

wet fine grinding

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Abstract

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The wet fine grinding in agitator bead mill is a physical process to produce particles in the nanometer range. Particles with an initial fineness of several micro meter can be ground down to a medium fineness of 40 200 nm.

The stress on the particles is created by impact and shear forces between smallest grinding media in an intensively agitated bulk. The product suspension is pumped through the agitator bead mill, while the grinding media has to stay inside the grinding chamber. Before the suspension leaves the grinding zone the media is separated from the product by a centrifugal separator. The product is ground in one or more passes, alternatively in a recirculation process.

Basically two different tasks can be solved; on the one hand the grinding of solid particles up to the mentioned fineness range, or, on the other hand the grinding, dispersion and stabilisation of particle agglomerates in a suspension.

The necessary grinding media has a size between 50 μm and 500 μm . Different materials like polymers, ceramic, glass, steel or even hard metal can be used.

The different fields of application are increasing. For example it is used for the production of pigments, finest coatings, polishing compounds for wafers, pigmented ink jet inks and in the field of life science.

In the last years the pharmaceutical industry developed new, poorly soluble drugs which make a wet fine grinding necessary. Advantages among others are increased bioavailability and rate of absorption, as well as enhancing efficacy. But there are also interesting applications in the cosmetic industry, biotechnology and for plant protectives.