

# Socio-economic Impacts of a Harmonized Classification of Titanium Dioxide (TiO<sub>2</sub>) as Suspected Carcinogen by Inhalation (Cat. 2)<sup>1</sup>

## Key highlights

The recommendation to classify TiO<sub>2</sub> as a suspected carcinogen by inhalation (cat 2) would result in severe social and economic impacts for a wide range of industry sectors from paper, plastics, paints, cosmetics and automotive. It would affect the jobs of millions of workers in Europe and beyond, and the billions of euros of value added to the EEA, across the industries using TiO<sub>2</sub> in their products.

These adverse socio-economic impacts would be highly disproportionate as the recommended classification is not expected to enhance any human health benefits or further protect workers or consumers.

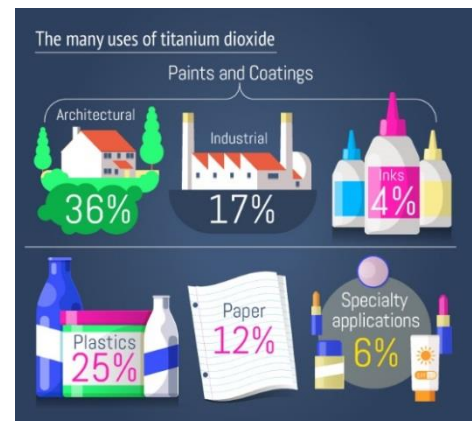
Beyond economic and human health impact, it would heavily impact on EU wider policy objectives that the EU is promoting, notably a circular economy as waste streams containing more than 1% TiO<sub>2</sub> become hazardous.

Additionally, it would open the door to a similar classification of other “poorly soluble low toxicity particles” which would result in similar adverse impacts for other industries in Europe and beyond.

## Introduction

**Titanium dioxide (TiO<sub>2</sub>) is the highest volume and most versatile globally-used white pigment.** No other comes close to matching its exceptionally high opacity, bright whiteness and UV absorbing, protective properties. **It is manufactured in 18 plants in the European Economic Area (EEA) with an annual production volume of ca. 1,100 ktonnes and an estimated market value of ca. €3 billion.**

Most TiO<sub>2</sub> is used in paints and coatings (see image on the right). Approximately 1-2% of all TiO<sub>2</sub> is made in non-pigmentary forms for use in many high value-added applications including cosmetic sunscreens and environmental, clean air technologies.



## Impacts of the recommendation to classify TiO<sub>2</sub> as suspected carcinogen by inhalation (cat. 2)

From the information gathered from manufacturers and users, it is clear that a **classification of TiO<sub>2</sub> as suspected carcinogen by inhalation (cat. 2) would have severe adverse consequences** as a result of (a) the **absence of technically feasible alternatives** for TiO<sub>2</sub>, and (b) the **triggering of a series of automatic changes** in how the marketing and use of TiO<sub>2</sub> is treated **under a variety of chemical safety regimes in the EEA**. Once classified, automatic regulatory changes would be applied with potential unintended and far-reaching negative legal and economic consequences in several important areas, well beyond the TiO<sub>2</sub>

<sup>1</sup> Executive summary of analysis of the socio-economic impacts of a harmonized classification of Suspected Carcinogen Category 2 for titanium dioxide (TiO<sub>2</sub>), Final Draft Report, 27 October 2017, RPA

industry. Although the only possible hazard identified by the RAC is based on effects seen in inhalation studies when rats (not humans) are exposed to exceptionally high concentrations of all poorly soluble dusts (PSLTs), not just TiO<sub>2</sub>, the classification would cover all forms of TiO<sub>2</sub> even when actual inhalation would not be possible. This is all against a backdrop of **no real benefit to safety or health since consumers do not interact with inhalable forms of TiO<sub>2</sub> and workers are protected by current laws.**

Additionally, **broad and far-reaching policy and societal cost implications are anticipated** as a result of this proposed action. While these have not been economically studied yet, they certainly will **greatly magnify the economic impacts** noted in this report. These include the collateral impact on the vast catalogue of other PSLT substances, hazardous waste disposal capacity, and the EU's goals for a sustainable, circular economy, among others.

### ***1. Impacts on titanium dioxide manufacturers and their suppliers***

It is estimated that up to **10-15% of current demand for TiO<sub>2</sub> would be lost**, leading to the shrinking of EEA's TiO<sub>2</sub> manufacturing base and the likely shutdown of an uncertain number of production lines. This would have a significant knock-on effect on both EEA-based and non-EEA supply chains as exports account for one-third of EEA manufacture because some TiO<sub>2</sub> grades are only produced by European plants. **The Gross Added Value of TiO<sub>2</sub> manufacture to the EEA economy is €560 million; the industry employs ca. 8,150 workers and is responsible for the creation of a further 22,800 support jobs.** The Cat. 2 harmonised classification would also cause market losses for two Norwegian feedstock manufacturers and would affect the trade of ca. 4 million tonnes of raw materials used in the manufacture of TiO<sub>2</sub>.

### ***2. Impacts on downstream users of titanium dioxide***

The Cat. 2 harmonised classification would **impact upon a multitude of downstream user sectors with a combined Gross Value Added of hundreds of billions of Euros; paints and plastics alone, the most important uses for TiO<sub>2</sub>, account for over €120 billion.** Downstream users might consider the reformulation of their products. However, in the vast majority of cases this could not be successful due to the lack of technically feasible alternative pigments. Also, there is no guarantee that any feasible substitute would have any less of a perceived hazard or a greater track record of safety. In any case, **substitution of TiO<sub>2</sub> would be costly (example estimates: €0.05-60 million per company), take considerable time (2-20 years) and invariably be a case of regrettable substitution.**

### ***3. Impacts on the EU's circular economy***

The Cat. 2 harmonised classification would impact upon the recycling and reuse of waste that contains over 1.0% TiO<sub>2</sub> as these are likely to be classified as hazardous, **threatening the EEA sustainable, circular economy model.** It might impose an additional cost ranging from a few thousand Euros to millions of Euros per site for the disposal of packaging, manufacturing, and construction and demolition wastes that would be classified. For instance, estimates by European Chemical Industry Council (Cefic), the European trade body representing large, medium and small chemical companies across Europe, show that **the price for treatment of waste classified as hazardous can be 2 to 3 times the price for the same material classified as non-hazardous.**

### ***4. Impacts on EEA competitiveness***

EEA business would become less competitive both domestically and overseas and, over time, **parts of the value chains would potentially relocate outside the EEA.** SMEs in the EEA would be particularly vulnerable to the loss of a critical raw material or articles that depend on it. Additional manufacturing, distribution, and disposal requirements will be imposed. Inevitably, manufacturing, product, and waste disposal costs will rise with the effect of reducing EEA competitiveness with the rest of the world. Certain

products would likely exit the EEA market, either as a result of direct or collateral regulatory impact, consumer deselection based upon misperception, or product cost.

#### **5. Impacts on workers**

**TiO<sub>2</sub> in its formulations and articles are used by millions of workers without potential for inhalation exposure. By way of example, 1 million workers apply paints/coatings and 4.5 million workers are involved in the use of plastics.** Even if the Cat 2 harmonised classification caused the loss of jobs for only a modest percentage of this workforce, the **total number of jobs lost across all EEA would be significantly high.** Impacts would not be limited to industries that use TiO<sub>2</sub> as a raw material; the re-classification of TiO<sub>2</sub>-containing products such as coatings, plastics, and papers would significantly impact employment in downstream industries that use these products—even though these are not inhalable forms of TiO<sub>2</sub>. Furthermore, inhalation exposure to workers during industrial use of TiO<sub>2</sub> in its powder form is already controlled by current laws and can continue to be feasibly kept below the effect threshold (which RAC has accepted) through adherence to an appropriate Occupational Exposure Limit for workers. Thus, **jobs will be lost for no added to protection to worker safety and health.**

#### **6. Impacts on the marketing and use of other substances**

The handling, processing and use of minerals that contain **TiO<sub>2</sub> impurities at up to 4% by weight** (e.g. kaolin, a mineral often referred to as a potential partial replacement for TiO<sub>2</sub>, bentonite, perlite, mica, diatomite, ball clays, vermiculite, refractory materials and zircon) **would be affected.** Combined, **these minerals are used in the EEA in a volume of over 20 million tonnes per year and have a market value of over €3.3 billion.** The volumes and market value of downstream products of these minerals are even larger.

In addition, in its September 2017 opinion, RAC acknowledges that the **suspected carcinogenicity profile** described for TiO<sub>2</sub> is **not exclusively characteristic of TiO<sub>2</sub> but applies to a group of chemicals with similar toxicity profile addressed as “poorly soluble low toxicity particles” (PSLTs).** Thus, adoption of this proposed Cat 2 harmonised classification could open the pathway for the classification of other PSLTs, including many minerals that might be considered potential (partial) substitutes for TiO<sub>2</sub>.

#### **7. Impacts on consumers**

**Consumers could face a reduction in product availability and choice, increased market prices, increased costs for redecoration and maintenance tasks, loss of performance, poorer aesthetics and also loss of a safe, effective UV filter in sunscreens and other cosmetics if the use of TiO<sub>2</sub> in these types of products was questioned or perceived unsafe even though these are not inhalable forms of TiO<sub>2</sub>.** For instance, the proposed Cat 2 classification would mean that the availability of a multitude of consumer formulations such as Do-It-Yourself (DIY) paints, (the vast majority of which contain TiO<sub>2</sub>) adhesives, sealants and other formulations might be reduced, despite that these products do not have the potential hazard identified by the RAC.

### **Conclusion**

This impact analysis demonstrates that the recommendation to classify TiO<sub>2</sub> as a cat 2 suspected carcinogen by inhalation **would result in severe social and economic impacts for a diverse range of industry sectors.** It would also **impact the marketing and use of a vast array of industrial, professional and consumer products.** Additionally, the economic multiplier of this classification proposal would **affect the employment of millions of workers and the billions of euros of value** across the industries using TiO<sub>2</sub> in their products. Furthermore, since there is no reasonably anticipated occurrence or significant level of

inhalation exposure during industrial, professional and consumer use of TiO<sub>2</sub> and its products, the **demonstrated adverse socio-economic impacts would be highly disproportionate to any potential human health benefits.**

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***Why was the report commissioned?***

In May 2016 the French competent authority ANSES submitted a proposal to classify TiO<sub>2</sub> as a Carcinogen Category 1B by inhalation (H350i). Following deliberations by ECHA's Risk Assessment Committee (RAC), RAC adopted an opinion on 14 September 2017 in which it recommends the classification of TiO<sub>2</sub> as a suspected carcinogen by inhalation (category 2). In the meantime, the Titanium Dioxide Industry Consortium (TDIC) commissioned Risk and Policy Analysts Ltd (RPA), an independent consultancy, to assess the regulatory and economic impacts this harmonised classification would have.

***Who contributed to the report?***

TiO<sub>2</sub> manufacturers and downstream users, both individual companies and trade associations, completed two questionnaires – a short initial questionnaire followed by a more detailed consultation. In total, 165 and 116 completed responses were received for the first and second questionnaire, respectively. The consultation also received responses from trade associations representing the producers of other poorly soluble powders. On the whole, paints and plastics accounted for the majority of responses, with significant representation also from the printing inks and cosmetics industries.

**About TDMA**

*The Titanium Dioxide Manufacturers Association - TDMA is a sector group of Cefic (the European Chemical Industry Council) and it represents the major producers of titanium dioxide (TiO<sub>2</sub>) and acts as their responsible voice in Europe since 1974. TDMA promotes and defends the merits of titanium dioxide in all suitable applications by bringing forward evidence of its safety and efficacy. TDMA is a non-profit organisation and it has no commercial role. For all commercial enquiries, please refer to the websites of our members.*

[www.tdma.info](http://www.tdma.info)