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Headline

Due to plant suspension caused by the Chinese New Year, the TiO2 imports and exports of China suffered decline in Feb. 2014 compared with that in Jan.

In Apr. 2014, China's TiO2 and titanium slag prices continued to decline slightly due to the depressing demand, while the prices of titanium concentrate ore remained unchanged. It is disclosed that in May 2014, the TiO2 prices will still stay at low levels.

The current situation of China's TiO2 industry is growing increasingly tense: the fluctuating prices together with the overcapacity of low-end products result in a chaotic market, putting innovation and changes on the agenda for players in this industry. Only who makes right decisions and timely responses can he survive in this crisis.

Many chlorination TiO2 projects are facing difficulties due to financial and technical problems.

In view of the environmental and cost pressure on TiO2 manufacturers, the national NOx emissions standards and the current domestic denitration TiO2 production capacity being unable to meet the domestic demand, denitration TiO2 is believed to be the wave of the future.

Since 2014, TiO2 enterprises have been trying to promote business development under the downturn of TiO2 market.

In 2013, Pangang Group suffered huge losses and defined that it would rely on vanadium and titanium instead of iron and steel for development.

Since 2014, due to generous profits and poor supervision, the coating industry has set off a storm of fraud: Nippon, Dulux, Sankeshu and other coating brands were counterfeited.

Over recent years, the promulgation and implementation of national policies have brought development opportunities to coatings manufacturers. However, these manufacturers have also faced challenges resulting from the upgrading and transformation of the industry.
Editor's Note

In Apr. 2014, due to the downturn of downstream demand, TiO$_2$ prices continued to fall, while titanium slag prices saw decline slightly. Additionally, the imports and exports of TiO$_2$ in Feb. also saw decline compared with that in Jan. In this economic downturn of TiO$_2$ market, many TiO$_2$ enterprises suffered from profit losses, so they had to take various measures to improve their businesses, such as implementing the co-generation technological reform of TiO$_2$ and expanding international market.

Moreover, CCM focused on the TiO$_2$ industry transformation and upgrading as well as inferior products:

1. Due to environmental pressures, market demand and other factors, TiO$_2$ industry encountered the transformation and upgrading. Although the technologies need to be improved, the overall development of denitration TiO$_2$ and chlorination TiO$_2$ were the general trend.

2. The new urbanization construction will bring new development for the coating industry. However, in order to regulate the market development, enterprises and government must improve the quality of the coating and pay attention to anti-counterfeiting activities to cope with the inferior coating products. CCM will continue to follow up on the development trend of the domestic TiO$_2$ industry.

The RMB/USD exchange rate in this issue is USD1.00=RMB6.1503 on 1 Apr., 2014, sourced from the People's Bank of China, except for the price updates on 18 Apr. 2014 (USD1.00=USD6.1586). All the prices mentioned in this newsletter include the VAT unless otherwise specified. If there is any specific topic you would like us to cover or any subjects you would like us to investigate.
Market Dynamics

China's TiO2 imports and exports see declines in Feb. 2014

Summary: Due to plant suspension caused by the Chinese New Year, the TiO$_2$ imports and exports of China suffered decline in Feb. 2014 compared with that in Jan.

In Feb. 2014 China's imports and exports of TiO$_2$ declined to a certain extent with prices unchanged.

Imports

In Feb. 2014, China's imports of TiO$_2$ witnessed large fluctuations, which reduced by 29.16% month on month from 19,073 tonnes in Jan. to 14,358 tonnes in Feb. The reason is that the major downstream domestic manufacturers have entered the peak period of stocking by the end of Jan. The TiO$_2$ import price remained low in Feb. at USD2,848/t, down 0.27% month on month.

Exports

Similarly, in Feb. 2014, TiO$_2$ exports were 35,767 tonnes, obviously down 27.69% month on month. Although the domestic price of TiO$_2$ continuously decreased in Feb., export price still remained at USD2,120/t without changes from last month. Faced with the downturn of domestic TiO$_2$, manufacturers turned to export and hoped to enhance their export competitiveness by optimizing the export structure, which changed the product structure of TiO$_2$ export: export ratio of rutile is rising, and export ratio between anatase and rutile up from 1:5 in Jan. to 1:10 in Feb. This trend is expected to continue in the following months.

Figure 1: Import and Export of TiO2 in China, Feb. 2013- Feb. 2014

Source: China Customs & CCM

Changes in importers

In Feb. 2014, total imports of China's top 20 TiO$_2$ importers reached 10,952 tonnes, accounting for 76.28% of the total imports, remained unchanged from last month. Of this, the biggest importer Shanghai Hyzone Link Imp & Exp Co., Ltd. imported 3,936 tonnes of TiO$_2$ directly from E. I. du Pont de Nemours and Company (DuPont).
Changes in import origins

Although imports of TiO$_2$ from Australia to China has increased enormously, up 114.61% month on month, imports in Feb. is still greatly reduced due to the following reasons.

One reason is that the imports from the US (a major import origin) was down 50.69% month on month; the other reason is that some manufacturers used to purchase TiO$_2$ from Mexico in Jan., stopped purchasing cost-effective TiO$_2$ from Mexico to China in Feb.

Changes in major TiO$_2$ exporters to China

As a whole, the exports of top three manufacturers accounted for 71.16% of the total exports and remained unchanged. But the ranks (by volume) in Feb. 2014 changed. DuPont and Ishihara Sangyo Kaisha, Ltd. (ISK) continued to maintain the position of top three. As Shanghai Sanchang Import and Export Co., Ltd. purchased 1,260 tonnes of TiO$_2$ from Saudi Arabia-based Cristal Global, Cristal Global jumped to the second place.

Changes in TiO$_2$ price of top 5 TiO$_2$ exporters to China

The TiO$_2$ prices of top five exporters to China, didn't change and stayed at USD2, 766/t. However, Australia-based Tronox's unit price fell by 4.52% compared with that in Jan.
Figure 3: Market shares of world's top three TiO2 producers in Chinese market by volume, Feb. 2013-Feb. 2014

Source: China Customs & CCM

Figure 4: Import prices of TiO2 from world's top five TiO2 producers, Feb. 2013-Feb. 2014

Source: China Customs & CCM
Table 1: Average import price of TiO₂ from world’s top five TiO₂ producers, Jan. 2014 & Feb. 2014, USD/t

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DuPont</td>
<td>2,551</td>
<td>2,675</td>
<td>4.85%</td>
</tr>
<tr>
<td>Cristal Global</td>
<td>2,598</td>
<td>2,737</td>
<td>5.33%</td>
</tr>
<tr>
<td>ISK</td>
<td>3,287</td>
<td>3,263</td>
<td>-0.73%</td>
</tr>
<tr>
<td>Huntsman</td>
<td>2,966</td>
<td>2,894</td>
<td>-2.43%</td>
</tr>
<tr>
<td>Tronox</td>
<td>2,565</td>
<td>2,449</td>
<td>-4.52%</td>
</tr>
<tr>
<td>Average</td>
<td>2,785</td>
<td>2,766</td>
<td>-0.70%</td>
</tr>
</tbody>
</table>

Note: Huntsman refers to America-based company

Source: China Customs & CCM

In Feb. 2014, domestic exporters exported 24,616 tonnes of TiO₂, accounting for 68.82% of total exports. Among them, export volume of Henan Billions Chemicals Co., Ltd. reached 6,577 tonnes, ranking first; export volume of Sichuan Lomon Titanium Co., Ltd. reached 5,997 tonnes. Both of them accounted for 19.4% of country's total export volume in Feb.

However, the average export price of the main exporters of domestic TiO₂ continued to decline in five months especially in Feb. 2014, down to USD2, 150/t. Of this, Wuxi HaoPu Titanium Co., Ltd. witnessed the largest decline, down 3.71% month on month. One thing should be noticed is that the overall export price movements and general trend of Shenyang Orient Titanium Co., Ltd. remained unchanged, but its export price increased to USD2,244/t this month due to the higher purchasing price of Iran (USD2, 793/t).

Regarding the export destinations by volume, China exported 14,434 tonnes to Asia-Pacific, 5,836 tonnes to the Middle East, 5,104 tonnes to Europe, 4,928 tonne to South America, 3,826 tonnes to North America, and 1,638 tonnes to Africa. It is noteworthy that, thanks to Ethiopia’s imports (Jan. only 33 tonnes, but 406 tonnes in Feb., recording the highest volume), Africa accounted for 4.58% of China’s total exports in Feb. 2014, which reached over 4% again after 4.78% in December.

Figure 5: Export prices of TiO₂ of top five Chinese TiO₂ exporters, Feb. 2013-Feb. 2014

Source: China Customs & CCM

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E-mail: econtact@cnchemicals.com
### Table 2: Average export prices of TiO2 of top five Chinese TiO2 exporters, Jan. 2014 & Feb. 2014, USD/t

<table>
<thead>
<tr>
<th>Company</th>
<th>Jan. 14</th>
<th>Feb. 14</th>
<th>Month-on-month change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sichuan Lomon Titanium Co., Ltd.</td>
<td>2,154</td>
<td>2,117</td>
<td>-1.72%</td>
</tr>
<tr>
<td>Henan Billions Chemical Co., Ltd.</td>
<td>2,158</td>
<td>2,099</td>
<td>-2.73%</td>
</tr>
<tr>
<td>Shandong Doguide Group Co., Ltd.</td>
<td>2,229</td>
<td>2,187</td>
<td>-1.88%</td>
</tr>
<tr>
<td>Wuxi HaoPu Titanium Co., Ltd.</td>
<td>2,184</td>
<td>2,103</td>
<td>-3.71%</td>
</tr>
<tr>
<td>Shenyang Orient Titanium Co., Ltd.</td>
<td>2,192</td>
<td>2,244</td>
<td>2.37%</td>
</tr>
<tr>
<td>Average</td>
<td>2,183</td>
<td>2,150</td>
<td>-1.53%</td>
</tr>
</tbody>
</table>

*Source: China Customs & CCM*

![Figure 6: Export volumes of China's TiO2 by destination, Feb. 2013-Feb. 2014](source)

*Source: China Customs & CCM*
In Feb. 2014, affected by the Spring Festival, China’s total domestic demand for titanium feedstock was only 395,150 tonnes, down 12% month on month. The titanium imports declined to 30.4% of the total domestic titanium; imports was 120,150 tonnes, down 35% month on month. At the same time, domestic output of titanium concentrate ore was 275,000 tonnes, up 4.96% month on month.

Overall, the reason for imports decline in Feb. is that the domestic manufacturers concentrated on stocking before the Chinese New Year. In addition, influenced by the downturn of Chinese TiO$_2$ market, the domestic TiO$_2$ manufacturers and international titanium concentrate ore suppliers continuously forced down the prices, decreasing the prices of titanium feedstock (average import price recorded at USD207/t in Feb.) and reducing the traditional titanium producing countries’ enthusiasm to export to China. Furthermore, according to 2013, TiO$_2$ imports showed cyclical effects that the trend of the first and the third quarter was relatively weak while the trend of the second quarter and the fourth quarter was relatively strong.

Great changes for import origins in Feb. 2014. Imports of Vietnamese traditional titanium feedstock fell to 2,400 tonnes, influenced by the Chinese market downturn and domestic production restrictions (mainly caused by environmental pollution). In particular, the focus for titanium concentrate ore plant in China, especially Hainan Province is gradually transferred from Vietnam to Mozambique (signed a series of titanium resources strategic cooperation agreement with Hainan government). Mozambique’s exported titanium feedstock has been rising in recent two months, and became the first source imports in Feb. with a total of 46,176 tonnes (analysis from data of Haikou Customs, the People’s Republic of China). Australia and India, the producing areas of traditional titanium feedstock, ranked the second and third places for 18,312 tonnes and 14,752 tonnes respectively.

Chinese production of titanium concentrate ore maintained a slight rebound after the Spring Festival while the production pattern is changing: smal land medium manufacturers are considering to cut or stop the production due to the low profits, while large manufacturers are maintaining the normal operating rates due to small financial pressure. This trend will become more apparent in the future.
Figure 7: Import volume and average import price of titanium feedstock in China, Feb. 2013-Feb. 2014

Source: China Customs & CCM

Table 3: Import of titanium feedstock in China by port of entry, Jan. 2014 & Feb. 2014

<table>
<thead>
<tr>
<th>No.</th>
<th>Port</th>
<th>Volume, tonne</th>
<th>Month-on-Month change</th>
<th>Value, '000 USD</th>
<th>Month-on-Month change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Haikou</td>
<td>4,498</td>
<td>31,185</td>
<td>593.31%</td>
<td>1,252</td>
</tr>
<tr>
<td>2</td>
<td>Ningbo</td>
<td>8,232</td>
<td>23,140</td>
<td>181.10%</td>
<td>1,822</td>
</tr>
<tr>
<td>3</td>
<td>Nanning</td>
<td>47,389</td>
<td>20,022</td>
<td>-57.75%</td>
<td>9,527</td>
</tr>
<tr>
<td>4</td>
<td>Shijiazhuang</td>
<td>14,698</td>
<td>14,941</td>
<td>1.65%</td>
<td>1,554</td>
</tr>
<tr>
<td>5</td>
<td>Shenyang</td>
<td>25,525</td>
<td>14,007</td>
<td>-45.12%</td>
<td>4,460</td>
</tr>
<tr>
<td>6</td>
<td>Tianjin</td>
<td>6,212</td>
<td>4,771</td>
<td>-23.20%</td>
<td>1,184</td>
</tr>
<tr>
<td>7</td>
<td>Shantou</td>
<td>8,068</td>
<td>3,950</td>
<td>-51.04%</td>
<td>4,142</td>
</tr>
<tr>
<td>8</td>
<td>Dalian</td>
<td>14,138</td>
<td>3,206</td>
<td>-77.32%</td>
<td>2,929</td>
</tr>
<tr>
<td>9</td>
<td>Zhanjiang</td>
<td>873</td>
<td>3000</td>
<td>243.64%</td>
<td>218</td>
</tr>
<tr>
<td>10</td>
<td>Nanjing</td>
<td>12,472</td>
<td>1,624</td>
<td>-86.98%</td>
<td>2,800</td>
</tr>
<tr>
<td>11</td>
<td>Shanghai</td>
<td>104</td>
<td>211</td>
<td>102.88%</td>
<td>122</td>
</tr>
<tr>
<td>12</td>
<td>Huangpu</td>
<td>375</td>
<td>54</td>
<td>-85.60%</td>
<td>66</td>
</tr>
<tr>
<td>13</td>
<td>Qingdao</td>
<td>42,631</td>
<td>40</td>
<td>-99.91%</td>
<td>14,340</td>
</tr>
<tr>
<td>14</td>
<td>Hefei</td>
<td>0</td>
<td>0</td>
<td>/</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>Xiamen</td>
<td>0</td>
<td>0</td>
<td>/</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: China Customs & CCM
Table 4: Consumption of imported titanium feedstock in China by region, Jan. 2014 & Feb. 2014

<table>
<thead>
<tr>
<th>No.</th>
<th>Region</th>
<th>Volume, tonne (Jan. 2014)</th>
<th>Month-on-Month change</th>
<th>Value, '000 USD (Jan. 2014)</th>
<th>Month-on-Month change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hainan Province</td>
<td>4,498</td>
<td>593.31%</td>
<td>1,252</td>
<td>440.73%</td>
</tr>
<tr>
<td>2</td>
<td>Ningbo City, Zhejiang Province</td>
<td>8,024</td>
<td>187.09%</td>
<td>1,617</td>
<td>191.77%</td>
</tr>
<tr>
<td>3</td>
<td>Qinzhou City, Guangxi Zhuang Autonomous Region</td>
<td>13,187</td>
<td>21.34%</td>
<td>3,254</td>
<td>-3.63%</td>
</tr>
<tr>
<td>4</td>
<td>Tangshan City, Hebei Province</td>
<td>14,698</td>
<td>1.65%</td>
<td>1,554</td>
<td>4.70%</td>
</tr>
<tr>
<td>5</td>
<td>Fuzin City, Liaoning Province</td>
<td>0</td>
<td>/</td>
<td>0</td>
<td>2,801</td>
</tr>
<tr>
<td>6</td>
<td>Shantou City, Guangdong Province</td>
<td>8,068</td>
<td>-51.04%</td>
<td>4,142</td>
<td>-49.44%</td>
</tr>
<tr>
<td>7</td>
<td>Fangchenggang City, Guangxi Zhuang Autonomous Region</td>
<td>34,202</td>
<td>-80.14%</td>
<td>1,521</td>
<td>-59.76%</td>
</tr>
<tr>
<td>8</td>
<td>Dalian City, Liaoning Province</td>
<td>7,735</td>
<td>-257.98%</td>
<td>172</td>
<td>-258.72%</td>
</tr>
<tr>
<td>9</td>
<td>Chaoyang City, Liaoning Province</td>
<td>840</td>
<td>-61.34%</td>
<td>172</td>
<td>-61.34%</td>
</tr>
<tr>
<td>10</td>
<td>Zhenjiang City, Jiangsu Province</td>
<td>873</td>
<td>243.64%</td>
<td>218</td>
<td>166.06%</td>
</tr>
<tr>
<td>11</td>
<td>Zhenjiang City, Jiangsu Province</td>
<td>12,340</td>
<td>-86.84%</td>
<td>2,632</td>
<td>-87.35%</td>
</tr>
<tr>
<td>12</td>
<td>Binhai New District, Tianjin City</td>
<td>0</td>
<td>/</td>
<td>0</td>
<td>213</td>
</tr>
<tr>
<td>13</td>
<td>Tianjin City</td>
<td>4,684</td>
<td>-89.28%</td>
<td>655</td>
<td>-84.73%</td>
</tr>
<tr>
<td>14</td>
<td>Kunshan City, Jiangsu Province</td>
<td>391</td>
<td>-59.85%</td>
<td>429</td>
<td>-57.34%</td>
</tr>
<tr>
<td>15</td>
<td>Dandong City, Liaoning Province</td>
<td>5,275</td>
<td>-97.65%</td>
<td>1,036</td>
<td>-97.59%</td>
</tr>
<tr>
<td>16</td>
<td>Honghe City, Yunnan Province</td>
<td>0</td>
<td>/</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>17</td>
<td>Pudong District, Shanghai City</td>
<td>0</td>
<td>/</td>
<td>0</td>
<td>103</td>
</tr>
<tr>
<td>18</td>
<td>Hongqiao District, Tianjin City</td>
<td>0</td>
<td>/</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>19</td>
<td>Guangzhou City, Guangdong Province</td>
<td>0</td>
<td>/</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>20</td>
<td>Zhabei District, Shanghai City</td>
<td>0</td>
<td>/</td>
<td>0</td>
<td>53</td>
</tr>
</tbody>
</table>

Source: CCM

Figure 8: Output of titanium concentrate ore in China, Feb. 2013-Feb. 2014

Source: http://www.cnfeol.com/ & CCM
China's TiO2 prices continue to decline slightly in Apr. 2014

Summary: In Apr. 2014, China's TiO2 and titanium slag prices continued to decline slightly due to the depressing demand, while the prices of titanium concentrate ore remained unchanged. It is disclosed that in May 2014, the TiO2 prices will still stay at low levels.

In Apr. 2014, the domestic TiO2 prices continued to decline slightly. In detail, rutile TiO2 price decreased from USD2,175/t in Mar. 2014 to USD2,141/t in Apr. 2014, down 1.56% month on month. Anatase TiO2 price decreased form USD1,891/t in Mar. 2014 to USD1,870/t, in Apr. 2014, down 1.11% month on month. At the same time, the prices of titanium slag saw slight decline, while the prices of titanium concentrate ore remained unchanged.

It is disclosed that the downturn of TiO2 is attributed to the depressing demand from downstream industries. According to statistics released by National Bureau of Statistics of the People's Republic of China on 16 Apr., 2014, from Jan. to Mar. 2014, the national real estate investment reached USD249.40 billion (RMB1.53 trillion), and the increasing rate was slowed down from 19.3% (Jan.-Feb.) to 16.8% (Jan.-Mar.) with the growth rate down by 2.5 percentage points; the sales value of commodity apartments reached USD215.65 billion (RMB1.33 trillion), down 5.2% year on year; the sales areas of commodity departments declined by 3.8% year on year. The data above reflected the poor performance of the national real estate market in the first quarter and the weak domestic market demand for coatings. In addition, the demand for downstream products was lack of motivation, so the prices of TiO2 saw decline all the time. What's more, compared with late Mar., the rutile TiO2 prices of Xichang Ruikang Titanium Industry Co., Ltd., Anhui Goldstar Chemical Co., Ltd., Anhui Annada Titanium Industry Co., Ltd. (Anhui Annada), Shandong Dawn Titanium Industry Co., Ltd., Wuxi Haopu Titanium Co., Ltd., Jinan Yuxing Chemical Co., Ltd., Panzhihua Orient Titanium Industry Co., Ltd. and other companies were reduced by USD16/t - USD162/t.

Moreover, there are two reasons for the declines of titanium slag prices. First of all, due to the low prices of TiO2, most manufacturers focused on cost-saving and didn't want to purchase slag in bulk as raw material for production. Therefore, titanium slag market had no significant increases in demand, causing prices to decline. Additionally, the slow payment collection of downstream enterprises leaded to the financial pressure for most manufacturers, and therefore they had to make low-priced transaction to maintain the operation.

The analysis of TiO2 market disclosed that TiO2 prices in May is expected to remain low. On one hand, according to Anhui Annada, TiO2 market will be stable in the second quarter, but prices will still stay at low levels. The net profit will continue to decline with the loss between USD3.74 million (RMB23 million) and USD4.55 million (RMB28 million). On the other hand, some manufacturers follow up the two price escalation of Sichuan Lomon Titanium Co., Ltd. (Sichuan Lomon). However, according to the actual survey, the current trading price of TiO2 of Sichuan Lomon remained at USD2,273/t, which was unchanged compared with that in Mar. 2014. In the future, the prices of TiO2 will be determined by market demand. Currently, no significant factors will lead to considerable demand for TiO2 in May.
Figure 9: Ex-works price of rutile TiO2 in China by region, mid-Apr. 2013 - mid-Apr. 2014

Source: CCM

Figure 10: Ex-works price of anatase TiO2 in China by region, mid-Apr. 2013 - mid-Apr. 2014

Source: CCM
Figure 11: Ex-works price of titanium slag (Grade 74%-76%) in China by region, mid-Apr. 2013 - mid-Apr. 2014

Source: CCM

Figure 12: Ex-works price of titanium slag (Grade 90%) in China by region, mid-Apr. 2013 - mid-Apr. 2014

Source: CCM
Change or die: way out of struggling for China’s TiO2 industry

Alex Jiang, sales manager of Chongqing ACME Tech. Co., Ltd.

Summary: The current situation of China’s TiO₂ industry is growing increasingly tense: the fluctuating prices together with the overcapacity of low-end products result in a chaotic market, putting innovation and changes on the agenda for players in this industry. Only those who make right decisions and timely responses can survive in this crisis.

China’s TiO₂ market passed through a severe downturn throughout 2013 and Q1 2014 but witnessed a surprising upturn in Apr.
2014. According to the report of China Chemical Industry News, the ex-works prices for Chinese rutile (R2 type) and anatase TiO$_2$ (A1 type) separately reduced to USD2,097/t (RMB13,000/t) and USD1,774/t (RMB11,000/t) in Apr. 2014, decreasing by about USD161/t (RMB1,000/t) compared to those in Jan. 2014.

In Apr. 2014, manufacturers from China postponed new orders and increased TiO$_2$ prices after the leading manufacturer Sichuan Lomon Titanium Co., Ltd. (Sichuan Lomon) initiated a tentative price increase of USD50/t (RMB300/t) early this month. This is also the first time of TiO$_2$ price increase in 2014. It is said that Sichuan Lomon managed to reduce inventory by making the best growing export demand and low-price strategy over last month. However, since smaller manufacturers were forced to price according to their market orientation and inventory levels, Sichuan Lomon’s market influence has become weaker.

Apart from the confusing prices, China’s TiO$_2$ industry also suffers from the structural overcapacity—excessive and inadequate low-end products, which becomes progressively worse these years. At present, most of China’s TiO$_2$ products are low-end and produced by sulphate process, which leads to lacking of competiveness compared to those produced by global leading TiO$_2$ manufacturers with chloride process.

Innovation is a good solution for this problem. Mr. Bi Sheng, Secretary General of China’s Titanium Dioxide Innovation Alliance (the TiO$_2$ Alliance, founded in Mar. 2011) said that the TiO$_2$ Alliance has made a progress in technological innovation projects that further improves product quality, environmental protection, energy conservation and consumption reduction for its member companies.

Henan Billions Chemicals Co., Ltd. (Henan Billions), a leading Chinese TiO$_2$ manufacturer, has set an example in developing high value-added products. Like most TiO$_2$ manufacturers in China, Henan Billions suffered losses in 2013. But it spares no effort to improve its profit level under that situation. In early 2014, the company was rewarded for its achievements in TiO$_2$ for denitration catalyst. As a carrier for SCR denitration catalyst, the special anatase TiO$_2$ attracts extensive attention worldwide. In 2013, Sachtleben Chemie GmbH (Sachtleben, the world’s leading TiO$_2$ manufacturer in Germany) acquired Crenox GmbH, which has developed denitration catalyst nano-TiO$_2$ for two decades. China’s market demand for denitration catalyst carrier TiO$_2$ is estimated to be 80,000-100,000 tonnes per year during 2011-2020, pushed by growing environmentally conscious of the government and the industry. In this field, Henan Billions leads the market again.

As the old saying goes, “To improve is to change; to be perfect is to change often.” Many global leading TiO$_2$ companies have made changes to adapt to the new TiO$_2$ industry. In late June 2013, the new Canadian TiO$_2$ manufacturer Argex Titanium Inc. (Argex) reached an agreement with the world’s leading coating company PPG in TiO$_2$ supply and development (Argex gets a stable buyer and technology partner; PPG gets stable TiO$_2$ supplier ). In August 2013, the Japanese leading TiO$_2$ manufacturer Ishihara Sangyo Kaisha (ISK) announced that it will close the TiO$_2$ plant of its ISK Singapore subsidiary to enhance profitability and competitiveness. In 2013, both DuPont and Rockwood show intention to sell their TiO$_2$ business to focus on its core businesses.

Compared to the industry concentration ratio in developed countries, China’s TiO$_2$ industry still shows a “small, scattered, chaotic” situation, which causes a waste in resources, diseconomy of scale and great environmental protection pressure. In this case,
expansion of big TiO$_2$ companies will further weaken the competitiveness of minor enterprises, which will help eliminate or integrate small production capacities and improve industry concentration ratio, also in favor of the increase of TiO$_2$ industry profitability and barrier to entry.

In a word, the present situation of China's TiO$_2$ industry is just "no struggle, no progress". Ahead of all Chinese TiO$_2$ manufacturers is one last choice: change or die?
TiO2 Alliance promotes industry development

On 12-14 Apr., 2014, the fourth plenary meeting of the first council and inaugural meeting of the second council was held by TiO2 Industry Technology Innovation Strategic Alliance (TiO2 Alliance) in Longkou City, Shandong Province. Bi Sheng, the secretary-general of the TiO2 Alliance introduced that the significant achievements including four technical innovation projects to China Petroleum and Chemical Industry Federation (CPCIF) and three demonstration projects of clean production and recycling industrial chain, lay a foundation for the technology progress in the industry. Of this, Bi Sheng detailed the major projects as follows:

1. The technology and equipment for TiO2 acidrolysis tail gas treatment by Wuhan Fangyuan Titanium Dioxide Co., Ltd. was finished. Nearly ten TiO2 enterprises effectively reduce emissions after carrying out this project.

2. The continuous acid hydrolysis technology for titanium slags jointly developed by Pangang Group Steel Vanadium & Titanium Co., Ltd. (Pangang Group) and Ansteel Research Institute of Vanadium & Titanium Pangang Group Research Institute Co., Ltd. (the core R&D institute of Pangang Group), will be applied in the 100,000t/a TiO2 production line of Chongqing Titanium Industry Co., Ltd. of Pangang Group.

3. The demonstration project for TiO2 clean production and recycling industrial chain by Guangdong Huiyun Titanium Industry Co., Ltd. and the innovation project for clean production by Shandong Daoen Titanium Industry Co., Ltd. will be promoted by the Secretariat of the TiO2 Alliance.

4. The technology and equipment for hydrolytic liquid titanium multieffect cryoconcentration developed by Nantong Sunshine Graphite Equipment Technology (Group) Co., Ltd. and Panzhihua Haifengxin Chemical Industry Co., Ltd. (Panzhihua Haifengxin), has been operated for two years after completion. It is proved that it can reduce steam consumption by 40%-50% with significant energy-saving effect compared with single-effect concentrator device.

Additionally, Bi Sheng also introduced the key work of the TiO2 Alliance in the second half of 2014: to promote the ultra high pressure sludge press technology and hydrolytic liquid titanium multieffect cryoconcentration technology and equipment in May; from June to Sept., to do field study on three technologies including magnetic separation and reuse of tailings with permanent magnet separator, recycling of acid hydrolysis tail slags by infiltrating a small amount of slags into the air swept mill, and recycling of acid hydrolysis tail slags by shaking table and corkscrew spin, and to integrate the advantages of these three technologies and report to CPCIF as the 2014 innovative project; to inspect the wastewater reclamation utilization technique by Panzhihua Haifengxin and the reuse technology to convert wastewater into desalted water by Shandong Doguide Group Co., Ltd., and then to integrate them into a project concerning the comprehensive utilization of water resource in TiO2 production process, and finally to report to CPCIF.
International Titanium & Zirconium Market Seminar (2014) was held in Amoy

On 27-28 March 2014, the International Titanium & Zirconium Market Seminar (2014) (hereinafter referred to as the Seminar) was held in Amoy, Fujian Province. The seminar lasted two days and highlighted the problems as follows:

1. The prolonged downturns in the domestic and international economies has seriously affected the operation of China's titanium and zirconium markets.

2. In the face of weak demand and increased inventory pressure, there have been declines in downstream enterprises' purchase intention, trade growth and the international market prices, resulting in falling domestic market prices of titanium and zirconium.

3. In production, environmental issues, technological innovation, and the absense of high value-added products are the problem difficult to solve that domestic titanium and zirconium manufacturers are faced with. Trade volumes and operating rates of these manufacturers also dropped significantly.

Company Dynamics

Baoji High-Tech Zone expected to export titanium products to Central Asia

In early Apr. 2014, oil rigs and ancillary products of Baoji Tengfei Oil Electromechanical New Technology Co., Ltd. arrived in Kazakhstan by "Chang'an" (an international freight train). It means that Baoji High-Tech Industrial Development Zone (Baoji High-Tech Zone, Shaanxi Province) starts the "westward open" action to open up markets in Central Asia by taking full advantage of the competitive industrial structure concerning new materials and equipment manufacturing cluster.

Since 2013, Baoji High-Tech Zone, quickening the revision of the Development Plan for New Materials and High-Tech Industry Base Construction, has built a comprehensive incubator building, Baoji Titanium Valley Institute for New Materials and China Titanium Trading Center, actively guiding the high-tech enterprises to quicken their pace at international market expansion. At present, Baoji High-Tech Zone has more than 400 companies involved in the R&D of tungsten, molybdenum, tantalum, niobium, zirconium, hafnium and other rare metals. Moreover, it has formed a complete industrial chain covering sponge titanium, titanium ingot, titanium processing materials, titanium alloy materials, titanium composite materials and titanium deep-processed products.

China's chlorination TiO2 industry in deep predicament

Summary: Many chlorination TiO₂ projects are facing difficulties due to financial and technical problems.

According to the survey, the chlorination TiO₂ project of Henan Billions Chemicals Co., Ltd. (Henan Billions) is under construction, but has an uncertain future. In addition, the projects of Jinzhou Titanium Industry Co., Ltd. (Jinzhou Titanium), Pangang Group Steel Vanadium & Titanium Co., Ltd. (Pangang Group), Yunnan Xinli Nonferrous Metal Co., Ltd. (Yunnan Xinli), Shandong Doguide Group Co., Ltd. (Shandong Doguide) and Sichuan Lomon Titanium Co., Ltd. (Sichuan Lomon) have not attained the progress that was expected.

Overall, the domestic chlorination TiO₂ industry is in trouble. Industry insiders believe that the developments in the chlorination TiO₂ industry will be relatively slow in the next five years due to financial and technical problems.
Financing difficulties

Shandong Doguide raised funds for its chlorination TiO\textsubscript{2} project and conducted environmental verifications, according to the website of the Shandong Environmental Protection Agency in Nov. 2011. Shandong Doguide planned to issue 33.5 million shares and raise USD151.70 million (RMB933 million) for 4 projects including production facilities for 60,000 t/a chlorination TiO\textsubscript{2} and 20,000 t/a new catalyst TiO\textsubscript{2}. On 10 Jan., 2014, the Basic Information of IPO Declaration Enterprise (issued by China Securities Regulatory Commission-CSRC, Initial Public Offerings-IPO) showed that Shandong Doguide has terminated the examination, and abandoned the listing plan. The reason is that after the public offering of RMB common stock (A-shares) IPO, the TiO\textsubscript{2} prices remained low, which led to the falling performance of Shandong Doguide. Therefore, it has opted not to continue with its plan to raise funds for its chlorination TiO\textsubscript{2} project.

In Sept. 2011, after the investigation by the Environmental Protection Administrative Department for the first listed company, the report showed that Sichuan Lomon planned to issue 96 million shares tentatively on the Shenzhen Stock Exchange, and the total capital after issuing was equivalent to 383 million shares. The total funds raised, of USD235.76 million (RMB1.45 billion), will all be invested in a 100,000 t/a chlorination TiO\textsubscript{2} project. However, CSRC disclosed that Sichuan Lomon had terminated the examination on 12 Mar., 2014. Sichuan Lomon finally missed the IPO due to financing difficulties.

Up to Apr. 2014, Yunnan Xinli has invested over USD812.97 million (RMB5 billion) into its chlorination TiO\textsubscript{2} project. Due to the financial pressure, Yunnan Xinli is having difficulties obtaining financing from banks. Recently, it has been dependent on shareholders’ investments to maintain its equipment.

Technical problems

According to the survey, due to the lack of key technologies, the TiO\textsubscript{2} businesses of Jinzhou Titanium, Yunnan Xinli and Pangang Group are unable to become profitable.

<table>
<thead>
<tr>
<th>Company</th>
<th>Capacity (t/a)</th>
<th>Technical resources</th>
<th>Production technology</th>
<th>Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jinzhou Titanium Industry Co., Ltd.</td>
<td>60,000</td>
<td>Independent development and consulting introduction</td>
<td>Process units with fluidizing chlorination and molten salt chlorination</td>
<td>Substantial loss in oxidation reactors, unstable product quality and unsatisfactory economic benefits.</td>
</tr>
<tr>
<td>Yunnan Xinli Nonferrous Metals Co., Ltd.</td>
<td>60,000</td>
<td>From Germany-based Ti-Cons</td>
<td>Plans to introduce advanced production technology and key equipment for boiling chlorination of TiO\textsubscript{2}</td>
<td>Using imported titanium in trial production; titanium sponge project has not started yet, and the chlorination TiO\textsubscript{2} project has not been put into operation.</td>
</tr>
<tr>
<td>Pangang Group Steel Vanadium &amp; Titanium Co., Ltd.</td>
<td>/</td>
<td>/</td>
<td>/</td>
<td>Facing intellectual property disputes with DuPont; no operation of its chlorination TiO\textsubscript{2} project.</td>
</tr>
</tbody>
</table>

Source: CCM

To sum up, the development of China's chlorination TiO\textsubscript{2} industry can be divided into three phases: the innovative type of technology R&D and industrial testing from 1960 to 1990; the introduction of foreign chlorination technology by technical
consultation and joint design from 1991 to 2009; and the domestic industrial production and trial for chlorination TiO\textsubscript{2} from 2010 to 2020. In addition, the progress of some chloride TiO\textsubscript{2} projects is lagging behind due to the following reasons: technical complexity, production difficulties, strong demand for equipment materials and automatic control levels, high investment for equipment and strictly confidential technology of multinational companies from western countries as well as the lack of technical personnel.

According to insiders, the current domestic chlorination TiO\textsubscript{2} technology is introduced from Russia, Germany and the US. However, the technology has not been completely obtained, and thus the technology can only be integrated into current operations, which means that the operating and economic benefits are not ideal.

### Denitration TiO\textsubscript{2}: the wave of the future

**Summary:** In view of the environmental and cost pressure on TiO\textsubscript{2} manufacturers, the national NO\textsubscript{x} emissions standards and the current domestic denitration TiO\textsubscript{2} production capacity being unable to meet the domestic demand, denitration TiO\textsubscript{2} is believed to be the wave of the future.

**Primary influencing factor:** environmental friendliness and low costs of denitration TiO\textsubscript{2} production

TiO\textsubscript{2} production usually generates large amounts of wastewater and waste residue. For example, production of 1 tonne of TiO\textsubscript{2} generates 1.5 tonnes of waste residue and 6 tonnes of wastewater. Since China has been intensifying efforts to treat pollution, domestic TiO\textsubscript{2} manufacturers require the upgrading and transformation of the TiO\textsubscript{2} industry, to expand production of high-end products and gradually eliminate backward production capacity and highly pollutive TiO\textsubscript{2} production lines.

The denitration technology is applied in the production process of nanoscale denitration TiO\textsubscript{2}. Specifically, nanoscale TiO\textsubscript{2} is prepared starting with metatitanic acid, free from pollution of wastewater and solid wastes; there is only small amounts of dust and sulfur dioxide generated during calcination, but the pollution can be minimized by using desulfurizing and dedusting apparatus.

In addition, the denitration technology effectively helps cut down production cost. With simple technological processes, low investment in equipment and availability for production expansion, the production technology requires only conventional chemical equipment (that has a 5,000/t production capacity and is invested with USD1.63 million) on the market and less time to construction the production line, therefore reducing production cost for the manufacturers.

**Second influencing factor:** NO\textsubscript{x} emission standards

China determined the emission reduction task for the 12\textsuperscript{th} Five-Year Plan: NO\textsubscript{x} emissions shall be reduced by 10%. He Wenshen, engineer at the State Power Environmental Protection Research Institute, said that nearly 70% of China’s NO\textsubscript{x} emissions comes from direct coal burning, and coal-fired thermal power has accounted for more than 50% of direct coal burning. It can be learned that China is in urgent need to develop the thermal power denitration industry, to reduce NO\textsubscript{x} emissions in thermal power plants.

The denitration process uses the most efficient selective catalytic reduction (SCR), in which TiO\textsubscript{2} is the carrier of active components in the denitration catalyst, accounting for 80% of the total weight of the catalyst and 40%-50% of the production cost of the catalyst. The demand from the thermal power denitration industry will boost the development of the denitration TiO\textsubscript{2} industry.
And SCR accounts for about 95% of the technologies applied in the existing and proposed domestic flue gas denitration projects. It can be seen that SCR's dominance in the flue gas denitration industry has created a new development space for the development of China's TiO₂ industry.

Third influencing factor: current domestic denitration TiO₂ production capacity being unable to meet domestic demand

Nanoscale denitration TiO₂ is the main raw material used for production of denitration catalyst. Although over recent years, some domestic enterprises have been introducing denitration TiO₂ production technology from developed countries like Japan, Germany and the United States, the current domestic denitration TiO₂ production capacity has not yet been able to meet the domestic demand; The low quality of domestically produced denitration TiO₂ brings down the quality of denitration catalyst, hindering the development requirement of the denitration market.

The current domestic demand for denitration TiO₂ is as low as 20,000 tonnes and dominated by imports. And the current denitration TiO₂ production capacity is far less the demand raised for the 12th Five-Year Plan, which presents a rare opportunity to domestic denitration TiO₂ manufacturers.

Under the aforementioned background, an increasing number of enterprises are entering the denitration TiO₂ industry. Except Sichuan Huatie Vanadium and Titanium Technology Co., Ltd., Guangan Beiteng Environmental Technology Co. Ltd. and Chongqing Puyuan Chemical Industry Co., Ltd. and Chongqing Xinhua Chemical Co., Ltd. and other manufacturers that are able to produce denitration TiO₂, Henan Billions Chemicals Co., Ltd. (Henan Billions) put its 10,000 t/a denitration TiO₂ project into trial production from Sept. 2013 to March 2014. Han Jianhua, general manager of Henan Billions, expressed that the denitration TiO₂ project was its growth point in 2014.

At the end of March 2014, Jilin Gpro Titanium Industry Co., Ltd., one of the top five listed TiO₂ manufacturers in China, announced its debut in the denitration TiO₂ industry. The company has recently signed a technology transfer agreement with Sakai Chemical Industry Co., Ltd. It can be learned that enterprises are taking production of denitration TiO₂ as a new business opportunity to convert the downturn in the current TiO₂ industry.

**TiO₂ enterprises promote business development creatively**

Summary: Since 2014, TiO₂ enterprises have been trying to promote business development under the downturn of TiO₂ market.

Hebei Billions Chemicals Co., Ltd. (Billions) builds Yili Microcredit Co., Ltd. (Yili Microcredit) to promote business development. On 28 Mar., 2014, Billions announced that Yili Microcredit established in Zhongzhan District, Jiaozuo City, Henan Province has completed relevant commercial registration procedures. Yili handles small loans, consulting services of development, management and finance for medium and small-sized enterprises and other business approved by provincial authorities. Shen Qingfei, deputy general manager and secretary of the board said: "At present, the company's main business TiO₂ undergoes the darkest period. We promote the upgrading of the business through the establishment of small-loan company."
Titanium) to expand import and export business.

On 26 Mar., 2014, according to evening announcement, Jilin Gpro plans to establish Nanjing Gold Titanium with a registered capital of USD4.88 million (RMB30 million) in order to expand import & export business. Nanjing Titanium Dioxide Chemical Co., Ltd. (Nanjing Titanium), a wholly-owned subsidiary of Jilin Gpro, is engaged in the production and sales of TiO₂. Nanjing Gold Titanium, a subsidiary will be wholly-owned by Nanjing Titanium, covers import & export trade, domestic trade and so on. It is announced that it can accelerate the integration of existing resources to facilitate the import & export trade of related products and extend the industry.

In its 2013 report, Jilin Gpro proposed to further intensify efforts to expand the international market, focusing on the development of foreign direct sales customers to expand its TiO₂ market.

Guangxi Tengxian Jinmao Titanium Co., Ltd. (Guangxi Jinmao) resorts to bank-enterprise negotiation to upgrade the TiO₂ industry. At the end of Mar. 2014, Teng County, Wuzhou City organized a negotiation meeting for five local banks and more than a dozen companies. Loan contracts were signed, with a total loan of USD138.70 million (RMB853 million), of which Guangxi Jinmao received USD15.93 million (RMB98 million) loans. In 2014, the company will invest in the technological reform of TiO₂ and acid titanium co-production, technological reform of sulfuric acid, TiO₂ R&D, anatase TiO₂ production, sewage treatment and other projects.

CNNC Hua Yuan Titanium Dioxide Co., Ltd. (Sino TiO₂) increases a capital of USD4.88 million (RMB30 million) for its subsidiary to promote business development. On 2 Apr., 2014, in order to ensure the further development for the wholly-owned subsidiary Wuxi CNNC Hua Yuan Titanium Dioxide Co., Ltd. (Wuxi Sino TiO₂), Sino TiO₂ proposed an additional investment of USD4.88 million (RMB30 million) for daily operations and procurement of raw materials. It is disclosed that since the establishment, Wuxi Sino TiO₂ has centralized purchasing to reduce costs and make overall plans for supply. However, with the further development of the core business, its existing registered capital is unable to match business scale. The capital increase is beneficial to conducting business, protect production and operation, in line with the company's long-term development strategy.

Jinzhou Titanium Industry Co., Ltd. (Jinzhou Titanium) achieves the transformation from "find" to "choose" suppliers' resources to improve efficiency on B2B platform. Since the fourth quarter of 2013, Jinzhou Titanium has launched the purchasing network to adapt to the mode of the company. Early in 2014, it successfully signed an agreement with Alibaba and adopted B2B platform for online purchasing, to achieve the improvement in work efficiency.
Pangang Group develops technology to reduce cost of TiO2

In early Apr. 2014, the key project namely the Technology Development for R5566 Quality and Efficiency Improvement in the charge of Ansteel Research Institute of Vanadium & Titanium Pangang Group Research Institute Co., Ltd. (the core R&D institution of Pangang Group Steel Vanadium & Titanium Co., Ltd. -Pangang Group) passed the verification and achieved the goal to reduce the TiO\textsubscript{2} cost by over USD16.26/t (RMB100/t), ensure the one-off qualified rate > 95% for common products and qualified rate > 60% for Class A products, which will effectively reduce the cost and increase efficiency for Pangang Group.

The main technical indicators of the project covers: increase in the one-off qualified rate of R5566 products from 80% to greater than or equal to 95%; increase in the qualified rate of Class A products to greater than or equal to 60%; reduction in the cost of material consumption by greater than or equal to USD16.26/t (RMB100/t). In detail, the project team reduces the TiO\textsubscript{2} cost by USD16.75 (RMB103/t) with inorganic coating process optimization; successfully increases Class A qualified rate from about 5% to 70% by optimizing the salt treatment formula and calciniation system; ensures the stability of product quality to ensure the average qualified rate up to 99% in H2 2014 by optimizing the hydrolysis, powder pulverization, washing and other measures.

CNNC TD and Henan Billions forecast Q1 2014 net losses

On 31 March, 2014, CNNC Hua Yuan Titanium Dioxide Co., Ltd. (CNNC TD) and Henan Billions Chemicals Co., Ltd. (Henan Billions) released their respective earnings Q1 2014 preannouncements. Despite estimated YoY increases in their TiO\textsubscript{2} Q1 2014 sales, CNNC TD forecast a net loss of USD1.95 million-USD 2.76 million in Q1 2014, down 60%-126% YoY; Henan Billions predicted a net profit of USD190,869-USD477,180 in Q1 2014, down 50%-80% YoY.

CNNC TD explained that the large decline in its TiO\textsubscript{2} price cauased a 10% YoY decrease in its prime operating revenue for Q1 2014, and the the increase in transport costs also caused its selling expenses to significantly increase over the same period of 2014. Therefore, there was a net loss, greater than that in the same period of 2013, in Q1 2014.

Henan Billions said that the decline in the selling price of its TiO\textsubscript{2} caused the Q1 2014 revenue to be basically flat from Q1 2013. In addition, the increase in the costs of its stock incentives, the decrease in government subsidies and the increase in its allowance for bad debts compared with the same period of 2013 together caused the YoY decrease in the company's Q1 2014 net profit.
Two TiO2 enterprises enforced to make rectification for environmental problems

Since Mar. 2014, the Environmental Protection Bureau of Guangxi Zhuang Autonomous Region (GXEPB) has received several complaints from Xincheng Village, Mengjiang Town, Teng County, Guangxi Zhuang Autonomous Region that emissions from Wuzhou Goldenway Enterprises Co., Ltd. (Wuzhou Goldenway) and ALFA FULL (Guangxi Tengxian ) Titanium Dioxide Co., Ltd. (ALFA FULL) seriously affected the local people's lives. Currently, GXEPB has ordered these two companies to make rectification within a prescribed time, and ordered the local environmental protection department to punish Wuzhou Goldenway for the irrational use of alkali spraying system.

Investigators found that the plant of Wuzhou Goldenway is slushy with worn-out equipment, chaotic pipelines and seriously leaky waste gas and water. Moreover, the leaky lye recycling pool is not repaired, so the strong corrosive lye corrodes the surface. However, the alkali spraying system was not running when inspected. Cofferdam and other protective measures for the waste acid tank located on a hilltop behind the plant are not set. Therefore, after raining, the waste acid spills over into surrounding area directly. In addition, the inspection team also found that the company does not have any dust and noise reduction measures. What's more, the coal and waste acid solution is also displayed in the open air without preventive measures. Currently, Wuzhou Goldenway has invested USD65,000 (RMB400,000) to reconstruct the calcination exhaust system, which is expected to be completed in early May 2014.

Additionally, neither the capacity of water spray nor the volume of sewage treatment tank in ALFA FULL is enough. For those environmental problems, it puts forward the improvement scheme which has entered the construction phase.

Panzhihua Orient becomes first provincial trade development demonstration enterprise in Sichuan Province

In mid-Apr., 2014, Sichuan Provincial Department of Commerce identified the provincial foreign trade development demonstration base, in which Panzhihua Orient Titanium Industry Co., Ltd. (Panzhihua Orient) became the first provincial foreign trade development demonstration enterprise in Panzhihua City, Sichuan Province.

Provincial foreign trade development enterprises, the industry aggregate involved in production, import and export, are supported and developed by the People' Government of Sichuan Province. It can stimulate the development of export-oriented enterprises, enhance the aggregation and quicken the rational development of foreign trade. This identification disclosed that Panzhihua Orient with large import and export scale, prospective export potential and advanced technology, can drive up the exports of upstream and downstream products and similar products in Sichuan Province.
Upstream Industrial Information

Xinjiang Bayi sets ore-dressing plant with new selection technology

An ore-dressing plant with a capacity of 1 million t/a was constructed by Baosteel Group Xinjiang Bayi Iron & Steel Co., Ltd. (Xinjiang Bayi) based on its new selection technology. Now the plant is put into trial operation with the titanium selection process under construction. The selection technology can better the integrative recycling of titanium in Bachu County, Xinjiang Uygur Autonomous Region.

The new selection technology was developed by Xinjiang Bayi and the Institute of Multipurpose Utilization of Mineral Resources, Chinese Academy of Geological Sciences. It follows the principle of "iron first and then titanium", and launches the process of "stage coarse particles discarding tailings–stage grinding and stage separation" in order to get high-quality iron concentrate ore, reduce the loss of titanium and lower the costs. This new technology can get iron concentrate with TFe (57.8%), TiO₂ (11.90%), and TFe recovery (52.92%). After the iron selection, another process will be launched to select titanium: use strong magnet to select titanium first and then grind coarse particles into fine particles and finally separate the titanium by flotation. During the flotation, Xinjiang Bayi uses the self-developed new effective collector EMZ-510 to get titanium concentrate ore with TiO₂ (48.2%) and TiO₂ recovery (80.65%, 37.73% for raw ore) from the raw material, TiO₂ (18.54%). EMZ-510 is an effective collector with advantages of stability, easy operation and environmental protection to collect ilmenite.

Pangang Group’s sustained losses from steel business

Summary: In 2013, Pangang Group suffered huge losses and defined that it would rely on vanadium and titanium instead of iron and steel for development.

Sustained losses from steel business

It is disclosed that since 2007, Pangang Group Steel Vanadium & Titanium Co., Ltd. (Pangang Group) suffered huge losses year after year, including USD731.67 million (RMB4.5 billion) in 2008, over USD162.59 million (RMB1 billion) in 2009, over USD1.14 billion (RMB7 billion) in 2012, and USD874.75 million (RMB5.38 billion) in 2013. Specially, the asset-liability ratio reached 83% at the end of 2013.

-Macro-economic situation and development trend of the steel industry. For example, Pangang Group lost its 40-year technology bonus from blast furnace smelting high vanadium titanium magnetite, because the development of iron and steel industry is restricted due to the overcapacity.

-Costs in the steel industry. Since electricity prices of some dressing plants are more than USD0.1/kW (RMB0.6/kW), Panzhihua City, Sichuan Province fights for Planned Electrovalence Policy for Pangang Group and other vanadium and titanium enterprises’ transition. However, the transition period lasts for only 5 years from 2012 to 2017. Zhang Dade, general manager of Pangang Group disclosed that the logistics costs of iron and steel products are USD21.46/t (RMB132/t) expensive than that of Anshan Iron and Steel Group Corporation's since the latter is located in coastal area. Due to the price continuously increased by railway department, the logistics costs will become even higher."
Transformation to development of vanadium and titanium resources

Pangang Group defined that it should rely on vanadium and titanium instead of iron and steel.

In 2013, Pangang Group turned to optimize the industrial structure, which lays a solid foundation for industrial restructuring and upgrading of titanium and vanadium and its development. Data show that in 2013, Pangang Group produced 12.07 million tonnes of iron concentrate, 36,500 tonnes of vanadium products, 555,800 tonnes of titanium concentrate, 77,200 tonnes of TiO₂, 74,600 tonnes of high titanium slag, 3,283 tonnes of titanium materials, and 1.23 million tonnes of vanadium rail.

Zhang Dade indicated that Pangang Group has carried out a series of fragmented innovation in recent years. In addition, it boasts technologies for titanium metal smelting, titanium plate rolling, titanium alloy and residual titanium recycling, to form batch production capacity of hot rolled titanium coil and cold rolled titanium coil, and further to become the first enterprise covering the entire titanium industrial chain of the world. Zhang Dade also considered that Pangang Group might stand up by titanium, when the technology to extract titanium from furnace slag is industrialized.

Incidentally, in early Apr. 2014, the key project namely the Technology Development for R566 Quality and Efficiency Improvement in the charge of Ansteel Research Institute of Vanadium & Titanium Pangang Group Research Institute Co., Ltd. (the core R&D institution of Pangang Group) passed the verification and achieved the goal to reduce the TiO₂ cost by over USD16.26/t (RMB100/t), ensure the one-off qualified rate > 95% for common products and qualified rate > 60% for Class A products, which will effectively reduce the cost and increase efficiency for Pangang Group.

**Downstream Industrial Information**

**NipponPaint wins Leadership Award in Paint Technology Asia**

By the end of Mar. 2014, NipponPaint was awarded the "Leadership award in Paint Technology Asia" by international publisher IAIR in recognition of its contribution to coating technology, global economy and sustainable development.

IAIR (iairawards.com), an internationally publisher, long-term focuses on the global economy and sustainable development, and its magazine (quarterly) provides strategic information for hundreds of thousands of business leaders and policy makers. IAIR award, presented by the IAIR Scientific Committee and iaireview.org organization, mainly commends innovations in global economy and sustainable development. The delegation includes experts of law, economy and finance from 120 countries. Meanwhile, news from NipponPaint China pointed out that the company launched the reflective insulation coating (cold wall technology) with superior environmental performance, annual savings of cooling capacity up to 4% to 9%. According to Chinese patent search system, NipponPaint gets a total of 187 Chinese patents. This award reaffirms the efforts of NipponPaint to sustainable development of ecological environment, coating technology and innovation, as well as environmental protection.

**Coating industry sets off fraud storm in 2014**

Summary: Since 2014, due to generous profits and poor supervision, the coating industry has set off a storm of fraud: Nippon, Dulux, Sankeshu and other coating brands were counterfeited.
Table 6: Fake coating events, 2014

<table>
<thead>
<tr>
<th>Time</th>
<th>Place</th>
<th>Event</th>
<th>Fake brand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 2014</td>
<td>Minhang, Shanghai City</td>
<td>There are 78 barrels of fake coating were found.</td>
<td>Dulux</td>
</tr>
<tr>
<td>17 Jan., 2014</td>
<td>Xiangcheng, Xiangyang City</td>
<td>More than 150 barrels of latex coating were found.</td>
<td>Six brands including Hongqi, Shanghai Mingrun and Dalian Xinfeiyang</td>
</tr>
<tr>
<td>Feb. 2014</td>
<td>Minhang, Shanghai City</td>
<td>More than 60 barrels of fake coating were found.</td>
<td>Dulux</td>
</tr>
<tr>
<td>Mar. 2014</td>
<td>Hongkou, Shanghai City</td>
<td>Totally 95 barrels of fake coating labeled with other factories names and addresses were found.</td>
<td>Shanghai Zhongnan, Dulux</td>
</tr>
<tr>
<td>18 Apr., 2014</td>
<td>Guilin City, Guangxi Zhuang Autonomous Region</td>
<td>More than 80kg of fake coating were found in Xufeng, Guilin City and more than 72 barrels of fake coating were found in Diecai, Guilin City.</td>
<td>Dulux</td>
</tr>
</tbody>
</table>

Source: CCM

The main cause of these problems is the high profits of fake coating and low cost of punishment. It is disclosed that the profits of selling fake Dulux products is five times over the real products, while the punishment cost is often less than USD8,129.68 (RMB50,000). In addition, long product cycles led to the difficult supervision for relevant government. In detail, it is unable to distinguish coating products between the true and the false in appearance; it is necessary to use professional equipment to test the hidden quality problems of the product so the conclusion often lags behind. Alternatively, some problems may only be spotted when coating is used in construction. For example, if the workers use inferior coating in order to save costs, it may be discovered after a long time by occupiers. Therefore, supervision departments are passive, so they always take action after problems are exposed. Also, they only supervise large enterprises and stores but ignore small workshops and small stores. Furthermore, fraud persons know the regular time of the random inspection well, so that they can manufacture and sell a large amount of fake coatings when there are no inspections.

Fake coating discredits enterprise products, and damages enterprise reputation, which is not conducive to the sustainable development for enterprises. Some measures should be taken: media and consumers should strengthen the exposure of fraud activities; regular manufacturers should make quality control in shipping, transporting and using in order to prevent the real products from changing into the fake ones; agent products should be inspected from time to time; after-sale service system should be improved and customer feedback should be collected in time. Also, control department should from time to time inspect large and small enterprises. It is reported that on 17 Apr., 2014, Hubei Provincial Bureau of Quality Supervision decided to carry out the quality and safety campaigns for more than 10 categories of products including wire from then on. "Formaldehyde floor" and other serious problems concerning quality and safety are the keys for law enforcement.
Influence of national policies on China’s coatings industry

Summary: Over recent years, the promulgation and implementation of national policies have brought development opportunities to coatings manufacturers. However, these manufacturers have also faced challenges resulting from the upgrading and transformation of the industry.

Figure 15: Influence of national policies on China’s coatings industry

Opportunity: new-type urbanisation

"To promote human-centered new-type urbanisation" is one of China’s nine work priorities for 2014. An industrial insider stated that the new-type urbanisation will stimulate construction of new houses, therefore boosting the development of the construction industry. The coatings industry, as a subordinate industry, will also be boosted.

"In the past ten years, the urban population has increased by 200 million, which has generated a demand for 6 billion square meters of real estate", said Chen Huiting, Chairman of the board of Guangdong Huilong Coating Co., Ltd., "so the next decade will be the golden period for the development of the coatings industry." Mr. Chen feels confident about the future coatings industry. He believes that the coatings industry will face a situation where the old market structure will break up. Manufacturers that used to occupy large market shares will lose their advantages, the entire coatings market will be realigned, and only extraordinary manufacturers will survive in the next decade.

In the Coatings and Paint Industries 2014 Annual Conference, Hong Jie, Chairman of the board of SKSHU Paint Co., Ltd., expressed that the coatings industry, as an important supporting industry in the national economy, is in close relation with the real estate industry and infrastructure projects. The NPC (the National People's Congress of the People's Republic of China) & CPPCC (Chinese People's Political Consultative Conference) 2014 Annual Sessions also mentioned the planning of the new-type urbanisation, which will bring great opportunities to the coatings industry. Mr. Hong also boldly predicted nine trends that the industry will face in the next decade.
coatings industry will face, such as "eliminating smog haze" and "curing pollution".

**Challenges**

**Pressure from environmental protection policies**

Over recent years China has introduced a number of environmental protection policies to treat environmental pollution. The coatings industry, as a highly pollutive chemical industry, has been identified as a target for these policies. Environmental pressures will force coatings manufacturers to undergo industrial transformation and industrial upgrading.

In 2013 China successively issued several environmental protection policies, such as the *Action Plan on Prevention and Control of Air Pollution*, *the Government Information Disclosure Guide for Environmental Impact Assessments of Construction Projects* and the *Notice on Effectively Strengthening Environmental Impact Assessment Supervision and Administration*. On 21 March, 2014, Li Keqiang, Premier of the People’s Republic of China and party secretary of the State Council, said that the elimination of backward production capacity and the shutdown of manufacturers that have high energy consumption and high emissions will affect the growth of some industries, but these actions also imply great opportunities and will provide a broad space for the growth of new energy industries, environmental protection and energy conservation industries, and other industries.

Coatings manufacturers should adjust their future development strategies in order to survive in the competitive market. Concerning production technology, more effort should be made in R&D on water-borne coatings and powder coatings as substitutes for solvent-based coatings, and environmentally friendly techniques should be applied in the production process to ensure clean production.

**Introduction of New Standards for Furniture Environmental Testing**

The promulgation and implementation of the *New Standards for Furniture Environmental Testing* (the New Standards) have raised the market entry threshold for furniture coatings and has integrated the furniture coatings sector.

In recent years, there has been frequent news regarding the excessive content of harmful substances in furniture coatings and home decorative paints. These negative events, coupled with customers’ growing environmental awareness, are increasing pressures on coatings manufacturers.

The New Standards indicates that the furniture industry has been increasingly standardised. It has also intensified the monitoring efforts for furniture coatings. Furniture coatings manufacturers have to keep solving their technical problems and improve the quality and environmental performance of their products, to meet the development requirements on the furniture coatings sector. Meanwhile, the New Standards stipulates the environmental protection requirements for furniture, therefore expanding the demand for water-borne coatings, UV furniture coatings and other environmentally friendly products. As a result, the New Standards will promote the industrial upgrading of the furniture coatings sector and will boost the development and integration of the entire coatings industry. Also, the production technologies and their levels will be improved.

**Recommendations to coatings manufacturers**

1. Focus on product innovation to ensure that they are able to adapt to changes in the market demand.

2. Use environmental protective measures in the production process to treat pollution. To this end, coatings industries should
formulate appropriate rules and regulations, promote clean production such as installing dedusting kits and degassing facilities in plants, build sewage treatment stations, and regulate the construction of solid waste landfills to ensure that they are windproof, rainproof and are protected against seepage and leaking.

3. Accelerate technological upgrading, and put more effort into R&D on water-borne coatings and powder coatings as substitutes for solvent-based coatings. Oil paints, which use various combinations of organic solvents as the diluent and contain volatile organic compounds such as methanal, are extremely harmful to human health and the environment. In contrast, water-borne coatings use water as the diluent rather than organic solvents, which makes them eco-friendly and easy to apply. As the current environment pollution situation requires urgent solutions, R&D on water-borne coatings should be accelerated.

**Axalta and Shanghai Kinlita provide environmental program for Foton Daimler**

On 15 Apr., 2014, Axalta Coating Systems (Axalta, formerly DuPont Performance Coatings) and Shanghai Kinlita Chemical Co., Ltd. (Shanghai Kinlita) reached a cooperation agreement with Beijing Foton Daimler Automotive Co., Ltd. (Foton Daimler, a joint venture of Beiqi Foton Motor Co., Ltd. and Germany-based Daimler AG). From then on, Axalta will provide environmental waterborne primer for Foton Daimler’s Auman heavy truck so as to greatly reduce the pollution. In addition, since Shanghai Kinlita is the long-term partner of Foton Daimler, it will continue to provide technical support.

The main reason for Foton Daimler choosing Axalta as its production line coating supplier for the new heavy truck is that Axalta can quickly adjust its waterborne coating and colors to meet the needs of Foton Daimler. In detail, Axalta provided high-quality waterborne primer for Foton Daimler with good technology in the testing phase and also filled its needs for different colors. Furthermore, Axalta can catch up with and surpass its customers’ standard schedule concerning the whole coating production line, and created a new record for rapid reaction.

Additionally, Shanghai Kinlita provided online support and logistics services for Foton Daimler to solidify the cooperation.

The construction of Shanghai environmental waterborne coating plant, invested by Axalta, has been started recently. The plant is expected to go into production in 2015, with a capacity of 25,000 t/a for high-quality waterborne coating.
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17th Floor, Huihua Commercial & Trade Building, No.80 XianlieZhong Road Guangzhou, 510070, P.R.China

Tel:+86-20-37616606
Fax:+86-20-37616768
E-mail:econtact@cnchemicals.com
Website:www.cnchemicals.com