

Acrylate gel for structure leak seal

Description

AR 800 is a super low viscosity, hydrophilic acrylate resin that produces an elastomeric gel with variable set times. This three-component product is used for leak sealing and soil consolidation. In wet or dry conditions, the weight of gel increases or decreases in a reversible manner.

AR 800	Primeset TEA	Primeset SP
Solution of acrylate monomers	Liquid activator to vary the set time	Powder initiator added to water

Primary Applications

- Mainline and lateral sewer grouting
- Curtain grouting
- Water control in tunneling operations
- Soil treatment and stabilization
- Crack injection water stop
- Tunnels (subway, water, utility, etc.)
- Storm sewers and box culverts
- Below-grade parking decks
- Manholes
- Retaining walls

Advantages

- The variable set time range is long– from minutes to more than an hour– and is adjustable in the field. The resin remains fluid until polymerization, allowing for excellent penetration. Ideal for geotechnical use in humid environments, sandy soil.

Packaging

- AR 800 5 gallon pails & 55 gallon drums (acrylic monomers)
- Primeset TEA 5 gallon pails (triethanolamine)
- Primeset SP 5 gallon pails (sodium persulfate)

Technical information: Physical properties

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

Test Data		
Cured Characteristics	50% Water Dilution	75% Water Dilution
Appearance	White flexible gel	White flexible gel
Consistency	Soft silicone gel	Cooked egg white
Solubility	Insoluble in water, kerosene, gasoline. Gel swells slightly in presence of water.	
Permeability	Substantially impermeable to water (5x10 ⁻⁹ cm/sec). Stable in 100% humidity.	
Can dehydrate in dry conditions	Shrinking occurs upon dehydration	
Chemical resistance	Resistant against bacteria, fungi and chemicals found in sewer systems.	

Uncured		
AR 800		
Appearance	Amber in color	
Density	10 lbs/gal	
Percent solids	39 - 41%	
Specific gravity	1.2	
Boiling point	200°F (93°C)	
Solubility in water	100%	
Toxicity	Very low toxicity (no certification program required)	
Acute oral toxicity	LD50, 5000 mg/kg	
AR 800 Grouting Solution	<u>75% Water solution</u>	<u>50% Water solution</u>
Viscosity	1-3 centipoise	10-15 centipoise
<i>Note: Viscosity scale for Prime Resins products: 50 and under= super low, 51-100= very low, 100-400=low and 401-1000= medium viscosity.</i>		
Density	8.9 lbs/gallon	9.2 lbs/gallon
PH	6.0 - 7.5	
Stability	24 hours	
PR13 SPSF - sodium persulfate		
Specific gravity	2.6	
Solubility in water	43% by weight @ 25°C	
PH	6.0 - 8.0	
PR11 TEA- triethanolamine		
Packaging	5 gal / 55 gal steel drum	
Specific gravity	1.10	

Mix Ratio: AR 800 initial water content and subsequent changes

We recommend the initial concentration of AR 800 be 50% or 25%. This will produce a gel with the following consistency:

- 50% concentration Soft silicone rubber
- 25% concentration Soft cooked egg white

The majority of sealing, grouting and consolidation applications may be achieved with a concentration of 25%. This reduces overall cost and provides the lowest viscosity possible for permeation into cracks and soil. 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 slowly without cracking. These dimensional changes are reversible and do not degrade the gel.

Premix preparations overview

The AR 800 system may be treated as a 1:1 by volume two-component system after premixing AR 800 with PR11 TEA and premixing PR13 SPSF with water. These two premixes may then be mixed at a ratio of 1:1. In order to prepare a 25% concentration the AR 800 premix is made by diluting the AR 800 with 100% water and then adding TEA. The second premix is made with SP adding to water. These premixes may then be mixed 1-1.

25% concentration	AR 800 premix	- One gallon AR 800 - One gallon water - TEA % addition to obtain desired set time
	Water premix	- Two gallons of water - SP % addition (equal to TEA%) to obtain desired set time

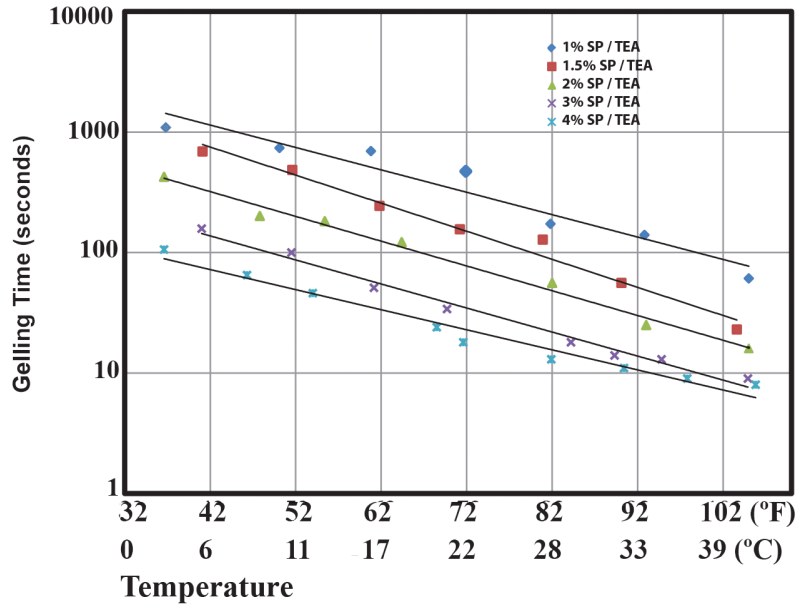
In order to prepare a 50% concentration the AR 800 premix is made directly by adding TEA. The second premix is made with SP adding to water. These premixes may then be mixed 1:1.

50% concentration	AR 800 premix	- One gallon AR 800 - TEA % addition to obtain desired set time
	Water premix	- One gallon of water - SP % addition (equal to TEA%) to obtain desired set time

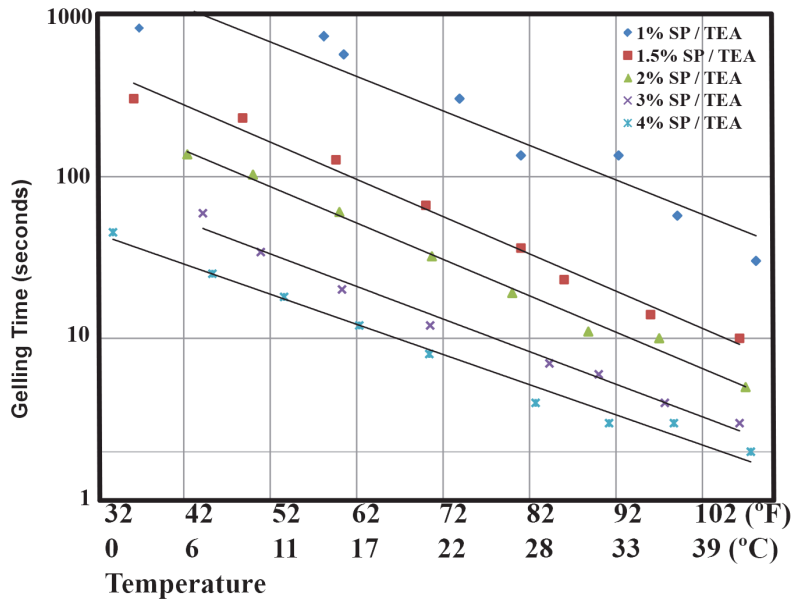
TEA and SP Addition Levels

The PR11 TEA and Primeset SP is added to the AR 800 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 volume 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.

Expected set time at 25% concentration:



Expected set time at 50% concentration:



PREMIX FORMULATIONS

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 800, TEA and SP. It will also be useful to know the following:

- 1 gallon of AR 800 weighs 10 lbs
- 1 gallon of water weighs 8.4 lbs

Premix formulation examples (can be scaled up or down as necessary):

Example 1: Require 60 gallons of 25% concentration AR 800 with a 4 minute gel at 72°F(22°C) (1.5% TEA and SP from chart).

Note: In order to obtain 1.0% multiply by .01, 2.0% multiply by .02, etc.

Formulation	
A tank	B tank
AR 800 / TEA mix	Water / SP mix
15 gallons AR 800 (150 lbs)	30 gallons water (252 lbs)
15 gallons water (126 lbs)	3.78 lbs SP (.015 x 252)
4.14 lbs TEA (.015 x (150+126))	

You may use the set time charts to approximate gel times at different temperatures. As the data confirms, slower set times will result at lower temperatures and faster set times will result at higher temperatures. Note that the temperature of the premixes is often different than the application area. There are other variables that can affect set times, so once you determine the TEA/SP levels to get the set time you desire, we recommend making a small test batch to confirm set times. We recommend using the fastest set time possible that still allows the application technique chosen.

Preparation:

The AR 800 premix is prepared by first adding 15 gallons of water to the mixing tank followed by 15 gallons of AR 800 and then mix. While you are mixing, add 4.14 pounds of TEA and thoroughly mix – completing the AR 800 premix preparation. The water/SP premix is prepared by adding 30 gallons of water to a second plastic mixing tank. The SPSF is a white crystal and dissolves in the water readily. While mixing, add 3.78 lbs of SP to the water and continue to mix until the SPSF is fully dissolved – completing the water/SPSF premix. The AR 800 premix and water/SPSF premix can now be mixed 1-1 obtaining a cooked egg white consistency setting up in 4 minutes at 72°F (22°C).

Example 2: Requires 20 gallons of 50% concentration AR 800 with a 1 minute gel at 72°F(22°C)(2.0% TEA and SP from chart).

Note: In order to obtain 1.0% multiply by .01, 2.0% multiply by .02 etc .

Formulation	
A tank	B tank
AR 800 / TEA mix	Water / SP mix
10 gallons AR 800 (100 lbs)	10 gallons water (84 lbs)
2.0 lbs TEA (0.2 x 100)	1.68 lbs SP (.02 x 84)

Preparation: The AR 800 premix is prepared by first adding 10 gallons of AR 800 to the mixing tank. While you are mixing, add 2.0 lbs. of TEA and thoroughly mix – completing the AR 800 premix preparation. The water/SPSF premix is prepared by adding 10 gallons 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 1.68 lbs of SPSF to the water and continue to mix until the SP is fully dissolved – completing the water/SP premix. The AR 800 premix and water/SPSF premix can now be mixed 1:1 obtaining a soft silicone consistency setting up in 60 seconds at 72°F (22°C).

Final Check

Before final 1:1 mixing we recommend mixing a few ounces of AR 800/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, using the chart as a guide. Note that equal dilutions are required on the AR 800 and water/ SP premix. Also, the 25% concentration AR 800 premix will require diluting with a 50/50 blend of AR 800/water.

We recommend only preparing the amount of premix which will be used immediately. However, the AR 800 premix is stable for 24 hours when kept cool, sealed and covered. The premixes are stable for a few days when kept below 77°F (25°C). Avoid exposure to sunlight.

DISPENSING

AR 800 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 800 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 dispensing 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 aluminum.

A two-component pump mixing system allows for shorter gel times. The AR 800 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 aluminum. Use all stainless steel pump and fittings.

Technical Datasheet



Accessory Products

Eco Flush, oakum, injection ports, Prime Plug, injection pumps

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 85°F (29°C) will cause solidification of the product.

Warning: 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 aluminum. Do not use aluminum equipment, pump components, mixing containers or utensils. Pump and all fittings must be stainless steel.

Directions For Use

Equipment cleaning: All equipment used should be thoroughly flushed with water prior to the gel time. This is critical for mixing equipment and pumps. Allowing the material to gel in a pump may result in the loss of the pump.

Limitations: Cold temperatures will slow down reaction time and increase viscosity. Use at temperatures above 40°F (4°C). Material that is off ratio or not mixed thoroughly will not cure to full strength and may remain tacky.

Storage

Store in dry environment between 40° and 80°F (4-27° C). Shelf Life: 18 months from date of manufacture in unopened containers properly stored.

Environmental Protection

Cured material is environmentally safe. Dispose of in accordance to appropriate regulations. Clean up any spilled catalyzed liquid

material and dispose of according to local, state and federal regulations.

Shipping

AR 800: Non hazardous / motor freight class 60

TEA (DOT): Not DOT regulated

SP (IMO): UN/NA#: UN-1505. Hazard class 5.1 (oxidizer)

Packing group III

Health & Safety

Safety: TEA is an amine and SP is a strong oxidizer. They may cause severe burns upon skin contact for any length of time. Use OSHA-approved personal protective equipment (PPE), including safety glasses, gloves and confined space equipment/procedures if applicable. Avoid skin contact; do not ingest. See SDS for complete safety precautions. For professional use only.

First Aid

Eye Contact: Immediately flush with large amounts of water. Seek medical attention. **Inhalation:** Move to fresh air if symptoms occur. If breathing is difficult, seek medical attention. **Ingestion:** Seek medical attention immediately. **Skin Contact:** Wipe off contaminated area and wash with soap and water immediately.

Manufacturing

Products manufactured by Prime Resins, Inc. in U.S.A. under strict quality assurance practices at our Conyers, GA plant.

Warranty & Disclaimer

Prime Resins, Inc. warrants its products to be free from manufacturing defects and that products meet the published characteristics when tested in accordance with ASTM and Prime Resins standards. No other warranties by Prime Resins, Inc. are expressed or implied, including no warranty of merchantability or fitness for a particular purpose. Prime Resins, Inc. will not be liable for damages of any sort resulting from any claimed breach of warranty. Prime Resins' liability under this warranty is limited to replacement of material or refund of sales price of the material. There are no warranties on any product that has exceeded the "shelf life" or "expiration date" printed on the package label.

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