

Process Technology | Technology Offer

Melt Emulsification without Emulsifier / Protective Colloids

Innovation

The Section food process engineering at the Karlsruhe Institute of Technology (KIT) has developed a processing concept and the required homogenization valve to produce dispersions of solid particles with reproducible and uniform characteristics without the use of special additives (emulsifiers or protective colloids). The particle size can be adjusted within a broad range, with the possibility of even submicron-sized particles.

Current Status of Technology

Normally the solid particles needed for dispersions are produced by milling the material to the required size. The mills and grinding elements used for this process are subject to constant abrasion and in addition pollute the product with the wear debris. Often the stickiness of the product to be milled limits the application of this process. Long processing times make it an expensive process.

Alternatively, it is possible to precipitate the solid to be dispersed from a solvent into a water-based medium. The downside of this approach is that for each material a suitable solvent needs to be found and significant amounts of solvents are required.

The process of melt emulsification involves melting the solid compound followed by the emulsification of the molten material. Processing times and energy requirements are significantly reduced. However, it is necessary to identify emulsifiers and colloidal systems that remain stable over a wide temperature range. These processing aids can to this day only be found by trial and error and are a significant cost factor in the process development and production.

The process and the equipment developed at the KIT based on a new and inventive concept overcome the disadvantages of current technologies described above. In particular, there is no longer any need for emulsifiers.

Fields of Use

Production of dispersions containing micron or submicron-size, rounded and homogenous solid particles which are of particular use in paints, varnishes and pharmaceuticals.

Your Advantages at a Glance:

- ✓ All the advantages of the melt emulsification process: short processing times, lower energy need, controlled particle size in the range of 1 to 10 μm or even $< 1 \mu\text{m}$.
- ✓ With no need for expensive stabilizing agents such as emulsifiers.
- ✓ High level of reproducibility of the particle size, narrow size distributions / homogenous particles.
- ✓ Range of control options depending on the homogenization system.
- ✓ Application of melt emulsification for products which so far could not be manufactured by this means.

Patent Portfolio

A German patent issued

An international PCT application pending.

The Technologie-Lizenz-Büro GmbH is charged with the commercialisation of this technology and now offers companies an opportunity to enter into a licensing arrangement.

For further information regarding this technology, please contact:

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