



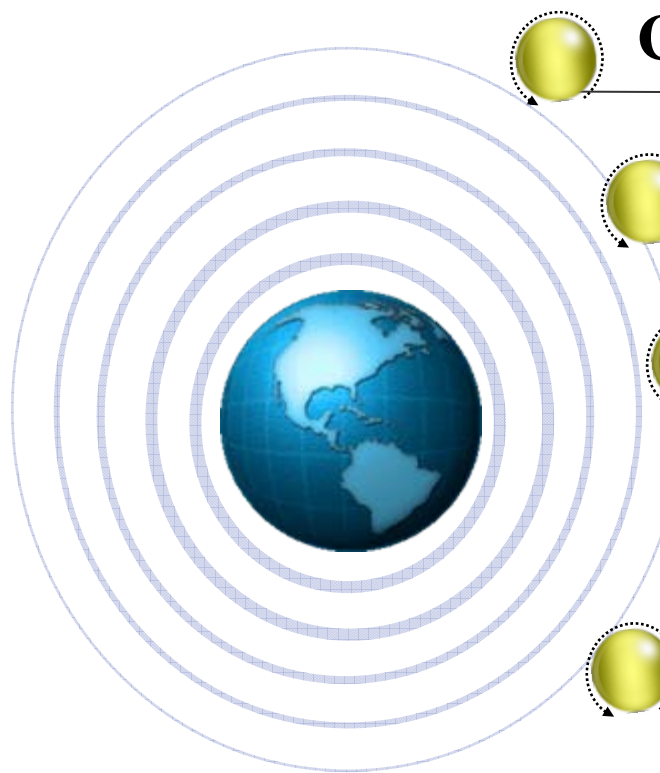
# Product Introduction of NGO Steel



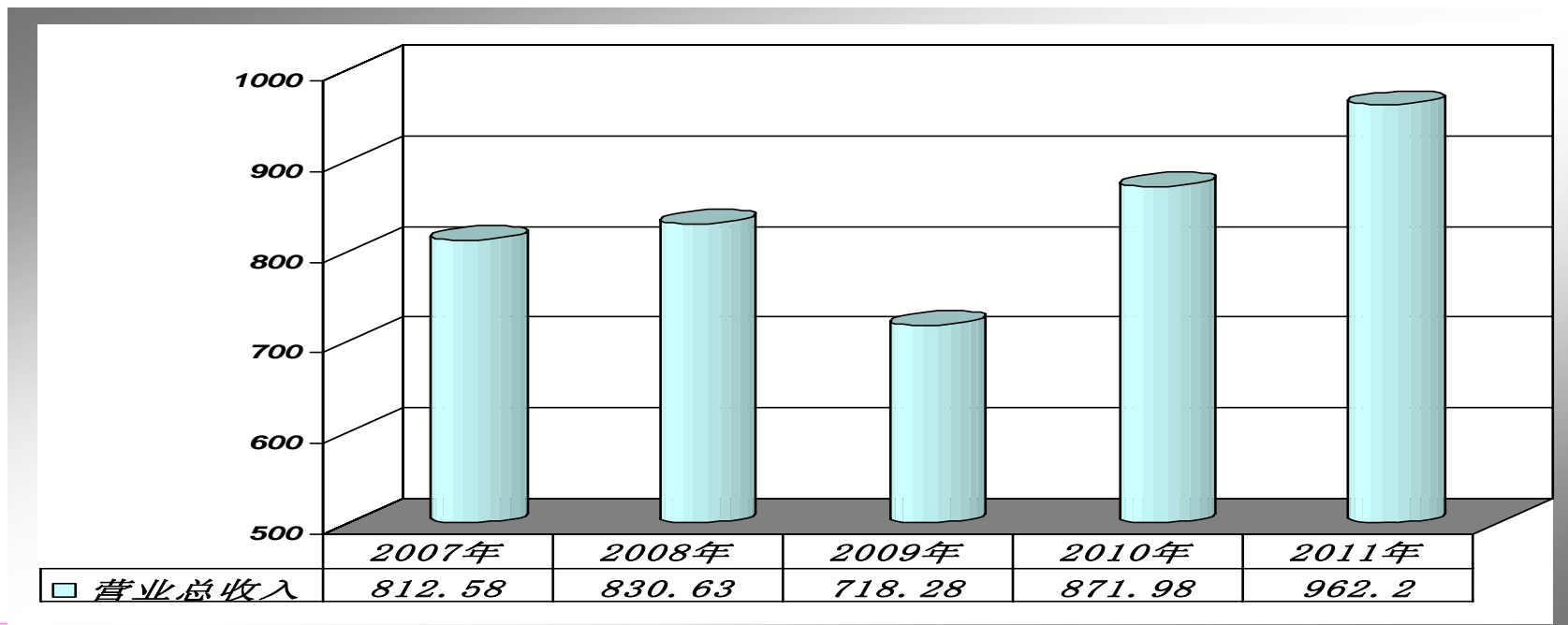
Shanxi Taigang Stainless Steel Co.,Ltd

2013.05.29

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- ✓ Tisco is one of the steel giants in China and the largest stainless and special steel producer in the world.
- ✓ As the biggest stainless steel enterprise, Tisco has the most up-to-date technology equipment and the most widest specification.
- ✓ Tisco technology center ranks 2th among enterprise in China and accredited by state as NO.1

## ● Development of Silicon Steel

**1954:** The first sheet of hot rolled silicon steel was produced by Taigang Iron & Steel Factory in cooperation with Iron & Steel Research Institute of China Ministry of Metallurgical Industry

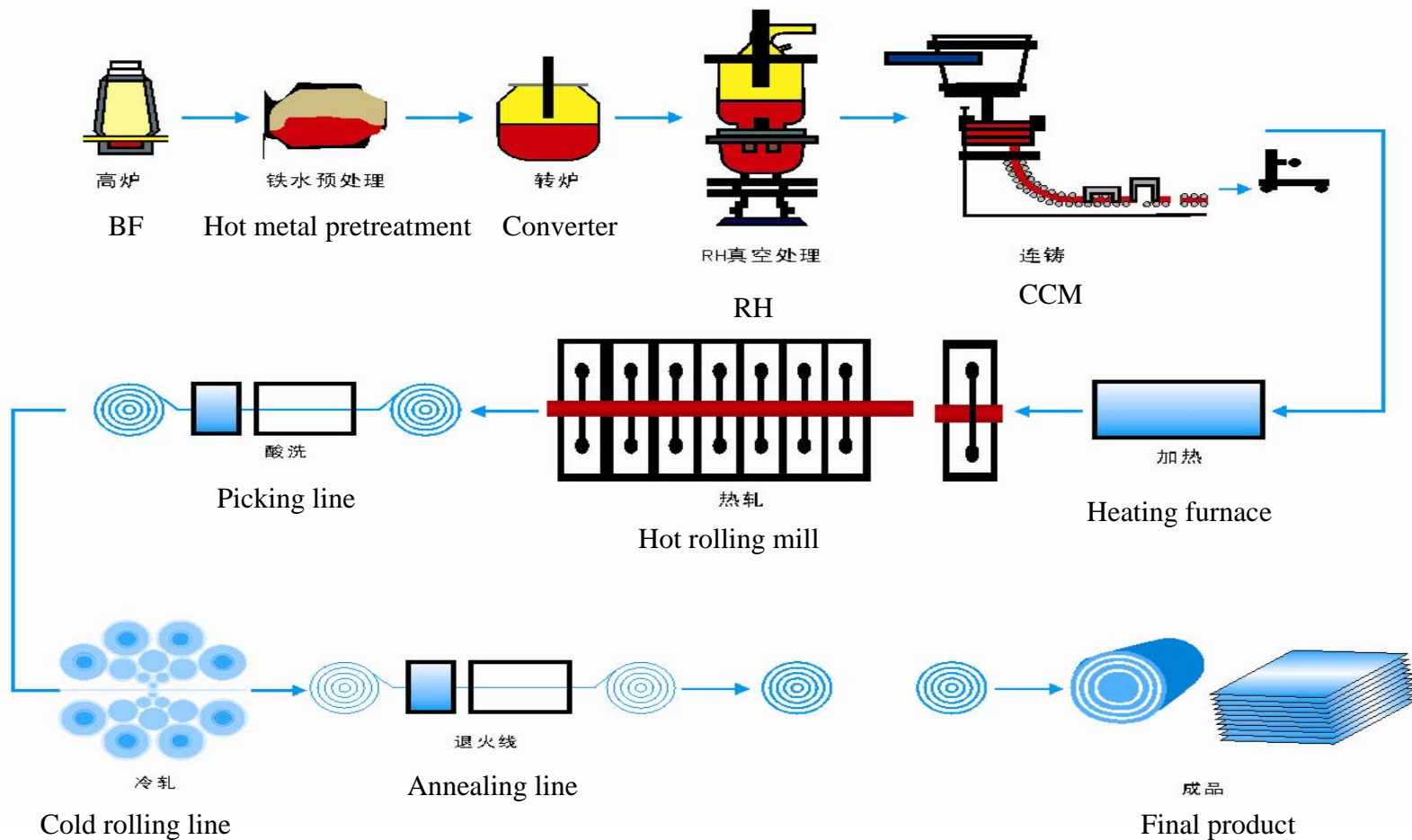
**1960`s** Tisco developed the cold rolled grain oriented silicon steel production technology of its own proprietary and put it in use for producing in batch of both grain oriented and non-grain oriented silicon steel product.

**1997** Without importing any patent technology, Tisco developed the Mid-Low cold-rolled NGO process and made many technology innovations

**2005** Tisco developed many H grade product such as 50TW350-50TW250 and 35TW360-35TW210

**From now on** Tisco has all series products of 50/35/65, covering all use of customer, and ranks the domestic first in marked for 5 years since 2007.

## ● Introduction of Process



● Specification and Tolerance

Unit: mm、ton

Grade	Inner dia	Outer dia	Width	Camber	Vertical	Coil weight
50TW250-800	510	810-1150	1000-1200	$\leq 0.01$	$\leq 0.005$	$\leq 5$
35TW230-550	510	810-1150	1000-1200	$\leq 0.01$	$\leq 0.005$	$\leq 5$

**Explain: 1. Provide suitable product as customer`s needs**

**2. With camber tolerance 0.007mm and vertical tolerance 0.003mm**

## ● Typical Magnetic Properties

Grade	Thickness	Density	Core loss/PT (W/Kg)				Induction/B (T)	
			P1.0/50	P1.5/50	P1.0/60	P1.5/60	B2500	B5000
35TW230	0.35	7.60	0.87	2.18	1.09	2.76	1.56	1.67
35TW250	0.35	7.60	0.99	2.24	1.27	3.05	1.55	1.65
35TW270	0.35	7.65	1.02	2.42	1.30	3.11	1.56	1.65
35TW300	0.35	7.65	1.07	2.53	1.34	3.17	1.56	1.65
35TW360	0.35	7.65	1.07	2.68	1.35	3.37	1.58	1.67
35TW440	0.35	7.70	1.29	2.96	1.61	3.71	1.59	1.68
50TW250	0.50	7.60	0.96	2.32	1.24	2.95	1.56	1.66
50TW270	0.50	7.60	1.03	2.40	1.31	3.06	1.55	1.65
50TW290	0.50	7.60	1.11	2.61	1.43	3.35	1.57	1.66
50TW310	0.50	7.65	1.18	2.71	1.51	3.47	1.58	1.67
50TW350	0.50	7.65	1.19	2.74	1.52	3.50	1.59	1.68
50TW400	0.50	7.65	1.32	3.02	1.69	3.87	1.60	1.69
50TW470	0.50	7.70	1.64	3.64	2.09	4.64	1.58	1.67
50TW600	0.50	7.75	1.75	3.84	2.25	4.95	1.60	1.69
50TW800	0.50	7.80	2.37	5.11	3.02	6.54	1.62	1.70

## ● Typical Mechanical Properties

Grade	Tensile strength/MPa	Yield strength/MPa	Elongation/%	Hardness/HV	No.of bends	Lamination factor/%
35TW230	595	490	24	196	≥2	≥95
35TW250	593	481	23	196	≥2	≥95
35TW270	550	437	32	178	≥2	≥95
35TW300	534	416	34	173	≥3	≥95
35TW360	480	355	35	168	≥5	≥95
35TW440	449	290	46	134	≥5	≥95
50TW250	576	483	17	207	≥3	≥97
50TW270	610	505	27	198	≥3	≥97
50TW290	567	447	29	187	≥3	≥97
50TW310	543	429	29	184	≥5	≥97
50TW350	536	409	34	176	≥5	≥97
50TW400	490	349	37	153	≥10	≥97
50TW470	479	300	44	143	≥10	≥97
50TW600	429	265	46	122	≥10	≥97
50TW800	402	241	49	102	≥10	≥97



● **Surface Insulation Coating**

Type	Characteristic
G <sub>2</sub>	A semi-organic chromate coating, brownish green in color, have excellent corrosion resistance, heat resistance, good weld ability, can withstand stress-relief annealing. It is suitable for big and medium-sized motors, generators.
X <sub>4</sub>	A semi-organic chromium-free environment-friendly coating in grayish white color, have good sheet-punching ability, good Freon resistance, high lamination resistance. It is suitable for medium, small-sized motors, household appliances and small-sized transformer Eliron core
H <sub>5</sub>	A semi-organic chromium-free environment-friendly coating in silver gray color, have good sheet-punching ability, good Freon resistance, corrosion resistance. It is suitable for medium, small-sized motors, household appliances motors and small-sized transformer EI iron cord
Others	Provide C <sub>5</sub> 、C <sub>6</sub> thick coating as customer`s need for layer resistance and heat resistance

## ● Apply and Customer

State	Typical Customer
Generator	 中国东方电气集团有限公司 DONGFANG ELECTRIC CORPORATION  上海电气 SHANGHAI ELECTRIC  哈尔滨电气集团公司 HARBIN ELECTRIC CORPORATION  中国北车集团永济电机厂 Yongji Electric Machine Factory.CNR
Household	 Haier  美的 Midea  Embraco 恩布拉科集团  jiaxipera 加西贝拉压缩机有限公司 JIAXIPERA COMPRESSOR CO.,LTD.  GREE 格力
Big Motor	 佳木斯电机股份有限公司 JIAMUSI ELECTRIC MACHINE CO.,LTD.  XEMC 湘电股份  ABB  XEMC 湘电股份  华力集团 HUALI GROUP  上电电机 SHANGDIAN MOTOR  南阳防爆集团股份有限公司 NANYANG EXPLOSION PROTECTION GROUP CO.,LTD
Small motor	 JOHNSON ELECTRIC  HBMOTOR 河北电机  SIEMENS  信质电机股份有限公司 Xinzhong Motor Co.,Ltd.

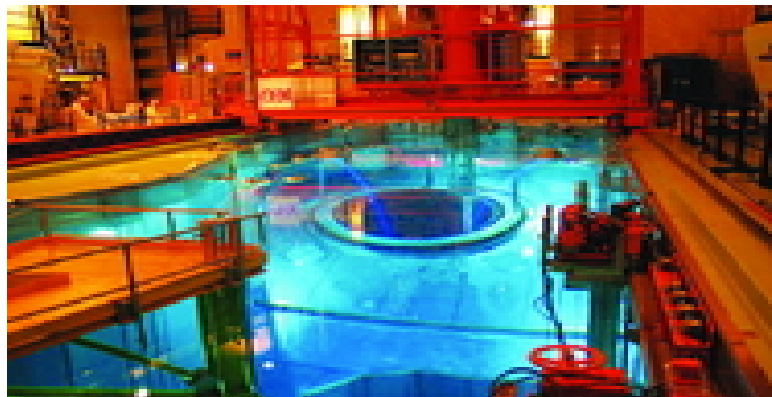
● Major projects



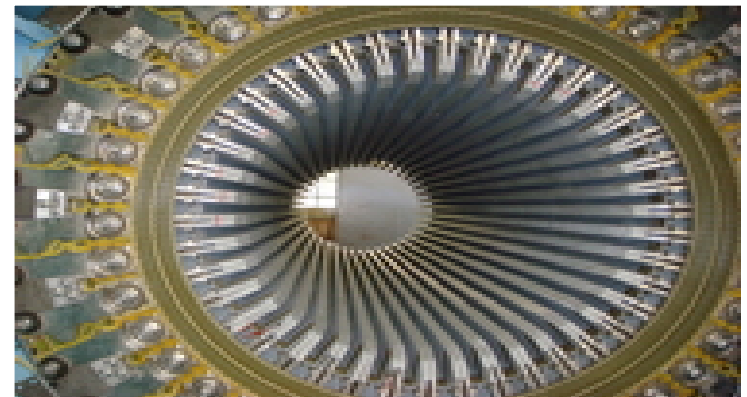
300 thousands pumped storage units in Pushi river



1 million kw Nuclear power units in Ningde



1 million kw Thermal power



600 thousands Steam unit

### ● Brief introduction

➤ 1 million tons of cold rolled silicon steel project aim at Mid-Low grade cold silicon steel and will be finished in April 2014.

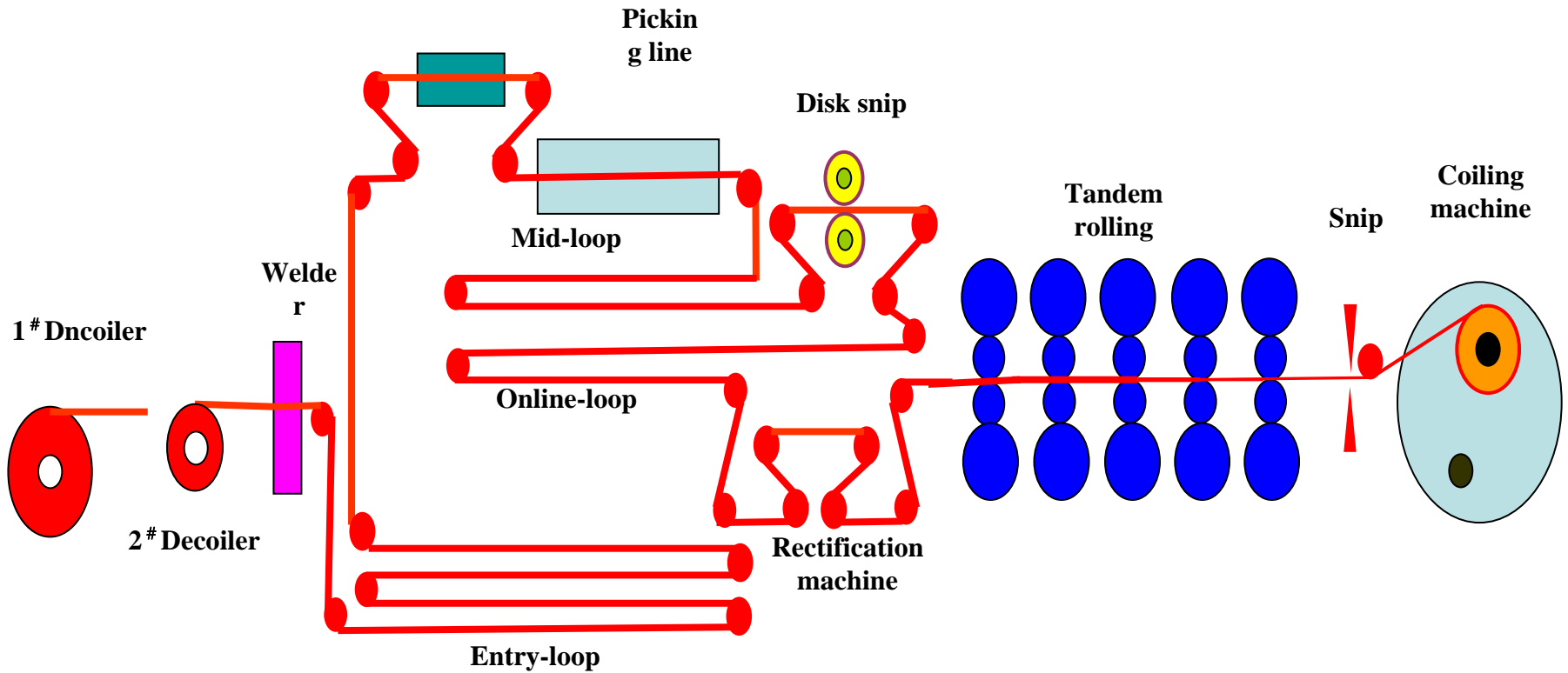
➤ Project including: Pickling mill unit ×1	1 million tons per year
Continuous annealing line ×4	0.25million tons per year
Recoiler unit ×4	0.25million tons per year
Automatic packaging units ×2	0.5million tons per year

➤ Advanced project: Acid mill with the most advanced machine and horizontal roller etc technology, Tisco can provide more excellent products with less tolerance.

➤ Continuous annealing line is adopted the most advanced pulse temperature control technology, and strip floating device is added, so as to make the electromagnetic properties and the strip surface more excellent;

➤ Packaging units have the ability to split and provide best width and length product to customer

## ● Process flow of Acid mill



Stand together through storm and stress,  
Win-win and develop together!

