	Nb Max	V Max	Ti Max	B Max	Al Min
太钢 700MPa	0.09	0.15	1.80	0.020	0.010	≤0.22				0.015

产品实物性能指标  
Mechanical property

牌 号 Steel grade	规格 (mm) Specification	力学性能 Mechanical property			
		Rel, MPa	Rm, MPa	A, %	冷弯 Cold bedding
700MPa	3.0	740	790	18	合格 Qualified

从化学分析、力学性能试验、显微组织及析出物的观察分析结果证明，太钢生产的700MPa热轧带钢达到用户技术要求，和国外同类钢种比较，在显微组织和性能方面表现出一定的优势。试验钢的强度-塑性有较好的配比，伸长率A5达到21.0-21.5%，同时均匀伸长率为9.0-9.5%，有利于成形性的提高。

The analysis results of chemical analyzing, mechanical property test, microscopic structure and performance indicate that TISCO's 700MPa hot rolled strip already reaches requirement of customers; its microscopic structure and performance also show the advantages to some extent comparing to its foreign counterparts. The specimen steel has fine match between strength and plasticity; the elongation A5 reaches 21.0-21.5%; its uniform elongation is 9.0-9.5% simultaneously, which shall be conducive to improve the formability.



## 产品标识与包装

### Product mark and package

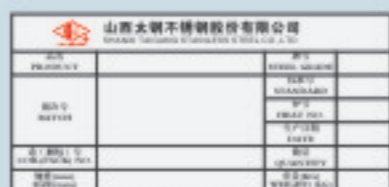
#### 钢卷标识与横切板喷号 Coil mark and plate marking



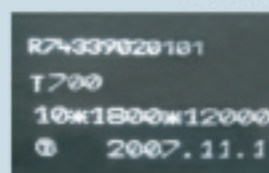
1549mm 普碳钢热轧卷  
1549mm hot rolling carbon steel



2250mm 热轧卷  
2250mm hot rolled coil



- ▶ 每卷钢带粘贴二张产品标签，内圈一张，外圈一张。  
Adhering two marks per coil, one inside and one outside.
- ▶ 在钢卷圈内喷印钢号、规格、重量，在钢卷端部喷印卷号。  
Marking the steel grade, size and weight in the eye of coil and the number at the end

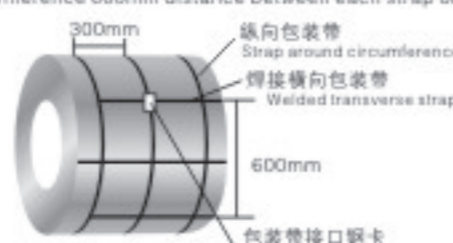
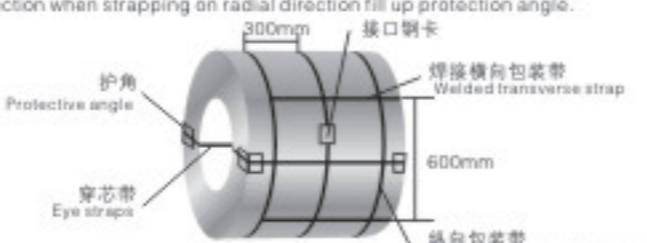


横切板的喷号  
Punching of Plate







钢卷的喷号  
Punching of steel coil

#### 1549钢卷包装 1549mm coil packing

钢带卷类型 Types of strip	捆扎道次 Strapping times		图示 For example
	径向 Radial direction	周向 Circumference direction	
一般产品 >2.50 mm Normal product >2.50mm		≥3	周向捆扎3条网式包装带，周向带间隔300mm，横向包装带间隔600mm。 3 network pattern packing straps around circumference 300mm distance between each strap around circumference 600mm distance between each strap on the transverse direction. 
集装箱板 及薄规格产品 ≤2.50 mm Container plate and thin plate specification	≥2	≥3	周向捆扎3条网式包装带；径向捆扎2条穿芯包装带；打径向包装带时在钢卷角部垫护角。 3 network pattern packing straps around circumference 2 eye packing straps on radial direction when strapping on radial direction fill up protection angle. 
品种钢 Special steel	≥6	≥3	周向捆扎3条网式包装带；径向捆扎6条穿芯包装带；固定内外圈加衬的镀锌铁皮防护卡圈。 3 network pattern packing straps around circumference 6 eye packing straps on radial direction; fixing lining galvanization locking ring inside and outside.

#### 2250直发卷、平整卷和卷切板包装

#### 2250common coil、Coil leveled and Cutting plate packing

方案号 Number	类型 Type	说明 Application	图示 For example
1	碳钢商品材直发卷 Commercial coil	1、三条周向捆带均匀分布，捆带间距400mm。 2、卷重≤10吨时打一条穿心带，带间加护角。卷重>10吨时不打穿心带。 3、根据产品规格及强度的情况，采用环形加固。 1. 3 straps of even distribution around the circumference distance of straps is 400mm. 2. Weight of coil ≤ 10ton, one eye strapping without protection angle weight of coil > 10ton without eye strapping. 3. according to the specifications and product strength, use of reinforcement ring. 	
2	平整卷 重卷卷 Coil leveled coil recoiled	1、宽度(B)≤1600mm时，三条捆带；B>1600mm时四条捆带。 2、卷重≤10吨时打一条穿心带，不加护角。卷重>10吨时不打穿心带。 1. Breath ≤ 1600mm, 3 straps B > 1600mm, 4 straps. 2. Weight of coil ≤ 10 ton, one eye strapping without protection angle weight of coil > 10 ton without eye strapping.	
3	碳钢卷切板，长度<6000mm Cutting plate of carbon steel length < 6000mm.	两组捆带分别捆扎两端，两边捆带距两头300mm，捆带间距200mm。 Strapping separately on double end with two groups of strap distance between straps and head of plate is 300mm distance of straps is 200mm. 	
4	碳钢卷切板，长度≥6000mm Cutting plate of carbon steel length ≥ 6000mm.	每1m~1.5m一条捆带，均匀分布。 Even strap distribution at intervals of 1m~1.5m. 	
5	平行四边形、梯形卷切板 Parallelogram and echelon plate cut	用两组捆带分别捆扎两端，两边捆带距最近端点300mm，组内捆带间距200mm。 Strapping separately on double end with two groups of strap distance between straps on both sides and nearest end is 300mm distance of straps of group is 200m. 	

产品应用

Product application



钢结构建筑  
Building structure industry



煤矿液压支架  
Coal mine hydraulic pressure brace



混凝土搅拌罐车  
Concrete mixer truck



混凝土泵车  
Concrete pump truck



挖掘机  
Excavator

产品应用

Product application



抗震管桩  
Anti-seismic



银行ATM柜员机  
ATM



保险柜  
Strongbox



汽车起重机  
Automobile crane



汽车改装



集装箱  
Container

## 服务承诺

### The service promise

- ◆ 为客户提供特定的成份、性能、规格设计。  
To provide customized products.
- ◆ 为客户在选材和加工工艺方面提供技术支持。  
Technical support to customers in material selection and fabrication.
- ◆ 交货准确及时。  
Accurate and prompt delivery.
- ◆ 对客户异议，在24小时内答复。  
Response to customer's claim within 24 hours.

## 太钢主要业务部门及外设销售公司通讯录

### Communication directory for TISCO marketing & sales departments and sales branches

营销部碳钢板材业务部	电话: (TEL) 0351-3013905 3012277	传真: (FAX) 0351-3010671
技术中心板材室 Rolling Section of Technology Center	电话: (TEL) 0351-3013795 3016489	传真: (FAX) 0351-3017895
热连轧厂 Hot striped mill	电话: (TEL) 0351-3011944 3017288	传真: (FAX) 0351-3011944
营销部客户服务中心	电话: (TEL) 800-806-1998 0351-3017291	传真: (FAX) 0351-3012464

#### 国际分公司联系方式 Contacting manners of international trading Co.,Ltd.

太钢国贸(美国)有限公司 Taigang International Trading (USA) Co., Ltd.	美国 USA	电话 (Tel) 001-4124340607	传真 (Fax) 001-4124340608
太钢国贸(香港)有限公司 Taigang International Trading (Hongkong) Co., Ltd.	香港 Hongkong	电话 (Tel) +0852-28271686	传真 (Fax) +0852-28271300
太钢欧洲有限公司 Taigang Europe Co., Ltd.	德国 Germany	电话 (Tel) +49(0)2154-81690	传真 (Fax) +049-2154-816911

#### 国内分公司联系方式 Contacting manners of deomestic trading Co.,Ltd

	公司名称 Branch Name	地址 Address	通讯方式 Telephone & Fax	
太钢华北区销售公司 TISCO sales company in North China	天津太钢销售有限公司 Tianjin TISCO Sales Co. Ltd.	天津 Tianjin	电话 (Tel) 022-24308106	传真 (Fax) 022-24308103
	北京太钢销售有限公司 Beijing TISCO Sales Co. Ltd.	北京 Beijing	电话 (Tel) 010-64441368	传真 (Fax) 010-64441369
	太原现货销售有限公司 Taiyuan Sales company Ltd. of TISCO	太原 Taiyuan	电话 (Tel) 0351-3096390	传真 (Fax) 0351-3090556
	郑州太钢销售有限公司 Zhengzhou TISCO Sales Co. Ltd.	郑州 Zhengzhou	电话 (Tel) 0371-60805079	传真 (Fax) 0371-60805085
太钢东北区销售公司 TISCO sales company in Northeast of China	辽宁太钢销售有限公司 Liaoning TISCO Sales Co. Ltd.	沈阳 Shenyang	电话 (Tel) 024-24230550	传真 (Fax) 024-24231216
	哈尔滨太钢销售有限公司 Harbin TISCO Sales Co. Ltd.	哈尔滨 Harbin	电话 (Tel) 0451-87905777	传真 (Fax) 0451-85195321
	沈阳沈水太钢不锈钢销售有限公司 Shenyang TISCO Sales Co. Ltd.	沈阳 Shenyang	电话 (Tel) 024-24230551	传真 (Fax) 024-24231216
太钢华东区销售公司 TISCO sales company in East China	无锡太钢销售有限公司 Wuxi TISCO Sales Co. Ltd.	无锡 Wuxi	电话 (Tel) 0510-82407713	传真 (Fax) 0510-82441187
	上海太钢销售有限公司 Shanghai TISCO Sales Co. Ltd.	上海 Shanghai	电话 (Tel) 021-61803397	传真 (Fax) 021-61803397
	杭州太钢销售有限公司 Hangzhou TISCO Sales Co. Ltd.	杭州 Hangzhou	电话 (Tel) 0571-85067265	传真 (Fax) 0571-85061968
太钢山东区销售公司 TISCO sales company in Shandong	青岛太钢销售有限公司 Qingdao TISCO Sales Co. Ltd.	青岛 Qingdao	电话 (Tel) 0532-81101847	传真 (Fax) 0532-87734798
	济南太钢销售有限公司 Jinan TISCO Sales Co. Ltd.	济南 Jinan	电话 (Tel) 0531-82638400	传真 (Fax) 0531-82638411
太钢华中区销售公司 TISCO sales company in Central China	武汉太钢销售有限公司 Wuhan TISCO Sales Co. Ltd.	武汉 Wuhan	电话 (Tel) 027-85615300	传真 (Fax) 027-85615311
	长沙太钢销售有限公司 Changsha TISCO Sales Co. Ltd.	长沙 Changsha	电话 (Tel) 027-85615300	传真 (Fax) 0731-85528325
太钢华南区销售公司 TISCO sales company in South China	佛山市太钢不锈钢销售有限公司 Foshan TISCO Stainless Steel Sales Co. Ltd.	佛山 Foshan	电话 (Tel) 0757-83315711	传真 (Fax) 0757-82215718
	衡阳太钢销售有限公司 Hengyang TISCO Sales Co. Ltd.	衡阳 Hengyang	电话 (Tel) 0463-8766018	传真 (Fax) 0993-8766048
太钢西南区销售公司 TISCO sales company in Southwest of China	成都太钢销售有限公司 Chengdu TISCO Sales Co. Ltd.	成都 Chengdu	电话 (Tel) 028-87604342	传真 (Fax) 028-87612940
	重庆太钢销售有限公司 Chongqing TISCO Sales Co. Ltd.	重庆 Chongqing	电话 (Tel) 023-68154181	传真 (Fax) 023-68400799
太钢西北区销售公司 TISCO sales company in Northwest of China	西安太钢销售有限公司 Xi'an TISCO Sales Co. Ltd.	西安 Xi'an	电话 (Tel) 029-86231507	传真 (Fax) 029-86231506