

High-Performance Polymers in Plastic-Rubber Composites

Evonik manufactures a line of compounds specially modified for the production of adhesion promoter-free plastic-rubber composites. These are

- Polyamide 612 compounds VESTAMID®
- Polyphthalamide compounds VESTAMID® HT *plus*
- Blends with other polyamides TROGAMID®
- Polyphenylene ether compounds VESTORAN®

Hard-soft composites

Wherever rubber components must be fastened or fixed, composites consisting of a hard component and an elastomer perform well. They represent an important sector of the rubber industry. Such composites are found in a wide variety of applications, for example, as shock-absorbing bearings in the chassis of motor vehicles, buffers or reinforced seals in engines and machines.

Traditionally, hard components consisted of metal composites. To reduce weight, particularly in vehicles, more and more metal components are being replaced by suitable plastic parts wherever possible. This has two additional advantages: Plastics do not corrode and can be efficiently processed into very complex moldings by injection molding. However, they must be dimensionally stable at the usual vulcanization temperatures of 160–190°C. The manufacture of such complex parts from metal is very expensive. The use of plastics in the design of complex components provides the designer and component developer with much greater latitude.

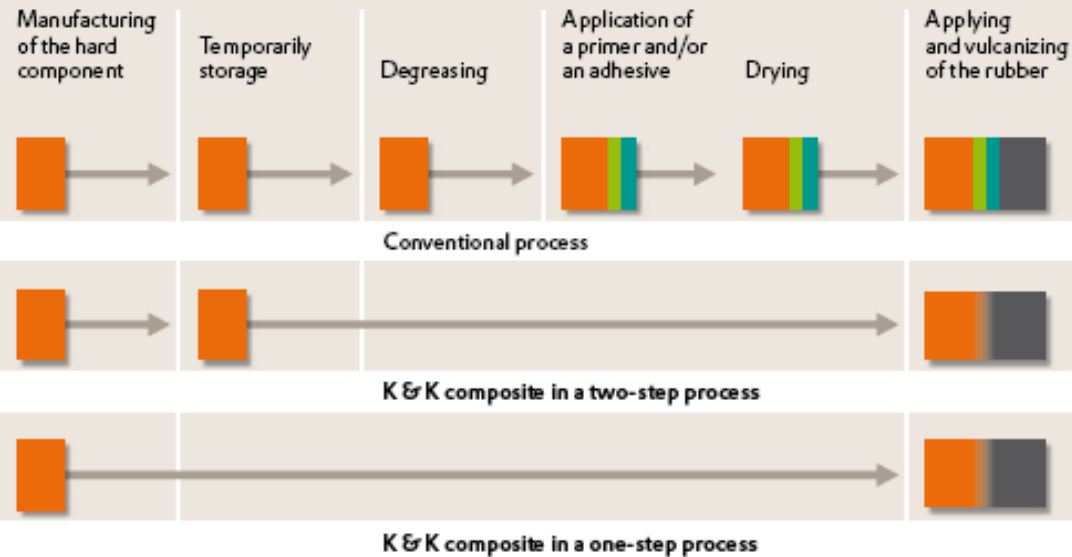


For the long-term function of composites, particularly under dynamic stress, the adhesion between the hard component and the soft component of the composite is an important criterion. It is usually achieved by adhesion promoters. Combinations of all standard rubber types with most metals and simple plastics are possible. Besides additional process steps for applying the adhesion promoter, protective measures against emissions of the usual solvents and their environmentally correct disposal are required.

Adhesion without Adhesion Promoters

By contrast, the plastic-rubber composite patented by Evonik obviates adhesion promoters. Stable, permanent bonds to suitable rubber blends can be produced without special pre-treatment using the specialty compounds.

Comparison of the conventional and the K & K process for manufacturing plastic-rubber composites



Combination possibilities of plastic-rubber composites

Rubber	VESTORAN® (PPE) Plastic	VESTAMID® (PA 612) Plastic	TROGAMID® (PA blends) Plastic	VESTAMID® HTplus (PPA) Plastic
SBR	S	–	–	–
NR/SBR	S	–	–	–
SBR/EPDM	S	–	–	–
SBR/NBR	S	–	–	–
EPDM	P	P new	(P)	P*
XNBR	–	P	P	–
HNBR	–	P	P	P
EAM	–	A	A	*
FPM	–	BIS/P/A	BIS/P/A	P/BIS*/A*

S – Sulphur, P – Peroxide, A – Amine, BIS – Bisphenol, * under evaluation

® = registered trademark

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