Titanium Dioxide

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Technical Information

As early as October 2019, the European Chemical Agency ECHA classified TiO_2 powders with a content of more than 1% titanium dioxide (TiO_2) particles smaller than 10 μm as suspected of causing cancer if inhaled. This regulation 2020/217 is an amendment to the REACH regulation and entered into force on 9 March 2020. The transitional period ended 1 October 2021.

Based on this new classification manufacturers and suppliers changed their **MSDS** accordingly. This may have an impact on the safety of the working environment and needs adjustments in the safety assessments as well as the health and safety measures of employees at work. Eurofins Environment is happy to consult you regarding any questions you may have concerning health and safety measures at work.

Up to now, food contact materials and the manufacturer, converter or user of food contact materials are not concerned as long as the inhalation of TiO_2 can be excluded. For master batches or printing inks used in food contact materials in which TiO_2 is included in a liquid matrix, there is no risk of TiO_2 inhalation. The European Plastic Regulation (EU) No. 10/2011 lists TiO_2 as an additive approved to be used in food contact materials without any restriction. In light of the new classification, it can be expected that this listing might be adjusted in the future.

Furthermore, European Commission recently notified an amendment of the European Food Additive Regulation (EC) No. 1333/2008 to the WTO regarding TiO_2 (E171) which is used as a food colourant. With the amendment, the use of TiO_2 will be completely forbidden as a food colourant as from 6 months after publication.

Food manufactured before this deadline may be legally sold until their best before date. It can be expected that food manufacturers will require evidence of the non-migration of TiO_2 from food contact materials even though European Plastic Regulation (EU) No. 10/2011 does not define and specific a migration limit.

Titanium Dioxide in Cosmetic Products

For use in cosmetic products, TiO_2 is included in two positive lists of EU Cosmetics Regulation (EC) No. 1223/2009 (EU-CR), namely in the list of colourants authorised in cosmetic products (*Annex IV of the EU-CR*) and in the list of authorised filters for protection against ultraviolet radiation (*Annex VI of the EU-CR*).

A special case is the intake of TiO_2 via tattooing products. It is used in tattooing products and permanent make-up as a white pigment or in mixtures with pigments to produce certain shades. The predominant crystal form used in tattooing products is rutile.

Nanoscale and non-nanoscale TiO_2 is used in UV filters. The transparent appearance of the nanoform is advantageous when applied to the skin.

The use of the nanoform of TiO_2 in sun screen products is not permitted in applications that may lead to lung exposure by inhalation. However, as a consequence of the Classification, Labelling and Packaging (CLP) of substances and mixtures, a new safety assessment of titanium dioxide by the Scientific Committee on Consumer Safety (SCCS) was necessary in accordance with Article 15 (1) of the Cosmetics Regulation and was published on 6 October 2020. Conclusions could only be reached for one specific material. An amendment to the EU Cosmetics Regulation based on this recommendation has not yet been made.

The SCCS considers TiO_2 safe when used as a UV-filter (*entry 27 Annex VI)* in cosmetic products up to a maximum concentration of 25%, as a colourant (*entry 143 Annex IV*) and as an ingredient in all other cosmetic products. In contrast, the use of pigmentary TiO_2 in a typical hair styling aerosol spray product up to a maximum concentration of 25% is not safe for either general consumers or hairdressers. A maximum concentration of 1.4% for general consumers and 1.1% for hairdressers is recommended.

In addition, it has been shown that the use of pigmentary TiO_2 in loose powder up to a maximum concentration of 25% in a typical face make-up application is safe for the general consumer based on the safety assessment of TiO_2 in the context of possible classification as a category-2 carcinogen (via inhalation). This means that the conclusions drawn in the SCCS opinion are applicable to the use of pigmentary TiO_2 in a cosmetic product that may give rise to consumer exposure by the inhalation route (i.e. aerosol, spray and powder form products) and therefore, it is not applicable to any pearlescent pigment, of which TiO_2 is only a minor constituent.

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