Desulfurization Gypsum Production Line

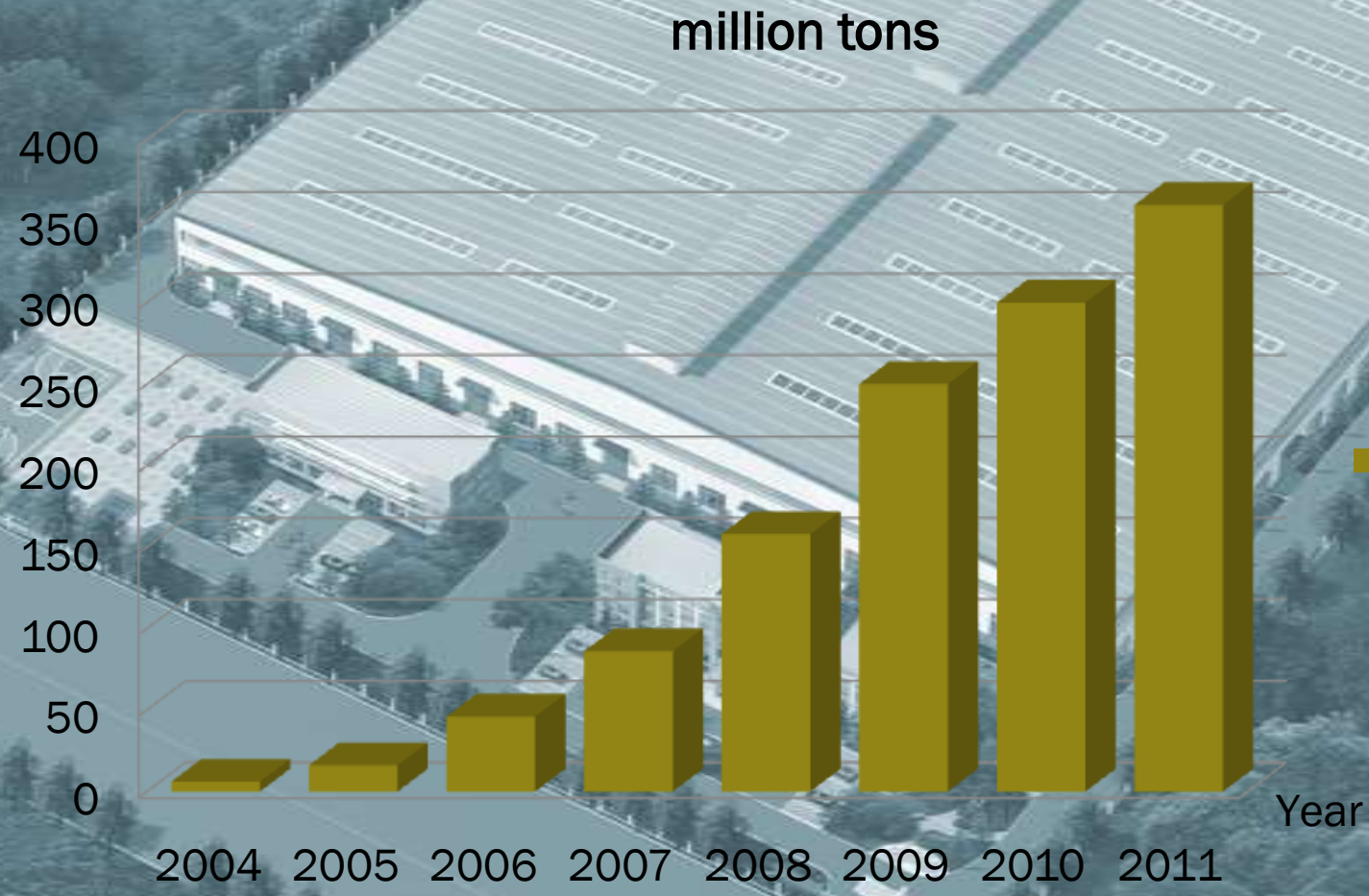
Tai'an Huisen Mechanical and Electrical Technology Co., LTD

2011

The Process of Desulfurization Gypsum Production Line of Our Company

- Our technicians started to research the phosphogypsum treatment process and equipments since 2002. In 2003, it was put into application and production in Shandong Jinxin Corporation. In 2004, the first Phosphogypsum Production Line with capacity of 1.5 million tons was launched and in 2005, it succeeded in producing materials for the company's 15 million square meters gypsum board production line.
- After the year of 2005, we provided phosphogypsum production lines in succession to Sichuan Gaoyu Chemical Industry Company with capacity of 200,000 tons, Guizhou Hongfu Industrial Group with capacity of 50,000 tons and 500,000m^2 gypsum block, Hebei Shenzhou Company with capacity of 100,000 tons and Henan Sanxing Company with capacity of 100,000 tons, which accumulated a wealth of experience at phosphogypsum's treatment and construction.
- Moreover, we also got distinctive achievement in the comprehensive utilization of desulfurization gypsum for electric power system. Companies that have installed our desulfurization gypsum production line include Huaneng Yangluo Power Plant, Huaneng Changxing Power Plant, Huhehaote Power Plant, Huadian Weifang Power Plant, Datang Longgang Power Plant, Datang Huayu Power Plant, Huaneng Shidongkou the First Power Plant, Huaneng Daba Power Plant and so on.
- At the end of June, 2011, the capacity of projects that contracted by our company has broken through 3.7 million tons, which made contribution for the treatment and reutilization of industrial by-product gypsum in China.

Total Handling Capacity of Chemical Gypsum Contracted by Our Company



Current Desulfurization Gypsum Treatment Process in Domestic

The processing of chemical gypsum treatment has just started in China. There are various phosphogypsum calcining methods and three methods are highlighted at present as follows: the first one is high-temperature airflow flash burning method fueled by heavy oil. This method has the merits of occupying small area, advanced technology and high degree of automation. But judging from the experience of Guohua Jiedi Company, it also has the disadvantages of high consumption, high costing and low yield. However, due to the limitation of current fuel thermal technology as well as capital, it is difficult to form the product serialization. A successful application of this is Beijing Guohua Jiedi's production line with capacity of 30, 000 tons building gypsum (Introduced by German Salzgitter Corporation, has not reached designed capacity). The second one is high-temperature airflow flash burn method fueled by coal, which has the obvious advantages of low consumption and occupying small area, but it also has congenital disadvantages of pollution, uncontrollable quality and unstable ingredient of finished products. At present, there is not a successful case in China. Some colleges have been setting about studying on this aspect. The third method is a comparatively mature one, which is called as drying and calcining two-step approach in building gypsum. This method has the merits of low consumption, simple process, stable quality and easy operation, but it also has the defect as occupying comparatively larger area than the above two. At present, the process have been put into application in many companies, including Qinhuangdao Line, Jingmen Line, Taihe 401 Line of Taihe Group, and Huachun Line, Gaoyu Line, Hongfu Line and Tianzhu Line of Nanchang.

Desulfurization Gypsum Treatment Process—Preview

* Based on a massive successful cases and abundant theoretical knowledge of our technicians in gypsum field and by integrating the characteristic of chemical industry, power industry and building material industry, etc. in domestic, we can provide various processes and equipments for different customers, and design perfect process project .
* Relying on our professional technicians and the operability of our equipments, we can also provide our customers different technological formula to satisfy the requirements of different terminal products like gypsum boards, gypsum blocks, stucco gypsum, glue plaster, filleting gypsum and so on.
* For the electric power enterprise, owning resources of superheated, achieves energy conservation, environmental protection, cyclic utilization and many other advantages by using superheated steam as fuel. Our company owns dozens of projects using steam as heat resource with capacity from 30,000 tons to 100,000 tons, adopting calcining, drying, returning material method and many other production process, spreading in a vast region from Heilong River to Yangtze River.

Desulfurization Gypsum Treatment Process—Process Selection

- On the basis of different capacities and user, we prepare two kinds of production process for our customers.
- The first is one-step production process which is based on boiling kiln. This process make use of our mature boiling kiln as the calcining facility and apply the principle of strong water absorption of semi-hydrated gypsum to absorb the free water of phosphogypsum by returning conveyor, which makes clammy material harder to agglomerate. This process has the advantages of simple equipments, small occupied area and low investment, but it has not been applied yet to production line with capacity above 100, 000 tons.
- The second is drying and calcining two-step process, which also adopts boiling kiln as the calcining facility. The drying equipment is selected upon heat resources. This process has the advantages of stable running and reliable quality, but it will need more investment in small scaled production line and cost performance is also very low.
- Both of the above production processes have a wide selecting range of heat resources, like coal, natural gas, diesel oil, heavy oil and so on. Steam is also a good choice for customers of power plants.

Desulfurization Gypsum Treatment Process—Process of Modified Mill

* Limited by its generative mechanism, desulfurization gypsum has a birth defect of small specific surface and irrational graduation. The specific surface of desulfurization gypsum is only 1500 cm^2/g, which accounts for 40~60% of the surface of natural gypsum. Its granules are evenly and narrowly dispersed with space between 40~60 μm, of which the graduation is far below milled natural gypsum. Due to above reasons, after adding water, the rheological behavior of desulfurization gypsum is not so good, the problem of particle segregation and stratification is serious and the volume-weight of its products is much higher. If gypsum board is made of this kind of gypsum, on one hand it is hard to control the flow, transmission and feeding performance of its dry powder hardly controlled, on the other hand it is easy to cause the problem of uneven strength and volume-weight of the board. Meanwhile, because of the cementation problem of board core and facial paper, it becomes difficult to operate with poor workability and water absorption when it is used as stucco gypsum.
* Therefore, we add modified milling process in order to improve its graduation, widen its granules and solve the problem said above. But the phase composition of milled gypsum will not change and the strength index of building gypsum depends largely on its phase composition , so the strength will not increase.

Desulfurization Gypsum Treatment Process— Process of Modified Mill

Diagram below shows composition and process data of desulfurization gypsum powder before and after its milling in comparison with natural gypsum powder：

Item	Building Gypsum Made of Phosphogypsum		Natural Gypsum Powder
	Before Milling	After Milling	
Dehydrate Gypsum（%）	4	4	2
Semi-hydrate Gypsum (%)	84	84	80
Anhydrous Gypsum Ⅲ(%)	4	4	5
Anhydrous Gypsum Ⅱ(%)	5	5	3
Specific Surface (Blaine Method cm^2/g)	1600	4700	4300
Bulk Density (g/l)	1100	900	900
Water/Gypsum Ratio	0.65	0.72	0.68

Processing Equipment of Desulfurization Gypsum Production Line—Appearance of the workshop

Processing Equipment of Desulfurization Gypsum Production Line—Feeding Machine

Processing Equipment of Desulfurization Gypsum Production Line—Steam Dryer

Processing Equipment of Desulfurization Gypsum Production Line—Calciner

Processing Equipment of Desulfurization Gypsum Production Line—Dedusting Machine

Processing Equipment of Desulfurization Gypsum Production Line–Modified Mill

Processing Equipment of Desulfurization Gypsum Production Line-- Pneumatic Conveying Equipment and Storage Equipment

Our Service

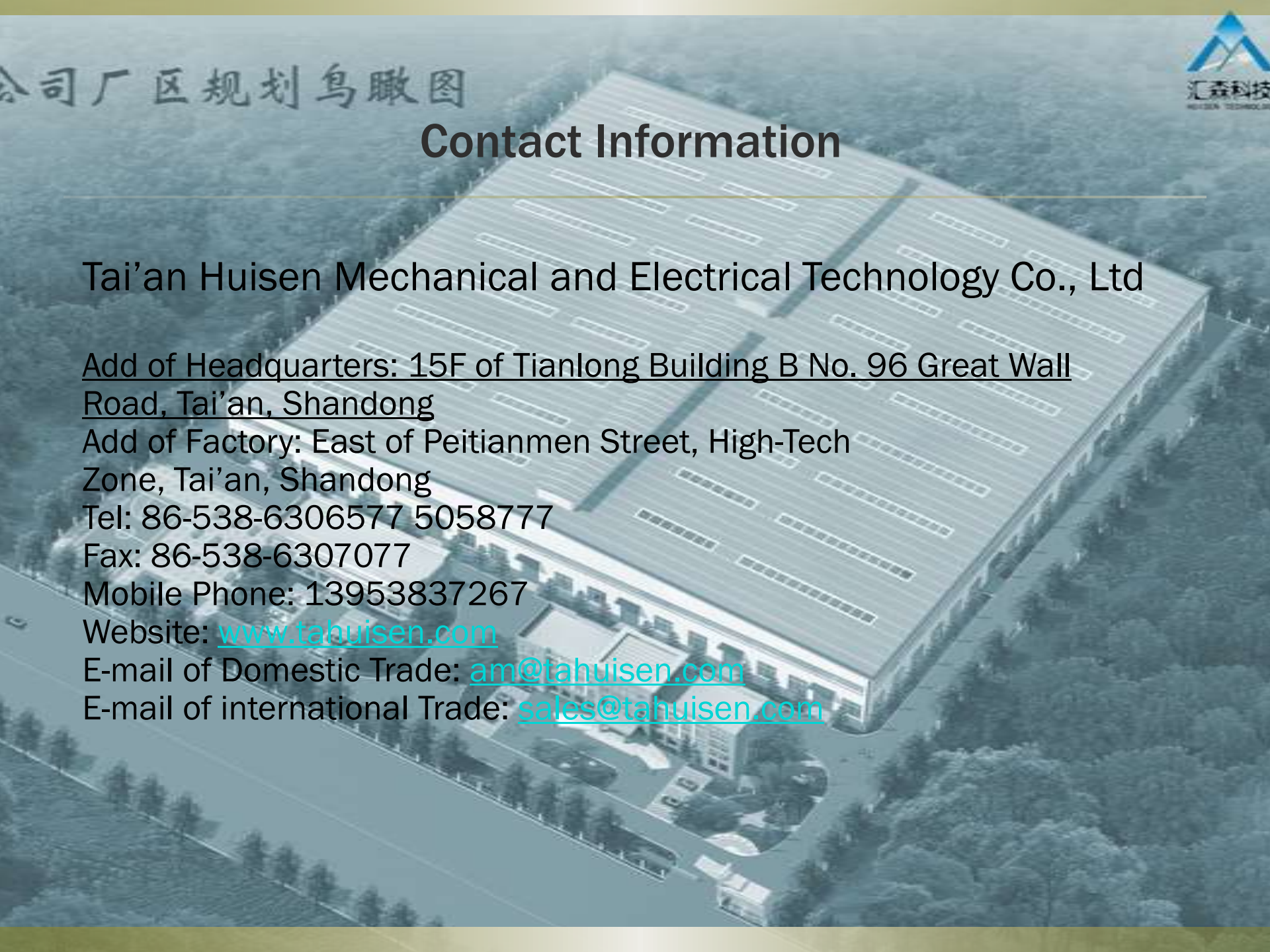
- We can offer a basket of services of design, producing, installation, commissioning and training, as well as turnkey project for customers.
- With a strong design team as the basis, we can supply equipments and production line with different configuration which are tailored to customers' requirements. We guarantee whole-life service for our equipments.
- We have a well-equipped laboratory which can assay raw material for our customers, and according to the test results, we can realize the finally debugging which reduced the cost for preliminary investigation and commissioning.

Parts of Our Customers

NO	CUSTOMER NAME	CAPACITY	DATE	FUEL
1	Columbia Paneltec S.A	10 million ㎡/year	2008	Natural gas
2	Mexico Gypsopanel Industries S.A. D.E C.V	20 million ㎡/year	2009	Natural gas
3	USA Serious Materials Inc.	4 million ㎡/year	2009	Natural gas
4	ITALY Gessi del Lago d'Iseo Spa	20 million ㎡/year	2008	Natural gas
5	China Nanchang Huachun Group	15 million ㎡/year	2008	Natural gas
6	China Shandong Jinxin Group -- Pingyi	10 million ㎡/year	2006	Coal
7	China Shandong Jinxin Group -- Guangan	10 million ㎡/year	2007	Coal
8	China Shandong Jinxin Group -- Inner Mongolia	10 million ㎡/year	2008	Coal
9	Indonesia	6 million ㎡/year	2008	Natural gas
10	China Hubei Honglin Building Material Co., Ltd	10 million ㎡/year	2010	Coal

Parts of Our Customers

NO	CUSTOMER NAME	CAPACITY	DATE	FUEL
12	China Hunan Building Material Co., Ltd	150,000 T/Y	2008	Coal
13	China Huaneng International – Yangluo Power plant	100,000 T/Y	2008	Steam
14	China Huaneng International – Shanghai Shi Dongkou Power plant	100,000 T/Y	2010	Steam
15	China Huaneng International – Ningxia Daba Power plant	100,000 T/Y	2010	Steam
16	China Huaneng International – Changxing Power plant	50,000 T/Y	2008	Coal
17	China Datang International – Huayu Power plant	150,000 T/Y	2009	Steam
18	China Datang International – XuChang Power plant	150,000 T/Y	2010	Steam
19	China Tianjin Tianzhu Building Material Co., Ltd	50,000 T/Y	2007	Coal
20	China Qingdao Huatuo Co., Ltd	50,000 T/Y	2008	Steam
21	China YuZhou GuanDa Building Material Co., Ltd	150,000 T/Y	2008	Coal
22	China Suzhou Taiyuan Building Material Co., Ltd	50,000 T/Y	2009	Coal
23	China Datang International – Liaoning Power plant	50,000 T/Y	2009	Coal



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