



ADVANCEMENTS

Simplify Coating Formulations with AEROSIL® Easy-to-Disperse Fumed Silica

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Evonik Coating Additives' AEROSIL® Easy-to-Disperse product range sets new standards in the coatings manufacturing process, allowing customers to disperse fumed silica in a single milling step, and thus saving time, money, and energy.

In the dynamic world of coatings, the continuous search for innovative solutions that streamline manufacturing processes and improve product performance is crucial. Evonik Coating Additives has responded to this industry demand with its AEROSIL® Easy-to-Disperse (E2D) product range: this advanced product line composed by four fumed silica-based additives is designed to significantly reduce the energy, time and costs associated with the dispersion process in coating formulations.

Fumed silica is a popular choice among coatings formulators for rheology control. However, a persistent challenge has been the

dispersion of aggregates and agglomerates, making optimal dispersion of fumed silica one of the most technically challenging and time-consuming steps in manufacturing coatings. Traditionally, a two-step process is used: a pre-dispersion step using a dissolver to wet-in the powder and to break up large aggregates and agglomerates, followed by bead milling to achieve the desired dispersion quality. This process is not only technically challenging, but also time and energy consuming. To address this, raw material manufacturers offer dispersions, preparations and pastes that have been optimised to disperse insoluble solids (such as silica, pigments and fillers). However, these goods may

contain undefined amounts of solvents, water, binders or additives that can significantly affect the finished coating system and are beyond the control of the formulator.

Eliminating one production step

“Our AEROSIL® E2D is designed to be incorporated directly into coating systems without the need for extensive milling or high shear forces,” stated Maximilian Cornelius, Head of Particle Design in the Research, Development & Innovation department at Evonik Coating Additives.

“Thanks to this globally unique technology, our customers can now perform wetting and dispersion processes in a single high-speed dispersion step.”

This ease of incorporation is a game changer for coatings manufacturers, as it not only speeds up the production process, but also minimises equipment wear and energy consumption. The result is a more sustainable and cost-effective operation that does not compromise the quality or performance of the final coating product. The AEROSIL® E2D range is versatile, suitable for rheology control in both pigmented and clear coating formulations, and can be used in a

wide range of coatings, including wood, plastic, automotive and general industrial coatings. AEROSIL® E 972 is recommended for rheology adjustment in a wide variety of formulations, while other silicas are tailored for specific applications – for example, AEROSIL® E 812 and AEROSIL® E 805 are especially suitable for automotive OEM and wood clearcoats, and AEROSIL® E 9200 is primarily used to improve durability, such as scratch resistance.

No need for formulation adjustments

“The viscosity curves at high and low shear rates are identical in the key area of increasing viscosity, compared to the standard AEROSIL® R grades” continued Cornelius. “This demonstrates another key advantage of our AEROSIL® E2D products: it achieves the same level of efficiency and optical characteristics, so manufacturers do not need to adjust existing formulations, and new formulations can be created using the same principles as previous coatings.”

In addition, the AEROSIL® E2D versions of fumed silica are chemically identical to the corresponding standard AEROSIL® products offered by Evonik Coating Additives. Using AEROSIL® E2D fumed silica reduces



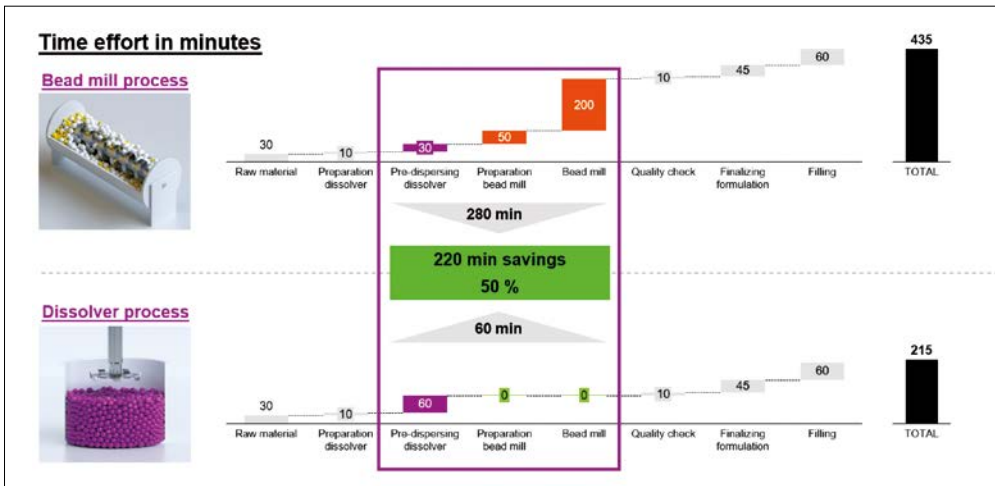
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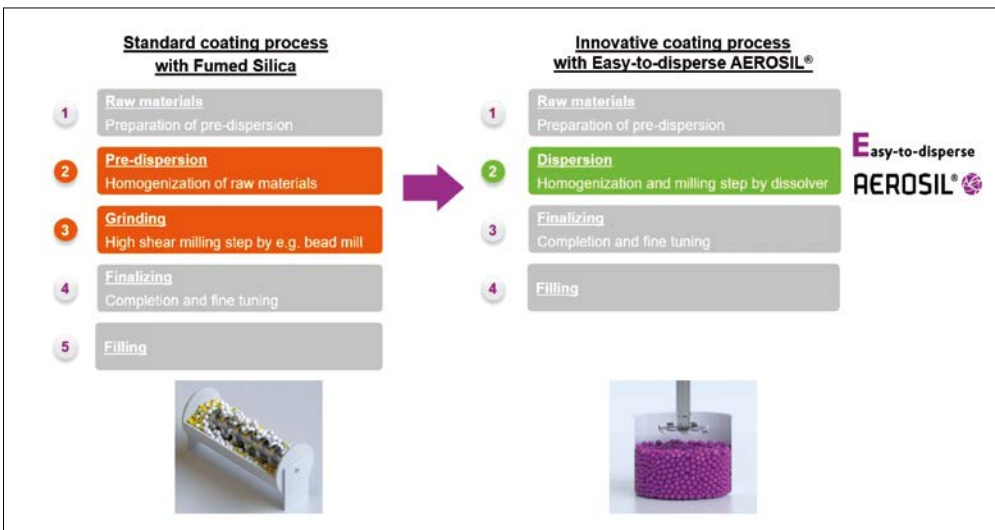
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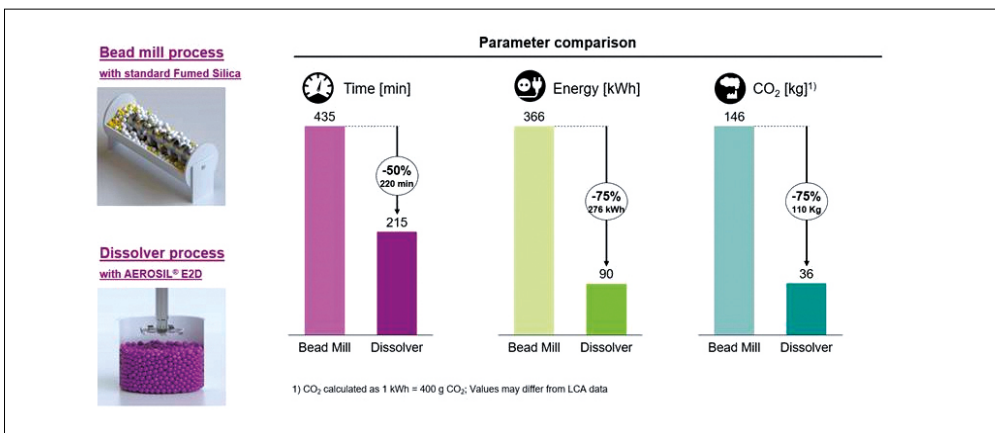




Comparison of high shear milling and dissolver milling regarding time effort.



Milling processes for incorporation of fumed silica with high shear milling (left) and innovative dissolver milling (right).



processing time, cleaning time, and production downtime, while eliminating the bead milling step reduces investment and maintenance costs, especially in coatings production. Pigment manufacturers also offer products that can be dispersed using dissolvers, opening the possibility of formulating colored coatings without the need for a bead mill.

Individual cost savings calculator

In line with Evonik’s approach to sustainability, AEROSIL® E2D products enable lower energy consumption and less waste in the production process. This environmental benefit can be quantified using the Cost Savings Calculator on COATINO®, the Dynamic Formulation Network. “The Cost Savings Calculator is an example of our customer-centric approach at Coating Additives,” explained Matthias Kremser, EMEA Marketing Industrial & Transportation Market Segment. “Customers can independently calculate their individual savings by using our AEROSIL® Easy-to-Disperse with low-shear dissolver milling, allowing them to make data-driven decisions that optimize their production processes and maximize profitability.”

Commitment to quality and innovation

Coatings manufacturers have long sought ways to simplify the fumed silica dispersion process. With the innovation of AEROSIL® 2 E2D technology, Evonik has met this demand by reducing the number of production steps and the required batch cycle time to achieve optimal dispersion. These efficiencies ultimately reduce production costs and energy consumption while maintaining performance. The technical performance of the AEROSIL® E2D range demonstrates Evonik Coating Additives’ commitment to quality and innovation. Developed in state-of-the-art production facilities, these additives not only meet but exceed industry standards for performance and ease of use. ○

Comparison between bead mill and use dissolver for 1% AEROSIL® for 1000 kg clear coating.