

One production step less

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An innovation in the manufacturing process for AEROSIL® fumed silica products allows paint and coating manufacturers to eliminate an entire production step. The omission of bead milling reduces machine usage, processing time, and costs. The innovation opens up the possibility of combining wetting and dispersion — two steps that, until now, were carried out in separate systems (dissolver and bead mill) — into one process step in the dissolver. Now that VP RS 92 has been produced successfully on a pilot scale (and is available for sampling), development of additional, easy-to-disperse versions of other AEROSIL® products is now underway.

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Customers' desire to reduce the cost of the dispersion process is nothing new. Using a bead mill to create the perfect dispersion is the most technically challenging and time-consuming processing step in manufacturing paints and coatings. The term "easy-to-disperse" (or "E2D" for short) was chosen to describe the unique properties of these products (i.e. easily dispersible and dispersible in a dissolver), which are now ready for sampling.

With the launch of VP RS 92, Evonik now has an E2D version of its familiar AEROSIL® R 972. Measurements of particle-size distribution have demonstrated a crucial difference between the two AEROSIL products: Whereas the particle spectrum of the standard version of AEROSIL® R 972 is split into two fractions, the new process yields only one, the finer fraction. The elimination of coarse particles allows paints and coatings manufacturers to dispense with milling processes involving high shear forces (bead milling, for example). In order to test its processing characteristics, rheological effects, and optical properties within a coating system, the standard product was processed using traditional bead milling procedures, while the experimental product was prepared exclusively in the dissolver. The results for viscosity, shine, haze, and jetness (depth of color) were all correct within the margin of error. A significant, absolute reduction in processing time was observed as well, even as the degree of dispersion improved.

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The viscosity curves at high and low shear rates were identical within the key range of rising viscosity. This showcases a key

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advantage of the E2D product: Because it achieves the same level of efficiency and the same optical characteristics, manufacturers do not need to adjust existing formulations, and new formulations can be created according to the same rules as earlier coatings. In addition, easy-to-disperse versions of fumed silicas are chemically identical to the corresponding AEROSIL® products. An important point to highlight here is that no additives of any kind are used, making these products just as compatible with coating systems as familiar standard products are.

The use of easy-to-disperse silica will decrease processing times, cleaning times, and production losses, while omitting the bead milling step reduces investment and maintenance costs, especially in varnish production. Pigment manufacturers likewise offer products that can be dispersed in solvents, opening up the possibility of formulating colored coatings with no need for a bead mill. Paints and coatings manufacturers wish to reduce the cost of the dispersion step, and fumed silicas fulfill this desire in two ways: In addition to reducing the number of plant components needed for processing, they also decrease the time required to achieve the optimum degree of dispersion — a development that ultimately reduces production costs.



Caption:
Manufacturing process for AEROSIL® allows paint and coating manufacturers to eliminate an entire production step.

Company information

Evonik, the creative industrial group from Germany, is one of the world leaders in specialty chemicals. Profitable growth and a sustained increase in the value of the company form the heart of Evonik's corporate strategy. Its activities focus on the key megatrends health, nutrition, resource efficiency and globalization. Evonik benefits specifically from its innovative prowess and integrated technology platforms. Evonik is active in over 100 countries around the world with more than 35,000 employees. In fiscal 2016 the enterprise generated sales of around €12.7 billion and an operating profit (adjusted EBITDA) of about €2.165 billion.

Evonik Industries has been producing specialty chemical products in the Greater China region (Mainland China, Hong Kong and Taiwan) since the late 1970's; with wide-ranging trading relations already in place prior to this in the region. Evonik regards Greater China as one of the driving forces of the global economy and we consequently endeavor to grow our business in the region. The company now has around 3,200 employees in the Greater China region, the regional sales reached about €1.3 billion in 2016.

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