

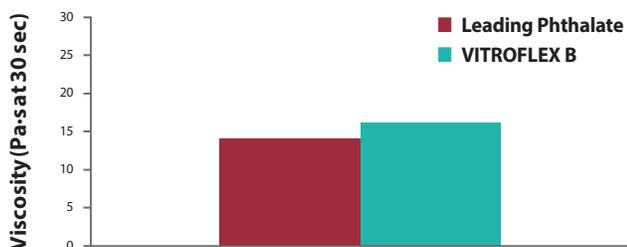


Kalama® VITROFLEX® Plasticisers for Polysulphide Sealants

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

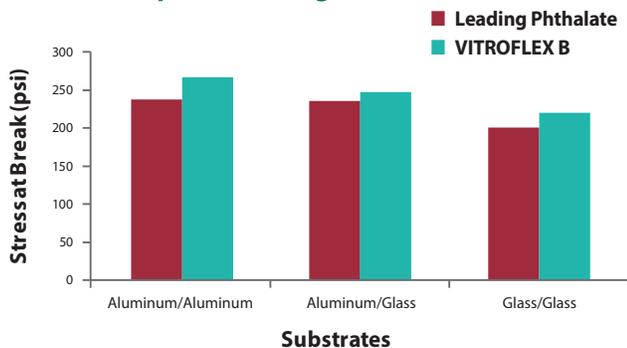
Polysulphide sealants provide high elasticity, adhesion, solvent resistance, and weathering resistance, which are valuable characteristics in end uses such as insulated glass seals, construction, transportation, and secondary containment. They can be formulated to pass the most stringent performance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

High Viscosity Stability Equivalent to Phthalates



Both components of a polysulfide system must have similar viscosities for even mixing. B-side polysulphide 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 polysulphide 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 polysulphide sealants, where it provides **exceptional permanence and low migration**. These properties are critical to ensure **low fogging** in insulated glass, the largest application for polysulphide sealants.

Kalama® VITROFLEX® A99

Kalama VITROFLEX A99 is a high-value offering for the A-side of polysulphide 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 polysulphide 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 plasticisers.

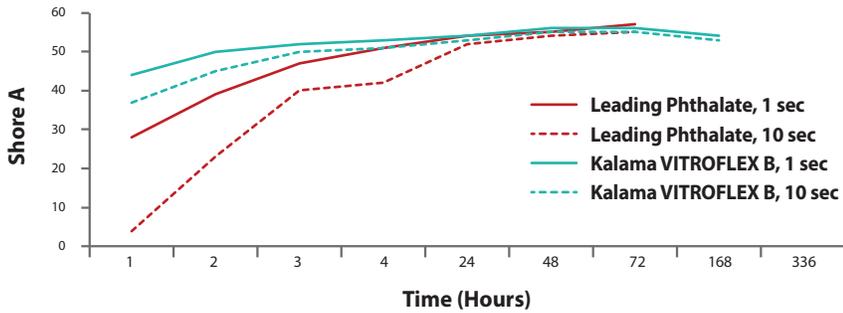
VITROFLEX™

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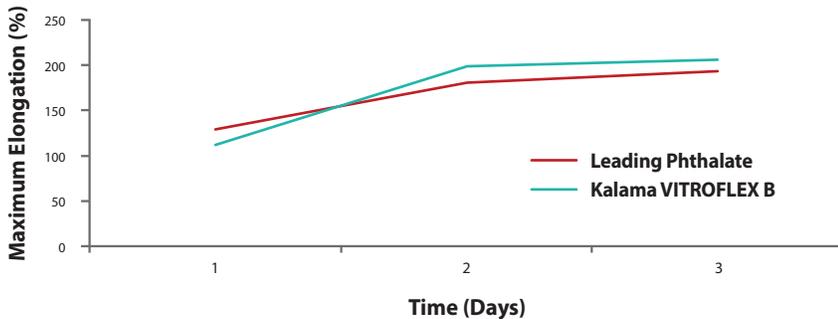
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Faster Hardness Development



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, a manufacturer of additives and polymers that make your products last longer, look, taste, smell, or perform better. We are 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 are certified to meet the highest standards, including ISO 9001:2015 and ISO 14001:2015.

Disclaimer The information contained herein is believed to be reliable, however is based upon laboratory work with small scale equipment and does not necessarily indicate end-product performance. Because of variations in methods, conditions and equipment used commercially in processing these materials, Emerald makes no representations, warranties or guarantees, express or implied, as to the suitability of the products for particular applications, including those disclosed, or the results to be obtained. Full-scale testing and end-product performance are the responsibility of the user. Emerald Performance Materials shall not be liable for and the customer assumes all risk and liability for use and handling of any materials beyond Emerald's direct control. Nothing contained herein is to be considered as permission, recommendation or as inducement to practice any patented invention without permission of the patent owner.

VITROFLEX™

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