

Belden's Experience with Thin Brick

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Flatback (2-face)

- Bed depth variation in brick creates thickness variation in thin brick
- Some thin brick systems more forgiving (TABS II or equivalent)
- Meeting ASTM spec for thickness variation ($\pm 1/16''$) does not imply customer satisfaction.

PCI Dovetailed

- Flexible, silicone-based form liners are more forgiving than urethane and other, more rigid liners.
- Meeting PCI dimensional specs is difficult because, while the standard specifies measurements according to ASTM C67 (nearest 1/32")...

A. Thin Brick Units: PCI Standard, not less than 1/2 in. (13 mm) nor more than 1 in. (25 mm) thick with an overall tolerance of plus 0 in., minus 1/16 in. (+0 mm, -1.6 mm) for any unit dimension 8 in. (200 mm) or less and an overall tolerance of plus 0 in., minus 3/32 in. (+0 mm, -2.4 mm) for any unit dimension greater than 8 in. (200 mm) measured according to ASTM C 67.

PCI Dovetailed (continued)

- ...customers typically use digital calipers with precision to the nearest 1/1000”.

Sample	H1	H2	H3	Average	> +0 -.0625 (1/16)"
1	1.501	1.494	1.498	1.498	0.0648
2	1.54	1.539	1.56	1.546	0.0162
3	1.567	1.547	1.531	1.548	0.0142
4	1.486	1.496	1.525	1.502	0.0602
5	1.52	1.557	1.5	1.526	0.0368
6	1.48	1.514	1.51	1.501	0.0612
7	1.515	1.524	1.529	1.523	0.0398
8	1.524	1.54	1.564	1.543	0.0198
9	1.52	1.54	1.566	1.542	0.0205
10	1.534	1.505	1.488	1.509	0.0535
11	1.485	1.477	1.486	1.483	0.0798
12	1.527	1.51	1.505	1.514	0.0485

Rates by Style

3 shifts/day, 5 days/week

<u>2 Face Styles</u>	<u>Units/yr</u>	<u>BE/yr</u>	
Mod Ashberry Flat Unground	732,452	732,452	
Mod Ashberry Dovetail Ground	1,473,625	1,473,625	
Mod 503-5 Flat Unground	3,794,801	3,794,801	
Mod 503-5 Dovetail Ground	4,250,840	4,250,840	
Uty 470-9 Dovetail Ground	2,081,845	5,121,339	2.46 BE
Mod 470-9 Dovetail Ground	5,310,280	5,310,280	
Split Paver Ground	5,584,950	5,584,950	
Mod Concord Dovetail Ground	6,068,892	6,068,892	
Uty 470-9 Flat Unground	2,831,081	6,964,458	2.46 BE
Mod 470-9 Flat Unground	7,366,379	7,366,379	
Mod Concord Flat Unground	8,805,125	8,805,125	
Mod Belcrest 500 Flat Unground	9,633,843	9,633,843	

Blade Inventory

- Manual Hand Cut Saws
 - 14” (MK, Core, Diteq)
 - 18” (MK, Diteq, Clipper)
- Automatic Main Line
 - 20” (Diamond Products, Diamant Boart - Husqvarna, Tyrolit, ADI Tools, MK)
- Corner Saw
 - 40” (Diamant Boart – Husqvarna)

Items that Affect Recovery

- Coursing Patterns
 - Cross Setting
- Firing Characteristics
 - Reduction
 - Coal Flash
- Chippage and Breakage
 - The non-traditional face on 2-faced units

New Equipment Purchases

PARK SAW



CENTRIFUGE/THICKENING Tank



Water Filtration

- Old System
 - Return water collected in tank.
 - Water filtrated through diatomaceous earth filter.
 - Gray water (remaining volume) returned to saws for cooling.
- Current System
 - Created new isolation zones in tank.
 - Return water pumped to sieve bend.
 - Finer particulate settled in thickening tank with sludge deposited into lugger tray.

Diatomaceous Earth Drum

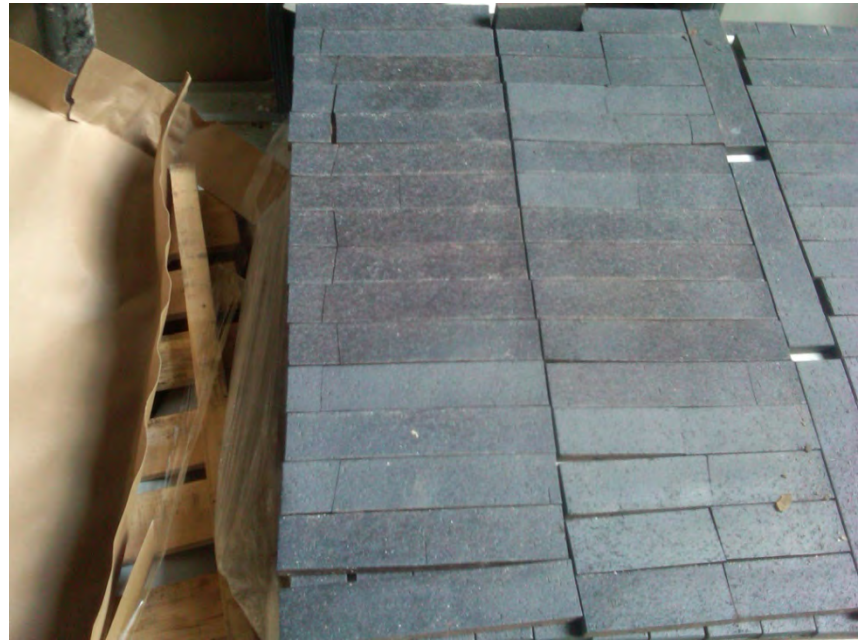


CENTRIFUGE/THICKENING Tank



Need for Clean Water



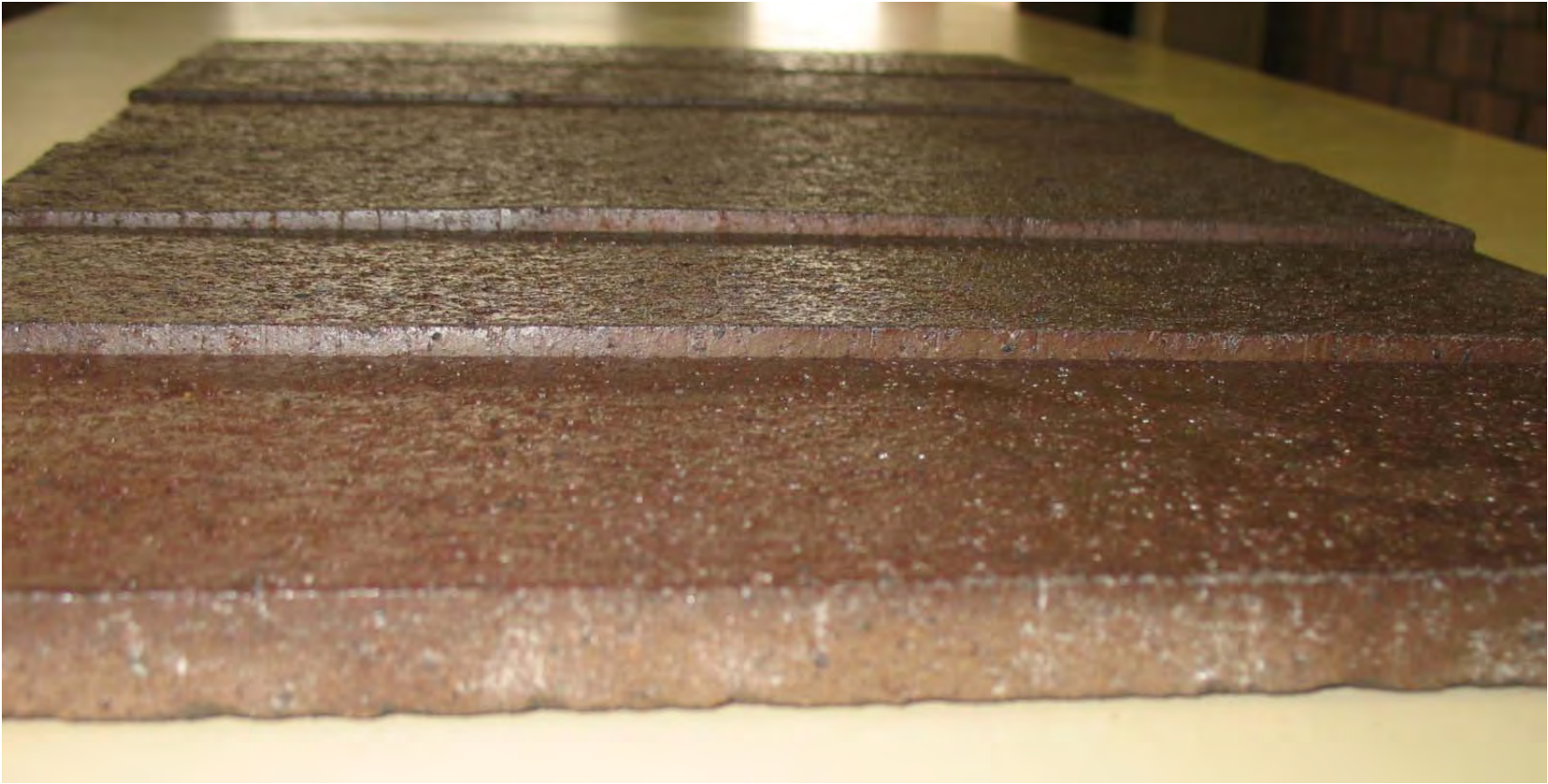




PCI Dovetailed

- The brickmaking process may result in uneven (convex) slabs that “rock” when placed into form liners.





- Rate of Cut (hardness of brick)
- Efficiency (Uptime)
- Recovery
- $\text{Rate} * \text{Downtime} * \text{Recovery} = \text{Output (in the box)}$

Effects of Cutting Hard Brick











