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Dimensional Stability Comparison
Competitor Fencepost Systems vs. Postloc

Project 100738

Updated: 7/5/2016

PURPOSE: Compare foam dimensional stability of Postloc system vs. competitor systems.

TESTED FOR
BMK

Testing Personnel
Mike Castner

Testing Reviewer
David Modray

EXPERIMENTAL:
Five systems were compared side-by-side in an effort hold a consistent test conditions:

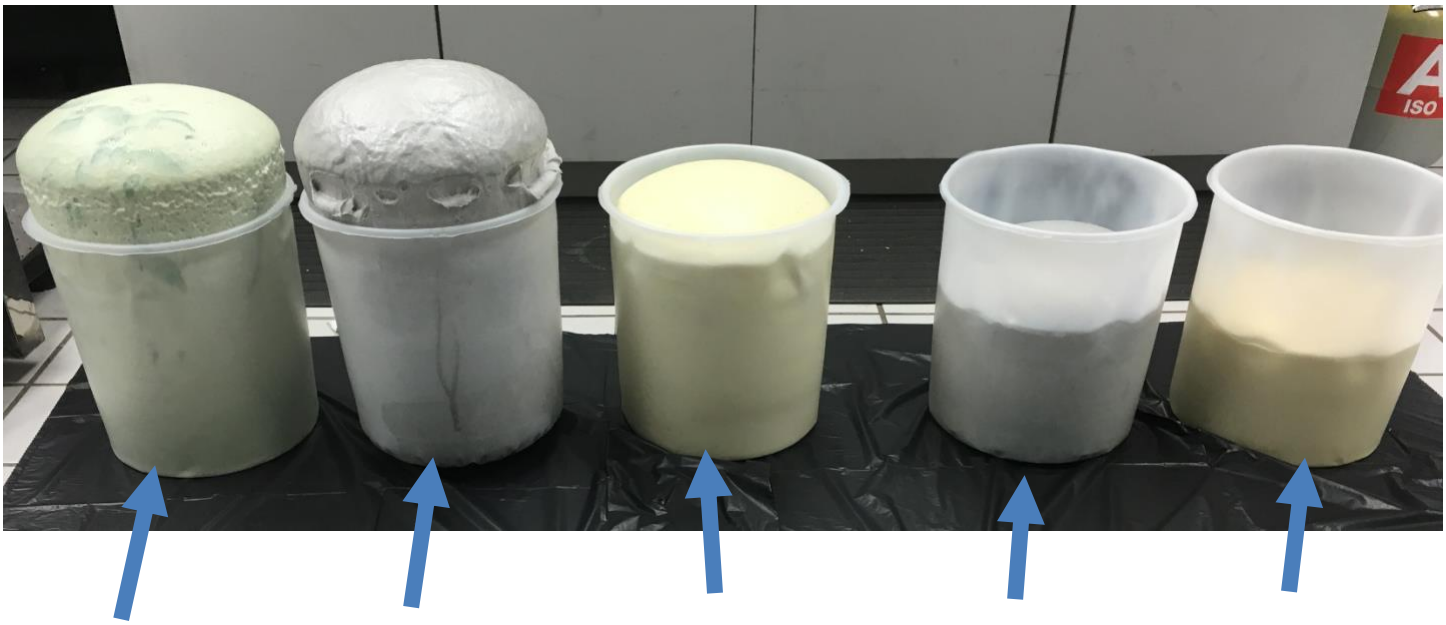
- Product A
- Product B variant 1
- Product B variant 2
- Postloc (on ratio) & Postloc (off ratio)
- Product C

All systems were run via the instruction on the label in the packaging. Postloc® was mixed for 20 seconds by shaking the bottles provided by BMK Products.

Postloc® was made at the designed ratio (1 lb. 10 oz. A side and 1 lb. 8 oz. B side) and off-ratio (1lb 10 oz. A side and 12 oz. B side). This is to demonstrate the robustness and range of stability in the chemical system in each of the dimensional stability aging methods. It is hypothesized that Postloc made off-ratio will still perform better than competitor's systems.

The reacted foam systems were cut to 4"x4"x1" dimensions. Three sets of samples were subjected to the following conditions for 7 days: Humid (159°F, >90% RH), Ambient (75°F, 50% RH), and dry heat (194°F). The samples were randomly selected to represent normal density distributions.

The samples were monitored throughout the testing period for the final %volume change. Photos were taken before, after 1 day, and after 7 days.



Product A	Product B var. 1	Postloc® On ratio	Product B var. 2	Postloc® Off ratio

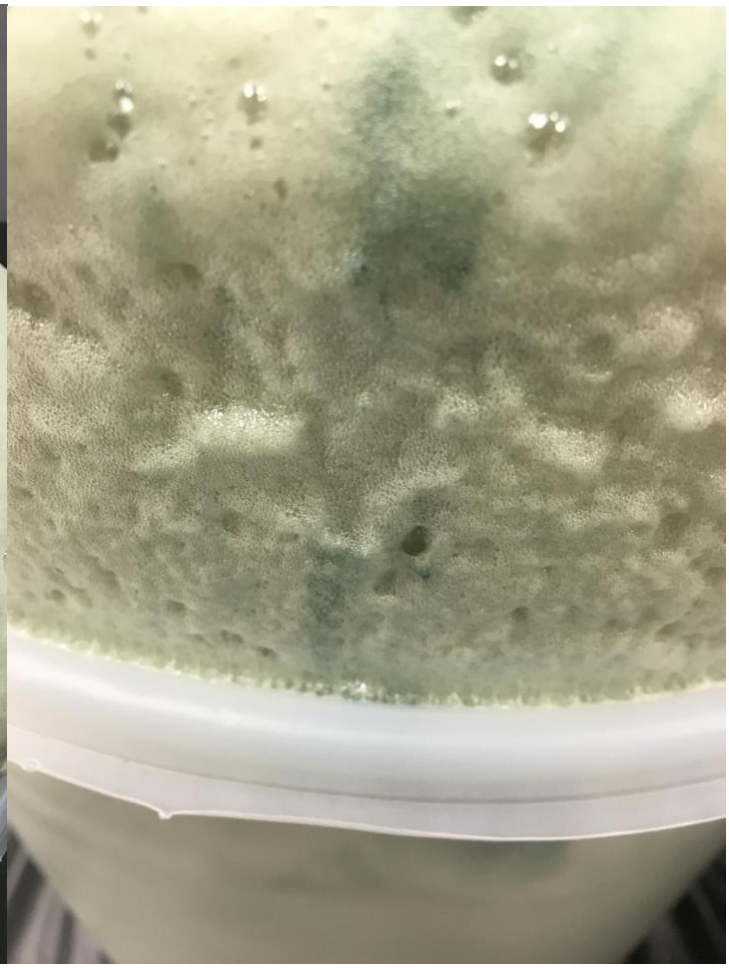
Tests run at different time	
Product C not pictured	Product D not pictured

Observations after application:

Product A:

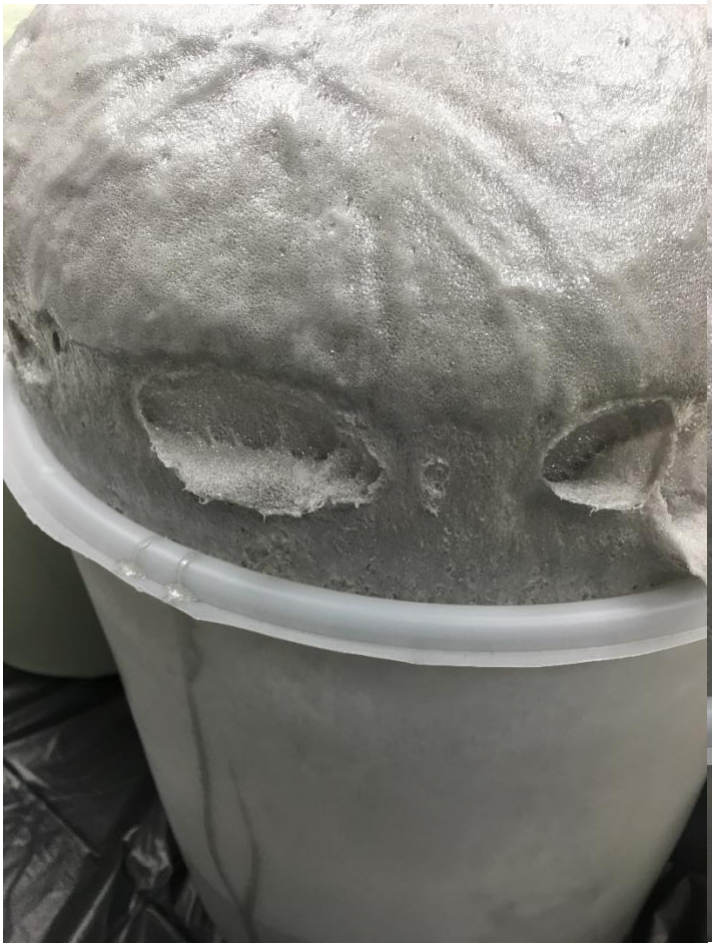
- Streaks prominent after mixing, implies an incomplete mix.
- Large cells visible on the surface.
- Outside surface was friable long after the reaction.

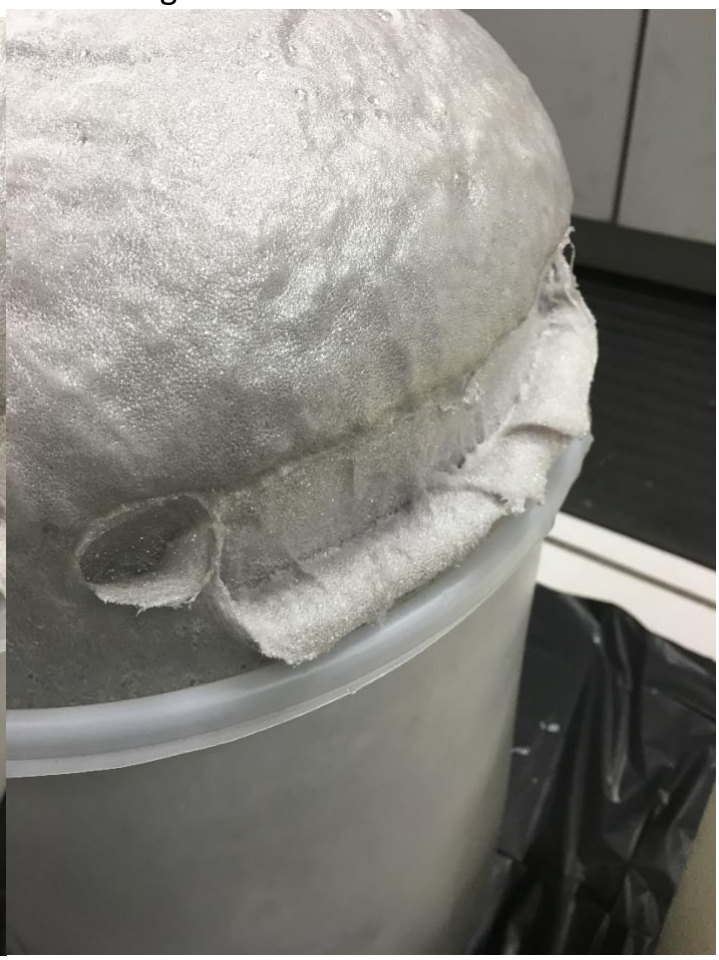
Postloc®



Product B variant 1:

- Tearing visible on the surface of the foam after rising out of the pail liner.
- Large cells.
- Very bad odor.
- Foam shrank in the pail liner an hour after application; sliding out easily before cutting.
- Large cracks/gaps present in the core of the foam after cutting prior to aging, which reduced the number of possible samples for testing.





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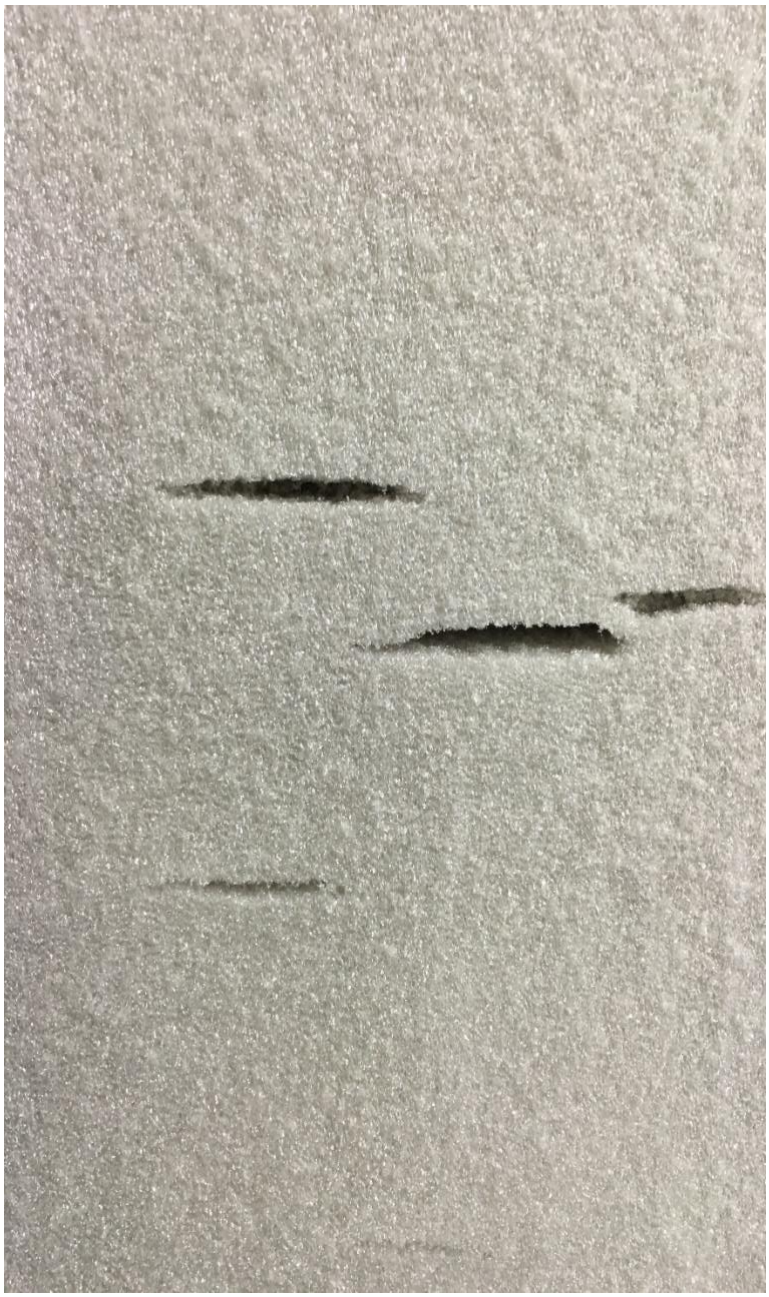
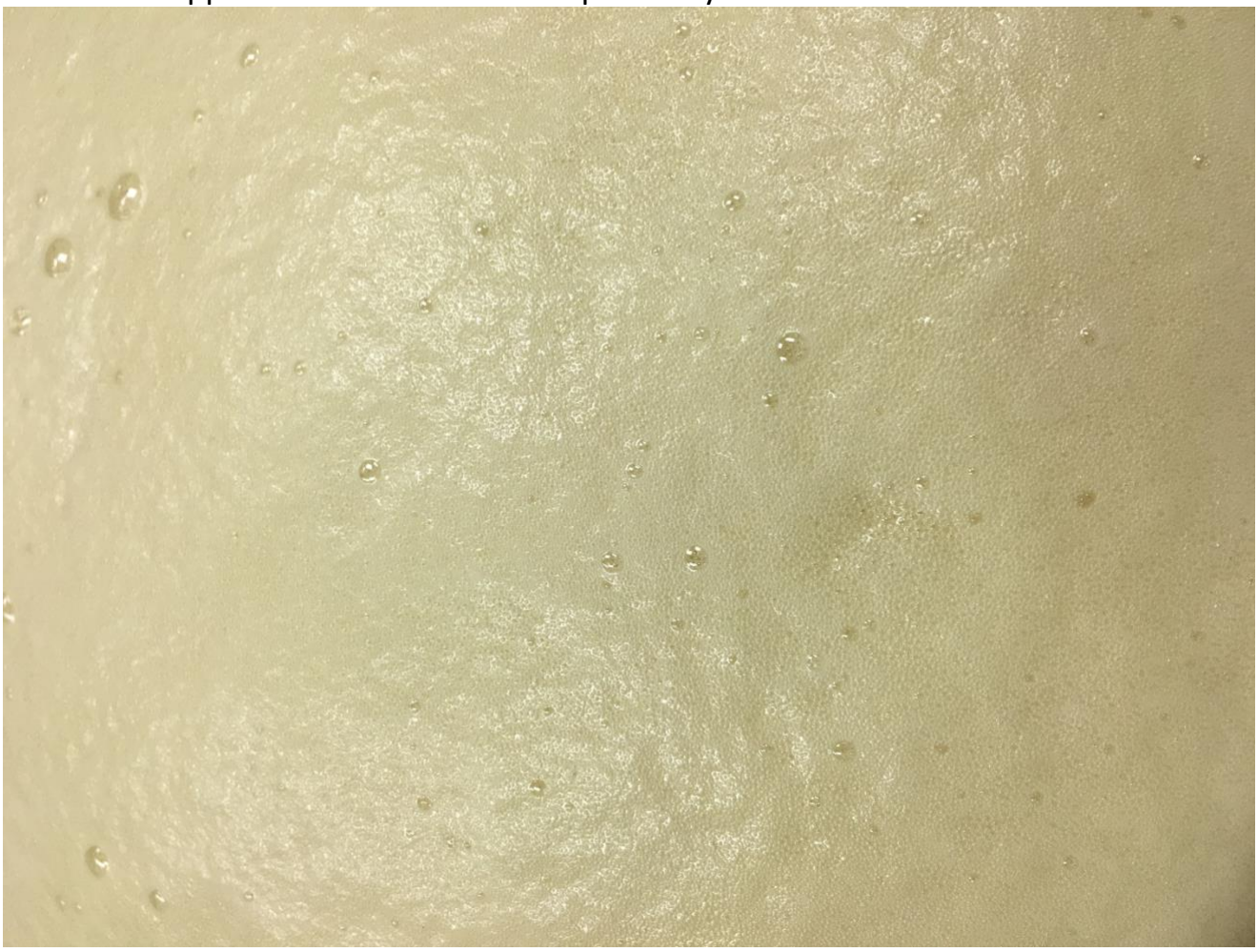


Postloc® (on ratio):

- Mixing was easier in the bottles, as it allowed for a more turbulent mix.
- Some Isocyanate leaked out when pouring into “B-side” bottle.
- No visible chemical streaks on the surface, however some chemical streaks present inside the foam after cutting. This is likely due to the nature of “slosh mixing”
- Cells appear much finer than competitor systems.

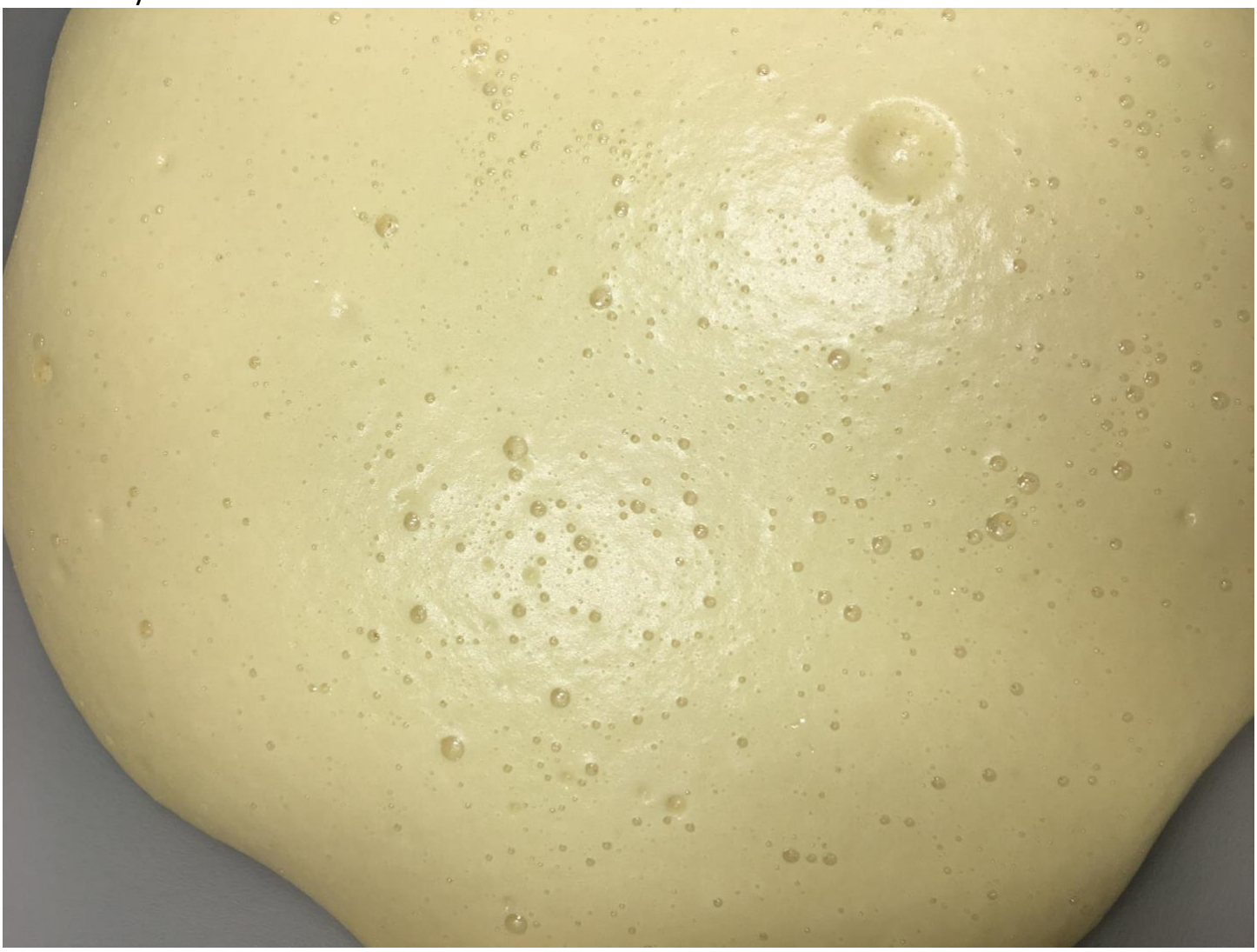


Product B variant 2:

- Cells appear larger than Postloc but smaller than Product A and Product B variant 1
- No odor compared to the other Product B variant 1.
- Shrank an hour after application; slid easily out of the pail liner.
- There was a big crack in the middle of the foam; as a result, fewer samples could be used for testing.

Postloc® (off ratio):

- Very turbulent mix due to fewer amount of total chemical.
- Fine cell structure observed.
- Surface was hard after curing, “rock-like”.
- Some outside friability due to isocyanate-rich ratio.
- Very dense.



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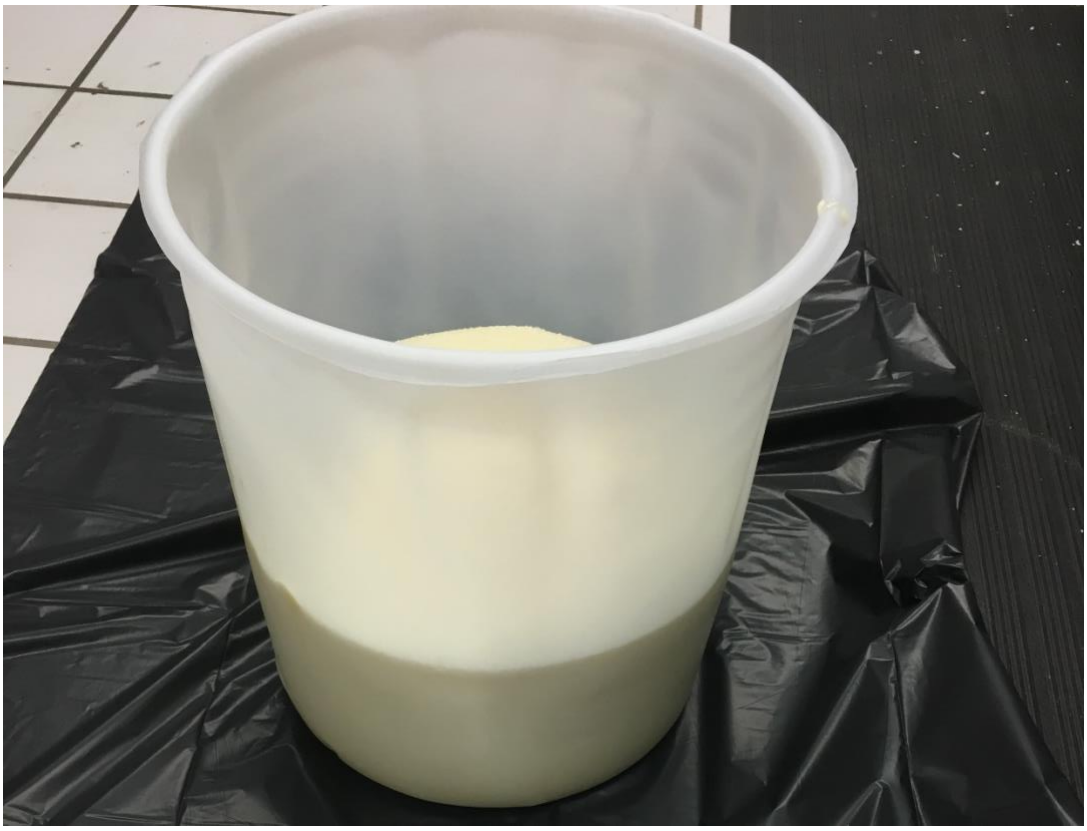
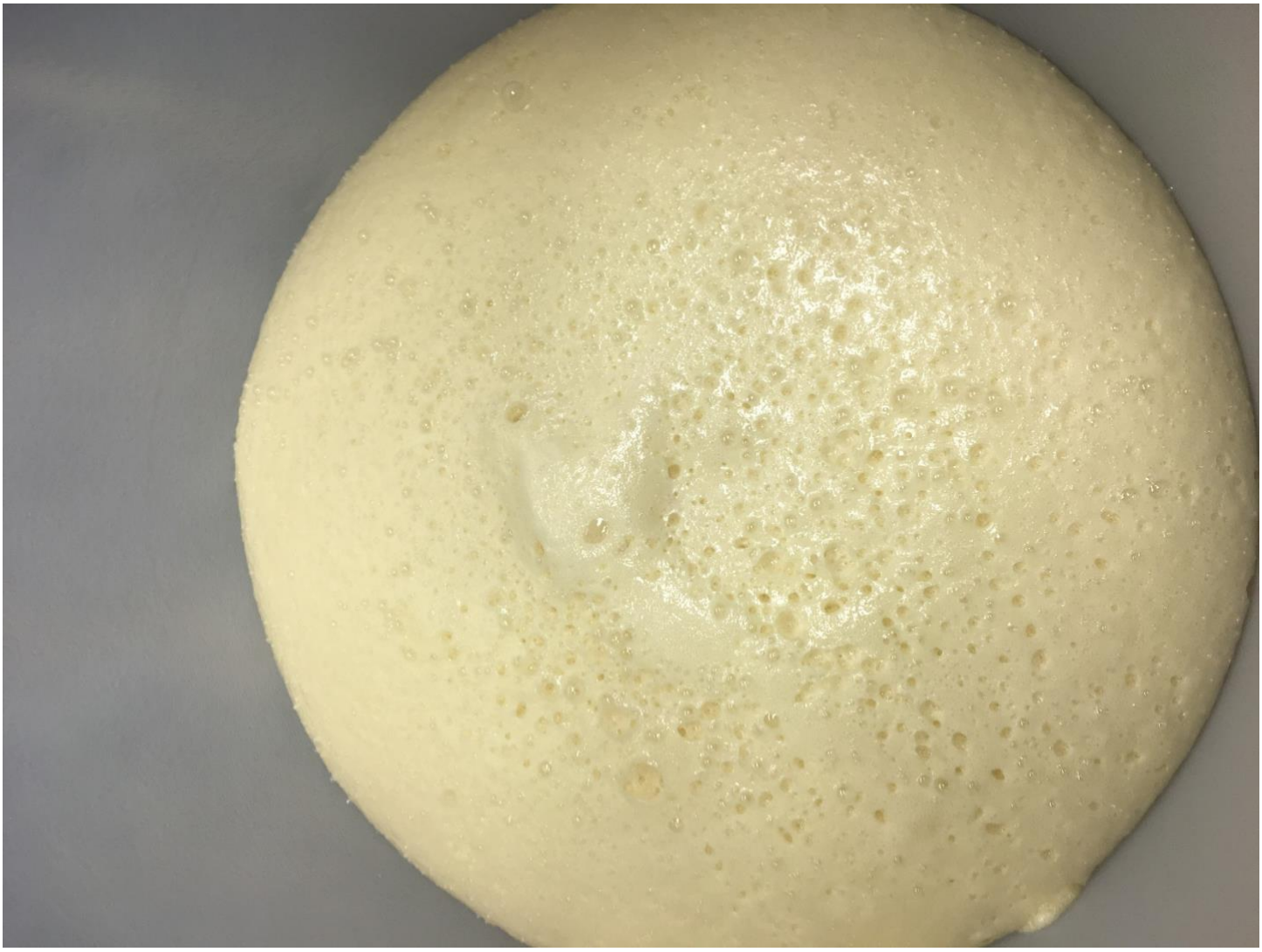
Product C

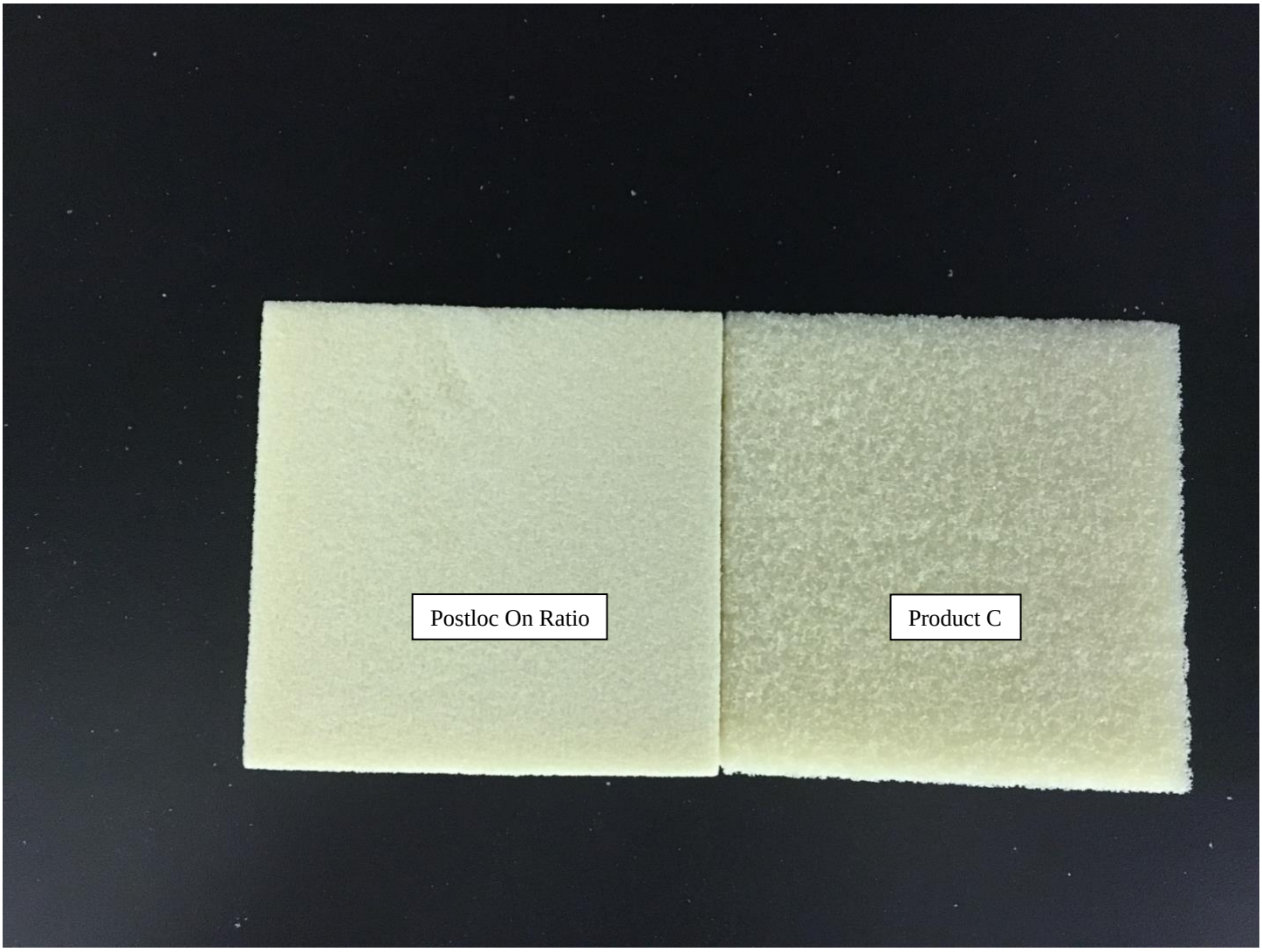
- **Pungent odor similar to other systems.**
- **Similar in color to Postloc**
- **Chemical streaks present when pouring the chemical.**
- **Larger cells than Postloc**
- **Crown of the foam had a lot of bubbles coming out of the top.**
- **Did not rise as high as other systems in the pail liner**



Postloc®



Note: The craters on the surface of the foam from bubbles coming to the top



Note: The cells are a lot larger in the Product C system.

Product D

Note: Packaging is similar to Postloc. There is a removable cover on the bottle for the B side, there is no cover on the A side.

Note: The cell structures look similar to that of Product C, which is still larger cells than Postloc.

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DIMENSIONAL STABILITY RESULTS

Average Ambient Aged % Volume Change:

Product A: **-4.18%**
Product B variant 1: **-3.20%**
Postloc (on ratio): **-.92%**
Product B variant 2: **-2.28%**
Postloc (off ratio): **-1.72%**

Average Humid Aged % Volume Change:

Product A: **-16.33%**
Product B variant 1: **-6.64%**
Postloc (on ratio): **-.02%**
Product C: **-1.93%**
Product B variant 2: **-3.79%**
Product D: -**1.84%**
Postloc (off ratio): **-1.56%**

Dry Heat Aged % Volume Change:

Product A: **-25.89%**
Product B variant 1: **-1.41%**
Postloc (on ratio): **+.42%**
Product C: **-.95%**
Product B variant 2: **-8.44%**
Postloc (off ratio): **-.73%**

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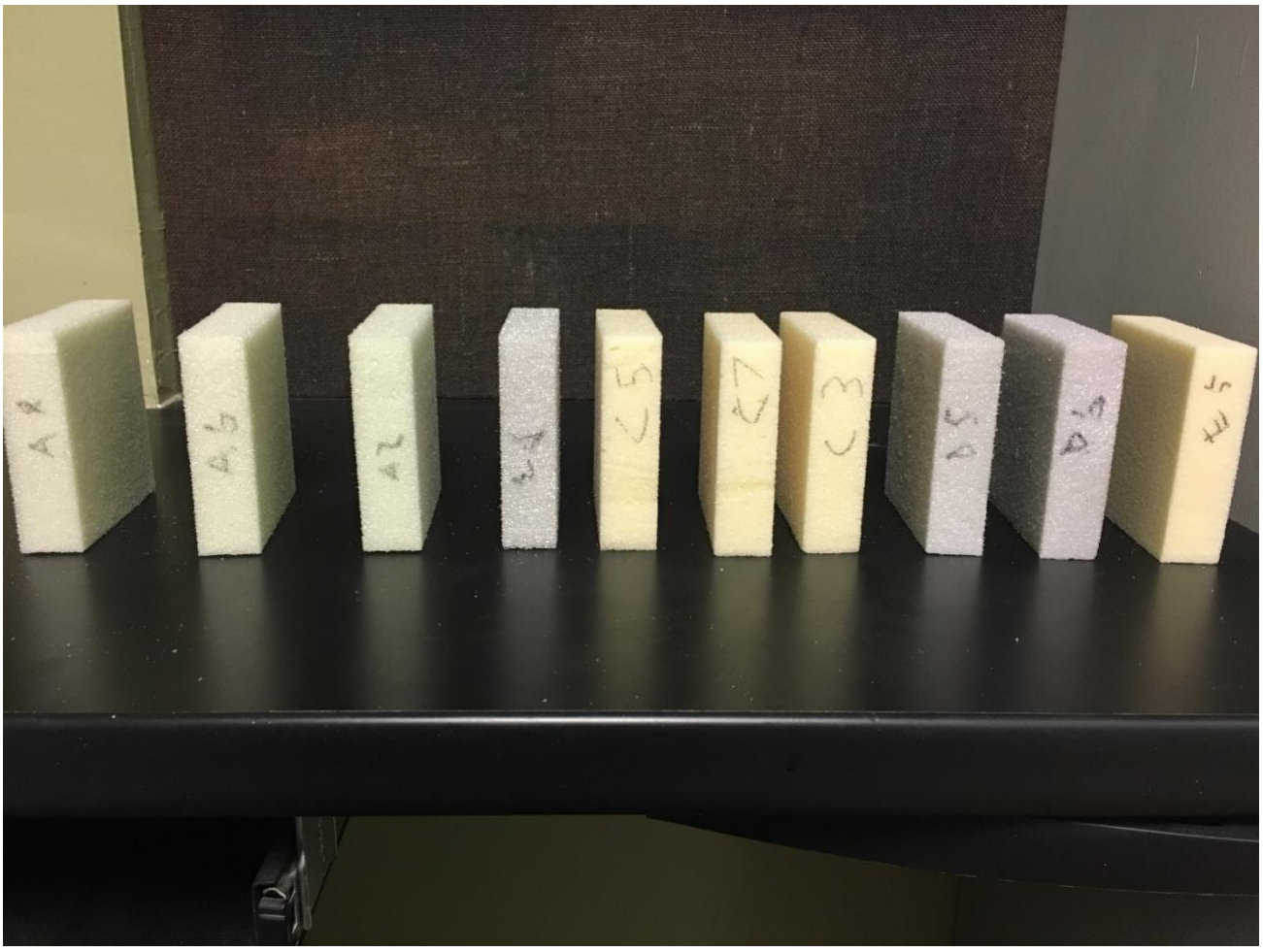
Note: All aging photos with more than one system are in the same order of products (from left to right):

1. **Product A – light green**
2. **Product B variant 1 – metallic silver**
3. **Postloc (on ratio) – light yellow**
4. **Product B variant 2 - gray**
5. **Postloc (off ratio) – sandy yellow**

AMBIENT AGING

INITIAL:



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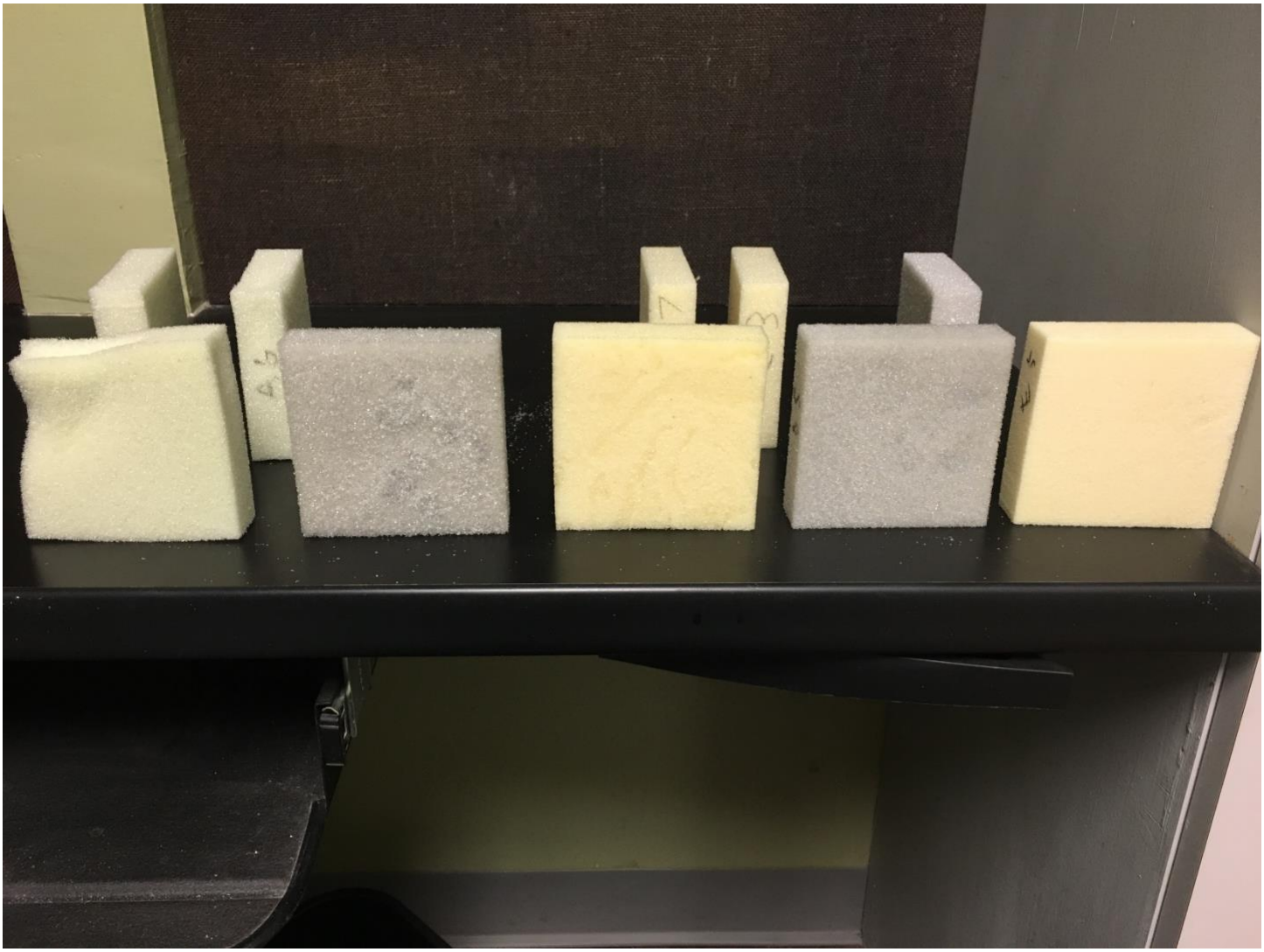
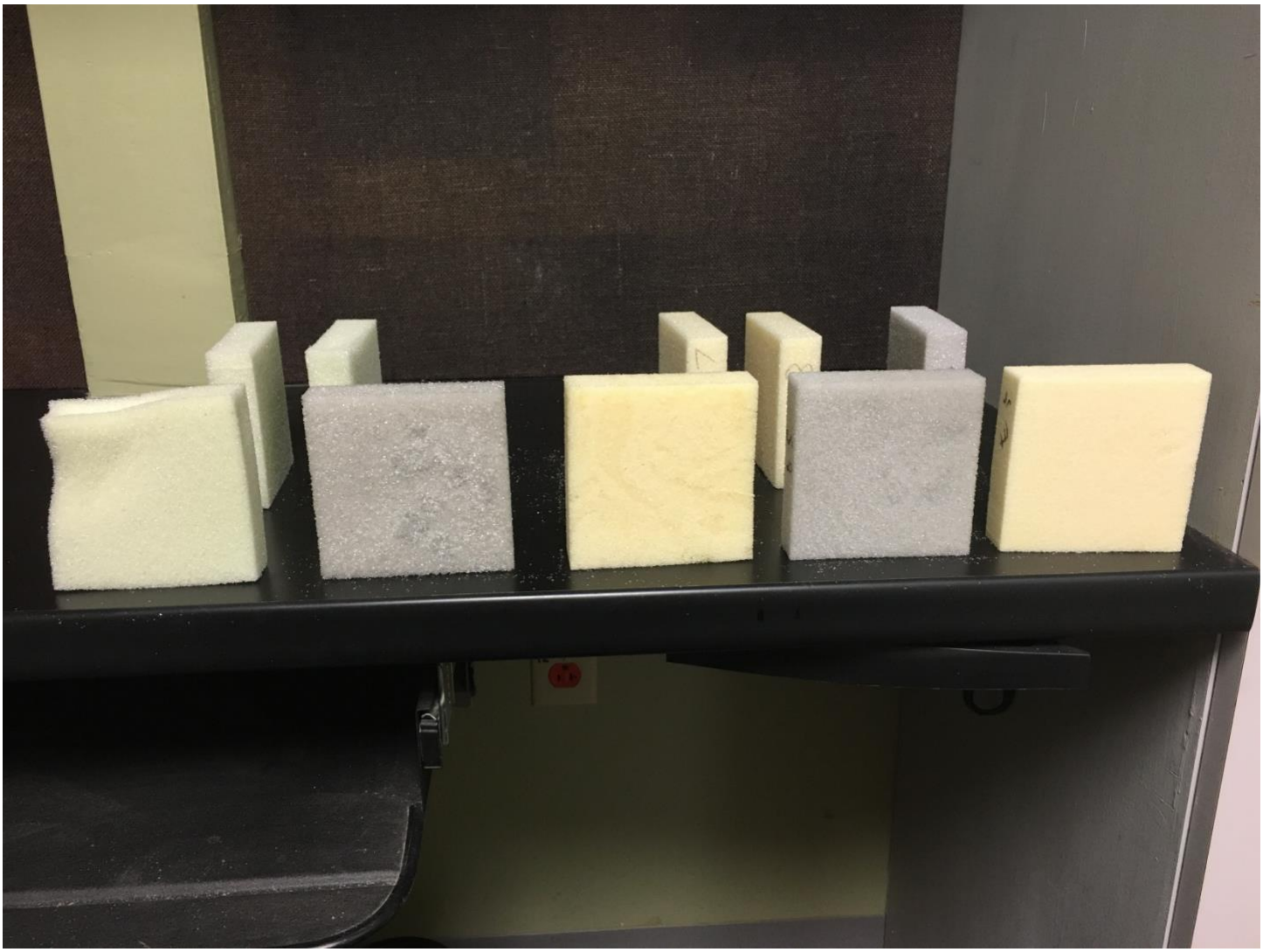
AFTER 1 DAY:

Postloc®



Postloc®

AFTER 7 DAYS:

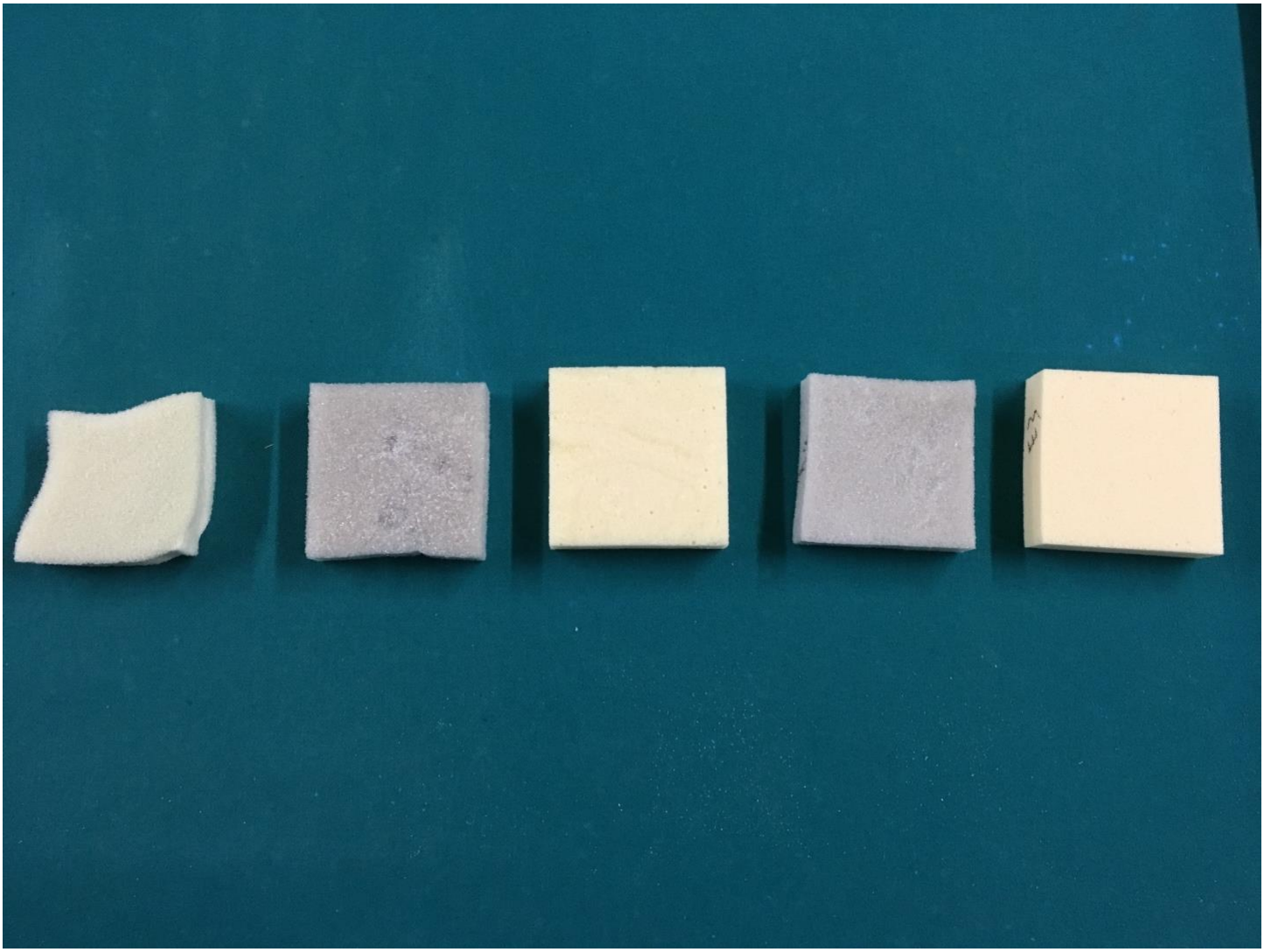


DRY HEAT AGING

INITIAL:

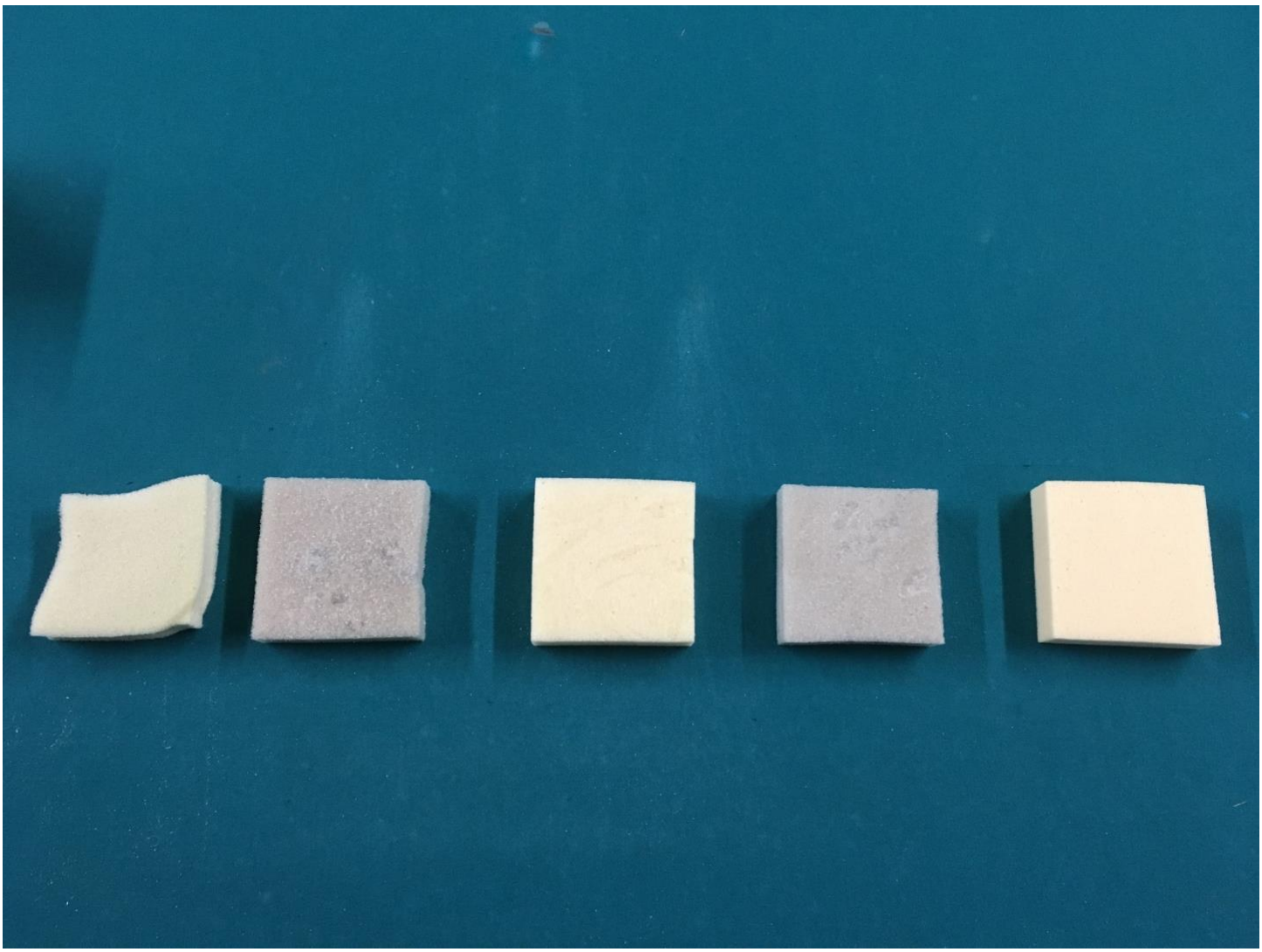
AFTER 1 DAY:

Postloc®



Postloc®

AFTER 7 DAYS:



HUMID AGING

INITIAL:

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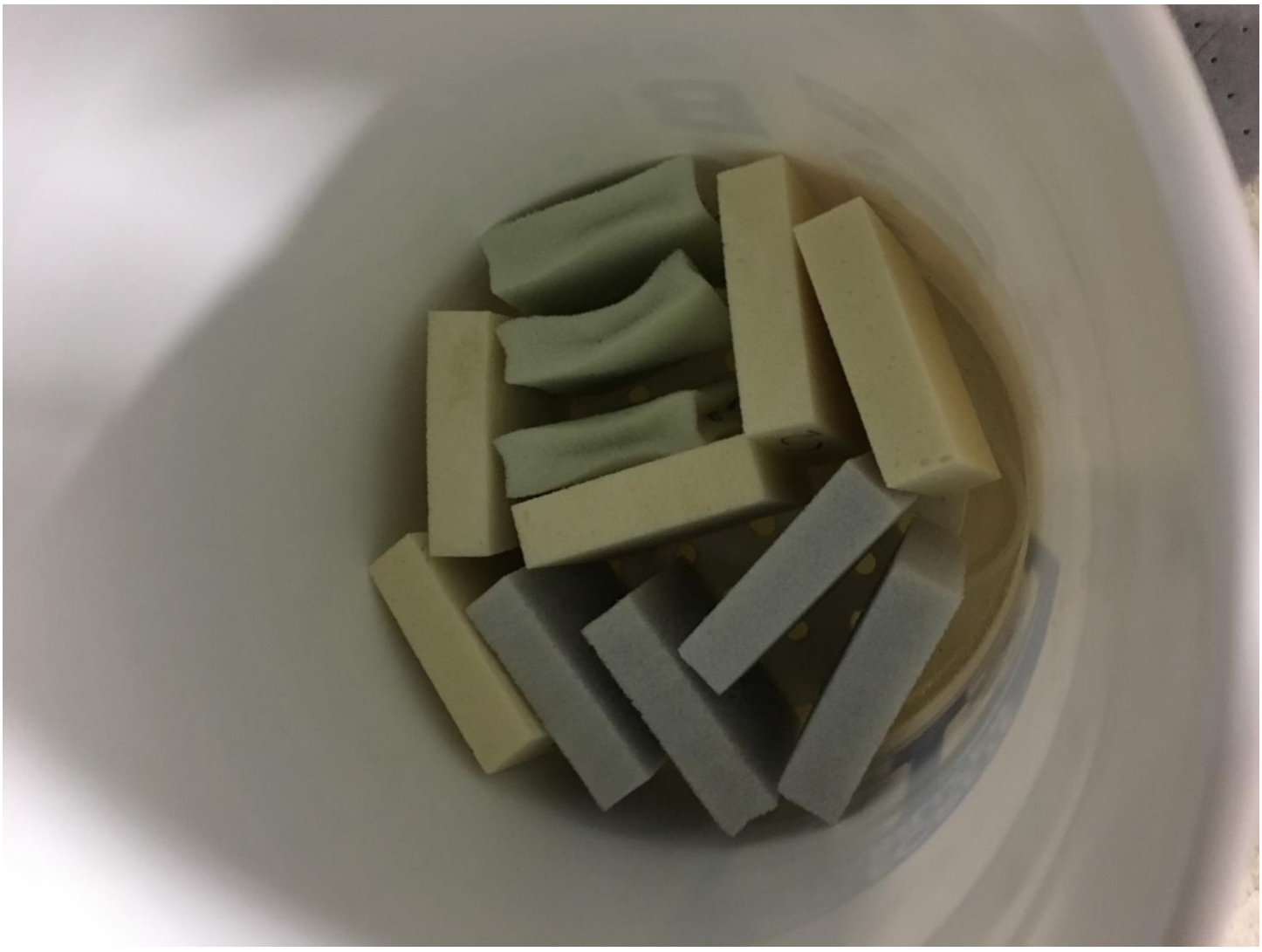
AFTER 1 DAY:



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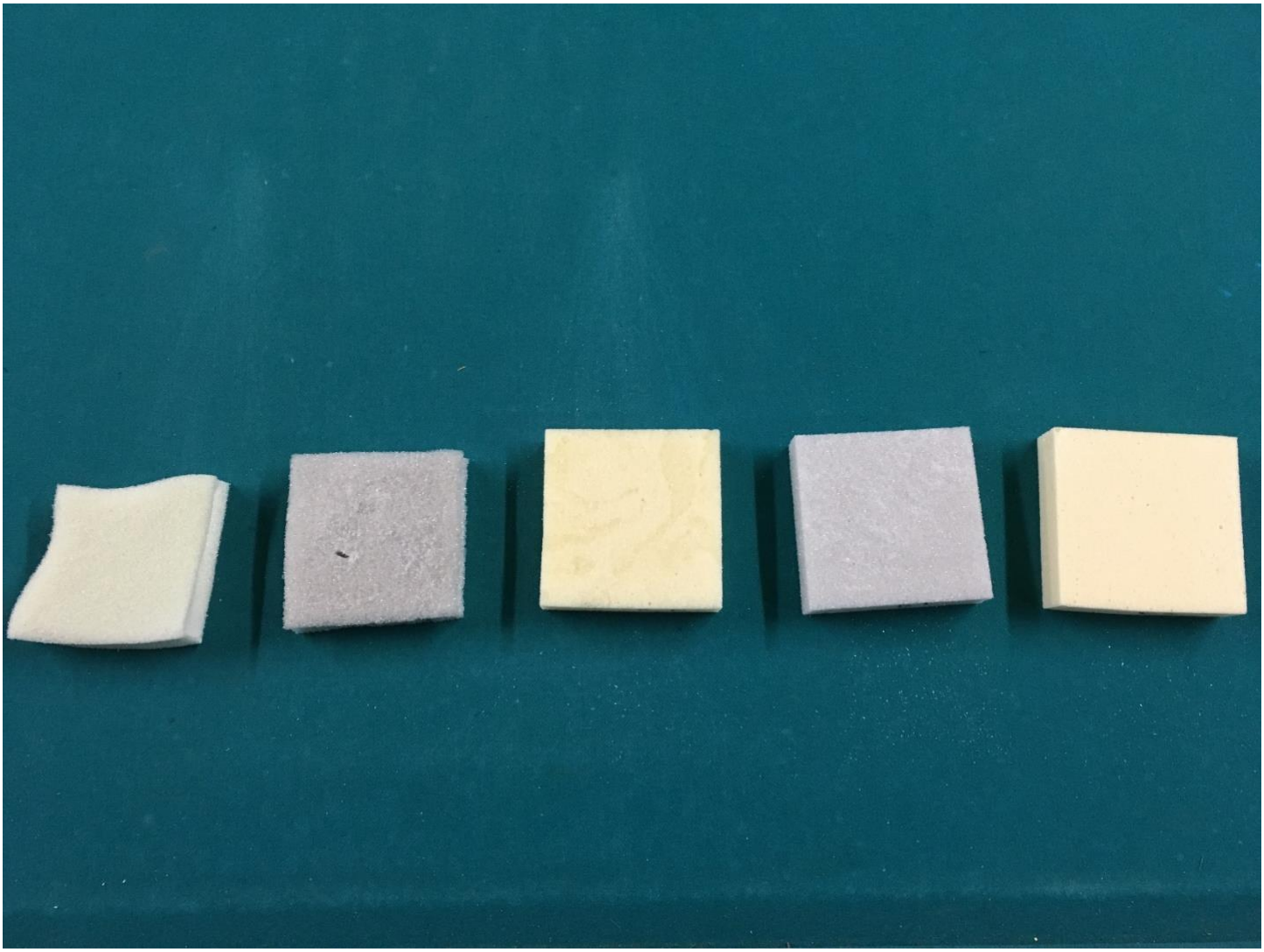

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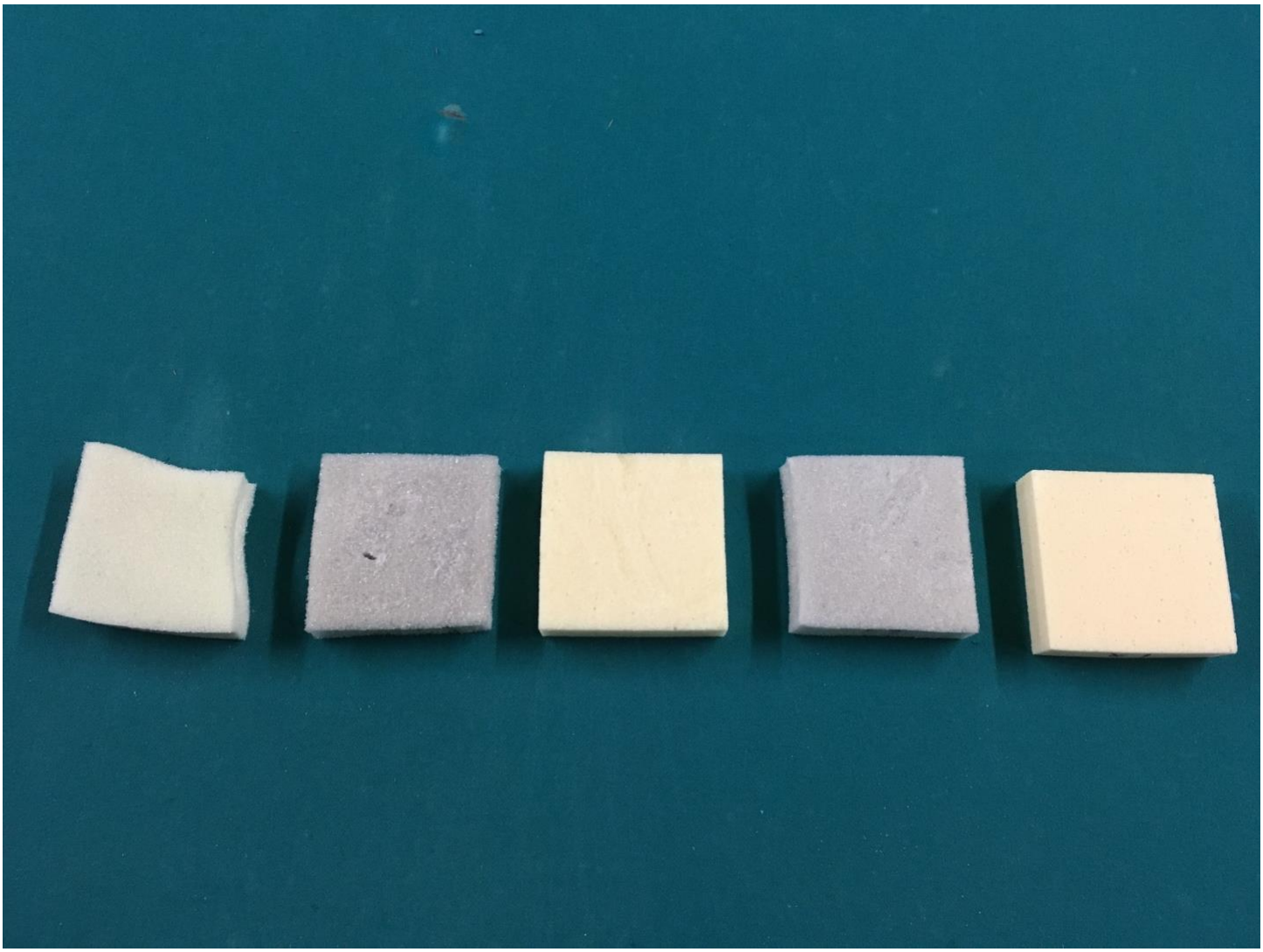
AFTER 7 DAYS:



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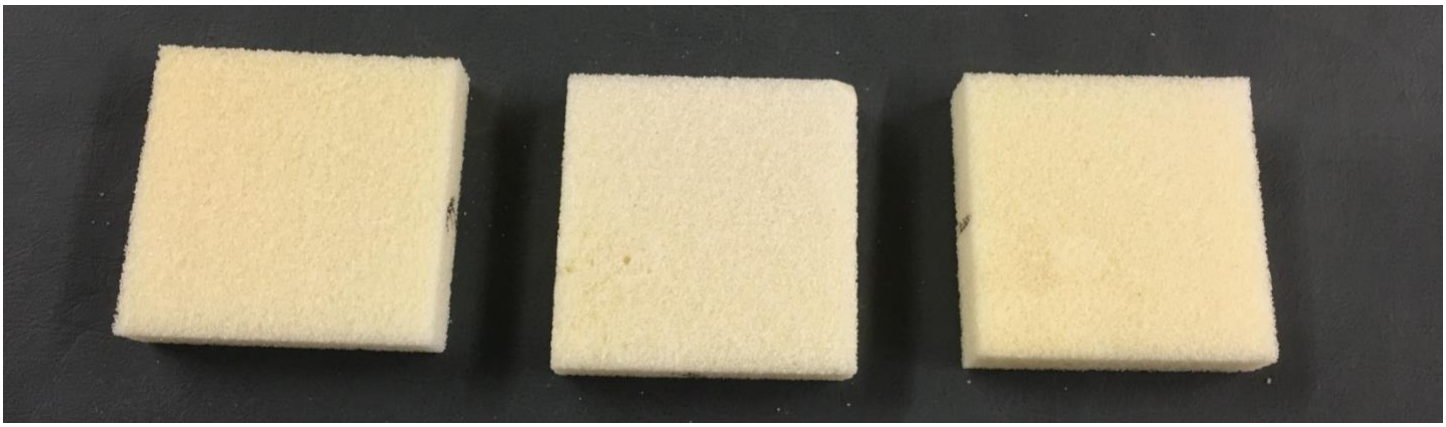
Prouct C HUMID AGING

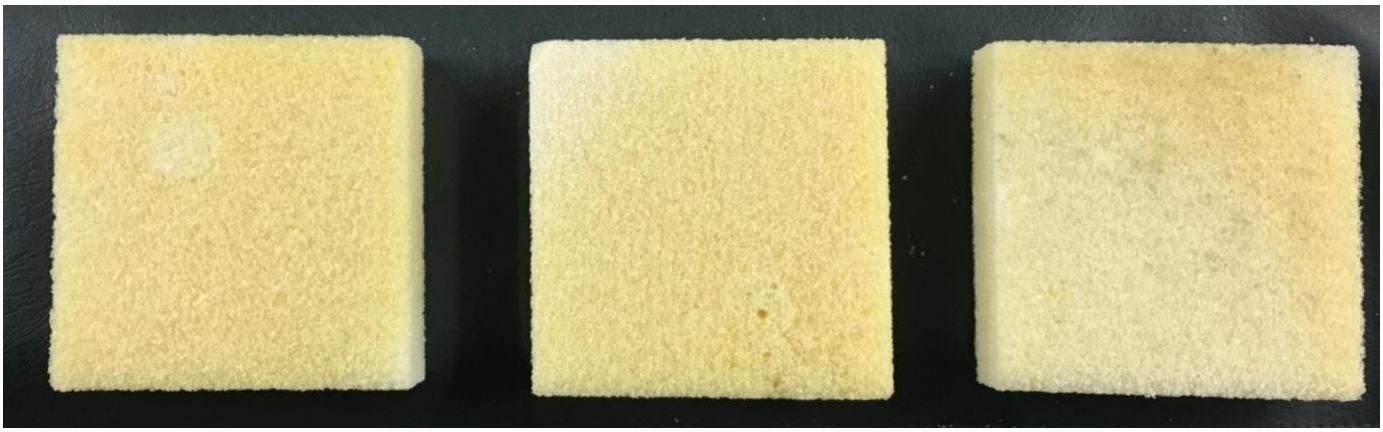
This system was run separately from the other systems because the sample was not present at the time the original 5 were run.

Before:



After 1 week:

- **The system showed discoloration after being in humid aging.**

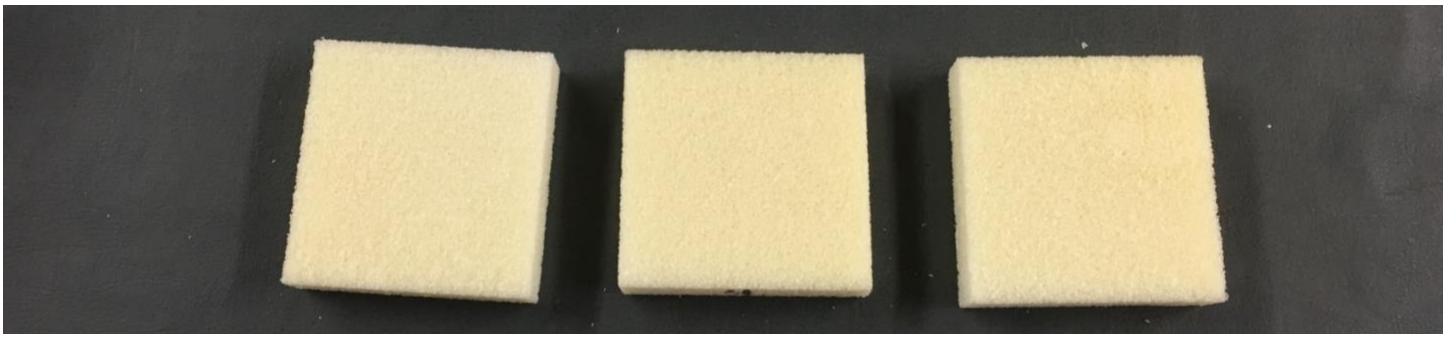


Note: A picture was not taken after 1 day due to the sample being placed on a Friday. The system passed humid aging easily so this did not affect the outcome of the pictures for visual purposes.

Product C DRY HEAT AGING

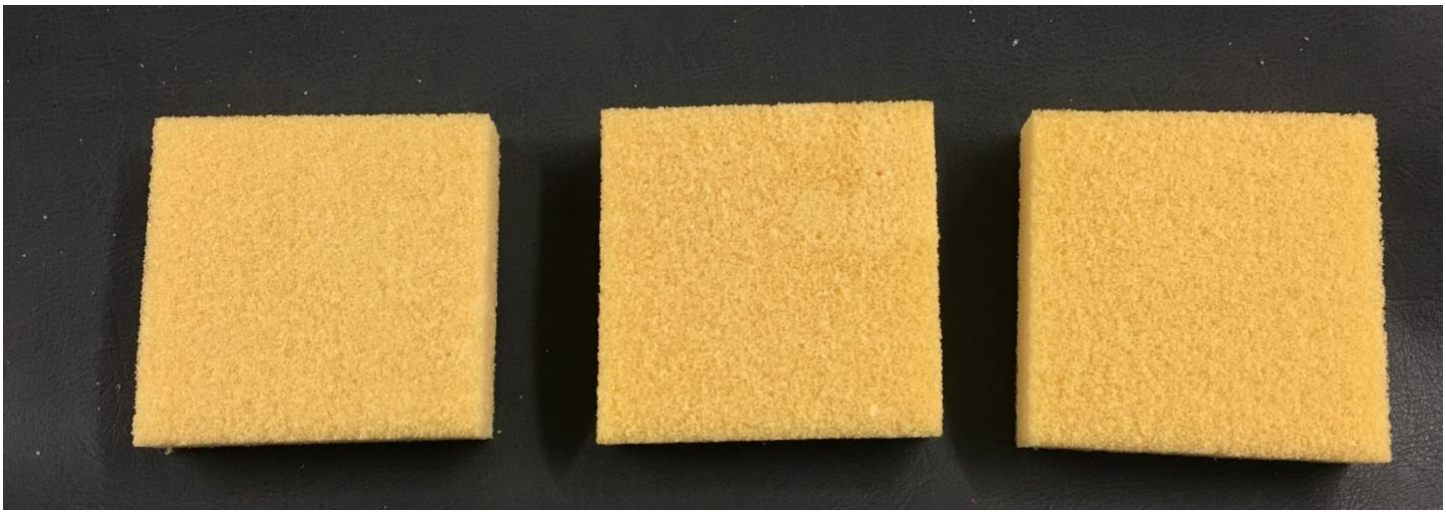
This system was run separately from the other systems because the sample was not present at the time the original 5 were run.

Before:



After 1 week:

- **The system showed discoloration after being in dry heat aging.**



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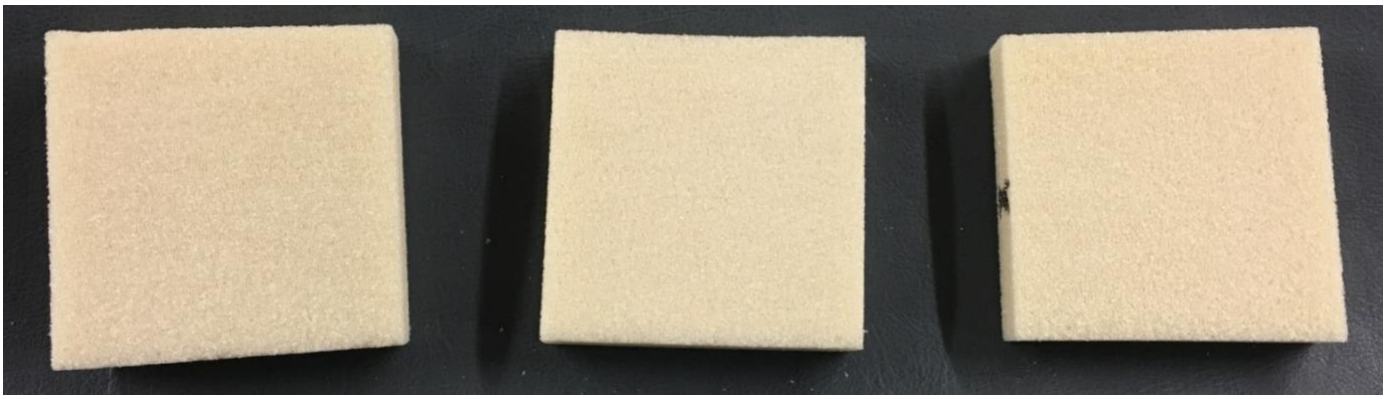
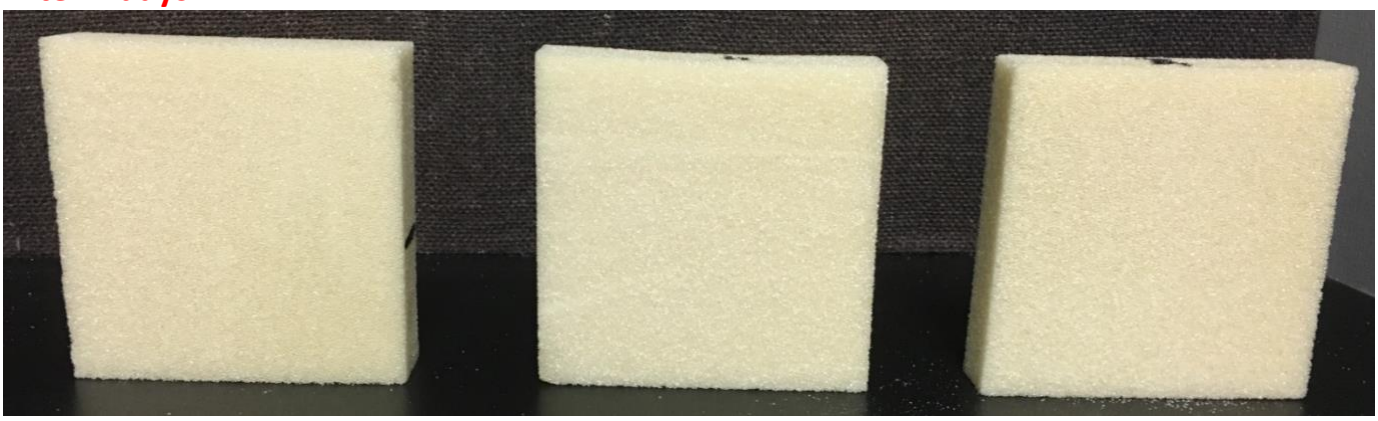
Note: A picture was not taken after 1 day due to the sample being placed on a Friday. The system passed humid aging easily so this did not affect the outcome of the pictures for visual purposes.

Product D Humid Aging:

Before:



After 7 days:



Note: A picture was not taken after 1 day due to the sample being placed on a Friday. The system passed humid aging easily so this did not affect the outcome of the pictures for visual purposes.

Postloc®

PRICING TABLE

Fence Post Kit Pricing			
Product	**Total Volume (fl oz.)**	**Packaging**	**Unit Price ($)**
Product C	22.83	aseptic packaging w/ exterior clamp	Unavailable
Product B variant 1	26	aseptic packaging w/ exterior clamp	16.99
Product B variant 2	12.4	aseptic packaging w/ exterior clamp	12.99
Product A	33	aseptic packaging w/ burstable interior seal	11.74
Product D	32	Plastic Bottles	15.74