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Basic chemical industry titanium dioxide

Snowball column from Foza Milan

one、Overview

Titanium dioxide is an important inorganic chemical pigment，The main component is titanium dioxide，Some organizations report that it is the best white pigment in the world.，Widely used in coatings、plastic、papermaking、Printing ink、chemical fiber、rubber、Cosmetics and other industrial segments。

two、Production Process

According to the production process, titanium dioxide can be divided into two process routes: sulfuric acid method and chlorination method.。

at present，The world mainly uses chlorination method；In my country, due to the technical complexity of the chlorination method,、 Factors such as higher requirements on equipment materials，Mainly based on sulfuric acid method。

The sulfuric acid method is an acidolysis reaction between ilmenite and concentrated sulfuric acid to produce titanyl sulfate.，The titanium dioxide hydrate obtained when it is then hydrolyzed in hot water is called metatitanic acid，then calcined、Grind、Surface treatment to obtain titanium dioxide。

The chlorination method uses raw materials containing titanium，After grinding titanium-rich materials such as rutile ore or Kochi slag，Reacts with chlorine to form titanium tetrachloride，Purified by distillation，Then proceed to gas phase oxidation，after rapid cooling，After gas-solid separation, washing and crushing, titanium dioxide is obtained.。

The chlorination method has three wastes and less、Less air pollution、Good product quality、Advantages such as ease of industrial production，Widely used internationally，Approximately half of global titanium dioxide production is produced by the chlorination method。

According to Zhiyan data，2022，The output of titanium dioxide produced by the chlorination method in my country is about 497,000 tons.，An increase of 121,000 tons compared with 2021，A year-on-year increase of 32.18%；same year，my country's sulfuric acid titanium dioxide production is approximately 3.364 million tons，A decrease of 76,800 tons compared with 2021。

Titanium、Yibin Tianyuan、Yunnan Xinli、Xianghai Titanium Industry，A total of six production bases， The total annual production capacity of chloride titanium dioxide is 935,000 tons， Accounting for 19% of total domestic production capacity， Among them, Longbai Group accounts for 71% of the entire chlorination process production capacity.。

in summary， 2022， my country's chloride titanium dioxide production accounts for approximately 12.87%，The sulfuric acid method accounts for about 87.13%。

three、supply and demand

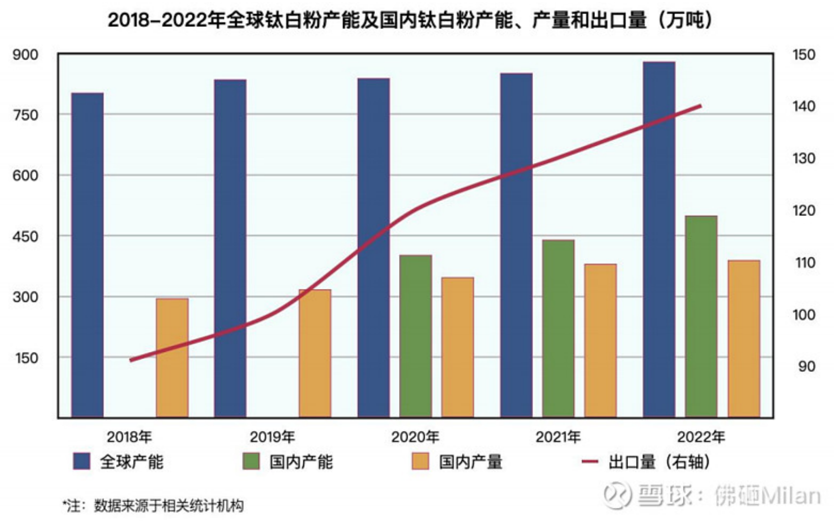
(one) supply situation

1. Capacity/output

Since the sulfuric acid method is the main production process of titanium dioxide in my country,， A third party agency predicts that the demand for its upstream raw material ilmenite will continue to grow.。my country is the country with the largest ilmenite reserves in the world.， in 2021， my country's ilmenite reserves reach 230 million tons， Accounting for approximately 32.86% of the world's total reserves，Play a guarantee role in the production of titanium dioxide。

According to the 2022 annual report data of CNNC Titanium Dioxide， my country's titanium dioxide production will reach 3.861 million tons in 2022，A year-on-year increase of 1.25% from 2021，China's titanium dioxide production is expected to reach 4.196 million tons in 2023。at the same time，Domestic titanium dioxide production capacity is also increasing year by year，2022，China's titanium dioxide production capacity is about 5 million tons，A year-on-year increase of 11.2% in 2021，Global titanium dioxide production capacity in 2022 will be approximately 8.8 million tons。According to estimates by relevant agencies，China's titanium dioxide production capacity will reach 5.2 million tons in 2023。

Domestic titanium dioxide exports in 2022 will be approximately 1.4 million tons， More than 1/3 of production。



Break it down， my country's titanium dioxide related products can be divided into rutile types、Anatase type、Non-pigment grade and other types of products，in，The output of rutile products reached 3.326 million tons，Accounting for 86.14% of total output，An increase of 3.64 percentage points compared with 2021，Mainly suitable for various architectural coatings、Industrial paint、Anticorrosive paint、ink、Powder coating and other industries；The output of anatase products is 411,000 tons，The proportion of total output is 10.64%， A decrease of 2.36 percentage points compared with 2021；The output of non-pigment grade and other types of products is 124,000 tons，Accounting for 3.21%，A decrease of 1.29 percentage points compared with 2021。

Judging from the output of various regions in my country， Mainly distributed in Sichuan Province、 Shandong Province、 Henan Province、 Anhui Province、 Guangxi Zhuang Autonomous Region 、 Jiangsu Province 、 hubei province 、 Yunnan Province 、Chongqing、Guizhou Province, etc.，in，Sichuan Province has the highest titanium dioxide output，Reached 815,000 tons，Accounting for 21% of the country's total output。

The production capacity and output pattern of each province are comparable， The top three regions are：Sichuan production capacity is 970,000 tons， Accounting for 20%、Shandong production capacity is 820,000 tons， Accounting for 17%、Henan production capacity is 650,000 tons，Accounting for 13%。

(two）demand situation

Already mentioned，Titanium dioxide is widely used in coatings、plastic、papermaking、Printing ink、 chemical fiber、 rubber、 Cosmetics and other industries。 Among them, coatings are the main application market for titanium dioxide in my country.， Accounting for about 61%。The real estate industry is the main downstream customer of the coatings industry.， therefore， With the development of the real estate industry gradually stabilizing， The growth rate of demand for titanium dioxide in this field is expected to be suppressed， This will further affect the demand pattern of the entire titanium dioxide industry.。

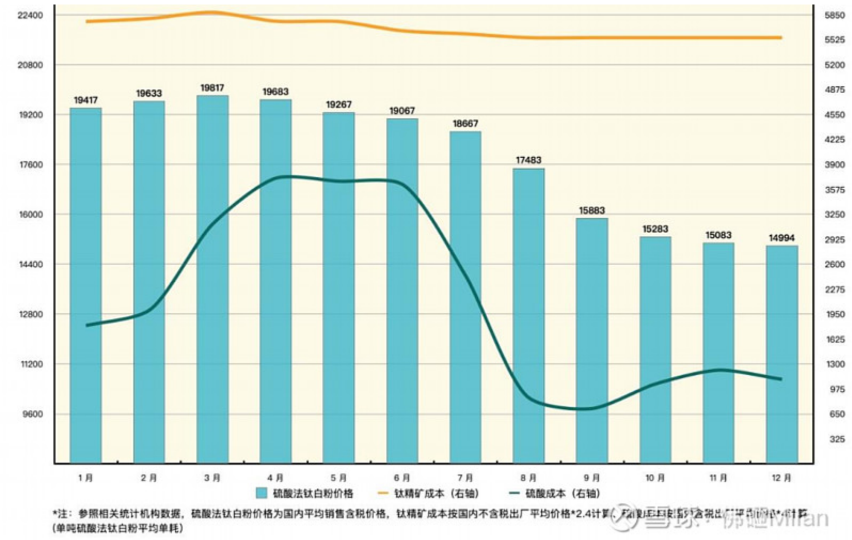
data aspect，2022，The apparent demand for titanium dioxide in China reaches 2.96 million tons， An increase of 274,000 tons compared with 2021， A year-on-year increase of 8.02%，Zhiyan predicts that my country's apparent demand for titanium dioxide will reach 3.06 million tons in 2023。

(three）price situation

from titanium dioxide（sulfuric acid method）Judging from the price，First half of 2022，The end-of-month price of titanium dioxide in my country is basically at a stable stage，The fluctuation range is not large，Basically maintained at around 19,500 yuan/ton；but，second half，The price of titanium dioxide in my country is declining rapidly，From 19,067 yuan per ton in June 2022 to 14,994 yuan per ton in December 2022， Among them, the cumulative decline from July to September was 21.36%。By February 2023，The end-of-month price of titanium dioxide in my country reached 16683.33 yuan/ton， A slight increase from December 2022。

(Four）Cost structure

Through research on the 2022 annual reports of major listed companies in the industry，The main raw material of rutile sulfuric acid titanium dioxide is titanium concentrate、sulfuric acid，The total accounts for more than 60% of production costs。Among them, a single ton of titanium dioxide consumes about 2.4-2.5 tons of titanium concentrate.。 The price fluctuations of the two main materials in 2022 are as follows：



The production costs per ton of titanium dioxide of each company are broken out as follows:（No distinction is made between rutile and anatase titanium dioxide）:

core strength

Production cost structure：

Titanium dioxide output: 334,319 tons， Sales volume 325,891 tons， Operating cost 4,112,344,822 yuan

The unit cost of titanium dioxide per ton is about 12,617 yuan， The material cost is approximately RMB 8,458/ton.、 Labor cost 313 yuan/ton、 Energy cost 2,029 yuan/ton、 Manufacturing overhead and depreciation 1,817 yuan/ton。

Huiyun Titanium Industry

Production cost structure：

Titanium dioxide output: 87,532 tons， Sales volume 78,746 tons， Operating cost 1,183,708,832 yuan

The unit cost of titanium dioxide per ton is about 15,083 yuan，The material cost is about 11,551 yuan/ton.、Labor cost 350 yuan/ton、Energy cost 1,761 yuan/ton、Manufacturing overhead and depreciation 1,420 yuan/ton。

Longbai Group

Production cost structure：

Titanium dioxide output: 989,820 tons， Sales volume 927,697 tons， Operating cost 1,183,708,832 yuan

The unit cost of titanium dioxide per ton is about 12,393 yuan， The material cost is approximately RMB 8,225/ton.、 Labor cost 523 yuan/ton、 Energy cost 2,332 yuan/ton、 Manufacturing overhead and depreciation 486 yuan/ton， Other costs 432 yuan/ton， Transportation cost 395 yuan/ton。

Jinpu Titanium Industry

Production cost structure：

Titanium dioxide output: 156,564 tons， Sales volume 151,767 tons， Operating cost 2,136,279,052 yuan overhead and depreciation 531 yuan/ton，Other costs 1,013 yuan/ton。

Four、Industry upstream

The upstream core raw material of titanium dioxide is titanium concentrate，Titanium concentrate is refined from vanadium titanium magnetite。

(one) Vanadium ferrotitanium resource reserves

Titanium resources are mainly stored in ilmenite、 Rutile， According to the U.S. Geological Survey《Mineral Product Summary 2023》statistics，In 2022, China's ilmenite reserves accounted for approximately 29.23% of global reserves.， Ranked first in the world。 my country's titanium resources are mainly concentrated in Sichuan Province，According to statistics from the Ministry of Natural Resources，National primary titanium at the end of 2021 （magnetic） iron ore （Based on titanium dioxide） Reserves are 212.7748 million tons，Sichuan Province native titanium（magnetic）iron ore（Based on titanium dioxide）Reserves are 189.6128 million tons，Accounting for 89.11% of national reserves。

according to《Mineral Product Summary 2023》statistics，In 2022, China's raw iron ore reserves will account for approximately 11.11% of global reserves.，Among them, the proportion of iron metal in the world is about 8.12%。 Chinese iron ore is of relatively low grade。 my country's iron resources are mainly concentrated in Sichuan、 Liaoning and other provinces， According to statistics from the Ministry of Natural Resources， At the end of 2021, the national iron ore ore reserves were 16.124 billion tons.， Sichuan Province’s iron ore reserves are 2.251 billion tons， Accounting for 13.96% of national reserves。

according to《Mineral Product Summary 2023》statistics， China's vanadium reserves will account for approximately 36.54% of global reserves in 2022， Ranked first in the world。 my country's vanadium resources mainly occur in vanadium-titanium magnetite and vanadium-containing stone coal.， Distributed in Sichuan、 Guangxi、 Gansu and Hubei and other places， Among them, Sichuan Province has the largest reserves。According to statistics from the Ministry of Natural Resources，National vanadium mines at the end of 2021（Based on vanadium pentoxide）Reserves are 7.8674 million tons，Among them, vanadium mines in Sichuan Province （Based on vanadium pentoxide） Reserves are 4.9773 million tons，Accounting for 63.26% of national reserves。

(two) Titanium concentrate market

1. Supply of titanium concentrate

according to《Mineral Product Summary 2023》statistics，The world’s main supplier of ilmenite products is China、Mozambique、South Africa、Australia and Senegal，In 2022, the output of ilmenite products in the five countries will account for approximately 38.20% of global production respectively.、 13.48%、 10.11%、 7.42% and 5.84%， China is the country with the largest output of ilmenite in the world。

Domestic titanium concentrate is mainly supplied by vanadium-titanium magnetite mining and processing enterprises in the Panxi area.。 According to data from the Sichuan Vanadium and Titanium Steel Industry Association， Sichuan Province's titanium concentrate output will reach 6.38 million tons in 2021， Accounting for more than 90% of the country’s total titanium concentrate，in，Panzhihua City’s titanium concentrate output is 5.3 million tons。

2. Demand for titanium concentrate

centrate in the domestic market is mainly determined by the production of domestic titanium dioxide.。

2018-2022， Domestic titanium dioxide production increased from 2.954 million tons to 3.914 million tons，The compound annual growth rate is 7.29%。Calculated based on the ratio of titanium concentrate consumption/titanium dioxide production = 2.3，2018-2022，my country's titanium dioxide industry's demand for titanium concentrate has increased from approximately 6.794 million tons to approximately 9.002 million tons。

Titanium concentrate is the main raw material for the production of titanium materials，Titanium materials are widely used in aerospace、architecture、Petrochemical、ship、Medical and other military and high-end industrial fields。According to Tu Duoduo's statistics，2022，my country's titanium sponge production is 176,900 tons，A year-on-year increase of 27.92% 。 Calculated based on the ratio of titanium concentrate consumption/titanium sponge production=4.0，In 2022, my country's titanium sponge production will require approximately 707,600 tons of titanium concentrate.。

3. Titanium concentrate price situation

The price trend of ilmenite concentrate is mainly affected by changes in market supply and demand.。 From the supply side， supply side reform、overcapacity reduction policy、Factors such as the operating rate of mining companies affect the output of titanium concentrate，Which in turn affects the price of titanium concentrate；From the demand side，The price of titanium dioxide and the operating rate of titanium dioxide manufacturers are the main factors affecting the price of titanium concentrate。 Since 2020， The overall price of titanium concentrate shows a fluctuating upward trend。

(three) Industry pattern

Domestic vanadium titanium magnetite resources are concentrated in the Panxi area，From mineral species、area、Judging from the consistency of mining methods and product forms，The main mining and processing enterprises of vanadium-titanium magnetite in Panxi area include Panzhihua Iron and Steel Mining Co., Ltd.、Longbai Mining and Metallurgy、Xichang Mining（Chongqing Iron and Steel Group）Four companies of He'an Ning Co., Ltd.。

in，Pangang Mining's titanium concentrate is mainly used internally.，Small amount of external sales，All vanadium-ilmenite concentrate is for internal use，External procurement of the gap part，The procurement targets are mainly Anning Co., Ltd. and Xichang Mining Co., Ltd.；All the titanium concentrate produced by Longbai Mining and Metallurgy is used internally by Longbai Group.， External procurement of the gap part， All vanadium-ilmenite concentrates are sold externally.， The end customers are mainly Desheng Vanadium and Titanium and steel companies in Panxi area.， The rest is sold to other vanadium-titanium steel companies around Yunnan；Titanium concentrate from Xichang Mining、All vanadium-ilmenite concentrates are sold externally.，The main end customer is Panzhihua Iron and Steel Group、Chengyu Vanadium Titanium、Desheng Vanadium Titanium；Anning's ilmenite concentrate and vanadium-ilmenite concentrate are all sold externally.， The main end customer is Panzhihua Iron and Steel Group、 Chengyu Vanadium Titanium、 Desheng Vanadium Titanium、 Blue Star Dahua、 Tianguang Titanium Industry、Fangyuan titanium dioxide, etc.。

As of November 30, 2022，The total amount of ore retained by Anning Co., Ltd. is approximately 258 million tons.，Among them, the company retains 188 million tons of industrial-grade iron ore resources within the scope of its mining rights.，TFe grade 29.47%，The amount of associated TiO_2 is 22.63 million tons，TiO_2 grade 12.02%，The amount of associated V_2O_5 is 510,200 tons，V_2O_5 grade 0.27%；Maintained 70.0609 million tons of low-grade iron ore。

downstream titanium dioxide manufacturers；2022 Vanadium Ilmenite Concentrate（61%）Output: 1.3047 million tons，It is a high-quality raw material supplier for vanadium and titanium steel companies.，Overall，Since the country's iron ore resources are widely distributed，Domestic independent iron ore mining and processing companies are small in scale，More scattered，A single enterprise has a low market share，Anning shares have strong competitiveness in the region。

Four、Import and export situation

my country's titanium dioxide export volume will reach 1.4058 million tons in 2022，An increase of 7.17% compared with 2021，Export value was US$3.834 billion，A year-on-year increase of 5.36% from 2021。my country's titanium dioxide imports will be on a downward trend in 2022，Import quantity is 123,100 tons，A year-on-year decrease of 35.85% from 2021，Import value was US$445 million，A year-on-year decrease of 24.58%。

From the perspective of import pattern，my country's titanium dioxide import sources mainly include Taiwan, China、Mexico、Australia、USA、Japan etc.，in，Taiwan, China, has the largest import volume，Reached US$141 million，Accounting for 32%；Next is Mexico，Import value reached US$97 million，Accounting for 22%。Shanghai is the province with the largest import demand for titanium dioxide in my country.，Its import value reached 262 million US dollars；Zhejiang Province ranked second with an import value of US$82 million.。

From the perspective of export pattern，The top five export destinations of my country's titanium dioxide in 2022 are India、Brazil、South Korea、The Russian Federation、Vietnam，Export value was US$489 million、$248 million、$203 million、$205 million、$188 million。at the same time，The province with the largest export volume in my country is Henan Province，Export value was US$786 million，Secondly，Sichuan Province's export value was US$701 million，Shandong Province ranks third，Export value was US$592 million。

five、competitive landscape

According to forward-looking industrial research data，Longbai Group has the highest production and sales volume of titanium dioxide in 2021，The group's production and sales in 2021 will be 902,200 tons and 877,800 tons respectively.。Judging from the operating income of titanium dioxide business，Longbai Group's titanium dioxide business revenue exceeds 15 billion yuan，Number one；China National Nuclear Titanium Dioxide is 5.314 billion yuan，Ranked second；Panzhihua Iron and Steel Vanadium Titanium、Jinpu Titanium Industry、Lubei Chemical ranked third to fifth in order。

图表12：2021年中国钛白粉行业产销量排名（单位：吨）

排名	企业名称	钛白粉生产量（万吨）	钛白粉销售量（万吨）	钛白粉营业收入（亿元）
1	龙佰集团股份有限公司	90.22	87.78	151.99
2	中核华原钛白股份有限公司	32.42	32.37	53.14
3	攀钢集团钒钛资源股份有限公司	24.44	24.74	36.47
4	金浦钛业股份有限公司	15.57	15.35	24.48
5	山东鲁北化工股份有限公司	15.34	14.55	23.44
6	安徽安纳达钛业股份有限公司	10.12	10.02	16.15
7	广东惠云钛业股份有限公司	8.23	8.12	13.35

资料来源：前瞻产业研究院

Vanadium Titanium、 The market shares of Gimpo Titanium and Anada are 9% respectively.、6%、4% and 3%。Industry CR5 accounts for about 46%，Industry concentration is average。

PS：In terms of market structure, no data for 2022 has been found yet.，Temporarily citing 2021 data for reference

six、Profit situation

2022， Longbai Group's titanium dioxide gross profit margin is 28.93%， A year-on-year decrease of approximately 16 percentage points；The gross profit margin of titanium dioxide of CNNC Titanium Dioxide Company is 18.64%， A year-on-year decrease of 17 percentage points；Panzhihua Iron and Steel Vanadium Titanium Dioxide gross profit margin is 7.6%，A year-on-year decrease of 16 percentage points；Gimpo Titanium's gross profit margin is approximately 5.39%，A year-on-year decrease of 14 percentage points；Annada titanium dioxide gross profit margin is approximately 12.47%， A year-on-year decrease of 5 percentage points；Lubei Chemical's titanium dioxide gross profit margin is approximately -3.14%，A year-on-year decrease of 18 percentage points。

Limited by the periodic restrictions of the real estate market，The performance of companies in the titanium dioxide industry is generally under pressure in 2022， There are mines、 processing、 The profit level of integrated production line enterprises is significantly higher than that of pure processing enterprises.。

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基础化工之钛白粉

来自 佛匝Milan的雪球专栏

一、概述

钛白粉是一种重要的无机化工颜料，主要成分为二氧化钛，有机构报道并认为其是世界上性能最好的一种白色颜料，广泛应用于涂料、塑料、造纸、印刷油墨、化纤、橡胶、化妆品等工业细分领域。

二、生产工艺

钛白粉按生产工艺可以分为硫酸法和氯化法两种工艺路线。

目前，全球主要以氯化法为主；而我国因氯化法技术复杂、对设备材质要求较高等因素，主要以硫酸法为主。

硫酸法是将钛铁矿与浓硫酸进行酸解反应生成硫酸氧钛，然后在热水中水解时得到的二氧化钛水合物称为偏钛酸，再经过煅烧、研磨、表面处理得到钛白粉。

氯化法是使用含钛的原料，以金红石矿或高钛渣等富钛料经粉磨后，与氯气反应生成四氯化钛，经精馏提纯，然后再进行气相氧化，在速冷后，经过气固分离再经过洗涤和粉碎得到钛白粉。

氯化法具有三废少、大气污染少、产品质量好、易于工业化生产等优点，在国际上得到广泛应用，全球钛白粉产量中大约有一半为氯化法生产的产品。

据智研数据，2022年，我国氯化法生产的钛白粉产量约49.7万吨，较2021年相比增加12.1万吨，同比上升32.18%；同年，我国硫酸法钛白粉产量约为336.4万吨，较2021年减少7.68万吨。

另据涂多多数据，2022年我国**氯化法钛白粉生产企业为龙佰集团、中信钛业、攀钢钒钛、宜宾天原、云南新立、祥海钛业，共**六个生产基地，氯化法钛白粉年总产能在93.5万吨，占国内总产能的19%，其中龙佰集团占整个氯化法产能71%。

综合来看，2022年，我国氯化法钛白粉产量占比约12.87%，而硫酸法占比约87.13%。

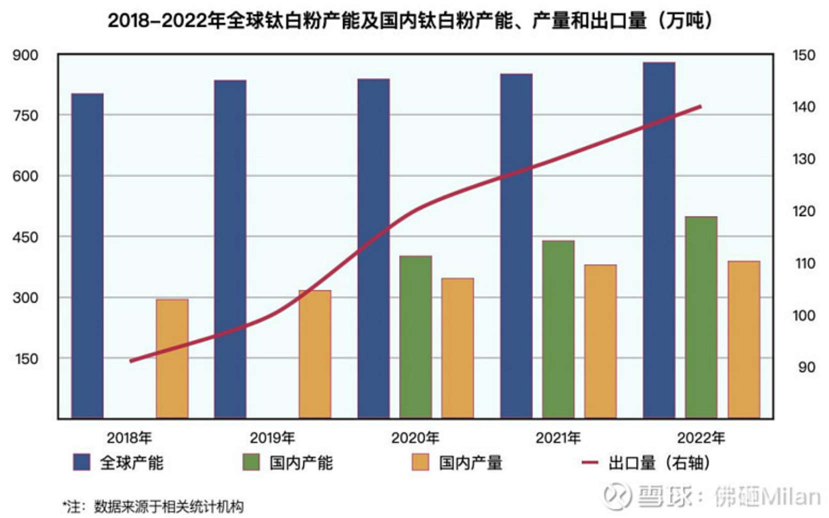
三、供给及需求

(一) 供给情况

由于硫酸法是我国钛白粉的主要生产工艺，有三方机构预计其上游原材料钛铁矿的需求量将会不断增长。而我国是世界上钛铁矿储量最多的国家，在2021年，我国钛铁矿储量达到2.3亿吨，约占全球总储量的32.86%，为钛白粉的生产起到保障作用。

根据中核钛白2022年报数据，2022年我国钛白粉的产量达到386.1万吨，较2021年同比上升1.25%，预计2023年中国钛白粉的产量将达到419.6万吨。同时，国内钛白粉产能也在逐年增加，2022年，中国钛白粉的产能约500万吨，较2021年同比上升11.2%，2022年全球钛白粉产能约880万吨。据有关机构预计，2023年中国钛白粉的产能将达到520万吨。

2022 年国内钛白粉出口量大约为 140 万吨，超过产量的 1/3。



细分来看，我国钛白粉相关产品可以分为金红石型、锐钛型、非颜料级和其他类型产品，其中，金红石型产品产量达到332.6万吨，占总产量的86.14%，与2021年相比增长3.64个百分点，主要适用于各种建筑涂料、工业漆、防腐漆、油墨、粉末涂料等行业；锐钛型产品产量为41.1万吨，占总产量的比例为10.64%，较2021年下降2.36个百分点；非颜料级和其他类型产品产量为12.4万吨，占比为3.21%，与2021年相比下降1.29个百分点。

2.地区分布

从我国各地区产量来看，主要分布在四川省、山东省、河南省、安徽省、广西壮族自治区、江苏省、湖北省、云南省、重庆市、贵州省等，其中，四川省钛白粉产量最高，达到81.5万吨，占全国总产量的比重达到21%。

各省的产能与产量格局相当，排名前三地区分别为：四川产能97万吨，占比为20%、山东产能82万吨，占比为17%、河南产能65万吨，占比为13%。

（二）需求情况

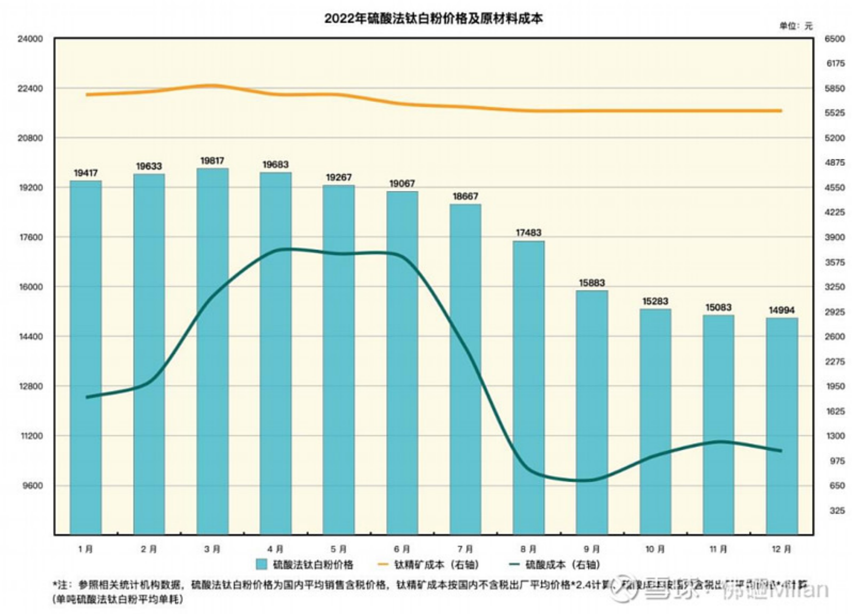
前文已述，钛白粉广泛应用于涂料、塑料、造纸、印刷油墨、化纤、橡胶、化妆品等工业。其中涂料是我国钛白粉主要的应用市场，占比约61%。而房地产行业又是涂料行业的主要下游客户，因此，随着房地产行业发展逐步平稳，预计该领域对钛白粉的需求量增速会受到抑制，进而影响整个钛白粉行业的需求格局。

数据方面，2022年，我钛白粉的表观需求量达到296万吨，较2021年增加27.4万吨，同比上升8.02%，智研预计2023年我国钛白粉的表观需求量达到306万吨。

（三）价格情况

从钛白粉（硫酸法）的价格来看，2022年上半年，我国钛白粉的月末价格基本上处于稳定阶段，上下震荡幅度不大，基本维持在19500元/吨左右；但是，下半年，我国钛白粉的价格处于快速下降状态，从2022年6月的每吨19067元降至2022年12月的14994元/吨，其中7-9月累计跌幅21.36%。到2023年2月，我国钛白粉的月末价格达到16683.33元/吨，较2022年12月略有增长。

通过调研行业内主要上市公司2022年报，金红石型硫酸法钛白粉主要原材料为钛精矿、硫酸，合计占生产成本60%以上。其中单吨钛白粉消耗钛精矿约2.4-2.5吨。两种主材2022价格波动情况如下：



分拆出各公司钛白粉单吨生产成本如下（未区分金红石型和锐钛型钛白粉）：

中核钛白

生产成本构成：

钛白粉产量334,319吨，销量325,891吨，营业成本4,112,344,822元

钛白粉吨单位成本约12,617元，其中材料成本约8,458元/吨、人工成本313元/吨、能源成本2,029元/吨、制造费用及折旧1,817元/吨。

惠云钛业

生产成本构成：

钛白粉产量87,532吨，销量78,746吨，营业成本1,183,708,832元

钛白粉吨单位成本约15,083元，其中材料成本约11,551元/吨、人工成本350元/吨、能源成本1,761元/吨、制造费用及折旧1,420元/吨。

龙佰集团

生产成本构成：

钛白粉产量989,820吨，销量927,697吨，营业成本1,183,708,832元

钛白粉吨单位成本约12,393元，其中材料成本约8,225元/吨、人工成本523元/吨、能源成本2,332元/吨、制造费用及折旧486元/吨，其他费用432元/吨，运输费用395元/吨。

金浦钛业

生产成本构成：

钛白粉产量156,564吨，销量151767吨，营业成本2,136,279,052元

钛白粉吨单位成本约14,076元，其中材料成本约8610元/吨、人工成本634元/吨、能源成本3,285元/吨、制造费用及折旧531元/吨，其他费用1,013元/吨。

钛白粉的上游核心原材料是钛精矿，钛精矿由钒钛磁铁矿提炼而成。

（一）钒钛铁资源储量

钛资源主要储存在钛铁矿、金红石，根据美国地质调查局《矿产品概要2023》统计，2022年中国钛铁矿储量占全球储量的比例约为 29.23%，排名全球第一。我国的钛资源主要集中在四川省，根据自然资源部统计，2021年末全国原生钛（磁）铁矿（以二氧化钛计）储量为21,277.48万吨，四川省原生钛（磁）铁矿（以二氧化钛计）储量为18,961.28万吨，占全国储量的89.11%。

根据《矿产品概要2023》统计， 2022年中国铁矿石原矿储量占全球储量的比例约为11.11%，其中铁金属量占全球的比例约为8.12%。中国铁矿石的品位相对较低。我国的铁资源主要集中在四川、辽宁等省，根据自然资源部统计，2021年末全国铁矿矿石储量为161.24亿吨，四川省铁矿矿石储量为22.51亿吨，占全国储量的13.96%。

根据《矿产品概要2023》统计，2022年中国钒储量占全球储量的比例约为36.54%，排名全球第一。我国钒资源主要赋存于钒钛磁铁矿和含钒石煤中，分布在四川、广西、甘肃和湖北等地，其中四川省储量最大。根据自然资源部统计，2021年末全国钒矿（以五氧化二钒计）储量为786.74万吨，其中四川省钒矿（以五氧化二钒计）储量为497.73万吨，占全国储量的63.26%。

（二）钛精矿市场

1.钛精矿供应情况

根据《矿产品概要2023》统计，全球主要的钛铁矿产品供应国是中国、莫桑比克、南非、澳大利亚和塞内加尔， 2022年五个国家钛铁矿产品产量占全球产量的比例分别约为38.20%、13.48%、10.11%、7.42%和5.84%，中国是全球钛铁矿产量最大的国家。

国内钛精矿主要由攀西地区的钒钛磁铁矿采选企业供应。根据四川省钒钛钢铁产业协会数据，2021年四川省钛精矿产量达到638万吨，占全国钛精矿总量的90%以上，其中，攀枝花市钛精矿产量为530万吨。

2.钛精矿需求情况

钛精矿主要用于生产钛白粉，另有少部分钛精矿用于生产海绵钛，国内市场对钛精矿的需求主要由国内钛白粉的产量决定。

2018-2022年，国内钛白粉产量由295.4万吨增加至391.4万吨，年复合增长率为7.29%。根据钛精矿消耗量/钛白粉产量=2.3的比例推算，2018-2022年，我国钛白粉行业对钛精矿的需求从约679.4万吨增长到约900.2万吨。

钛精矿是生产钛材的主要原材料，钛材广泛运用于航空航天、建筑、石油化工、舰船、医疗等军工和高端工业领域。根据涂多多数据统计，2022年，我国海绵钛产量为17.69万吨，同比增长27.92%。根据钛精矿消耗量/海绵钛产量=4.0的比例推算，2022年我国海绵钛生产对钛精矿的需求约为70.76万吨。

3.钛精矿价格情况

钛精矿价格走势主要受市场供给需求关系变动的影响。从供给端看，供给侧改革、去产能政策、采矿企业开工率等因素影响钛精矿产量，进而影响钛精矿价格；从需求端看，钛白粉价格和钛白粉厂商开工率是影响钛精矿价格的主要因素。2020年以来，钛精矿价格整体呈现波动上涨趋势。

（三）行业格局

国内钒钛磁铁矿资源集中在攀西地区，从矿种、区域、开采方式和产品形态一致性来看，攀西地区钒钛磁铁矿主要采选企业有攀钢矿业、龙佰矿冶、西昌矿业（重钢集团）和安宁股份四家。

部自用，缺口部分对外采购，钒钛铁精矿全部对外销售，终端客户以德胜钒钛和攀西地区的钢铁企业为主，其余部分销往云南周边其他钒钛钢铁企业；西昌矿业的钛精矿、钒钛铁精矿全部对外销售，主要终端客户为攀钢集团、成渝钒钛、德胜钒钛；安宁股份的钛精矿和钒钛铁精矿均全部对外销售，主要终端客户为攀钢集团、成渝钒钛、德胜钒钛、蓝星大华、添光钛业、方圆钛白等。

截至2022年11月30日，安宁股份保有矿石量合计约2.58亿吨，其中公司采矿权范围内保有工业品位铁矿石资源量1.88亿吨，TFe品位29.47%，伴生TiO_2的量为2263万吨，TiO_2品位12.02%，伴生V_2O_5的量为51.02万吨，V_2O_5品位0.27%；保有低品位铁矿石量7,006.09万吨。

安宁股份2022年钛精矿产量49.30万吨，是目前国内重要的钛精矿供应商，对于下游钛白粉厂商有一定的议价能力；2022年钒钛铁精矿（61%）产量130.47万吨，是钒钛钢铁企业的优质原材料供应商，总体来看，由于全国的铁矿资源分布广泛，国内的独立铁矿石采选企业规模较小，较为分散，单个企业市场占有率较低，安宁股份在区域内具有较强的竞争力。

四、进出口情况

2022年我国钛白粉的出口数量达到140.58万吨，较2021年上升7.17%，出口金额为38.34亿美元，较2021年同比上升5.36%。而我国钛白粉的进口量在2022年处于下滑态势，进口数量为12.31万吨，较2021年同比下降35.85%，进口金额为4.45亿美元，同比下降24.58%。

从进口格局来看，我国钛白粉进口来源地主要包括中国台湾、墨西哥、澳大利亚、美国、日本等地，其中，中国台湾进口金额最大，达到1.41亿美元，占比达到32%；其次是墨西哥，进口金额达到0.97亿美元，占比达到22%。上海市是我国钛白粉进口需求最多的省份，其进口金额达到2.62亿美元；浙江省以0.82亿美元的进口金额排名第二。

从出口格局来看，2022年我国钛白粉出口目的地排名前五的地区分别为印度、巴西、韩国、俄罗斯联邦、越南，出口金额依次为4.89亿美元、2.48亿美元、2.03亿美元、2.05亿美元、1.88亿美元。同时，我国出口金额最多的省份为河南省，出口金额为7.86亿美元，其次，四川省出口金额为7.01亿美元，山东省排名第三，出口金额为5.92亿美元。

五、竞争格局

据前瞻产研数据，2021年龙佰集团的钛白粉生产及销售量最高，2021年该集团产销量为分别为90.22万吨和87.78万吨。从钛白粉业务的营业收入情况来看，龙佰集团钛白粉业务收入超过150亿元，排名第一；中核钛白为53.14亿元，排名第二；攀钢钒钛、金浦钛业、鲁北化工依次排名三到五位。

图表12：2021年中国钛白粉行业产销量排名（单位：吨）

排名	企业名称	钛白粉生产量（万吨）	钛白粉销售量（万吨）	钛白粉营业收入（亿元）
1	龙佰集团股份有限公司	90.22	87.78	151.99
2	中核华原钛白股份有限公司	32.42	32.37	53.14
3	攀钢集团钒钛资源股份有限公司	24.44	24.74	36.47
4	金浦钛业股份有限公司	15.57	15.35	24.48
5	山东鲁北化工股份有限公司	15.34	14.55	23.44
6	安徽安纳达钛业股份有限公司	10.12	10.02	16.15
7	广东惠云钛业股份有限公司	8.23	8.12	13.35

资料来源：前瞻产业研究院

按产量划分，在2021年钛白粉市场份额占比中，龙佰集团以24%的市场份额位居第一，中核钛白、攀钢钒钛、金浦钛业和安纳达市场份额分别为9%、6%、4%和3%。行业CR5占比约46%，行业集中度一般。

六、利润情况

2022年，龙佰集团钛白粉毛利率为28.93%，同比下降约16百分点；中核钛白企业钛白粉毛利率为18.64%，同比下降17百分点；攀钢钒钛钛白粉毛利率为7.6%，同比下降16百分点；金浦钛业毛利率约5.39%，同比下降14百分点；安纳达钛白粉毛利率约12.47%，同比下降5百分点；鲁北化工钛白粉毛利率约-3.14%，同比下降18百分点。

受限于房地产市场的阶段性受限，钛白粉行业内企业2022年业绩普遍承压，有矿山、加工、产线的一体化企业的利润水平明显高于纯加工类型的企业。