



GRAFT POLYMER
COMBINE INCOMPATIBLE

**BLOCK-COPOLYMER
GRAFTAKIT SMA**

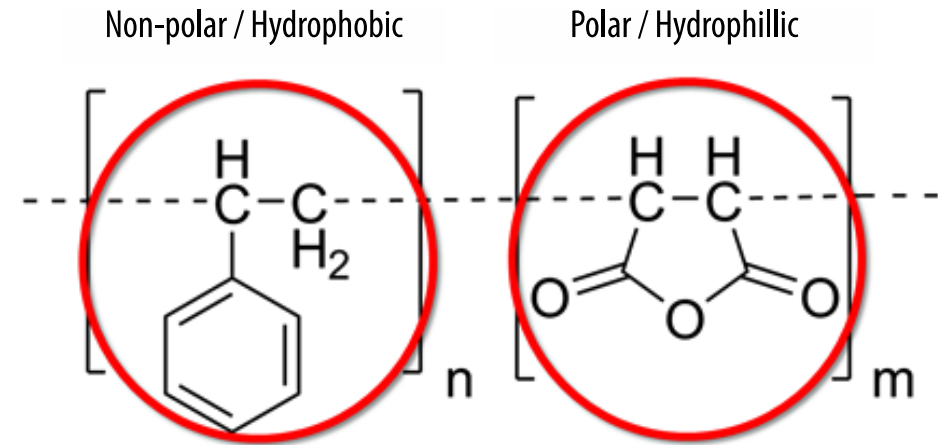
2021

INTRODUCTION

GRAFTAKIT SMA copolymers are block-copolymers consisting of styrene and maleic anhydride.

These products have varying maleic anhydride content and molecular weight with a high glass transition temperature (T_g) (100 to 165°C). GRAFTAKIT SMA is highly appreciated in many markets due to the combination of the properties of styrene and maleic anhydride.

GRAFTAKIT SMA-20, SMA-40 are available in granules.

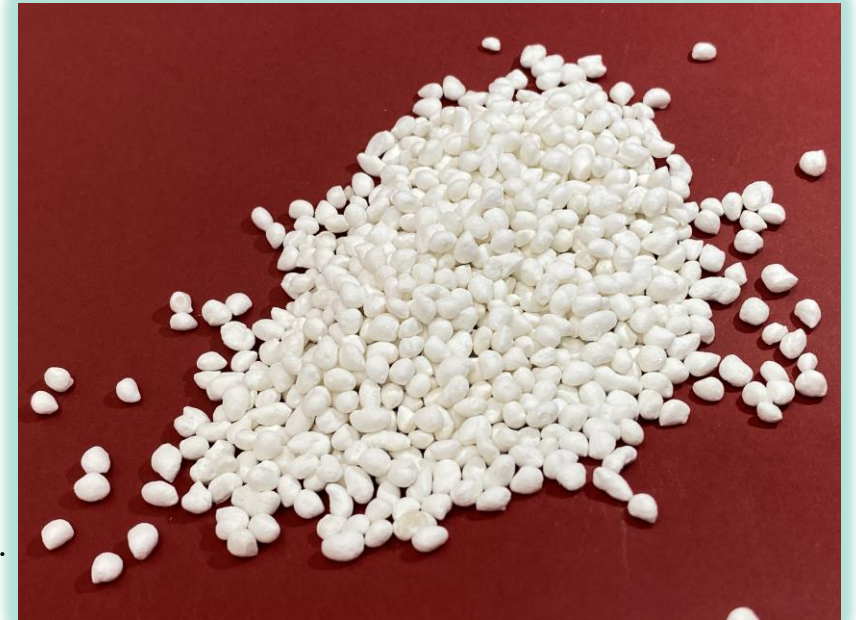


SMA is intrinsically non water soluble, however it can be hydrolysed in caustic solutions. It can also be reacted with alcohols and amines, resulting in esterification, amidification and imidisation reactions. These reactions add functionalities to the copolymer as its properties such as solubility, HLB value (hydrophile-lipophile balance) and glass transition temperature (T_g) are modified.

GRAFTAKIT SMA CHARACTERISTICS

GRAFTAKIT SMA base resins are characterized by:

- ✓ high glass transition temperatures and softening points;
- ✓ high thermal stability;
- ✓ extremely low VOC content;
- ✓ high melt viscosities;
- ✓ high solubility in a number of organic solvents;
- ✓ ability to form low viscosity aqueous alkali salt solutions at basic pH.



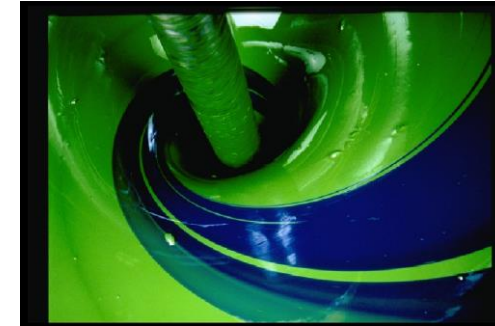
The anhydride functionality in GRAFTAKIT SMA base resins is much less reactive towards atmospheric moisture up-take and hydrolysis than is a typical non-polymeric anhydride.

CURRENT APPLICATIONS OF GRAFTAKIT SMA

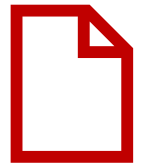
GRAFTAKIT SMA products are used in diverse applications:

- paper sizing;
- powder coating;
- pigment dispersions;
- inks;
- overprint varnishes;
- leather retanning;
- microelectronics fabrication and processing;
- carpet/textile cleaners;
- floor care products.

GRAFTAKIT SMA resins can function as **polymeric surfactants** in dispersing and emulsifying applications, as **high functionality cross-linking agents**, or as **chemical intermediates** in the production of specialty polymers.



PROPERTIES OF GRAFTAKIT SMA



Application	Property
Overprint Varnishes, Ink	Heat Resistance
	Adhesion To Polymer Films
	Viscosity Stability
Powder Coatings	Matting Agent
Paper making, Surface Sizing	Water Resistance
Paper Making – Wet End, Paper Coatings for Ink Jet	Stability in Cationic Systems
Waterborne Ink, Paint Pigment Dispersion	Dispersion Stability, Color Development, Low Viscosity
	Cationic Systems
	Carbon Black
	Metallics
Solvent Borne Ink, Paint Pigment Dispersion	Dispersion Stability, Color Development, Low Viscosity
Latex gloves – flame retardant/antioxidant dispersant	Stability of divalent ion containing fillers (calcium, magnesium)
Emulsion Polymerization	Particle size control and stability, heat resistance
Carpet Treatment/Shampoos	Stain/water resistance
Wax/Floor Polish	Coating Leveling
Printed Wiring Boards	Improved Dielectric Properties, Heat resistance
Wax Emulsions	Hydrophobicity, Particle size control and stability
Leather Tanning	Divalent cation stability

USAGE OF GRAFTAKIT SMA

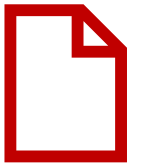
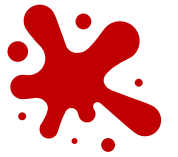
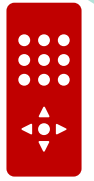
Typical applications of SMA copolymers:

- ✓ In the building and construction industry are as **thermo-setting binder systems** in insulation and glass fiber mats for non-woven applications;
- ✓ In the electronics industry, they are used as **cross-linking agents in epoxy systems** in copper clad laminates for printed circuit boards;
- ✓ SMA copolymers are also used in bottle labelling applications due to their **ability to improve ice-water resistance** while increasing alkaline removability.

SMA copolymers are used as dispersants for organic, inorganic pigments and fillers, as well as superplasticisers in concrete, because they can **provide superior dispersion stability and reduced viscosity**.

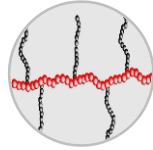
Moreover, they are also used as **polymeric dispersing agents in emulsion polymerisation** or as post-stabilisers for polymer dispersions/emulsions. As a polymer, SMA is REACH exempt.

Furthermore, SMA co-polymers can be used as **polymeric dispersing agent for wax emulsions**. Hence, it can be used for dispersing paraffin wax emulsions in gypsum boards.



BUSINESS MODEL: INNOVATIONS

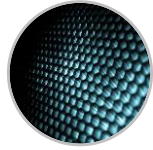
GRAFT / BLOCK POLYMERS



POLYMERIC NANO ALLOYS



CROSSLINKING



POROUS



SYNTHESIS



INNOVATIVE TECHNOLOGIES

- Flow induced crystallization
- Solid Phase Grafting
- Solution Grafting
- Fillers Treatments
- Powders Hybridization
- Hot ozonolysis/plasma modification
- Nitroxide Mediated Polymerization
- Micro/Nano Porous polymer carries

To support its unique modification technologies, GP has built the **R&D** center including **Laboratory** and **Synthesis facilities**



GRAFT POLYMER
COMBINE INCOMPATIBLE

Contact information

Anjeza Kuhar | Sales Manager
English / Italian / Albanian
Phone: +386 40 380 668
anjeza.kuhar(at)graftpolymer.com

Pavel Kobzev | English / Hebrew
Business Development & Sales Director
Phone: +386 40 867 937
Pavel(at)graftpolymer.com

Ekaterina Kulevskaia | Sales Manager
English / Russian / Slovenian
Phone: :+386 31 399 366
ekaterina(at)graftpolymer.com

www.graftpolymer.com

[Info\(at\)graftpolymer.com](mailto:Info(at)graftpolymer.com)