

Titanium Dioxide

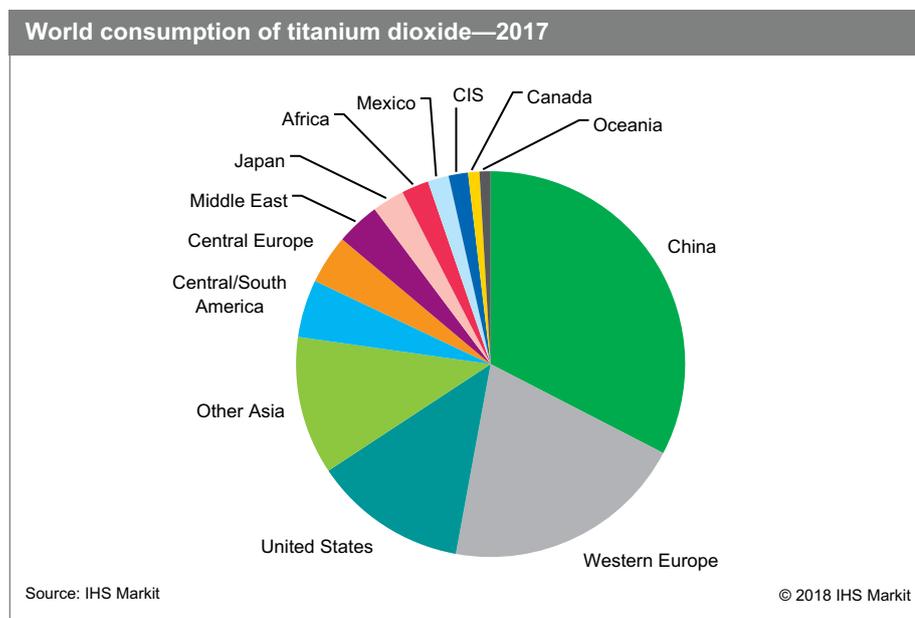
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Abstract

Titanium dioxide (TiO_2) is the standard white pigment used principally in paints, paper, and plastics. It is the most important pigment in the world, accounting for approximately 70% of total pigment volume. Titanium dioxide is made by processing a variety of titanium-containing minerals such as ilmenite and rutile. Rutile has a titanium dioxide content of 94–96%, making it highly desirable as a feedstock. Ilmenite is much more plentiful, but has a titanium dioxide content of 50–60%, so it is usually upgraded, or beneficiated, to a higher titanium dioxide content.

Between 2014 and 2015, the paints and pigments industry faced substantial challenges in the Western Hemisphere as Asian, particularly Chinese, producers increased the production levels of cheaper finished product. This resulted in the destocking of inventories, which continued until the middle of 2016. Titanium dioxide is produced by more than 50 companies in China and approximately 20 companies elsewhere. Seven major world titanium dioxide producers account for just over half of the world capacity.

The following pie chart shows world consumption of titanium dioxide:



The major consuming industries for TiO_2 pigments are paints and surface coatings, plastics, and paper and paperboard. Consumption tends to parallel general economic trends for these end-use applications. Ultrafine grades of titanium dioxide (particle sizes between one and 150 nanometers) are used as catalysts, UV blockers, color pigment precursors, and electroceramics. This area is growing, but is still relatively small and will not affect the overall market significantly.

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North American consumption decreased slightly between 2014 and 2015, but picked up again in 2016 and 2017, mainly because of a fluctuation in coatings consumption caused by the swing in the construction and manufacturing markets. Paint and coatings continues to be the largest outlet, accounting for 61% of consumption. Western European and Japanese consumption remains stagnant. The real driver of growth is China, where the coatings and plastics industries continue to expand at high rates. The potential remains high; per capita consumption of TiO₂ in China is about 1.1 kilograms per year, compared with 2.7 kilograms for Western Europe and the United States.

Between 2014 and 2017, China's share of total world titanium dioxide consumption decreased slightly, from 33% to about 32.5%, but is forecast to increase to 34% by 2022. An average annual growth rate of about 3.5% is forecast for Chinese TiO₂ consumption over the next five years.

Poor profitability and lack of growth in Western Europe have prompted further rationalization by sulfate process-based producers, which has led to slightly higher operating rates at a slightly lower capacity level. A capacity reduction in Western Europe of 6.5% between 2014 and 2017 was due primarily to the closure of the titanium dioxide production facility at Huntsman's (Venator's) Calais site in 2015.

The TiO₂ industry expects to have attractive margins for the foreseeable future. The development of new feedstock mines can take five to ten years and new grassroots pigment plants take four to five years to complete, especially when permitting and infrastructure needs must be addressed. With demand forecast to rise by 4–5% annually, the industry needs 200,000–300,000 metric tons of new capacity every year (discounting capacity in China, which generally does not make high-quality pigment).

Contents

Executive summary	5
Summary	6
Introduction	13
Industry structure	15
Chemours	15
Venator-Huntsman	16
Cristal	17
Kronos	17
Tronox	18
Manufacturing processes	21
Raw material preparation	21
Pigment manufacturing processes	23
– Sulfate process	23
– Chloride process	25
– Other processes	26
Environmental issues	28
Transportation and handling	30
Supply and demand by region	31
North America	31
– United States	31
– Raw materials	31
– Titanium dioxide	34
– Producing companies	34
– Salient statistics	36
– Consumption	37
– Price	43
– Trade	46
– Canada	51
– Raw materials	51
– Titanium dioxide	52
– Producing companies	52
– Salient statistics	52
– Consumption	53
– Price	53
– Trade	54
– Mexico	55
– Raw materials	55
– Titanium dioxide	56
– Producing companies	56
– Salient statistics	56
– Consumption	57
– Price	58
– Trade	58
– Central and South America	59
– Raw materials	59

– Titanium dioxide	60
– Producing companies	60
– Salient statistics	60
– Consumption	62
– Price	63
– Trade	63
Western Europe	65
– Raw materials	65
– Titanium dioxide	66
– Producing companies	66
– Salient statistics	69
– Consumption	71
– Paints and coatings	72
– Plastics	73
– Paper	73
– Printing inks	73
– Other	73
– Price	74
– Trade	75
– Imports	75
– Exports	76
Central Europe	77
– Producing companies	77
– Salient statistics	78
– Consumption	79
– Price	79
– Trade	80
– Imports	80
– Exports	82
CIS	82
– Raw materials	83
– Titanium dioxide	84
– Producing companies	84
– Salient statistics	84
– Consumption	85
– Price	86
– Trade	86
– Imports	86
– Exports	87
Middle East	87
– Producing companies	88
– Salient statistics	88
– Consumption	89
– Price	90
– Trade	90
– Imports	90
– Exports	91
Africa	92

– Raw materials	92
– Titanium dioxide	94
– Producing companies	94
– Salient statistics	94
– Consumption	95
– Price	96
– Trade	96
– Imports	96
– Exports	97
Asia	98
– China	98
– Raw materials	98
– Titanium dioxide	100
– Producing companies	100
– Salient statistics	102
– Consumption	102
– Price	104
– Trade	105
– Japan	106
– Raw materials	106
– Titanium dioxide	108
– Producing companies	108
– Salient statistics	109
– Consumption	110
– Price	114
– Trade	114
– Other Asia	117
– Raw materials	117
– India	117
– Malaysia	119
– Sri Lanka	119
– Vietnam	119
– Titanium dioxide	121
– Producing companies	121
– Salient statistics	121
– Price	126
– Trade	127
Oceania	127
– Raw materials	127
– Titanium dioxide	129
– Producing companies	129
– Salient statistics	130
– Trade	131
Bibliography	132
Revisions	133

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