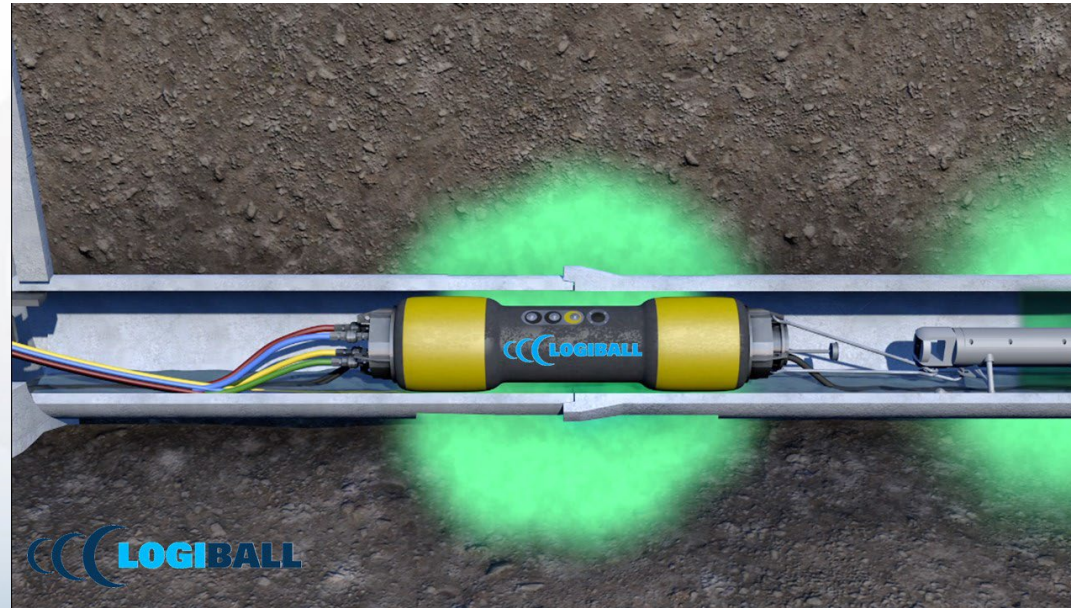


SUGGESTED MIXING GUIDELINES FOR PR 10 ACRYLAMIDE GRANULAR BLEND



Complement this document with the SOPP document

Version 1.2



To meet OSHA's CFR
29 1910.134 Standard

Full Face Piece Respirator



Half- Face Piece Respirator



Chemical Resistant Gloves



Organic Vapor Cartridges

Air purifying respirator (APR) requires a respirator cartridge, if using a 3M respirator, the 3M brand 60921 Organic Vapor Cartridge/P100 Filter. The 3M brand 60921 Organic Vapor Cartridge/P100 Filter is designed to be effective for use with acrylamide liquids and granules.



Safety Glasses



Chemical Resistant Goggles



Chemical Resistant Steel Toe Rubber Boots



DuPont brand Tychem® model (SL) protection suit (recommended) and Steel toe rubber Boots

PR10L ACLM Product Packaging



PR10 ACLM GRANULAR 50 lb bag



28 BAGS/PALLET
(Approximately 42" X 42" X 42")
+- 1520 lbs



MIXING INSTRUCTIONS

PR10 ACLM (Granular blend)

The information contained in the document is property of Logiball Inc. Logiball offers the following verbiage as a technical reference to assist in the education of chemical grouting contractors and government agencies in addition to the creation of specifications for chemical grouting.

PR10 ACLM GRANULAR BLEND

When using PR10 ACLM Acrylamide

See the Safe Operating Practices Program (SOPP) booklet for further mixing instructions and information.

Most CCTV/Grout truck suppliers of equipment used for pumping acrylamide chemical grout have standardized on two 30-gallon (113.56 liters) chemical tanks, shown below as TANK A and TANK B. When properly mixed, one 50-lb. (22.68 liters) bag of PR10 ACLM Granular Blend Chemical Grout results in a 10% strength grout mix.

Two bags of PR10 ACLM Granular Blend result in a 20% strength grout mix. Percentages, as used here, refer to parts of chemical per 100 parts of total grout solution mixed.

A 50-lb. (22.68 liters) bag of PR10 ACLM that has been dissolved in water contains the equivalent of the 50-liter (13.21 gallon) container.

One bag will make a 60-gallon (227.12 liters) batch of grout (Tank A + Tank B). For best results, these grouts should be used at solids concentrations of 10% or greater. Concentrations of up to 15% are favored for higher-strength gels and greater ability to handle dilution prior to gelation.

When mixing the PR10 ACLM Chemical Grout solution using PR10 ACLM Granular Blend, follow these steps:

PR10 ACLM Chemical Grout Grout Components

- PR10 ACLM Chemical Grout (Granular)
- PR11 TEA Catalyst T+ (Triethanolamine)
- H2O

TANK A

- PR-13 SPSF Catalyst (Sodium Persulfate) or
- PR-12 APSF (Ammonium Persulfate) (catalyst)
- H2O

TANK B

TANK A

Fill Tank A with approximately 15 gallons (57 liters) of water.

Unroll inner bag and place opening of bag underwater.

Pour the contents of the 50 lb. (22.68 kg) bag of PR10 ACLM granules into Tank A. Stir well.

Add the PR-101 CAT-T+ (2 Quarts/5lbs.) (1.89 liters). (Do not exceed 2.5% PR-101 CAT-T+)

Add enough water to Tank A to reach the 25-gallon (95 liter) mark for a 12% mix or 30-gallon mark (113 liters) for a 10% mix

Stir until all of the granules are in solution.

TANK B

Fill Tank B with approximately 15 gallons (57 liters) of water.

Add the PR 12 AP or PR 13 SP (2 Quarts/5 lbs.). (Do not exceed 3% PR 12 AP or PR13)

Stir until PR 12 AP or PR 13 (SP) is completely dissolved.

Add enough water to Tank B to reach the 25-gallon (95 liter) mark for a 12% mix or 30-gallon mark (113 liters) for a 10% mix

PR10 ACLM Grout Components

TANK A

PR10 ACLM

PR11(TEA)

Water

TANK B

PR13 (SPSF)

Or

PR12 (APSF)

Water

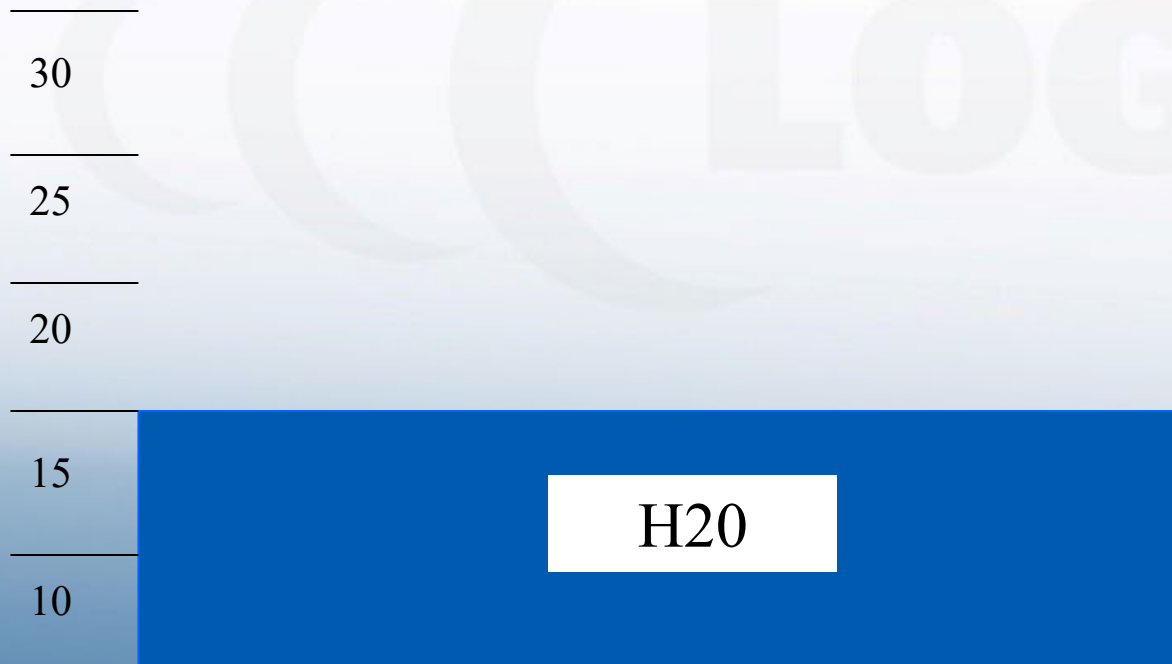
Secured Tank Covers



NEVER open both covers
at the same time,
without taking proper
precautions.



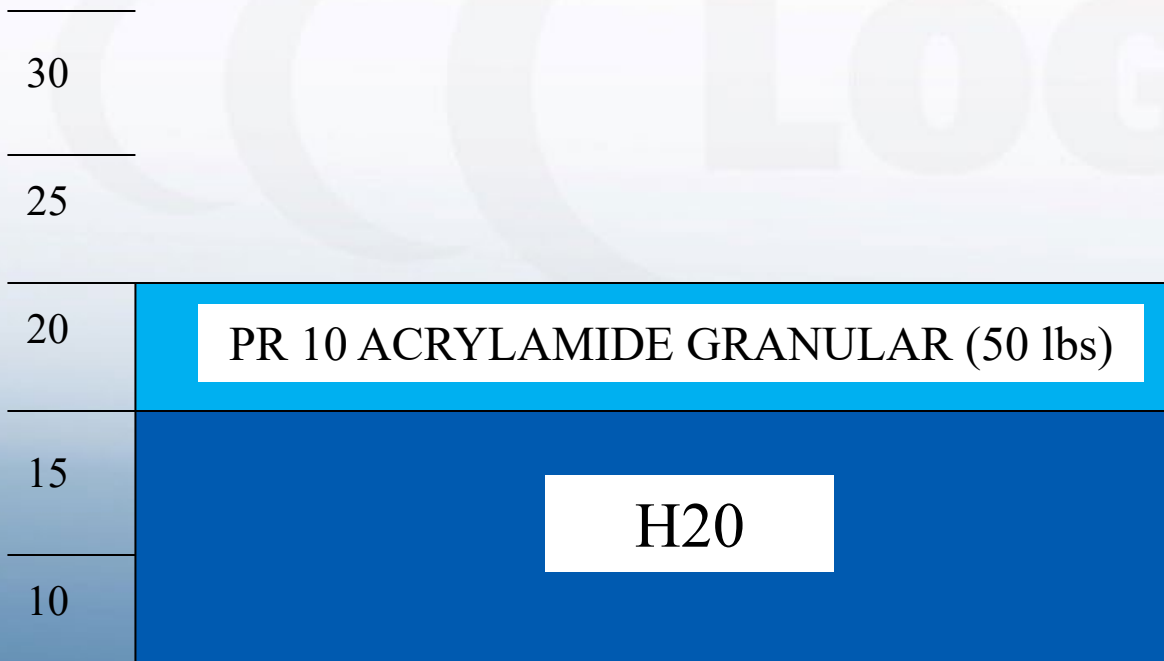
Add 15 gallons of water to Tank A



PR10 ACLM Mixing

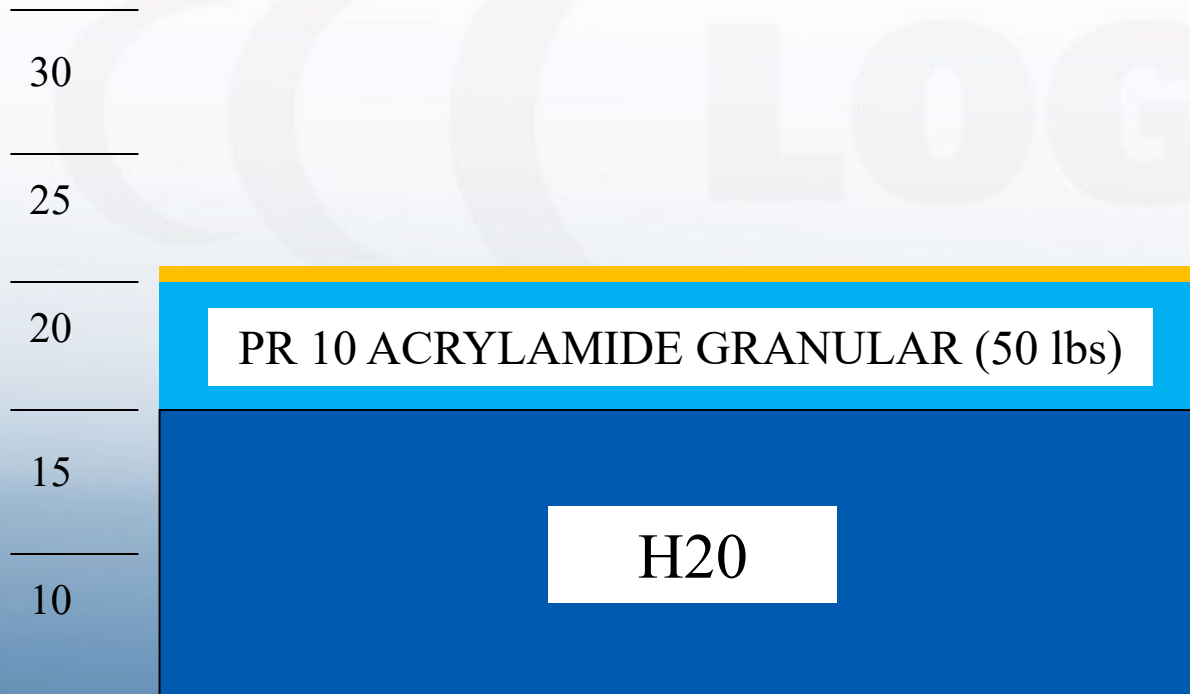
**Add (1) 50 lb bag of
acrylamide grout PR10
ACLM.**

Make sure the neck of the inner
liner bag is inserted in the water
(reduce airborne particles).



PR10 ACLM Mixing 12% mix: Add PR11 (TEA)

**Add 2 quarts or 5 lbs. of PR-11
TEA Cat T+ to the grout tank**
(Do not exceed 2.5% PR-11 Cat T +)



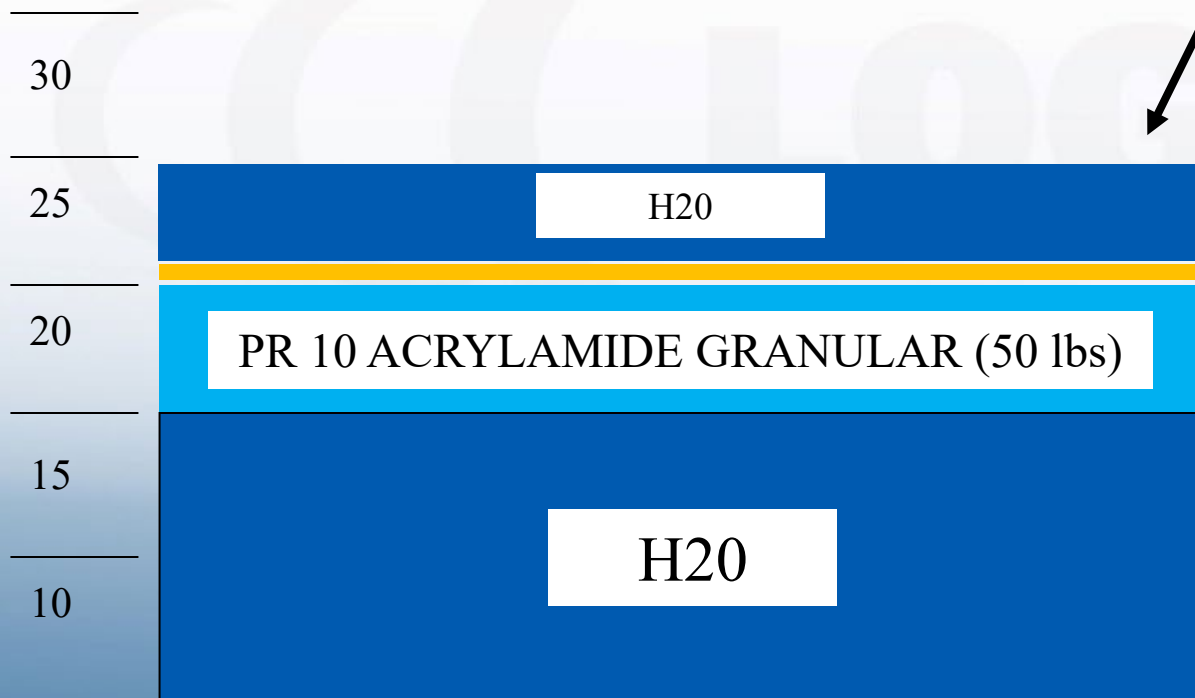
**Catalyst
Transfer:**
Use only
stainless
steel or
plastic
scoops



PR10 ACLM Mixing: Grout Tank A

Add enough water and dye to make
25 gallon batch (12% MIX)

Mix & stir contents



Complete Grout Mixture

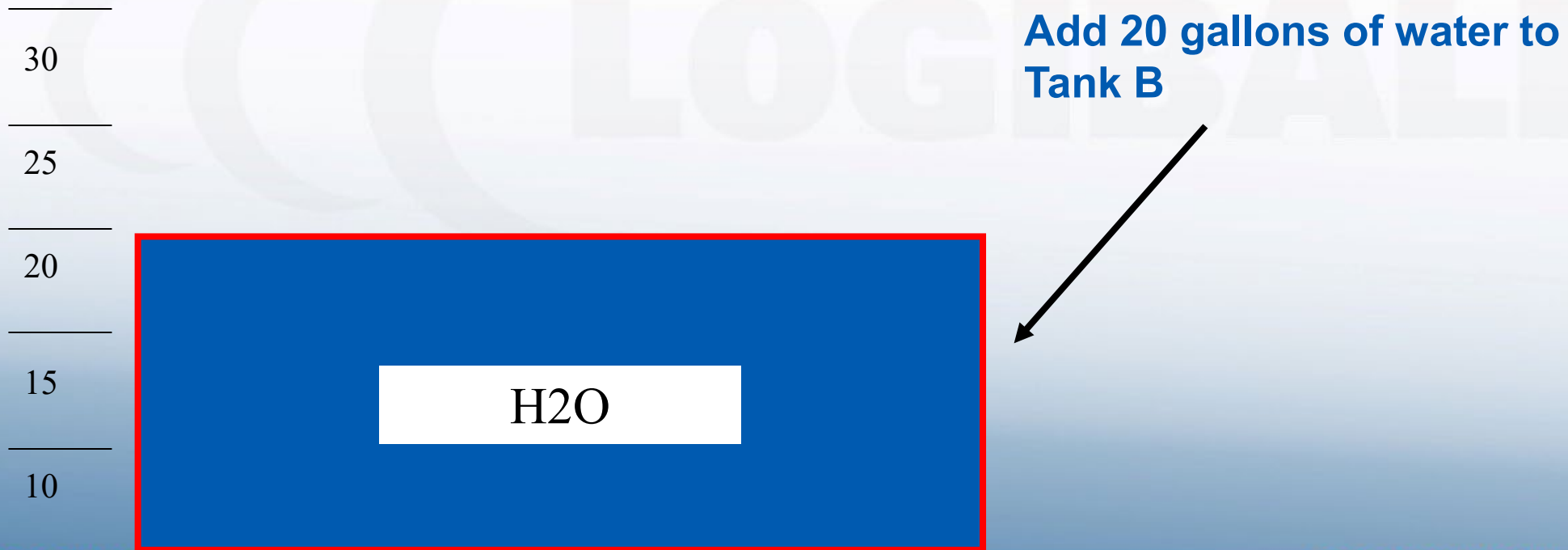
15 Gallons of Water

(1) 50 lbs bag of PR10 ACLM

2 quarts or 5 lbs. of PR11 TEA Cat T+

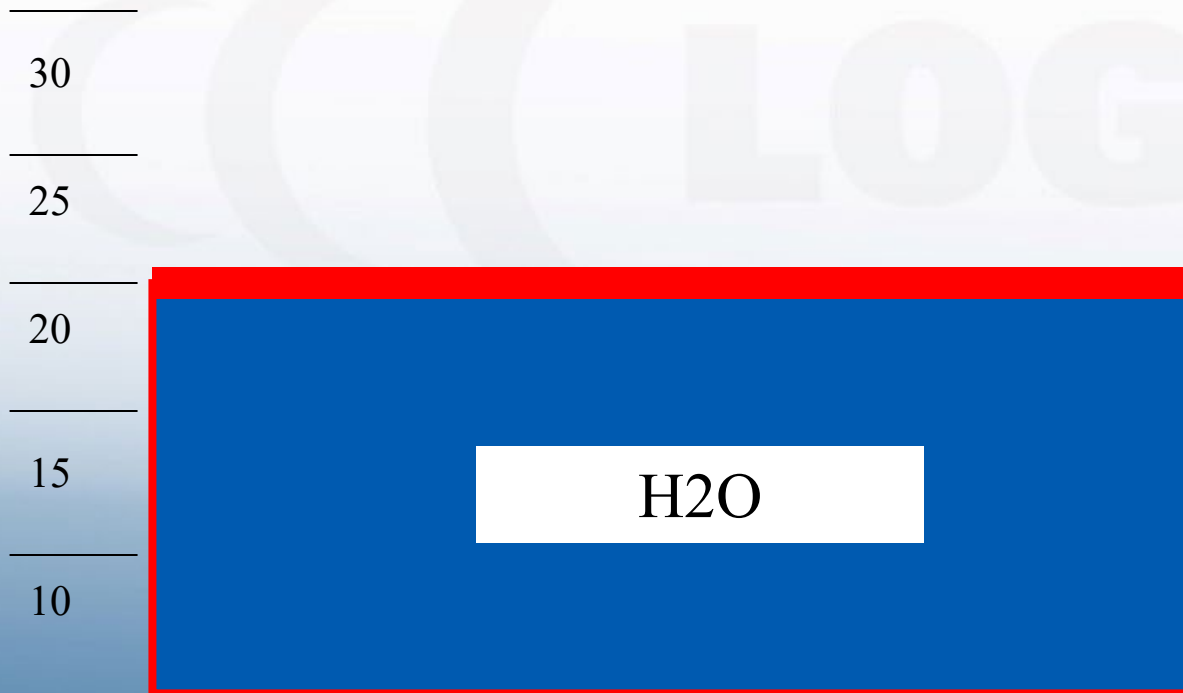
Fill to 25-gal. mark with water (12% mix)

PR10 ACLM Mixing: Add Water to Tank B



PR10 ACLM Mixing: Add PR-12 AP or PR-13 SP TANK B

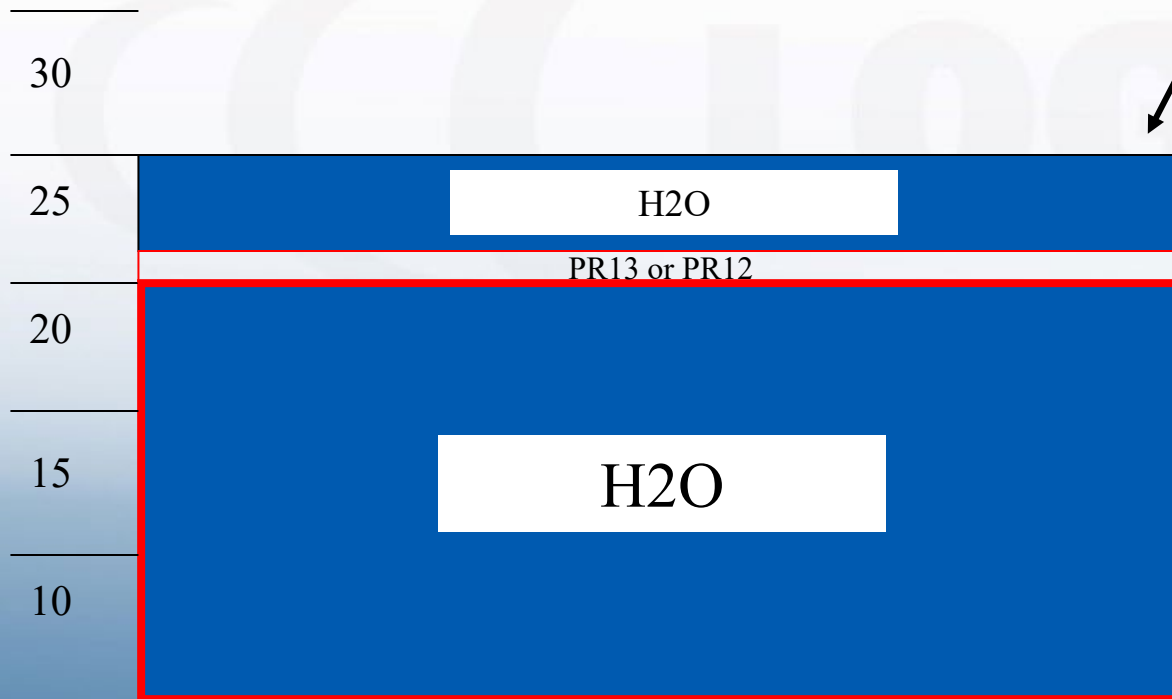
Add 2 quarts or 5 lbs of PR-12 AP or PR-13 SP (Do not exceed 3% PR-12 AP **OR** PR-13 SP)



PR10 ACLM Mixing: Catalyst **Tank B**

Add enough water and dye to make
25 gallon batch

Mix & stir contents



Complete Grout Mixture

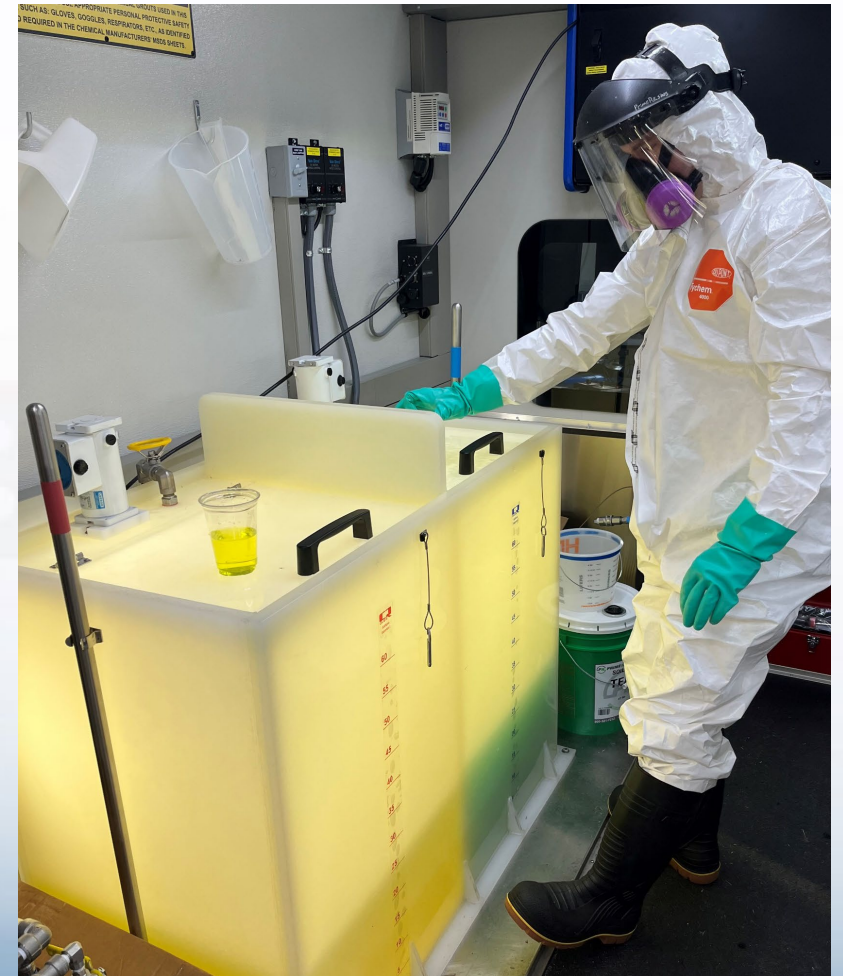
20 Gallons of Water

2 quarts or 5 lbs. of PR-13 SP or PR-12 AP

Fill to 25-gal. mark with water



Never open both covers at the same time, without taking the proper precautions.



Cup Test

•*Note: Before grouting, perform a “cup test” which consists of using two (2) cups, filling one ¼ full with TANK A solution and the other ¼ full with the solution from TANK B. Using a timer, track the time required for the solutions to gel as you mix the solutions together, pouring from cup to cup. The normal gel time at 72°F (22° C) should be approximately 20 – 30 seconds.*



PR10 ACLM Additives

- **Ethylene Glycol**– Reduces freezing point, enhances compressive strength without reducing permeation capabilities
 - Maximum Amount: 2.0 gallons
 - Add equal amounts to both tanks – replaces water
- **Latex**– Gel strengthening agent, increases viscosity
 - Maximum Amount: 3.0 gallons
 - Add to **Tank A only** - it replaces water



- **Tracer Dyes** – Used to track path and mix ratios of grout. Available in green, yellow, red and blue. Provides visual confirmation (post grouting)
 - Amount: Approx. a teaspoon
 - Add blue to Tank A, Add yellow to Tank B (mixture turns green)
- **Potassium Ferricyanide (KFe)** - Extends gel times for chemically activated gel systems. Small quantities yield effective results.
 - Amount: Less than ½ teaspoon to start
 - Add to Grout Tank (Tank A)



How to calculate mixed grout concentrations

Mixed Grout Concentration % (Tank A + Tank B)	Tank A	Tank B	Mixed Solution (A+B) Weight +/-
10%	30 us gal	30 us gal	500 lbs
12%	25 us gal	25 us gal	417 lbs
15%	22.5 us gal	22.5 us gal	375 lbs
20%	15 us gal	15 us gal	250 lbs

1 us gal of water = 8.345 lbs @70 deg F

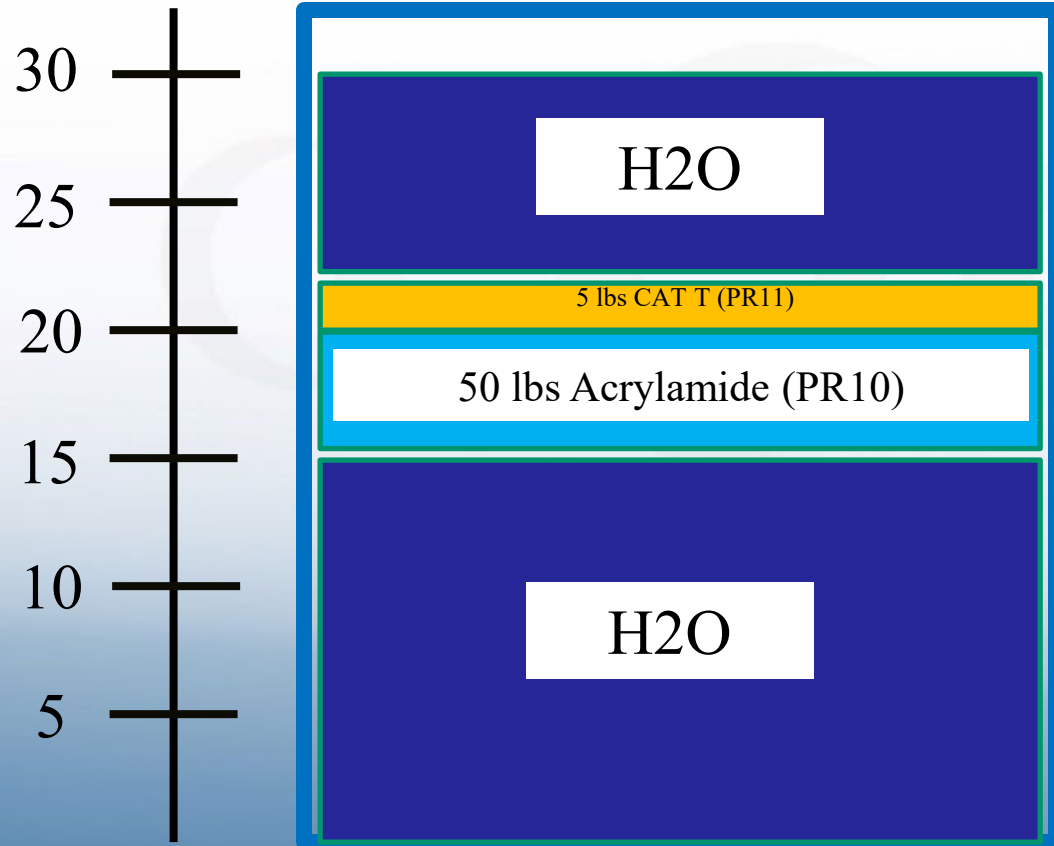
50 lbs of acrylamide in 500 lb batch = 10% mix

50 lbs of acrylamide in 417 lb batch = 12% mix

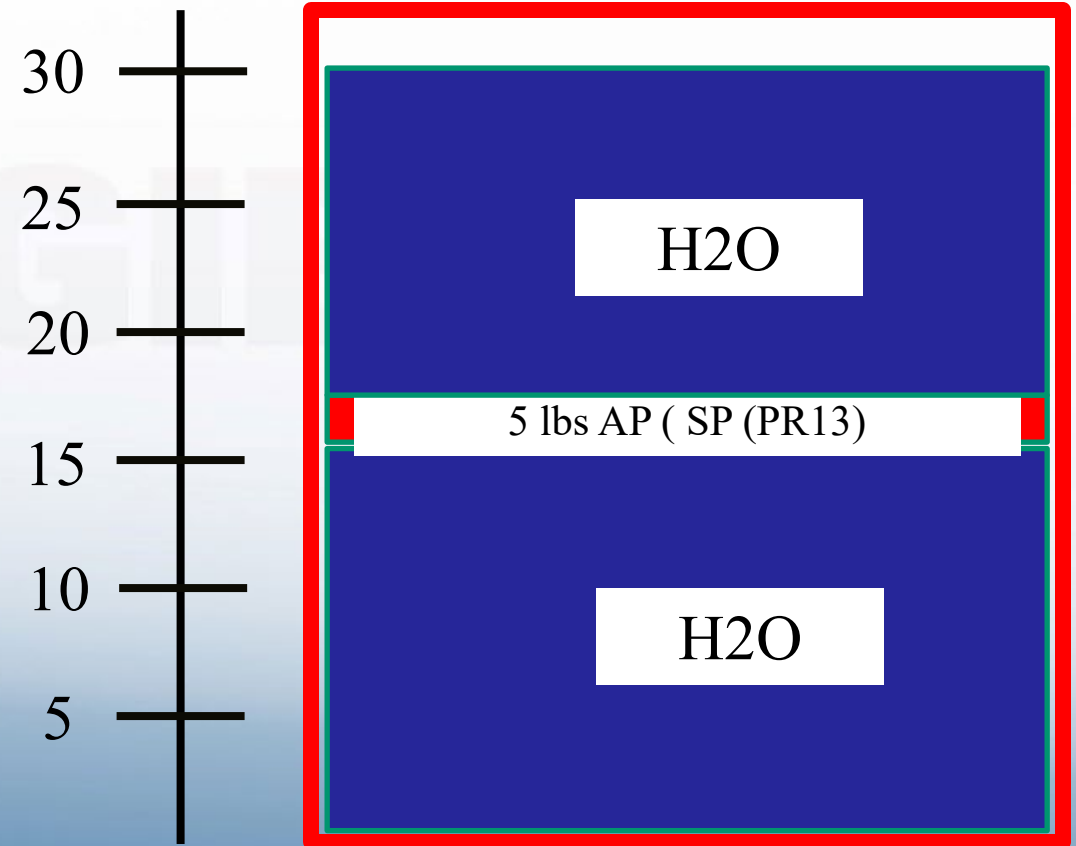


50 lb bag of
PR10 ACLM

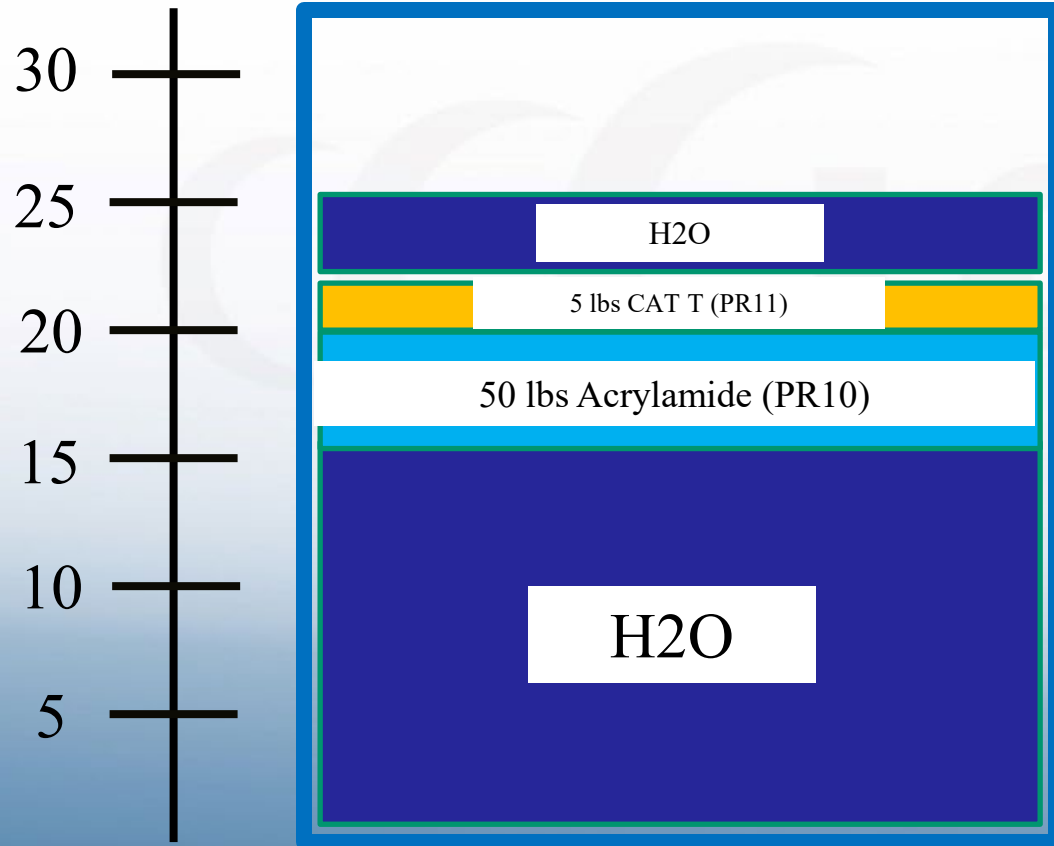
TANK A



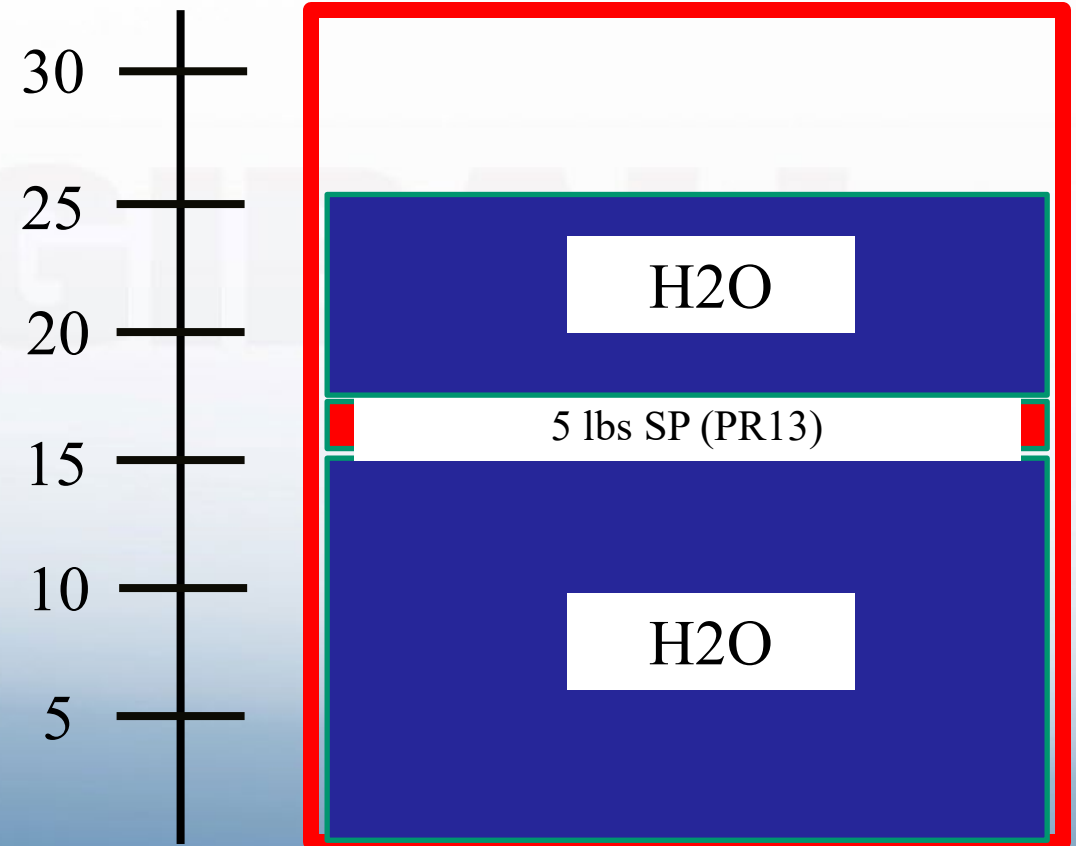
TANK B



TANK A



TANK B



- **How does temperature affect gel time?**
 - A general rule of thumb is for every 10°F (6° C) increase in temperature, the cure time reduces by **half**.
 - **Ex:**

Temperature of Water	Cure Time
73°F (23°C)	+/- 25 seconds
63°F (17°C)	+/- 50 seconds
53°F (11°C)	+/- 100 seconds



- Problem: I have a more than normal infiltration of water. (High Flow)
- Solution:
 - Reduce the amount of make-up water in both tanks.
 - You can **only** reduce the amount of water during mixing, so it is a good idea to anticipate this problem.

- Problem: My gel time is too slow, and I only have access to 55°F (13°C) water.
- Solution:
 - Add 2 lbs. of PR-11 TEA Cat T+ in Tank A and 2 lbs. of PR-12 AP or PR-13 to Tank B in addition to the typical recommendation of 5 lbs. Remember to keep the same proportions no matter how much is added. (*Do not exceed 2.5% Cat T+ or 3% AP or SP*)

- Issue: The gel kicks off too fast



- Solution:

- Reduce the temperature of both tanks by adding bagged ice, beginning with 10 lbs. It is not recommended to use more than two bags of ice. Do not add the ice directly to the solution, as the melting water will change its properties. *It is not recommended to start the mixers while the bags of ice are in the tanks.*

Questions?

Technical Support

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