Technical Datasheet

AR 870

Acrylate gel injection resin

Description

AR 870 is designed for leak sealing in concrete structures. Hydrophilic in nature, it is a multi-component system developed using an advanced non-toxic aqueous solution of multifunctional acrylate and methacrylate monomers. The components include the AR 870 resin, TEA, SP and water. The monomers are reacted in the presence of water and the previously listed additives to produce various elastomeric gel consistencies. In wet or dry conditions the weight of gel increases or decreases in a reversible manner.

AR 800
Solution of acrylate and methacrylate monomers

Primeset TEA
Liquid activator to 870 resin side to vary the set time

Primeset SP
Powder initiator added to water side.

Advantages

- Swells in the presence of water
- Penetrates easily into cracks and joints - very low viscosity
- Suitable for sealing leaks in concrete structures
- Great adhesion to concrete
- Variable set times over hydrophilic polyurethane gels
- Soap and water clean-up
- Not flammable or explosive
- Operates in the same equipment as acrylamide grouts

Applications

- Water treatment tanks
- Below-grade concrete walls
- Tunnels
- Elevator service pits

Technical information

Properties will vary depending upon site conditions, application method, mixing method and equipment, material temperature, and curing conditions.

Typical Properties - Cured	50% Water Dilution
Appearance	White flexible gel
Consistency	Soft silicone gel with excellent adhesiveness
Solubility	Insoluble in water, kerosene, gasoline. Gel swells slightly in presence of water, marginal shrinkage occurs upon dehydration
Permeability	Substantially impermeable to water (5x10-9 cm/sec). Stable in 100% humidity.
Shrinkage	Shrinking occurs upon dehydration
Chemical Resistance	Resistant against bacteria, fungi, and chemicals found in sewer systems

AR800—Uncured	
Appearance	Amber in colour
Density	1.11 kg/L
Solids content	39-41%
Specific Gravity	1.11
Boiling Point	100°C
Solubility in water	100%
Toxicity	Very low toxicity (no certification program required)
Acute oral toxicity	LD50, 5000 mg/kg

Primeset SP - Sodium Persulfate	
Specific Gravity	2.6
Solubility in water	43% by wt. @ 25°C
pH	6.0-8.0
Primeset TEA-Triethanolamine	
Specific Gravity	1.10

A USL Company

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Mixing Ratio

When immersed in water the unconfined gel can absorb up to two times its own weight, expanding slightly. Humid conditions allow the gel to remain relatively constant. In the absence of water, the gel shrinks without cracking. These dimensional changes are reversible and do not degrade the gel.

AR 870 system may be treated as a 1:1 by volume two-component system after premixing AR 870 with Primeset TEA and premixing Primeset SP with water. These two premixes may then be mixed at a ratio of 1:1.

In order to prepare the "A" component, the AR 870 premix is made directly by adding TEA. The second premix ("B" component) is made with SP adding to water. These premixes may then be mixed 1:1.
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AR 870 premix
- 5 litres of AR870
- TEA % addition to obtain desired set time (see chart)

Water premix
- 5 litres of water
- SP % addition (equal to TEA %) to obtain desired set time.

TEA and SP Addition Levels

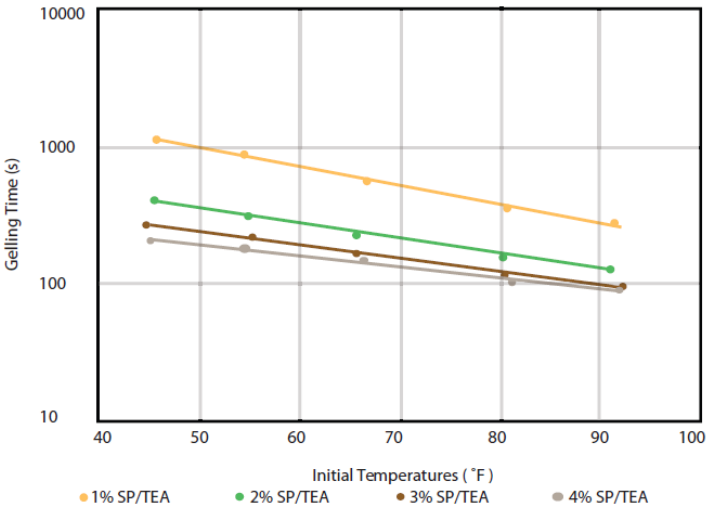
The Primeset TEA and Primeset SP are added to the AR 870 and water respectively for the purpose of controlling the set time of the gel. This level should be kept between 1% and 4% of each tank's liquid weight depending upon the set time desired. The set time is influenced by a number of factors, including TEA/SP concentration, water dilution level and temperatures. The following chart provides expected set times for TEA/SP addition levels at various water dilutions and temperatures

After determining the desired dilution and set time, the premix formulations can be finalized and prepared. In order to make the premixes you will need appropriate size plastic mixing containers, a mixer, a scale and appropriate amounts of AR 870, TEA and SP. It will also be useful to know the following:

• 5 litres of AR 870 weighs 5.55kg
• 5 litres of water weighs 5kg

Material Preparation

The AR 870 premix is prepared by first adding 9.1 Litres of AR 870 to the mixing tank. While you are mixing, add 0.84 Kgs of TEA and thoroughly mix – completing the AR 870 premix preparation. The water/SP premix is prepared by adding 9.1 Litres of water to a second plastic mixing tank. The SP is a white crystal and dissolves in the water readily.
While mixing you should add 0.76 Kgs of SP to the water and continue to mix until the SP is fully dissolved – completing the water/SP premix. The AR 870 premix and water/SP premix can now be mixed 1:1 obtaining a soft silicone consistency setting up in 60 seconds at 22°C.



Final Check

Before final 1:1 mixing we recommend mixing a few grams of AR 870/TEA and water/SP premix to confirm gelling in the desired time frame. If the gelling time needs to be shortened, using the chart as a guide, additional TEA and SP may be added to shorten the desired set time. If the set time is too fast then, use the chart as a guide. Note that equal dilutions are required on the AR 870 and water/ SP premix.
We recommend only preparing the amount of premix that will be used immediately. However, the AR 870 premix is stable for 24 hours when kept cool, sealed and covered. The SP/water premix is stable for a few days when kept below 23°C.

Application

AR 870 gel can be dispensed or injected using either a single-component pump or a dual-component fixed, **all stainless steel** ratio pump depending upon the application method of choice.
In order to use a single-component pump the AR 870 and SP/water premixes must be thoroughly mixed at a 1:1 ratio. You should only mix as much material as you can use at the set time prepared. We suggest a longer set time be prepared when using a single component pump as this allows a greater working time. You must also allow time to flush out your pump before gelling or risk setting up your pump rendering it inoperable. **DO NOT** use pumps made of copper or aluminium.
A two-component pump mixing system allows the use of shorter gel times. The AR 870 and Water/SP premixes are pumped separately through a mixer and then into the application area. The set time of the gel must allow complete penetration of the area, cleaning out of the mixing head/tube and possibly cleaning of the supply tube. An appropriate dual pump mixing machine must be selected which allows the pressure and flow rate for the application. The technical service personnel at Prime Resins can help you with the appropriate selection. Again, **DO NOT** use pumps made of copper or aluminium. Use all-stainless steel pumps with stainless fittings.

Handling

Materials should be mixed or stored in stainless steel or plastic containers (polyethylene or polypropylene).

Warning: Prolonged exposure to UV, sunlight and elevated temperatures above 29°C will cause solidification of the product.

Warning: Do not let Primeset TEA and Primeset SP come into contact with one another prior to field mixing. A poisonous gas may result. Components should be stored separately from each other. We recommend transporting them separately to avoid mixing in case of a vehicular accident.

Warning: Primeset TEA and Primeset SP are incompatible with aluminium. Do **not** use aluminium equipment, pump components, mixing containers or utensils. Pump and all fittings must be stainless steel.

Packaging

Pack sizes:
AR 870 25L pails & 200L drums (acrylate/methacrylate monomers)
Primeset TEA 25L units (triethanolamine)
Primeset SP 25L units (sodium persulfate)

Storage

Store in dry environment between 4-27°C.

The shelf life is 18 months from date of manufacture when stored correctly in unopened containers

Limitations

Cold temperatures will slow down reaction time and increase viscosity. Use at temperatures above 4°C.
Material that is off ratio or not mixed thoroughly will not cure to full strength and may remain tacky.

Health & Safety

Product Safety Data Sheets (SDS) are available from Nufins. SDS sheets are provided to help customers satisfy their safe handling, use and disposal needs as well as assist with any conformance requirements made locally by health and safety regulations.

SDS are continually updated to provide the latest information to our customers. We therefore recommend contacting our head office to obtain the most recent and accurate SDS before handling and using any product.

Technical Support

Through our technical department and laboratories we can offer a comprehensive service to specifiers and contractors. Technical contacts are available to provide further information and arrange demonstrations.

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