TDMA
TITANIUM DIOXIDE MANUFACTURERS ASSOCIATION
for a brighter future

Titanium Dioxide Manufacturers Association - TDMA Response to Customers Concerning the Presence of Nanoparticles in Titanium Dioxide Pigment

Titanium Dioxide pigment is manufactured as a fine particulate powder with major uses in paints, plastics, fabrics and high quality papers. It is supplied in a range of grades that are tailored for the particular end use. The Titanium Dioxide particles may be surface treated to further enhance their properties.

Nanoparticles are defined as particles having all external dimensions in the size range 1 – 100nm by ISO/TC 229[1]. Under the European Commission recommendation[2] the definition requires only a single dimension in this size range whereas such particles would be termed nano-objects under ISO/TC 229[1]. A nanomaterial can be considered as a material comprising of such particles and under the Commission recommendation[2] this requires 50 number per cent of nanoparticles for the material to be considered as a nanomaterial.

Irrespective of which of these definitions is used, the average primary particle size for Titanium Dioxide pigments is larger than the defined size range of 1 – 100nm.

As with other particulate materials there is a distribution of primary particle sizes around the average value and therefore a minor fraction of the primary particles could be considered as nanoparticles. The exact proportion of nanoparticles will depend on the definition used. Specifying the proportion on a mass or number basis makes a significant difference to a reported value. The measurement technique and sample preparation used is also critical to ensure that values obtained are truly representative of the primary particle size distribution and comparable across different samples and laboratories.

Nevertheless, based on the best knowledge and techniques available within the industry, Titanium Dioxide pigments should not be considered as nanoparticles, manufactured nanoparticles, or nanomaterials.

It is important to note that the primary particle size does not represent the size of particles in the products supplied by the industry, since in practical systems these are aggregated or agglomerated into larger particles.

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[1] ISO/TC 229 Nomenclature system for nanoparticles
[2] European Commission Recommendation of 18 October 2011 on the definition of a nanomaterial (2011/696/EU)

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