

SIKAGARD® CRV-20

JULY 2020

Chemical-Resistant Vinyl Ester System Properties and Application Guidelines

GENERAL DESCRIPTION

Sikagard® CRV-20 modified Vinyl Ester resin provides excellent protection for concrete and steel against a wide range of acids, alkalies and solvents. The material is commonly used to create smooth coatings, built-up broadcast systems and glass fabric reinforced linings. Sikagard® CRV-20 provides extended heat load capacity and unique chemical resistance properties relative to other high performance, barrier materials, such as epoxy or polyurethane formulations. It is ideally suited to provide protection to primary and secondary containment vessels or facilities and afford a high level of ground water protection as a result.

PRODUCT DESCRIPTION

Sikagard® CRV-20 is a Novolac enhanced Vinyl Ester (epoxy acrylate) resin system designed to provide exceptional thermal and chemical resistance properties. It offers high resistance to a variety of solvents, acids and oxidizing substances and excellent dry heat resistance up to 140 °C (284 °F).

For additional physical properties, limitations and chemical resistance information, please consult the current Sikagard® CRV-20 Product Data Sheet and Chemical Resistance Guide.

APPLICATION GUIDELINES

Application of Sikagard® CRV-20 resin systems provide many unique benefits, but require specific application techniques to achieve full cure and optimum results. This Technical Bulletin will explain these unique requirements and the resulting consequences of non-compliance.

PRIMER SYSTEMS

Sikagard® WDE Primer is a clear, two-component, moisture-tolerant and fast setting Bisphenol A based epoxy primer, specifically formulated for use on concrete prior to the application of the Sikagard® line of chemical resistant linings.

Why use an epoxy primer?

- While Vinyl Esters have very good adhesion to dry concrete, they exhibit reduced adhesion on wet or damp substrates. Therefore, because of the variability of concrete and difficulty in determining if it is dry enough to coat, a fast curing epoxy is utilized to guard against potential problems.
- Sikagard® WDE Primer is a fast curing epoxy primer with good adhesion to relatively damp substrates (< 6 % pbw- parts by weight as measured with Tramex CME/CMExpert type concrete moisture meter) and it is capable of continuing to cure down to 0 °C (32 °F). It isolates Sikagard® CRV-20 from substrate moisture and provides positive adhesion to the concrete under most conditions.



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PRIMER APPLICATION AND CURE

Sikagard® WDE Primer is always applied as a primer on concrete surfaces before the application of Sikagard® CRV-20. It handles like a traditional epoxy coating, with two common methods of installation before the application of Sikagard® CRV-20 as either smooth coating or built-up, broadcast systems.

1. Neat Primer for Smooth System: This consists of the Sikagard® WDE Primer being applied and after sufficient cure, the first coat of Sikagard® CRV-20 is applied and cured, followed by a second coat. This procedure produces a smooth, matt coating.

2. Broadcast Primer for Built-Up Broadcast System: This incorporates quartz aggregate broadcast into the Sikagard® WDE Primer. The sand is broadcast to saturation and, after sufficient cure, un-bonded aggregate is removed by sweeping and vacuuming. Two coats of Sikagard® CRV-20 are then applied. There is also an option to broadcast quartz aggregate into the 1st coat of Sikagard® CRV-20. This procedure produces a textured surface. The degree of texture is dependent upon the size of broadcast aggregate used and the coverage rate of the Sikagard® CRV-20 1st coat and 2nd coat.

Caution: Applying Sikagard® CRV-20 over the Sikagard® WDE Primer too soon will inhibit the cure of the CRV Vinyl Ester!

The reasons for this are:

1. The styrene monomer in the Sikagard® CRV-20 behaves like a solvent until it has reacted. It has strength similar to Xylene. Applying the Sikagard® CRV-20 before the Sikagard® WDE Primer has achieved resistance to the styrene will inhibit the cure of the Sikagard® CRV Vinyl Ester. The styrene attacks the epoxy, softening it and this prevents the accelerators in the Sikagard® CRV-20 from initiating properly. The result can be anything from a soft gel, which curls and peels over time to a film that appears well cured, but may not have the desired chemical resistance.

2. Sikagard® WDE Primer is an epoxy that is affected by ambient and substrate temperatures during cure. With decreasing temperature the cure time is extended. The guideline for cure time of Sikagard® WDE Primer before application of Sikagard® CRV-20 is approximately six (6) hours at 20 °C (68 °F) and ten (10) hours at 10 °C (50 °F). Keep in mind that these are guidelines and that substrate and ambient conditions can vary greatly, affecting cure times.

KEY ADVANTAGES: BROADCAST PRIMER VS. NEAT PRIMER.

- The use of quartz aggregate as a broadcast into the surface of Sikagard® WDE Primer isolates it from Sikagard® CRV-20, increasing the margin of safety from applying the coatings too early.
- It helps to minimise the variance in cure time due to temperature fluctuations.
- It adds significant film build and mechanical strength to the containment system.
- Silica aggregate has good chemical resistance and adds a secondary line of defence to Sikagard® WDE Primer in case Sikagard® CRV-20 is damaged.
- It improves the thermal shock resistance of the system
- The broadcast surface texture acts as a gauge to ensure proper thickness is achieved during application of the 1st coat of Sikagard® CRV-20.



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- There is no maximum overcoat time for Sikagard® WDE Primer when broadcast to saturation. The exposed surface is quartz aggregate, providing a physical key/profile, and not epoxy which cross-links as it cures and produces a smooth, dense and difficult-to-bond-to surface. Obviously the quartz aggregate surface area must be kept clean and dry until Sikagard® CRV-20 is applied.

VINYL ESTER APPLICATION

Sikagard® CRV-20 is packaged in 3.75 L (1 US gal.) units that consist of Part “A” resin in a metal can and Part “B” powdered BPO catalyst in a plastic container. Sika recommends mixing only full units because it is difficult to accurately split in to smaller quantities. If less than full units must be mixed, contact Sika Canada for complete instructions.

UNIQUE INSTALLATION REQUIREMENTS

1. Styrene Vapour Displacement

Vinyl Ester resins systems; including Sikagard® CRV-20, will not cure properly in the presence of oxygen or styrene vapours given off during their initial cure. It is necessary in formulating Vinyl Esters to isolate the uncured surface from both. Incorporating a wax or styrene suppressant does this. These additives rise to the surface and form a film which excludes oxygen. The styrene suppressant in Sikagard® CRV-20 Vinyl Ester systems is somewhat soluble in styrene, so in order for it to form a film the styrene must be evacuated from the surface. Styrene vapours are heavier than air and tend to remain at the coating level, causing cure inhibition on the surface. To achieve proper cure, a small amount of air movement causing a fresh air exchange and displacing the styrene vapours is mandatory.

2. Insufficient Film Build

When Sikagard® CRV-20 is applied at less than 10 mil, the styrene suppressant additive does not evenly float to the surface. This will result in air inhibition because oxygen is in contact with the surface. To avoid such problems, it very important to apply the Vinyl Ester resin as uniformly as possible. Brush streaks, for instance, will leave fine valleys in the coating, which are susceptible to both insufficient film build, causing air inhibition, and creates valleys for the styrene vapours to sit in. The cured product then appears as a generally low gloss matt film with some glossy streaks.

3. Overworking the Coating

Sikagard® CRV-20 is very fast curing. It is possible to still be spreading or making the coating even, while it is at or close to, its gel point. This does not allow enough time for the styrene suppressant to float and form a film on the surface. The result is a coating that is generally well cured but with a surface that is glossy and slightly sticky.

Consult Product Data Sheet for complete installation instructions, additional physical properties, limitations and the effect of temperature on cure rate.

In case of further questions please contact your local Sika Technical Representative.

The information contained herein and any other advice are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. The information only applies to the application(s) and product(s) expressly referred to herein and is based on laboratory tests which do not replace practical tests. In case of changes in the parameters of the application, such as changes in substrates etc., or in case of a different application, consult Sika's Technical Service prior to using Sika products. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

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