# **GRAFE pushes ahead with development of injection-molded wax crayons**

### **Alternative manufacturing method poses major challenges, but offers all the more advantages**

The GRAFE company from Blankenhain is currently pushing ahead with a successful development project for color compounds for wax crayons. This allows the popular painting tools to be produced by injection molding. "What speaks in favor of this is that it is an automated process, which leads to a reduction in manual processing and thus enables higher quantities to be produced. These factors in turn have a positive effect on the cost structure," explains Business Development Manager Florian Ludwig.

During development, emphasis was also placed on ensuring that the crystallization behavior of the materials is as low in distortion as possible, so that no stress cracks occur even during the injection molding of voluminous geometries. In addition, smudge-free painting is ensured so that small and large hands remain clean. Washability from textiles and uniform rub-off behavior also play a not insignificant role. Since these are products for children, the challenges are demanding.   
  
"The pencils must be very safe and meet special requirements. EN71 for toys is just one of many standards which must be taken into account during development. This leads to a strong restriction in the selection of the ingredients used," says Ludwig. Here, GRAFE can score with its knowledge of the possible ingredients that can be used in this type of product. Added to this are many years of experience and the ability to produce wax compounds of a high quality. Ludwig: "These competencies make us an experienced project partner in development."   
  
"Because it is wax, the production process for the compounds is correspondingly challenging," the expert explains. Because the wax becomes liquid, the production of the compound is difficult, he says. However, thanks to years of development work involving a great deal of effort, the company has succeeded in overcoming these challenges. In the meantime, he said, even customer-specific colors are possible as part of development projects. "Compared to a normal color setting, the selection of permissible ingredients, as well as various preliminary tests with regard to customer-specific requirements, cause a disproportionately greater effort," reports the Business Development Manager.   
  
Wax crayons were already used in ancient Egypt. At that time, people mixed beeswax with natural color pigments to paint pictures on stones or papyrus. Even today crayons are still a popular   
writing and painting tool. A major reason for this is the high opacity of the wax crayons, which ensure bright colors on the paper. At Fakuma 2015, GRAFE had already presented specially developed color compounds for the production of of wax crayons via the injection molding   
process with a range of six main and six six secondary colors. Since then, the development   
has been driven forward with great effort.

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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