KANEKA BELGIUM NV

The Dreamology Company
—Make your dreams come true—

Acryl modified MS Polymer™

A true problem solver

Introduction

Kaneka MS Polymer™
Your Premium Polymer of Choice!

As a pioneer, Kaneka launched the silane terminated polyether's (STPEs) technology about 40 years ago. The first Kaneka MS Polymer™ grades were launched to be used as highly elastic low modulus sealants. The shortcomings of the existing silicone and polyurethane sealants, made the market longing for a new innovative technology. The high elasticity, paintability and good UV-resistance made MS Polymer™ a success story in Japan and far beyond.

Acryl modified MS Polymer™
A true problem solver!

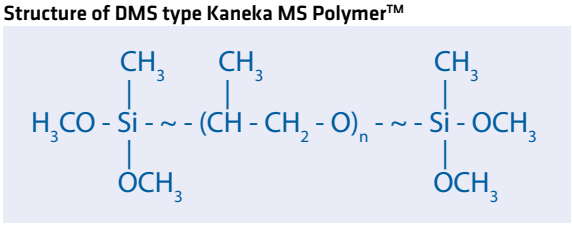
In 1986 Kaneka launched the first acryl modified MS Polymer™ grades on the market and remains until today the exclusive producer of this technology. Kaneka's continuous drive to innovate has led to nine different acryl modified MS Polymer™ grades for various sealant, adhesive and coating applications. Nevertheless, more unique grades are to be expected in the coming years!

Chemistry

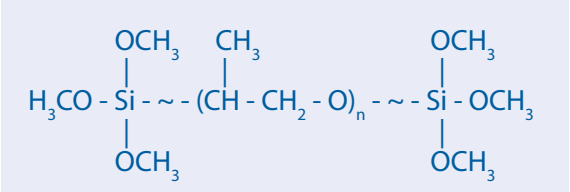
MS Polymer™ grades consist of a polyether backbone, which can be dimethoxysilyl (DMS) or trimethoxysilyl (TMS) functionalised. The majority of the Kaneka MS Polymer™ portfolio is based on this pure silane terminated polyether technology.

In 1986 the first acryl modified MS Polymer™ was added to the MS Polymer™ portfolio. By combining randomly silane functionalized acrylic polymers with silane terminated polyether polymers, the compatibility and glass transition temperature can be controlled, resulting in unique properties. For sealant, adhesive and coating applications these acrylic modified MS Polymer™ grades can be considered as solution providers or problem solvers.

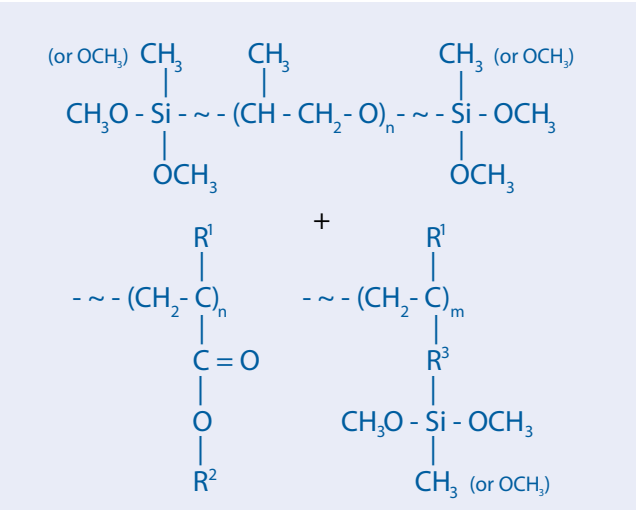
Structure of DMS type Kaneka MS Polymer™



Structure of TMS type Kaneka MS Polymer™



Structure of acrylic modified type Kaneka MS Polymer™



Benefits

The acryl modified MS Polymer™ portfolio comprises nine different grades, which can be divided into two classes: the DMS acryl modified MS Polymer™ and the TMS acryl modified MS Polymer™. Each class contains polymers for both sealant and adhesive applications. While the sealant grades are highly elastic and provide superior UV resistance, the adhesive grades enable the formulation of higher strength adhesives with an excellent adhesion profile.

Sealant application

For sealant applications the acryl modified MS Polymer™ grades combine an excellent elasticity with a superior UV resistance. On top, the adhesion profile can be broadened significantly. The acryl modified MS Polymer™ grades are the preferred choice for sealants with an outstanding UV resistance.

Adhesive application

The acryl modified MS Polymer™ grades developed for adhesive applications combine an excellent adhesion profile with outstanding mechanical performance. On top, the adhesion to various plastic materials is first class, making the acryl modified MS Polymer™ range the perfect solution for high demanding industrial, transportation, DIY and construction applications.

KANEKA MS POLYMER™

Applications

Luxury vinyl tile (LVT) floors adhesive

Besides the wood or ceramic systems, nowadays vinyl flooring is gaining great interest. Such vinyl floors combine a huge variety of designs, durability and a soft/warm feel at an interesting cost.

While the vinyl floor market is growing significantly, also the demand for robust adhesives is gaining interest year by year. The latter is necessary for bonding these vinyl floors in harsh conditions like wet rooms or on floor heating/cooling systems. On top, the commonly used processing aids or additives in these vinyl floor elements can be another hurdle to take as adhesive supplier.

Adhesives based on Kaneka's acryl modified MS Polymer™ are considered as real problem solvers in these demanding applications. A broad adhesion profile with exceptional peel strength to various vinyl floor systems make them the perfect alternative for one-component and two-component polyurethane-based adhesives and the more common acrylic dispersions.

Figure 1 T-Peel sample of an LVT bonded on plywood

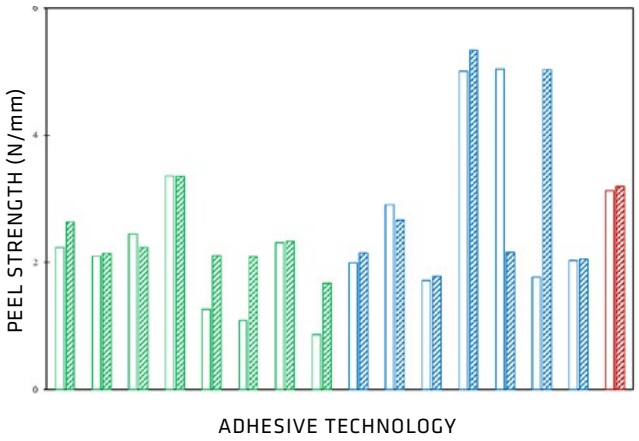


Figure 2 T-Peel values according to EN 1372 for acrylic dispersion (green), MS Polymer™ based (blue) and a two-component polyurethane system (red), after 28 days and 49 days conditioning

Applications

High strength elastic adhesive for industrial applications

The drive towards a greener economy has great impact on our industrial processes and thereby manufactured goods. Combined with the urge for durable and ecological resources, make the next generation in the industrial revolution extremely challenging.

One example is the automotive industry, in which the traditional materials have been shifted towards plastics and composite materials. These alternatives for metals are more durable and allow the manufacturing of light weighted cars, which can cut CO2 emissions. These novel concepts require a higher level of engineering and traditional bonding techniques like welding or riveting are being replaced. Joining the composites, plastics and metals with adhesives on the other hand is the future. High strength elastic adhesives, which adhere excellently to various substrates and allow the final assembly to move or vibrate without generating local stresses, are the only way forward. The challenges for most adhesive technologies will be the variety of materials available and the combination of a high strength with a proper elasticity.
Kaneka's acryl modified MS Polymer™ can be part of this next industrial revolution, by combining a broad adhesion profile with an excellent mechanical performance for high-end applications.

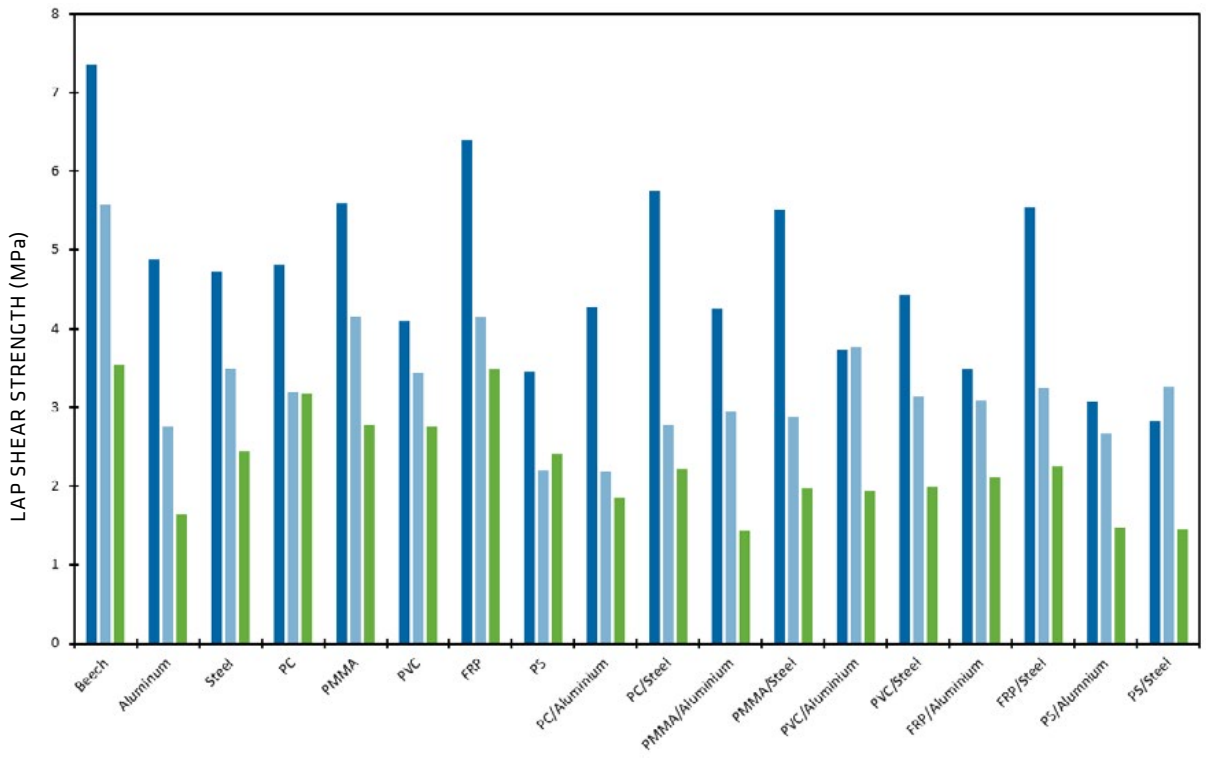


Figure 3 Lap shear strength values of two different acryl modified MS Polymer™ based adhesives (blue) and a standard MS Polymer™ based adhesive (green) on beech, aluminium, steel, polycarbonate (PC), polymethylmethacrylate (PMMA), polyvinylchloride (PVC), fibre reinforced plastic (FRP), polystyrene (PS) and combinations thereof.

Applications

High weather resistant sealant

While standard MS Polymer™ grades are abundantly being used for façade sealants or other weather exposed applications, some more demanding application might need an upgrade in weather resistance. The acryl modified MS Polymer™ technology enables the formulation of highly durable sealants for the more demanding applications.

In the figure below, you can consult the relative exposure data for standard MS Polymer™ and acryl modified MS Polymer™ grades. While the established standard MS Polymer™ grades outclass the polyurethanes, the acryl modified MS Polymer™ grades resemble the performance of silicones.

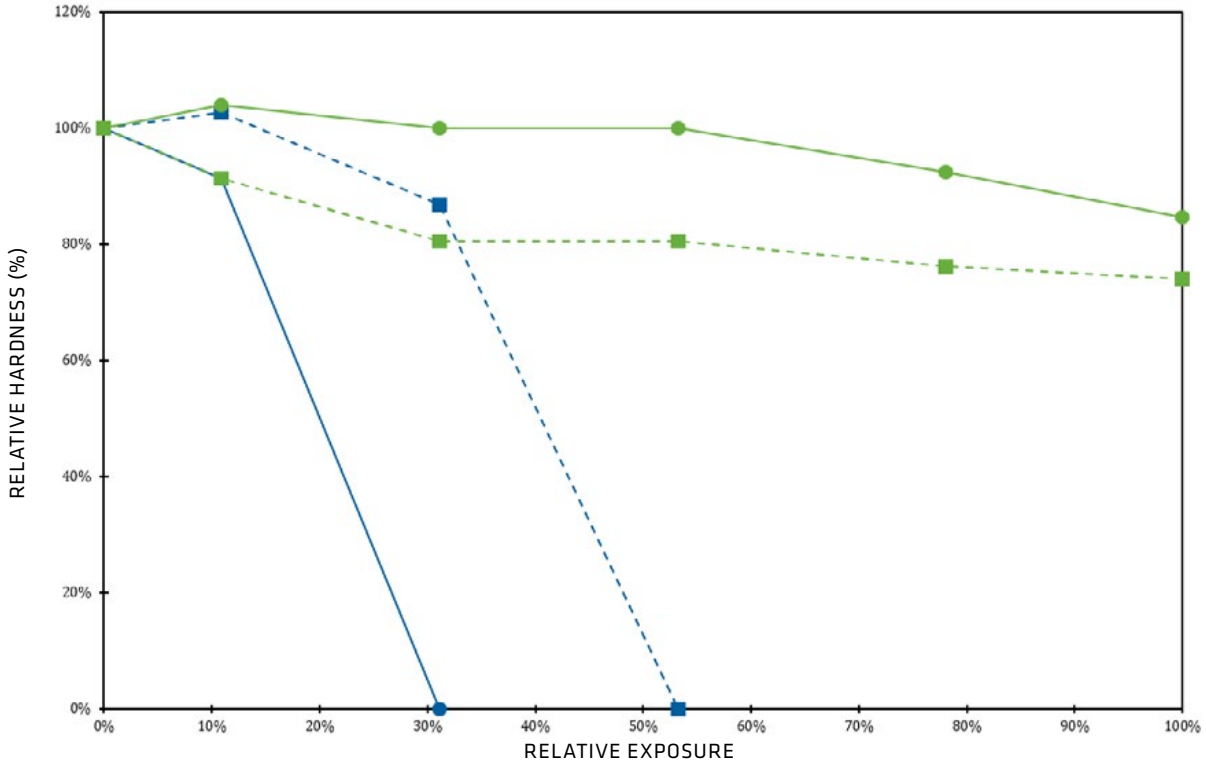


Figure 4 The relative hardness decay as a function of the relative exposure in a Xenon-arc weather-o-meter for Dimethoxysilyl MS Polymer™ (●), Trimethoxysilyl MS Polymer™ (■), Dimethoxysilyl acryl modified MS Polymer™ (●) and Trimethoxysilyl acryl modified MS Polymer™ (■)

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