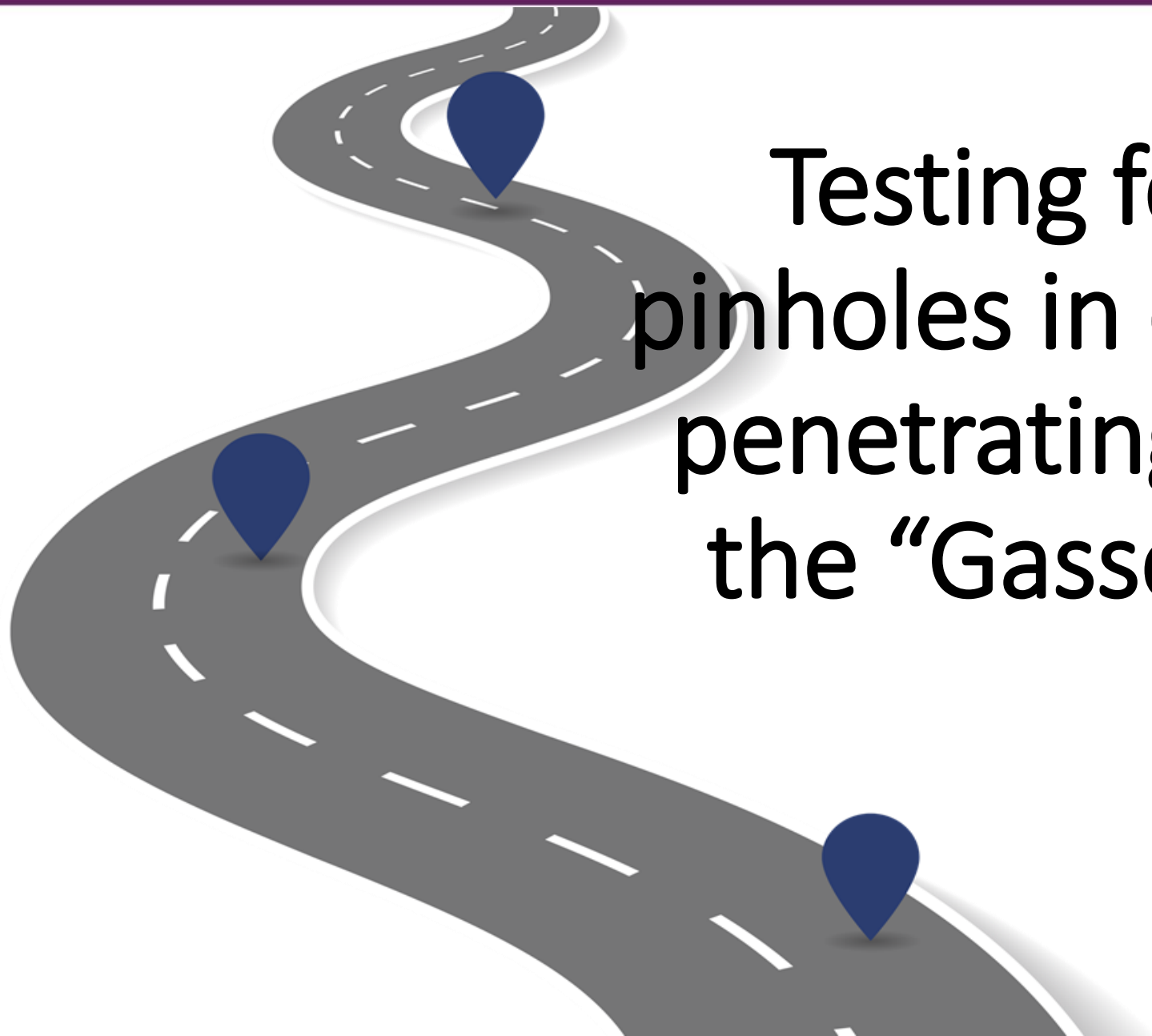


Testing for limiting pinholes in coatings with penetrating primers by the “Gasser” method

Presented by Kathy Romans

THE PROBLEM

For years, a constant source of frustration for coatings applicators has been the cost of labor to repair “out-gassing” or “pinholes” in coatings over concrete substrates

THE PROBLEM

- Concrete in Porous
- Air Passes through concrete
  - .05 -.3 psi
- With Rising Temperatures, air expands causing “outgassing”

Coating Outgassing in a Concrete Structure

The Challenge

- Develop a product to prevent outgassing
- Find a consistently manufactured “structure” to test with
- Develop a test apparatus to provide consistent results
- Simulate the conditions of air traveling through concrete at a measurable rate

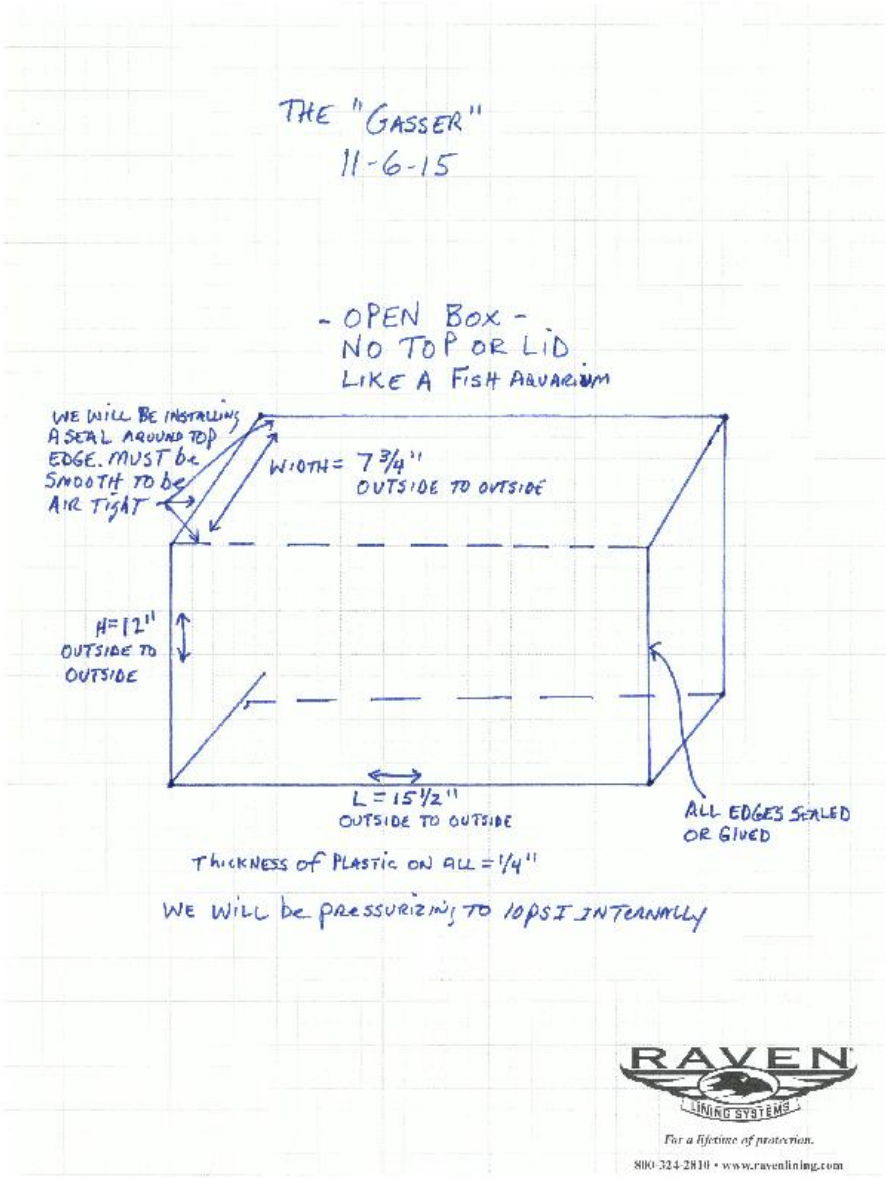
The Challenge

- Develop a quantifiable and repeatable test method to determine the capability of various primers to prevent “outgassing” of concrete substrates.
- In addition, to make the lab testing and “in field” testing similar by adjusting the pressures and temperatures of the test chamber.

The Challenge

- Large Precast Structures
  - Manhole Barrel Sections
  - Jersey Barriers
  - Pipe Segments

- Smaller Precast Concrete Options
  - Flat Top Panels
  - Patio Blocks/Stepping Stones



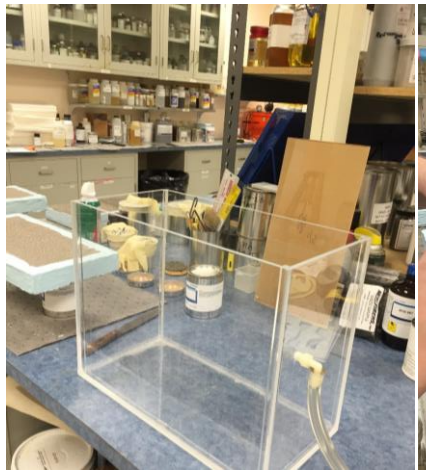
The Concept

- 1/4 “ acrylic rectangle “aquarium” style
- The top is open and the exact size of a concrete paver available from local hardware stores

Introducing – The Gasser

It works!

Soapy water with edges sealed.

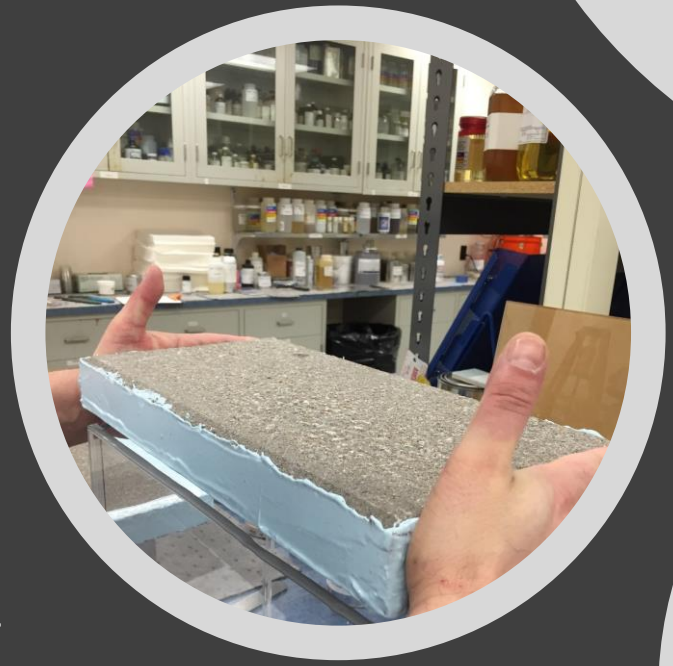


Test Method Development

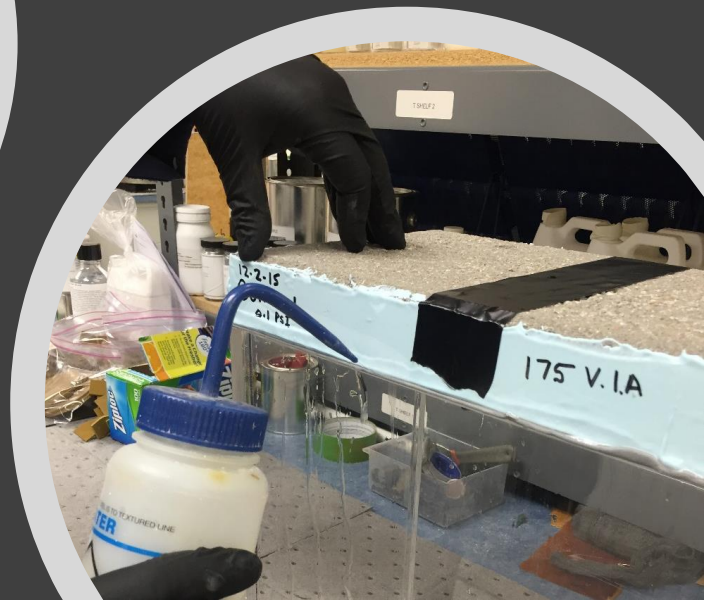
- A Highly Accurate pressure regulator controls the air pressure in the test structure
- Start with Clean Edges
- Apply Butyl Tape

Test Method Development

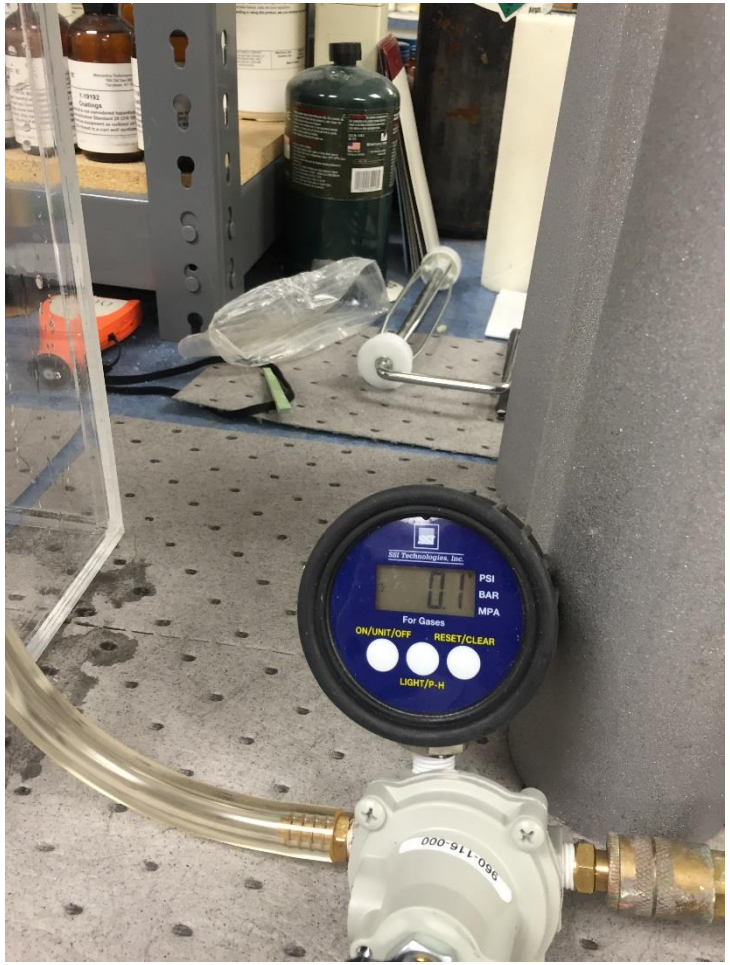
a previously coated patio block that “blocks” passage of air out the sides of the block. Allows air to escape thru the “top” surface only.



Press and seal the block on the butyl tape. Checked for leaks using soapy water

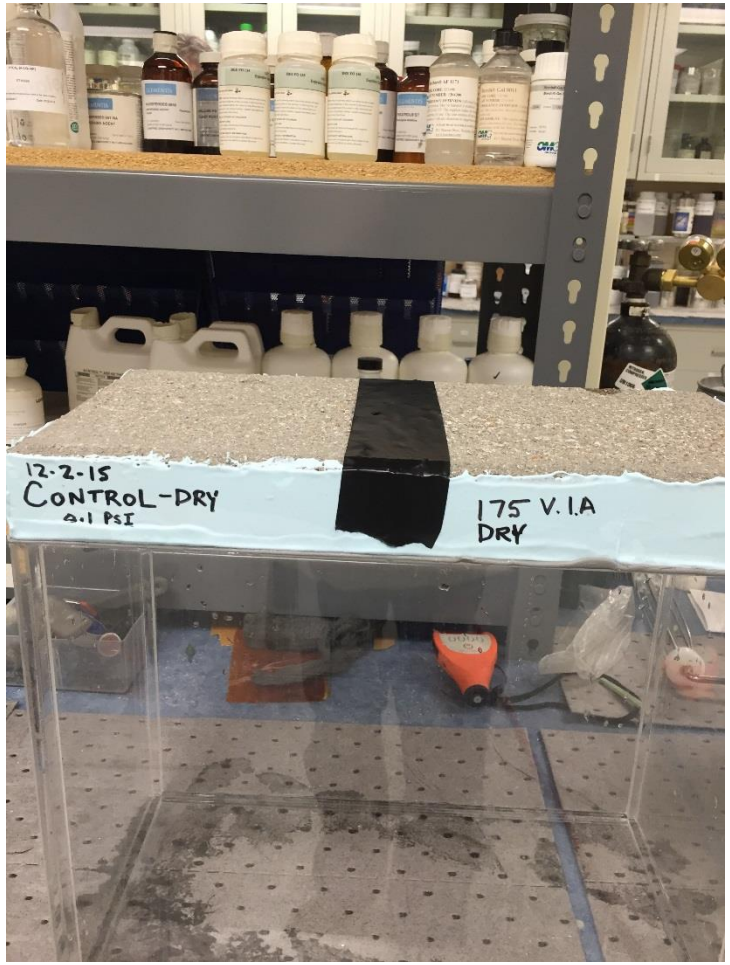


Test Method

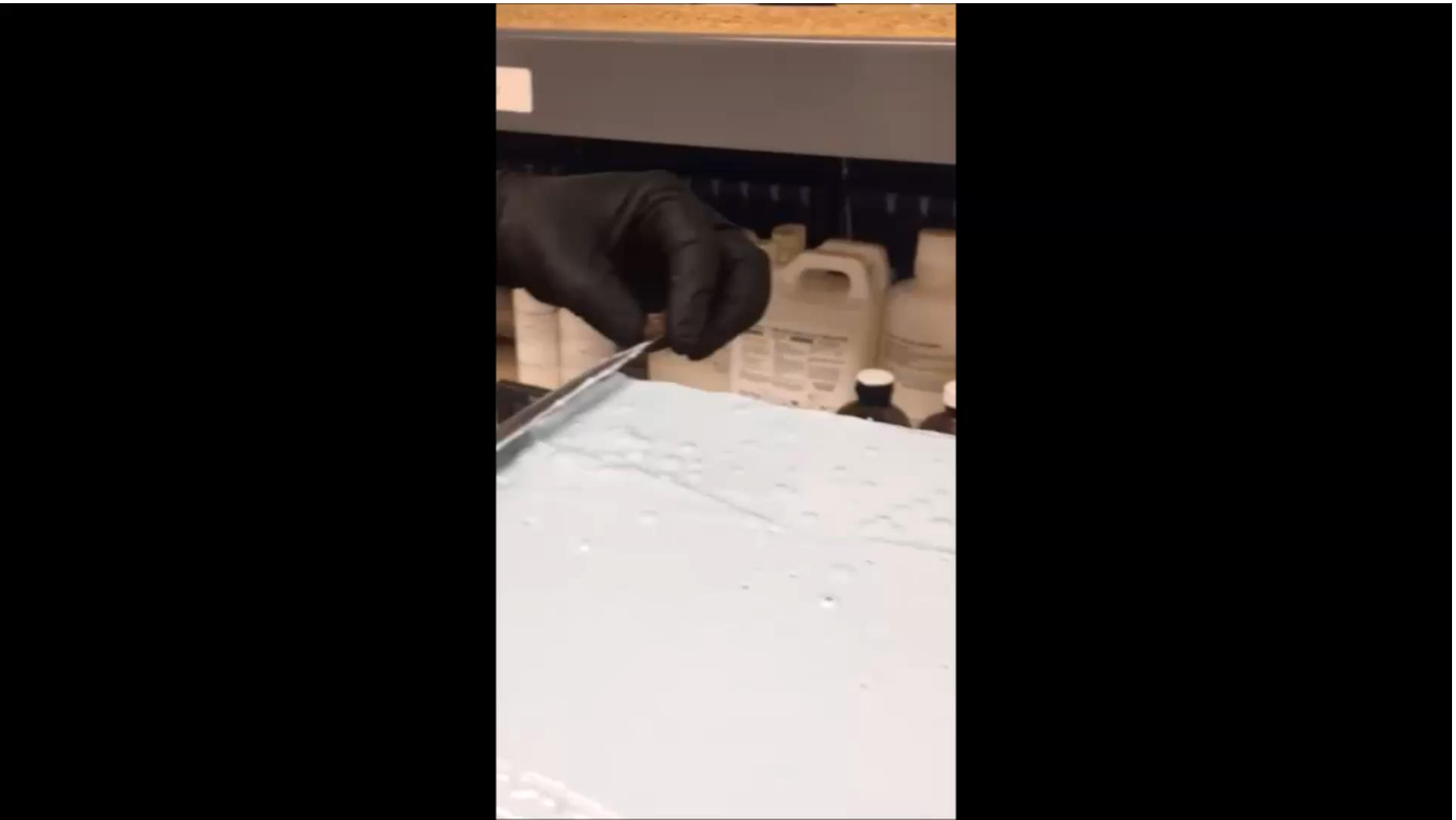


Pressure regulator set to 0.1 psi.

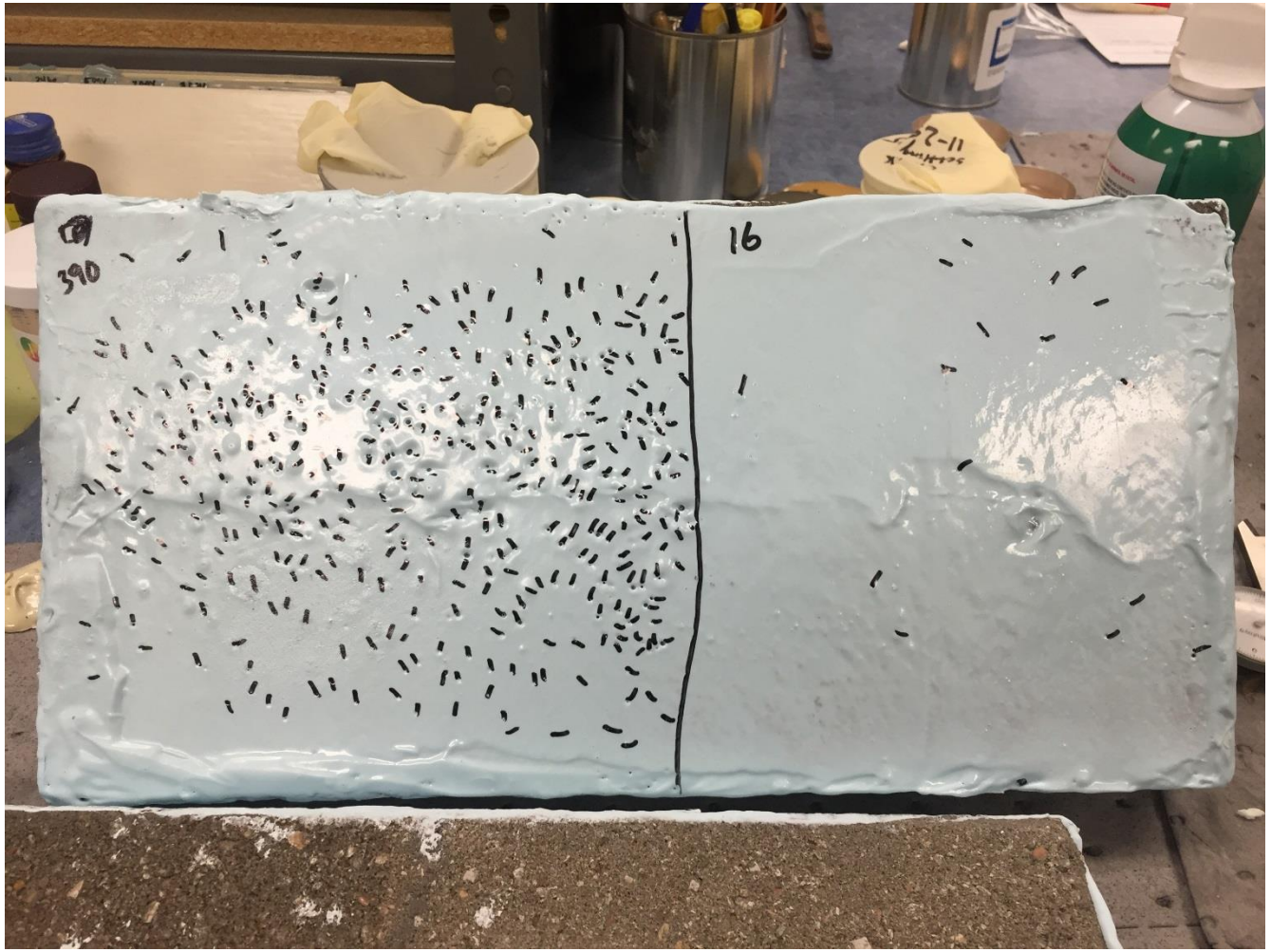
Tape separates the control



The Test Proof



Test Results



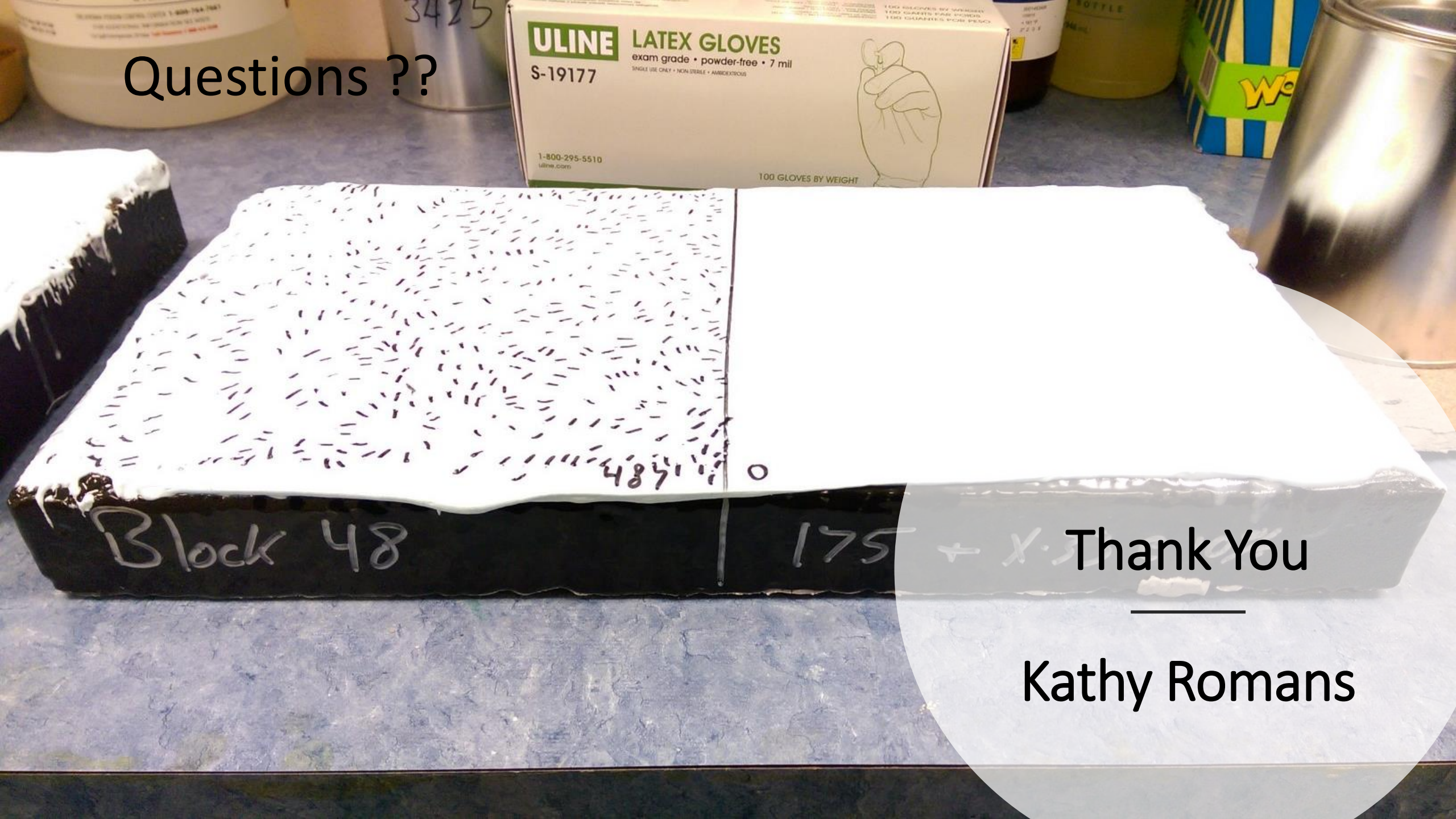
Control = 390 Pinholes/Bubbles

Use of 175 Primer = 16 Pinholes/Bubbles

95.9% Improvement over control

Primer	Psi	Grams	Wet/Dry	Control	Primer	% Change
Primer A	0.1	17.9	Dry	279	399	-43.01%
Primer A	0.1	17.9	Damp	111	52	53.15%
Primer A	0.1	31.5	Dry	94	244	-159.57%
Primer A	0.1	93.7	Dry	213	1	99.53%
Primer A	0.1	61	Dry	183	14	92.35%
Primer B	0.1	18	Dry	314	0	100.00%
Primer B	0.1	18	Dry	385	205	46.75%
Primer B	0.1	18.1	Damp	86	0	100.00%
Primer B	0.1	17.9	Dry	164	113	31.10%
Primer C	0.1	17.8	Dry	168	77	54.17%
Primer C	0.1	18	Dry	124	0	100.00%
Primer C	0.1	17.8	Dry	405	138	65.93%
Primer C	0.1	21	Dry	90	33	63.33%
Primer D	0.1	17.8	Damp	203	111	45.32%
Raven 175	0.1	15	Dry	390	16	95.90%
Raven 175	0.1	17.8	Dry	473	0	100.00%
Raven 175	0.4	15.5	Dry	350	0	100.00%
Raven 175	0.1	15.5	Dry	401	0	100.00%
Raven 175	0.1	15.5	Dry	341	0	100.00%
Raven 175	0.1	15.5	Dry	341	0	100.00%
Raven 175	0.1	18	Dry	244	0	100.00%
Raven 175	0.1	18	Dry	399	3	99.25%
Raven 175	0.1	17.4	Damp	168	1	99.40%
Raven 175	0.1	17.12	Damp	86	1	98.84%
Raven 175	0.1	17.5	Dry	371	21	94.34%
Raven 175	0.1	16.9	Dry	336	0	100.00%
Raven 175	0.1	17.8	Dry	375	4	98.93%
Raven 175	0.1	17.7	Dry	146	3	97.95%
Raven 175	0.1	16.5	Dry	294	3	98.98%
Raven 175	0.1	17.5	Dry	135	0	100.00%
Raven 175	3	17.9	Dry	487	0	100.00%

- Over 300 individual test performed under varied conditions
- 5 Penetrating Primers Tested
- Controls without primer resulted in between 85 & 473 pinholes/bubbles
- Primer results varied from 309 to Zero Pinholes


Questions ??
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Block 48
175
Thank You
Kathy Romans