

AF-Complex[®] TM

Foamed plastics made easy



AF-COLOR

Branch of AKRO-PLASTIC GmbH

Industriegebiet Scheid 27

56651 Niederzissen

Germany

Phone: +49(0)2636-8092-0

Fax: +49(0)2636-8092-31

info@af-color.com

www.af-color.com

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 **AF-COLOR**
MASTERBATCHES

AF-Complex[®] TM – Ease in plastics production and Processing

Chemical blowing agents are used to create foam structures in plastics. They contain substances which react under the conditions of the



Structured surfaces like fur or other naturally appearances can be obtained with AF-Complex[®] EBA 990164 TM natural in several polymers.

processing method, thereby forming harmless gaseous products such as carbon dioxide and water vapour, which dissolve and thereby are distributed homogeneously in the polymer melt. As the pressure decreases during processing, the polymer expands and forms a cellular foam structure.

Combined with the necessary additives, blowing agent masterbatches provide the significant benefit of a dust-free ready-to-use solution, optimised for the respective purpose and process. This system provides a simple way to achieve your individual goals.



Large-volume industrial container with foamed inner and middle layer (PEHD with 1 % AF-Complex[®] PE 990400 TM).

Advantages:

By creating a suitable foam structure adapted to the component demands, winning advantages can be obtained in the process and the component alike.

This reduces:

- Component weight
- Cycle time
- Shrinkage
- Sink marks
- Holding pressure
- Warpage

While also realising:

- Greater stiffness per weight unit
- Thermal and acoustic insulation
- Improved dimensional stability
- Optimised flowability
- Decorative effects
- Foam nucleation for optimisation of physical foaming

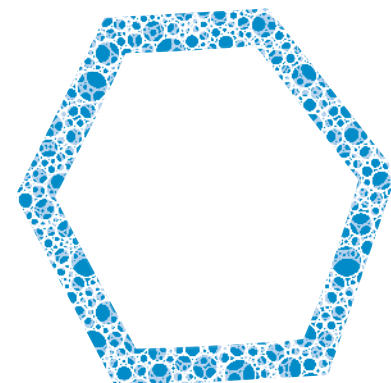
Foamable polymers:

- PE
- PP
- PA 6, PA 6.6
- PS
- ABS
- PET
- PLA
- PVC
- Biopolymers on request

Following consultation and previous testing, PU, TPU, PMMA and PC can also be foamed.

Carrier materials

The carrier materials used are matched for maximum compatibility in the base polymer for the application.



Product	Content	Min. process temp.	Application	Dosing	Application examples
PE 990199 TM natur	7 %	180 °C	Injection moulding	1–2 %	Against sink marks and warpage
PE 990477 TM natur*	20 %	180 °C	Injection moulding and Extrusion	0,5–3 %	Homogeneous, fine-cell foam structure, also for foils and tapes
PE 990219 TM natur*	70 %	180 °C	Injection moulding and Extrusion	0,5–5 %	Effective blowing agent / structural foams with fine cell size
PE 990400 TM natur*	30 %	180 °C	Extrusion	1–2 %	Extrusion of thick-walled profiles and plates
PE 990300 TM natur*	40 %	180 °C	Injection moulding and Extrusion	0,5–2 %	Structural foam in IM and profile extrusion
PE 990828 TM natur*	40 %	180 °C	Injection moulding	0,5–2 %	Structural foam in injection moulding and profile extrusion (FDA compliant)
PA 990813 TM natur*	30 %	180 °C	Injection moulding	1–4 %	fine-cell foam structure, weight and material savings and reduction of warpage and sink marks
EBA 990209 TM natur*	20 %	180 °C	Injection moulding and Extrusion	0,5–2 %	against sink marks in injection moulding and produce surface structures in profile extrusion

*for these products, we recommend high-alloyed mould steels

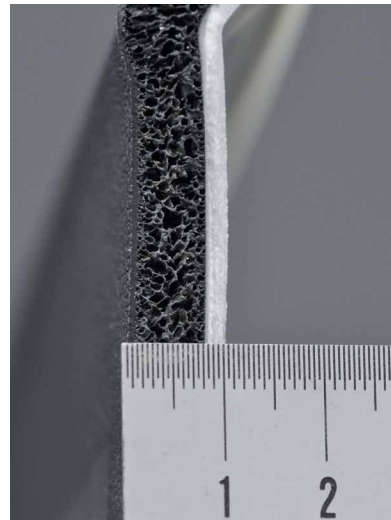
Disclaimer: All specifications and information given in this brochure are based on our current knowledge and experience. A legally binding promise of certain characteristics or suitability for a concrete individual case cannot be derived from this information. The information supplied here is not intended to release processors and users from the responsibility of carrying out their own tests and inspections in each concrete individual case. AKROMID[®], AKROLEN[®], AKROLOY[®], AKROTEK[®], PRECITE[®], AF-Carbon[®], AF-Color[®], AF-Complex[®], AF-Clean[®], ICX[®], BIO-FED[®], M-VERA[®] and AF-Eco[®] and are registered or applied trademarks of the Feddersen Group.

Processing and applications

AF-Complex® TM blowing agent batches are optimised for both injection moulding and extrusion applications.

Injection moulding

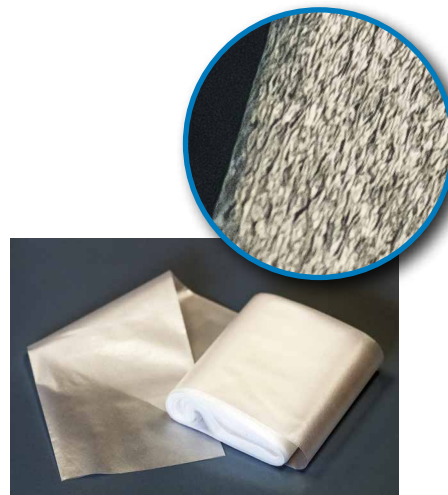
- Structural foam in mouldings with a closed surface and foamed core enable weight reductions of 3 % to 8 % in thin-walled applications. In thick-walled mouldings, cost-effective weight savings of up to 35 % can be achieved.
- The AF-Complex® TM range offers special blowing agent systems for generating microcellular foams and optimising surfaces, while taking into account strict requirements with regard to mechanical properties.
- With the optimised formulation of the AF-Complex® TM range and the resulting reduction in sink marks, warpage, shrinkage and cycle times, thin-walled components can also be realised by minimising the holding pressure and reducing the viscosity.
- In physical foams, a foam nucleator serves to increase the cell density, thereby improving the surface. Surface effects such as an animal skin appearance or natural looking wood or stone structures can also be created.



Example of structural foam injection moulding: By adding 2 % AF-Complex® PE 990300 TM, the PP copolymer expands by 700 %. This creates a soft surface.

Extrusion

- Blowing agent masterbatches are used to save weight or create visual effects, such as a pearlescent effect in biaxially orientated flat-film PP strips.
- The use of AF-Complex® PP 990303 TM for manufacturing orientated strips reduces splicing.
- A wide range of optimisations can be achieved in profile extrusion: weight savings, increased productivity, improvement of insulation properties, optimisation of damping behaviour.
- In hollow body mono-layer and multiple-layer extrudates, blowing agent masterbatches can be used to save weight as well as to increase the stiffness per weight unit ratio.
- In film extrusion, blowing agent masterbatches also help with weight reduction. An improvement in the insulation properties and the stiffness to weight unit ratio is also possible. In orientated applications, visual effects such as pearlescence can also be obtained.
- Thermoforming films and blown films can also be foamed, resulting in density reductions of up to 50 % and significantly increased thermal insulation properties.



Foam film with microcellular structure [LDPE with 2 % AF-Complex® PE 990427 TM 80 µm, density: < 0.5 g/cm³]

Detailed information on the application and processing of AF-Complex® is available from our application engineers. We would also be happy to send you our technical data sheets for further information.

AF-COLOR – Think masterbatch

AF-COLOR means high-quality technical masterbatches. As a registered branch of AKRO-PLASTIC GmbH at our Niederrissen site, we use the synergies created through combined expertise in compounding, research, development and production technologies to expertly transform our customers' requirements into solutions. AF-COLOR has been a member of the international corporate combine of the Feddersen Group since 2004.

In previous years, we have continuously invested in the expansion and further development of environment friendly production facilities and in the important divisions of R&D, logistics and sales. That is why, we, with our state-of-the-art production facilities, rank today among the most renowned providers of high value color, carbon black and additive masterbatches for the global market and the most varied customer requirements. We meet the required standards with our DQS certified processes (DIN ISO 9001, DIN ISO 14001, DIN ISO 18001 and DIN ISO 50001).



Production made easy with AF-Complex® TM

Whether for weight reduction, surface quality improvement or process optimisation – for every requirement, our AF-Complex® TM line of blowing agents has the right product for your application. Beyond the typical market offering, we provide new developments which deliver above-average performance, particularly for hydrolysis-sensitive engineering polymers, for instance. These also unlock entirely new approaches for producing microcellular foam films or enable the foaming of bioplastics. Every formulation has been developed and tested in and for the end applications.

