Producing Brilliant Effect Pigment Masterbatches Without Damaging the Platelet Structure

Special effect pigments are gaining significance in materials compounding, as rapidly growing industries, such as, automotive, fashion, consumer appliances and electronic goods, are fuelling their demand. With an estimated global market of USD 12.7 billion in 2015, the market for special effect pigments is growing at a CAGR of 4.5 per cent annually. As the demand continues to increase, especially in the emerging economies, the focus has shifted towards producing brilliant effect pigment masterbatches.

One of the biggest challenges faced by compounders is producing effect pigments without damaging the platelet structure. For example, Mica, a delicate and natural mineral, which is an integral part of effect pigments used to greatly enhance the visual appeal of products. Processing Mica is not easy, as the efficacy of the coated mica crystalline platelets depends on the ability to restrict damage to the platelet structure while processing, particularly when compounding high concentrations of the pigment for masterbatch production.

It is well document that Mica crystalline platelets are extremely sensitive and any alteration or change in size of the structure will hinder effective colouration and alter the appearance of the pigments and plastics, resulting in a higher reject rates of the final moulded part.

STEER, a pioneer in developing platform technologies for material transformation, has been working on special effects pigments. We have achieved multiple breakthroughs in mastering the co-rotating twin screw extruder technology to process special effect pigments and bring to market the most advanced platforms. Having developed best practices to produce brilliant effect pigment masterbatches without damaging the platelet structure, we have overcome some of the industry challenges in the process.

While compounding materials, the biggest cause of attrition to the platelet structure is exposure to shear during the various processing steps — Wetting, Dispersion, Distribution and Stabilisation. STEER has addressed each of these concerns while evolving a twin-screw extruder for

processing of special effect pigments. The understanding of these processing steps by our engineers is crucial for the overall industry.

With fractional lobed invention, STEER transformed the co-rotating twin-screw extruder into a 21st century fully self-cleaning Intelligent Compounding (IC) processor to work on materials using precise application of forces that smear, elongate, re-orient, compress or fold the material - kneading or stirring or shearing at specific zones of the processor. This resulted in a quantum jump in process capability (>10x) that allows process to be achieved in “fraction of a second” residence time.

Most of the technology available today does not account for some or all the following: Efficient mixing means; Control over shear and elimination of shear peaks; Stagnation and Degradation and the resulting char formation; Efficient energy transmission; issue of ‘leakage’ and subsequent damage due to shearing and the ability to work with low-bulk density or shear-sensitive materials. STEER platform technology takes care of all these aspects while producing brilliant effect pigment masterbatches without damaging the platelet structure.

Our technology now extends beyond processing polymers. The fractional lobed processor, the new IC Engine, creates necessary impetus for product development in pharmaceuticals, sustainable programs in bio-materials, advancement in polymer compounds and paints, unique processing conditions for food & beverage products ushering in a yet another IC revolution. For more information about Steer please visit: www.steerworld.com