

A new integrated measurement approach to support the implementation of the Commission recommendation for the definition of nanomaterial

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The EC recommendation for the definition of nanomaterial [2011/696/EU] requires the quantitative size determination of constituent particles in samples down to 1 nm. Accordingly, a material is a nanomaterial if 50 % or more of the particles are in the size range 1-100 nm. The fact that engineered nanomaterials already exist in many industrial and consumer products challenges the development of measurement methods to reliably identify, characterize and quantify their occurrence as substance and in various matrices.

The EU FP7 NanoDefine project [www.nanodefine.eu] has addressed this challenge by developing a robust, readily implementable and cost-effective measurement strategy to obtain quantitative particle size distributions and to distinguish between nano and non-nano materials according to the EU definition. Based on a comprehensive evaluation of existing methodologies and intra- and inter-lab comparisons, validated measurement methods and instrument calibration procedures have been established to reliably measure the size of particles within 1-100 nm, and beyond, including different shapes, coatings and chemical compositions in industrial materials and consumer products. Case studies prove their applicability for various sectors, including food, pigments and cosmetics.

Main outcome is the establishment of an integrated tiered approach including rapid screening (tier 1) and confirmatory methods (tier 2), and a user manual to guide end-users, such as manufacturers, in selecting appropriate methods. Another main product is the “NanoDefiner” e-Tool allowing the standardised / semi-automated selection of appropriate methods for material classification according to the EU definition. Results also contribute to standardization efforts, such as CEN TC 352 or ISO TC 229.

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