



TPGP中正活芯爐排片
TPGP Bulk Boiler Chain Grate

共享科技 體驗完美 貴於品質 恆於服務
Sharing Perfection Quality Service

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I. ZIBCO TPGP Introduction



1.Feature

Large air vent	Enable fuels to be used completely, In line with the requirements of energy saving and carbon reduction.
Multiple sizes	With different kinds of sizes 200 、 220 、 240 can be used on different types of boilers .
Strong material	Nodular cast iron, FCD450 level, strong, abrasion resistance.

2.Quality Inspection

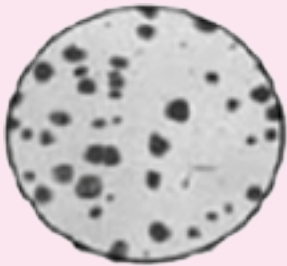
Matching with America ASTM A536 GR. 65-45-12 & ASTM A395 GR. 65-45-15. TPGP has went through German import CE testing machine, Swiss import spectrometer, Universal testing machine, Nodularity metallographic analysis instrument, Load compression testing equipment, Hardness testing equipment, Portable ultrasonic instrument, the quality is very reliable, it is entrusted by numerous of companies from home and abroad.

3.Material Introduction

Nodular cast iron is extremely suitable for manufacturing mechanical products; its strength is similar to malleable iron and grey cast iron and even stronger. So nowadays a lot of mechanical products materials are replaced by Nodular case iron.

The hardness is come from graphite crystal when it turns into ball shape it will become incredible hard, its tensile strength and yield strength are better than other general casting.

TPGP Boiler Chain Grate has gone through varies mechanical tests and its mechanical properties such as CE, Hardness, Tensile strength, Yield strength and Elongation are all in matching with ASTM A536 Gr.65-45-12, ASTM A395 Gr.65-45-15 and FCD450 standards.



Component analysis table

Chemical Composition*	Lower Limit	Upper Limit
C · %	3.0	3.5
Si · %	2.0	2.5
Mn · %	0.2	0.35
P · %		0.03
S · %		0.02
Mg · %	0.03	0.03
Cr · %		0.37
Physical properties		
Tensile strength · Psi (MPa)	65,000 (448)	---
Yield strength · Psi (MPa)	51,000 (352)	---
Elongation · %	12	---

*ASTM A536 ; FCD450 does not require chemical composition this table is for reference only.

II. Process inspection equipment and materials elemental analysis

Comparison Chart On Various Materials

	ASTM	Tensile strength (Lowest limit) Psi (Mpa)	Yield strength (Lowest limit) Psi (Mpa)	Elongation 2" · %
Nodular cast iron Castings	A536:Gr. 65-45-12	65,000 (448)	45,000 (310)	12
Nodular cast iron Castings	A395:Gr. 65-45-15	65,000 (448)	45,000 (310)	15
Forged steel	A105	70,000 (485)	40,000 (250)	20
Cast Carbon Steel	A216:WCB	70,000 (485)	36,000 (205)	22
Carbon steel pipe	A53:Gr. B	60,000 (415)	35,000 (240)	(29.5)
Malleable Iron Castings	A47:Gr. 32510	51,000 (345)	32,000 (224)	10
Gray iron castings	A126:Gr. B	31,000 (214)	not specified	not specified

TPGP Top-In Boiler Chain Grate has met with the following standards ASTM A536: Gr. 65-45-12, FCD450



1.CE Testing Machine

This CE Testing Machine is imported from Germany and we test our chain grate to study its CE value and make sure the specifications is matching the FCD450 standard.



2. Spectrometer

This spectrometer is imported from Swiss, it can analysis 14 kinds of different metallic chemical elements within minutes.

III. Product analysis and various destructive testing



1. Universal Testing Machine

This testing equipment is controlled by computer and it can test tensile strength, yield strength, elongation and other specifications.



2. Nodularity Metallographic Analysis Instrument

This full auto computerized equipment can test the physical properties and nodularities accurately.



3. Load compression testing equipment.

This equipment can test the bending strength and loading strength of the product.

IV. Product analysis with non-destructive testing



1. Hardness testing equipment

Using portable microcomputer infrared hardness tester, and matching with the international testing standard.



2. Portable Ultrasonic Instrument

This instrument can test the thickness & hardness of the product to 180mm, the hardness scales can be HL/HBW/HS/HV/HRC.

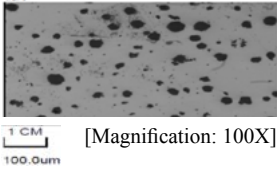
V.Metallographic Analysis Report

VI.Elemental & Mechanical Analysis

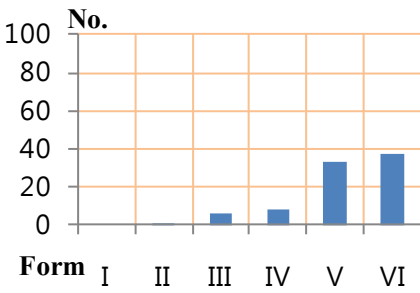
Analysis Result

Field	Nodule Count (15um)	Total counts mm²	Max D (um)	Min D (um)	Avg. D (um)	Avg. Spheroid	Nodularity (%)
1	85	122.4	73.7	11.8	32.8	67.8	82.4
2	94	135.3	69.1	10.8	33.8	72.6	87.2
3	110	158.4	78.7	10.7	35.6	71.4	86.4
4	92	132.4	77.6	10.6	34.7	73.1	93.5
5	96	138.2	101.0	10.7	33.8	74.6	88.5
Weighted Average	95	137.3	80.0	10.9	34.1	71.9	87.6
Remark	---						

View-1



Nodular Graph Data X 100, mm						
Total Nodule	85					
Sizes	25-50	12-25	6-12	3-6	1.5-3	<1.5
Class	3	4	5	6	7	8
Counts	0	0	0	17	68	0
Form	I	II	III	IV	V	VI
Counts	0	1	6	8	33	37



Elemental & Mechanical Analysis

Project	Component Analysis						Remarks
Standard Values	C	Si	Mn	P	S	Mg	
	2.50 MIN	2.70 MAX	0.40 MAX	0.08 MAX	0.02 MAX	0.09 MAX	
Measured values	3.50	2.38	0.25	0.073	0.006	0.037	

Project	Mechanical properties				Remarks
Standard Values	Tensile Strength Kgf/mm²	Yield strength Kgf/mm²	Elongation (%)	Hardness (HB)	
	46 MIN	29 MIN	10 MIN	170~ MAX	
Measured values	53	33	14	158	

Project	Nodularity		Remarks
Standard Values	80%↑	Nodularity Photo 	
Measured values	88%		

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VII. Taiwn & China Chain Grate Element Analysis

Taiwan Active Chain Grate VS China Active Chain Grate



(Fe-99%, Mn-0.49%)



(Pb, Nb, Zr, Zn, Co, Fe, Mn)

Taiwan 240mm Passive Chain Grate



(Fe-99.3%, Mn-0.16%, Cu-0.11%, Cr-0.03%)



(Fe-98.3%, Mn-0.4%, Cr-0.07%, Co-0.3%, Mo-0.007%)

Taiwan 20mm Passive Chain Grate



(Fe-99.39%, Mn-0.16%, Cu-0.11%, Cr-0.03%)



(Fe-98.39%, Mn-0.49%, Cu-0.45%, Cr-0.03%)

VIII. Other types of Chain grate

Has numerous of pieces the linking parts are easily stuck / each pieces is lacking of thickness and easy to break down.



This type chain grates are too thin and was impacted by the fuel and caused all kinds of damages.



This brand has insufficient rotation speed it lead to smoldering and cause chain grate deform, in addition it lead to insufficient air pressure.



This brand the plugging part is not thick enough which can deform easily and cause insufficient air vent, in addition the fuels will not be able to burn completely.



Large air outlet~ fuels can be completely burned

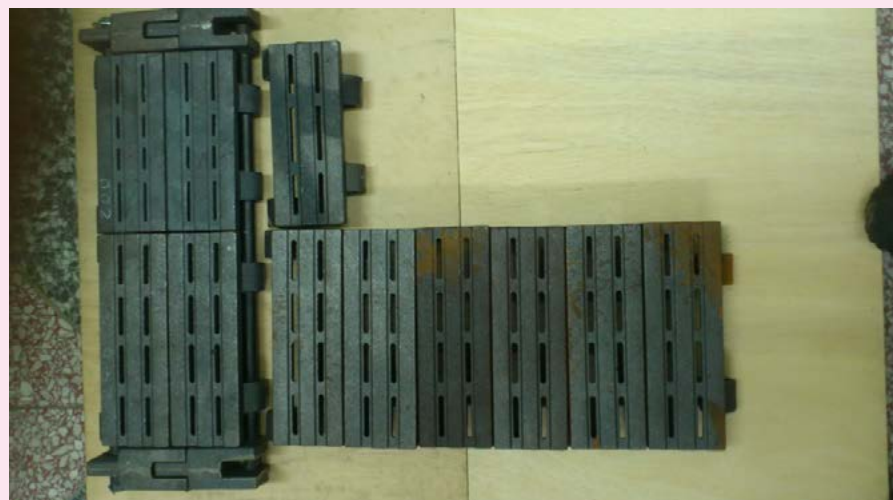


Strong, durable FCD450 chain grate

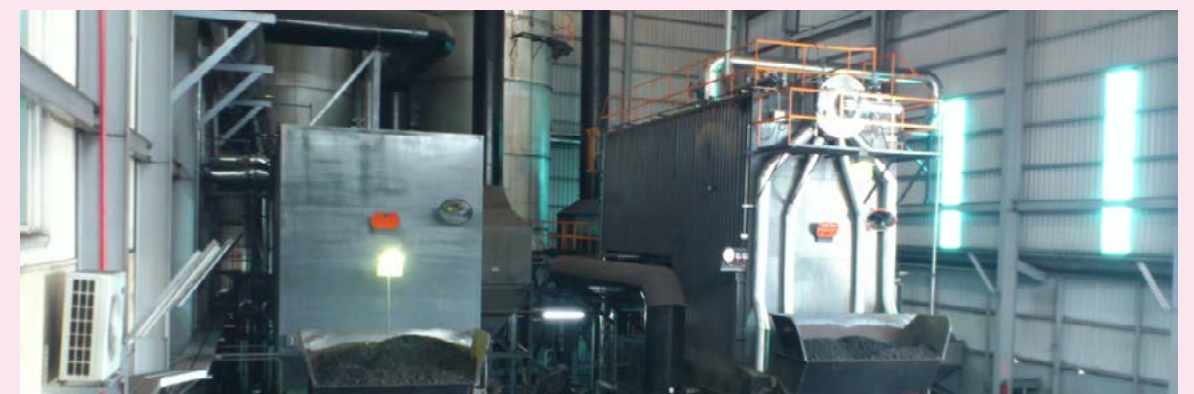


TPGP has multiple different sizes to suit all kinds of boilers

TPGP200 、 220 、 240



TPGP has been trusted by numerous of factories





中正鍋爐
ZOZEN BOILER

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