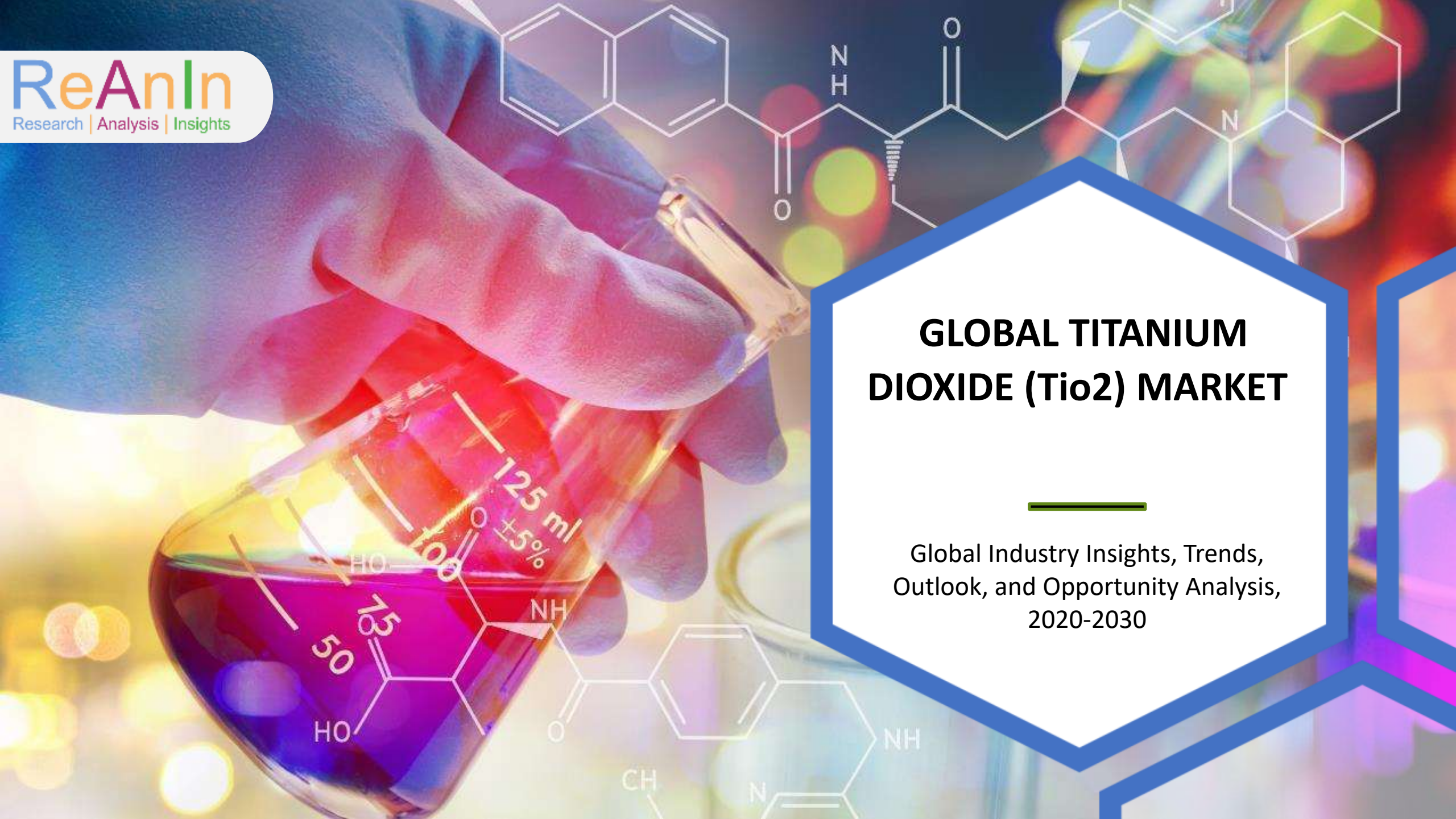

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GLOBAL TITANIUM DIOXIDE (Tio2) MARKET

Global Industry Insights, Trends, Outlook, and Opportunity Analysis, 2020-2030

INDEX

SECTION 1

MARKET DEFINITION AND SCOPE

MARKET DEFINITION AND SCOPE

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET

BY GRADE

- Rutile
- Anatase

BY PROCESS

- Sulfate
- Chloride

BY APPLICATION

- Paints
- Plastics
- Paper
- Others

BY REGION

- North America
- Europe
- Asia Pacific
- Latin America
- Middle East & Africa

Historical Period: 2020-2022; Base Year: 2023; Forecast Period: 2024-2030; CAGR: 2024-2030

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● Primary Analysis ● Secondary Analysis ● ReAnIn Analysis

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Section 8: Titanium Dioxide (Tio2) in Sodium Ion Battery Technology

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SECTION 2

INTRODUCTION

- Key Data Pointers Provided Through Report
- Research Objectives and Assumptions
- Research Methodology
- Abbreviations

KEY DATA POINTERS PROVIDED THROUGH REPORT

Total addressable market (USD) at global, regional and country-level including 18 countries and 4 association of countries (i.e. ASEAN, GCC, Nordic and Benelux)

Key takeaways and analyst views

Market growth rate through 2030

Competitive strategies adopted by leading market participants

Market drivers, restraints, opportunities and its impact on Titanium Dioxide (Tio2) Market

Attractive investment proposition

Global and country market trends

Ecosystem analysis

Regulatory scenario, regional dynamics, and insights of leading countries in each region

PEST analysis

Segment trends and analysis

Comprehensive mapping of industry parameters

Absolute dollar opportunity for the period: 2020-2030

RESEARCH OBJECTIVES

- **Market Analysis** – Providing global, regional and country-level analysis, qualitative and quantitative, for all market segments (listed in the TOC).
- **Market Size and Growth Rate** – Providing market estimates, year-on-year (Y-o-Y) growth rate, and Compound Annual Growth Rate (CAGR) and for all market segments over the historic and forecast period.
- **Market Trend Analysis** – Providing trend analysis (both upward and downward trends) for all market segments.
- **Market Share** – Providing market share analysis for different market segments and the key players in the market.
- **Market Dynamics** – Providing analysis of the various factors influencing the market such as market drivers, restraints, and opportunities.
- **PEST Analysis** - Analysis of the effect of exogenous & endogenous factors, viz. Political, Economic, Social and Technological factors that affect the market.
- **Porter's Five Forces Analysis** – Analysis of Porter's Five Forces that directly control the market, viz. Bargaining Power of Suppliers, Bargaining Power of Buyers, Threat of New Entrants, Threat of Substitutes and Competitive Rivalry.
- **SWOT analysis** for key players in the market along with detailed company overview, product portfolio, financial performance and strategy information provided for each player.
- **Identification of potential investment opportunities in the market**

RESEARCH ASSUMPTIONS

- **Base Year** – The base year was identified based on the availability of annual reports and secondary information. The base year considered for this study is 2023.
- **Historical and Forecast Period Years** – The historical period considered in this report is from 2020 to 2022. The forecast period is from 2024 to 2030.
- **Base Currency** – United States Dollar (USD) is considered as the base currency for this report. The conversion of other currencies to USD was done considering the average exchange rate for the respective review period years, and for the forecast period, the currency conversion was as per the base year's conversion rates.
- **Sizing Units** – All market values in this report are given in USD million.
- **Market Size** – The market size in terms of USD million is determined using the following equation:

  Market Size = Volume X Average Selling Price (ASP)

- **Other Assumptions** - The market numbers provided for the year 2023 are based on the financials reported in the annual reports and proxy statements of the major players tracked in this market.

RESEARCH METHODOLOGY

As it might be evident by now, we named our company to represent our research methodology. We know what you are thinking by this point; of all the ways in which a company can be named, why to name it after research methodology?

The answer is straight and simple, it is the research methodology that separates **Good Research** from **Great Research**. Hence, we couldn't find a better way to name our company.

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As our name indicates, our research methodology involves 3 main steps:

- **Research** – Involves market scoping followed by fixing of market taxonomy/segmentation and collection of both qualitative and quantitative data relevant to market segments.
- **Analysis –** Involves analysis of the data collected in previous step to get an understanding of the market from different view points.
- **Insights –** Involves generating actionable insights using the market understanding that was developed in the previous step.

RESEARCH METHODOLOGY

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Research

Market Scoping

- In this step, we try to determine if there is a gap/potential for growth in the market that we are planning to study. This step is extremely important as it helps to decide if, our insights can help the clients in filling a gap in the market or tap into the potential growth opportunities.
- We proceed to next steps of research only if we find the gap/potential for growth in the market we are planning to study.

Fixing Market Taxonomy

- In this step, we study different ways in which the market can be segmented in order to facilitate the best possible analysis of the market followed by deriving actionable insights. By the end of this step, we segment the market in the best possible way.

Data Collection Methods/ Approaches/Sources

Primary Research

- Paid primary calls
- Cold Calling
- Email Outreach
- Surveys
- In person interviews

Secondary Research

- Databases
  - Paid
  - Free
- Press Releases
- Whitepapers
- Company Websites
- SEC Filings
- Financial Reports

RESEARCH METHODOLOGY

Types of Data Collected

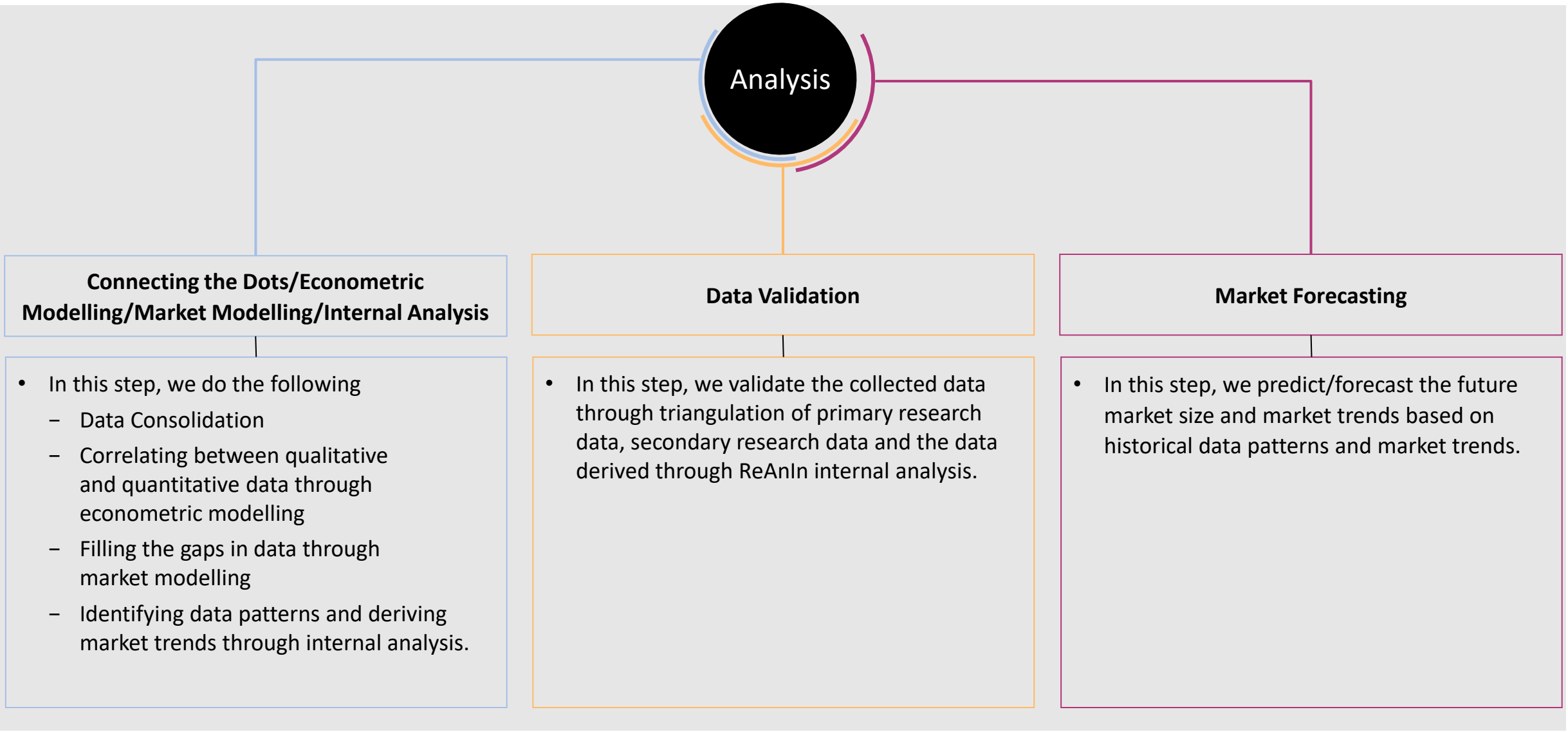
Qualitative Data

- This involves collection of information regarding various factors that impact the market/market trends. The qualitative data includes (but not limited to):
  - Information on product/service launches
  - Information on product development breakthroughs (pipeline data collection).
  - Information on regulatory changes
  - Factors affecting price changes
  - Information on regional trends.
  - Information required to determine market drivers, restraints and opportunities.
  - Changes in Political, Economic, Social and Technological factors.
  - Information about business overview and strategy of key players in the market.
  - Information required for SWOT Analysis of companies.
  - Information required to analyze Porter's Five Forces.

Quantitative Data

- This involves collection of data to determine market size, market share, company revenues etc. Some of the quantitative data includes (but not limited to):
  - Average Selling Price (ASP) of products.
  - Product Volume or the data that can help in determining product volume.
  - Company financials
  - Data required to determine company market share.

RESEARCH METHODOLOGY



RESEARCH METHODOLOGY

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Research

- Market Scoping
- Fixing Market Taxonomy/Segmentation
- Data Collection

Data Collection

Primary Research

- Collection of Qualitative Data
- Collection of Quantitative Data

Secondary Research

- Collection of Qualitative Data
- Collection of Quantitative Data

Analysis

- Connecting the Dots/ Econometric Modelling/ Market Modelling/ Internal Analysis
- Data Validation
- Market Forecasting

Insights

- What's working and what's not.
- Strategies to improve revenues in near term.
- Insights on possible product obsolescence in near term and long term.
- Best go to market strategy for new companies/products.
- Strategies/Actions for being future proof.
- Investment Opportunities.
- Exit Strategies (if applicable).

ABBREVIATIONS

Mn	Million
EU	European Union
USD	United States Dollar
GDP	Gross Domestic Product
ASEAN	Association of Southeast Asian Nations
U.S.	United States
GCC	Gulf Cooperation Council
UK	United Kingdom
UAE	United Arab Emirates

CAGR	Compound Annual Growth Rate
TiO2	Titanium Dioxide
RPF	Reef Protection Factor
AFC	Africa Finance Corporation
EFSA	European Food Safety Authority
FSANZ	Food Standards Australia New Zealand
TDMA	Titanium Dioxide Manufacturers Association
RTFT	Rio Tinto Fer et Titane

SECTION 3

EXECUTIVE SUMMARY

- Market Snapshot, By Grade
- Market Snapshot, By Process
- Market Snapshot, By Application
- Market Snapshot, By Region

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET OVERVIEW

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FIGURE 3.1 Global Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030

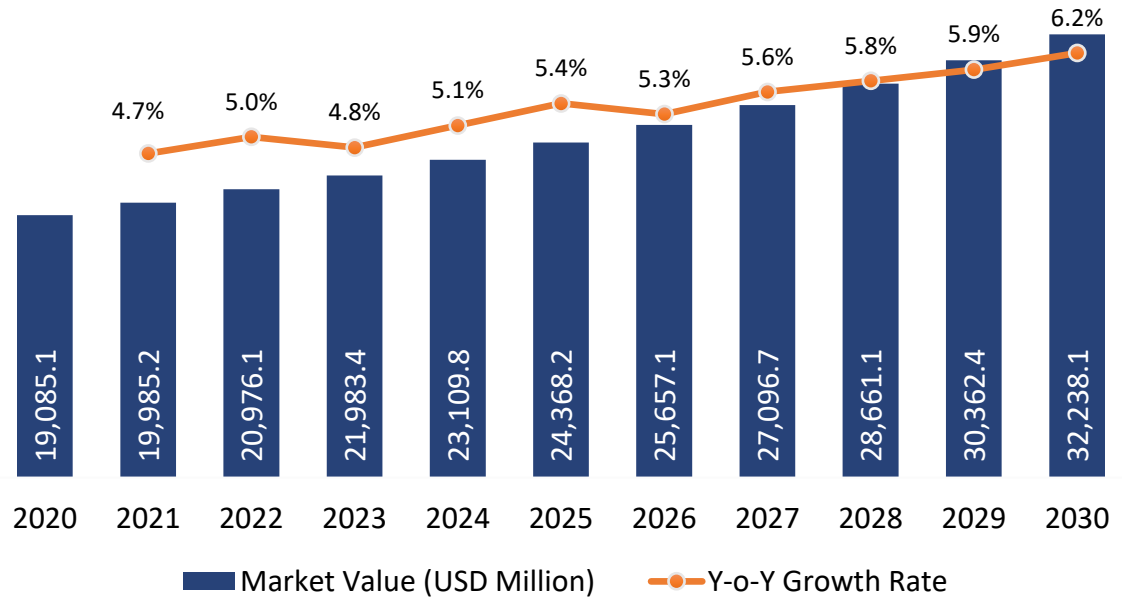
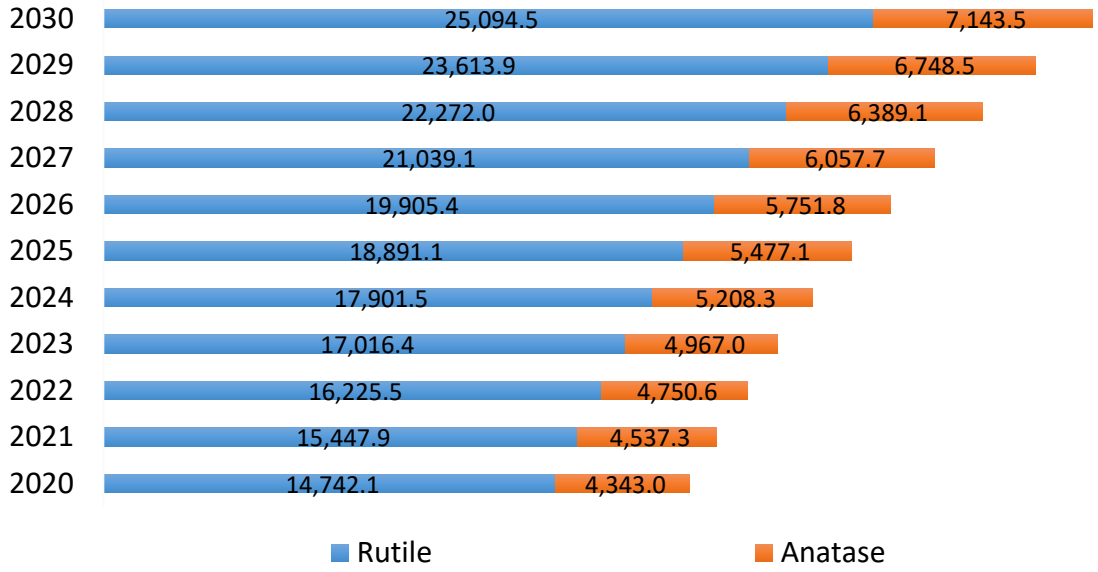


FIGURE 3.2 Global Titanium Dioxide (Tio2) Market Value (USD Million), By Grade, 2020-2030



- Global Titanium Dioxide (Tio2) Market was valued at **21,983.4 USD Million** in 2023 and is estimated to register a growth rate of **5.7%** during the forecast period (2024-2030).
- The global titanium dioxide market is flourishing, fueled by rising demand across critical industries including paints, coatings, plastics, paper, and cosmetics. Growth is being propelled by emerging economies, rapid urbanization, infrastructure development, and the automotive sector. This market expansion is anticipated to continue, offering numerous opportunities for stakeholders in various end-use sectors around the world.
- Among the Grade segment, Rutile accounted for a larger market share of **77.4%** in 2023.
- Rutile, an important titanium dioxide mineral, plays a crucial role in high-performance coatings and plastics. Its rising demand in various industries highlights its strategic importance in manufacturing. With its broad range of applications and ability to improve product performance, the market potential for rutile remains strong.

Source: ReAnIn, Primary Analysis and Secondary Analysis

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET SNIPPET

TABLE 3.1 Global Titanium Dioxide (Tio2) Market Value (USD Million), By Grade, 2022, 2026 & 2030

GRADE	2022	2026	2030
Rutile	16,225.5	19,905.4	25,094.5
Anatase	4,750.6	5,751.8	7,143.5

TABLE 3.2 Global Titanium Dioxide (Tio2) Market Value (USD Million), By Process, 2022, 2026 & 2030

PROCESS	2022	2026	2030
Sulfate	11,360.6	13,988.1	17,708.1
Chloride	9,615.5	11,669.1	14,530.0

Source: ReAnIn Analysis

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET SNIPPET

TABLE 3.3 Global Titanium Dioxide (Tio2) Market Value (USD Million), By Application, 2022, 2026 & 2030

APPLICATION	2022	2026	2030
Paints	12,643.1	15,598.6	19,791.8
Plastics	4,387.6	5,345.8	6,687.3
Paper	2,707.8	3,249.1	3,995.1
Others	1,237.6	1,463.7	1,763.9

TABLE 3.4 Global Titanium Dioxide (Tio2) Market Value (USD Million), By Region, 2022, 2026 & 2030

REGION	2022	2026	2030
North America	4,996.6	6,201.5	7,925.1
Europe	4,332.5	5,242.5	6,513.3
Asia Pacific	9,592.7	11,792.0	14,861.5
Latin America	1,310.9	1,555.2	1,899.5
Middle East & Africa	743.4	866.0	1,038.7

Source: ReAnIn Analysis

SECTION 4

MARKET ANALYSIS

- Perception Patterns
- Consumption Patterns
- White Space Analysis
- Unique/Specific Limitations
- Positioning
- Trends Analysis
- Economic Analysis (Purchasing Power Parity)

PERCEPTION PATTERNS

PERCEPTION PATTERNS

PERCEPTION PATTERNS

- Titanium dioxide (TiO2) is extensively utilized in various industries. People's views on Titanium Dioxide differ based on their knowledge and experience with the substance. Both manufacturers and consumers have distinct perspectives on it.
- Manufacturers assess TiO2 primarily based on its utility and diverse applications, which are beneficial for business. It is widely used in the cosmetics, paints and coatings, and plastics industries. This versatility, stemming from its functional properties, drives substantial demand, especially in paints and coatings. To stay competitive, manufacturers focus on factors like production capacity, cost efficiency, product quality, and other relevant aspects.
- Public opinions on Titanium Dioxide vary depending on their level of awareness and exposure. Some individuals are knowledgeable about its use in cosmetics and its properties, while others may have limited or no knowledge about it.
- For example, a report from the Scientific Committee on Consumer Safety (SCCS) of the European Commission assesses the use of pigmentary Titanium Dioxide in cosmetics, indicating ongoing evaluations regarding its safety and application in these products.

Source: ReAnIn, Primary Analysis and Secondary Analysis

CONSUMPTION PATTERNS

CONSUMPTION PATTERNS

CONSUMPTION PATTERNS

- Titanium Dioxide consumption patterns in the global market differ across various sectors and end users. These patterns are shaped by economic conditions, industry trends, and technological advancements. The primary consumers and sectors utilizing Titanium Dioxide fluctuate based on these factors and regional market dynamics.
- The paints and coatings industry is the leading consumer of Titanium Dioxide, primarily because it provides whiteness, brightness, and opacity to coatings. It is used as a pigment in paints and coatings to achieve the desired color and opacity. The construction industry, automotive sector, and architectural coatings significantly drive Titanium Dioxide consumption in this field.
- According to a study published in the Chemical Economics Handbook, the paints and coatings industry represents a substantial portion of Titanium Dioxide usage, accounting for approximately 50% to 56% of the total global volume.
- The Asia-Pacific region, including countries like China, India, and Japan, is notable for its extensive industrial activity and manufacturing sectors. These countries exhibit a high demand for Titanium Dioxide due to their large populations, numerous construction projects, and robust manufacturing industries. China, in particular, stands out as one of the largest producers and consumers of Titanium Dioxide worldwide.

Source: ReAnIn, Primary Analysis and Secondary Analysis

WHITE SPACE ANALYSIS

WHITE SPACE ANALYSIS

WHITE SPACE ANALYSIS

- Identifying untapped market opportunities in the Titanium Dioxide sector requires up-to-date market research and analysis. This process involves investigating niche or emerging applications, with a strong focus on sustainability and technological innovations, which are key to discovering and leveraging new market potentials.
- A recent study by the National Institute of Materials Physics in Bucharest, Romania, has revealed a nanofilament material based on photocatalytic titanium oxide. This material can use sunlight to extract hydrogen from water over extended periods, presenting a sustainable and cost-effective method for hydrogen fuel production.
- Research is currently being conducted on the potential applications of Titanium Dioxide in the electronics industry. The unique properties of Titanium Dioxide make it a valuable candidate for various electronic uses.
- Ongoing studies are also evaluating the safety and application of Titanium Dioxide in different products, such as cosmetics and food items. Researchers are investigating its potential health and environmental impacts, which could lead to new market opportunities for Titanium Dioxide.

UNIQUE/SPECIFIC LIMITATIONS

UNIQUE/SPECIFIC LIMITATIONS

UNIQUE/SPECIFIC LIMITATIONS

- In our continually advancing and scientifically progressive world, Titanium Dioxide presents unique limitations, especially regarding safety concerns and regulatory guidelines. Issues include its safety as a food additive and in cosmetics, uncertainties in risk assessments, occupational exposure limits, potential genotoxicity of nanoparticles, and disparities in physicochemical characteristics.
- Titanium Dioxide, commonly used as a food colorant (E171) to enhance the visual appeal of food products, has raised safety concerns. In 2022, the European Food Safety Authority (EFSA) reviewed the risks associated with Titanium Dioxide as a food additive, highlighting uncertainties and data gaps initially identified by the French Agency for Food, Environment, and Occupational Health Safety.
- The unique properties of Titanium Dioxide nanoparticles have attracted attention for various applications. However, their small size raises concerns about potential health and environmental impacts. Until relevant toxicological and human exposure data are available, the use of TiO2 nanoparticles should be approached with caution.
- Studies on Titanium Dioxide nanoparticles (TiO2 NPs) suggest potential health risks, especially through inhalation exposure. While animal studies have shown adverse effects, human evidence remains limited. To ensure safety, there is a need for comprehensive risk assessments, detailed physicochemical characterizations, long-term toxicity studies, toxicokinetics research, and exploration of the molecular mechanisms of TiO2 NP-induced carcinogenesis.

Source: ReAnIn, Primary Analysis and Secondary Analysis

POSITIONING

POSITIONING

POSITIONING

- The perception of Titanium Dioxide in the market is shaped by changing regulations, scientific advancements, consumer trends, and sustainability concerns. Both manufacturers and stakeholders are working to overcome challenges and fulfill the demands of consumers and end-users.
- Manufacturers: Titanium Dioxide is highly regarded by manufacturers for its ability to improve product performance and appearance. However, they must navigate safety issues, regulatory requirements, and the necessity for ongoing research and development.
- Consumers: Consumers favor Titanium Dioxide in items like sunscreen due to its effective sun protection. Yet, there are continuous debates and studies about the safety of this ingredient. With growing awareness of safety and environmental impacts, consumers increasingly demand transparency and sustainable alternatives.
- Titanium Dioxide's capacity to enhance product durability and aesthetics is also notable. When choosing and utilizing Titanium Dioxide-based products, manufacturers weigh factors like cost, environmental impact, and regulatory adherence.
- To enhance the reputation and market presence of Titanium Dioxide, companies can distinguish their products, target specific consumer groups, inform consumers about safety and efficacy, collaborate with experts, and explore new market possibilities.

TRENDS ANALYSIS

TRENDS ANALYSIS

- The Titanium Dioxide market is shaped by several current trends and developments, which are pivotal in determining the market dynamics and the industry's future direction.
- Ongoing debates and controversies regarding the safety of Titanium Dioxide in applications like food additives and healthcare are prominent. These issues necessitate additional research and development to mitigate safety and environmental concerns.
- In the realm of drug delivery systems, Titanium Dioxide nanoparticles are being investigated for their potential in enabling controlled release and targeted drug delivery.
- There is a rising demand for sustainable and eco-friendly products. Innovations in the production process and the creation of sustainable alternatives to Titanium Dioxide could influence its market share.
- Technological progress and research initiatives may lead to the development of superior Titanium Dioxide products with enhanced features, such as improved UV protection, better dispersion, and a reduced environmental footprint.

ECONOMIC ANALYSIS (PURCHASING POWER PARITY)

ECONOMIC ANALYSIS
(PURCHASING POWER PARITY)

ECONOMIC ANALYSIS (PURCHASING POWER PARITY)

- The economic status of a region or country significantly impacts the Titanium Dioxide market. Elements like GDP growth, industrial production, construction activities, consumer spending, and trade policies shape the demand and supply dynamics of Titanium Dioxide.
- A prominent example of this influence is the global supply chain disruptions caused by the COVID-19 pandemic. The subsequent economic recovery and growth in China, combined with purchasing power parity, had a substantial effect on the Titanium Dioxide market. China plays a crucial role as both a leading consumer and producer of Titanium Dioxide globally.
- As China's economy rebounded from the pandemic's effects, there was a marked increase in industrial production, construction activities, and consumer spending. Improved economic conditions and higher purchasing power among Chinese consumers significantly boosted the demand for Titanium Dioxide across various sectors, including automotive, construction, and cosmetics.
- For instance, the semiconductor shortage has impacted multiple industries, including the automotive sector, which relies heavily on Titanium Dioxide for coatings and pigments used in vehicle applications.
- The growth of the Titanium Dioxide market is driven by the economic conditions of a region or country. Factors such as economic recovery, infrastructure development, government stimulus packages, and favorable trade policies positively influence the demand for Titanium Dioxide. Conversely, economic downturns, trade disputes, and financial instability can negatively affect the market.

Source: ReAnIn, Primary Analysis and Secondary Analysis

SECTION 5

MARKET DYNAMICS

- Drivers, Restraints, and Opportunities
- Impact Analysis
- PEST Analysis
- Porter’s Analysis

MARKET DYNAMICS

DRIVERS

- RISING DEMAND IN PAINTS AND COATINGS

RESTRAINTS

- RAW MATERIAL PRICE VOLATILITY

OPPORTUNITIES

- SUSTAINABILITY PACKAGING AND PRINTING INKS

Source: ReAnIn Analysis and Secondary Analysis

RISING DEMAND IN PAINTS AND COATINGS

- Titanium dioxide, also known as titanium(IV) oxide, is an inorganic compound with the chemical formula TiO_2. This highly adaptable pigment is widely utilized across various industries, such as in paints, sunscreens, and food coloring. It is estimated that titanium dioxide is integral to about two-thirds of all pigment formulations.

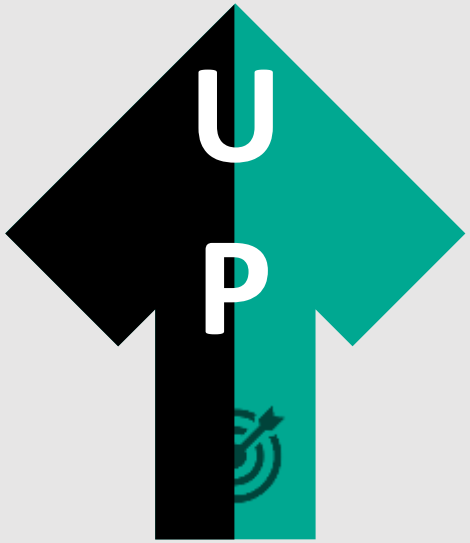
- In paints, titanium dioxide pigment delivers superior whiteness and opacity, providing exceptional hiding power that effectively masks the underlying surface, outperforming other white pigments. These attributes are due to titanium dioxide's high refractive index, which determines its capability to refract and scatter light.

- Titanium dioxide boasts a refractive index higher than that of diamond, making it the material with the highest refractive index. When combined with other white pigments, it imparts opacity to paint films by diffusely reflecting light. This light dispersion and refraction result in almost complete reflection of visible light, giving the paint film a bright, white, and opaque appearance.

- Besides enhancing whiteness, TiO_2 plays a crucial role in maintaining the stability of paint colors, preventing fading and discoloration caused by sunlight and environmental factors. Its ease of dispersion ensures a uniform distribution, preserving consistent color and paint characteristics.

- In July 2023, the introduction of Ti-Pure TS-6700 marked a significant advancement in TiO_2 performance and sustainability. Developed by Chemours for water-based architectural coatings, this pigment set a new benchmark with its outstanding physicochemical properties and sustainability features.

- To sum up, the primary reasons for using titanium dioxide in the paints and coatings industry are its ability to enhance the quality, durability, and performance of paints. As the industry continues to advance, TiO_2 will remain an essential component in the development of high-quality paints.



Source: ReAnIn, Primary Analysis, Secondary Analysis.

RESTRAINTS

RAW MATERIAL PRICE VOLATILITY

- The erratic swings in prices of critical raw materials used in titanium dioxide production, such as titanium ore and other minerals, pose significant challenges in establishing stable cost structures. This volatility complicates financial forecasting and budgeting for manufacturers, undermining their overall financial stability.
- Rising raw material costs directly drive up production expenses for titanium dioxide, presenting manufacturers with obstacles in maintaining profitability during periods of heightened expenditure. This financial strain puts pressure on the industry as a whole.
- In the titanium dioxide sector, unexpected spikes in raw material prices create competitive disadvantages for companies. Inability to absorb these increased costs threatens competitiveness and potentially diminishes market share.
- Fluctuating raw material prices continuously challenge profit margins in titanium dioxide manufacturing. Sharp cost increases, without corresponding adjustments in product pricing, squeeze profit margins and present financial hurdles for industry players.
- The investment landscape for titanium dioxide production facilities is fraught with uncertainty due to fluctuating raw material prices. Long-term planning becomes difficult as the industry grapples with the unpredictable nature of essential input costs.
- The titanium dioxide industry must navigate the impacts of unpredictable raw material prices on cost structures, profitability, competitiveness, and investment certainty, demanding strategic resilience and adaptability for sustained success.

OPPORTUNITIES

SUSTAINABILITY PACKAGING AND PRINTING INKS

- Titanium dioxide plays a pivotal role in enhancing the sustainability of packaging through multiple avenues. Firstly, it enhances the visual appeal of paper and cardboard by improving their whiteness, opacity, and printability. This not only reduces the need for excessive ink but also supports sustainable packaging goals by making products more visually appealing.

- Additionally, titanium dioxide's photocatalytic properties pave the way for innovative packaging materials that are self-cleaning and air-purifying. This innovation not only helps maintain cleanliness throughout production and use but also contributes to improved air quality, thereby reducing environmental impact.

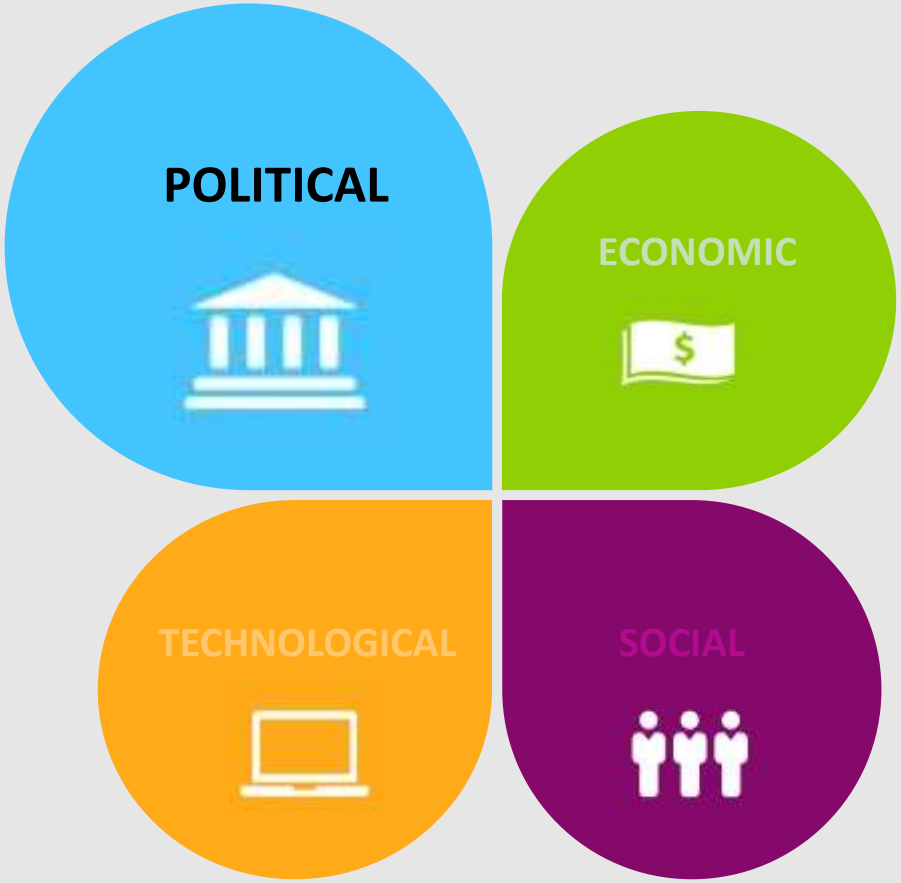
- Furthermore, the titanium dioxide sector collaborates closely with packaging and printing ink manufacturers to drive sustainable advancements. Ongoing research and development efforts are focused on exploring new formulations, refining processes, and expanding applications across various industries.

- In a recent development, Covestro partnered with KRONOS in November 2023 to pioneer new materials for inkjet printing on fabrics, underscoring their commitment to sustainable practices in the textile sector.

- The growing demand for high-quality inks, coupled with collaborative efforts promoting sustainability and the expanding applications in eco-friendly and smart packaging solutions, are anticipated to fuel the global titanium dioxide market's growth in the coming years.

Source: ReAnIn, Primary Analysis, Secondary Analysis, Company websites .

PEST ANALYSIS

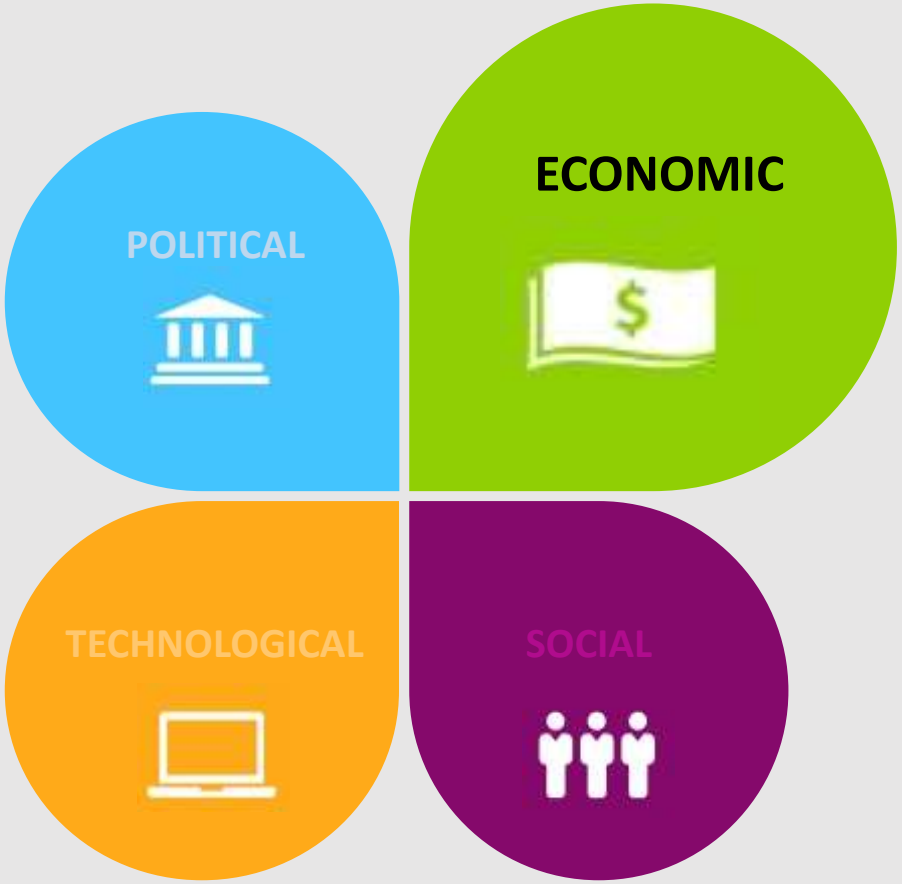


POLITICAL FACTORS

- Stringent government regulations significantly impact the titanium dioxide industry, influencing manufacturing processes and prompting investments in cleaner technologies for emissions, waste disposal, and chemical processing.
- International trade policies and tariffs have significantly impacted the Titanium Dioxide market. Changes in import/export regulations and trade agreements affect the cost of raw materials, which in turn affects supply chain dynamics and the competitiveness of manufacturers.
- In April 2023, the Food and Drug Administration (FDA) filed a petition to repeal the use of titanium dioxide in food. The petition was submitted by several environmental organizations, who argue that the safety standard for this color additive is no longer met. They cite an opinion by the European Food Safety Authority (EFSA) and the European Commission's ban on titanium dioxide as evidence.
- These factors have the potential to significantly influence the development and growth of the titanium dioxide market.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and US Department of Health And Human Services.

PEST ANALYSIS

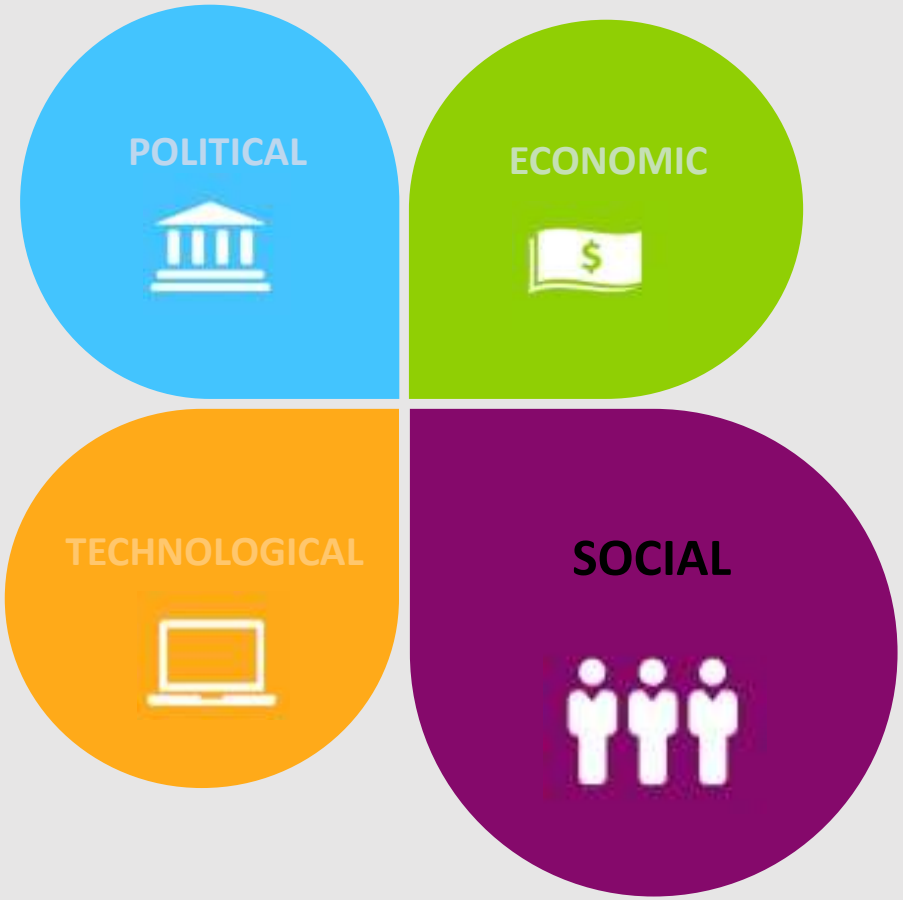


ECONOMIC FACTORS

- The titanium dioxide industry is influenced by global economic conditions, and economic downturns have the potential to decrease industrial activities, impacting demand in sectors such as construction, automotive, and consumer goods.
- Exchange rate fluctuations heavily impact the cost of raw materials, production, and international sales of titanium dioxide, a globally traded commodity. A stronger domestic currency increases export costs and potentially affects competitiveness in global markets.
- Fluctuations in economic conditions have a direct impact on consumer spending, influencing the demand for titanium dioxide-containing products like paints, coatings, and plastics in consumer goods, which is sensitive to income levels and consumer confidence.
- These factors had a significant impact on the growth of the market.

Source: ReAnIn, Primary Analysis and Secondary Analysis

PEST ANALYSIS

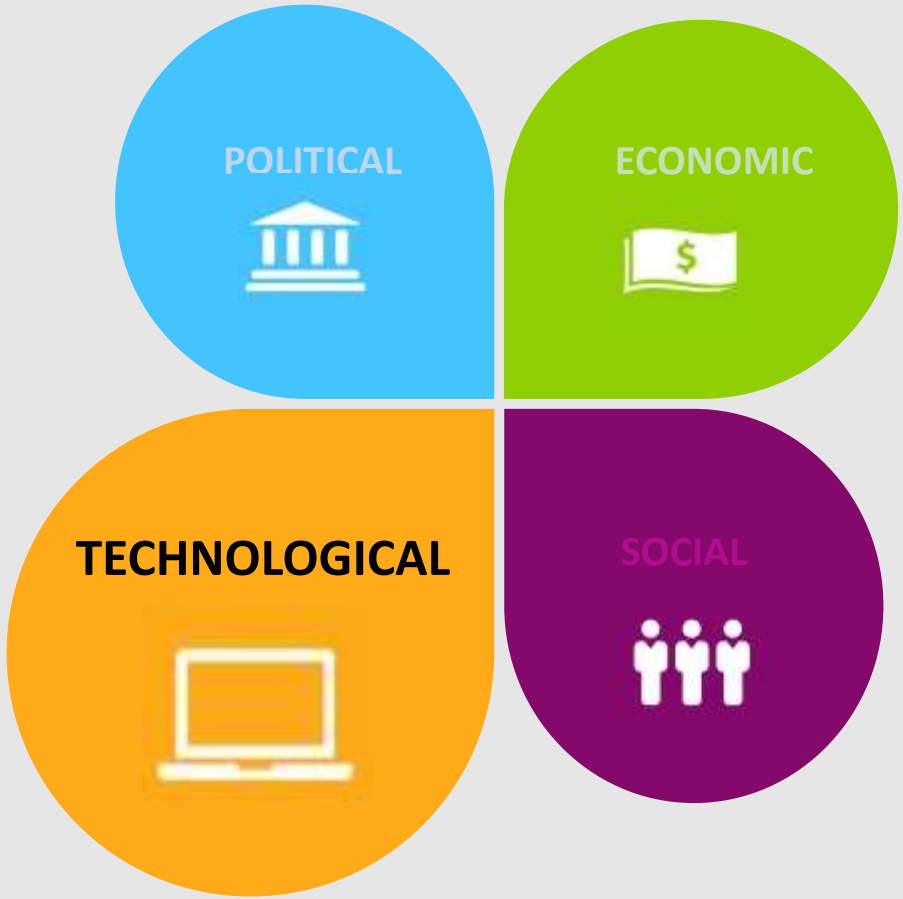


SOCIAL FACTORS

- Increased awareness of health and safety issues among consumers and workers can influence regulations in the titanium dioxide industry, leading to changes in production processes to enhance worker safety and reduce health risks associated with titanium dioxide exposure.
- Changing consumer preferences, emphasizing sustainability, can affect the demand for products with titanium dioxide. Manufacturers may embrace eco-friendly production methods in response to increased awareness of sustainable practices.
- Demographics, such as population growth and urbanization, affect the demand for titanium dioxide. The rise in urban areas results in increased construction activities, elevating the requirement for titanium dioxide in paints and coatings.
- Social dynamics, including health and safety awareness, consumer preferences, demographic shifts, and ethical considerations, shape the titanium dioxide industry, driving changes in production, demand, and sustainability practices.

Source: ReAnIn, Primary Analysis, Secondary Analysis

PEST ANALYSIS



TECHNOLOGICAL FACTORS

- Ongoing technological advancements enhance the efficiency of titanium dioxide production, while research and development investments empower companies to maintain competitiveness and reduce production costs.
- The incorporation of automation and robotics into titanium dioxide manufacturing enhances precision, reduces labor costs, and improves overall production efficiency, resulting in increased productivity for manufacturers.
- In November 2023, Croda introduced sunscreen components, such as Solaveil CT-60W, utilizing Solaveil Clarus technology. This water-based dispersion of titanium dioxide delivers enhanced SPF protection without the typical whitening effect, ensuring skin clarity without compromising SPF efficacy.
- These factors had a positive impact on the market and are expected to grow further.

Source: ReAnIn, Primary Analysis and Secondary Analysis, and Company webisite.

PORTER'S ANALYSIS

BARGAINING POWER OF SUPPLIERS

- The bargaining power of suppliers is **moderate** in the Titanium dioxide market
- Transitioning suppliers in the titanium dioxide industry may involve moderate costs, but it remains feasible. Manufacturers can explore alternative sources, minimizing switching expenses and bolstering their bargaining power.
- The titanium dioxide industry acquires raw materials, such as titanium ore and minerals, from diverse global suppliers. The lack of a highly concentrated supplier base diminishes the influence of individual suppliers.
- In summary, while transitioning suppliers in the titanium dioxide industry incur moderate costs, the availability of diverse global sources minimizes switching expenses, strengthening manufacturers' bargaining power.

BARGAINING POWER OF BUYERS

- The bargaining power of buyers is **low** in the Titanium dioxide market
- Transitioning to a new titanium dioxide supplier involves substantial costs, including adjusting to new formulations, testing, and potential supply chain disruptions, discouraging casual changes by buyers.
- The pivotal role of titanium dioxide in manufacturing significantly impacts the quality of final products. Suppliers wield enhanced control over pricing and terms due to heightened demand from buyers for this essential component.
- Titanium dioxide's uniqueness, limited substitutes, industry concentration, essential role, switching costs, product differentiation, and long-term contracts collectively strengthen supplier control, diminishing buyer bargaining power in the market.

PORTER'S ANALYSIS

THREAT OF NEW ENTRANT

- Threat of new entrants is **low** in the Titanium dioxide market
- The titanium dioxide industry poses high entry barriers, primarily attributed to substantial capital requirements for establishing manufacturing plants, creating challenges for potential new entrants.
- Established manufacturers leverage economies of scale for efficient large-scale titanium dioxide production. New entrants may encounter challenges achieving similar cost efficiencies, resulting in a production cost disadvantage.
- Ensuring a stable and cost-effective supply of raw materials, such as titanium ore, is essential for titanium dioxide production. Established supply chain relationships of existing players present difficulties for new entrants in securing competitive access.
- The titanium dioxide industry's high entry barriers, driven by substantial capital requirements and challenges in achieving cost efficiencies, create a competitive landscape favoring established players over potential new entrants.

THREAT OF SUBSTITUTION

- The threat of substitution is **moderate** in the Titanium dioxide market
- The distinctive optical features of titanium dioxide, such as a high refractive index and brightness, create challenges for substitutes in applications with specific optical requirements.
- Titanium dioxide plays a crucial role in determining the color, opacity, and quality of diverse end products. Its unique properties pose challenges for substitutes to meet performance standards, limiting the feasibility of substitution without compromising product quality.
- Regulatory approval and adherence to industry standards for titanium dioxide establish a barrier to testing and approval for substitutes, curbing their rapid adoption and mitigating the threat of substitution.
- The unique optical and performance characteristics of titanium dioxide, coupled with regulatory approval barriers, collectively limit the viability of substitutes, reinforcing titanium dioxide's market position.

Source: ReAnIn, Primary Analysis and Secondary Analysis

PORTER'S ANALYSIS

COMPETITIVE RIVALRY

- Competitive rivalry in the Titanium dioxide market is **high**.
- Suppliers frequently distinguish their titanium dioxide products through variations in quality, purity, and specific applications, heightening competition as manufacturers aim to provide distinctive features and target niche markets.
- Established manufacturers capitalize on economies of scale, enabling efficient large-scale production of titanium dioxide. This cost advantage presents challenges for smaller or newer entrants, intensifying competition.
- Swift technological progress in titanium dioxide production processes and formulations fuels ongoing innovation. Competitors aim to lead in technological advancements, seeking a competitive edge in efficiency and product performance.
- In conclusion, the titanium dioxide industry faces heightened competition driven by market concentration, slow growth, product differentiation, economies of scale, brand loyalty, global dynamics, technological advancements, and price wars.

SECTION 6

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET – SEGMENTATION

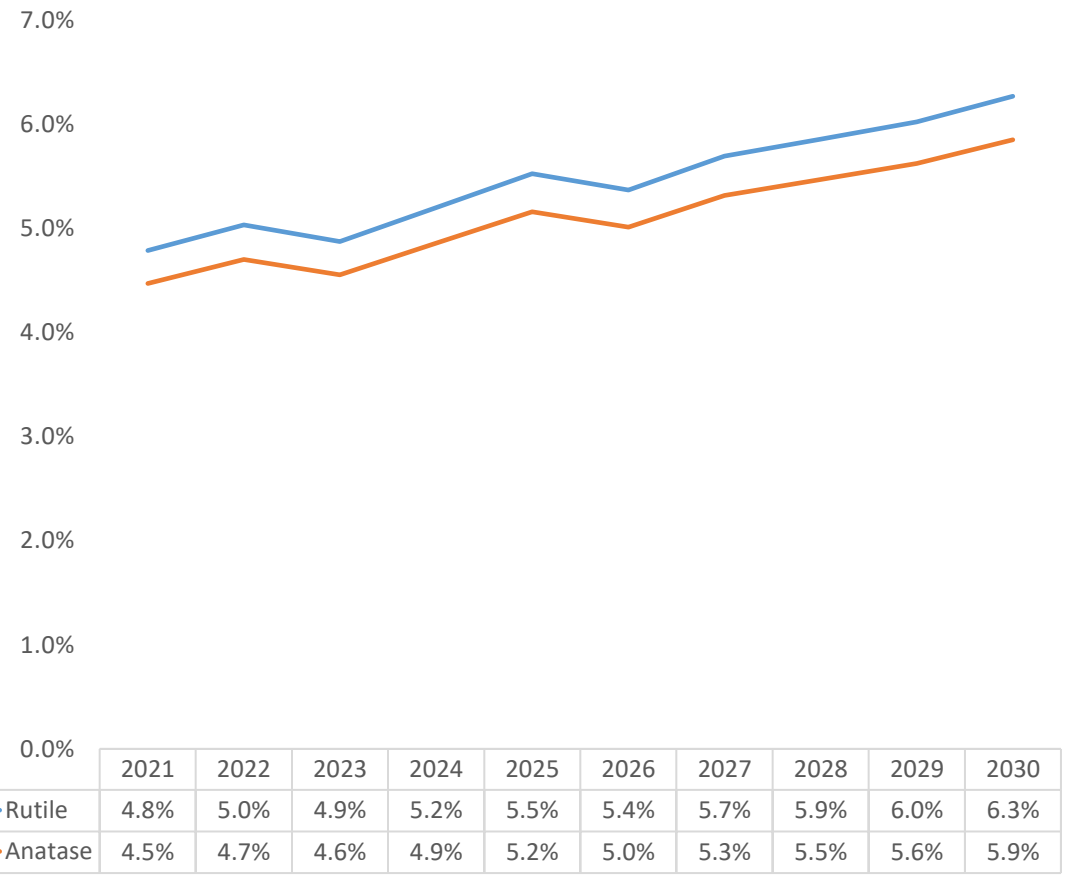
6.1 - By Grade

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.1.1 Global Titanium Dioxide (Tio2) Market – Value Share (%), By Grade, 2022, 2026 & 2030

GRADE	2022	2026	2030
Rutile	77.4%	77.6%	77.8%
Anatase	22.6%	22.4%	22.2%

FIGURE 6.1.1 Global Titanium Dioxide (Tio2) Market Y-o-Y Growth (%), By Grade, 2021-2030



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Rutile	4.8%	5.0%	4.9%	5.2%	5.5%	5.4%	5.7%	5.9%	6.0%	6.3%
Anatase	4.5%	4.7%	4.6%	4.9%	5.2%	5.0%	5.3%	5.5%	5.6%	5.9%

Source: ReAnIn Analysis and Primary Analysis

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

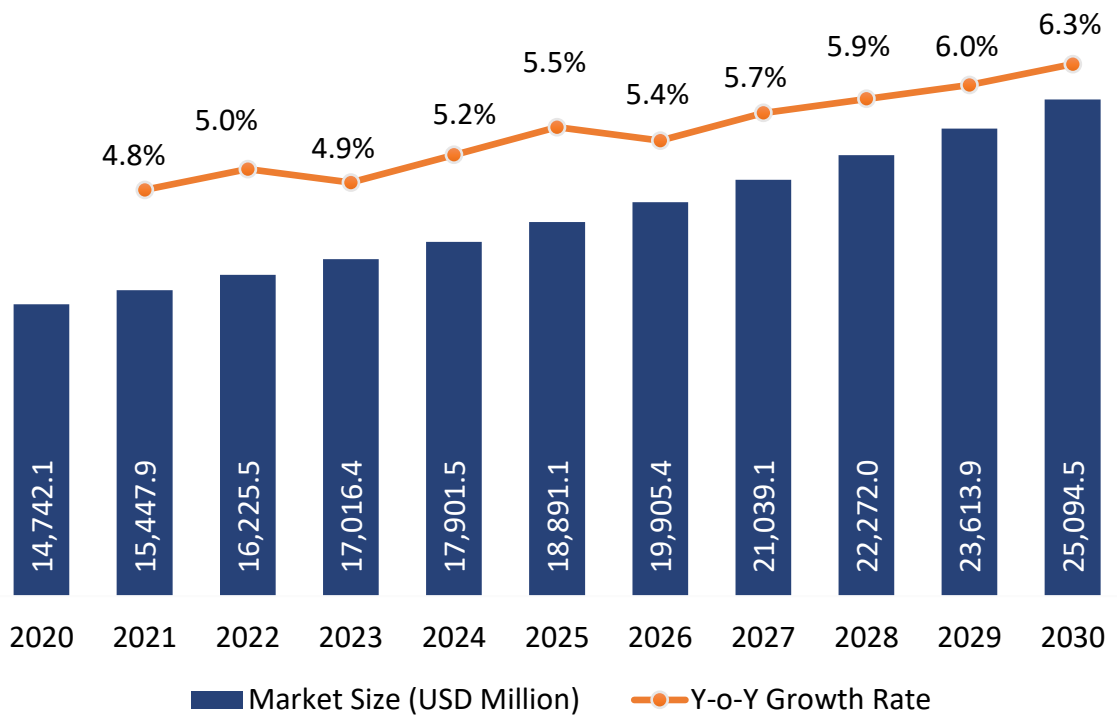
TABLE 6.1.2 Global Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	14,742.1	15,447.9	16,225.5	17,016.4	17,901.5	18,891.1	19,905.4	21,039.1	22,272.0	23,613.9	25,094.5	**5.8%**
Anatase	4,343.0	4,537.3	4,750.6	4,967.0	5,208.3	5,477.1	5,751.8	6,057.7	6,389.1	6,748.5	7,143.5	**5.4%**
Total	**19,085.1**	**19,985.2**	**20,976.1**	**21,983.4**	**23,109.8**	**24,368.2**	**25,657.1**	**27,096.7**	**28,661.1**	**30,362.4**	**32,238.1**	**5.7%**

Source: ReAnIn Analysis and Primary Analysis

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

FIGURE 6.1.2 Global Titanium Dioxide (Tio2) Market Value (USD Million), By Rutile, 2020-2030



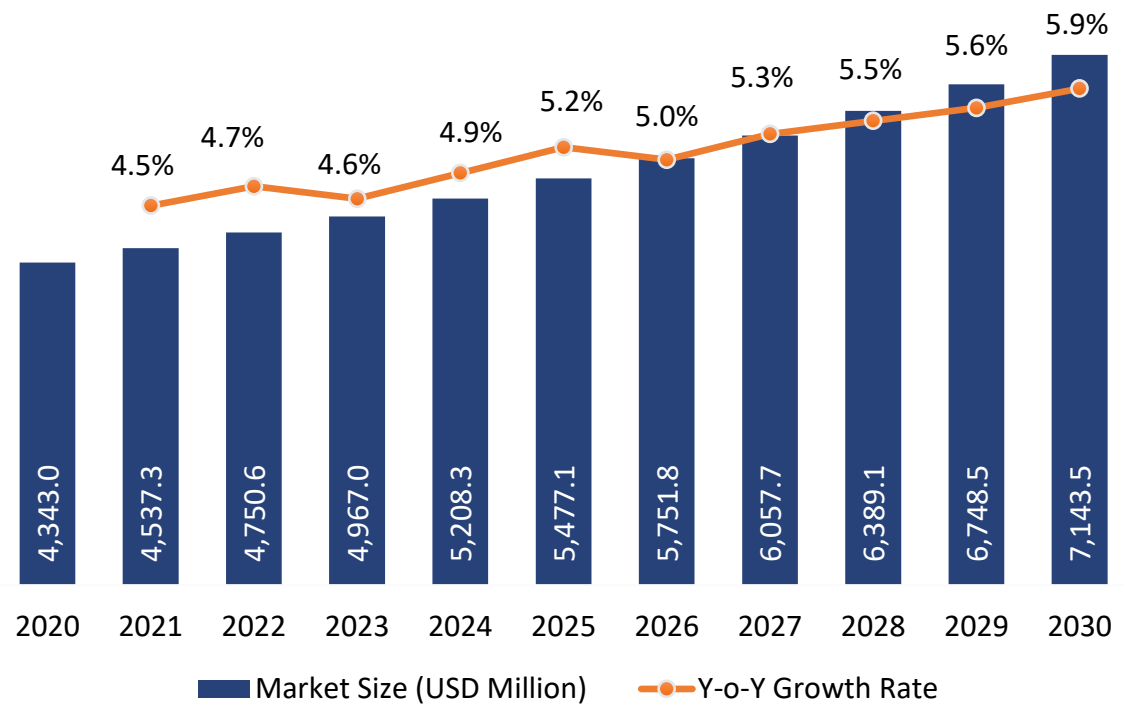
1.4x **Projected growth of Rutile during the forecast period of 2024-2030**

- **Rutile** segment was valued at **US$ 17,016.4 Mn** in 2023 and is estimated to reach **US$ 25,094.5 Mn** in 2030, expanding at a CAGR of **5.8%** during the forecast period.
- Market share percentage of **Rutile** in 2023 was valued at **77.4%,** estimated to account for **77.8%** in 2030, during the forecast period.
- Rutile, when processed, transforms into titanium dioxide, a versatile white pigment used in paints, plastics, and various applications, driven by environmental concerns and expanding to UV protection and emerging technologies.
- In January 2023, Chemours introduced Ti-Pure TS-1510, a sustainable rutile Titanium Dioxide (TiO_2) pigment. Designed for plastics masterbatch producers, it enhanced processing performance, reduced energy use, and lowered the carbon footprint, offering recyclable packaging and improved efficiency.
- In April 2020, Shandong Jinhai relocated its 100,000-ton-per-year rutile titanium dioxide (TiO_2) production line to Binzhou, Shandong. The project, which covered 150,000 square meters and cost RMB 550 million, aimed to enhance technological and environmental standards, thereby improving TiO_2 production capabilities.
- Chemours' sustainable rutile TiO_2 pigment enhances processing and reduces carbon footprint. Shandong Jinhai's relocation aims to improve rutile TiO_2 production capabilities, enhancing technological and environmental standards.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Website.

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

FIGURE 6.1.3 Global Titanium Dioxide (Tio2) Market Value (USD Million), By Anatase, 2020-2030



1.4x **Projected growth of Anatase during the forecast period of 2024-2030**

- **Anatase** segment was valued at **US$ 4,967.0 Mn** in 2023 and is estimated to reach **US$ 7,143.5 Mn** in 2030, expanding at a CAGR of **5.4%** during the forecast period.
- Market share percentage of **Anatase** in 2023 was valued at **22.6%,** estimated to account for **22.2%** in 2030, during the forecast period.
- Anatase, a tetragonal crystalline form of titanium dioxide, is extensively utilized in high-quality paints, coatings, and fiber treatments. Within the cosmetics industry, it functions as a pigment, sunscreen, and thickener, improving opacity in various products.
- In November 2022, Shizuoka University, in collaboration with partners, developed a cost-effective method for synthesizing epitaxial thin films of anatase titanium dioxide, which is notably cheaper than vapor phase techniques. This innovation holds promise for advancing understanding of photocatalytic properties, doping effects, and their applications in solar cells, as detailed in the Chemical Engineering Journal.
- In June 2024, Empire Metals Ltd announced a major find of rutile and anatase deposits, rich in Titanium Dioxide (TiO_2), at the Pitfield project in Western Australia. These nearly 95% pure TiO_2 minerals were ideal for high-end applications, simplifying processing and enhancing the project's economics and development dynamics.
- The advancements in titanium dioxide synthesis and the discovery of high-purity deposits signify significant strides toward cost-efficient, high-performance applications in various industries.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Website.

SECTION 6

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET – SEGMENTATION

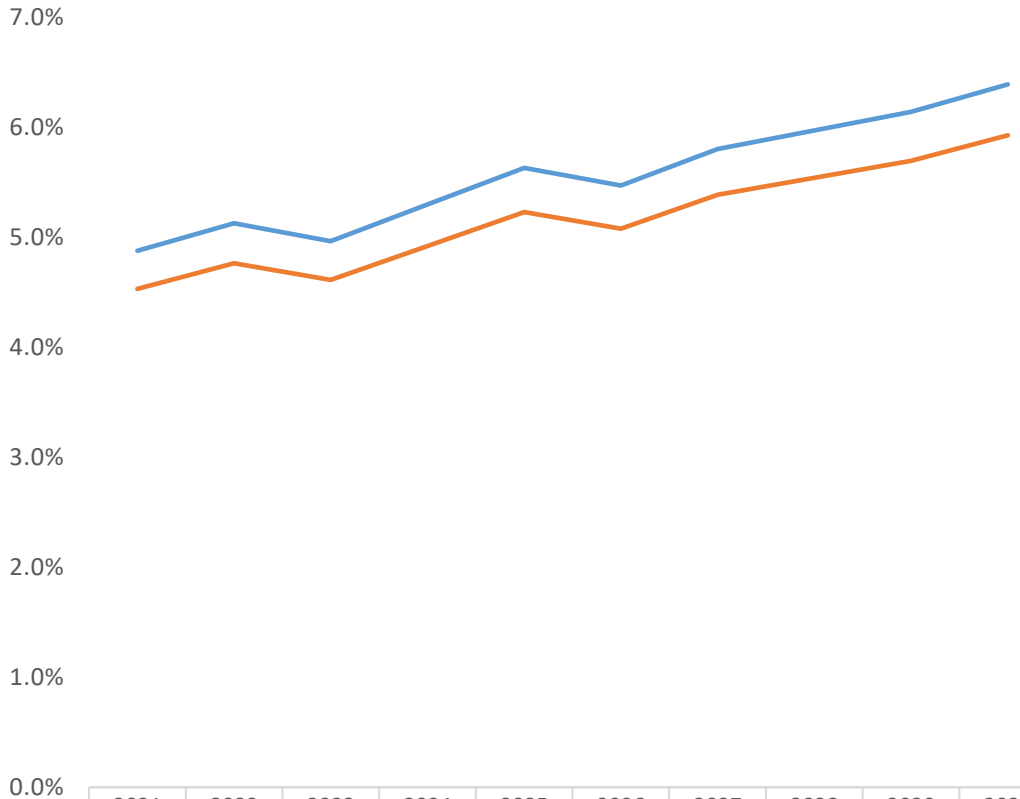
6.2 - By Process

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.2.1 Global Titanium Dioxide (Tio2) Market – Value Share (%), By Process, 2022, 2026 & 2030

PROCESS	2022	2026	2030
Sulfate	54.2%	54.5%	54.9%
Chloride	45.8%	45.5%	45.1%

FIGURE 6.2.1 Global Titanium Dioxide (Tio2) Market Y-o-Y Growth (%), By Process, 2021-2030



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Sulfate	4.9%	5.1%	5.0%	5.3%	5.6%	5.5%	5.8%	6.0%	6.1%	6.4%
Chloride	4.5%	4.8%	4.6%	4.9%	5.2%	5.1%	5.4%	5.5%	5.7%	5.9%

Source: ReAnIn Analysis and Primary Analysis

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

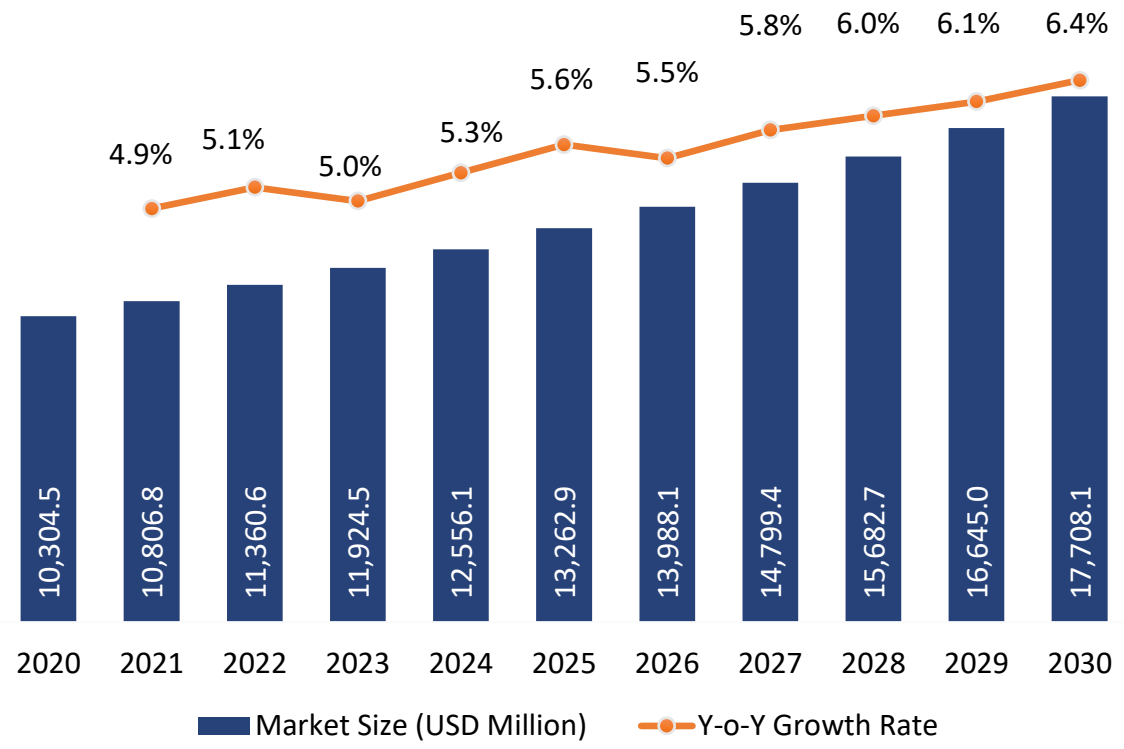
TABLE 6.2.2 Global Titanium Dioxide (Tio2) Market Value (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	10,304.5	10,806.8	11,360.6	11,924.5	12,556.1	13,262.9	13,988.1	14,799.4	15,682.7	16,645.0	17,708.1	**5.9%**
Chloride	8,780.6	9,178.4	9,615.5	10,058.9	10,553.7	11,105.3	11,669.1	12,297.3	12,978.4	13,717.3	14,530.0	**5.5%**
Total	**19,085.1**	**19,985.2**	**20,976.1**	**21,983.4**	**23,109.8**	**24,368.2**	**25,657.1**	**27,096.7**	**28,661.1**	**30,362.4**	**32,238.1**	**5.7%**

Source: ReAnIn Analysis and Primary Analysis

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

FIGURE 6.2.2 Global Titanium Dioxide (Tio2) Market Value (USD Million), By Sulfate, 2020-2030



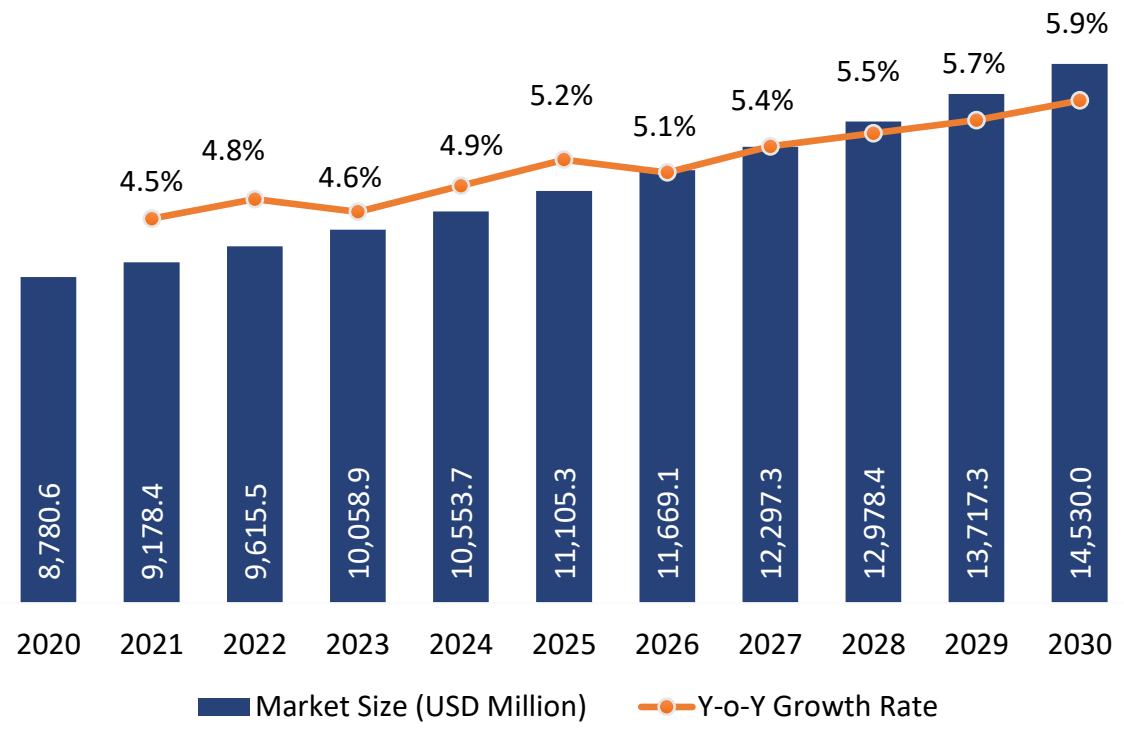
1.4x **Projected growth of Sulfate during the forecast period of 2024-2030**

- **Sulfate** segment was valued at **US$ 11,924.5 Mn** in 2023 and is estimated to reach **US$ 17,708.1 Mn** in 2030, expanding at a CAGR of **5.9%** during the forecast period.
- Market share percentage of **Sulfate** in 2023 was valued at **54.2%,** estimated to account for **54.9%** in 2030, during the forecast period.
- Sulfate process TiO2, a crucial pigment, originates from titanium-bearing ores like ilmenite, employing cost-effective methods. Its versatility benefits industries including paints, plastics, coatings, cosmetics, and food coloring, while continuous efforts strive to improve environmental sustainability.
- Tronox Holdings Plc. offers Titanium dioxide (TiO2) pigment, a versatile white pigment widely used in coatings and plastics, comprising over 80% of global consumption. The company provides a range of TiONA and TiKON products, utilizing both proprietary chloride and sulfate processes for manufacturing.
- In February 2023, LB Group will promote its latest titanium dioxide (TiO_2) pigments for coatings and inks at ECS 2023. The lineup includes sulfate-process TiO_2 pigments like BILLIONS R-996 for architectural and industrial coatings, chloride-process pigments like BILLIONS BLR-895 for brilliant whiteness, and specialized options such as BILLIONS TR53 for printing inks.
- Tronox Holdings Plc. makes a versatile white pigment called TiO2 using special processes. The LB Group is showing how important these processes are for making coatings and inks at ECS 2023.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Website.

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

FIGURE 6.2.3 Global Titanium Dioxide (Tio2) Market Value (USD Million), By Chloride, 2020-2030



1.4x **Projected growth of Chloride during the forecast period of 2024-2030**

- **Chloride** segment was valued at **US$ 10,058.9 Mn** in 2023 and is estimated to reach **US$ 14,530.0 Mn** in 2030, expanding at a CAGR of **5.5%** during the forecast period.
- Market share percentage of **Chloride** in 2023 was valued at **45.8%,** estimated to account for **45.1%** in 2030, during the forecast period.
- The chloride process, vital in TiO2 production alongside sulfate, involves chlorinating titanium-bearing ores like rutile or ilmenite, extracting refined TiO2 known for superior optical properties in various applications.
- In December 2019, PPG announced the utilization of titanium dioxide (TiO2) pigment from Lomon Billions new chloride production line. Lomon Billions had expanded its chloride technology capacity to meet PPG's quality requirements for paints and coatings manufacturing.
- In November 2020, Xinli Titanium achieved remarkable chloride titanium dioxide production milestones. Their system operated continuously for a record-breaking 309 hours and 9 minutes, producing 5,138 tons of base material and 5,160 tons of titanium dioxide, marking a new high in production efficiency and output.
- Innovative chloride technology in titanium dioxide production, as demonstrated by Lomon Billions and Xinli Titanium, sets new benchmarks for efficiency and output, meeting industry demands for high-quality paints and coatings.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Website.

SECTION 6

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET – SEGMENTATION

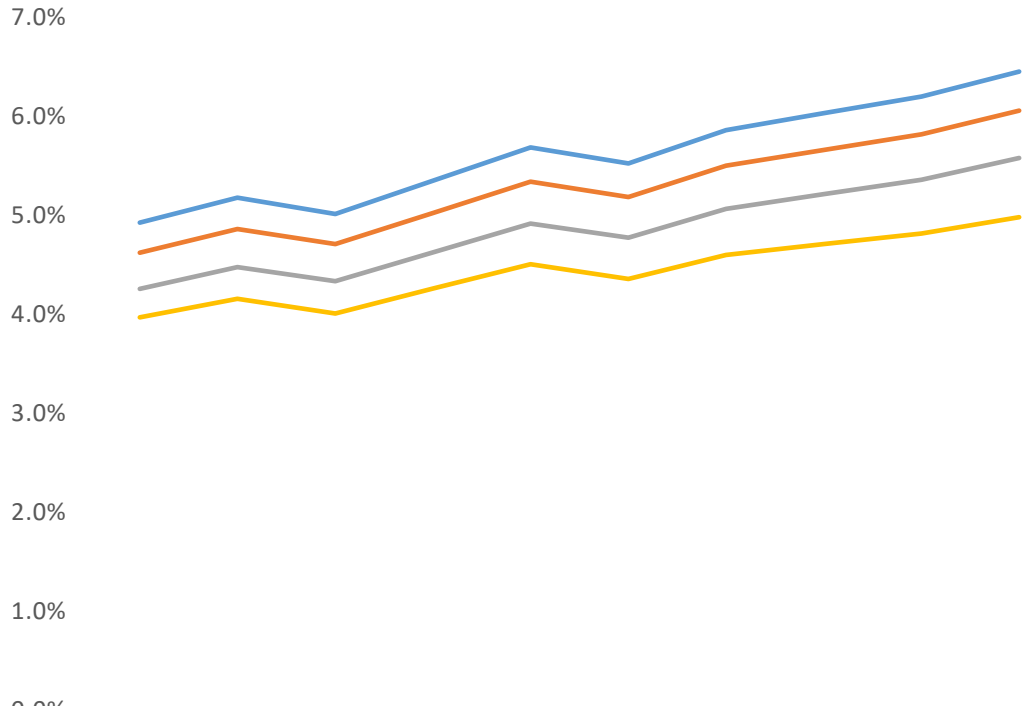
6.3 - By Application

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

TABLE 6.3.1 Global Titanium Dioxide (Tio2) Market – Value Share (%), By Application, 2022, 2026 & 2030

APPLICATION	2022	2026	2030
Paints	60.3%	60.8%	61.4%
Plastics	20.9%	20.8%	20.7%
Paper	12.9%	12.7%	12.4%
Others	5.9%	5.7%	5.5%

FIGURE 6.3.1 Global Titanium Dioxide (Tio2) Market Y-o-Y Growth (%), By Application, 2021-2030



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Paints	4.9%	5.2%	5.0%	5.3%	5.7%	5.5%	5.9%	6.0%	6.2%	6.4%
Plastics	4.6%	4.9%	4.7%	5.0%	5.3%	5.2%	5.5%	5.7%	5.8%	6.1%
Paper	4.3%	4.5%	4.3%	4.6%	4.9%	4.8%	5.1%	5.2%	5.4%	5.6%
Others	4.0%	4.2%	4.0%	4.3%	4.5%	4.4%	4.6%	4.7%	4.8%	5.0%

Source: ReAnIn Analysis and Primary Analysis

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

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Research | Analysis | Insights

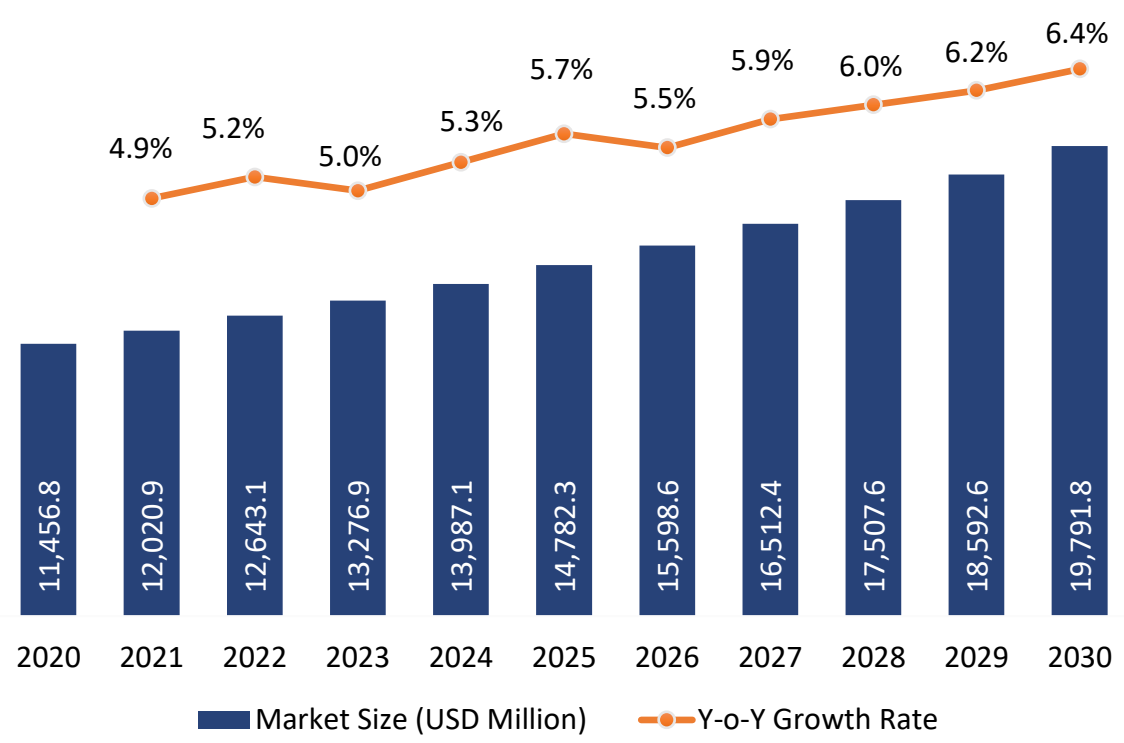
TABLE 6.3.2 Global Titanium Dioxide (Tio2) Market Value (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	11,456.8	12,020.9	12,643.1	13,276.9	13,987.1	14,782.3	15,598.6	16,512.4	17,507.6	18,592.6	19,791.8	**6.0%**
Plastics	3,999.4	4,184.2	4,387.6	4,594.1	4,824.8	5,082.3	5,345.8	5,639.7	5,958.9	6,305.5	6,687.3	**5.6%**
Paper	2,486.0	2,591.8	2,707.8	2,825.1	2,955.8	3,101.1	3,249.1	3,413.7	3,591.6	3,784.0	3,995.1	**5.1%**
Others	1,142.9	1,188.3	1,237.6	1,287.2	1,342.1	1,402.5	1,463.7	1,531.0	1,603.0	1,680.2	1,763.9	**4.7%**
Total	**19,085.1**	**19,985.2**	**20,976.1**	**21,983.4**	**23,109.8**	**24,368.2**	**25,657.1**	**27,096.7**	**28,661.1**	**30,362.4**	**32,238.1**	**5.7%**

Source: ReAnIn Analysis and Primary Analysis

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

FIGURE 6.3.2 Global Titanium Dioxide (Tio2) Market Value (USD Million), By Paints, 2020-2030



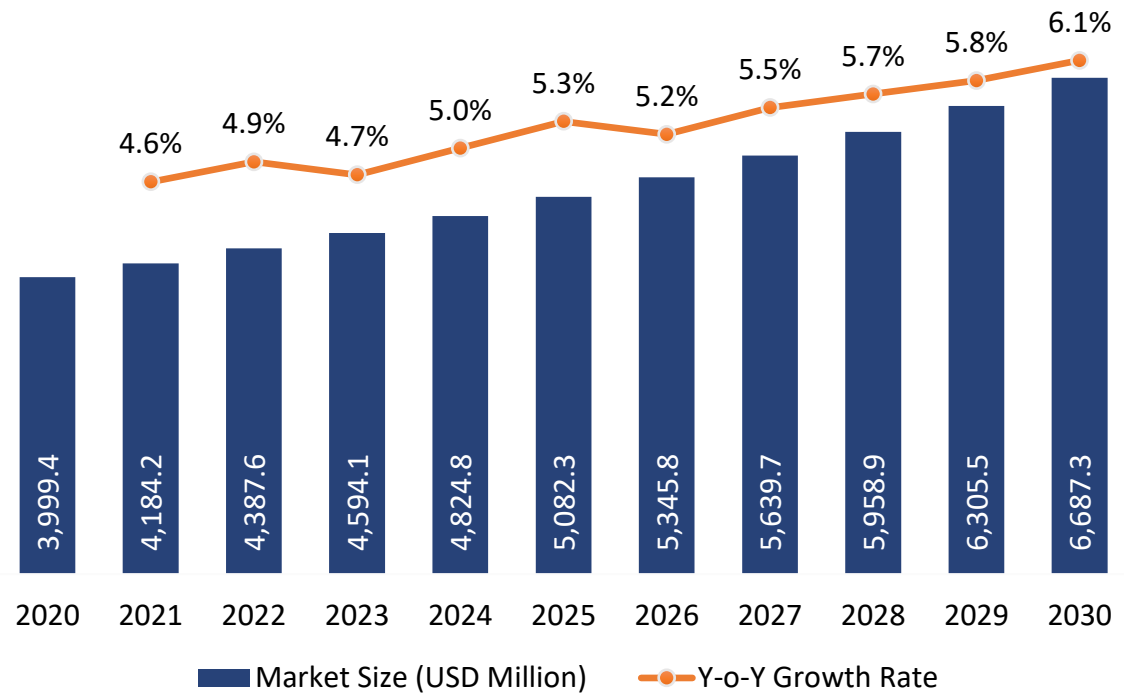
1.4x **Projected growth of Paints during the forecast period of 2024-2030**

- **Paints** segment was valued at **US$ 13,276.9 Mn** in 2023 and is estimated to reach **US$ 19,791.8 Mn** in 2030, expanding at a CAGR of **6.0%** during the forecast period.
- Market share percentage of **Paints** in 2023 was valued at **60.4%,** estimated to account for **61.4%** in 2030, during the forecast period.
- Titanium Dioxide (TiO2) is a white pigment used in paints to enhance brightness and opacity. It serves as a primary component, providing coverage and UV resistance, essential for protecting surfaces and maintaining color durability.
- In June 2024, PT Mowilex, the recipient of Frost & Sullivan's Indonesian Company of the Year Award, is praised for its premium paints and coatings. As the industry's first carbon-neutral company, it introduces eco-friendly products like NaturalleTM bio-based paint and Recycled Paint, utilizing materials such as titanium dioxide.
- Telko partnered with Cristal to ensure a steady supply of titanium dioxide (TiO2), crucial for various everyday products like paints, inks, paper, and plastics. TiO2 served as a primary pigment, providing brightness and UV resistance in paints, coatings, and sunscreen, with over 60% of global production dedicated to paints and coatings.
- PT Mowilex, honored as Frost & Sullivan's Indonesian Company of the Year, leads with premium paints and sustainability initiatives. Partnering with Telko ensures a stable titanium dioxide supply, vital for diverse applications.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Website.

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

FIGURE 6.3.3 Global Titanium Dioxide (Tio2) Market Value (USD Million), By Plastics, 2020-2030



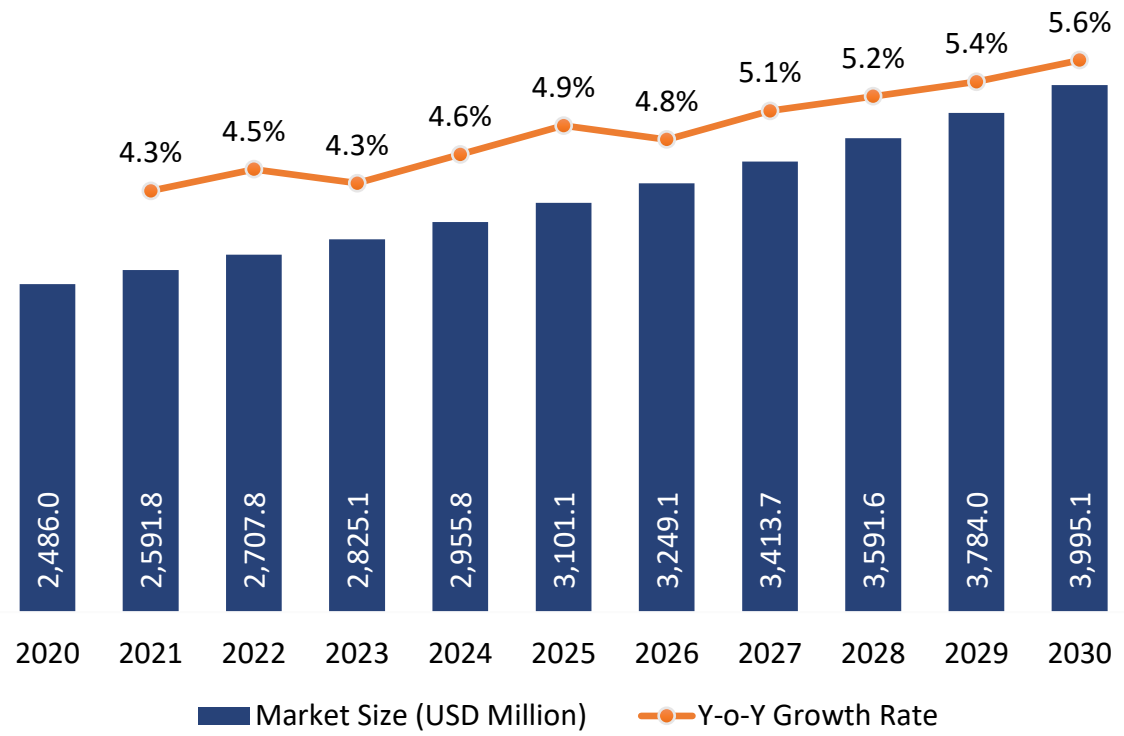
1.4x **Projected growth of Plastics during the forecast period of 2024-2030**

- **Plastics** segment was valued at **US$ 4,594.1 Mn** in 2023 and is estimated to reach **US$ 6,687.3 Mn** in 2030, expanding at a CAGR of **5.6%** during the forecast period.
- Market share percentage of **Plastics** in 2023 was valued at **20.9%,** estimated to account for **20.7%** in 2030, during the forecast period.
- Titanium dioxide enhances the coloration of plastics while offering UV protection, heat reflection, and weather resistance, ensuring durability and aesthetic appeal. Its versatile application aligns seamlessly with safety and environmental regulations.
- In May 2024, DKSH Business Unit Performance Materials will distribute Kronos TiO_2 pigments for coatings and plastics in Australia, New Zealand, Japan, and the Philippines. They will provide business development, marketing, sales, and logistics for Kronos TiO2 products, crucial for paints, coatings, plastics, papers, fibers, and specialties.
- In January 2023, Meghmani Organics Limited announced the commissioning of Phase 1 of its Titanium Dioxide (TiO2) plant in Dahej, Gujarat, with an installed capacity of 16,500 MTPA. This move marks the company's entry into the TiO2 for plastics, enhancing its pigment portfolio and venturing into higher-margin products.
- DKSH's distribution of Kronos TiO2 pigments for coatings and plastics and Meghmani Organics entry into TiO2 for plastics, the sector sees a heightened focus on enhancing plastic pigment portfolios.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Website.

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

FIGURE 6.3.4 Global Titanium Dioxide (Tio2) Market Value (USD Million), By Paper, 2020-2030



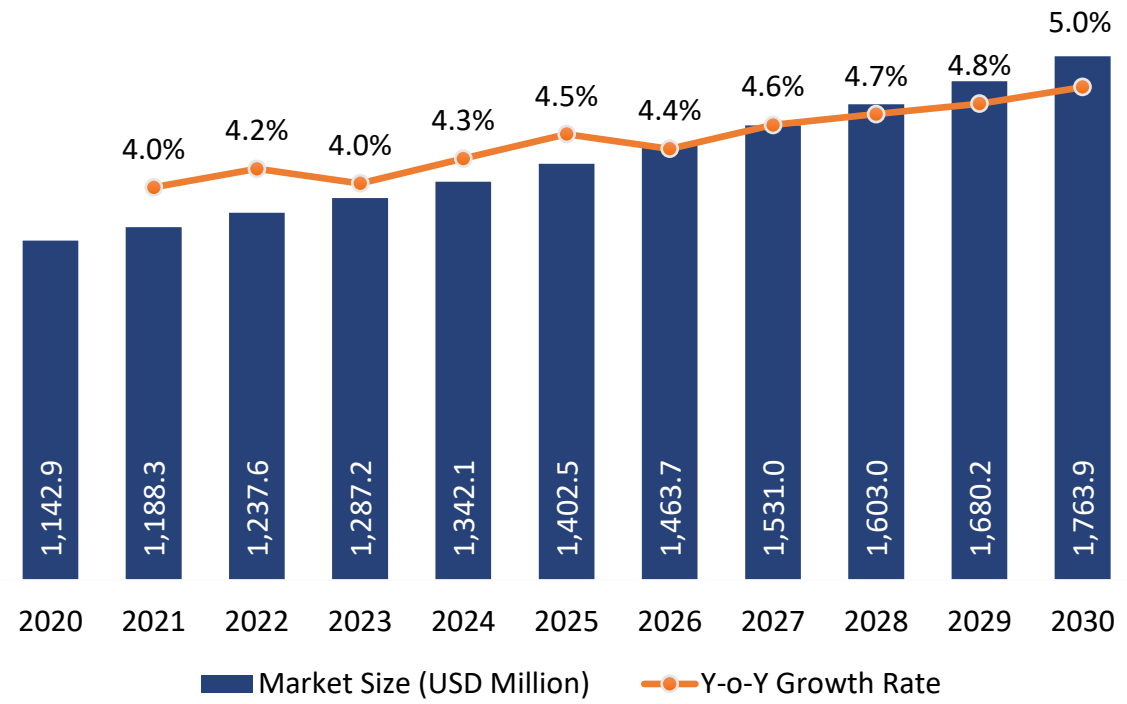
1.4x **Projected growth of Paper during the forecast period of 2024-2030**

- **Paper** segment was valued at **US$ 2,825.1 Mn** in 2023 and is estimated to reach **US$ 3,995.1 Mn** in 2030, expanding at a CAGR of **5.1%** during the forecast period.
- Market share percentage of **Paper** in 2023 was valued at **12.9%,** estimated to account for **12.4%** in 2030, during the forecast period.
- Titanium dioxide, a key white pigment in paper manufacturing, enhances brightness, whiteness, and durability, meeting diverse paper needs while adhering to rigorous safety and environmental regulations.
- Zhongyuan Sun Bang (Xiamen) Technology Co., Ltd. offers high-quality Titanium Dioxide Papers known for exceptional whiteness, opacity, and durability. Ideal for printing, packaging, and decorative uses, they resist light, heat, chemicals, and weathering, ensuring long-lasting performance.
- G&J Resources Inc. supplies titanium dioxide (TiO2) for high-end paper applications, enhancing opacity, brightness, and strength. Key products include NR-956 for superior brightness in coatings and NA-100 for untreated, high-brightness applications in paper pulp and coatings.
- Zhongyuan Sun Bang (Xiamen) Technology Co., Ltd. and G&J Resources Inc. offer top-tier Titanium Dioxide solutions, catering to diverse paper applications with enhanced performance and quality.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Website.

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

FIGURE 6.3.5 Global Titanium Dioxide (Tio2) Market Value (USD Million), By Others, 2020-2030



1.3x **Projected growth of Others during the forecast period of 2024-2030**

- **Others** segment was valued at **US$ 1,287.2 Mn** in 2023 and is estimated to reach **US$ 1,763.9 Mn** in 2030, expanding at a CAGR of **4.7%** during the forecast period.
- Market share percentage of **Others** in 2023 was valued at **5.9%,** estimated to account for **5.5%** in 2030, during the forecast period.
- Others include Ink, Food Coloring, and SunScreen.
- In December 2023, Croda introduced advanced sunscreen formulas with Titanium Dioxide, offering high SPF and UVA protection. Using Solaveil Clarus technology, Solaveil CT-60W ensured skin clarity without whitening, while Solaveil CT-300 provided true transparency, revolutionizing modern sun care solutions.
- In March 2021, Nanoland Materials Inc. offered TiO2-NP-1, a clear, non-toxic colloidal Titanium Dioxide (TiO2) nanoparticle solution for sunscreens, providing UVA/UVB protection and antiviral properties. The product, utilizing green synthesis, aimed to replace toxic materials in personal care products.
- Innovations in Titanium Dioxide-based sunscreen formulations, from Croda's advanced clarity and high SPF to Nanoland's non-toxic nanoparticle solution, redefine sun protection with safety and efficacy.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Website.

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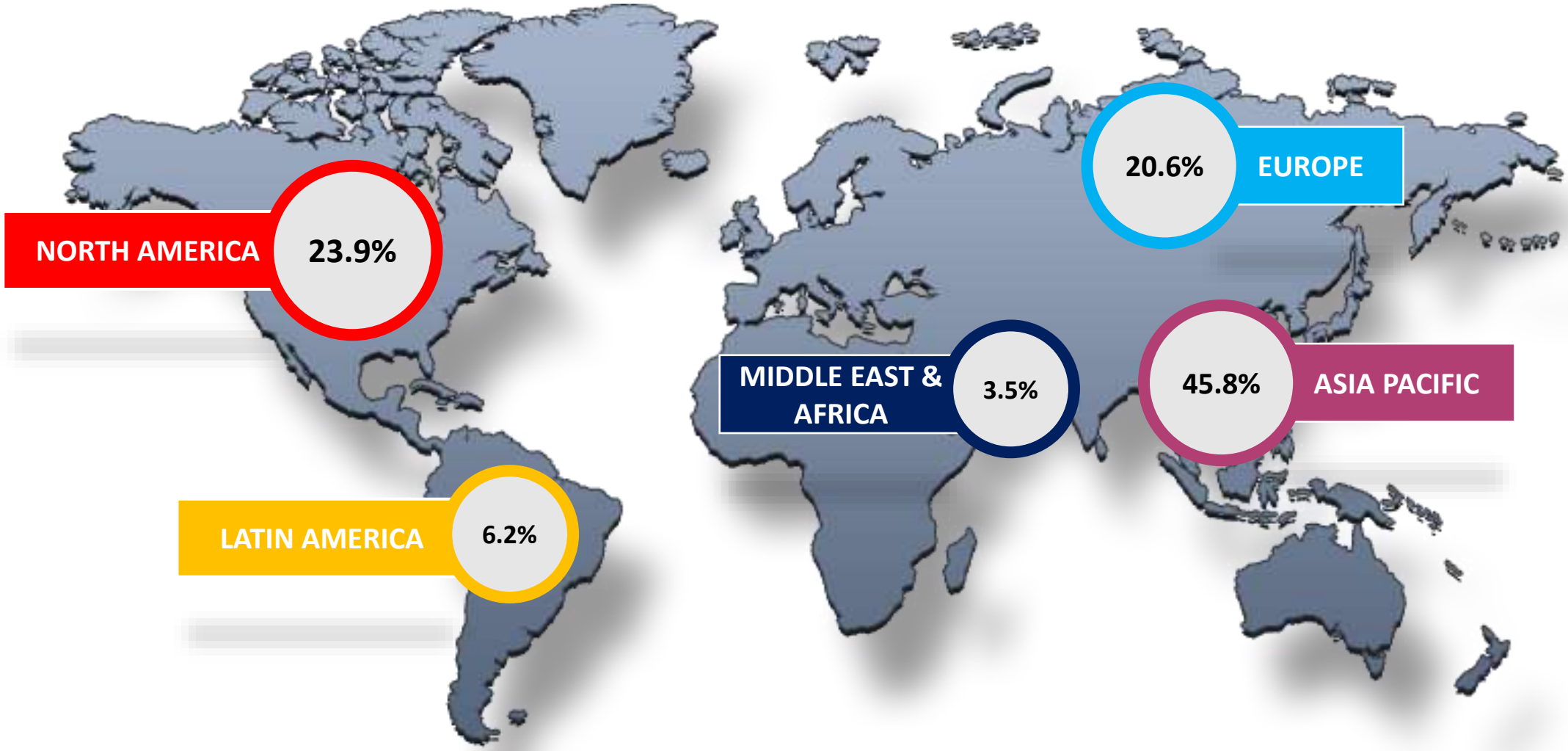
SECTION 6.4

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET

6.4.1 Regional Analysis

- Introduction
- Regional Market Size
- Regional Market Share, 2022, 2026 & 2030
- Regional Year-on-Year Growth Rate

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, REGIONAL MARKET SHARE (2023)



Source: ReAnIn Analysis and Primary Analysis

GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY REGION

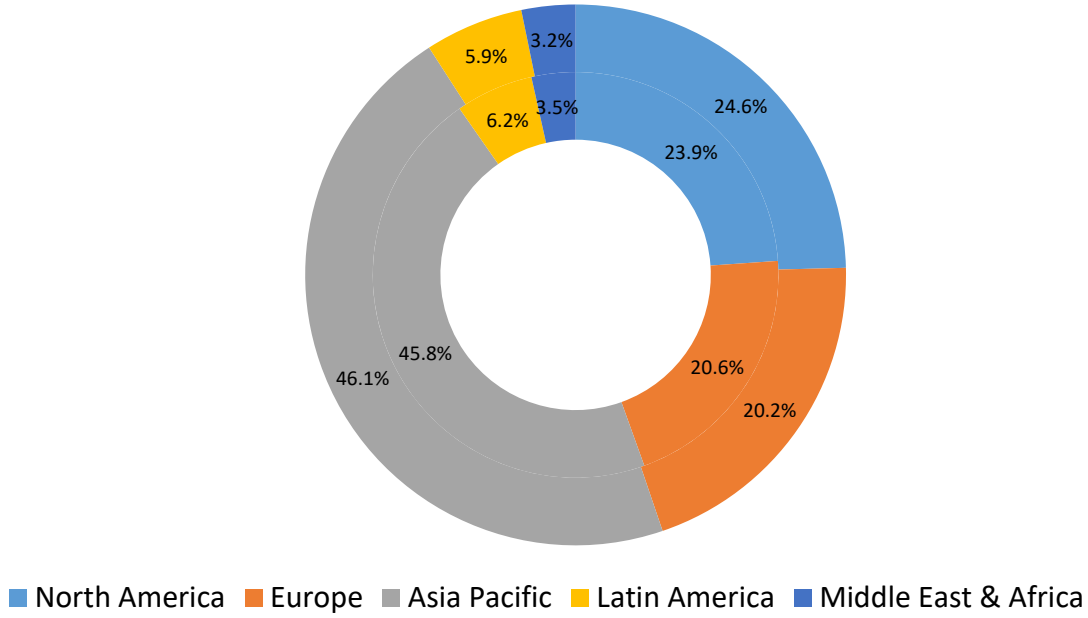
TABLE 6.4.1 Global Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Region, 2020-2030

REGION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
North America	4,515.3	4,743.9	4,996.6	5,254.0	5,543.3	5,868.0	6,201.5	6,575.8	6,984.3	7,430.6	7,925.1	**6.1%**
Europe	3,962.8	4,138.8	4,332.5	4,528.6	4,747.8	4,992.7	5,242.5	5,521.3	5,823.7	6,152.0	6,513.3	**5.4%**
Asia Pacific	8,702.1	9,126.8	9,592.7	10,068.4	10,597.8	11,186.7	11,792.0	12,465.3	13,195.8	13,989.1	14,861.5	**5.8%**
Latin America	1,211.5	1,258.6	1,310.9	1,363.0	1,421.9	1,488.3	1,555.2	1,630.6	1,712.4	1,801.3	1,899.5	**4.9%**
Middle East & Africa	693.4	717.1	743.4	769.4	799.0	832.5	866.0	903.8	944.9	989.4	1,038.7	**4.5%**
Total	**19,085.1**	**19,985.2**	**20,976.1**	**21,983.4**	**23,109.8**	**24,368.2**	**25,657.1**	**27,096.7**	**28,661.1**	**30,362.4**	**32,238.1**	**5.7%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

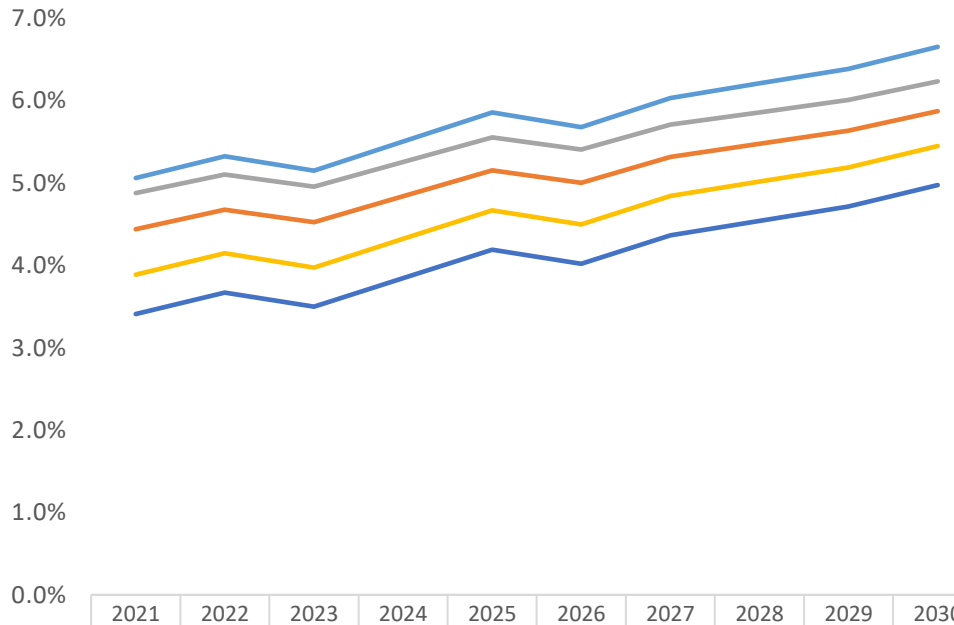
GLOBAL TITANIUM DIOXIDE (Tio2) MARKET, BY REGION

FIGURE 6.4.1 Global Titanium Dioxide (Tio2) Market - Value Share (%), by Region, 2023 & 2030



Inner Circle: 2023
Outer Circle: 2030

FIGURE 6.4.2 Global Titanium Dioxide (Tio2) Market Y-o-Y Growth, by Region, 2021-2030



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
North America	5.1%	5.3%	5.2%	5.5%	5.9%	5.7%	6.0%	6.2%	6.4%	6.7%
Europe	4.4%	4.7%	4.5%	4.8%	5.2%	5.0%	5.3%	5.5%	5.6%	5.9%
Asia Pacific	4.9%	5.1%	5.0%	5.3%	5.6%	5.4%	5.7%	5.9%	6.0%	6.2%
Latin America	3.9%	4.1%	4.0%	4.3%	4.7%	4.5%	4.8%	5.0%	5.2%	5.5%
Middle East & Africa	3.4%	3.7%	3.5%	3.8%	4.2%	4.0%	4.4%	4.5%	4.7%	5.0%

Source: ReAnIn, Primary Analysis and Secondary Analysis

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SECTION 6.4.1

NORTH AMERICA TITANIUM DIOXIDE (Tio2) MARKET

Regional and Country-level Analysis

Segment-specific Market Size and Forecast

- By Grade
- By Process
- By Application
- By Country

Country-specific Market Size and Forecast

- United States
- Canada

NORTH AMERICA TITANIUM DIOXIDE (Tio2) MARKET, BY REGION

FIGURE 6.4.1.1 North America Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030

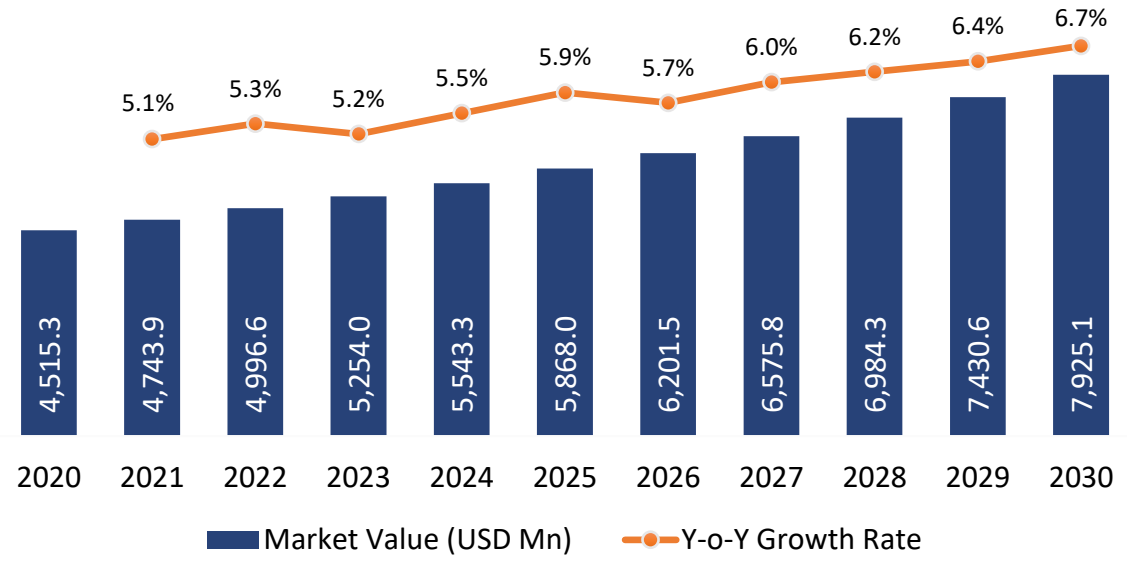
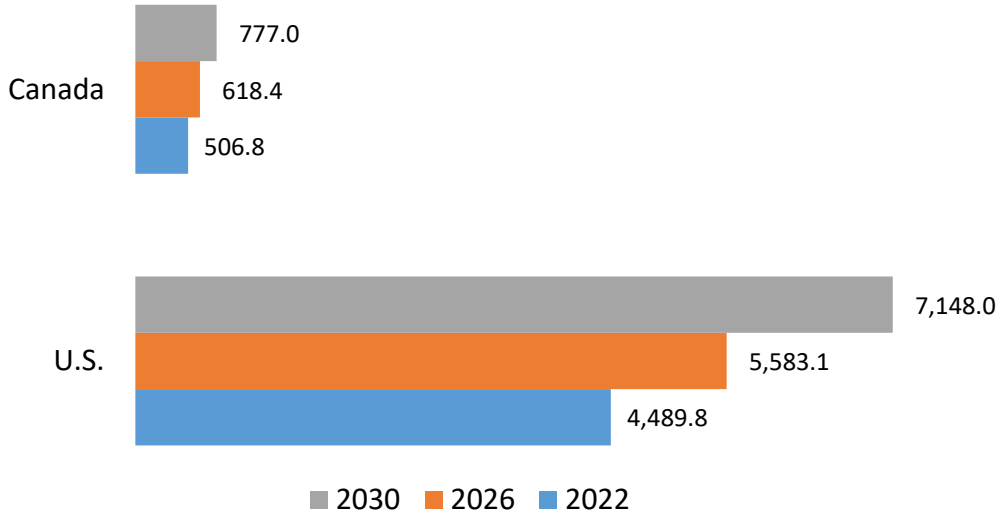


FIGURE 6.4.1.2 North America Titanium Dioxide (Tio2) Market Value (USD Million), By Country



- **North America Titanium Dioxide (Tio2) Market** was valued at **5,254.0 USD Million in 2023** and is estimated to reach **7,925.1 USD Million in 2030**, expanding at a CAGR of **6.1%** during the forecast period.
- **United States** held a major market share in North America Titanium Dioxide (Tio2) Market in 2023, which is estimated to reach **90.2%** in 2030, during the forecast period.

Source: ReAnIn, Primary Analysis and Secondary Analysis

NORTH AMERICA TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.1.1 North America Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	3,506.2	3,686.5	3,885.9	4,089.2	4,317.8	4,574.7	4,838.6	5,135.1	5,459.0	5,813.0	6,205.7	**6.2%**
Anatase	1,009.1	1,057.4	1,110.7	1,164.8	1,225.5	1,293.4	1,362.9	1,440.7	1,525.3	1,617.5	1,719.3	**5.8%**
Total	**4,515.3**	**4,743.9**	**4,996.6**	**5,254.0**	**5,543.3**	**5,868.0**	**6,201.5**	**6,575.8**	**6,984.3**	**7,430.6**	**7,925.1**	**6.1%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

NORTH AMERICA TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.1.2 North America Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	2,437.6	2,564.8	2,705.6	2,849.3	3,010.9	3,192.7	3,379.7	3,589.9	3,819.8	4,071.3	4,350.5	**6.3%**
Chloride	2,077.6	2,179.1	2,291.0	2,404.8	2,532.3	2,675.3	2,821.8	2,985.9	3,164.6	3,359.3	3,574.6	**5.9%**
Total	**4,515.3**	**4,743.9**	**4,996.6**	**5,254.0**	**5,543.3**	**5,868.0**	**6,201.5**	**6,575.8**	**6,984.3**	**7,430.6**	**7,925.1**	**6.1%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

NORTH AMERICA TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

TABLE 6.4.1.3 North America Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	2,709.8	2,852.7	3,010.9	3,172.4	3,354.2	3,558.8	3,769.3	4,006.1	4,265.2	4,548.9	4,864.1	**6.4%**
Plastics	946.3	993.6	1,045.9	1,099.2	1,158.9	1,226.0	1,294.9	1,372.1	1,456.3	1,548.3	1,650.1	**6.1%**
Paper	564.1	590.0	618.4	647.3	679.6	715.7	752.5	793.7	838.3	886.9	940.3	**5.6%**
Others	295.1	307.6	321.4	335.2	350.6	367.6	384.8	403.9	424.4	446.5	470.6	**5.0%**
Total	**4,515.3**	**4,743.9**	**4,996.6**	**5,254.0**	**5,543.3**	**5,868.0**	**6,201.5**	**6,575.8**	**6,984.3**	**7,430.6**	**7,925.1**	**6.1%**

Source: ReAnIn Analysis and Primary Analysis

NORTH AMERICA TITANIUM DIOXIDE (Tio2) MARKET, BY COUNTRY

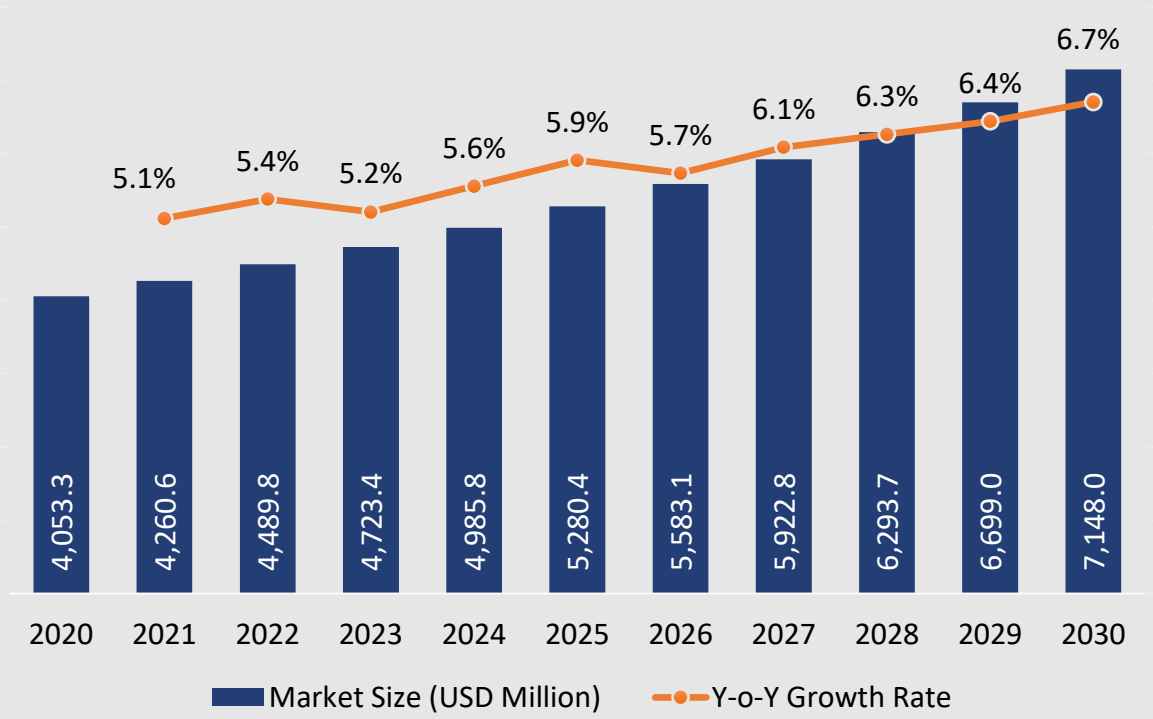
TABLE 6.4.1.4 North America Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Country, 2020-2030

COUNTRY	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
United States	4,053.3	4,260.6	4,489.8	4,723.4	4,985.8	5,280.4	5,583.1	5,922.8	6,293.7	6,699.0	7,148.0	**6.2%**
Canada	461.9	483.2	506.8	530.7	557.5	587.7	618.4	653.0	690.6	731.6	777.0	**5.7%**
Total	**4,515.3**	**4,743.9**	**4,996.6**	**5,254.0**	**5,543.3**	**5,868.0**	**6,201.5**	**6,575.8**	**6,984.3**	**7,430.6**	**7,925.1**	6.1%

Source: ReAnIn, Primary Analysis and Secondary Analysis

UNITED STATES TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.1.1.1 United States Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030



1.4x **Projected growth of United States Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **United States Titanium Dioxide (Tio2) Market** was valued at **US$ 4,723.4 Mn** in 2023 and is estimated to reach **US$ 7,148.0 Mn** in 2030, expanding at a CAGR of **6.2%** during the forecast period.
- The market share percentage of the **United States** in 2023 was valued at **89.9%** which is estimated to account for **90.2%** in 2030, during the forecast period.
- Titanium dioxide, a highly adaptable white pigment, elevates opacity and luminosity across a spectrum of applications. Its extensive utilization in cosmetics, paints, and food items ensures enhanced UV shielding and steadfastness.
- In January 2023, The Chemours Company, a prominent global player in Titanium Technologies, unveiled Ti-Pure TS-1510, an innovative rutile titanium dioxide pigment tailored for plastics applications. Engineered to optimize processing efficiency in polyolefin masterbatch, this product underscores the company's dedication to advancing innovation and sustaining its leading market position in the titanium dioxide industry.
- In November 2022, Tronox, headquartered in the United States, led the TiO2 market with essential products spanning paints, coatings, plastics, and medical equipment. Their innovations enhanced durability, energy efficiency, and sustainability, supporting renewable energy and combating climate change by improving air quality and reducing urban heat island effects.
- Chemours introduces Ti-Pure TS-1510 for plastics, showcasing innovation. Tronox, a US leader in TiO2, advances durability and sustainability, contributing to renewable energy and combating climate change through improved air quality.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company websites

U.S. TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.1.1.1 U.S. Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	3,146.3	3,309.6	3,490.4	3,674.8	3,882.1	4,114.9	4,354.4	4,623.4	4,917.3	5,238.7	5,595.2	**6.3%**
Anatase	907.1	951.0	999.4	1,048.6	1,103.7	1,165.4	1,228.6	1,299.4	1,376.4	1,460.2	1,552.8	**5.9%**
Total	**4,053.3**	**4,260.6**	**4,489.8**	**4,723.4**	**4,985.8**	**5,280.4**	**5,583.1**	**5,922.8**	**6,293.7**	**6,699.0**	**7,148.0**	**6.2%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

U.S. TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.1.1.2 U.S. Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	2,186.9	2,302.2	2,429.8	2,560.1	2,706.6	2,871.5	3,041.1	3,231.8	3,440.4	3,668.7	3,922.2	**6.4%**
Chloride	1,866.4	1,958.5	2,060.0	2,163.3	2,279.1	2,408.9	2,542.0	2,691.0	2,853.3	3,030.2	3,225.9	**6.0%**
Total	**4,053.3**	**4,260.6**	**4,489.8**	**4,723.4**	**4,985.8**	**5,280.4**	**5,583.1**	**5,922.8**	**6,293.7**	**6,699.0**	**7,148.0**	**6.2%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

U.S. TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

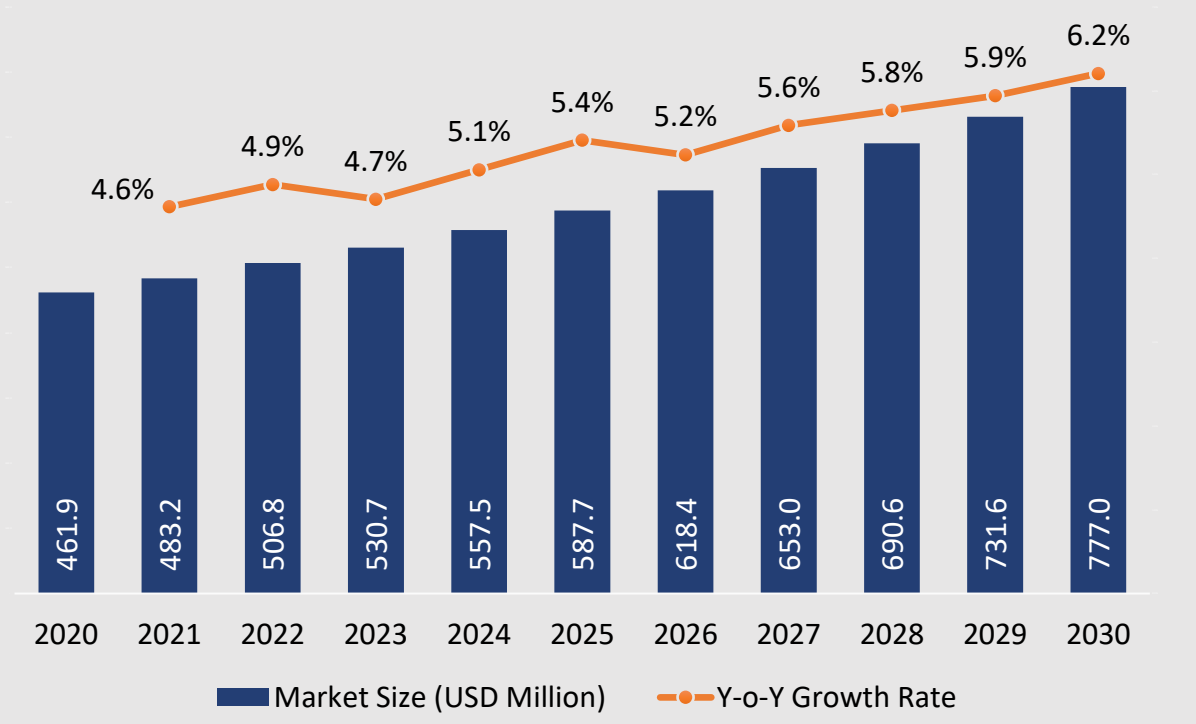
TABLE 6.4.1.1.3 U.S. Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	2,433.3	2,562.8	2,706.3	2,852.9	3,017.9	3,203.5	3,394.7	3,609.8	3,845.1	4,102.8	4,389.2	**6.4%**
Plastics	848.4	891.4	938.8	987.2	1,041.5	1,102.4	1,165.0	1,235.1	1,311.7	1,395.3	1,487.9	**6.1%**
Paper	505.7	529.1	554.9	581.0	610.2	642.8	676.1	713.3	753.7	797.6	845.9	**5.6%**
Others	265.9	277.3	289.7	302.3	316.2	331.7	347.3	364.6	383.2	403.2	425.0	**5.1%**
Total	**4,053.3**	**4,260.6**	**4,489.8**	**4,723.4**	**4,985.8**	**5,280.4**	**5,583.1**	**5,922.8**	**6,293.7**	**6,699.0**	**7,148.0**	**6.2%**

Source: ReAnIn Analysis and Primary Analysis

CANADA TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.1.2.1 **Canada Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.4x **Projected growth of Canada Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **Canada Titanium Dioxide (Tio2) Market** was valued at **US$ 530.7 Mn** in 2023 and is estimated to reach **US$ 777.0 Mn** in 2030, expanding at a CAGR of **5.7%** during the forecast period.
- The market share percentage of **Canada** in 2023 was valued at **10.1%** which is estimated to account for **9.8%** in 2030, during the forecast period.
- In February 2024, Temas Resources Corp. unveiled positive outcomes for its La Blache Titanium-Vanadium-Iron Project, showcasing robust economics. Successful pilot plant results were announced, extracting high-purity titanium dioxide from anorthosite ore, highlighting potential growth in the TiO2 market, and significantly impacting the industry.
- Rio Tinto, a key player in Canada's TiO2 market, advanced BlueSmelting to cut emissions by 70%, meeting global demand while reducing their carbon footprint. TiO2's properties also enabled carbon-reducing applications in buildings, solar technology, and products like paint and cosmetics, enhancing its market significance.
- Temas Resources Corp. demonstrates promising outcomes for La Blache Project, fueling TiO2 market growth. Rio Tinto's BlueSmelting innovation reduces emissions, reinforcing TiO2's versatility and sustainability.

Source: ReAnIn, Primary Analysis, Secondary Analysis, Company Website, Titanium Dioxide (Tio2) Manufacturers Association(TDMA)

CANADA TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.1.2.1 Canada Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	359.9	376.8	395.5	414.4	435.7	459.7	484.2	511.7	541.6	574.3	610.5	**5.8%**
Anatase	102.0	106.4	111.3	116.2	121.7	127.9	134.2	141.3	149.0	157.3	166.5	**5.4%**
Total	**461.9**	**483.2**	**506.8**	**530.7**	**557.5**	**587.7**	**618.4**	**653.0**	**690.6**	**731.6**	**777.0**	**5.7%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

CANADA TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.1.2.2 Canada Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	250.7	262.6	275.8	289.2	304.3	321.2	338.6	358.1	379.3	402.6	428.3	**5.9%**
Chloride	211.2	220.6	231.0	241.4	253.2	266.4	279.8	294.9	311.3	329.1	348.7	**5.5%**
Total	**461.9**	**483.2**	**506.8**	**530.7**	**557.5**	**587.7**	**618.4**	**653.0**	**690.6**	**731.6**	**777.0**	**5.7%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

CANADA TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

TABLE 6.4.1.2.3 Canada Titanium Dioxide (Tio2) Market Value (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	276.5	289.8	304.5	319.5	336.3	355.2	374.6	396.3	420.1	446.1	474.9	**5.9%**
Plastics	97.9	102.2	107.1	112.0	117.5	123.6	129.9	136.9	144.6	152.9	162.1	**5.5%**
Paper	58.3	60.8	63.6	66.3	69.4	72.9	76.4	80.4	84.6	89.3	94.4	**5.2%**
Others	29.2	30.3	31.6	32.9	34.3	35.9	37.5	39.3	41.2	43.3	45.6	**4.8%**
Total	**461.9**	**483.2**	**506.8**	**530.7**	**557.5**	**587.7**	**618.4**	**653.0**	**690.6**	**731.6**	**777.0**	**5.7%**

Source: ReAnIn Analysis and Primary Analysis

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SECTION 6.4.2

EUROPE TITANIUM DIOXIDE (Tio2) MARKET

Regional and Country-level Analysis

Segment-specific Market Size and Forecast

- By Grade
- By Process
- By Application
- By Country

Country-specific Market Size and Forecast

- Germany
- United Kingdom
- France
- Italy
- Spain
- Nordic
- Benelux
- Rest of Europe

EUROPE TITANIUM DIOXIDE (Tio2) MARKET, BY REGION

FIGURE 6.4.2.1 Europe Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030

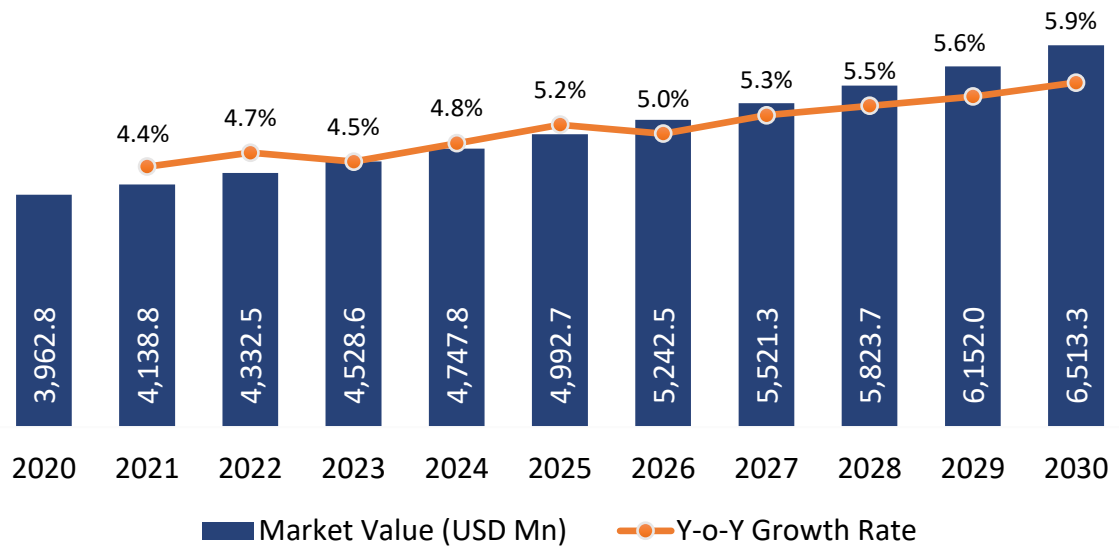
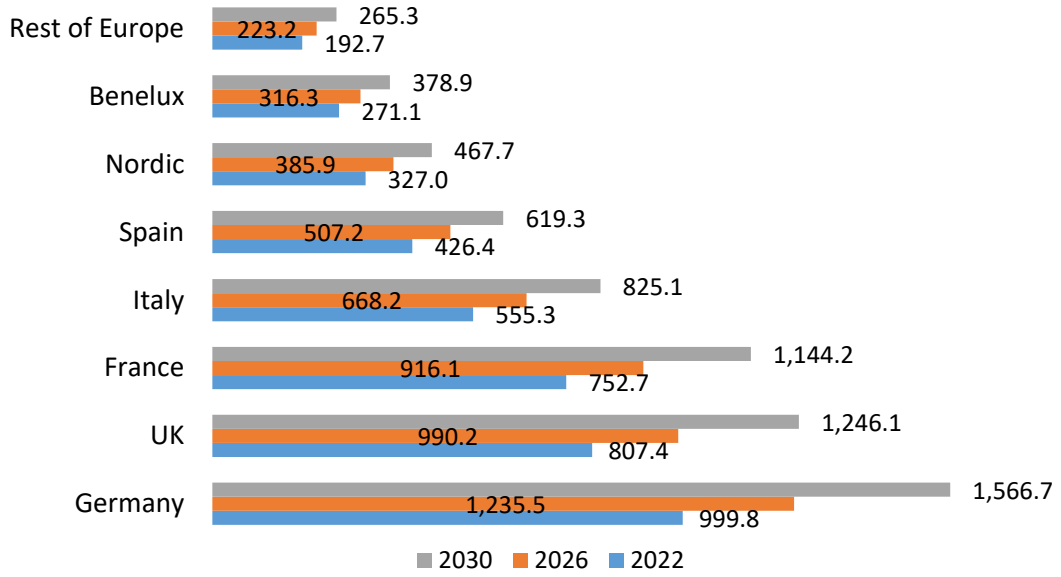


FIGURE 6.4.2.2 Europe Titanium Dioxide (Tio2) Market Value (USD Million), By Country



- **Europe Titanium Dioxide (Tio2) Market** was valued at **4,528.6 USD Million in 2023** and is estimated to reach **6,513.3 USD Million in 2030**, expanding at a CAGR of **5.4%** during the forecast period.
- **Germany** held a major market share in Europe Titanium Dioxide (Tio2) Market in 2023, which is estimated to reach **24.1%** in 2030, during the forecast period.

Source: ReAnIn, Primary Analysis and Secondary Analysis

EUROPE TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.2.1 Europe Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	3,062.2	3,200.4	3,352.5	3,506.6	3,679.1	3,871.7	4,068.5	4,288.2	4,526.7	4,785.8	5,071.2	**5.5%**
Anatase	900.5	938.4	980.0	1,021.9	1,068.8	1,120.9	1,174.0	1,233.1	1,297.0	1,366.2	1,442.1	**5.1%**
Total	**3,962.8**	**4,138.8**	**4,332.5**	**4,528.6**	**4,747.8**	**4,992.7**	**5,242.5**	**5,521.3**	**5,823.7**	**6,152.0**	**6,513.3**	**5.4%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

EUROPE TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.2.2 Europe Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	2,167.4	2,267.0	2,376.6	2,487.8	2,612.4	2,751.7	2,894.0	3,053.2	3,226.1	3,414.2	3,621.5	**5.6%**
Chloride	1,795.3	1,871.8	1,955.9	2,040.7	2,135.5	2,241.0	2,348.4	2,468.1	2,597.6	2,737.8	2,891.8	**5.2%**
Total	**3,962.8**	**4,138.8**	**4,332.5**	**4,528.6**	**4,747.8**	**4,992.7**	**5,242.5**	**5,521.3**	**5,823.7**	**6,152.0**	**6,513.3**	**5.4%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

EUROPE TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

ReAnIn
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TABLE 6.4.2.3 Europe Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	2,408.5	2,520.3	2,643.4	2,768.4	2,908.3	3,065.0	3,225.1	3,404.3	3,599.0	3,810.9	4,044.7	**5.7%**
Plastics	803.8	838.7	877.1	916.0	959.4	1,007.8	1,057.1	1,112.1	1,171.6	1,236.2	1,307.2	**5.3%**
Paper	520.6	541.5	564.4	587.5	613.2	641.8	670.8	703.1	737.9	775.5	816.7	**4.9%**
Others	229.8	238.2	247.5	256.7	266.9	278.1	289.5	301.9	315.2	329.4	344.7	**4.4%**
Total	**3,962.8**	**4,138.8**	**4,332.5**	**4,528.6**	**4,747.8**	**4,992.7**	**5,242.5**	**5,521.3**	**5,823.7**	**6,152.0**	**6,513.3**	**5.4%**

Source: ReAnIn Analysis and Primary Analysis

EUROPE TITANIUM DIOXIDE (Tio2) MARKET, BY COUNTRY

ReAnIn
Research | Analysis | Insights

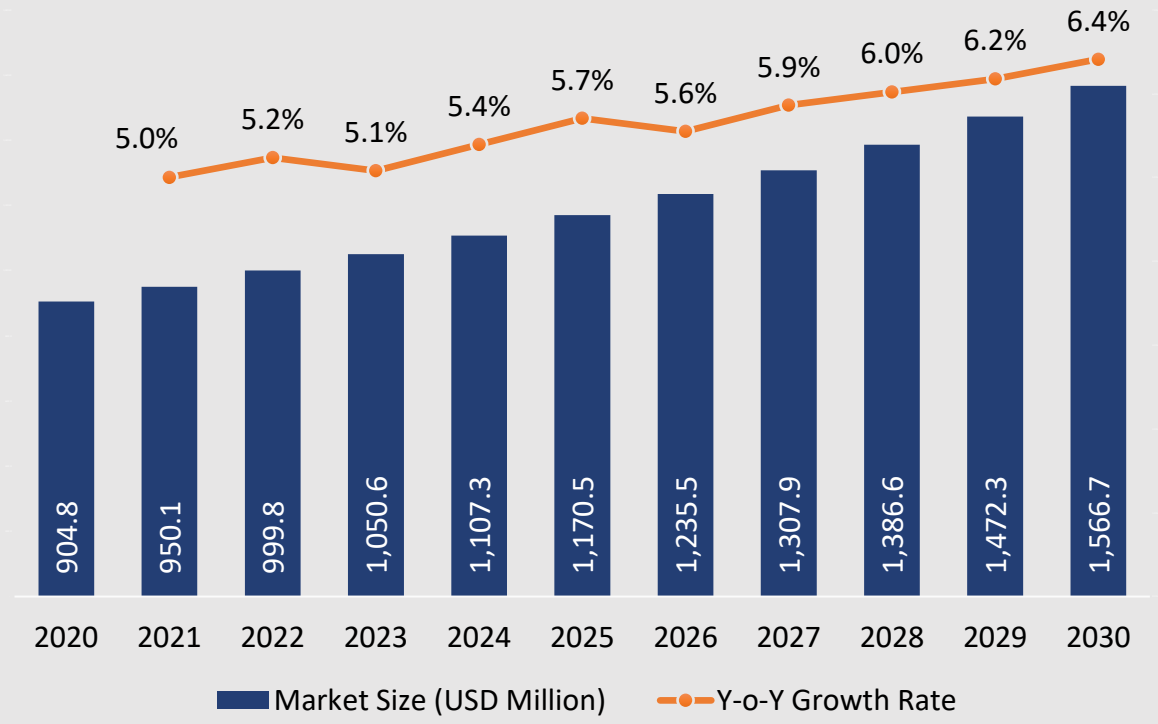
TABLE 6.4.2.4 Europe Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Country, 2020-2030

COUNTRY	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Germany	904.8	950.1	999.8	1,050.6	1,107.3	1,170.5	1,235.5	1,307.9	1,386.6	1,472.3	1,566.7	**6.0%**
United Kingdom	733.5	768.7	807.4	846.8	890.8	939.9	990.2	1,046.2	1,107.1	1,173.3	1,246.1	**5.8%**
France	686.4	718.0	752.7	788.0	827.3	871.2	916.1	966.1	1,020.4	1,079.3	1,144.2	**5.6%**
Italy	509.3	531.2	555.3	579.7	606.9	637.2	668.2	702.6	740.0	780.5	825.1	**5.3%**
Spain	393.3	409.1	426.4	443.8	463.3	485.1	507.2	531.9	558.6	587.5	619.3	**5.0%**
Nordic	302.7	314.3	327.0	339.6	353.9	369.8	385.9	403.9	423.4	444.5	467.7	**4.8%**
Benelux	252.4	261.3	271.1	280.8	291.7	304.0	316.3	330.1	345.0	361.2	378.9	**4.5%**
Rest of Europe	180.2	186.1	192.7	199.3	206.6	214.9	223.2	232.5	242.5	253.4	265.3	**4.3%**
Total	**3,962.8**	**4,138.8**	**4,332.5**	**4,528.6**	**4,747.8**	**4,992.7**	**5,242.5**	**5,521.3**	**5,823.7**	**6,152.0**	**6,513.3**	**5.4%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

GERMANY TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.2.1.1 **Germany Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.4x **Projected growth of Germany Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **Germany Titanium Dioxide (Tio2) Market** was valued at **US$ 1,050.6 Mn** in 2023 and is estimated to reach **US$ 1,566.7 Mn** in 2030, expanding at a CAGR of **6.0%** during the forecast period.
- The market share percentage of **Germany** in 2023 was valued at **23.2%** which is estimated to account for **24.1%** in 2030, during the forecast period.
- In May 2024, Kuncai Material Technologies solidified its presence in Germany through Kuncai Pigments Europe in Grossostheim. Led by Dr. Corinna Ludwig with 25 years in pigments, the company aimed to introduce innovative titanium dioxide and iron oxide products to Europe, revolutionizing sectors like plastics, coatings, inks, and papers, impacting the TiO2 market.
- In November 2021, the remarkable 95% filter availability of KRONOS TITAN GMBH, facilitated by a Life Cycle Services agreement, is strengthening the Titanium dioxide market. The high-quality TiO2 is sourced from Ilmenite ore in a subsidiary mine in Norway and serves as a crucial pigment in paints and plastics, contributing to the industry's growth and stability.
- Kuncai Pigments Europe's entry with innovative products shapes European markets. KRONOS TITAN GMBH's reliable filter system sustains high-quality TiO2 supply, supporting industry growth.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Website.

GERMANY TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.2.1.1 Germany Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	699.8	735.3	774.3	814.2	858.8	908.5	959.6	1,016.7	1,078.8	1,146.3	1,220.9	**6.0%**
Anatase	205.0	214.8	225.5	236.4	248.5	262.0	275.8	291.2	307.9	326.0	345.8	**5.7%**
Total	**904.8**	**950.1**	**999.8**	**1,050.6**	**1,107.3**	**1,170.5**	**1,235.5**	**1,307.9**	**1,386.6**	**1,472.3**	**1,566.7**	**6.0%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

GERMANY TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.2.1.2 Germany Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	489.3	514.8	542.8	571.5	603.6	639.5	676.5	717.7	762.7	811.8	866.0	**6.2%**
Chloride	415.5	435.3	457.0	479.1	503.7	531.0	559.0	590.2	623.9	660.5	700.7	**5.7%**
Total	**904.8**	**950.1**	**999.8**	**1,050.6**	**1,107.3**	**1,170.5**	**1,235.5**	**1,307.9**	**1,386.6**	**1,472.3**	**1,566.7**	**6.0%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

GERMANY TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

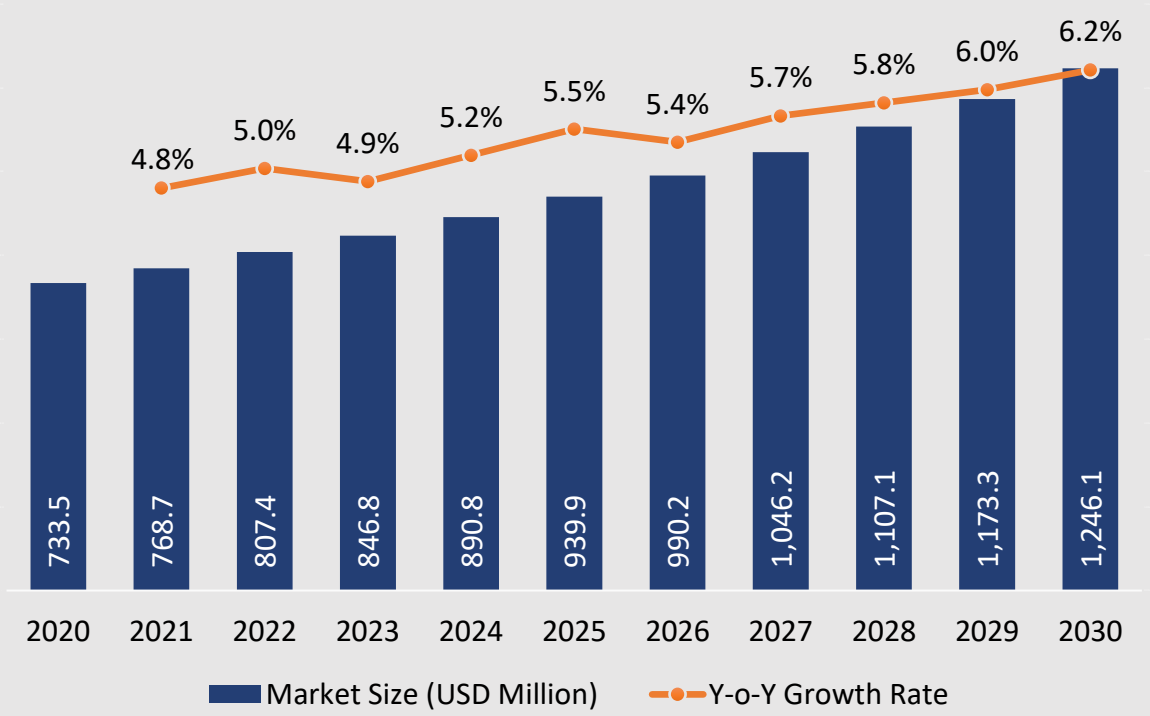
TABLE 6.4.2.1.3 Germany Titanium Dioxide (Tio2) Market Value (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	545.0	573.4	604.7	636.7	672.4	712.4	753.5	799.5	849.7	904.3	964.6	**6.2%**
Plastics	187.8	197.0	207.2	217.5	229.0	241.8	254.9	269.6	285.5	302.8	321.8	**5.8%**
Paper	114.4	119.7	125.4	131.3	137.9	145.1	152.6	160.8	169.7	179.4	190.0	**5.5%**
Others	57.5	59.9	62.5	65.1	68.0	71.2	74.4	78.0	81.7	85.8	90.2	**4.8%**
Total	**904.8**	**950.1**	**999.8**	**1,050.6**	**1,107.3**	**1,170.5**	**1,235.5**	**1,307.9**	**1,386.6**	**1,472.3**	**1,566.7**	**6.0%**

Source: ReAnIn Analysis and Primary Analysis

UNITED KINGDOM TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.2.2.1 **United Kingdom Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.4x **Projected growth of the United Kingdom Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **United Kingdom Titanium Dioxide (Tio2) Market** was valued at **US$ 846.8 Mn** in 2023 and is estimated to reach **US$ 1,246.1 Mn** in 2030, expanding at a CAGR of **5.8%** during the forecast period.
- The market share percentage of the **United Kingdom** in 2023 was valued at **18.7%** which is estimated to account for **19.1%** in 2030, during the forecast period.
- In December 2023, Croda in the UK introduced cutting-edge titanium dioxide (TiO2) sunscreen formulas, Solaveil CT-60W and Solaveil CT-300, offering high SPF and UVA protection. These innovations aligned with the evolving sun care landscape in the UK, meeting the demand for effective UV protection, thus shaping the TiO2 market.
- In September 2022, UK-based Venator achieved a milestone in the TiO2 market by securing an ECO PASSPORT by OEKO-TEX for their HOMBITAN LW-S 100 pigment. This certification underscores their commitment to sustainable and responsible production, enhancing the appeal of their TiO2 products in the textile industry.
- Croda had introduced advanced TiO2 sunscreen formulas in the UK, while Venator's ECO PASSPORT certification had highlighted their sustainable TiO2 production for textiles, both shaping the TiO2 market.

Source: ReAnIn, Primary Analysis, Secondary Analysis, Company Website and The Food Standards Agency

UNITED KINGDOM TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.2.2.1 United Kingdom Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	565.8	593.4	623.7	654.6	689.1	727.6	767.1	811.2	859.1	911.2	968.6	**5.8%**
Anatase	167.7	175.3	183.7	192.2	201.7	212.3	223.0	235.0	248.0	262.1	277.5	**5.5%**
Total	**733.5**	**768.7**	**807.4**	**846.8**	**890.8**	**939.9**	**990.2**	**1,046.2**	**1,107.1**	**1,173.3**	**1,246.1**	**5.8%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

UNITED KINGDOM TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.2.2.2 United Kingdom Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	398.8	418.5	440.2	462.4	487.1	514.8	543.2	574.9	609.3	646.9	688.3	**5.9%**
Chloride	334.7	350.2	367.2	384.5	403.7	425.1	447.0	471.4	497.8	526.4	557.9	**5.5%**
Total	**733.5**	**768.7**	**807.4**	**846.8**	**890.8**	**939.9**	**990.2**	**1,046.2**	**1,107.1**	**1,173.3**	**1,246.1**	**5.8%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

UNITED KINGDOM TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

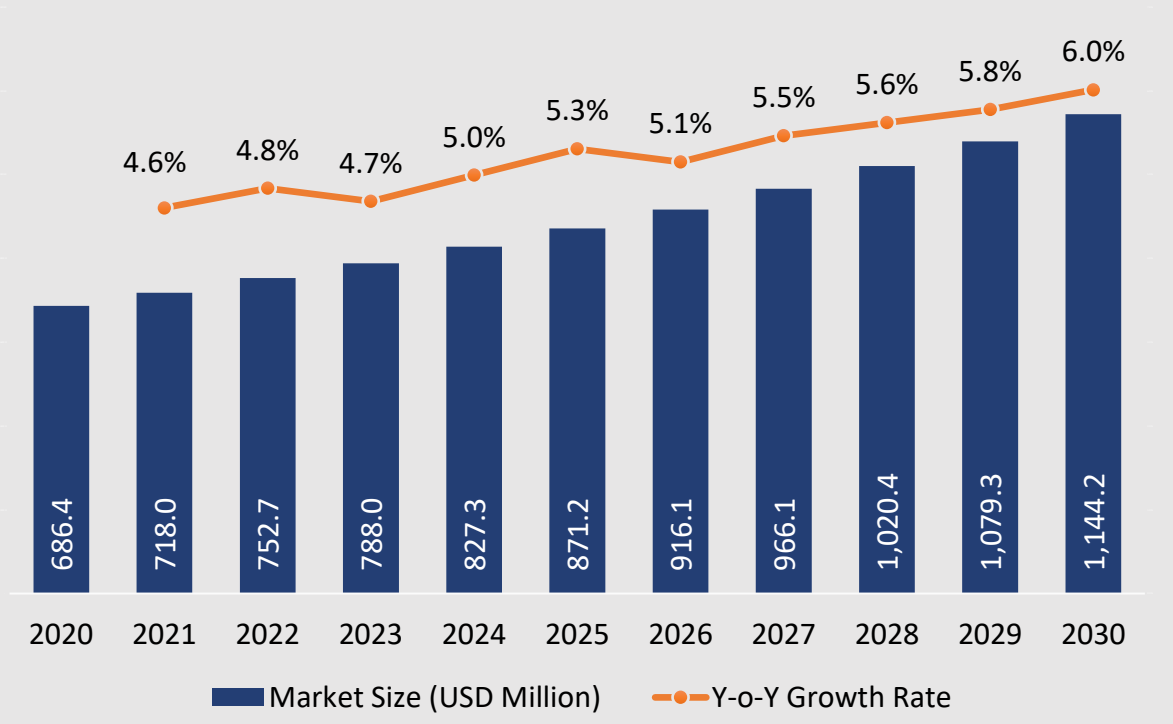
TABLE 6.4.2.2.3 United Kingdom Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	443.4	465.6	490.0	514.9	542.7	573.8	605.8	641.5	680.4	722.7	769.4	**6.0%**
Plastics	151.0	158.0	165.8	173.6	182.4	192.1	202.1	213.2	225.2	238.3	252.6	**5.6%**
Paper	94.2	98.3	102.9	107.5	112.7	118.4	124.3	130.8	137.8	145.4	153.7	**5.3%**
Others	44.9	46.8	48.8	50.8	53.1	55.5	58.0	60.8	63.8	66.9	70.4	**4.8%**
Total	**733.5**	**768.7**	**807.4**	**846.8**	**890.8**	**939.9**	**990.2**	**1,046.2**	**1,107.1**	**1,173.3**	**1,246.1**	**5.8%**

Source: ReAnIn Analysis and Primary Analysis

FRANCE TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.2.3.1 **France Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.4x **Projected growth of France Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **France Titanium Dioxide (Tio2) Market** was valued at **US$ 788.0 Mn** in 2023 and is estimated to reach **US$ 1,144.2 Mn** in 2030, expanding at a CAGR of **5.6%** during the forecast period.
- The market share percentage of **France** in 2023 was valued at **17.4%** which is estimated to account for **17.6%** in 2030, during the forecast period.
- In October 2023, Seppic, a leading French chemicals company, led efforts to address evolving TiO2 market trends in pharmaceutical formulations. With expertise in tablet film coatings, Seppic innovated TiO2 alternatives. The introduction of the Sepifilm PW TF colored range offered regulatory-compliant, cost-effective solutions, aligning with the industry's sustainability goals.
- Based in France, Brenntag played a pivotal role in distributing titanium dioxide, a versatile compound widely utilized in paints, plastics, paper, and various industries. Brenntag ensured the availability of titanium dioxide, meeting the demands of sectors such as pharmaceuticals, cosmetics, construction, and food, shaping the TiO2 market.
- Seppic innovated TiO2 alternatives, aligning with industry sustainability goals. Brenntag, based in France, played a pivotal role in distributing titanium dioxide, shaping its market presence across diverse industries.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Website

FRANCE TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.2.3.1 France Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	528.1	552.8	580.0	607.5	638.3	672.7	707.9	747.2	789.8	836.1	887.1	**5.6%**
Anatase	158.3	165.2	172.8	180.4	189.0	198.5	208.2	218.9	230.6	243.2	257.0	**5.3%**
Total	**686.4**	**718.0**	**752.7**	**788.0**	**827.3**	**871.2**	**916.1**	**966.1**	**1,020.4**	**1,079.3**	**1,144.2**	**5.6%**

FRANCE TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.2.3.2 France Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	375.1	392.8	412.1	431.8	453.8	478.4	503.5	531.6	562.0	595.2	631.7	**5.7%**
Chloride	311.3	325.3	340.6	356.2	373.5	392.8	412.6	434.5	458.3	484.2	512.5	**5.4%**
Total	**686.4**	**718.0**	**752.7**	**788.0**	**827.3**	**871.2**	**916.1**	**966.1**	**1,020.4**	**1,079.3**	**1,144.2**	**5.6%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

FRANCE TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

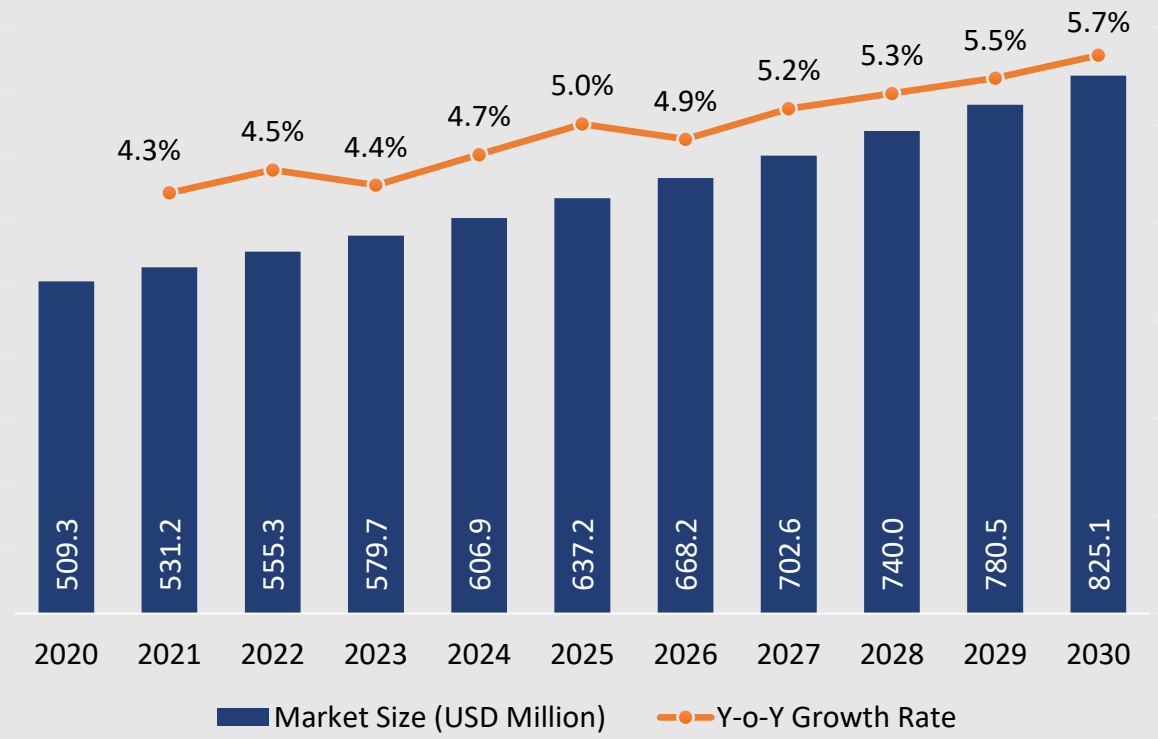
TABLE 6.4.2.3.3 France Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	417.1	437.1	459.1	481.5	506.5	534.4	563.1	595.1	629.9	667.8	709.6	**5.8%**
Plastics	139.7	146.0	152.9	160.0	167.8	176.5	185.4	195.3	206.1	217.8	230.6	**5.4%**
Paper	89.5	93.3	97.4	101.6	106.3	111.5	116.8	122.7	129.1	136.0	143.5	**5.1%**
Others	40.1	41.6	43.3	44.9	46.7	48.7	50.7	52.9	55.3	57.8	60.5	**4.4%**
Total	**686.4**	**718.0**	**752.7**	**788.0**	**827.3**	**871.2**	**916.1**	**966.1**	**1,020.4**	**1,079.3**	**1,144.2**	**5.6%**

Source: ReAnIn Analysis and Primary Analysis

ITALY TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.2.4.1 **Italy Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.4x **Projected growth of Italy Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **Italy Titanium Dioxide (Tio2) Market** was valued at **US$ 579.7 Mn** in 2023 and is estimated to reach **US$ 825.1 Mn** in 2030, expanding at a CAGR of **5.3%** during the forecast period.
- The market share percentage of **Italy** in 2023 was valued at **12.8%** which is estimated to account for **12.7%** in 2030, during the forecast period.
- In April 2024, a research team from TU Wien and Universita Politecnica delle Marche, Italy, developed titanium dioxide (TiO2) nanoparticles for self-cleaning wall paints. Using sunlight, these nanoparticles decomposed air pollutants, enhancing indoor air quality and paint stability, significantly impacting the TiO2 market.
- In May 2023, Italcementi, a division of Heidelberg Materials, filed a patent application for an innovative cementitious material that incorporates carbon-doped titanium dioxide. The process involves treating titanium dioxide (TiO2) with carbon dopants through irradiation in the presence of an inert gas and an organic compound.
- Italcementi filed a patent for carbon-doped titanium dioxide cement, and TU Wien developed self-cleaning TiO2 nanoparticles, both innovations significantly impacting the TiO2 market by enhancing material functionality and environmental benefits.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Website.

ITALY TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.2.4.1 Italy Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	392.9	410.1	429.0	448.1	469.5	493.3	517.7	544.8	574.3	606.2	641.4	**5.3%**
Anatase	116.4	121.2	126.4	131.6	137.4	143.9	150.5	157.8	165.8	174.3	183.7	**5.0%**
Total	**509.3**	**531.2**	**555.3**	**579.7**	**606.9**	**637.2**	**668.2**	**702.6**	**740.0**	**780.5**	**825.1**	**5.3%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

ITALY TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.2.4.2 Italy Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	279.2	291.7	305.5	319.4	335.0	352.5	370.3	390.2	411.8	435.2	461.1	**5.5%**
Chloride	230.1	239.5	249.9	260.3	271.9	284.8	297.9	312.5	328.3	345.3	364.0	**5.0%**
Total	**509.3**	**531.2**	**555.3**	**579.7**	**606.9**	**637.2**	**668.2**	**702.6**	**740.0**	**780.5**	**825.1**	**5.3%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

ITALY TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

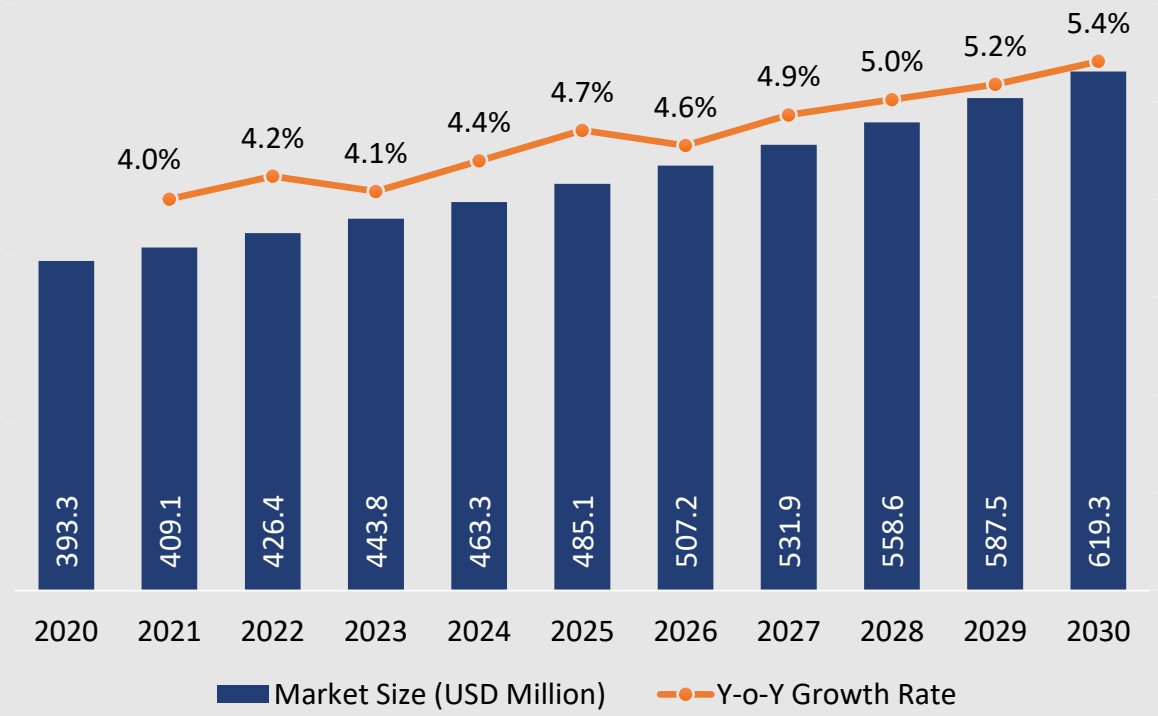
TABLE 6.4.2.4.3 Italy Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	310.2	324.2	339.7	355.3	372.9	392.5	412.5	434.9	459.2	485.7	514.8	**5.5%**
Plastics	102.6	107.0	111.7	116.5	121.9	127.9	133.9	140.7	148.0	156.0	164.7	**5.1%**
Paper	67.8	70.3	73.1	75.9	79.1	82.5	86.0	89.9	94.1	98.7	103.6	**4.6%**
Others	28.7	29.7	30.8	31.9	33.1	34.4	35.7	37.1	38.6	40.2	41.9	**4.0%**
Total	**509.3**	**531.2**	**555.3**	**579.7**	**606.9**	**637.2**	**668.2**	**702.6**	**740.0**	**780.5**	**825.1**	**5.3%**

Source: ReAnIn Analysis and Primary Analysis

SPAIN TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.2.5.1 Spain Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030



1.3x **Projected growth of Spain Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **Spain Titanium Dioxide (Tio2) was valued** at **US$ 443.8 Mn** in 2023 and is estimated to reach **US$ 619.3 Mn** in 2030, expanding at a CAGR of **5.0%** during the forecast period.
- The market share percentage of **Spain** in 2023 was valued at **9.8%** which is estimated to account for **9.5%** in 2030, during the forecast period.
- In September 2023, Colorcon, one of the global leaders in film coating systems, introduced a TiO2-free Opadry film coating for pharmaceutical tablets to address moisture management needs. Through Colorcon Iberica SL in Spain, they ensured European market access, aligned with regulatory requirements, and significantly impacted the TiO2 market with innovative alternatives.
- In May 2022, AGROLAB Iberica, located in Tarragona, introduced an efficient and sensitive method for detecting titanium dioxide in food. Using ICP-MS, enables precise quantification, irrespective of particle size, with results expressed as TiO2, considering insignificant alternative sources of titanium in food ingredients.
- Colorcon's TiO2-free Opadry film coating for pharmaceuticals and AGROLAB Iberica's advanced method for detecting TiO2 in food demonstrated significant advancements, impacting the TiO2 market by providing innovative, compliant solutions for various industries.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Website.

SPAIN TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.2.5.1 Spain Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	304.2	316.6	330.2	343.9	359.3	376.5	394.0	413.4	434.6	457.4	482.6	**5.0%**
Anatase	89.1	92.5	96.2	99.9	104.0	108.6	113.2	118.4	124.0	130.0	136.7	**4.7%**
Total	**393.3**	**409.1**	**426.4**	**443.8**	**463.3**	**485.1**	**507.2**	**531.9**	**558.6**	**587.5**	**619.3**	**5.0%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

SPAIN TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.2.5.2 Spain Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	216.5	225.5	235.4	245.4	256.6	269.2	282.0	296.3	311.7	328.5	347.0	**5.2%**
Chloride	176.9	183.6	191.0	198.4	206.7	215.9	225.2	235.6	246.8	258.9	272.2	**4.7%**
Total	**393.3**	**409.1**	**426.4**	**443.8**	**463.3**	**485.1**	**507.2**	**531.9**	**558.6**	**587.5**	**619.3**	**5.0%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

SPAIN TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

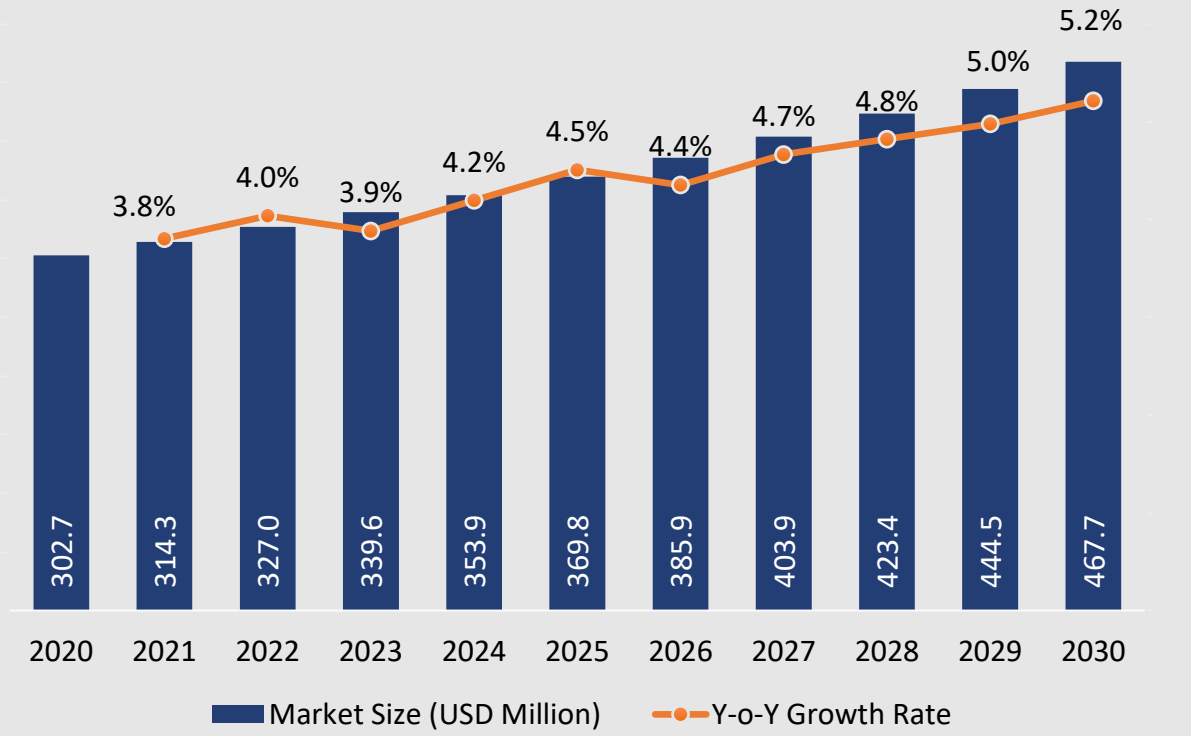
TABLE 6.4.2.5.3 Spain Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	240.1	250.3	261.6	272.9	285.7	300.0	314.5	330.7	348.3	367.5	388.6	**5.3%**
Plastics	78.6	81.7	85.0	88.3	92.0	96.2	100.4	105.1	110.2	115.6	121.7	**4.8%**
Paper	53.2	55.0	57.0	59.0	61.3	63.7	66.2	69.0	72.0	75.2	78.7	**4.3%**
Others	21.4	22.1	22.8	23.5	24.3	25.2	26.1	27.0	28.1	29.1	30.3	**3.7%**
Total	**393.3**	**409.1**	**426.4**	**443.8**	**463.3**	**485.1**	**507.2**	**531.9**	**558.6**	**587.5**	**619.3**	**5.0%**

Source: ReAnIn Analysis and Primary Analysis

NORDIC TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.2.6.1 Nordic Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030



1.3x **Projected growth of Nordic Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **Nordic Titanium Dioxide (Tio2) was valued** at **US$ 339.6 Mn** in 2023 and is estimated to reach **US$ 467.7 Mn** in 2030, expanding at a CAGR of **4.8%** during the forecast period.
- The market share percentage of **Nordic** in 2023 was valued at **7.5%** which is estimated to account for **7.2%** in 2030, during the forecast period.
- Nordic includes Denmark, Norway, Sweden, Finland, and Iceland.
- TioTech AS, a Norwegian leader in titanium dioxide nanomaterials, significantly impacted the TiO2 market. Initially known as Joma International AS, they developed advanced, sustainable titania technologies since 2005. Their innovations included photocatalytic products for air purification and anode materials for Li-ion batteries, marking notable advancements in the industry.
- Titanium dioxide (TiO2) played a crucial role in Denmark's industry, with TP Polymer Private Limited as a leading manufacturer and supplier. Known for its whiteness, opacity, and brightness, TiO2 was essential in paints, coatings, plastics, and cosmetics. TP Polymer's adherence to quality standards positioned them prominently in the market.
- TioTech AS and TP Polymer significantly advanced the TiO2 market. TioTech innovated sustainable titania technologies, while TP Polymer supplied high-quality TiO2 for paints, coatings, and cosmetics, crucial for Denmark's industry.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Website.

NORDIC TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.2.6.1 Nordic Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	234.7	243.8	253.9	263.9	275.2	287.8	300.5	314.8	330.3	347.0	365.4	**4.8%**
Anatase	68.0	70.4	73.1	75.7	78.7	82.0	85.4	89.1	93.2	97.5	102.3	**4.5%**
Total	**302.7**	**314.3**	**327.0**	**339.6**	**353.9**	**369.8**	**385.9**	**403.9**	**423.4**	**444.5**	**467.7**	**4.8%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

NORDIC TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.2.6.2 Nordic Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	167.7	174.3	181.6	188.8	197.0	206.2	215.4	225.8	237.0	249.1	262.5	**4.9%**
Chloride	135.0	139.9	145.4	150.8	156.9	163.7	170.5	178.2	186.4	195.4	205.1	**4.6%**
Total	**302.7**	**314.3**	**327.0**	**339.6**	**353.9**	**369.8**	**385.9**	**403.9**	**423.4**	**444.5**	**467.7**	**4.8%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

NORDIC TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

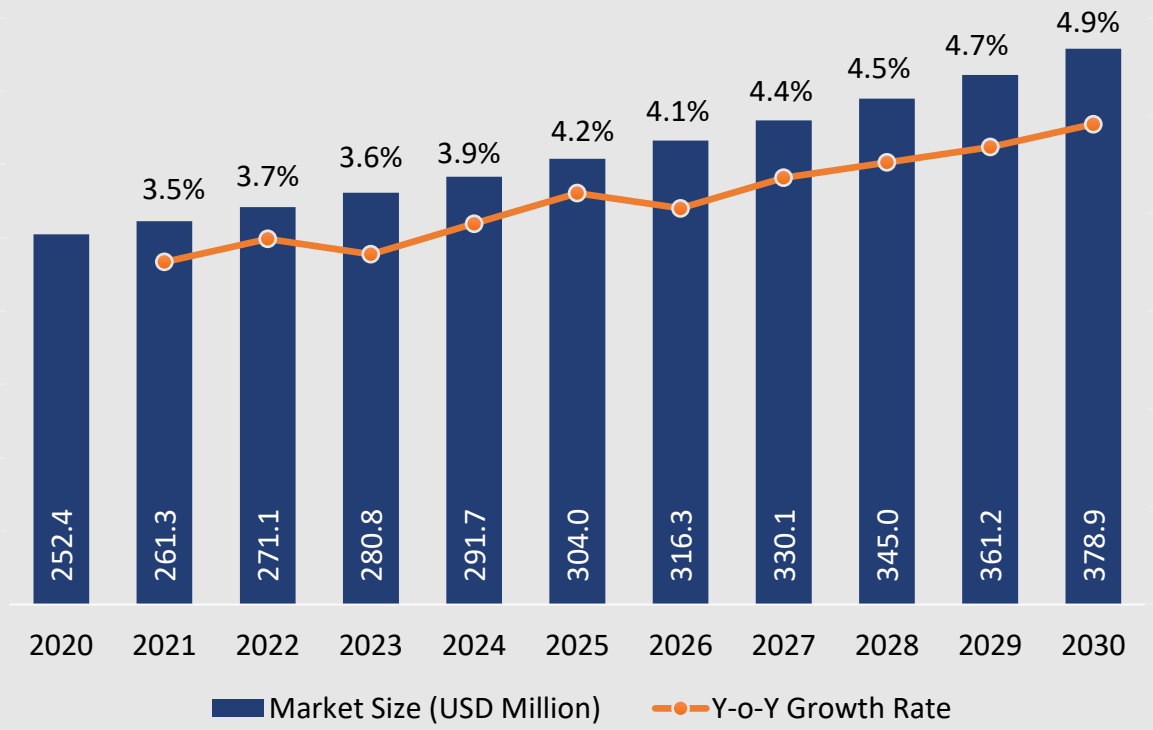
TABLE 6.4.2.6.3 **Nordic** Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	185.9	193.3	201.4	209.6	218.7	229.0	239.3	251.0	263.6	277.2	292.3	**5.0%**
Plastics	59.8	62.0	64.5	66.9	69.7	72.7	75.8	79.3	83.1	87.1	91.6	**4.7%**
Paper	41.3	42.7	44.3	45.9	47.6	49.5	51.5	53.7	56.0	58.5	61.3	**4.3%**
Others	15.7	16.2	16.8	17.3	17.9	18.6	19.3	20.0	20.8	21.6	22.6	**3.9%**
Total	**302.7**	**314.3**	**327.0**	**339.6**	**353.9**	**369.8**	**385.9**	**403.9**	**423.4**	**444.5**	**467.7**	**4.8%**

Source: ReAnIn Analysis and Primary Analysis

BENELUX TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.2.7.1 **Benelux Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.3x **Projected growth of Benelux Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **Benelux Titanium Dioxide (Tio2) was valued** at **US$ 280.8 Mn** in 2023 and is estimated to reach **US$ 378.9 Mn** in 2030, expanding at a CAGR of **4.5%** during the forecast period.
- The market share percentage of **Benelux** in 2023 was valued at **6.2%** which is estimated to account for **5.8%** in 2030, during the forecast period.
- Benelux includes Belgium, Netherlands, and Luxemborg.
- Keyser & Mackay partnered with Nanjing Titanium Dioxide Chemical for European TiO2 distribution. With a Netherlands presence, they capitalized on growing demand. Nanjing's capacity expansion aligned with its strategy, facilitating access to quality products and fostering market growth, meeting evolving needs in the TiO2 market.
- Chemours, with a notable presence in Belgium, revolutionized the Titanium Dioxide (TiO_2) market with its Ti-Pure Sustainability (TS) Series. Aspired to be the most sustainable TiO_2 enterprise globally, Chemours offered high-quality TiO_2 innovations, driving progress in coatings, plastics, and laminates while prioritizing environmental responsibility and customer success.
- Keyser & Mackay, in the Netherlands, partnered with Nanjing Titanium Dioxide Chemical to distribute TiO2 across Europe, meeting rising demand. Chemours, based in Belgium, revolutionized the TiO2 market with its sustainable TS Series.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Website.

BENELUX TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.2.7.1 Benelux Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	196.3	203.3	211.0	218.7	227.4	237.2	246.9	257.9	269.8	282.7	296.8	**4.5%**
Anatase	56.2	58.0	60.0	62.1	64.3	66.8	69.4	72.2	75.2	78.5	82.1	**4.2%**
Total	**252.4**	**261.3**	**271.1**	**280.8**	**291.7**	**304.0**	**316.3**	**330.1**	**345.0**	**361.2**	**378.9**	**4.5%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

BENELUX TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.2.7.2 Benelux Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	140.3	145.4	151.0	156.7	163.0	170.2	177.3	185.4	194.1	203.6	214.0	**4.6%**
Chloride	112.2	115.9	120.0	124.1	128.7	133.8	139.0	144.7	150.9	157.6	164.9	**4.2%**
Total	**252.4**	**261.3**	**271.1**	**280.8**	**291.7**	**304.0**	**316.3**	**330.1**	**345.0**	**361.2**	**378.9**	**4.5%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

BENELUX TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

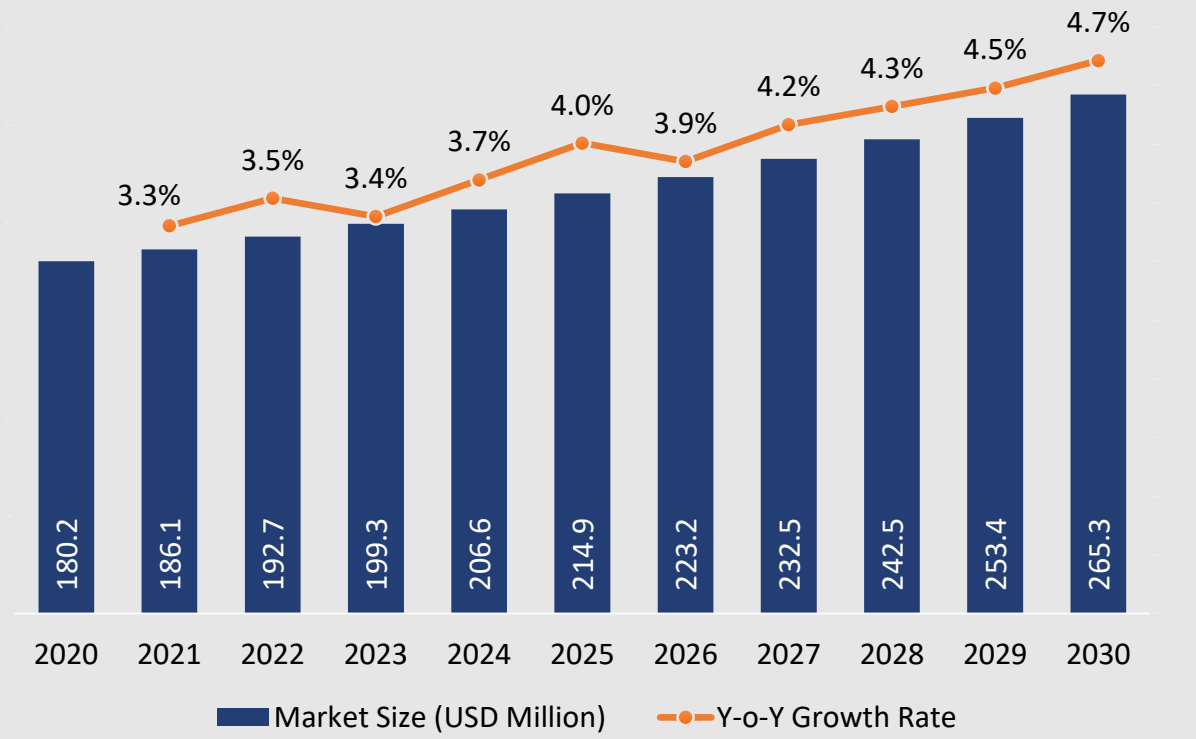
TABLE 6.4.2.7.3 Benelux Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	155.4	161.2	167.5	173.8	180.9	188.9	197.0	206.0	215.8	226.4	238.1	**4.7%**
Plastics	49.3	51.0	52.9	54.8	56.8	59.2	61.5	64.2	67.0	70.1	73.5	**4.4%**
Paper	35.0	36.1	37.3	38.5	39.8	41.2	42.7	44.4	46.1	48.0	50.1	**3.9%**
Others	12.7	13.0	13.4	13.8	14.2	14.6	15.1	15.6	16.1	16.7	17.3	**3.3%**
Total	**252.4**	**261.3**	**271.1**	**280.8**	**291.7**	**304.0**	**316.3**	**330.1**	**345.0**	**361.2**	**378.9**	**4.5%**

Source: ReAnIn Analysis and Primary Analysis

REST OF EUROPE TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.2.8.1 **Rest of Europe Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.3x **Projected growth of Rest of Europe Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **Rest of Europe Titanium Dioxide (Tio2) was valued** at **US$ 199.3 Mn** in 2023 and is estimated to reach **US$ 265.3 Mn** in 2030, expanding at a CAGR of **4.3%** during the forecast period.
- The market share percentage of the **Rest of Europe** in 2023 was valued at **4.4%** which is estimated to account for **4.1%** in 2030, during the forecast period.
- The rest of Europe region includes all developed and developing regions of Europe including Poland, Portugal, Austria, Croatia, and more.
- In January 2022, Ukrainian Chemical Products PrJSC, a titanium dioxide manufacturer within Dmytro Firtash's Group DF, successfully sold its assets in Crimea to the Russian company Russkiy Titan. The transaction encompasses the transfer of all assets from the former Crimean Titan plant to the buyer.
- Research on titanium dioxide at Poland's SOLARIS synchrotron, led by scientists, enhanced understanding of its surface and oxidation. Insights could optimize TiO2, which is crucial for industries like catalysis, plastics, paints, cosmetics, and medical implants. Findings promised innovation, enhancing competitiveness, and driving economic growth in Poland's TiO2 market.
- Ukrainian Chemical Products PrJSC transfers assets to Russkiy Titan. SOLARIS synchrotron research in Poland elevates TiO2 understanding, fostering innovation and economic growth.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Website.

REST OF EUROPE TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.2.8.1 Rest of Europe Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	140.4	145.2	150.4	155.6	161.5	168.1	174.7	182.1	190.1	198.8	208.4	**4.3%**
Anatase	39.7	41.0	42.3	43.6	45.1	46.8	48.5	50.4	52.4	54.6	57.0	**4.0%**
Total	**180.2**	**186.1**	**192.7**	**199.3**	**206.6**	**214.9**	**223.2**	**232.5**	**242.5**	**253.4**	**265.3**	**4.3%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

REST OF EUROPE TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.2.8.2 Rest of Europe Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	100.6	104.1	107.9	111.8	116.1	121.0	125.9	131.4	137.4	143.9	151.0	**4.5%**
Chloride	79.6	82.1	84.8	87.5	90.5	93.9	97.3	101.0	105.1	109.5	114.3	**4.0%**
Total	**180.2**	**186.1**	**192.7**	**199.3**	**206.6**	**214.9**	**223.2**	**232.5**	**242.5**	**253.4**	**265.3**	**4.3%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

REST OF EUROPE TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

TABLE 6.4.2.8.3 Rest Of Europe Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	111.3	115.2	119.5	123.7	128.5	134.0	139.4	145.5	152.1	159.3	167.2	**4.5%**
Plastics	34.9	36.0	37.2	38.5	39.8	41.4	42.9	44.7	46.5	48.6	50.8	**4.1%**
Paper	25.3	26.1	26.9	27.7	28.6	29.6	30.7	31.8	33.0	34.4	35.8	**3.8%**
Others	8.7	8.9	9.1	9.4	9.6	9.9	10.2	10.5	10.8	11.2	11.6	**3.1%**
Total	**180.2**	**186.1**	**192.7**	**199.3**	**206.6**	**214.9**	**223.2**	**232.5**	**242.5**	**253.4**	**265.3**	**4.3%**

Source: ReAnIn Analysis and Primary Analysis

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SECTION 6.4.3

ASIA PACIFIC TITANIUM DIOXIDE (Tio2) MARKET

Regional and Country-level Analysis

Segment-specific Market Size and Forecast

- By Grade
- By Process
- By Application
- By Country

Country-specific Market Size and Forecast

- Japan
- China
- India
- Australia and New Zealand
- South Korea
- ASEAN
- Rest of Asia Pacific

ASIA PACIFIC TITANIUM DIOXIDE (Tio2) MARKET, BY REGION

FIGURE 6.4.3.1 Asia Pacific Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030

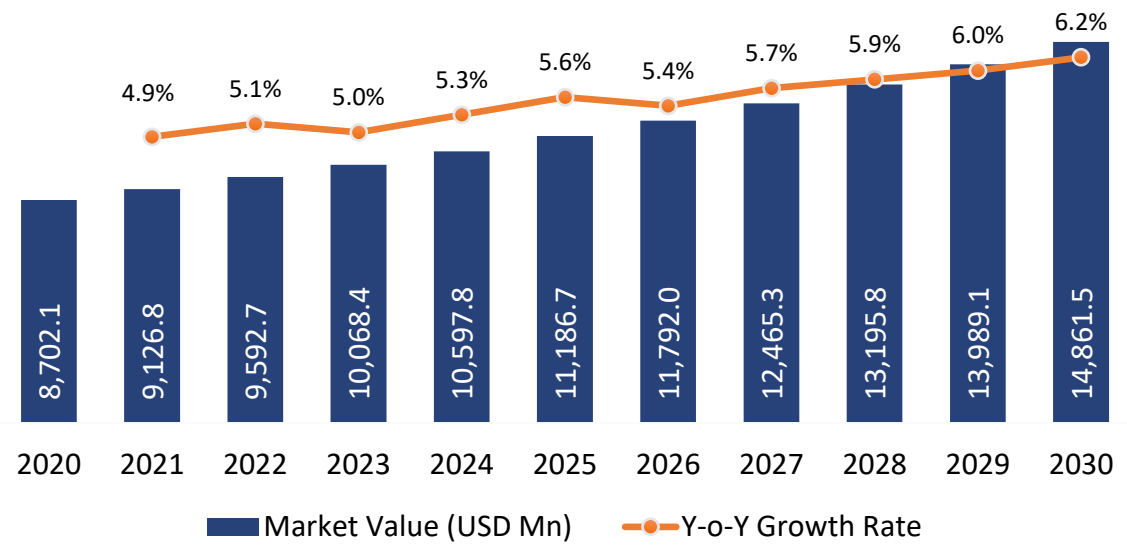
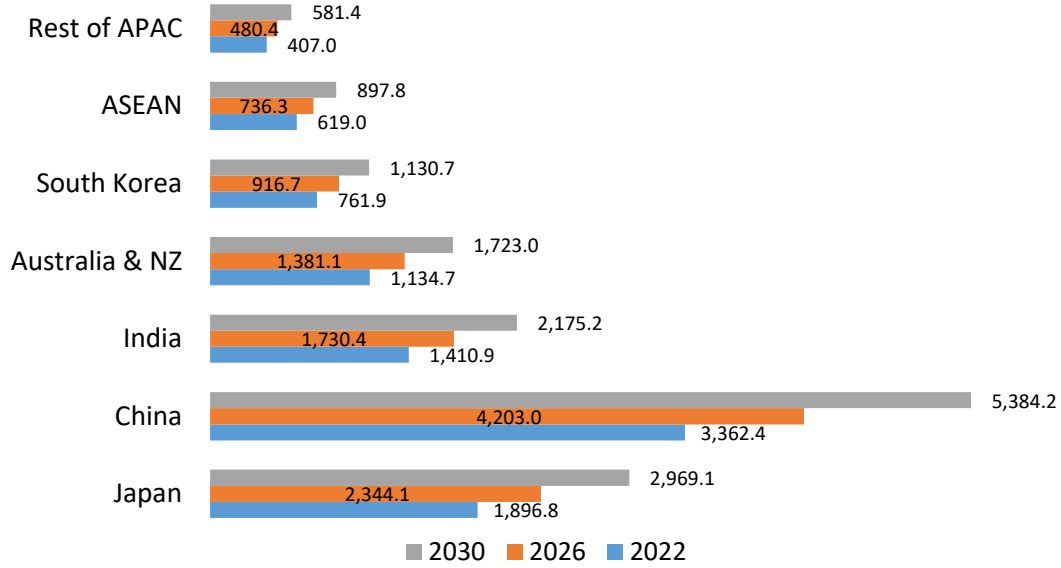


FIGURE 6.4.3.2 Asia Pacific Titanium Dioxide (Tio2) Market Value (USD Million), By Country



- **Asia Pacific Titanium Dioxide (Tio2) Market** was valued at **10,068.4 USD Million in 2023** and is estimated to reach **14,861.5 USD Million in 2030**, expanding at a CAGR of **5.8%** during the forecast period.
- **China** held a major market share in Asia Pacific Titanium Dioxide (Tio2) Market in 2023, which is estimated to reach **36.2%** in 2030, during the forecast period.

Source: ReAnIn, Primary Analysis and Secondary Analysis

ASIA PACIFIC TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.3.1 Asia Pacific Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	6,682.7	7,013.6	7,376.9	7,748.0	8,161.3	8,621.4	9,094.6	9,621.5	10,193.5	10,815.2	11,499.4	**5.9%**
Anatase	2,019.4	2,113.2	2,215.9	2,320.4	2,436.5	2,565.3	2,697.3	2,843.8	3,002.3	3,173.9	3,362.0	**5.5%**
Total	**8,702.1**	**9,126.8**	**9,592.7**	**10,068.4**	**10,597.8**	**11,186.7**	**11,792.0**	**12,465.3**	**13,195.8**	**13,989.1**	**14,861.5**	**5.8%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

ASIA PACIFIC TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.3.2 Asia Pacific Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	4,659.1	4,894.5	5,153.2	5,417.7	5,712.7	6,041.3	6,379.8	6,756.9	7,166.9	7,612.9	8,104.4	**6.0%**
Chloride	4,043.1	4,232.3	4,439.6	4,650.7	4,885.1	5,145.4	5,412.2	5,708.4	6,028.9	6,376.1	6,757.0	**5.6%**
Total	**8,702.1**	**9,126.8**	**9,592.7**	**10,068.4**	**10,597.8**	**11,186.7**	**11,792.0**	**12,465.3**	**13,195.8**	**13,989.1**	**14,861.5**	**5.8%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

ASIA PACIFIC TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

TABLE 6.4.3.3 Asia Pacific Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	5,187.9	5,452.8	5,743.9	6,041.9	6,374.1	6,744.6	7,126.3	7,551.9	8,014.7	8,518.6	9,074.2	**6.1%**
Plastics	1,855.4	1,943.7	2,040.5	2,139.2	2,248.9	2,370.8	2,496.0	2,635.0	2,785.7	2,949.1	3,128.5	**5.7%**
Paper	1,151.4	1,202.1	1,257.4	1,313.6	1,375.9	1,444.8	1,515.3	1,593.3	1,677.5	1,768.5	1,868.0	**5.2%**
Others	507.3	528.2	550.9	573.7	598.8	626.4	654.4	685.1	717.9	752.9	790.8	**4.7%**
Total	**8,702.1**	**9,126.8**	**9,592.7**	**10,068.4**	**10,597.8**	**11,186.7**	**11,792.0**	**12,465.3**	**13,195.8**	**13,989.1**	**14,861.5**	**5.8%**

Source: ReAnIn Analysis and Primary Analysis

ASIA PACIFIC TITANIUM DIOXIDE (Tio2) MARKET, BY COUNTRY

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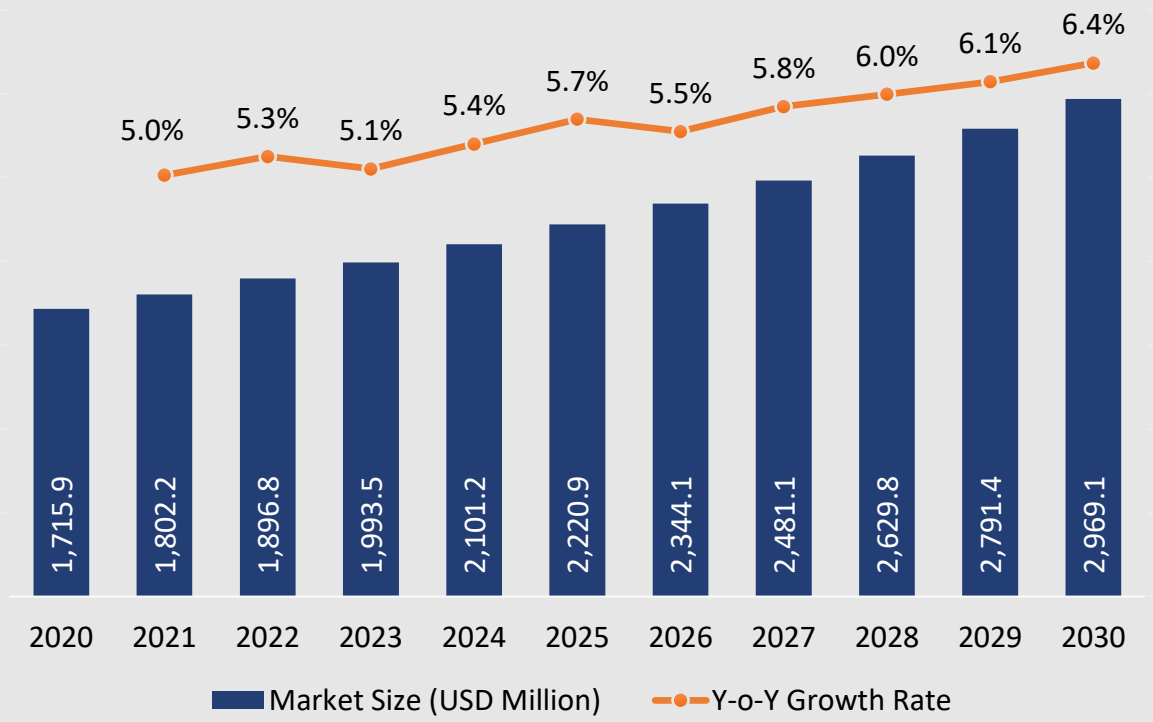
TABLE 6.4.3.4 Asia Pacific Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Country, 2020-2030

COUNTRY	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Japan	1,715.9	1,802.2	1,896.8	1,993.5	2,101.2	2,220.9	2,344.1	2,481.1	2,629.8	2,791.4	2,969.1	**5.9%**
China	3,024.5	3,185.6	3,362.4	3,544.1	3,746.1	3,970.7	4,203.0	4,461.3	4,742.1	5,047.7	5,384.2	**6.2%**
India	1,281.2	1,343.1	1,410.9	1,480.1	1,557.0	1,642.6	1,730.4	1,828.1	1,934.0	2,048.9	2,175.2	**5.7%**
Australia & New Zealand	1,034.4	1,082.3	1,134.7	1,188.1	1,247.4	1,313.5	1,381.1	1,456.3	1,537.7	1,626.0	1,723.0	**5.5%**
South Korea	698.5	728.7	761.9	795.4	832.8	874.4	916.7	963.9	1,014.9	1,070.1	1,130.7	**5.2%**
ASEAN	570.8	593.8	619.0	644.4	672.7	704.3	736.3	771.9	810.5	852.1	897.8	**4.9%**
Rest of Asia Pacific	376.8	391.2	407.0	422.9	440.6	460.4	480.4	502.7	526.8	552.8	581.4	**4.7%**
Total	**8,702.1**	**9,126.8**	**9,592.7**	**10,068.4**	**10,597.8**	**11,186.7**	**11,792.0**	**12,465.3**	**13,195.8**	**13,989.1**	**14,861.5**	**5.8%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

JAPAN TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.3.1.1 **Japan Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.4x **Projected growth of Japan Titanium Dioxide (Tio2) Market during forecast period of 2024 to 2030**

- **Japan Titanium Dioxide (Tio2) Market** was valued at **US$ 1,993.5 Mn** in 2023, and is estimated to reach **US$ 2,969.1 Mn** in 2030, expanding at a CAGR of **5.9%** during the forecast period.
- The market share percentage of **Japan** in 2023, was valued at **19.8%** which is estimated to account for **20.0%** in 2030, during the forecast period.
- In April 2023, according to a survey by Ishihara Sangyo Kaisha, Ltd., they have the largest production volume of titanium dioxide in Japan. This substance is crucial for whitening various industrial products and daily essentials. Additionally, ISK is the only Japanese company using an environmentally friendly chloride process in the production of titanium dioxide.
- In Jan 2024, Doshisha University researchers present a novel, eco-friendly method using titanium dioxide (TiO2) and blue light to synthesize thiochromenopyrroledione derivatives. This sustainable approach sidesteps high-temperature and precious metal catalysts, showing promise for diverse applications, notably in pharmaceutical synthesis.
- Ishihara Sangyo Kaisha, Ltd. claimed Japan's largest titanium dioxide production, vital for whitening various products. They employ an eco-friendly chloride process. Doshisha University introduced a green method using TiO2 and blue light to synthesize thiochromenopyrroledione derivatives, offering pharmaceutical synthesis potential.

Source: ReAnIn, Primary Analysis, Secondary Analysis, Company websites and National Institute of Health Sciences

JAPAN TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.3.1.1 Japan Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	1,320.3	1,387.6	1,461.4	1,537.0	1,621.1	1,714.8	1,811.2	1,918.5	2,035.1	2,161.9	2,301.4	**6.0%**
Anatase	395.6	414.6	435.3	456.5	480.0	506.1	532.9	562.6	594.7	629.5	667.7	**5.7%**
Total	**1,715.9**	**1,802.2**	**1,896.8**	**1,993.5**	**2,101.2**	**2,220.9**	**2,344.1**	**2,481.1**	**2,629.8**	**2,791.4**	**2,969.1**	**5.9%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

JAPAN TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.3.1.2 Japan Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	919.3	967.5	1,020.3	1,074.5	1,134.9	1,202.2	1,271.6	1,349.0	1,433.2	1,524.9	1,625.9	**6.2%**
Chloride	796.6	834.7	876.4	919.0	966.3	1,018.7	1,072.4	1,132.1	1,196.6	1,266.5	1,343.2	**5.6%**
Total	**1,715.9**	**1,802.2**	**1,896.8**	**1,993.5**	**2,101.2**	**2,220.9**	**2,344.1**	**2,481.1**	**2,629.8**	**2,791.4**	**2,969.1**	**5.9%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

JAPAN TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

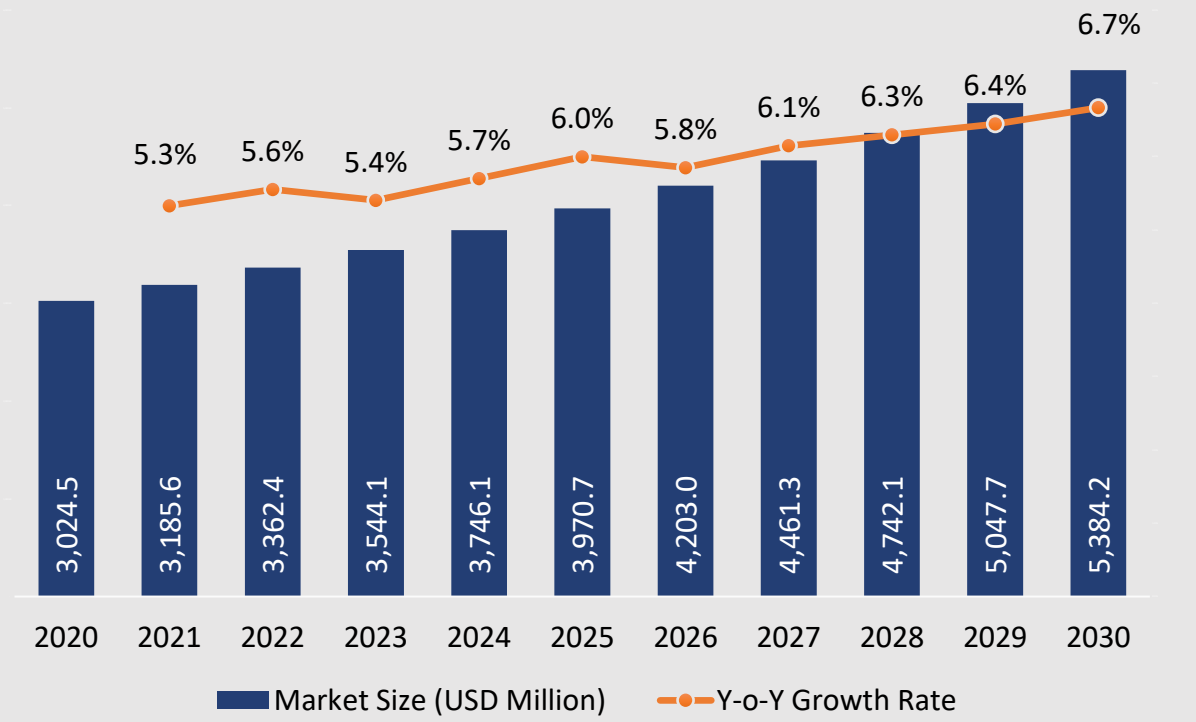
TABLE 6.4.3.1.3 Japan Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	1,026.8	1,080.5	1,139.6	1,200.1	1,267.6	1,342.7	1,420.3	1,506.7	1,600.7	1,703.1	1,816.0	**6.2%**
Plastics	363.1	381.0	400.6	420.6	442.9	467.6	493.1	521.3	551.9	585.2	621.7	**5.8%**
Paper	224.2	234.5	245.7	257.2	269.9	283.9	298.3	314.2	331.4	350.0	370.4	**5.4%**
Others	101.8	106.2	110.9	115.6	120.9	126.6	132.5	138.9	145.8	153.1	161.1	**4.9%**
Total	**1,715.9**	**1,802.2**	**1,896.8**	**1,993.5**	**2,101.2**	**2,220.9**	**2,344.1**	**2,481.1**	**2,629.8**	**2,791.4**	**2,969.1**	**5.9%**

Source: ReAnIn Analysis and Primary Analysis

CHINA TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.3.2.1 China Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030



1.4x **Projected growth of China Titanium Dioxide (Tio2) Market during forecast period of 2024 to 2030**

- **China Titanium Dioxide (Tio2) Market** was valued at **US$ 3,544.1 Mn** in 2023, and is estimated to reach **US$ 5,384.2 Mn** in 2030, expanding at a CAGR of **6.2%** during the forecast period.
- The market share percentage of **China** in 2023, was valued at **35.2%** which is estimated to account for **36.2%** in 2030, during the forecast period.
- In December 2022, LB Sichuan Mining, a subsidiary of LB Group, completed a 240 million yuan agreement to boost its ownership in PZH Zhenxing V & Ti Resources. This move doubled its vanadium-titanium magnetite resources in Sichuan, China. This strategic step strengthens the company's competitiveness and resource capacity. The acquired materials are crucial for iron and steel production, as well as for the production of titanium dioxide.
- In Feb 2024, China's titanium dioxide manufacturers, including Longbai Group, announced a second round of price hikes in 2024 due to tight supply and high costs. Domestic prices rose by RMB 500-700/ton, and international prices by USD 100/ton, with further increases anticipated.
- LB Sichuan Mining doubled its vanadium-titanium magnetite resources. China's titanium dioxide manufacturers, including Longbai Group, raised prices due to tight supply and high costs, with domestic and international price increases expected to continue.

Source: ReAnIn, Primary Analysis, Secondary Analysis,, Company websites.

CHINA TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.3.2.1 China Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	2,333.3	2,459.2	2,597.5	2,739.6	2,897.7	3,073.8	3,255.8	3,458.6	3,679.1	3,919.3	4,184.0	**6.3%**
Anatase	691.2	726.4	765.0	804.5	848.4	897.0	947.1	1,002.7	1,063.0	1,128.4	1,200.3	**6.0%**
Total	**3,024.5**	**3,185.6**	**3,362.4**	**3,544.1**	**3,746.1**	**3,970.7**	**4,203.0**	**4,461.3**	**4,742.1**	**5,047.7**	**5,384.2**	**6.2%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

CHINA TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.3.2.2 China Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	1,631.5	1,721.1	1,819.6	1,920.9	2,033.7	2,159.4	2,289.6	2,434.6	2,592.6	2,764.7	2,954.7	**6.4%**
Chloride	1,392.9	1,464.5	1,542.8	1,623.2	1,712.4	1,811.3	1,913.4	2,026.7	2,149.6	2,283.0	2,429.5	**6.0%**
Total	**3,024.5**	**3,185.6**	**3,362.4**	**3,544.1**	**3,746.1**	**3,970.7**	**4,203.0**	**4,461.3**	**4,742.1**	**5,047.7**	**5,384.2**	**6.2%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

CHINA TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

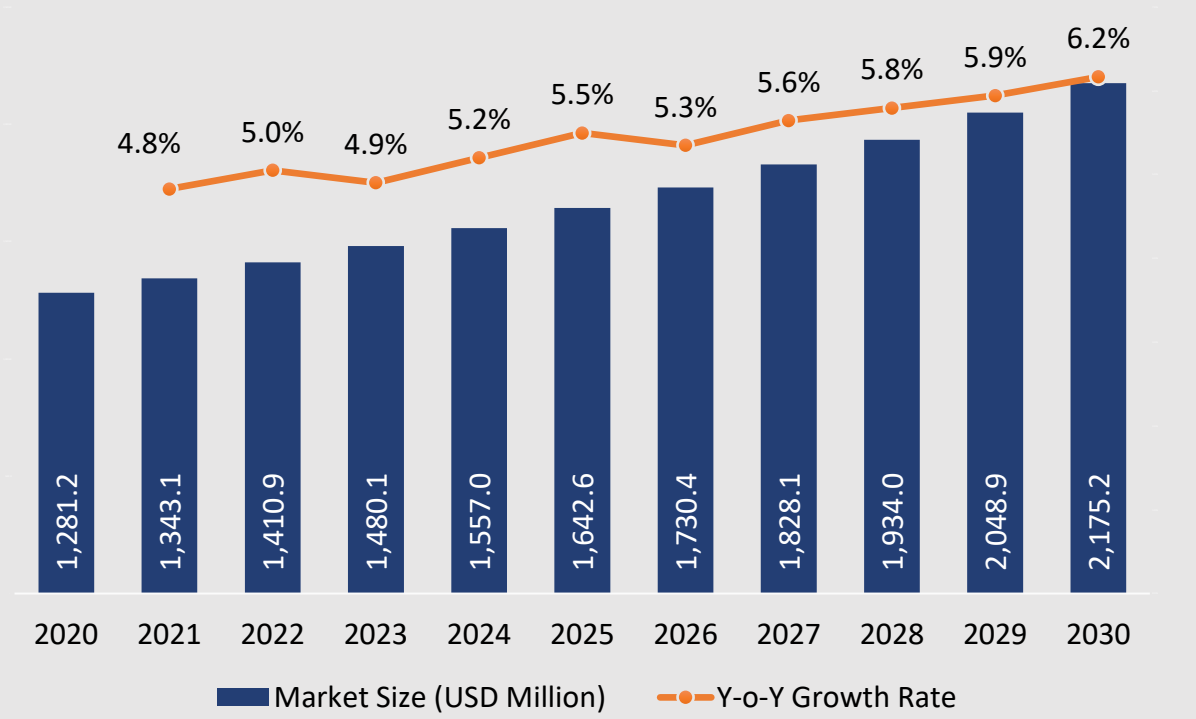
TABLE 6.4.3.2.3 China Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	1,815.3	1,915.9	2,026.6	2,140.6	2,267.6	2,409.2	2,555.9	2,719.4	2,897.6	3,092.0	3,306.6	**6.5%**
Plastics	634.1	667.2	703.5	740.7	782.1	828.1	875.5	928.3	985.5	1,047.8	1,116.2	**6.1%**
Paper	389.3	408.2	428.9	450.1	473.5	499.5	526.2	555.7	587.7	622.3	660.1	**5.7%**
Others	185.9	194.3	203.4	212.6	222.8	234.0	245.4	257.9	271.3	285.7	301.2	**5.2%**
Total	**3,024.5**	**3,185.6**	**3,362.4**	**3,544.1**	**3,746.1**	**3,970.7**	**4,203.0**	**4,461.3**	**4,742.1**	**5,047.7**	**5,384.2**	**6.2%**

Source: ReAnIn Analysis and Primary Analysis

INDIA TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.3.3.1 India Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030



1.4x **Projected growth of India Titanium Dioxide (Tio2) Market during forecast period of 2024 to 2030**

- **India Titanium Dioxide (Tio2) Market** was valued at **US$ 1,480.1 Mn** in 2023, and is estimated to reach **US$ 2,175.2 Mn** in 2030, expanding at a CAGR of **5.7%** during the forecast period.
- The market share percentage of **India** in 2023, was valued at **14.7%** which is estimated to account for **14.6%** in 2030, during the forecast period.
- In January 2023, Meghmani Organics Limited completed the first phase of its Dahej, Gujarat Titanium Dioxide (TiO2) plant with a capacity of 16,500 MTPA. This follows the acquisition of Kilburn Chemicals Limited in December 2021 for Rs. 132 crore. The move into TiO2 strengthens Meghmani's pigment portfolio and provides access to the high-margin market, which is important for products such as paints, coatings, plastics, papers, inks, foods, medicines, and toothpaste.
- In May 2023, according to the Indian Bureau of Mines, India possesses 11% of the global Ilmenite deposits in its beach sands. However, the country imports a billion dollars' worth of titanium dioxide annually due to inadequate mining and processing. Ilmenite is a primary source of titanium, which is crucial for manufacturing the white pigment used in various products. This underscores the need for increased domestic production to meet industrial demands and reduce dependency on imports.
- Meghmani Organics expands into TiO2 with Dahej plant, bolstering pigment portfolio. India's Ilmenite reserves highlight the potential for domestic production, reducing reliance on imports.

Source: ReAnIn, Primary Analysis, Secondary Analysis, Company websites and Indian Bureau of Mines.

INDIA TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.3.3.1 India Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	983.3	1,031.4	1,084.3	1,138.2	1,198.2	1,265.0	1,333.6	1,409.9	1,492.8	1,582.8	1,681.8	**5.8%**
Anatase	298.0	311.7	326.6	341.9	358.8	377.6	396.8	418.1	441.2	466.1	493.5	**5.5%**
Total	**1,281.2**	**1,343.1**	**1,410.9**	**1,480.1**	**1,557.0**	**1,642.6**	**1,730.4**	**1,828.1**	**1,934.0**	**2,048.9**	**2,175.2**	**5.7%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

INDIA TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.3.3.2 India Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	684.1	718.4	756.2	794.8	837.8	885.7	935.0	990.0	1,049.7	1,114.6	1,186.2	**6.0%**
Chloride	597.2	624.6	654.7	685.3	719.2	756.8	795.4	838.1	884.3	934.3	989.1	**5.5%**
Total	**1,281.2**	**1,343.1**	**1,410.9**	**1,480.1**	**1,557.0**	**1,642.6**	**1,730.4**	**1,828.1**	**1,934.0**	**2,048.9**	**2,175.2**	**5.7%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

INDIA TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

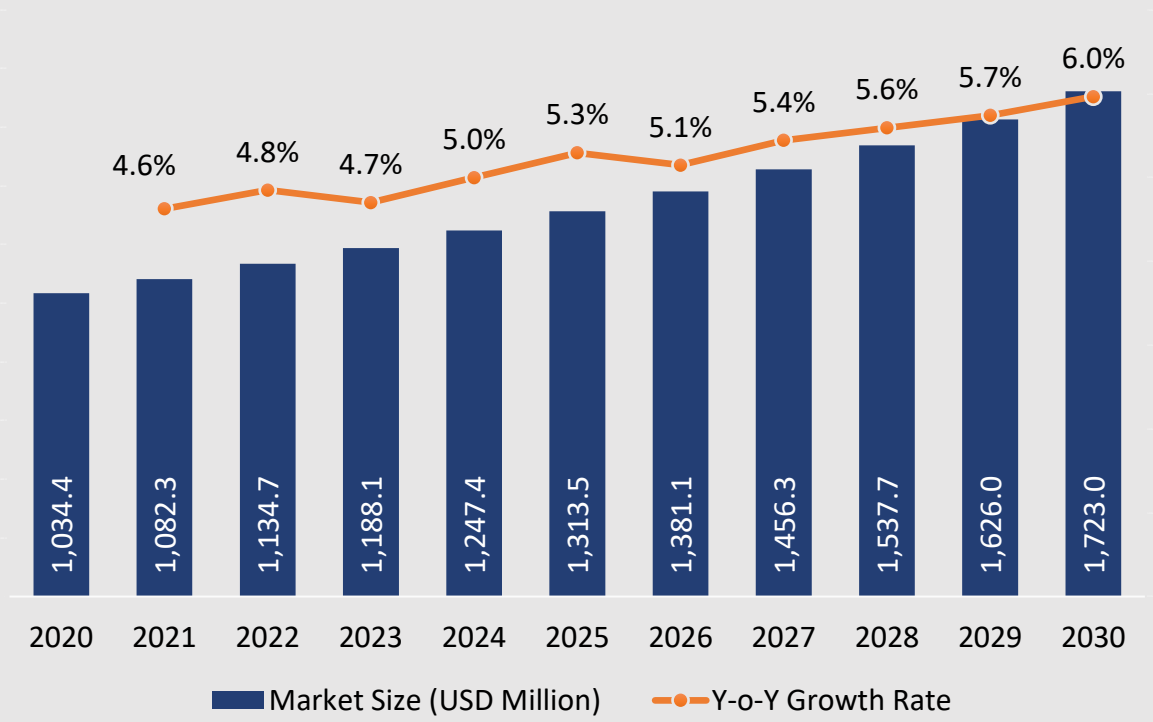
TABLE 6.4.3.3.3 India Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	761.9	800.6	843.1	886.6	935.0	989.0	1,044.7	1,106.7	1,174.1	1,247.5	1,328.3	**6.0%**
Plastics	274.1	286.9	300.9	315.3	331.2	348.8	366.9	387.0	408.8	432.3	458.2	**5.6%**
Paper	170.6	177.9	185.8	193.9	202.8	212.7	222.8	233.9	245.9	258.9	273.0	**5.1%**
Others	74.7	77.8	81.0	84.4	88.0	92.0	96.0	100.5	105.2	110.2	115.7	**4.7%**
Total	**1,281.2**	**1,343.1**	**1,410.9**	**1,480.1**	**1,557.0**	**1,642.6**	**1,730.4**	**1,828.1**	**1,934.0**	**2,048.9**	**2,175.2**	**5.7%**

Source: ReAnIn Analysis and Primary Analysis

AUSTRALIA & NEW ZEALAND TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.3.4.1 **Australia & New Zealand Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.4x **Projected growth of Australia & New Zealand Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **Australia & New Zealand Titanium Dioxide (Tio2) Market** was valued at **US$ 1,188.1 Mn** in 2023 and is estimated to reach **US$ 1,723.0 Mn** in 2030, expanding at a CAGR of **5.5%** during the forecast period.
- The market share percentage of **Australia & New Zealand** in 2023, was valued at **11.8%** which is estimated to account for **11.6%** in 2030, during the forecast period.
- In July 2023, a New Zealand startup called Avertana achieved a significant milestone by securing a deal with the Chinese steelmaker Tranvic Group. This marks a major step forward in commercializing its titanium recycling technology. The agreement is focused on refining slag by-products into high-value titanium dioxide pigment, which is used in paints and various chemical and mineral products for water treatment applications.
- In October 2022, Food Standards Australia New Zealand (FSANZ) aligned with Health Canada and the UK Food Standards Authority, affirming the safety of titanium dioxide in food based on a review that included new scientific data. The Titanium Dioxide Manufacturers Association (TDMA) welcomes FSANZ's confirmation of titanium dioxide's safety for human consumption.
- Avertana secures deal with Tranvic Group, advancing titanium recycling. FSANZ, Health Canada, and UK affirm titanium dioxide safety in food, supported by TDMA.

Source: ReAnIn, Primary Analysis, Secondary Analysis, Company Websites and Food Standards Australia New Zealand(FSANZ)

AUSTRALIA & NEW ZEALAND TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.3.4.1 Australia & New Zealand Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	791.8	829.0	869.8	911.3	957.5	1,008.9	1,061.6	1,120.3	1,183.9	1,252.9	1,328.8	**5.6%**
Anatase	242.6	253.3	265.0	276.8	290.0	304.6	319.5	336.0	353.8	373.1	394.3	**5.3%**
Total	**1,034.4**	**1,082.3**	**1,134.7**	**1,188.1**	**1,247.4**	**1,313.5**	**1,381.1**	**1,456.3**	**1,537.7**	**1,626.0**	**1,723.0**	**5.5%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

AUSTRALIA & NEW ZEALAND TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.3.4.2 Australia & New Zealand Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	551.1	577.4	606.2	635.6	668.4	704.8	742.2	783.9	829.0	878.1	932.1	**5.7%**
Chloride	483.3	504.9	528.5	552.5	579.1	608.7	638.9	672.4	708.7	747.9	790.9	**5.3%**
Total	**1,034.4**	**1,082.3**	**1,134.7**	**1,188.1**	**1,247.4**	**1,313.5**	**1,381.1**	**1,456.3**	**1,537.7**	**1,626.0**	**1,723.0**	**5.5%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

AUSTRALIA & NEW ZEALAND TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

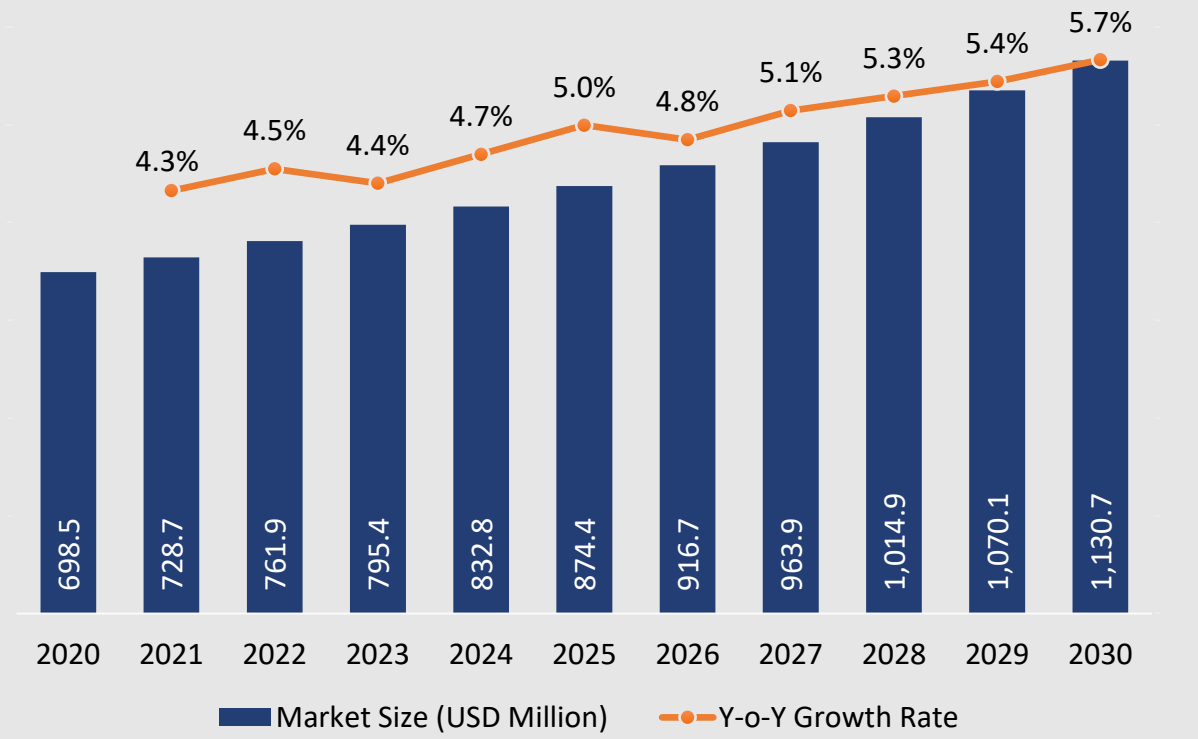
TABLE 6.4.3.4.3 Australia & New Zealand Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	613.3	643.1	675.9	709.3	746.6	788.1	830.8	878.3	930.0	986.1	1,048.0	**5.8%**
Plastics	223.3	233.3	244.3	255.4	267.8	281.6	295.6	311.3	328.2	346.4	366.5	**5.4%**
Paper	139.5	145.3	151.6	158.0	165.1	172.9	180.9	189.7	199.2	209.4	220.6	**5.0%**
Others	58.3	60.5	62.9	65.3	68.0	70.9	73.8	77.0	80.4	84.0	87.9	**4.4%**
Total	**1,034.4**	**1,082.3**	**1,134.7**	**1,188.1**	**1,247.4**	**1,313.5**	**1,381.1**	**1,456.3**	**1,537.7**	**1,626.0**	**1,723.0**	**5.5%**

Source: ReAnIn Analysis and Primary Analysis

SOUTH KOREA TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.3.5.1 South Korea Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030



1.4x **Projected growth of South Korea Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **South Korea Titanium Dioxide (Tio2) Market** was valued at **US$ 795.4 Mn** in 2023 and is estimated to reach **US$ 1,130.7 Mn** in 2030, expanding at a CAGR of **5.2%** during the forecast period.
- The market share percentage of **South Korea** in 2023, was valued at **7.9%** which is estimated to account for **7.6%** in 2030, during the forecast period.
- Kumyang, located in South Korea, specializes in providing Titanium Dioxide. Titanium Dioxide is a brilliant white substance known for its high refractive index and superior covering capacity. This essential ingredient adds whiteness and coverage to paints, coatings, plastics, paper, inks, food products, medicines, and various toothpaste formulations.
- Cosmo Chemical Co. Ltd, based in South Korea, plays a crucial role in providing TiO_2, an essential inorganic compound that is indispensable as a white pigment in various applications, including plastics, paints, rubbers, and papers. The usage of TiO_2 per person often serves as a benchmark for measuring economic development in a country.
- South Korea's Kumyang and Cosmo Chemical contribute to TiO_2 supply, crucial for diverse applications. TiO_2 usage per capita reflects economic development, highlighting its significance in various industries.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Websites.

SOUTH KOREA TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.3.5.1 South Korea Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	533.3	556.7	582.4	608.5	637.5	669.9	702.9	739.6	779.4	822.4	869.8	**5.3%**
Anatase	165.3	172.0	179.4	186.9	195.2	204.5	213.9	224.3	235.5	247.7	260.9	**5.0%**
Total	**698.5**	**728.7**	**761.9**	**795.4**	**832.8**	**874.4**	**916.7**	**963.9**	**1,014.9**	**1,070.1**	**1,130.7**	**5.2%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

SOUTH KOREA TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.3.5.2 South Korea Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	370.9	387.4	405.6	424.0	444.5	467.4	490.7	516.7	544.9	575.4	609.0	**5.4%**
Chloride	327.7	341.3	356.3	371.5	388.3	407.0	426.0	447.2	470.0	494.7	521.7	**5.0%**
Total	**698.5**	**728.7**	**761.9**	**795.4**	**832.8**	**874.4**	**916.7**	**963.9**	**1,014.9**	**1,070.1**	**1,130.7**	**5.2%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

SOUTH KOREA TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

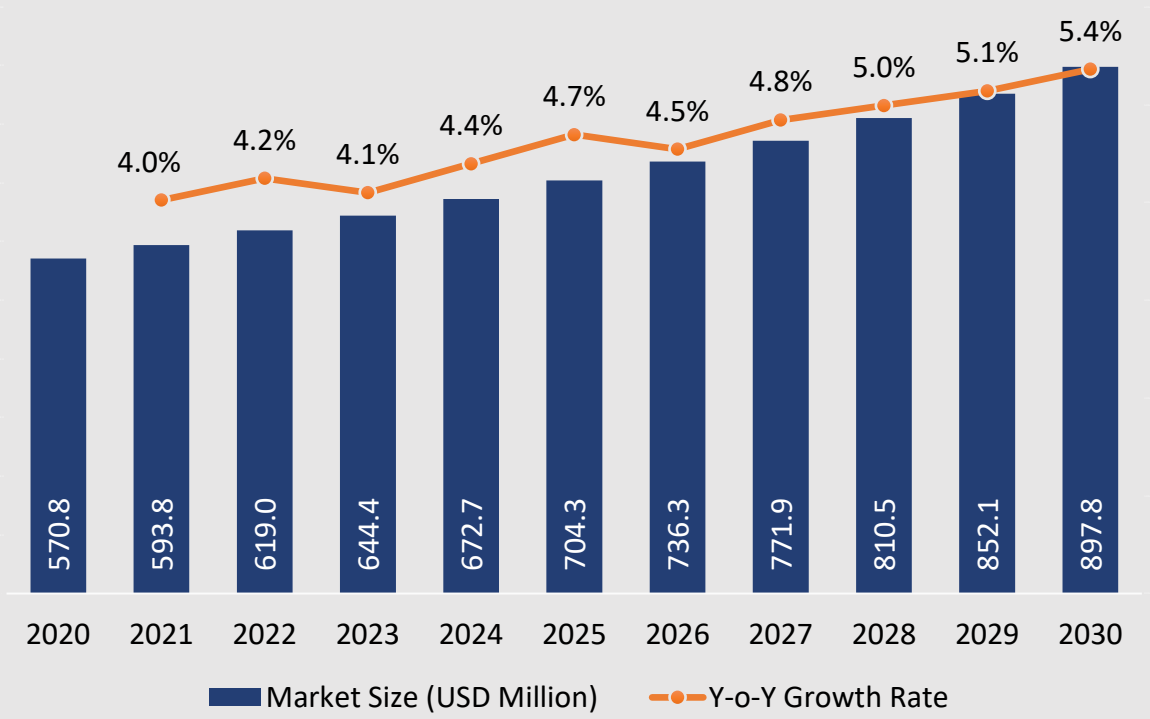
TABLE 6.4.3.5.3 South Korea Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	412.9	431.7	452.3	473.3	496.6	522.7	549.4	579.1	611.3	646.3	684.8	**5.5%**
Plastics	152.2	158.5	165.5	172.6	180.5	189.2	198.1	208.0	218.7	230.2	242.9	**5.1%**
Paper	95.6	99.3	103.3	107.4	111.9	116.9	122.0	127.6	133.6	140.1	147.2	**4.7%**
Others	37.9	39.2	40.7	42.2	43.8	45.5	47.3	49.2	51.3	53.5	55.8	**4.1%**
Total	**698.5**	**728.7**	**761.9**	**795.4**	**832.8**	**874.4**	**916.7**	**963.9**	**1,014.9**	**1,070.1**	**1,130.7**	**5.2%**

Source: ReAnIn Analysis and Primary Analysis

ASEAN TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.3.6.1 **ASEAN Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.3x **Projected growth of ASEAN Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **ASEAN Titanium Dioxide (Tio2) Market** was valued at **US$ 644.4 Mn** in 2023 and is estimated to reach **US$ 897.8 Mn** in 2030, expanding at a CAGR of **4.9%** during the forecast period.
- The market share percentage of the **ASEAN** in 2023, was valued at **6.4%** which is estimated to account for **6.0%** in 2030, during the forecast period.
- ASEAN consists of Brunei, Burma (Myanmar), Cambodia, Timor-Leste, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand, and Vietnam.
- In August 2023, Brenntag expanded its distribution agreement with Kronos International to include Southeast Asian countries. The expanded coverage now includes countries like Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam. This extension encompasses Kronos's value-added titanium dioxide pigments, which are crucial for various applications, including the Life Science segments such as pharmaceuticals, cosmetics, and personal care.
- In 2020, a study showed that the 'Your Future Energy' initiative successfully brought a hands-on solar cell practical to Cambodia. This overcame concerns about transporting titanium dioxide, a crucial material for the experiment, on a plane. The participants conducted the practical successfully, demonstrating the feasibility of similar educational initiatives.
- Brenntag expands Kronos distribution to Southeast Asia, including key markets like Indonesia, Malaysia, and Thailand. 'Your Future Energy' initiative brings solar cell practical to Cambodia, showcasing titanium dioxide's educational value.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Websites.

ASSOCIATION OF SOUTHEAST ASIAN NATIONS (ASEAN) TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

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TABLE 6.4.3.6.1 ASEAN Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	434.6	452.4	472.0	491.7	513.7	538.2	563.1	590.8	620.8	653.2	688.9	**5.0%**
Anatase	136.2	141.4	147.0	152.7	159.1	166.1	173.2	181.2	189.7	198.9	209.0	**4.7%**
Total	**570.8**	**593.8**	**619.0**	**644.4**	**672.7**	**704.3**	**736.3**	**771.9**	**810.5**	**852.1**	**897.8**	**4.9%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

ASSOCIATION OF SOUTHEAST ASIAN NATIONS (ASEAN) TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

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Research | Analysis | Insights

TABLE 6.4.3.6.2 ASEAN Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	301.6	314.3	328.2	342.2	357.8	375.3	393.1	412.9	434.3	457.6	483.1	**5.1%**
Chloride	269.2	279.5	290.8	302.2	314.9	329.0	343.2	359.1	376.1	394.6	414.7	**4.7%**
Total	**570.8**	**593.8**	**619.0**	**644.4**	**672.7**	**704.3**	**736.3**	**771.9**	**810.5**	**852.1**	**897.8**	**4.9%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

ASSOCIATION OF SOUTHEAST ASIAN NATIONS (ASEAN) TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

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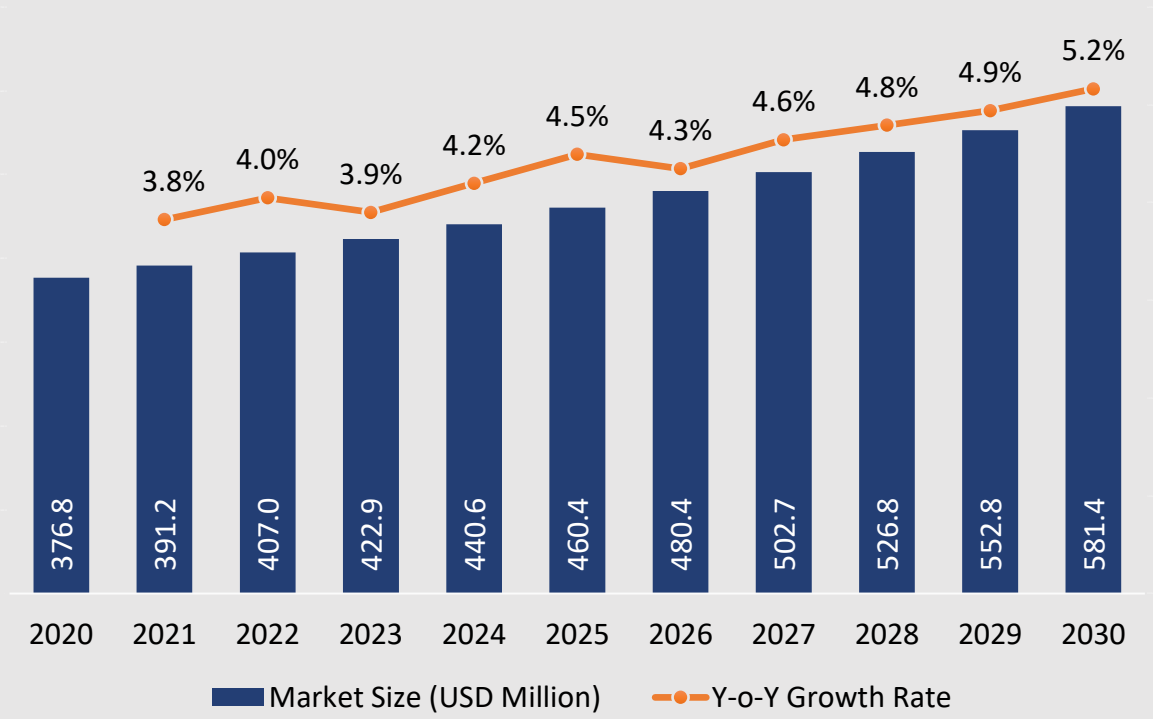
TABLE 6.4.3.6.3 ASEAN Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	336.4	350.7	366.3	382.1	399.8	419.5	439.6	461.9	486.2	512.5	541.4	**5.2%**
Plastics	125.3	130.2	135.7	141.1	147.2	154.0	160.8	168.5	176.7	185.6	195.4	**4.8%**
Paper	79.3	82.1	85.2	88.3	91.7	95.5	99.4	103.7	108.2	113.2	118.5	**4.4%**
Others	29.8	30.8	31.8	32.9	34.0	35.3	36.5	37.9	39.3	40.9	42.6	**3.8%**
Total	**570.8**	**593.8**	**619.0**	**644.4**	**672.7**	**704.3**	**736.3**	**771.9**	**810.5**	**852.1**	**897.8**	**4.9%**

Source: ReAnIn Analysis and Primary Analysis

REST OF ASIA PACIFIC TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.3.7.1 **Rest Of Asia Pacific Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.3x **Projected growth of Rest Of Asia Pacific Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **Rest Of Asia Pacific Titanium Dioxide (Tio2) Market** was valued at **US$ 422.9 Mn** in 2023 and is estimated to reach **US$ 581.4 Mn** in 2030, expanding at a CAGR of **4.7%** during the forecast period.
- The market share percentage of the **Rest Of Asia Pacific** in 2023, was valued at **4.2%** which is estimated to account for **3.9%** in 2030, during the forecast period.
- The rest of Asia Pacific consists of Bangladesh, Maldives, Nepal, Mauritius, Sri Lanka, Taiwan, Mongolia, Fiji, Tonga, Hong Kong, Papua New Guinea, Lao's and Pakistan.
- As per the study, Cox's Bazar beach placer deposits in Bangladesh highlight zircon's association with Ti-rich minerals. This underscores the imperative for upgrading processes in zircon, ilmenite, and rutile extraction to meet industrial standards, especially for chlorination feedstock and TiO2 pigment extraction, driving advancements in the titanium dioxide market.
- Cosmoss VU Limited, a reputable exporter in Hong Kong, is a trusted supplier of high-quality Titanium Dioxide Rutile. With a customer-centric approach, they ensure premium products, adhering to international standards, making them preferred Titanium Dioxide Rutile Suppliers in the industry.
- Cox's Bazar beach deposits in Bangladesh emphasize zircon's significance alongside Ti-rich minerals. Cosmoss VU Limited, based in Hong Kong, stands out as a reliable supplier of top-notch Titanium Dioxide Rutile.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Websites.

REST OF ASIA PACIFIC TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.3.7.1 Rest of Asia Pacific Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	286.1	297.3	309.5	321.8	335.6	350.9	366.4	383.7	402.5	422.7	444.9	**4.8%**
Anatase	90.7	93.9	97.5	101.1	105.1	109.5	114.0	119.0	124.3	130.1	136.5	**4.5%**
Total	**376.8**	**391.2**	**407.0**	**422.9**	**440.6**	**460.4**	**480.4**	**502.7**	**526.8**	**552.8**	**581.4**	**4.7%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

REST OF ASIA PACIFIC TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.3.7.2 Rest of Asia Pacific Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	200.5	208.4	217.1	225.8	235.6	246.5	257.5	269.8	283.2	297.6	313.4	**4.9%**
Chloride	176.3	182.8	189.9	197.1	205.0	213.9	222.9	232.9	243.6	255.2	267.9	**4.6%**
Total	**376.8**	**391.2**	**407.0**	**422.9**	**440.6**	**460.4**	**480.4**	**502.7**	**526.8**	**552.8**	**581.4**	**4.7%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

REST OF ASIA PACIFIC TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

TABLE 6.4.3.7.3 Rest Of Asia Pacific Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	221.4	230.3	240.1	249.9	260.9	273.3	285.8	299.7	314.8	331.2	349.1	**5.0%**
Plastics	83.5	86.6	90.0	93.5	97.3	101.6	105.9	110.7	115.9	121.5	127.7	**4.6%**
Paper	53.1	54.8	56.8	58.8	61.0	63.4	65.8	68.5	71.5	74.6	78.0	**4.2%**
Others	18.9	19.5	20.1	20.7	21.4	22.2	22.9	23.7	24.6	25.5	26.5	**3.7%**
Total	**376.8**	**391.2**	**407.0**	**422.9**	**440.6**	**460.4**	**480.4**	**502.7**	**526.8**	**552.8**	**581.4**	**4.7%**

Source: ReAnIn Analysis and Primary Analysis

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SECTION 6.4.4

LATIN AMERICA TITANIUM DIOXIDE (Tio2) MARKET

Regional and Country-level Analysis

Segment-specific Market Size and Forecast

- By Grade
- By Process
- By Application
- By Country

Country-specific Market Size and Forecast

- Brazil
- Mexico
- Argentina
- Rest of Latin America

LATIN AMERICA TITANIUM DIOXIDE (Tio2) MARKET, BY REGION

FIGURE 6.4.4.1 Latin America Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030

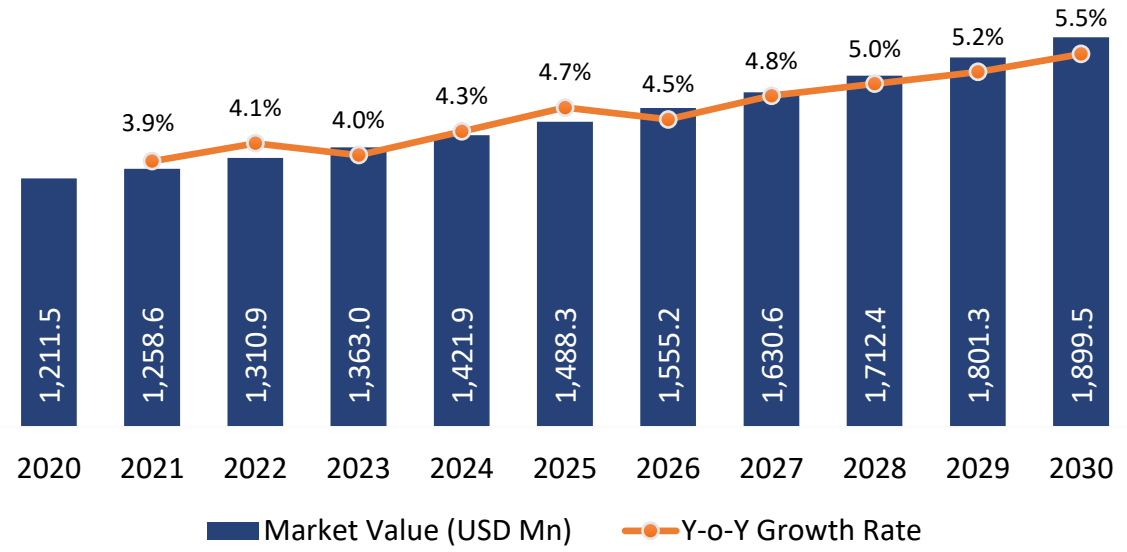
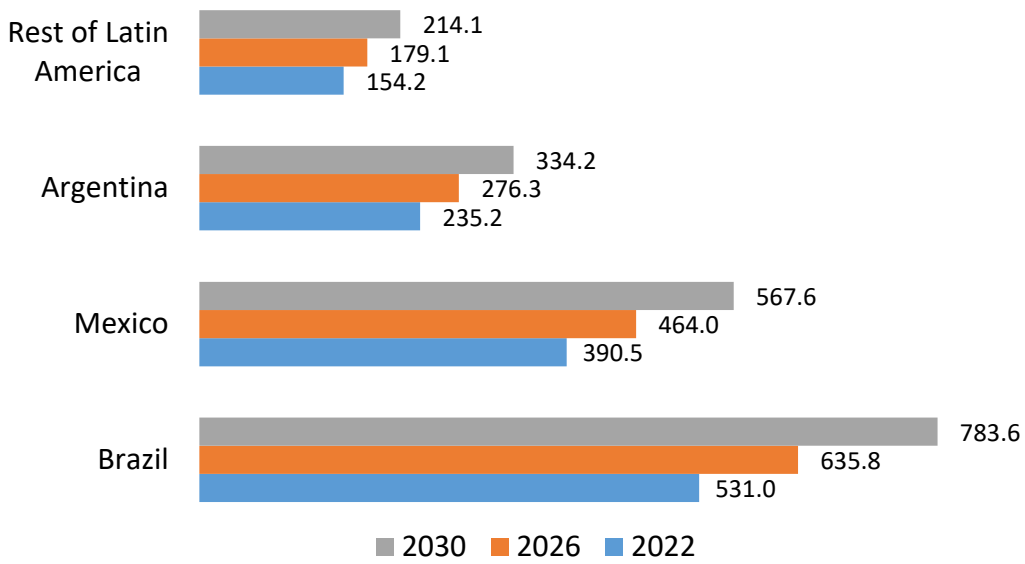


FIGURE 6.4.4.2 Latin America Titanium Dioxide (Tio2) Market Value (USD Million), By Country



- **Latin America Titanium Dioxide (Tio2) Market** was valued at **1363.0 USD Million in 2023** and is estimated to reach **1,899.5 USD Million in 2030**, expanding at a CAGR of **4.9%** during the forecast period.
- **Brazil** held a major market share in Latin America Titanium Dioxide (Tio2) Market in 2023, which is estimated to reach **41.3%** in 2030, during the forecast period.

Source: ReAnIn, Primary Analysis and Secondary Analysis

LATIN AMERICA TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.4.1 Latin America Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	949.0	986.6	1,028.3	1,070.0	1,117.1	1,170.2	1,223.8	1,284.1	1,349.7	1,421.0	1,499.9	**5.0%**
Anatase	262.5	272.0	282.6	293.0	304.8	318.1	331.5	346.5	362.7	380.3	399.7	**4.6%**
Total	**1,211.5**	**1,258.6**	**1,310.9**	**1,363.0**	**1,421.9**	**1,488.3**	**1,555.2**	**1,630.6**	**1,712.4**	**1,801.3**	**1,899.5**	**4.9%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

LATIN AMERICA TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.4.2 Latin America Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	660.1	686.8	716.4	746.0	779.6	817.4	855.6	898.7	945.6	996.6	1,053.1	**5.1%**
Chloride	551.4	571.8	594.4	616.9	642.3	670.9	699.6	731.9	766.8	804.7	846.5	**4.7%**
Total	**1,211.5**	**1,258.6**	**1,310.9**	**1,363.0**	**1,421.9**	**1,488.3**	**1,555.2**	**1,630.6**	**1,712.4**	**1,801.3**	**1,899.5**	**4.9%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

LATIN AMERICA TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

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TABLE 6.4.4.3 Latin America Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	730.8	760.4	793.3	826.1	863.4	905.4	947.9	995.7	1,047.8	1,104.6	1,167.4	**5.2%**
Plastics	251.4	261.0	271.6	282.1	294.0	307.5	321.0	336.2	352.7	370.6	390.3	**4.8%**
Paper	158.0	163.5	169.7	175.8	182.8	190.5	198.3	207.1	216.5	226.7	238.0	**4.5%**
Others	71.4	73.8	76.3	78.9	81.7	84.9	88.1	91.6	95.4	99.5	103.9	**4.1%**
Total	**1,211.5**	**1,258.6**	**1,310.9**	**1,363.0**	**1,421.9**	**1,488.3**	**1,555.2**	**1,630.6**	**1,712.4**	**1,801.3**	**1,899.5**	**4.9%**

Source: ReAnIn Analysis and Primary Analysis

LATIN AMERICA TITANIUM DIOXIDE (Tio2) MARKET, BY COUNTRY

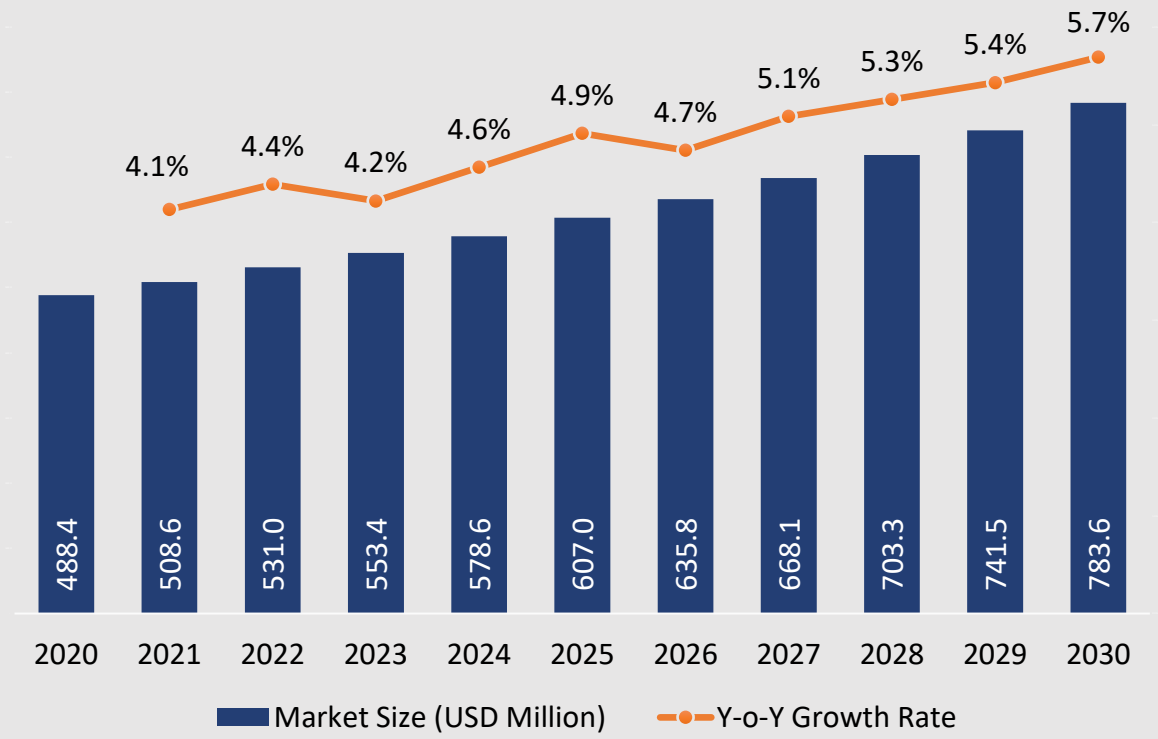
TABLE 6.4.4.4 Latin America Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Country, 2020-2030

COUNTRY	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Brazil	488.4	508.6	531.0	553.4	578.6	607.0	635.8	668.1	703.3	741.5	783.6	**5.2%**
Mexico	360.6	374.8	390.5	406.2	423.9	443.9	464.0	486.7	511.3	538.1	567.6	**5.0%**
Argentina	218.5	226.4	235.2	244.0	253.9	265.1	276.3	289.0	302.8	317.7	334.2	**4.7%**
Rest of Latin America	144.0	148.8	154.2	159.5	165.5	172.3	179.1	186.7	195.1	204.1	214.1	**4.4%**
Total	**1,211.5**	**1,258.6**	**1,310.9**	**1,363.0**	**1,421.9**	**1,488.3**	**1,555.2**	**1,630.6**	**1,712.4**	**1,801.3**	**1,899.5**	**4.9%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

BRAZIL TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.4.1.1 **Brazil Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.4x **Projected growth of Brazil Titanium Dioxide (Tio2) Market during forecast period of 2024 to 2030**

- **Brazil Titanium Dioxide (Tio2) Market** was valued at **US$ 553.4 Mn** in 2023 and is estimated to reach **US$ 783.6 Mn** in 2030, expanding at a CAGR of **5.2 %** during the forecast period.
- The market share percentage of **Brazil** in 2023, was valued at **40.6%** which is estimated to account for **41.3%** in 2030, during the forecast period.
- In July 2023, Anvisa, the Brazilian Health Regulatory Agency, will actively monitor and re-evaluate the use of titanium dioxide additives in food, in line with global safety initiatives. Anvisa will ensure transparency and prioritize consumer health and well-being through evidence-based decision-making, by engaging with stakeholders.
- In May 2023, Univar Solutions and Croda collaborated in a distribution partnership to expand the mineral sunscreen product range in Brazil. The focus was on products like Solaveil, Infraveil, and Optisol, which are based on titanium dioxide. This collaboration aimed to improve the transparency of facial and body lotions with UV physical filters. It also aimed to strengthen Univar Solutions' beauty and personal care offerings by incorporating Croda's specialty ingredients.
- Anvisa pledges to monitor titanium dioxide in food, aligning with global safety standards. Univar Solutions and Croda join forces to expand mineral sunscreen products in Brazil, enhancing transparency and product offerings.

Source: ReAnIn, Primary Analysis, and Secondary Analysis, and Company Website.

BRAZIL TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.4.1.1 Brazil Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	381.6	397.7	415.4	433.3	453.4	476.1	499.0	524.8	552.9	583.5	617.2	**5.3%**
Anatase	106.8	111.0	115.5	120.1	125.2	131.0	136.8	143.3	150.3	158.0	166.4	**4.9%**
Total	**488.4**	**508.6**	**531.0**	**553.4**	**578.6**	**607.0**	**635.8**	**668.1**	**703.3**	**741.5**	**783.6**	**5.2%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

BRAZIL TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.4.1.2 Brazil Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	265.8	277.3	290.0	302.7	317.1	333.3	349.7	368.2	388.4	410.3	434.7	**5.4%**
Chloride	222.6	231.3	241.0	250.7	261.6	273.8	286.1	299.9	314.9	331.1	349.0	**4.9%**
Total	**488.4**	**508.6**	**531.0**	**553.4**	**578.6**	**607.0**	**635.8**	**668.1**	**703.3**	**741.5**	**783.6**	**5.2%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

BRAZIL TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

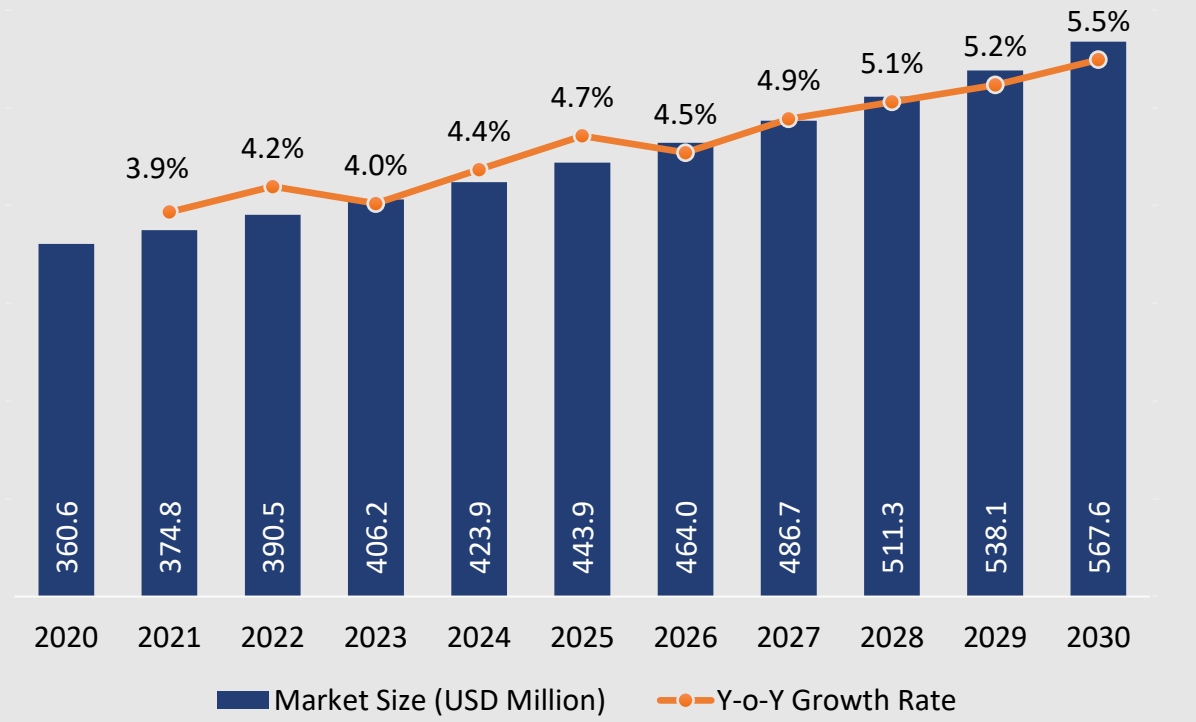
TABLE 6.4.4.1.3 Brazil Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	293.5	306.2	320.2	334.2	350.1	368.0	386.2	406.6	428.9	453.1	479.9	**5.4%**
Plastics	102.3	106.5	111.1	115.7	120.8	126.6	132.5	139.1	146.3	154.1	162.7	**5.1%**
Paper	62.7	65.1	67.7	70.3	73.2	76.5	79.8	83.5	87.5	91.9	96.6	**4.7%**
Others	29.9	30.9	32.1	33.2	34.5	35.9	37.3	38.9	40.6	42.4	44.4	**4.3%**
Total	**488.4**	**508.6**	**531.0**	**553.4**	**578.6**	**607.0**	**635.8**	**668.1**	**703.3**	**741.5**	**783.6**	**5.2%**

Source: ReAnIn Analysis and Primary Analysis

MEXICO TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.4.2.1 **Mexico Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.3x **Projected growth of Mexico Titanium Dioxide (Tio2) Market during forecast period of 2024 to 2030**

- **Mexico Titanium Dioxide (Tio2) Market** was valued at **US$ 406.2 Mn** in 2023 and is estimated to reach **US$ 567.6 Mn** in 2030, expanding at a CAGR of **5.0 %** during the forecast period.
- The market share percentage of **Mexico** in 2023, was valued at **29.8%** which is estimated to account for **29.9%** in 2030, during the forecast period.
- The Chemours Company has officially started the commercial operation of its new titanium dioxide (TiO2) line at the Altamira plant in Tamaulipas, Mexico. The plant uses the chloride process to produce Ti-Pure pigment and has been designed to gradually increase its production to reach its full capacity of 200,000 metric tonnes per year. This enhancement will improve cost efficiency and pave the way for future growth.
- According to a study, a Mexican company called Nanomateriales has introduced a cosmetic sunscreen that includes titanium dioxide nanoparticles to provide improved UVA/UVB protection and skin preservation. The company's principal scientist, Joel Antonio Gutierrez, oversaw the development, which emphasizes particle dispersion (5-10 nanometers) to prevent clumping, thereby enhancing the effectiveness of the sunscreen in cosmetic formulations.
- Chemours launches TiO2 line in Mexico, enhancing production efficiency. Nanomateriales introduces sunscreen with titanium dioxide nanoparticles for improved UVA/UVB protection and skin preservation.

Source: ReAnIn, Primary Analysis, and Secondary Analysis, and Company Website.

MEXICO TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.4.2.1 Mexico Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	282.4	293.8	306.3	318.8	333.0	349.0	365.1	383.3	403.0	424.5	448.2	**5.1%**
Anatase	78.1	81.0	84.2	87.3	90.9	94.9	98.9	103.4	108.3	113.6	119.4	**4.7%**
Total	**360.6**	**374.8**	**390.5**	**406.2**	**423.9**	**443.9**	**464.0**	**486.7**	**511.3**	**538.1**	**567.6**	**5.0%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

MEXICO TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.4.2.2 Mexico Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	197.0	205.1	214.0	223.0	233.1	244.6	256.1	269.1	283.3	298.7	315.8	**5.2%**
Chloride	163.6	169.7	176.4	183.2	190.8	199.3	207.9	217.6	228.0	239.3	251.8	**4.7%**
Total	**360.6**	**374.8**	**390.5**	**406.2**	**423.9**	**443.9**	**464.0**	**486.7**	**511.3**	**538.1**	**567.6**	**5.0%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

MEXICO TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

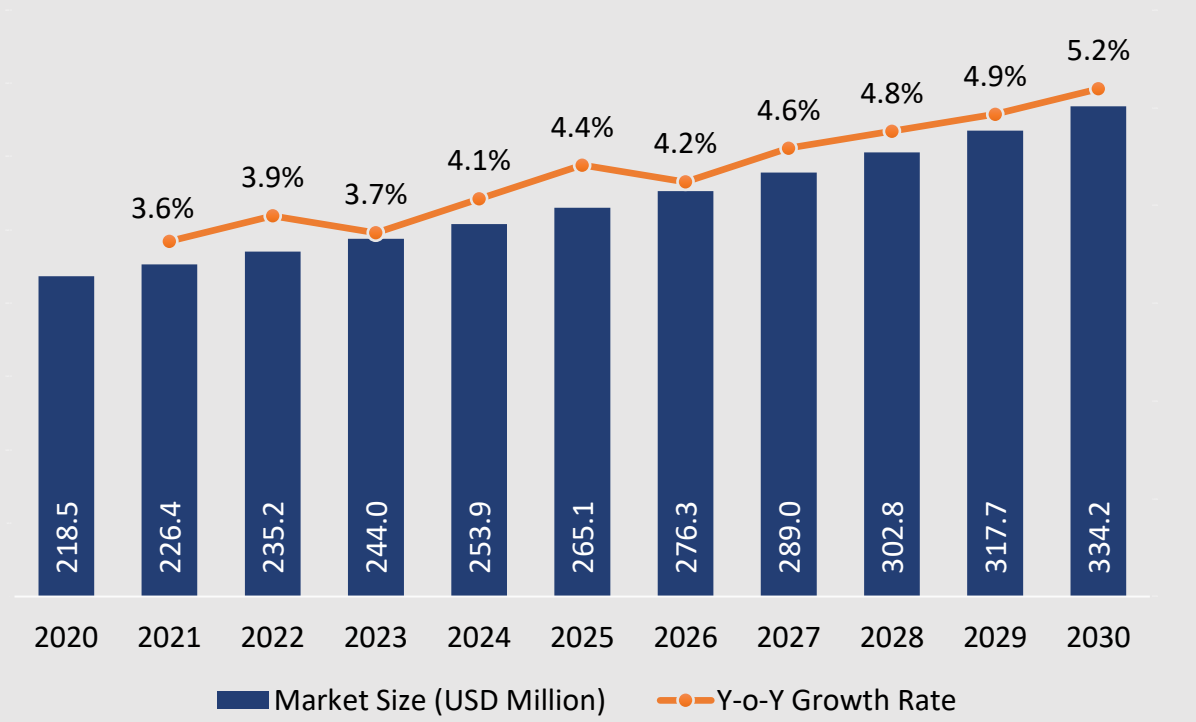
TABLE 6.4.4.2.3 Mexico Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	217.5	226.4	236.3	246.1	257.3	269.9	282.7	297.1	312.7	329.8	348.6	**5.2%**
Plastics	74.8	77.7	80.9	84.1	87.7	91.7	95.8	100.4	105.4	110.8	116.7	**4.9%**
Paper	47.0	48.7	50.5	52.4	54.5	56.8	59.2	61.8	64.7	67.8	71.2	**4.6%**
Others	21.3	22.0	22.8	23.6	24.4	25.4	26.3	27.4	28.5	29.8	31.1	**4.1%**
Total	**360.6**	**374.8**	**390.5**	**406.2**	**423.9**	**443.9**	**464.0**	**486.7**	**511.3**	**538.1**	**567.6**	**5.0%**

Source: ReAnIn Analysis and Primary Analysis

ARGENTINA TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.4.3.1 **Argentina Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.3x **Projected growth of Argentina Titanium Dioxide (Tio2) Market during forecast period of 2024 to 2030**

- **Argentina Titanium Dioxide (Tio2) Market** was valued at **US$ 244.0 Mn** in 2023 and is estimated to reach **US$ 334.2 Mn** in 2030, expanding at a CAGR of **4.7 %** during the forecast period.
- The market share percentage of **Argentina** in 2023, was valued at **17.9%** which is estimated to account for **17.6%** in 2030, during the forecast period.
- According to the study in Argentina, employing Auger electron spectroscopy, chemical changes occur during the early phases of titanium (Ti0) oxidation and titanium dioxide (Ti4+) reduction under electron bombardment. Factor analysis identifies the presence of an intermediate Ti oxidation state, Ti2O3 (Ti3+), in both processes.
- Stellar Exports, based in the UAE, supplies high-quality Rutile and Anatase-grade titanium dioxide in Argentina. Their products, known for excellent opacity, dispersion, and UV protection, serve industries including coatings, pharmaceuticals, cosmetics, and plastics, offering superior quality and competitive pricing.
- A study in Argentina using Auger electron spectroscopy revealed intermediate Ti2O3 (Ti3+) during early titanium oxidation and titanium dioxide reduction under electron bombardment. Meanwhile, Stellar Exports, based in the UAE, supplies high-quality Rutile and Anatase-grade titanium dioxide to Argentina for various industries.

Source: ReAnIn, Primary Analysis, and Secondary Analysis, and Company Website.

ARGENTINA TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.4.3.1 Argentina Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	171.6	177.9	185.0	192.0	200.0	209.0	218.0	228.2	239.2	251.3	264.5	**4.8%**
Anatase	46.9	48.5	50.2	52.0	53.9	56.1	58.3	60.8	63.5	66.4	69.6	**4.4%**
Total	**218.5**	**226.4**	**235.2**	**244.0**	**253.9**	**265.1**	**276.3**	**289.0**	**302.8**	**317.7**	**334.2**	**4.7%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

ARGENTINA TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.4.3.2 Argentina Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	119.1	123.6	128.5	133.5	139.0	145.4	151.7	158.9	166.7	175.2	184.5	**4.8%**
Chloride	99.4	102.8	106.7	110.5	114.8	119.7	124.6	130.1	136.1	142.5	149.7	**4.5%**
Total	**218.5**	**226.4**	**235.2**	**244.0**	**253.9**	**265.1**	**276.3**	**289.0**	**302.8**	**317.7**	**334.2**	**4.7%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

ARGENTINA TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

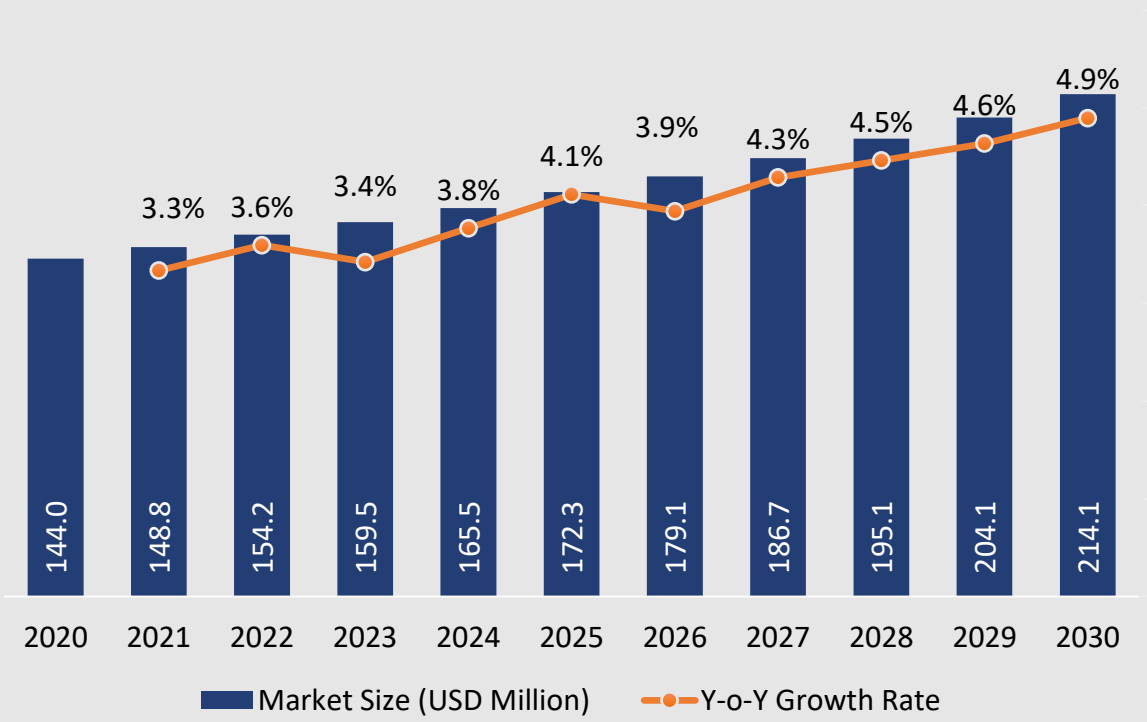
TABLE 6.4.4.3.3 Argentina Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	132.1	137.1	142.8	148.3	154.7	161.9	169.1	177.2	186.1	195.7	206.4	**4.9%**
Plastics	45.0	46.5	48.3	50.0	52.0	54.2	56.4	58.9	61.6	64.5	67.7	**4.5%**
Paper	28.9	29.9	30.9	32.0	33.1	34.4	35.7	37.2	38.8	40.5	42.4	**4.2%**
Others	12.5	12.8	13.3	13.7	14.1	14.6	15.1	15.7	16.3	17.0	17.7	**3.8%**
Total	**218.5**	**226.4**	**235.2**	**244.0**	**253.9**	**265.1**	**276.3**	**289.0**	**302.8**	**317.7**	**334.2**	**4.7%**

Source: ReAnIn Analysis and Primary Analysis

REST OF LATIN AMERICA TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.4.4.1 Rest of Latin America Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030



1.3x **Projected growth of the Rest of Latin America Titanium Dioxide (Tio2) Market during forecast period of 2024 to 2030**

- **Rest of Latin America Titanium Dioxide (Tio2) Market** was valued at **US$ 159.5 Mn** in 2023 and is estimated to reach **US$ 214.1 Mn** in 2030, expanding at a CAGR of **4.2 %** during the forecast period.
- The market share percentage of Rest of **Latin America** in 2023, was valued at **12.6%** which is estimated to account for **12.1%** in 2030, during the forecast period.
- The rest of the Latin American countries mainly include Colombia, Venezuela, Peru, Chile, and Cuba.
- A Colombian study highlighted the lack of technical-economic evaluations on titanium dioxide production. The study demonstrated successful laboratory-scale extraction of titanium dioxide from ilmenite, resulting in over 82% yield with purity exceeding 97% using hydrochloric acid leaching. While the results are promising, further steps are needed for the nation to fully utilize this resource in different industrial sectors.
- According to a study, the use of photocatalytic mortar with TiO2 reduces air pollutants from vehicle emissions. It demonstrates significant reductions in carbon dioxide, hydrogen sulfide, sulfur dioxide, nitrogen monoxide, and carbon monoxide, along with improved self-cleaning capacity. These benefits were observed in Peru and affirm the efficacy of TiO2 in enhancing air quality and reducing pollution.
- Colombian study shows successful TiO2 extraction. Photocatalytic mortar in Peru reduces vehicle emissions, highlighting TiO2's potential in improving air quality and reducing pollution.

Source: ReAnIn, Primary Analysis, and Secondary Analysis, and Company Website.

REST OF LATIN AMERICA TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.4.4.1 Rest of Latin America Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	113.4	117.3	121.6	125.8	130.7	136.1	141.6	147.8	154.5	161.8	169.9	**4.5%**
Anatase	30.6	31.6	32.6	33.6	34.8	36.1	37.5	38.9	40.5	42.3	44.2	**4.1%**
Total	**144.0**	**148.8**	**154.2**	**159.5**	**165.5**	**172.3**	**179.1**	**186.7**	**195.1**	**204.1**	**214.1**	**4.4%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

REST OF LATIN AMERICA TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.4.4.2 Rest of Latin America Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	78.2	80.9	83.9	86.9	90.3	94.2	98.0	102.4	107.2	112.4	118.1	**4.6%**
Chloride	65.9	67.9	70.3	72.6	75.2	78.1	81.0	84.3	87.9	91.8	96.0	**4.2%**
Total	**144.0**	**148.8**	**154.2**	**159.5**	**165.5**	**172.3**	**179.1**	**186.7**	**195.1**	**204.1**	**214.1**	**4.4%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

REST OF LATIN AMERICA TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

TABLE 6.4.4.4.3 Rest Of Latin America Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	87.6	90.7	94.1	97.4	101.3	105.6	109.9	114.8	120.2	126.0	132.4	**4.6%**
Plastics	29.3	30.3	31.3	32.4	33.6	34.9	36.3	37.8	39.4	41.2	43.2	**4.3%**
Paper	19.3	19.9	20.6	21.2	21.9	22.8	23.6	24.5	25.5	26.6	27.8	**4.0%**
Others	7.8	8.0	8.2	8.5	8.7	9.0	9.3	9.6	10.0	10.3	10.7	**3.6%**
Total	**144.0**	**148.8**	**154.2**	**159.5**	**165.5**	**172.3**	**179.1**	**186.7**	**195.1**	**204.1**	**214.1**	**4.4%**

Source: ReAnIn Analysis and Primary Analysis

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SECTION 6.4.5

MIDDLE EAST & AFRICA TITANIUM DIOXIDE (Tio2) MARKET

Regional and Country-level Analysis
Segment-specific Market Size and Forecast
- By Grade
- By Process
- By Application
- By Country

Country-specific Market Size and Forecast
- GCC
- Israel
- South Africa
- Rest of Middle East & Africa

MIDDLE EAST & AFRICA TITANIUM DIOXIDE (Tio2) MARKET, BY REGION

FIGURE 6.4.5.1 Middle East & Africa Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030

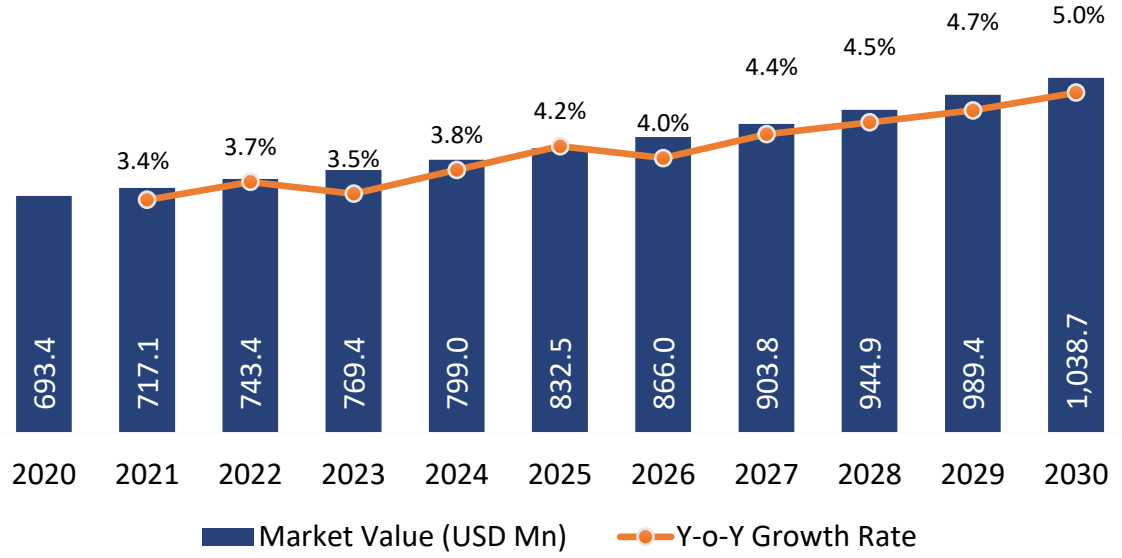
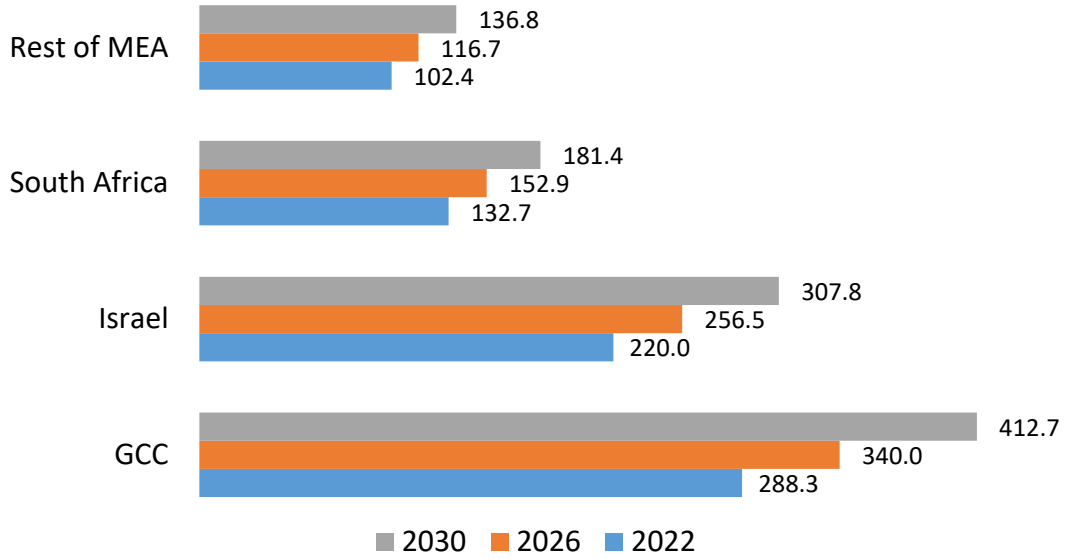


FIGURE 6.4.5.2 Middle East & Africa Titanium Dioxide (Tio2) Market Value (USD Million), By Country



- **Middle East & Africa Titanium Dioxide (Tio2) Market** was valued at **769.4 USD Million in 2023** and is estimated to reach **1,038.7 USD Million in 2030**, expanding at a CAGR of **4.5%** during the forecast period.
- **GCC** held a major market share in the Middle East & Africa Titanium Dioxide (Tio2) Market in 2023, which is estimated to reach **39.7%** in 2030, during the forecast period.

Source: ReAnIn, Primary Analysis and Secondary Analysis

MIDDLE EAST & AFRICA TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.5.1 Middle East & Africa Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	541.9	560.8	581.9	602.7	626.3	653.1	679.9	710.2	743.1	778.8	818.4	**4.6%**
Anatase	151.5	156.3	161.5	166.8	172.7	179.4	186.1	193.6	201.8	210.6	220.3	**4.1%**
Total	**693.4**	**717.1**	**743.4**	**769.4**	**799.0**	**832.5**	**866.0**	**903.8**	**944.9**	**989.4**	**1,038.7**	**4.5%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

MIDDLE EAST & AFRICA TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.5.2 Middle East & Africa Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	380.3	393.7	408.8	423.6	440.6	459.8	479.0	500.7	524.4	550.1	578.5	**4.6%**
Chloride	313.2	323.3	334.6	345.8	358.5	372.8	387.0	403.1	420.5	439.4	460.2	**4.3%**
Total	**693.4**	**717.1**	**743.4**	**769.4**	**799.0**	**832.5**	**866.0**	**903.8**	**944.9**	**989.4**	**1,038.7**	**4.5%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

MIDDLE EAST & AFRICA TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

TABLE 6.4.5.3 Middle East & Africa Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	419.7	434.8	451.5	468.1	487.1	508.5	530.0	554.4	580.9	609.7	641.6	**4.7%**
Plastics	142.4	147.2	152.4	157.6	163.5	170.2	176.9	184.4	192.6	201.4	211.2	**4.4%**
Paper	91.9	94.7	97.8	100.9	104.4	108.3	112.2	116.6	121.3	126.4	132.1	**4.0%**
Others	39.4	40.4	41.6	42.7	44.0	45.5	46.9	48.5	50.1	51.9	53.9	**3.4%**
Total	**693.4**	**717.1**	**743.4**	**769.4**	**799.0**	**832.5**	**866.0**	**903.8**	**944.9**	**989.4**	**1,038.7**	**4.5%**

Source: ReAnIn Analysis and Primary Analysis

MIDDLE EAST & AFRICA TITANIUM DIOXIDE (Tio2) MARKET, BY COUNTRY

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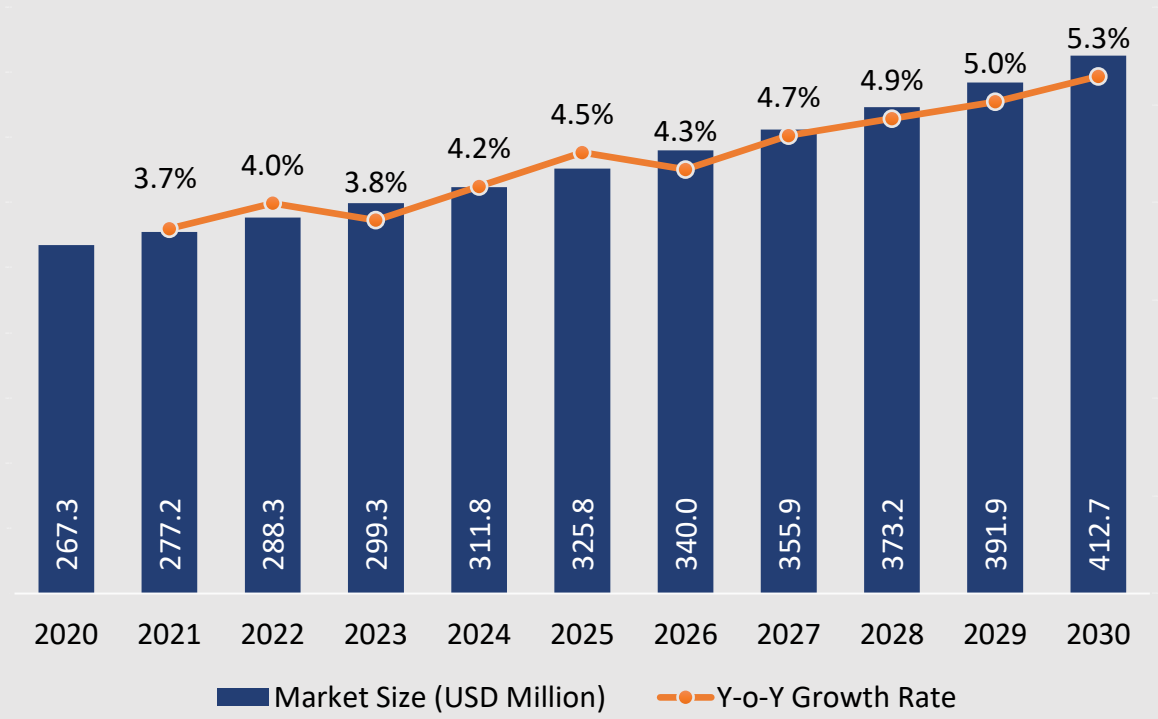
TABLE 6.4.5.4 Middle East & Africa Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Country, 2020-2030

COUNTRY	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
GCC	267.3	277.2	288.3	299.3	311.8	325.8	340.0	355.9	373.2	391.9	412.7	**4.8%**
Israel	205.1	212.2	220.0	227.7	236.6	246.5	256.5	267.7	279.9	293.2	307.8	**4.5%**
South Africa	124.4	128.3	132.7	137.0	141.8	147.4	152.9	159.1	165.9	173.3	181.4	**4.2%**
Rest of Middle East & Africa	96.6	99.3	102.4	105.4	108.9	112.8	116.7	121.1	125.9	131.1	136.8	**3.9%**
Total	**693.4**	**717.1**	**743.4**	**769.4**	**799.0**	**832.5**	**866.0**	**903.8**	**944.9**	**989.4**	**1,038.7**	**4.5%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

GCC TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.5.1.1 **GCC Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.3x **Projected growth of GCC Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **GCC Titanium Dioxide (Tio2) Market** was valued at **US$ 299.3 Mn** in 2023 and is estimated to reach **US$ 412.7 Mn** in 2030, expanding at a CAGR of **4.8%** during the forecast period.
- The market share percentage of the **GCC** in 2023, was valued at **38.9%** which is estimated to account for **39.7%** in 2030, during the forecast period.
- GCC includes Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE).
- Tronox plans to quickly enhance the 200,000 tonne/year Cristal titanium dioxide (TiO2) plant in Yanbu, Saudi Arabia, after completing the Cristal deal. The upgrades, including minor adjustments, are intended to improve pigment quality, increase production volume, and enhance overall product quality at Yanbu.
- In November 2022, Sohar Titanium launched its $111 million production plant in Oman's Sohar Freezone. The plant covers a 120,000 sq m area and is designed to produce 150,000 tonnes of titanium dioxide. Minerals Development Oman holds a 35% stake, while Dubai Holding and Stork International, through Gulf Titanium, hold the remaining 65%.
- Tronox accelerates enhancements at Cristal plant in Saudi Arabia, aiming to boost pigment quality and production. Sohar Titanium's new plant in Oman promises significant TiO2 production capacity.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Websites.

GCC TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.5.1.1 GCC Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	208.3	216.2	225.0	233.8	243.7	254.9	266.2	278.9	292.7	307.7	324.2	**4.9%**
Anatase	59.0	61.0	63.3	65.5	68.1	70.9	73.8	77.0	80.5	84.3	88.4	**4.5%**
Total	**267.3**	**277.2**	**288.3**	**299.3**	**311.8**	**325.8**	**340.0**	**355.9**	**373.2**	**391.9**	**412.7**	**4.8%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

GCC TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.5.1.2 GCC Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	146.2	151.9	158.1	164.3	171.4	179.3	187.4	196.4	206.2	216.9	228.7	**4.9%**
Chloride	121.0	125.4	130.2	135.0	140.4	146.5	152.6	159.5	166.9	175.0	183.9	**4.6%**
Total	**267.3**	**277.2**	**288.3**	**299.3**	**311.8**	**325.8**	**340.0**	**355.9**	**373.2**	**391.9**	**412.7**	**4.8%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

GCC TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

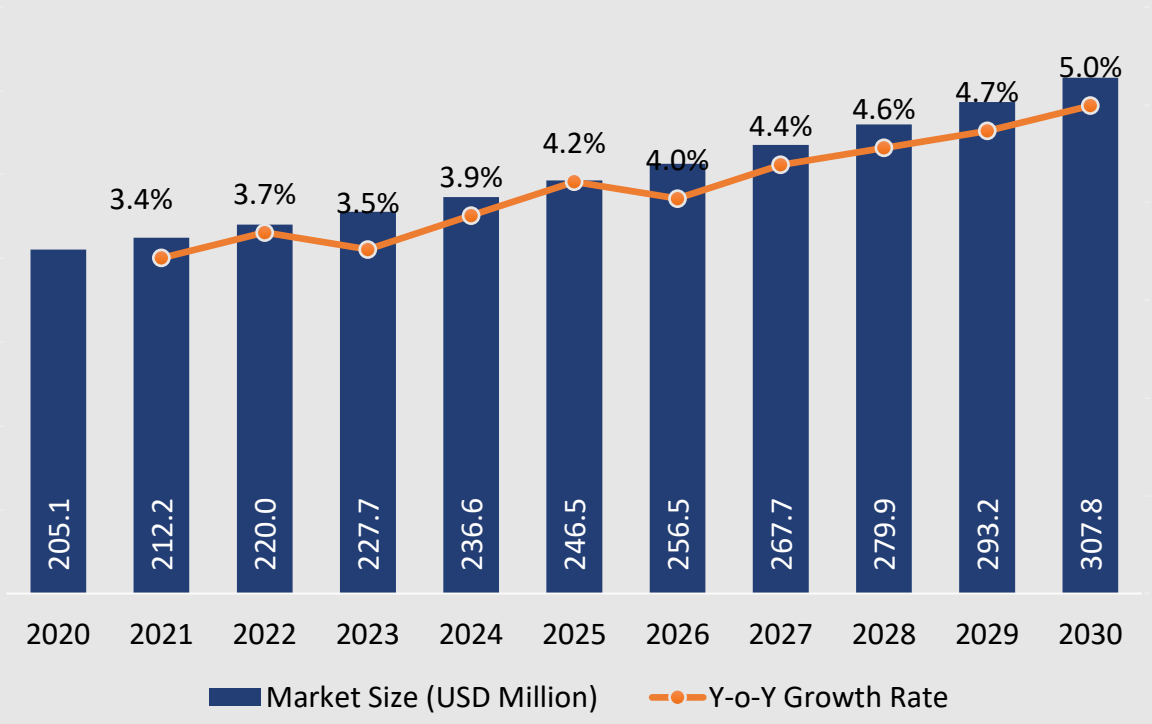
TABLE 6.4.5.1.3 GCC Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	161.0	167.4	174.4	181.4	189.3	198.3	207.3	217.6	228.7	240.8	254.2	**5.0%**
Plastics	55.5	57.5	59.7	62.0	64.5	67.3	70.1	73.3	76.8	80.5	84.6	**4.6%**
Paper	34.9	36.0	37.3	38.6	40.0	41.7	43.3	45.1	47.1	49.2	51.5	**4.3%**
Others	15.8	16.3	16.8	17.4	17.9	18.6	19.2	19.9	20.7	21.5	22.4	**3.8%**
Total	**267.3**	**277.2**	**288.3**	**299.3**	**311.8**	**325.8**	**340.0**	**355.9**	**373.2**	**391.9**	**412.7**	**4.8%**

Source: ReAnIn Analysis and Primary Analysis

ISRAEL TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.5.2.1 **Israel Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030**



1.3x **Projected growth of Israel Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **Israel Titanium Dioxide (Tio2) Market** was valued at **US$ 227.7 Mn** in 2023 and is estimated to reach **US$ 307.8 Mn** in 2030, expanding at a CAGR of **4.5%** during the forecast period.
- The market share percentage of **Israel** in 2023, was valued at **29.6%** which is estimated to account for **29.6%** in 2030, during the forecast period.
- The Israeli Ministry of Economy and Industry has allocated land to Velta Titanium, a division of Velta Group Global, to establish a plant for producing pigmentary titanium dioxide. The plant will initially target an annual capacity of 40,000 tons, and eventually expand to 70,000 tons. The investment is estimated to be between $150 million to $200 million and it will use raw materials from Velta LLC in Ukraine. This investment aligns with Israel's subsidy programs. The location of the plant is advantageous due to its proximity to a forthcoming ammonia plant.
- In July 2023, Eilat, Israel introduced Reef Relief, the first coral-friendly sunscreen containing non-nano titanium dioxide. Developed by marine and skincare experts, it offers UV protection and carries a unique Reef Protection Factor (RPF) certification to support coral health. The formula, compliant with Ecocert standards, has undergone extensive aquatic safety testing.
- Velta Titanium secures land in Israel for TiO2 plant, aligning with subsidy programs. Reef Relief sunscreen from Eilat offers coral-friendly protection, meeting Ecocert standards and supporting marine health with RPF certification.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Websites.

ISRAEL TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.5.2.1 Israel Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	160.3	165.9	172.1	178.3	185.4	193.3	201.3	210.3	220.1	230.7	242.4	**4.6%**
Anatase	44.9	46.3	47.9	49.4	51.2	53.2	55.2	57.4	59.8	62.5	65.4	**4.2%**
Total	**205.1**	**212.2**	**220.0**	**227.7**	**236.6**	**246.5**	**256.5**	**267.7**	**279.9**	**293.2**	**307.8**	**4.5%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

ISRAEL TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.5.2.2 Israel Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	112.6	116.6	121.1	125.5	130.5	136.3	142.0	148.5	155.5	163.2	171.6	**4.7%**
Chloride	92.6	95.6	99.0	102.3	106.0	110.3	114.5	119.2	124.4	130.0	136.1	**4.3%**
Total	**205.1**	**212.2**	**220.0**	**227.7**	**236.6**	**246.5**	**256.5**	**267.7**	**279.9**	**293.2**	**307.8**	**4.5%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

ISRAEL TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

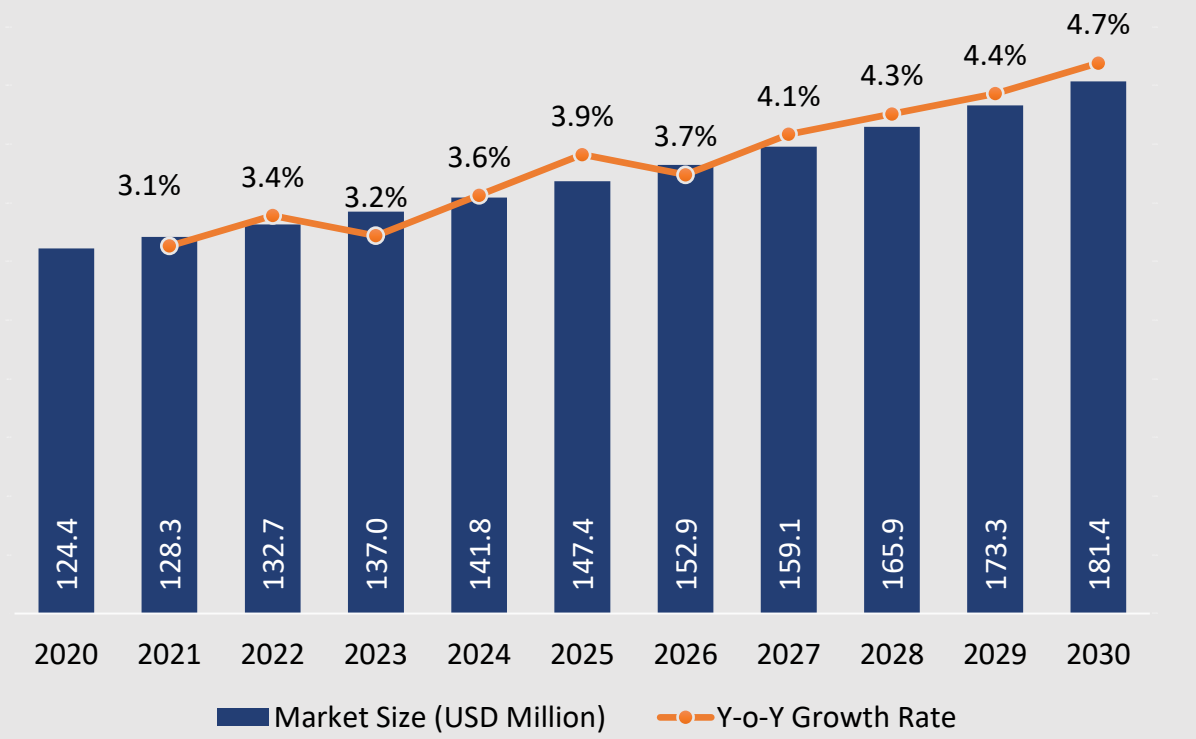
TABLE 6.4.5.2.3 Israel Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	124.1	128.5	133.5	138.5	144.1	150.5	156.9	164.1	172.0	180.5	190.0	**4.7%**
Plastics	42.2	43.6	45.1	46.7	48.4	50.4	52.4	54.6	57.0	59.7	62.5	**4.4%**
Paper	27.1	28.0	28.9	29.8	30.9	32.1	33.2	34.5	36.0	37.5	39.2	**4.1%**
Others	11.8	12.1	12.4	12.8	13.1	13.6	14.0	14.4	14.9	15.5	16.0	**3.4%**
Total	**205.1**	**212.2**	**220.0**	**227.7**	**236.6**	**246.5**	**256.5**	**267.7**	**279.9**	**293.2**	**307.8**	**4.5%**

Source: ReAnIn Analysis and Primary Analysis

SOUTH AFRICA TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.5.3.1 South Africa Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030



1.3x **Projected growth of South Africa Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **South Africa Titanium Dioxide (Tio2) Market** was valued at **US$ 137.0 Mn** in 2023 and is estimated to reach **US$ 181.4 Mn** in 2030, expanding at a CAGR of **4.2%** during the forecast period.
- The market share percentage of **South Africa** in 2023, was valued at **17.8%** which is estimated to account for **17.5%** in 2030, during the forecast period.
- In August 2022, the Africa Finance Corporation (AFC) made an initial investment of $3 million as an early-stage investor and codeveloper for Nyanza Light Metals' $550 million titanium dioxide pigment plant in South Africa. This investment supports project development activities and aims to help reach financial closure, in conjunction with co-funding from the African Export-Import Bank.
- In October 2023, Donghua Engineering Science and Technology Co., Ltd. signed an EPC (engineering, procurement, construction) contract with Nyaza in South Africa for an 80,000 tons/year titanium dioxide project. The project will utilize Chinese technology to produce premium rutile titanium dioxide. It aims to have a significant impact on 30.2 million square kilometers of land in Africa.
- AFC invests in Nyanza's South African TiO2 plant. Donghua Engineering signs EPC contract, utilizing Chinese tech for premium TiO2 production, set to impact African land significantly.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Websites.

SOUTH AFRICA TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.5.3.1 South Africa Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	97.5	100.6	104.1	107.5	111.4	115.9	120.3	125.3	130.8	136.7	143.2	**4.3%**
Anatase	27.0	27.7	28.6	29.4	30.4	31.5	32.6	33.8	35.1	36.6	38.2	**3.9%**
Total	**124.4**	**128.3**	**132.7**	**137.0**	**141.8**	**147.4**	**152.9**	**159.1**	**165.9**	**173.3**	**181.4**	**4.2%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

SOUTH AFRICA TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.5.3.2 South Africa Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	68.5	70.7	73.3	75.7	78.6	81.8	85.0	88.7	92.6	97.0	101.7	**4.4%**
Chloride	56.0	57.6	59.4	61.2	63.3	65.6	67.9	70.5	73.3	76.3	79.7	**3.9%**
Total	**124.4**	**128.3**	**132.7**	**137.0**	**141.8**	**147.4**	**152.9**	**159.1**	**165.9**	**173.3**	**181.4**	**4.2%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

SOUTH AFRICA TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

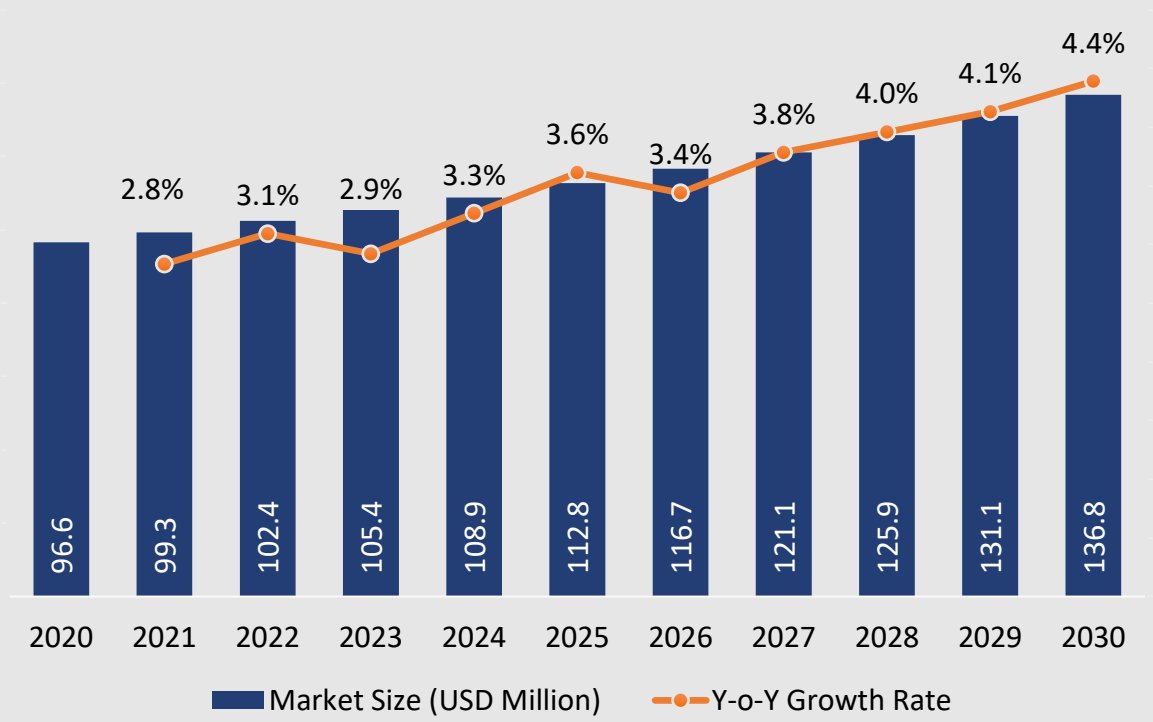
TABLE 6.4.5.3.3 South Africa Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	75.7	78.2	80.9	83.7	86.8	90.4	93.9	98.0	102.4	107.1	112.4	**4.4%**
Plastics	25.3	26.1	27.0	27.8	28.8	29.9	31.0	32.2	33.6	35.0	36.6	**4.1%**
Paper	16.7	17.2	17.7	18.2	18.8	19.5	20.1	20.8	21.6	22.5	23.4	**3.7%**
Others	6.8	6.9	7.1	7.3	7.5	7.7	7.9	8.1	8.4	8.6	8.9	**3.0%**
Total	**124.4**	**128.3**	**132.7**	**137.0**	**141.8**	**147.4**	**152.9**	**159.1**	**165.9**	**173.3**	**181.4**	**4.2%**

Source: ReAnIn Analysis and Primary Analysis

REST OF THE MIDDLE EAST & AFRICA TITANIUM DIOXIDE (Tio2) MARKET OUTLOOK

FIGURE 6.4.5.4.1 Rest of the Middle East & Africa Titanium Dioxide (Tio2) Market Value (USD Million), 2020-2030



1.3x **Projected growth of Rest of the Middle East & Africa Titanium Dioxide (Tio2) Market during the forecast period of 2024 to 2030**

- **Rest of the Middle East & Africa Titanium Dioxide (Tio2) Market** was valued at **US$ 105.4 Mn** in 2023 and is estimated to reach **US$ 136.8 Mn** in 2030, expanding at a CAGR of **3.9%** during the forecast period.
- The market share percentage of **Rest of the Middle East & Africa** in 2023, was valued at **13.7%** which is estimated to account for **13.2%** in 2030, during the forecast period.
- Rest of the Middle East & Africa includes countries like Turkey, Syria, Lebanon, Iraq, Iran, and more.
- In May 2020, Safic-Alcan extended its exclusive distribution agreement with TRONOX for TiONA TiO2 pigments in Benelux and Turkey, solidifying its position as a premier distributor of titanium dioxide pigments. The partnership, originally announced for France, underscores Safic-Alcan's renowned supply of top-tier and dependable TiO2 pigments, which are widely used in diverse Turkish industries.
- In August 2022, Iran initiated the operation of its third titanium processing plant in Rudab Sabzevar. This new facility, with a capacity of 27,000 tonnes, was completed in just eight months by Iranian specialists using local equipment. The plant aims to boost titanium dioxide production to cater to the needs of aerospace, marine, and automotive industries.
- Safic-Alcan expands TRONOX distribution to Benelux and Turkey, reinforcing its TiO2 pigment distribution prowess. Iran's new titanium processing plant in Rudab Sabzevar targets industry demand for aerospace, marine, and automotive sectors.

Source: ReAnIn, Primary Analysis, Secondary Analysis, and Company Websites.

REST OF MIDDLE EAST & AFRICA TITANIUM DIOXIDE (Tio2) MARKET, BY GRADE

TABLE 6.4.5.4.1 Rest of Middle East & Africa Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Grade, 2020-2030

GRADE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Rutile	76.0	78.2	80.6	83.1	85.8	89.0	92.2	95.7	99.6	103.8	108.5	**4.0%**
Anatase	20.6	21.2	21.8	22.3	23.0	23.8	24.5	25.4	26.3	27.3	28.4	**3.6%**
Total	**96.6**	**99.3**	**102.4**	**105.4**	**108.9**	**112.8**	**116.7**	**121.1**	**125.9**	**131.1**	**136.8**	**3.9%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

REST OF MIDDLE EAST & AFRICA TITANIUM DIOXIDE (Tio2) MARKET, BY PROCESS

TABLE 6.4.5.4.2 Rest of Middle East & Africa Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Process, 2020-2030

PROCESS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Sulfate	53.0	54.6	56.4	58.1	60.1	62.4	64.6	67.2	70.0	73.0	76.4	**4.1%**
Chloride	43.6	44.8	46.1	47.3	48.8	50.4	52.1	53.9	55.9	58.1	60.4	**3.6%**
Total	**96.6**	**99.3**	**102.4**	**105.4**	**108.9**	**112.8**	**116.7**	**121.1**	**125.9**	**131.1**	**136.8**	**3.9%**

Source: ReAnIn, Primary Analysis and Secondary Analysis

REST OF MIDDLE EAST & AFRICA TITANIUM DIOXIDE (Tio2) MARKET, BY APPLICATION

ReAnIn
Research | Analysis | Insights

TABLE 6.4.5.4.3 Rest of Middle East & Africa Titanium Dioxide (Tio2) Market Value Forecast (USD Million), By Application, 2020-2030

APPLICATION	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	CAGR (2024-2030)
Paints	59.0	60.7	62.7	64.6	66.8	69.4	71.9	74.7	77.9	81.2	85.0	**4.1%**
Plastics	19.5	20.0	20.6	21.2	21.9	22.6	23.4	24.3	25.2	26.2	27.4	**3.8%**
Paper	13.2	13.5	13.9	14.2	14.6	15.1	15.6	16.1	16.7	17.3	17.9	**3.4%**
Others	5.0	5.1	5.3	5.4	5.5	5.7	5.8	6.0	6.1	6.3	6.5	**2.9%**
Total	**96.6**	**99.3**	**102.4**	**105.4**	**108.9**	**112.8**	**116.7**	**121.1**	**125.9**	**131.1**	**136.8**	**3.9%**

Source: ReAnIn Analysis and Primary Analysis

SECTION 7
COMPETITIVE LANDSCAPE

- Company Profiles
  - Company Overview and Product Portfolio
  - Key Development
  - Financial Overview
  - Strategies
  - Company SWOT Analysis

THE CHEMOURS COMPANY

COMPANY DETAILS

Company Name	The Chemours Company
Establishment Year	2015
Headquarter	Delaware, United States
Key Management (CEO)	Denise Dignam
Operating Regions	North America, Europe and Asia Pacific, Latin America, Middle East and Africa
Employee Strength (2024)	~6,400

COMPANY OVERVIEW

- Chemours operates in three segments: Titanium Technologies, Fluoroproducts, and Chemical Solutions, producing and marketing performance chemicals such as titanium dioxide, refrigerants, Teflon, cyanide, and sulfuric acid.
- The company contributes to a better world through its Titanium Technologies, Thermal & Specialized Solutions, and Advanced Performance Materials businesses. Key brands include Opteon for low GWP refrigerants, Ti-Pure for titanium dioxide, and others for diverse applications.
- The company has more than 35 manufacturing sites worldwide and operations in more than 120 countries approximately.
- The Chemours Company is spin off with dupont company in 2015.

CATEGORY	PRODUCTS	DESCRIPTION
Titanium Technologies	Ti-Pure TS-6300 (coating)	Ti-Pure TS-6300, designed for optimal paint formulation, enhances titanium dioxide efficiency for outstanding coverage. Precise process control and customized inorganic surface treatment maintain ideal particle spacing, crucial for dense paint systems.

Source- Company Website and Annual Report

PRODUCTS	DESCRIPTION
Ti-Pure R-900 (coating)	Ti-Pure R-900 is a rutile titanium dioxide (TiO_2) pigment with a simplified surface design that unlocks a broad spectrum of performance possibilities. It is well-known for its high brightness and superior hiding, making it excellent for various gloss applications.
Ti-Pure R-706 (coating)	Ti-Pure R-706 is a rutile titanium dioxide (TiO_2) pigment that sets the standard for interior and exterior coatings. Its high-quality grade ensures flexibility and reliability in applications where appearance is crucial.
Ti-Pure R-960 (plastics)	Ti-Pure R-960 is a rutile titanium dioxide (TiO_2) pigment known for its proven protection in the harshest weather and industrial conditions. It is trusted for its durability and excels in demanding environments, ensuring steadfast performance.
Ti-Pure R-104 (plastics)	Ti-Pure R-104, a rutile titanium dioxide (TiO_2) pigment, sets the benchmark for film and sheet processing. Recognized by DIN CERTCO, it's the sole certified TiO_2 for use in compostable resins, meeting EN 13432 standards globally.
Ti-Pure R-350 (plastics)	Ti-Pure R-350 is a rutile titanium dioxide (TiO_2) pigment with a unique combination of properties and characteristics, making it ideal for industries that rely on specific attributes.

Source- Company Website and Annual Report

- In January, Chemours introduced Ti-Pure TS-1510, a high-efficiency rutile titanium dioxide pigment. It reduces carbon footprint by up to 6% in plastics masterbatch production compared to traditional pigments, significantly contributing to the growth of titanium dioxide.

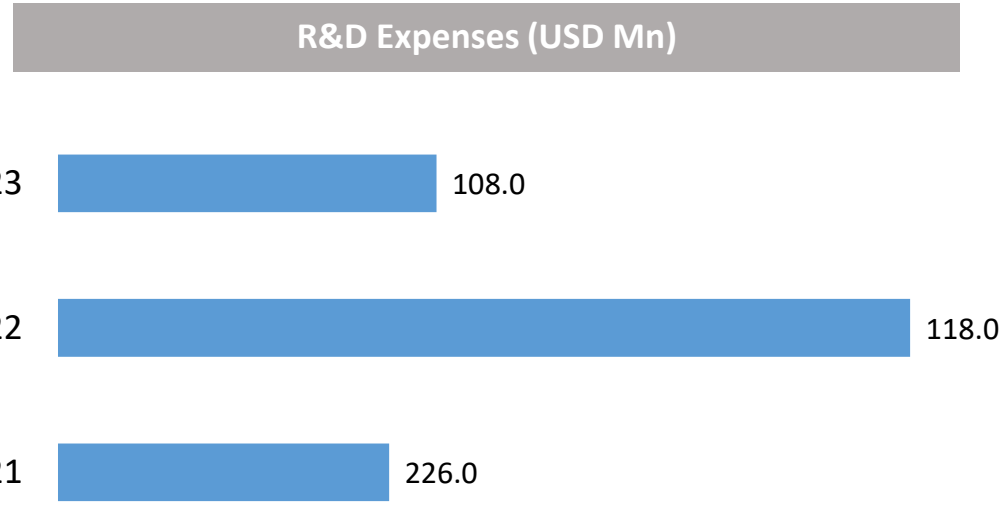
2023

2022

- In December, The Chemours Company introduced the Ti-Pure Sustainability (TS) series, which is a titanium dioxide (TiO_2) product portfolio featuring two high-performance grades. This innovation underscores Chemours' dedication to advancing sustainability goals for the enterprise, business unit, and customers, contributing to the growth of titanium dioxide.

Source- Company Website and Annual Report

THE CHEMOURS COMPANY



FINANCIAL PARAMETER	2021	2022	2023
Revenue (USD Million)	6,345.0	6,794.0	6,027.0
Net Income (USD Million)	608.0	578.0	-238.0
Operating Margin (%)	10.6	11.5	-2.0
Net Margin (%)	9.5	8.5	-3.9
Gross Margin (%)	21.7	23.7	21.6

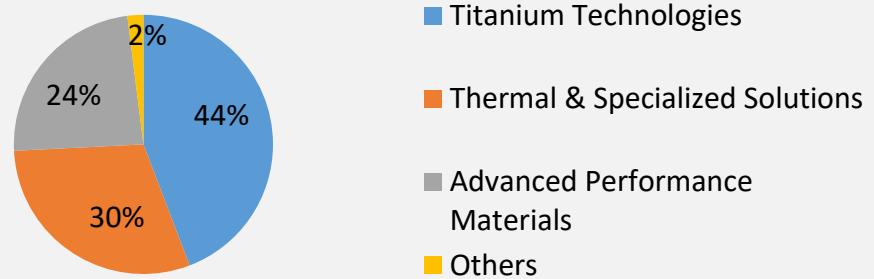
KEY TAKEWAYS

- Net sales decreased by $767 million (11%) to $6 billion for the year ended December 31, 2023, compared to $6.8 billion for the same period in 2022. This decline was primarily due to a decrease in volume, partially offset by price increase. Volume decreases affected our Titanium Technologies and Advanced Performance Materials segments, while our Thermal & Specialized Solutions segment saw higher volume. Price increases were attributed to the Thermal & Specialized Solutions and Advanced Performance Materials segments.

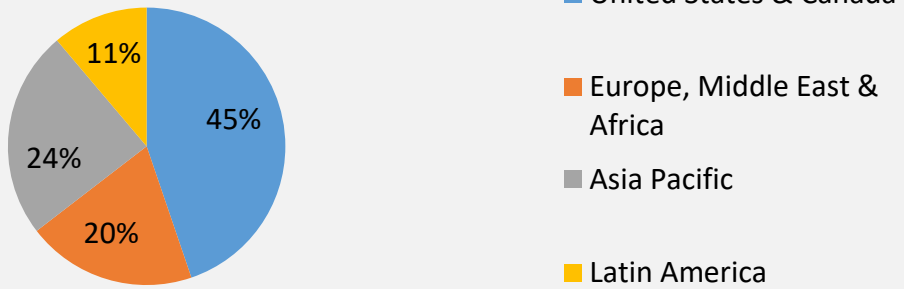
Source- Company Website and Annual Report

THE CHEMOURS COMPANY

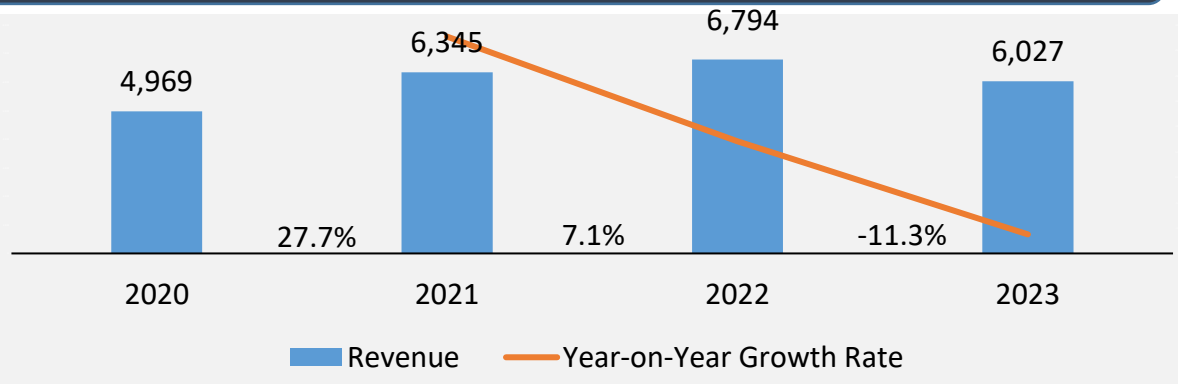
REVENUE SPLIT BY BUSINESS SEGMENTS (2023)



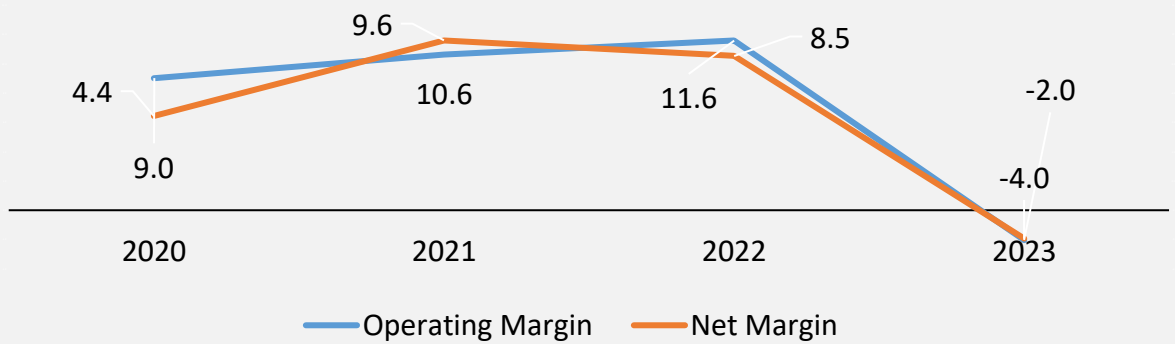
REVENUE SPLIT BY REGION (2023)



Total Revenue and Year-on-Year Growth 2020-2023, (USD Mn)



OPERATING MARGIN AND NET MARGIN (%), 2020-2023



Source- Company Website and Annual Report

ORGANIC

In May 2022, Chemours led a three-year recycling research project, Remove2Reclaim, aiming to develop an efficient and sustainable process for recovering titanium dioxide (TiO2) and polymers from plastic end-use products. This initiative, fostering circularity, is poised to drive environmental benefits and contribute to titanium dioxide growth by reducing waste and energy consumption in manufacturing.

Source- Company Website and Annual Report

THE CHEMOURS COMPANY

- Chemours Company's investments in R&D facilitate the development of advanced technologies and manufacturing processes, offering a competitive market advantage.
- Renowned for its high-quality titanium dioxide products, the company fosters customer trust and loyalty through consistent production excellence.

- The company is highly exposed to risk due to its significant reliance on the titanium dioxide segment. This makes the company susceptible to fluctuations in demand for this particular product.

- Compliance with environmental, health, safety, and labeling regulations presents challenges for the titanium dioxide industry, requiring investments in technology and processes.
- Securing raw materials, efficient logistics, and optimizing production processes to meet customer demand pose complex challenges for the company.

- The company can capitalize on the increasing demand for sustainability by developing eco-friendly titanium dioxide products and promoting their environmental benefits.
- The growing demand for titanium dioxide in paints, plastics, and cosmetics presents an opportunity for the Company to expand its market share and revenue.

Source- ReAnIn Analysis

CINKARNA CELJE, D.D

COMPANY DETAILS

Company Name	Cinkarna Celje
Establishment Year	1873
Headquarter	Solevina, Europe
Key Management (CEO)	Ales Skok
Operating Regions	North America, Europe and Asia Pacific, Latin America, and Middle East
Employee Strength (2024)	~800

COMPANY OVERVIEW

- Cinkarna Celje primarily specializes in producing and marketing titanium dioxide pigments, extensively utilized in diverse industries like paints, coatings, plastics, and cosmetics.
- The company primarily concentrates on manufacturing and selling titanium dioxide, supplemented by various products including powder coatings, masterbatches, zinc alloy, and wire, agrichemical products, chemical processing equipment, sulphuric acid, and more.
- The company operates under advanced techniques and environmental standards. It's the implementation of sustainable development principles that supports operations.

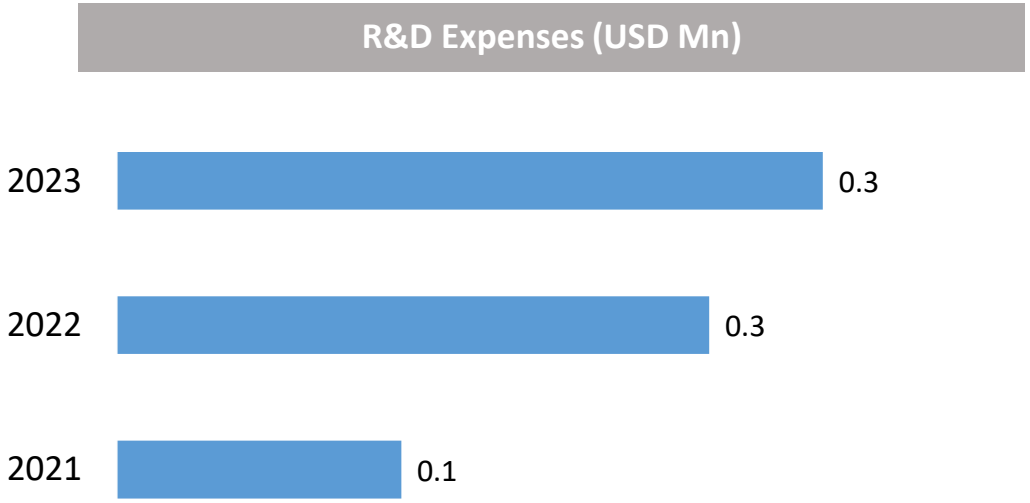
CATEGORY	DESCRIPTION
Titanium dioxide coating and inks	Titanium dioxide is a micronized rutile pigment produced by the sulfate process, pigment is lattice-stabilized with alumina and surface-treated with aluminum and silicon compounds. This category includes many products such as RC82, RC84, RC86, RC813, RC823, and RC833.

Source- Company Website and Annual Report

CATEGORY	DESCRIPTION
Titanium Dioxide for building and construction	The pigment is high surface treated and enhances an excellent hiding power, and high durability so as light and weather stability, especially in high PVC and excellent dispersibility. This category contains many products such as RC82, RC84, RC86, RC813, RC823, and RC833.
Titanium Dioxide for packaging and plastics	A special organic treatment provides excellent dispersion. This category contains many products such as RC813 and RC819.
Titanium Dioxide for household appliances	The pigment is stabilized within a lattice with alumina and treated on the surface with aluminum and silicon compounds. This category includes various products such as RC82 and RC823.
Titanium Dioxide for interior furniture	Titanium Dioxide pigment is treated with aluminum and phosphorus compounds, ensuring high lightfastness and opacity. There is only one product in this category, named RC87.

CINKARNA CELJE, D.D

COMPANY OVERVIEW | FINANCIAL OVERVIEW | COMPANY SWOT ANALYSIS



FINANCIAL PARAMETER	2021	2022	2023
Revenue (USD Million)	217.9	242.4	194.7
Operating Income (USD Million)	45.2	56.7	14.0
Net Income (USD Million)	37.6	46.3	13.9
Operating Margin (%)	20.8	23.4	7.8
Net Margin (%)	17.2	19.1	7.1
Gross Margin (%)	43.7	40.6	28.4

KEY TAKEWAYS

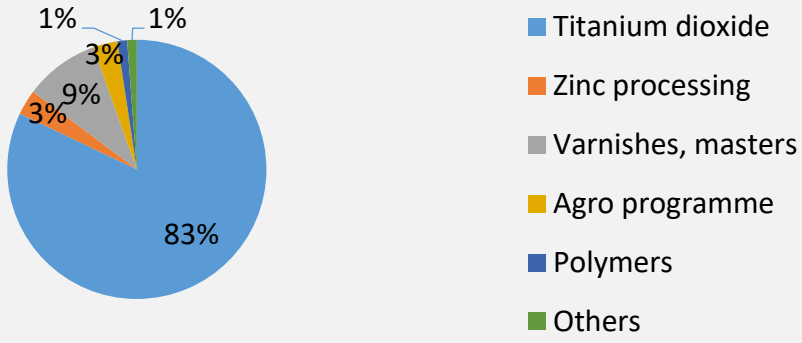
- In 2023, the revenue decreased by USD 47.7 million or 19.7 % compared to the previous fiscal year 2022.

(Currency Conversion Rate 31st December: 2021: 1 EUR = 1.1324 USD ; 2022: 1 EUR = 1.06749 USD; 2023 1 EUR = 1.10364)

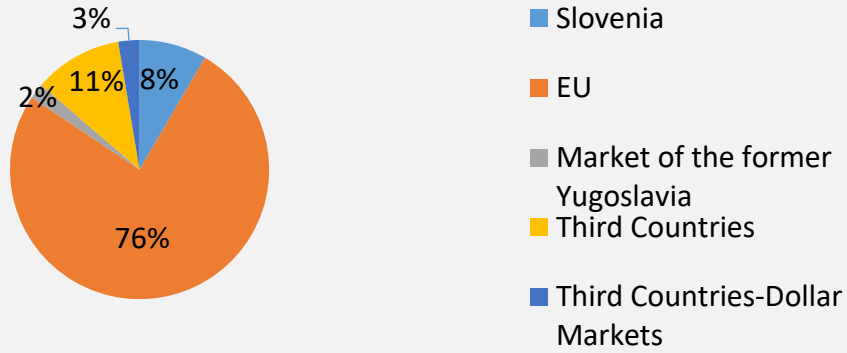
Source- Company Website and Annual Report

CINKARNA CELJE, D.D,

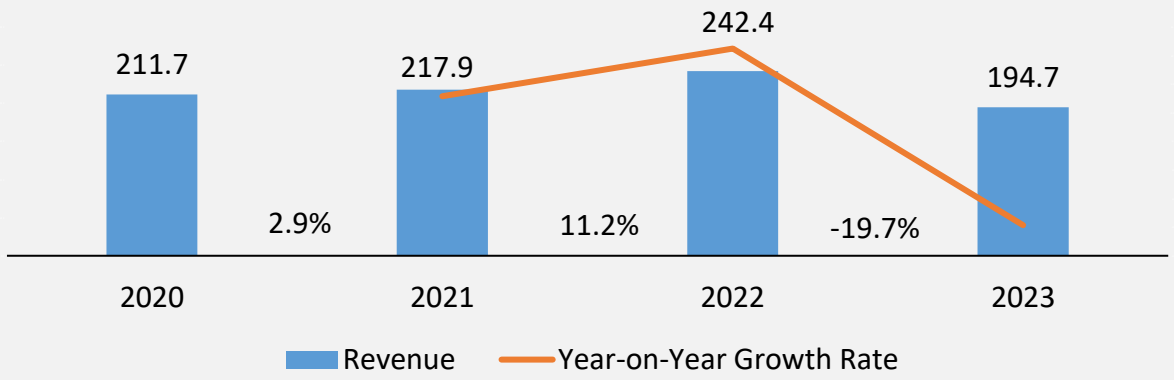
REVENUE SPLIT BY BUSINESS SEGMENTS (2023)



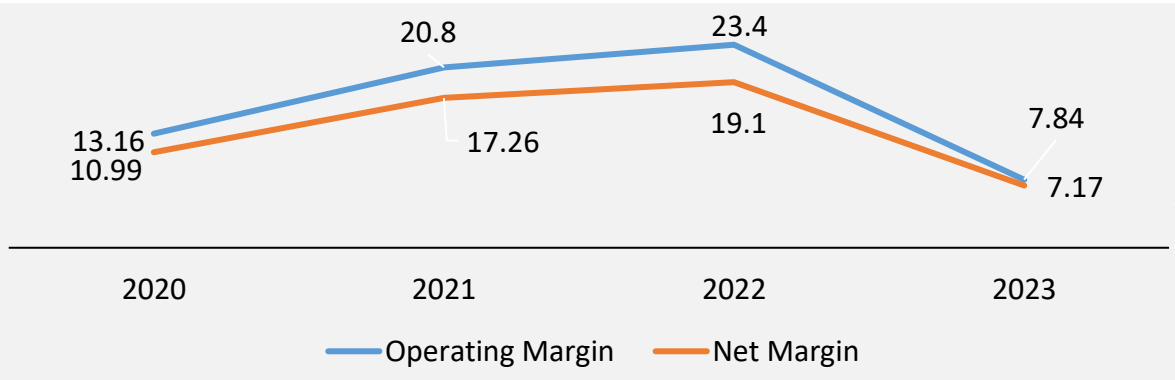
REVENUE SPLIT BY REGION (2023)



Total Revenue and Year-on-Year Growth 2020-2023, (USD Mn)



OPERATING MARGIN AND NET MARGIN (%), 2020-2023



CINKARNA CELJE, D.D

- The company excels in producing premium titanium dioxide for paints, plastics, and coatings. Its strong reputation for consistent quality and performance gives it a competitive market edge.
- Focused on R&D, the company drives innovation in titanium dioxide products, meeting market demands and regulatory requirements.

- The company can struggle with cost competitiveness when compared to low-cost producers in other regions, which can impact its ability to maintain favorable pricing and margins.

- The company concentration on titanium dioxide restricts its diversification, leaving the company vulnerable to market demand fluctuations and industry-specific challenges due to reliance on a single product line.

- Increasing industrialization and urbanization in emerging markets are driving the demand for titanium dioxide in applications such as paints, coatings, and plastics. Expanding presence in these markets offers significant growth potential for the company.
- Engaging with industry partners and research institutions to develop innovative applications for titanium dioxide can open up opportunities in new market segments and enhance the company's product range.

Source- ReAnIn Analysis

EVONIK INDUSTRIES AG

COMPANY DETAILS

Company Name	Evonik Industries AG
Establishment Year	2007
Headquarter	Essen, Germany
Key Management (CEO)	Christian Kullmann
Operating Regions	North America, Europe and Asia Pacific, Latin America, Middle East and Africa
Employee Strength (2021)	~340,00

COMPANY OVERVIEW

- Evonik Industries AG was formed from the restructuring of RAG AG, consolidating RAG's chemical, energy, and real estate business sectors.
- The company operates in five segments such as specialty additives, nutrition & care, smart materials, performance materials, and technology & infrastructure. The company also indirectly supports the production of tires, mattresses, medications, and animal feeds.
- The Company With a diverse product portfolio serves various markets, including aerospace, agriculture, automotive, coatings, construction, electronics, environment, food, home, metals, pharma, plastics, pulp, and general industry.
- The company manufactures and distributes products in over 100 countries.

PRODUCTS	DESCRIPTION
AEROXIDE TiO2 P 25	Aeroxide TiO2 P 25 is a high-purity, fine-particle titanium dioxide with a specific surface area and a unique anatase-rutile crystal structure, making it ideal for catalytic, photocatalytic, and UV filter applications.

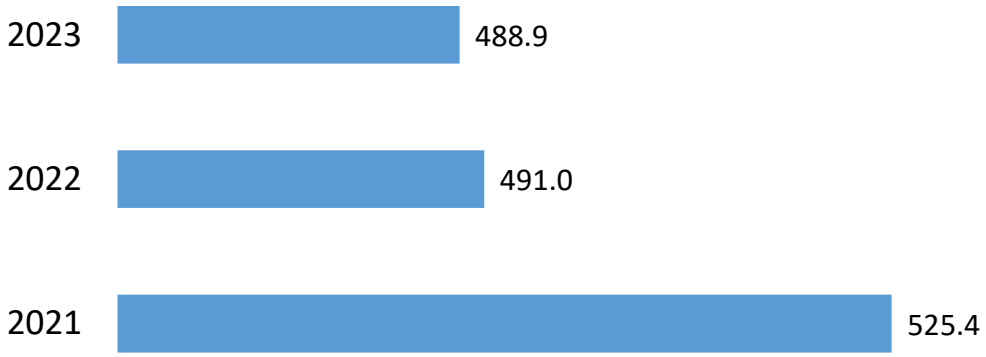
Source- Company Website and Annual Report

PRODUCTS	DESCRIPTION
AEROXIDE TiO_2 P 75	Aeroxide TiO2 P 75 is a high-purity titanium dioxide manufactured using the AEROSIL process, ensuring quality and reliability in production.
AEROXIDE TiO2 P 90	Aeroxide TiO2 P 90 is a highly dispersed form of titanium dioxide, produced using the AEROSIL process to ensure quality and uniform dispersion.
AEROXIDE TiO2 PF 2	Aeroxide TiO2 PF 2, a unique fine-particle mixed oxide of titania and iron oxide, offers excellent heat stability in silicone rubber systems. Certified according to BfR XV.
AEROXIDE TiO2 T 805	Aeroxide TiO_2 T 805 is a finely-particulate, fumed titanium dioxide that has been hydrophobized with an organosilane, enhancing its water-repellency and versatility..
MAXCEL 777	Extruded titanium dioxide (TiO2) Claus SRU catalyst ensures very high hydrolysis conversion of CS2 and COS to H2S, with superior resistance to sulfation poisoning and hydrothermal aging.

Source- Company Website and Annual Report

EVONIK INDUSTRIES AG

R&D Expenses (USD Mn)



FINANCIAL PARAMETER-	2020	2021	2022	2023
Revenue (USD Million)	14,983.3	16,935.0	19,735.8	16,849.3
Net Income (USD Million)	571.1	844.7	576.4	513.1
Operating Margin (%)	7.17	8.22	6.85	-0.65
Net Margin (%)	3.81	4.99	2.92	-3.05
Gross Margin (%)	27.59	26.95	22.89	17.69

KEY TAKEWAYS

- In 2023, revenue decreased by $ 2,886.5 USD million or by 14.6 % compared to the previous fiscal year 2022. Sales decreased due to reduced volumes and, in some cases, lower selling prices. Negative currency effects and the divestment of the TAA derivatives business at the end of 2022 and the Lulsdorf site as of June 30, 2023, also contributed to the decline.

(Currency Conversion Rate 31st December: 2021: 1 EUR = 1.1324 USD ; 2022: 1 EUR = 1.06749 USD ; I EUR = 1.10364)

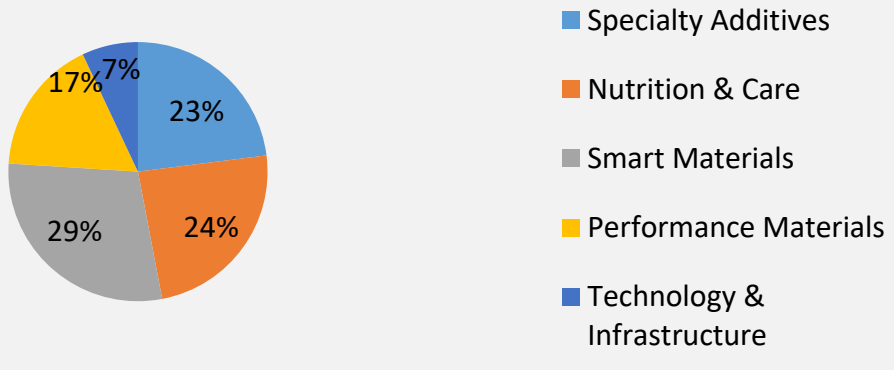
Source- Company Website and Annual Report

EVONIK INDUSTRIES AG

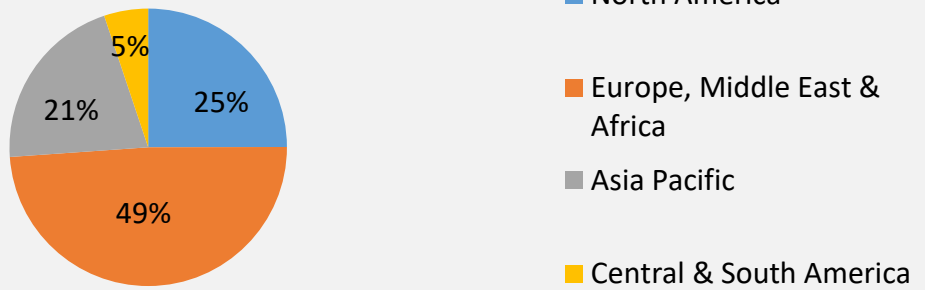
ReAnIn
Research | Analysis | Insights

COMPANY OVERVIEW | **FINANCIAL OVERVIEW** | COMPANY SWOT ANALYSIS

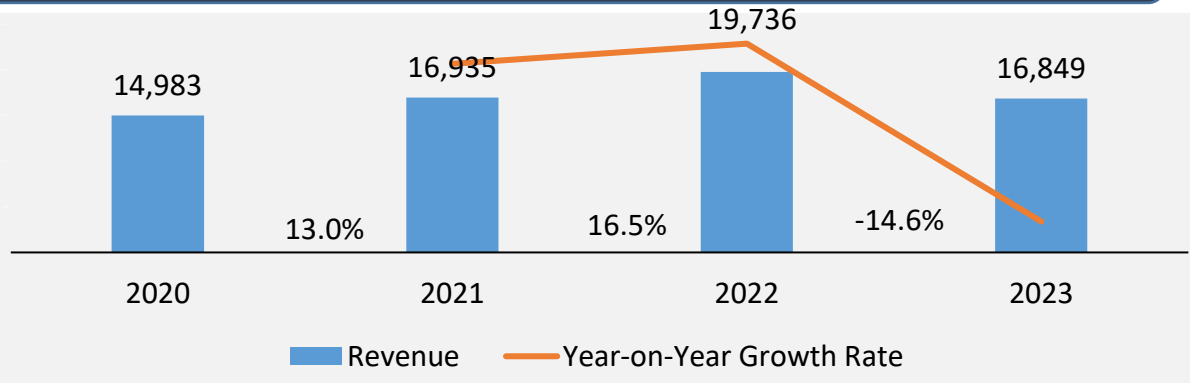
REVENUE SPLIT BY BUSINESS SEGMENTS (2023)



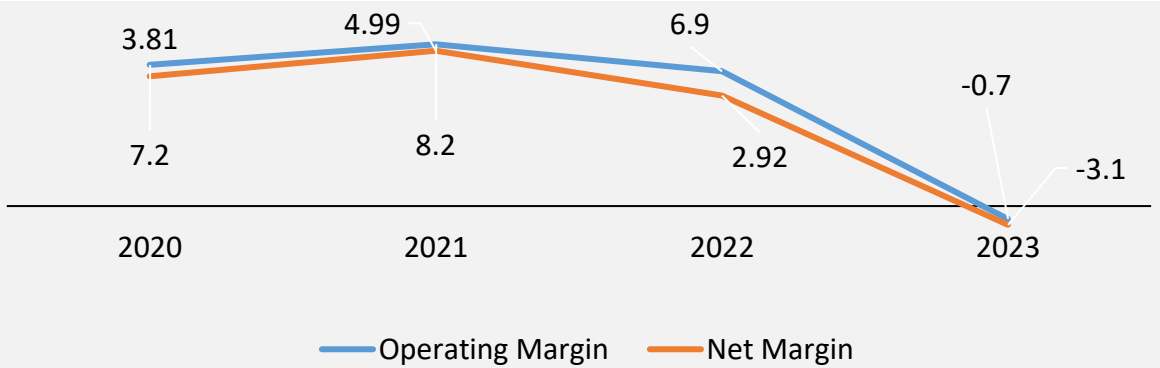
REVENUE SPLIT BY REGION (2023)



Total Revenue and Year-on-Year Growth 2020-2023, (USD Mn)



OPERATING MARGIN AND NET MARGIN (%), 2020-2023



Source- Company Website and Annual Report

EVONIK INDUSTRIES AG

- Evonik Industries AG specializes in titanium dioxide technology, driving high-quality product and solution innovation.
- The company is a major player in the titanium dioxide industry with a strong global presence, allowing it to effectively serve diverse regional markets through economies of scale.

- The company's profitability is directly influenced by the prices of raw materials and energy, making it vulnerable to fluctuations. Effective risk management is essential for mitigating this weakness and ensuring success.

- The company can face challenges with the cost structure of titanium dioxide production, including raw material procurement, energy expenses, and regulatory compliance, which can impact its competitive pricing in the market.

- Continued advancements in titanium dioxide production technologies present opportunities for the company to improve efficiency, reduce costs, and develop new products with superior properties.
- The company can collaborate with industry stakeholders and research institutions to develop new applications for titanium dioxide, unlocking opportunities in new market segments and enriching its product portfolio.

Source- ReAnIn Analysis

TRONOX HOLDINGS PLC HOLDINGS PLC

COMPANY DETAILS

Company Name	Tronox Holdings Plc Holdings Plc
Establishment Year	2006
Headquarter	Connecticut, United States
Key Management (CEO)	John Romano
Operating Regions	North America, Europe and Asia Pacific, Latin America, Middle East and Africa
Employee Strength (2024)	~6,500

COMPANY OVERVIEW

- Tronox is a global producer of titanium dioxide (TiO2) and other industrial minerals. Tronox was originally part of Kerr-McGee Corporation, but it was spin off as a separate public company in 2006.
- In addition to TiO2, the company produces a variety of other industrial minerals, including zircon, pig iron, and rutile. Zircon is used in ceramics, refractories, and other applications, while pig iron and rutile are used in the production of steel.
- The company products are marketed under the brand names TIONA, and TiKON.
- The company manufactures and distributes its products in America, Africa, Asia Pacific, and the Middle East.

PRODUCT	DESCRIPTION
TiONA 592	The most common use-coatings and plastics-accounts for more than 80 percent of global consumption.
TiONA 244	A neutral-blue tone, chloride-process rutile titanium dioxide pigment designed for optimal dispersion and processing performance in plastics.

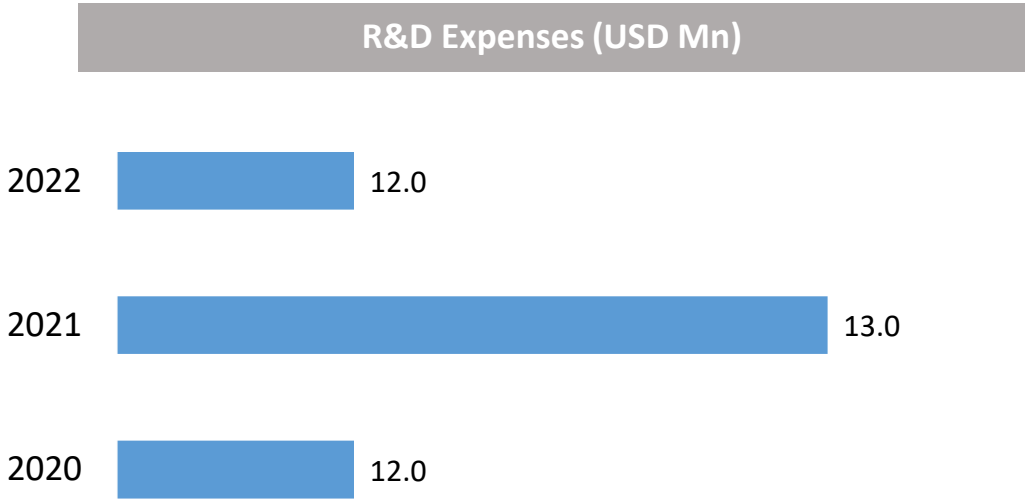
Source- Company Website and Annual Report

TRONOX HOLDINGS PLC HOLDINGS PLC

PRODUCT	DESCRIPTION
TiONA 826	TiONA 826 is a universal, high-performance product designed to provide an exceptional combination of ease of dispersion, superior optical properties, and very high wearability in a wide range of applications.
TiONA 595	TiONA 595 is a high-performance, multipurpose product most suited in applications requiring good dispersion, durability, and optical properties. It is particularly suited in applications where it provides high opacity and low viscosity.
TiONA 826SL	TiONA 826SL is a universal, high-performance product designed to provide an exceptional combination of ease of dispersion, superior optical properties, and very high wearability in a wide range of applications.
TiONA 828	TiONA 828 is a multi-purpose, blue tint tone product with an outstanding combination of ease of dispersion, excellent optical properties, and good durability.
TiONA 722	TiONA 722 is a neutral tone rutile titanium dioxide pigment made by the chloride process and specially designed for use in the production of décor paper and laminates. The surface treatment is optimized to give maximized production first pass retention and paper opacity combined with an excellent initial color and long term color stability.
TiONA RCL-69	TiONA RCL-69 is a general-purpose blue tint tone product optimized to provide excellent optical performance, ease of processing, and dispersion in a wide range of plastics including some engineering resins.
TiONA (Titanium dioxide)	Titanium dioxide pigment (TiO2) is an inorganic white pigment used in various applications, with the most common being coatings and plastics. This category contains products such as TiONA 8870, TiONA RUF, TiONA 4000, TiONA 828E, TiONA AT-1, TiONA 813SL, TiONA 113, TiONA 3, TiONA 822, TiONA 122, TiONA 813, and more.
TiKON (Titanium dioxide)	TiKONT is a versatile rutile titanium dioxide pigment made with advanced sulfate process technology. It is specifically formulated to provide excellent optical properties and dispersibility in coatings. It boasts features such as high opacity, easy wet-in and dispersion, superior whiteness, and exceptional durability. This Category includes products such as TiKON 35, and TiKON 36.

Source- Company Website and Annual Report

TRONOX HOLDINGS PLC HOLDINGS PLC



FINANCIAL PARAMETER	2021	2022	2023
Revenue (USD Million)	3,572.0	3,454.0	2,850.0
Operating Income (USD Million)	577.0	458.0	186.0
Net Income (USD Million)	286.0	497.0	-316.0
Operating Margin (%)	16.2	15.2	6.5
Net Margin (%)	8.0	14.3	-11.0
Gross Margin (%)	25.0	24.0	16.2

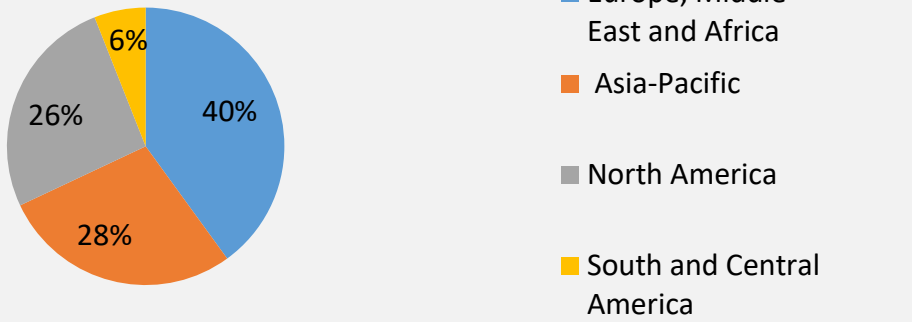
KEY TAKEWAYS

- In 2023, the revenue has decreased by USD 604 million or by -17.5 % compared to the previous fiscal year 2021.

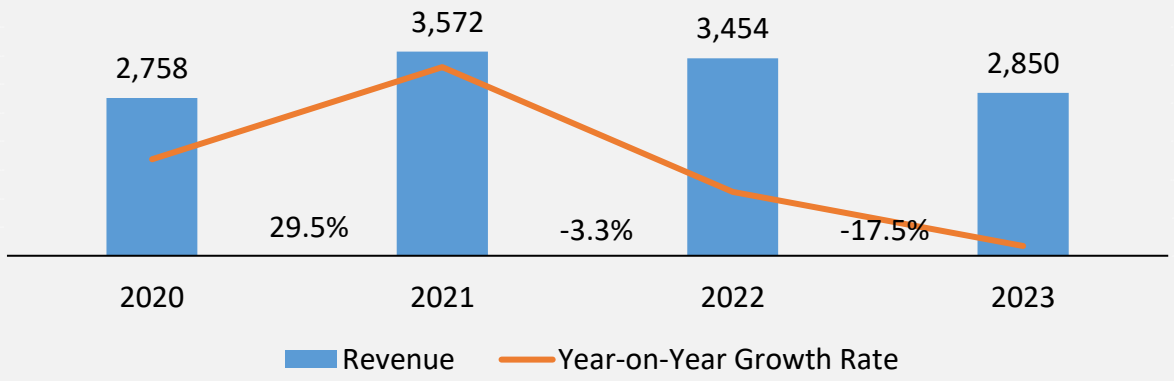
TRONOX HOLDINGS PLC HOLDINGS PLC

REVENUE SPLIT BY BUSINESS SEGMENTS (2023)

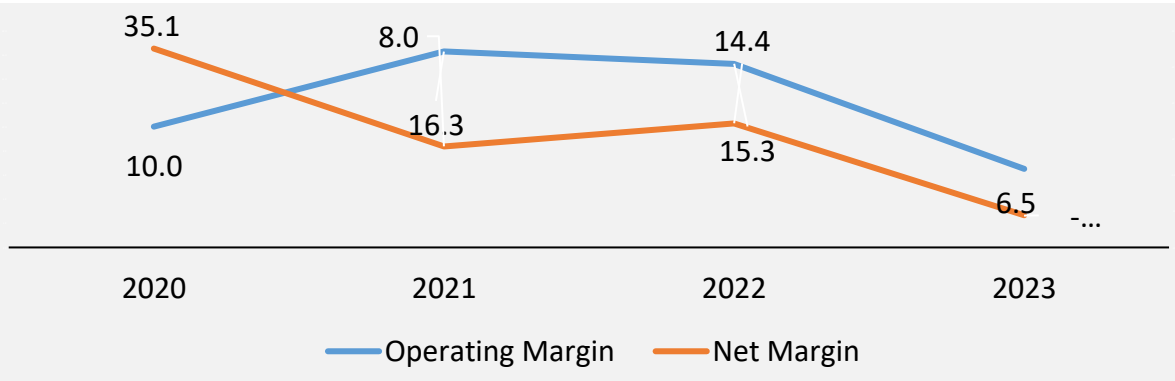
REVENUE SPLIT BY REGION (2023)



Total Revenue and Year-on-Year Growth 2020-2023, (USD Mn)



OPERATING MARGIN AND NET MARGIN (%), 2020-2023



TRONOX HOLDINGS PLC HOLDINGS PLC

INORGANIC

- **In May 2020, Tronox Holdings plc announced a definitive agreement to acquire the TiZir Titanium and Iron (TTI) business from Eramet S.A. for approximately $300 million. The acquisition of TiZir's TTI facility in Tyssedal, Norway, enhances Tronox's capabilities in producing high-grade titanium slag and high-purity pig iron. This strategic move enhances Tronox's titanium dioxide production capabilities.**

Source- Company Website and Annual Report

TRONOX HOLDINGS PLC HOLDINGS PLC

- Tronox is a global leader in the production of titanium dioxide (TiO2) pigments. They are known for being one of the largest vertically integrated producers of TiO2, with a strong emphasis on titanium chemical sales and substantial nameplate capacity.
- The company's strong presence in key global markets helps diversify its revenue streams in titanium dioxide.

- The company faces significant competition in the mineral sands and titanium dioxide industries, which presents challenges in acquiring market share.

- Maintaining a broad range of product portfolios across various applications is a strength for the company, but any imbalance in product management could potentially hinder its growth and operational efficiency.

- Increasing demand for mineral sands and titanium dioxide is expected due to infrastructure development, urbanization, and rising disposable incomes, creating growth opportunities for the company.
- The company can use its strong global presence to expand into emerging markets, which present significant growth opportunities.

Source- ReAnIn Analysis

ISHIHARA SANGYO KAISHA LTD.

COMPANY DETAILS

Company Name	Ishihara Sangyo Kaisha Ltd
Establishment Year	1920
Headquarter	Osaka, Japan
Key Management (CEO)	Hideo Takahashi
Operating Regions	North America, Europe and Asia Pacific, Latin America, Middle East and Africa
Employee Strength (2024)	~1,770

COMPANY OVERVIEW

- Ishihara Sangyo Kaisha Ltd is a Japanese company that specializes in the production of various chemicals, including pigments, pharmaceuticals, and functional materials.
- The company's Inorganic Chemicals segment produces and sells titanium dioxide, functional and electronic materials, and other inorganic chemicals.
- The Organic Chemicals segment deals with organic intermediates such as agrochemicals and active pharmaceutical ingredients. The Other Businesses segment includes trading and construction businesses.
- In addition to their work in the chemical industry, the company is also involved in various community and environmental initiatives, including programs to reduce greenhouse gas emissions and promote the use of renewable energy sources.

CATEGORY	PRODUCT	DESCRIPTION
WHITE Pigments (Titanium dioxide)	Paint application	It has high weather resistance and excellent coating film properties and can be used in a wide range of fields. This includes indoor coatings as well as outdoor paints and inks. The product grades in this category include R-820, R-830, CR-50, CR-50-2, and more.

Source- Company Website and Annual Report

CATEGORY	DESCRIPTION
Ink usage	Featuring high gloss and excellent whiteness, the product is versatile and suitable for applications in various paints (solvent-based and water-based), printing inks, and plastics. This category includes products such as CR-Super70, CR-80, CR-90, and more.
Plastic applications	With exceptional hiding ability at high pigment concentrations, the product is perfect for applications requiring thin film coatings, such as can coating ink and white coating. This category includes items like PF-711, PF-739, PC-3, and more.
Cosmetics/Others	The substance appears as a bright white color with a bluish tint, making it suitable for use in plastics, rubber, and road marking paints. In cosmetics, it highlights the exceptional coverage ability of titanium oxide. Products in this category include A-100, A-220, W-10, PFA412, and more.
YELLOW products (Titanium dioxide)	A yellow pigment, known for its high safety and exceptional weather, heat, and chemical resistance, finds applications in various industries, including paints and plastics. The lemon yellow contains products such as TY-50, Ty-70 & S and reddish yellow products such as TY-100, Ty-200, Ty-300, and TY-400.

ISHIHARA SANGYO KAISHA LTD.

FINANCIAL PARAMETER	2021	2022	2023
Revenue (USD Million)	910.0	989.5	914.6
Operating Income (USD Million)	94.7	65.0	75.9
Net Income (USD Million)	95.8	52.3	52.7
Operating Margin (%)	10.4	6.5	-
Net Margin (%)	10.4	5.2	-
Gross Margin (%)	29.43	25.35	-

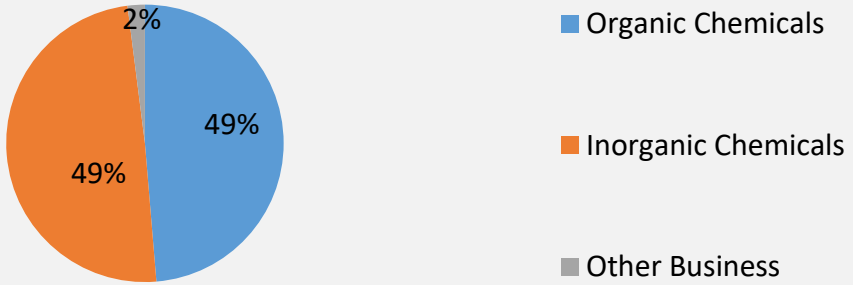
KEY TAKEWAYS

- In 2023, the net revenue decreased by $74.9 million or by 7.6% compared to the previous fiscal year 2022.

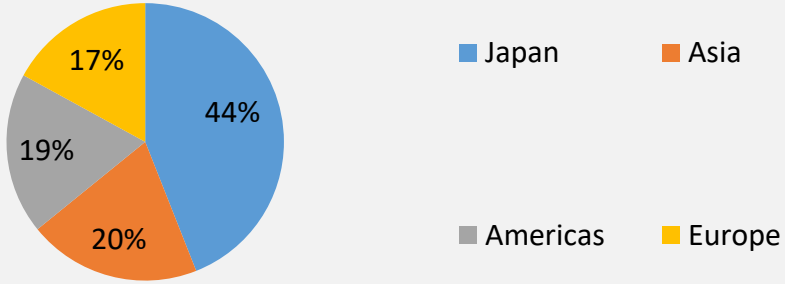
(Currency Conversion Rate on 31st March-: 2022; 1 YEN = 0.0082 USD; 2023; 1 YEN = 0.00754 USD, 2024; 1 YEN = 0.00661 USD)

ISHIHARA SANGYO KAISHA LTD.

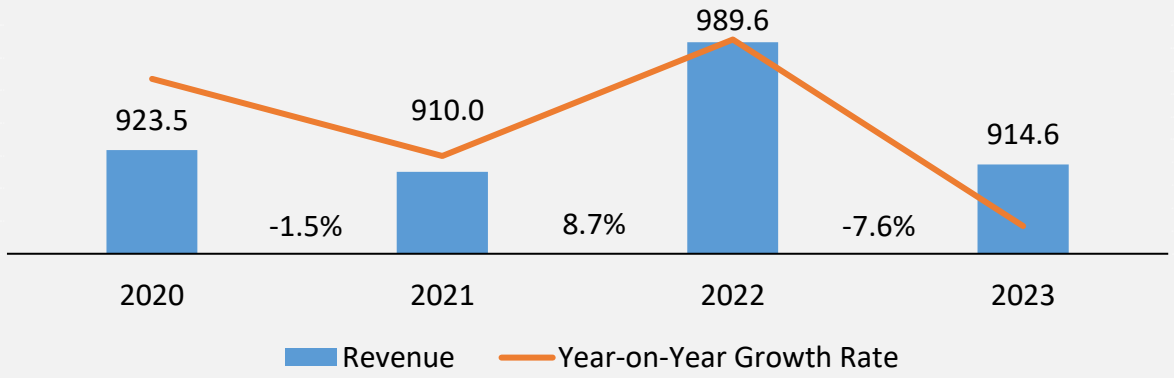
REVENUE SPLIT BY BUSINESS SEGMENTS (2023)



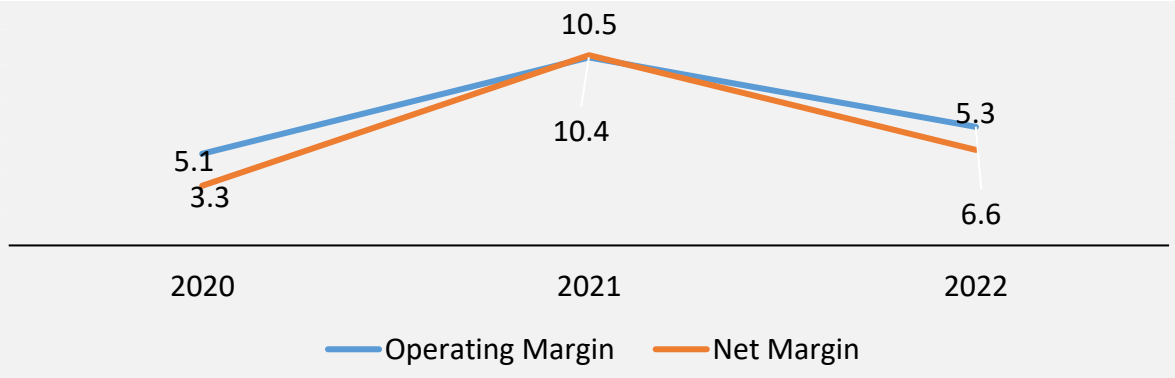
REVENUE SPLIT BY REGION (2023)



Total Revenue and Year-on-Year Growth 2020-2023, (USD Mn)



OPERATING MARGIN AND NET MARGIN (%), 2020-2023



Source- Company Website and Annual Report

ISHIHARA SANGYO KAISHA LTD.

- Ishihara Sangyo Kaisha Ltd. (ISK) holds a good position in the titanium dioxide industry, boasting a well-established market presence and recognized brand.
- The company has maintained the leading market share in Japan for titanium dioxide. It is the sole manufacturer in Japan with facilities for sulfate and chloride processing.

- A significant portion of the company's revenue is generated in Japan, making it vulnerable to domestic market fluctuations and economic changes, which could risk its overall financial stability and growth.

- The titanium dioxide industry is highly competitive, and the company faces competition from established players in the market.
- Changes in government regulations could impact the company's ability to operate, particularly in relation to its sustainability initiatives.

- The pharmaceutical industry is expected to grow in the coming years, which presents an opportunity for the company to expand its titanium dioxide product offerings in this sector.
- The company could continue to develop new, sustainable products to meet the growing demand for environmentally-friendly solutions.

Source- ReAnIn Analysis

KRONOS WORLDWIDE, INC.

COMPANY DETAILS

Company Name	Kronos Worldwide, Inc.
Establishment Year	1916
Headquarter	Dallas, USA
Key Management (CEO)	Jim Buch
Operating Regions	North America, Europe and Asia Pacific, Latin America, Middle East and Africa
Employee Strength (2024)	~2,200

COMPANY OVERVIEW

- KRONOS is a producer of value-added titanium dioxide pigments (TiO2), used widely. Company contribute to brightening the world with TiO2, an effective whitening agent.
- The company has a product portfolio that includes applications for coatings, plastics, and paper.
- The company provides services in applications including coatings, plastics, paper and paper laminates, as well as weathering investigations.
- The company manufactures and distributes its products in North America, Latin America, Europe, the Middle East, Asia, and Africa.

CATEGORY	DESCRIPTION
KRONOS slurries	KRONOS Slurries are known for easy handling and precise dosing, specifically designed for high-volume throughput, contributing to consistent batch-to-batch quality. This category includes products such as KRONOS 4045, KRONOS 4320 and KRONOS 4390.

Source- Company Website and Annual Report

KRONOS WORLDWIDE, INC.

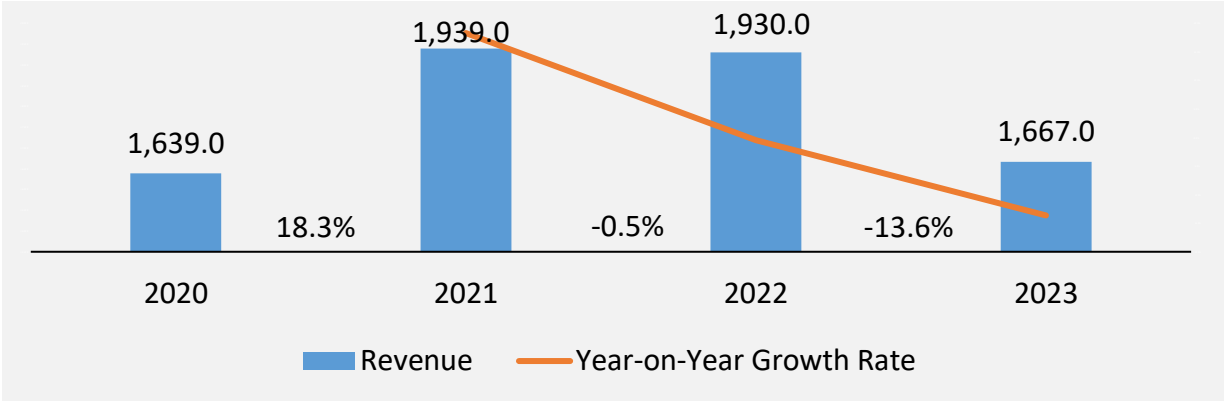
FINANCIAL PARAMETER	2021	2022	2023
Revenue (USD Million)	1,939.4	1,930.2	1,666.5
Operating Income (USD Million)	187.1	159.6	-56.0
Net Income (USD Million)	112.9	104.5	-49.1
Operating Margin (%)	8.7	7.0	-3.7
Net Margin (%)	5.8	5.4	-2.9
Gross Margin (%)	23.0	20.2	9.9

KEY TAKEWAYS

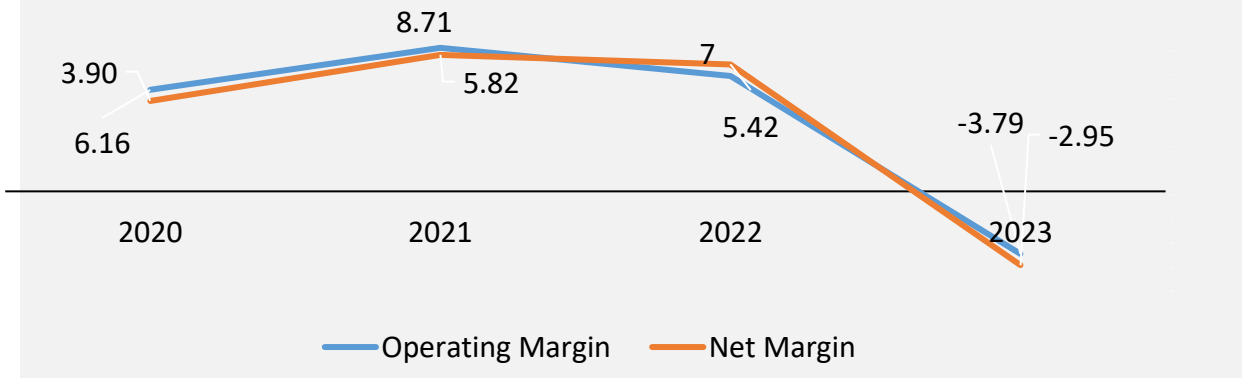
- In 2023, revenue decreased by $263.7 million or by 13.6 % compared to the previous fiscal year 2022.

Source- Company Website and Annual Report

Total Revenue and Year-on-Year Growth 2020-2023, (USD Mn)



OPERATING MARGIN AND NET MARGIN (%), 2020-2023



Source- Company Website and Annual Report

INORGANIC

- **In October 2020, KRONOS and Omya announced a distribution partnership for the Philippines, appointing Omya as the official agent and distributor of KRONOS titanium dioxide pigments. This collaboration contribute to the growth of titanium dioxide in the region.**

KRONOS WORLDWIDE, INC.

- KRONOS possesses a robust global presence, featuring production facilities and distribution networks across various regions, enhancing its ability to cater to a diverse customer base, showcasing a significant strength.
- The company distinguishes itself by manufacturing high-quality titanium dioxide, providing a competitive advantage in the market.

- Environmental concerns related to the production process, including waste management and emissions, pose challenges for the company.

- The Company's financial performance can be impacted by changes in titanium dioxide prices, influenced by factors like demand, supply, and raw material costs, indicating a potential vulnerability.

- Engaging with suppliers, distributors, and customers can enhance the company's market position and uncover new business prospects.
- The growing application of titanium dioxide in construction, automotive, and cosmetics creates opportunities for the company to increase its market presence.

Source- ReAnIn Analysis

LB GROUP

COMPANY DETAILS

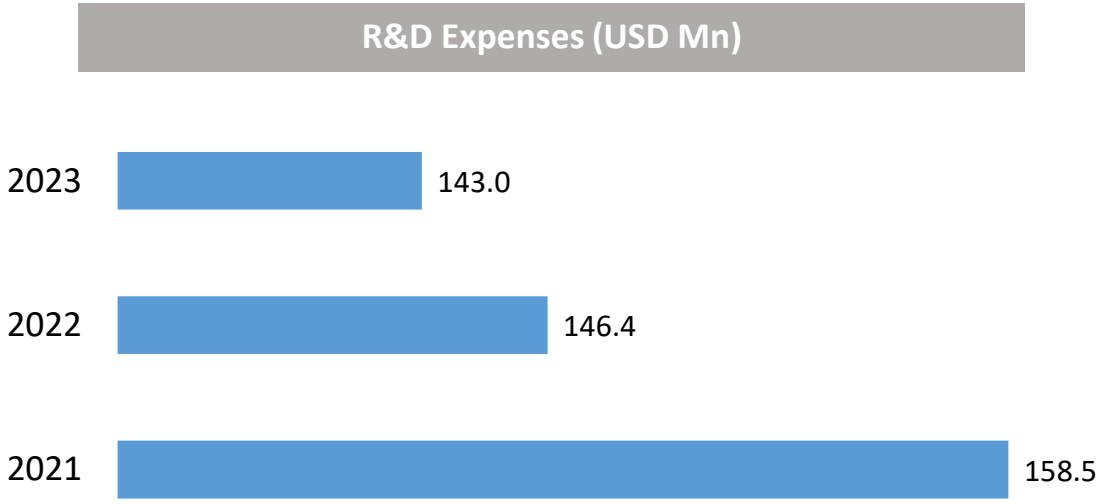
Company Name	LB Group
Establishment Year	1955
Headquarter	Henan Province, China
Key Management (CEO)	Wu Pengsen
Operating Regions	North America, Europe and Asia Pacific, Latin America, Middle East and Africa
Employee Strength (2022)	~10,000

COMPANY OVERVIEW

- LB Group holds the top position globally as the leading manufacturer of high-performance titanium dioxide (TiO_2) pigments based on production capacity.
- Their renowned BILLIONS TiO_2 pigment brand is recognized worldwide, backed by over three decades of expertise in TiO_2 pigment manufacturing.
- The company manufactures a variety of titanium dioxide (TiO_2) pigments using both the sulfate and chloride processes, serving diverse applications like paints, plastics, inks, and paper.
- The company operates 6 TiO_2 pigment plants: 2 chloride processes, 3 sulfate processes, and 1 intermediate TiO_2 plant, totaling approximately 1,510kt capacity, with 660kt chloride and 850kt sulfate capacity, including 200kt intermediate capacity.

CATEGORY	DESCRIPTION
BILLIONS BLR-852	BILLIONS BLR-852 pigment, produced using the chloride process, is designed for decorative paper laminates. It ensures excellent opacity, brightness, lightfastness, and retention properties in various paper-making applications.

PRODUCTS	DESCRIPTION
BILLIONS BLR-886	BILLIONS BLR-886, a rutile TiO2 pigment for plastics made through the chloride process, provides bright, white color, excellent processability, and lacing resistance. Suitable for various applications.
BILLIONS BLR-891 (Chloride process)	BILLIONS BLR-891, a high-opacity TiO2 pigment for coatings produced through the chloride process, offers excellent dispersion, opacity, and tint strength. Ideal for various applications like internal and external applications. This includes BILLIONS BLR-895, and BILLIONS BLR-896.
BILLIONS BLR-688 (Sulfate process)	BILLIONS BLR-688, a sulfate-process rutile TiO2 pigment, is crafted for plastics, particularly exterior applications like profile and pipe. Features high opacity and excellent processing properties. This includes products such as BILLIONS BLR-698, BILLIONS BLR-699, BILLIONS LR-108, BILLIONS LR-952 and more.
BILLIONS TR53	BILLIONS TR53 pigment, a sulfate-process rutile TiO2, is tailored for reverse laminated printing inks. Its alumina-silica treatment ensures excellent dispersion and high opacity in relevant resin systems.
BILLIONS TR52	BILLIONS TR52 pigment, a sulfate-process rutile TiO2, is crafted for the printing ink industry. Its high gloss, opacity, and dispersion make it suitable for printing ink and coatings applications.
BILLIONS R-996 (Sulfate process)	BILLIONS R-996 pigment, a sulfate-process rutile TiO2 with zirconia and alumina treatment, is a versatile and durable pigment suitable for industrial and architectural coatings, known for high opacity and brightness.



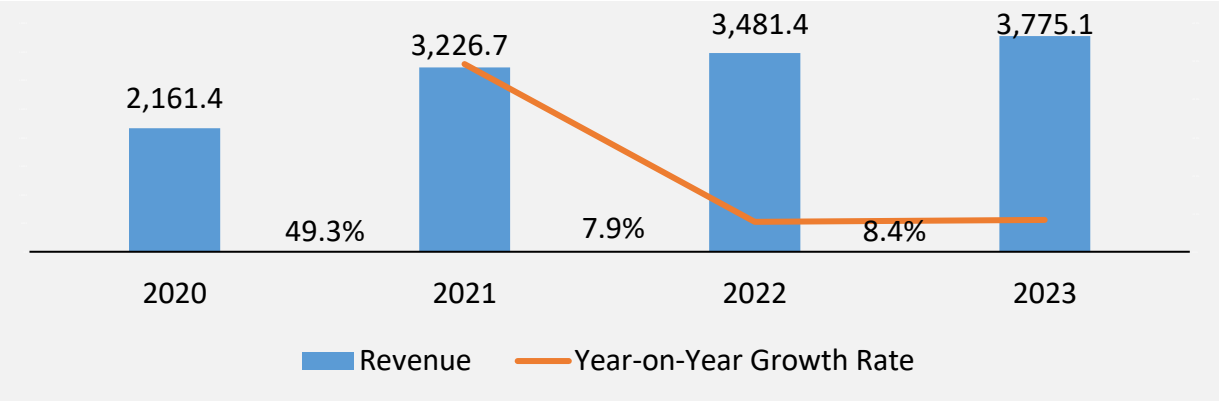
FINANCIAL PARAMETER	2021	2022	2023
Revenue (USD Million)	3,226.7	3,481.4	3,775.1
Net Income (USD Million)	733.7	493.6	455.0
Operating Margin (%)	28.73	17.84	16.72
Net Margin (%)	22.68	14.16	12.04
Gross Margin (%)	42.07	30.31	26.79

KEY TAKEWAYS

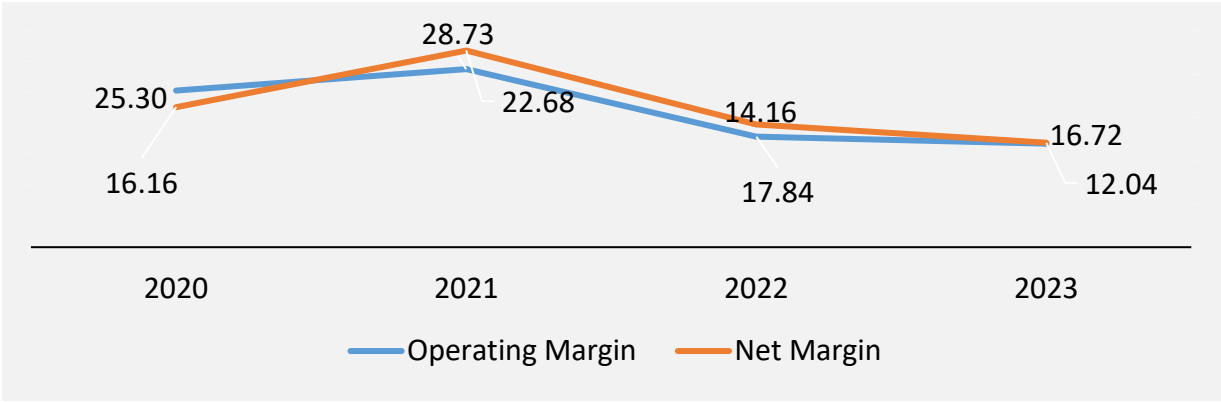
- In 2023, the revenue increased by USD 293.7 million or 8.4% compared to the previous fiscal year 2022.

(Currency Conversion Rate: 2021: 1 CNY = 0.1569 USD ; 2022: 1 CNY = 0.14438 USD; 2023 1 CNY = 0.14105)

Total Revenue and Year-on-Year Growth 2020-2023, (USD Mn)



OPERATING MARGIN AND NET MARGIN (%), 2019-2022



Source- Company Website , Annual Report and Morningstar.

INORGANIC

- **In December 2022, LB Group's subsidiary, LB Sichuan Mining and Metallurgy Co., signed a 240 million yuan (USD 34.44 million) agreement, doubling vanadium-titanium magnetite resources. Vanadium-titanium magnetite ore is typically used in the production of titanium dioxide and titanium sponge. This strategic partnership contribute to the growth of titanium dioxide.**

LB GROUP

- LB Group, a major player in the titanium dioxide industry, has a strong production capacity to meet the diverse demand for titanium dioxide in various applications.
- The Company's extensive global presence, featuring production facilities and distribution networks across regions, facilitates serving a diverse customer base effectively.

- The company's reliance on both sulfate and chloride processes across its six titanium dioxide production plants poses a weakness to the company that could impede its growth and operational efficiency.

- The company faces challenges in addressing environmental concerns linked to production, such as waste management and emissions while manufacturing titanium dioxide.

- The company has an opportunity to expand into new markets through investment in research and development aimed at creating innovative titanium dioxide products.
- By collaborating closely with suppliers, distributors, and customers, the company can bolster its market position, pursue fresh opportunities, and enrich its product range.

NANJING TITANIUM DIOXIDE CHEMICAL CO., LTD

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COMPANY OVERVIEW

COMPANY SWOT ANALYSIS

COMPANY DETAILS

Company Name	Nanjing Titanium Dioxide Chemical Co., Ltd
Establishment Year	1957
Headquarter	Jiangsu, China
Key Management (CEO)	-NA-
Operating Regions	North America, Europe and Asia Pacific, Latin America, and Middle East
Employee Strength (2021)	~500

COMPANY OVERVIEW

- Nanjing Titanium Company is one of the largest manufacturers of titanium powder using the sulfuric acid process. The company has been certified as a 'high-tech enterprise' and has obtained the ISO 9001:2000 quality management system certification.
- The Company products are mainly used in coating, papermaking, chemical fiber, ink, plastic tube, film, rubber, leather, cosmetics, and other fields.
- The company has been honored with titles such as 'Famous Products in Jiangsu Province' and 'Famous Trademark in Nanjing City' for its 'Nannan' titanium dioxide. Both NA100 and NR950 types have successfully passed the new product technical evaluation in Jiangsu province.

CATEGORY	DESCRIPTION
Anatase titanium dioxide	Anatase titanium dioxide has excellent whiteness, glossiness, favorable covering power, and lightning power, along with good dispersion, low oil absorption, and a wide range of applications. This category contains products such as NA100, including anatase (general type).

Source- Company Website.

NANJING TITANIUM DIOXIDE CHEMICAL CO., LTD

CATEGORY	DESCRIPTION
Rutile titanium dioxide	Rutile titanium dioxide exhibits excellent pigment performance with outstanding whiteness and glossiness, high lightening power, moderate weather resistance, heat resistance, low oil absorption, good dispersion, and dry powder with good fluidity. This category includes various products such as NR930 rutile, NR9502 rutile, NR9503 rutile, NR960 rutile, and more.

Source- Company Website.

NANJING TITANIUM DIOXIDE CHEMICAL CO., LTD

COMPANY OVERVIEW

COMPANY SWOT ANALYSIS

- Nanjing Titanium Dioxide Chemical Co., Ltd. has a diverse range of titanium dioxide products, catering to industries such as paints and coatings, thereby enhancing its competitive position.
- The company's research and development focus drives innovation, leading to the creation of new titanium dioxide products to meet evolving market demands and technological advancements.

- The company faces challenges regarding environmental concerns tied to its production process, such as waste management and emissions, which need to be addressed.

- The company's limited product portfolio poses a weakness, hindering its growth and restricting its ability to compete effectively and expand in the market.

- The growing demand for titanium dioxide in sectors like construction, automotive, and cosmetics presents opportunities for the company to expand its market share and product offerings.
- The company can leverage technological advancements in titanium dioxide production and application methods to enhance its product portfolio and meet the evolving needs of its customers.

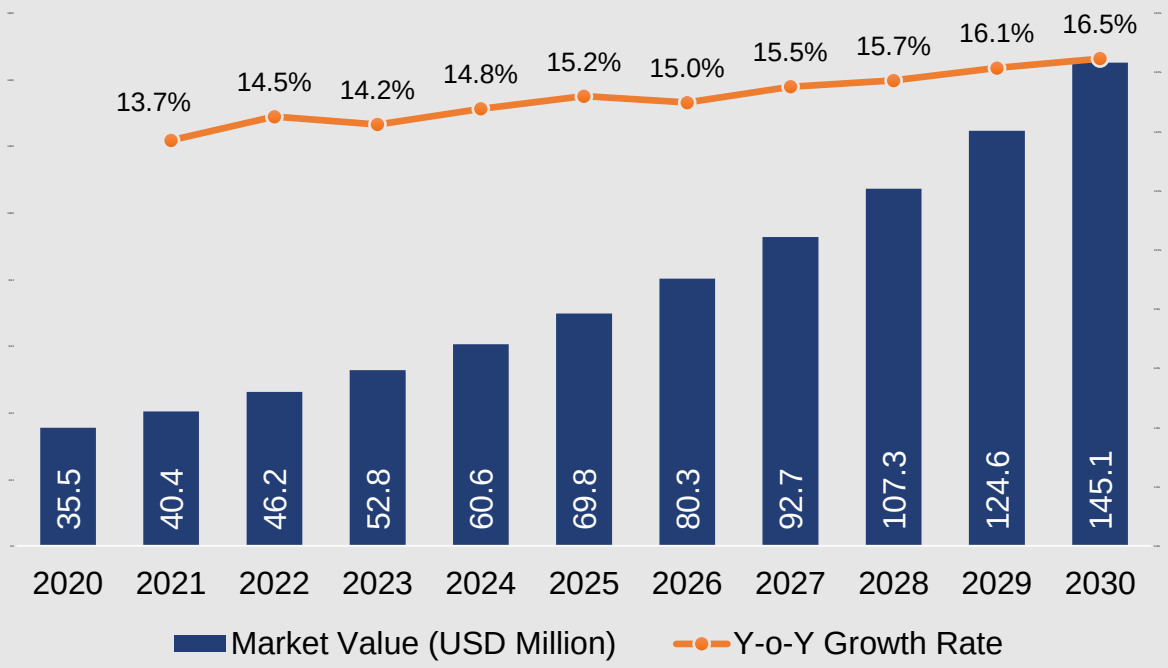
Source- ReAnIn Analysis

SECTION 8

Titanium Dioxide (Tio2) in Sodium Ion Battery Technology

TITANIUM DIOXIDE (Tio2) IN SODIUM ION BATTERY TECHNOLOGY

FIGURE 7.1 **Titanium Dioxide (Tio2) in Sodium Ion Battery Market Value (USD Million), 2020-2030**



2.4x **Projected growth of Titanium Dioxide (Tio2) in Sodium Ion Battery Technology Market during forecast period of 2023 to 2029**

- **Titanium Dioxide (Tio2) in Sodium Ion Battery Technology Market** was valued at **US$ 52.8 Mn** in 2023 and is estimated to reach **US$ 145.1 Mn** in 2030, expanding at a CAGR of **15.7%** during the forecast period.
- TiO2 plays a pivotal role in Sodium-ion battery technology, offering a safe, cost-effective anode with appropriate voltage characteristics and structural stability.
- Titanium dioxide (TiO2) crucially enhances sodium ion battery technology, serving as a cathode material to improve electrochemical performance, optimize ion conductivity, and increase energy density for enhanced energy storage capabilities.
- According to a study, scientists at Singapore's Nanyang Technological University (NTU) developed a sodium-ion battery replacing graphite with titanium dioxide gel, enabling rapid charging in two minutes to 70%, with a lifespan exceeding 20 years. The gel's simple preparation involves mixing titanium dioxide and sodium hydroxide.
- TiO2 emerges as a critical component in sodium-ion battery advancements, enhancing safety and performance. Its expanding role anticipates robust growth in the titanium dioxide market, driven by evolving energy storage technologies.

Source: ReAnIn, Primary Analysis.

SECTION 9

- Analyst Views
- Future Outlook
- About Us

ANALYST VIEWS

- The titanium dioxide market is witnessing strong demand due to its broad use in paints, coatings, polymers, and cosmetics. Raw material price volatility and environmental concerns, on the other hand, provide obstacles to pricing strategies and supply networks.
- Technological Advancements like ongoing research and development in nanotechnology and manufacturing methods are set to improve titanium dioxide's efficiency, quality, and environmental friendliness. Innovative materials, such as photocatalytic TiO2, are gaining pace, with potential uses in self-cleaning surfaces, air purification, and renewable energy.
- Growing environmental consciousness encourages a change towards more environmentally friendly practices in the titanium dioxide business. Manufacturers are investing in environmentally friendly production processes, waste reduction, and recycling activities to comply with global sustainability goals and cater to environmentally conscious customers and regulatory requirements.
- Mergers and acquisitions are altering the competitive environment, with larger businesses looking for synergies to increase efficiency and market share. Smaller businesses are focused on specialized markets and specialty applications to differentiate themselves, which is helping to boost market competitiveness and strategic partnerships.
- Geopolitical concerns, transportation difficulties, and raw material supply are all causing disruptions in the titanium dioxide industry. Diversifying supply chain sources, optimizing logistics, and using digital technology can all help to reduce risks and boost resilience in the event of unexpected disruptions.
- Evolving rules on environmental standards and safety precautions have an influence on manufacturing operations and market access. To negotiate the complicated regulatory landscape and ensure market access, industry actors must proactively adapt to compliance requirements, investing in regulatory information and sustainable practices.

FUTURE OUTLOOK OF THE MARKET

- The titanium dioxide market is projected to witness a CAGR of 5.7%, reaching USD 32,238.1 million by 2030 from USD 21,983.4 million in 2023. Rutile-grade titanium dioxide dominates with a value of USD 17,016.4 million in 2023, poised to grow to USD 25,094.5 million by 2030.
- The sulfate process leads by generating USD 11,924.5 million in 2023, expected to rise to USD 17,708.1 million by 2030. Paints application commands the market with USD 13,276.9 million in 2023, forecasted to surge to USD 19,791.8 million by 2030. Increasing demand for titanium dioxide in the paints industry, especially in the Asia Pacific region, contributes significantly to market expansion.
- Technological advancements in sulfate processing methods propel the growth of the titanium dioxide market, enhancing efficiency and product quality. The sulfate process, driven by technological advancements, is anticipated to dominate the market due to its efficient production and high-quality output.
- Growing industrial applications, especially in paints and coatings, coupled with advancements in manufacturing processes, are major contributors to the market's robust growth. Asia Pacific's dominant regional share is attributed to burgeoning industrialization, increasing construction activities, and rising demand for titanium dioxide in key sectors like paints and plastics.

Source- ReAnIn Analysis

ABOUT US

ReAnIn is a market research company that provides end to end market research services which span across different support areas as shown below. We are strong believers in **Client First** approach and it clearly reflects in our value proposition and business model.

Mission: To develop value-offerings that support our clientele in making great business decisions by constantly redefining the perspectives, challenging the status quos and breaking all the barriers

Vision: To be a well-recognized market intelligence partner for companies across the industries, that intend to make rapid strides of progress. Our objective is to deliver unparalleled and unprecedented value to our stakeholders who have reposed faith in us

OUR OFFERINGS

- Market Research Reports
  - Syndicated Market Research Reports
  - Custom Market Research Reports
- Custom Research
  - Consulting
  - Long Term Engagement
  - Flash Delivery

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We are strong believers in client first approach.

We Know the Difference

We know the difference between “good research” & “ great research

Free Customization

We provide 100% free customization for all our deliverables

1 Year Free Support

We provide after sales analyst support for a period of 1 full year for free

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