# **Reliable plagiarism protection in the plastic matrix**

### **Special marking substances make originals counterfeit-proof, ensure product protection and prevent brand piracy**

Invisible product protection in the form of marking substances offers significantly increased counterfeit protection for original labels and thus effectively prevents brand piracy. GRAFE, headquartered in Blankenhain, Germany, has been active in this field for many years and works with various partners in the field of marking substances and measuring devices for detection in order to develop and offer the best possible solutions in cooperation with customers. This is because the demand for invisible marking of components with masterbatch and the corresponding testing technology for a wide variety of end applications in plastics processing is constantly increasing.  
  
To ensure product protection and prevent brand piracy, GRAFE has developed a simple and elegant solution that also offers a high level of security. The basis is special markers. "The highly complex pigments with special physical properties designed for this purpose are used in minute quantities within the plastic matrix. With an appropriately calibrated detector, products equipped with them can thus be read and authenticated," explains Business Development Manager Florian Ludwig. At the same time no changes in properties can usually be observed.  
  
"Almost all sectors are affected by plagiarism and product counterfeiting, resulting in high sales losses for manufacturers. Our goal is to make this more difficult by making it possible to determine directly on the end product whether it is an original or a copy," Ludwig reports. "Visible product protection is implemented with the help of labels or QR codes. These are quick and easy to integrate with a product. However, security is low because these features can be copied," the expert says. Since it is a visually recognizable feature, the difference between original and counterfeit is   
no longer recognizable at first glance, he said.  
  
In contrast, product protection in the form of marking substances is not as easily recognizable, he says. "Even though the effort required to implement it is greater, the advantages outweigh the disadvantages, because safety is significantly higher. The marking is checked via a measuring device," Ludwig explains, describing how it works: "An indicator substance is added during the manufacturing process. This addition can be added as a combi-batch, i.e. as a master batch in combination with a color, or as a special marking batch without color." The detectors can use an LED display to check within seconds whether the unique marker is contained in the product and whether this item is the original product.  
  
In general, there are two options: x ray and light fluorescence, i.e. fluorescent X-rays or light. With the first option, the base color has no influence (not even black) and the customer benefits from low addition dosage and batch price, but this method requires higher investment. "With light fluorescence, on the other hand, detection is done by a measuring device, which is preconfigured by our partner or by us directly. Different types are available, from handy hand-held measuring devices to stationary office solutions to inline spectrometers, in order to have a control take place directly during production," Ludwig explains. With this method, the masterbatch dosage is based on the base color, among other things. The method of operation is fast and simple, and the necessary investment is also manageable.  
  
"In addition to custom markers - depending on the end use and the product protection to be achieved, it may be necessary for the marker to be individually unique - we are seeing increased demand for general markers for identification, as these are already sufficient for many end uses," Ludwig reports.  
  
From injection molding and extrusion to transparent and fiber applications, almost all areas of plastics processing come into question, explains the Business Development Manager. However,   
not every component geometry can be detected equally well via every measuring device. "Therefore, the selection of the marker system and the suitable measuring device is made in close cooperation with our customers and suppliers," he assures.  
  
"The markers can only be detected chemically by very complex analytical methods. The structure and composition of the property profile required for detection can only be produced by the respective producer," says Ludwig. "Since no additional processing steps are required, the markers can either be part of a standard masterbatch finish or simply added as special marker masterbatches."

General information

**GRAFE**:

In addition to color and additive masterbatches, GRAFE's product range includes a broad range of functional plastic compounds. One of the largest research and development departments in the industry is working on the latest technologies that equip plastics with intelligent functions. The family business was founded in 1991 by the four Grafe brothers and today employs more than 300 people who develop and produce for the national and international market in the state of the art facilities in Blankenhain (Thuringia) in the middle of Germany. GRAFE attaches great importance to quality management - and with success. The company is successfully certified according to ISO 9001:2015, IATF 16949:2016 and ISO 50001:2018.   
For further information, please visit: www.grafe.com

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