

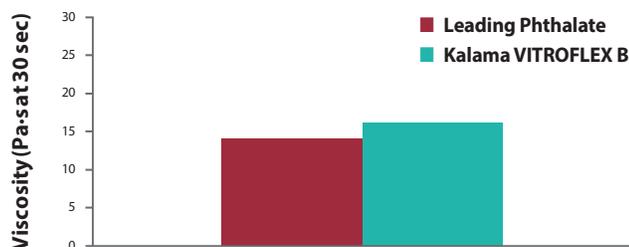


## Kalama® VITROFLEX® Plasticizers for Polysulfide Sealants

Kalama VITROFLEX non-phthalate, benzoate plasticizers have **excellent safety and regulatory profiles** for polysulfides. They enable formulators to eliminate plasticizers facing scrutiny and regulatory pressure, such as benzyl phthalate and chlorinated paraffins. Because Kalama VITROFLEX Plasticizers have been expressly designed for polysulfides, they also offer excellent **performance characteristics, compatibility, and value** in this application.

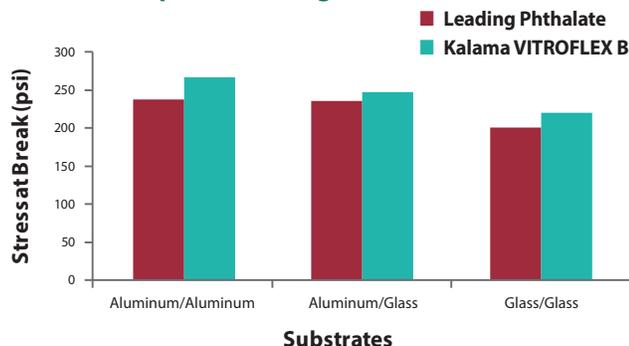
Polysulfide sealants provide high elasticity, adhesion, solvent resistance, and weathering resistance, which are valuable characteristics in end uses such as insulated glass seals, construction, transportation, and secondary containment. They can be formulated to pass the most stringent performance requirements.

### High Viscosity Stability Equivalent to Phthalates



Both components of a polysulfide system must have similar viscosities for even mixing. B-side polysulfide sealant formulations with Kalama VITROFLEX B exhibit high viscosity stability and show no signs of settling.

### Increased Lap Shear Strength



Replacing a phthalate plasticizer with Kalama VITROFLEX B in the B-side resulted in cohesive failure and improved lap shear stress at break, demonstrating good adhesion to substrates such as aluminum and glass.

Emerald® offers solutions for both the “A” (polymer) and “B” (catalyst) sides of two-part polysulfide sealants. These products are **manufactured in Europe**, offering an excellent supply chain to serve EMEA customers.

### Kalama® VITROFLEX® A90

Kalama VITROFLEX A90 is tailored for the A-side of polysulfide sealants, where it provides **exceptional permanence and low migration**. These properties are critical to ensure **low fogging** in insulated glass, the largest application for polysulfide sealants.

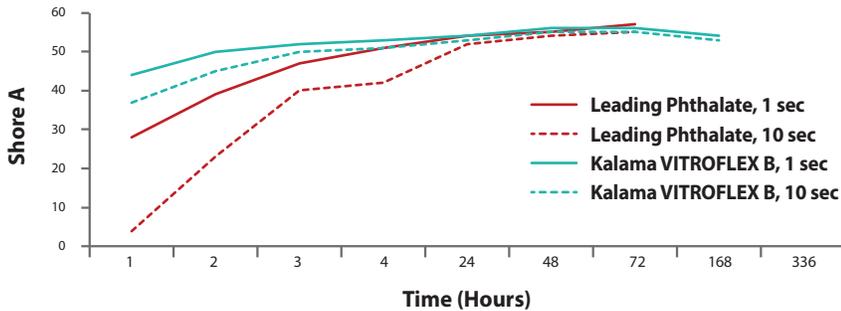
### Kalama® VITROFLEX® A99

Kalama VITROFLEX A99 is a high-value offering for the A-side of polysulfide sealants. It offers similar benefits to VITROFLEX A90, but also maximizes purity to meet the highest performance requirements, such as exceptionally **low odor**.

### Kalama® VITROFLEX® B

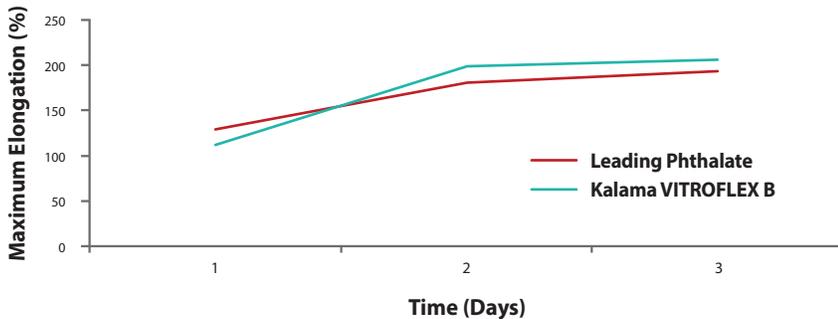
Kalama VITROFLEX B enables formulators to achieve desirable characteristics in the B-side of polysulfide sealants. These include: faster **hardness** development, improved **lap shear strength**, excellent flexibility and **adhesion, non-settling** (high viscosity stabilization), and equivalent **pot life** to other common plasticizers.

## Faster Hardness Development



Kalama® VITROFLEX® B plasticizer contributes to faster cure rates in B-side polysulfide formulations.

## Excellent Flexibility (ASTM D412 Elongation Method)



B-side polysulfide formulations with Kalama VITROFLEX B plasticizer maintain excellent adhesion while providing flexibility for tailored performance in insulated window sealant applications.

**Emerald Kalama Chemical** is a business group of Emerald Performance Materials and a leading global producer of benzoic acid, benzaldehyde, and other chemistries, shipping over 500 million pounds annually to approximately 75 countries. Emerald's manufacturing operations in the U.S. and Europe meet the highest industry standards and use schemes certified under ISO 9001:2015 and ISO 14001:2015.

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Kalama VITROFLEX is a registered trademark of Emerald Kalama Chemical, LLC for its line of benzoate plasticizers. It is not associated with Viking Chemical, ARKEMA, or the VIKOFLEX product line.

EMERALD KALAMA  
**VITROFLEX®**  
Plasticizers for Polysulfides

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