

AF-Color®

Masterbatches for diverse applications
of daily use



AF-COLOR

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 **AF-COLOR**
MASTERBATCHES

AF-COLOR – customer-focused masterbatch expertise within the corporate alliance of the Feddersen Group



AF-COLOR means high-quality engineering masterbatches. As a registered branch of AKRO-PLASTIC GmbH located in Niederrissen, we make use of the synergies from our compounding expertise in research, development and production technologies to create successful solutions which meet our customers' requirements.

Since 2003, AF-COLOR has been the specialist in masterbatch production within the international corporate alliance of the Feddersen Group.

In previous years, the company has continuously invested to expand and further develop environmentally friendly facilities in important divisions such as R&D, logistics and sales. We currently rank alongside renowned suppliers of high-end masterbatches and provide solutions to all industries, incorporating their varied requirement profiles thanks to our state-of-the-art production facilities. The standards we provide are in line with our DQS-certified processes. We are continuously adapting our production capacities to meet the increasing market demand.

Welcome to the colorful world of plastics

Color has become an indispensable part of the consumer goods market segment. It no longer serves only to differentiate, but also represents the

values and image of a brand. What is more, it stands for a certain level of quality, so that the coloration of an article also signifies a promise of

quality and function. "Form follows function": this design principle says that the function of a device takes precedence over the actual design.

Multi-talented masterbatch

In addition to coloration, material properties are also of great importance, e.g. to achieve a certain mechanical strength. UV exposure has a damaging effect on all polymer materials over a certain period of time, so that these mechanical properties can be lost. Additional stabilisers are therefore necessary (e.g. UV absorbers), which can be added together with the coloring components of a masterbatch formulation – in this case we speak of a combi-masterbatch (combination of color and additive).

Every color difference in the numerous injection-moulded parts, once aggregated into a single unit, becomes visible on the finished component. In addition to a highly trained eye, a standardised measurement methodology is therefore also required, allowing even the smallest color differences to be rectified.

The metric commonly used here is the CIELab reflectance measurement, which analyses the spectral components of the light type used (D65, TL84, A10) as they are reflected by the component.



All plastic products are subject to ageing processes. These can be slowed down by the use of additives. The photos show the phenomenon of ageing on a flower pot made of PP (so-called chalking).

The conversion is carried out according to a calculation model that is aimed at imitating the human eye to the best possible approximation. The resulting values L, a and b form a three-dimensional body, the so-called color space, in which all possible colors are located, depending on the "coordinates" formed from these values.

Appliances – white goods

However, color can also constitute a specific requirement for the end use, as in the area of household appliances for example (washing machines and refrigerators), where the color white symbolises purity and hygiene.



Power Tools – strong colors for powerful applications

Power tools include all types of electrically driven tools, for the do-it-yourselfer as well as for the professional user. Protection against electricity (dielectric strength), mechanical strength and thermal stability are the essential requirements. These requirements for the properties of the polymer must not

be changed or reduced by coloring with a masterbatch. AF-COLOR offers color and additive concentrates which fulfil these necessary properties. In addition, we offer a range of suitable polymers through our parent company AKRO-PLASTIC GmbH. Most of the materials used in the "power tools" plastic applica-

tion are PA 6.6 grades that are impact-modified and filled with glass fibre.

We work in a solution-oriented manner and are only satisfied when all functionalities of your component are guaranteed – far beyond the mere coloration.

Automotive

The automotive industry places the highest demands on masterbatch manufacturers in terms of color accuracy and delivery consistency.

If an automotive supplier produces components directly at the injection moulding machine using masterbatch and natural material, the supplier is responsible for complying with the corresponding and very strict tolerances.

Compared to the classic use of pre-dyed compounds, this means that the processor bears a greater responsibility. On the other hand, the advantages, such as lower fixed cost and optimised warehousing, offer greater flexibility in purchasing as well as in scheduling and logistics.



Flexibility is particularly advantageous where, for example, large quantities of a natural material can be

purchased, if necessary as silo product, and where corresponding price advantages can be achieved.

Toys – high standards for children's health

Every toy manufacturer has a duty to eliminate any risk potential with regard to the possible health risks. This applies equally to all raw materials used: Every formulation ingredient of a masterbatch must also comply with DIN EN 71-3 for infants under 3 years of age. This standard

excludes the possibility of volatile substances entering the child's metabolism through the action of saliva. For the masterbatch manufacturer, this means compliance with certain due diligence requirements, which must be reported to the product manufacturer on the basis

of appropriate material certifications. AF-COLOR is ideally equipped to meet these requirements.

A well-trained eye

When customers contact us with a request for a new color setting, the requirement criteria are usually already fixed: Often, a certain color objective has to be realised in different polymers. This presents our colorists with the challenge of finding the suitable pigment or dye from a very limited colorant portfolio.

Special attention must be paid to temperature stability in injection moulding applications: It is not unusual for an injection-moulded component to be manufactured in a hot runner mould. If, for example, PA 6.6 GF 30 is used, melting points > 320 °C are reached for a short time.

Many pigments already lose their properties at 260 to 280 °C. The higher the requirements, the more limited the number of colorants available. The fact that the desired color objective is nevertheless achieved is due to the expertise of our colorists, who face these challenges on a daily basis.

Guaranteed quality – A question of high standards

It goes without saying that our trained and experienced employees in quality control are only provided with working equipment of the latest standards. Based on the quality criteria agreed with our customers, we comprehensively test all products before they leave our factory.

Proper documentation is provided with our deliveries on the basis of our inspection certificates (IC).



Our catalogue of services

A special masterbatch formulation is used to transform a color design into different formulations for various plastic grades. Often, other polymers to which the respective

color series is to be adapted are used in the later implementation phase. In such cases, flexibility and fast feedback are required. AF-COLOR has broad expertise in

a wide range of polymer grades and the required masterbatch carrier systems. In this way, we can guarantee you speedy implementation.

Support during the introduction of the masterbatch into the production process

Every manufacturing process has a certain influence on the color result. In most cases, this circumstance can be countered by adjusting the machine parameters. If color matching

becomes necessary nevertheless, it may make sense to carry it out directly in the production line, for example on the customer's injection moulding machine on site. The

formulation is tested here in various polymers for migration, temperature stability and metamerism.

Metamerism

Not all colorants are suitable for every grade of polymer. When adapting a color design to a particular grade of plastic, the color result has to be achieved using alternative colorants. In general, a color objective

can be achieved in many different ways, i.e. by using different colorants. However, this results in so-called metamerism effects, where the perceived color differs depending on the incident light source.

Usually, a solution can be found, but this demands great skill of the colorist. We are happy to provide you with our service package to solve these individual challenges.

Temperature stability

We can check the temperature stability for you in advance as part of a thermal stress test. In our data sheets, we also give you corresponding processing recommendations. Please note that the processing method has a decisive influence on this aspect. The temperature settings on the production line, and also the geometry of the component, are decisive.

Migration

Unlike pigments, dyes can migrate (i.e. bleed) because they dissolve in the polymer. This migration should therefore be subject to prior testing.

Please also note our disclaimer.



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