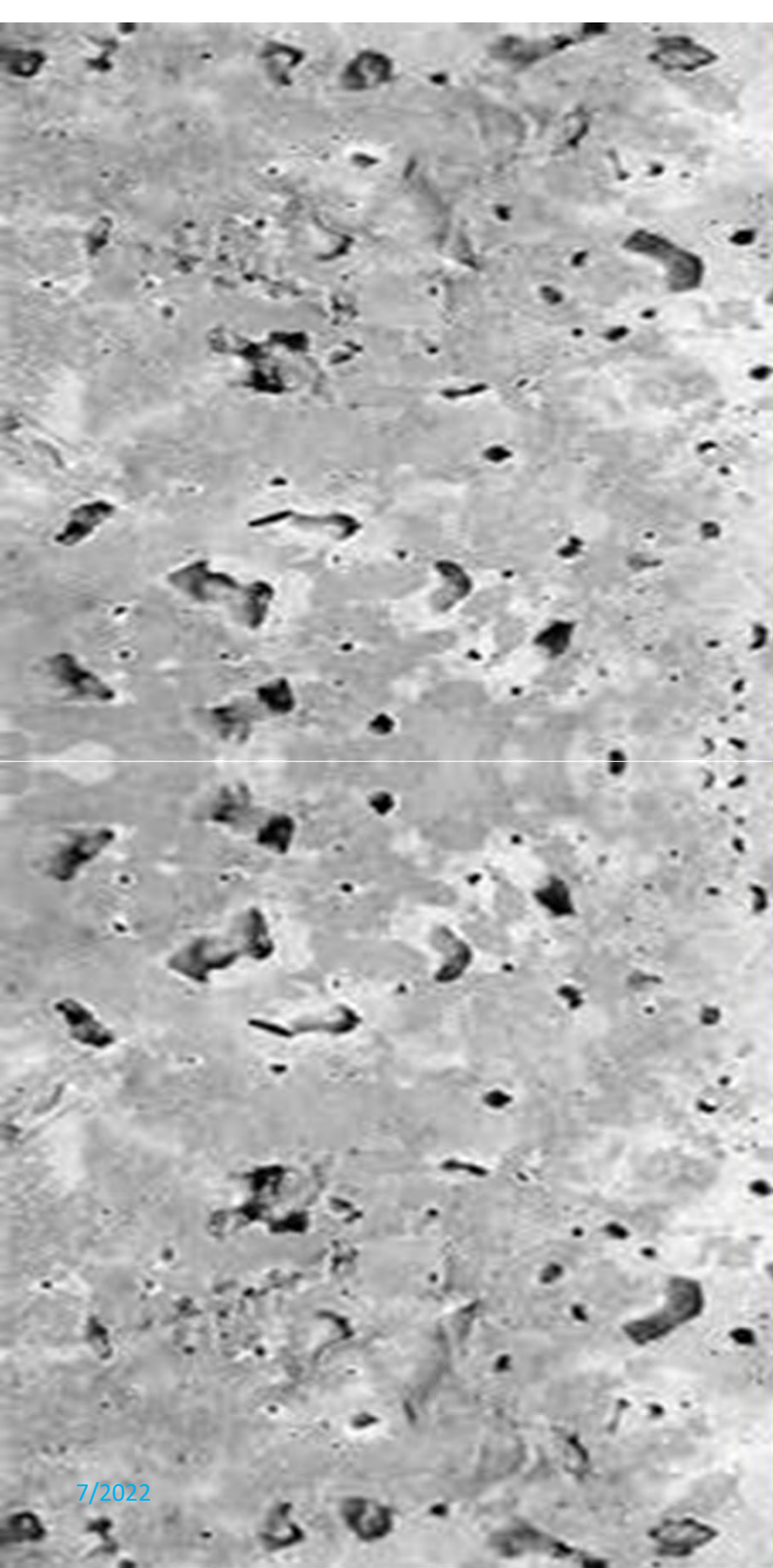


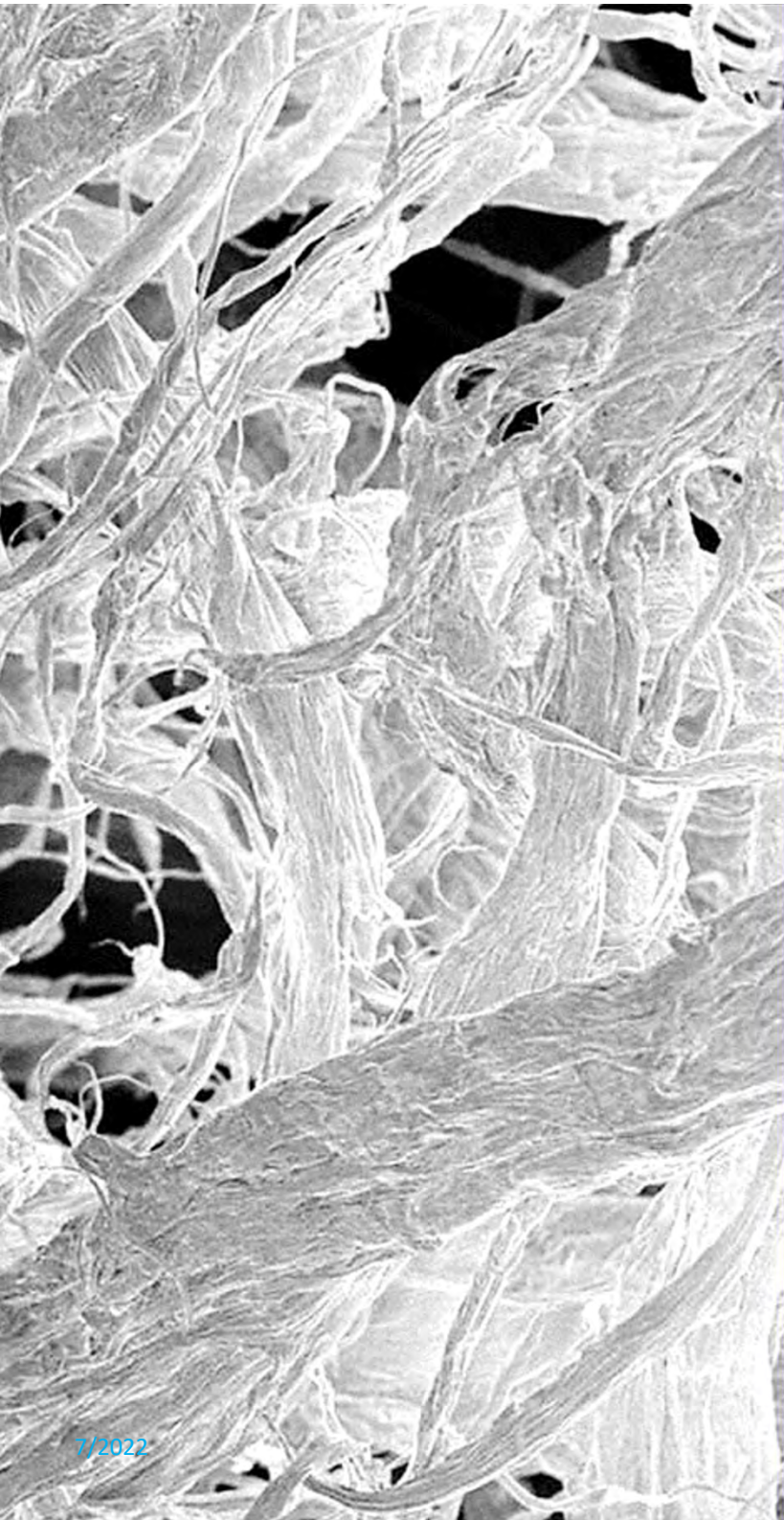
**Improving Cycle Time and  
Reducing Bug Holes in  
Cast Concrete Applications  
With Short Stuff<sup>®</sup> ESS5F**

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# Challenges for Cast Concrete

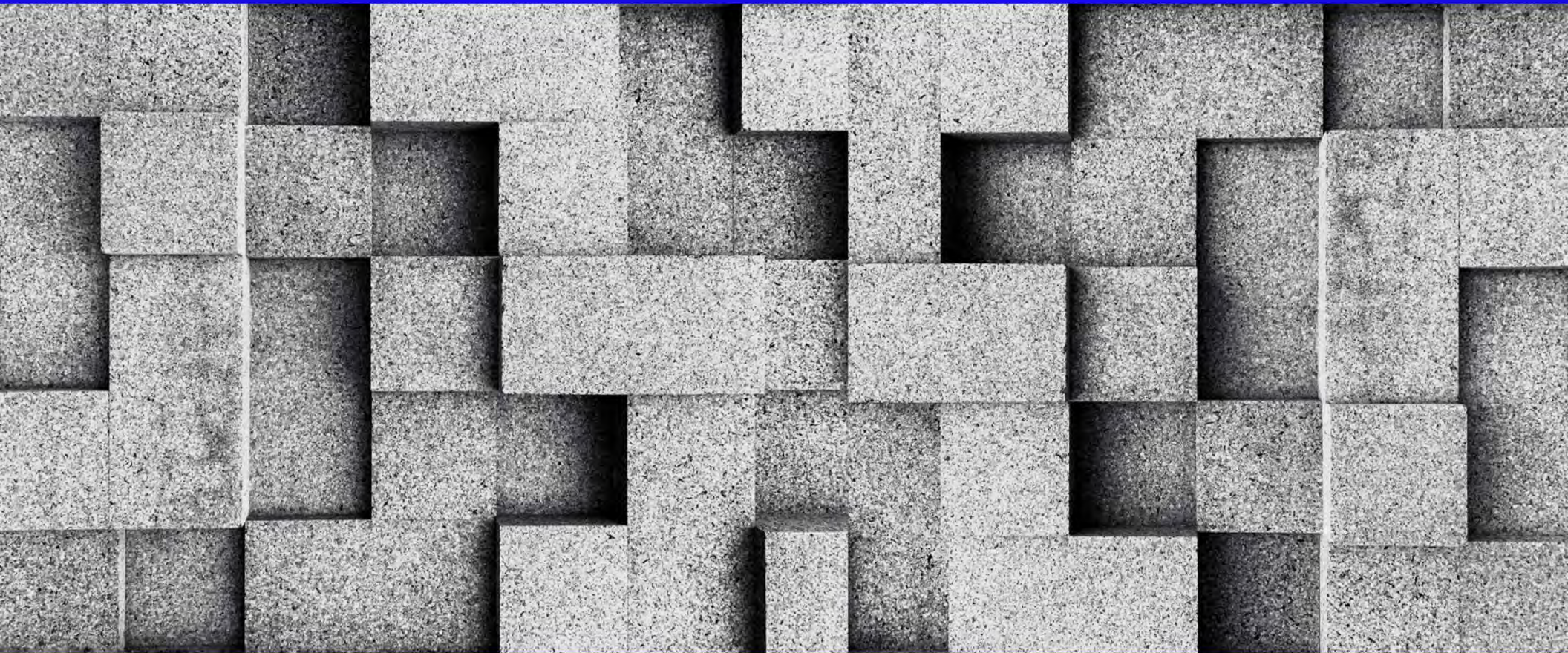
- Cure Rate
  - Determines production rate
- Surface blemishes
  - Bug Holes



# Short Stuff<sup>®</sup> Multi-Dimensional Structure

- Fine fibrils
- Secondary & tertiary fibrils
- High surface area to volume

# Compressive Strength Improvement Cast Concrete Formulation



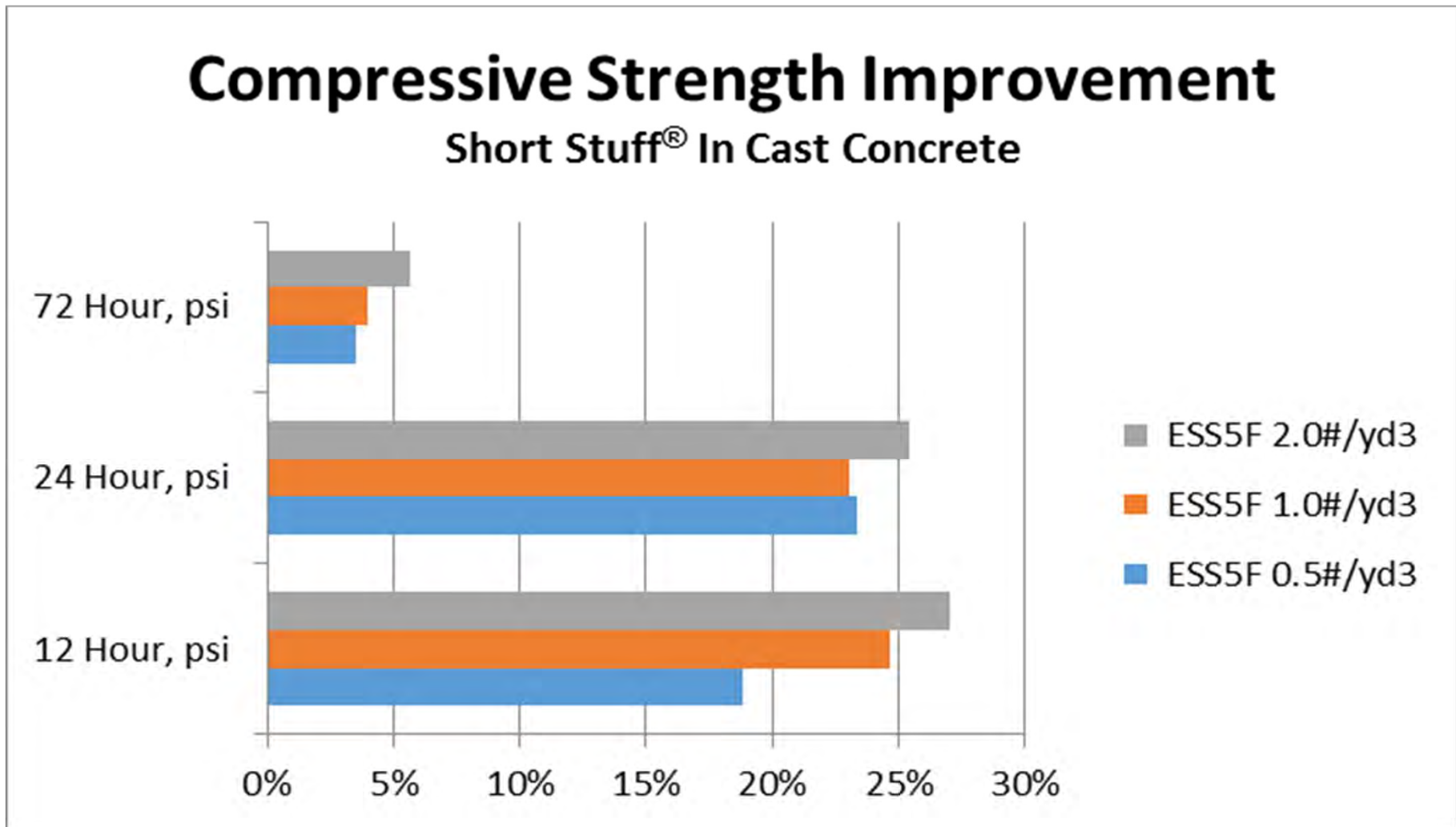
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# Cast Concrete Formulation

Material	lbs/yd <sup>3</sup>
River Sand	900
River Sand	898
1/2" Limestone	1888
Water	316.5
Entrained Air	2%
Unit Weight	148.3 lbs/ft <sup>3</sup>
w/c ratio	0.352
Glenium 7500 @	8 fl oz per cwt
MasterSet AC534	@ 40 fl oz per cwt

# Compression Strength

Increase at Various Addition Rates

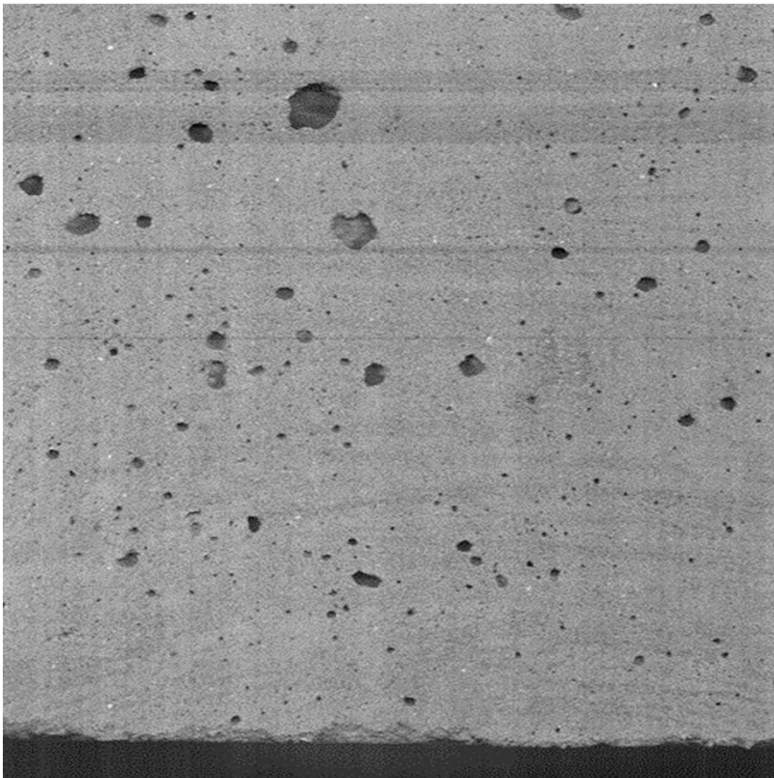


# Bug Hole Comparison

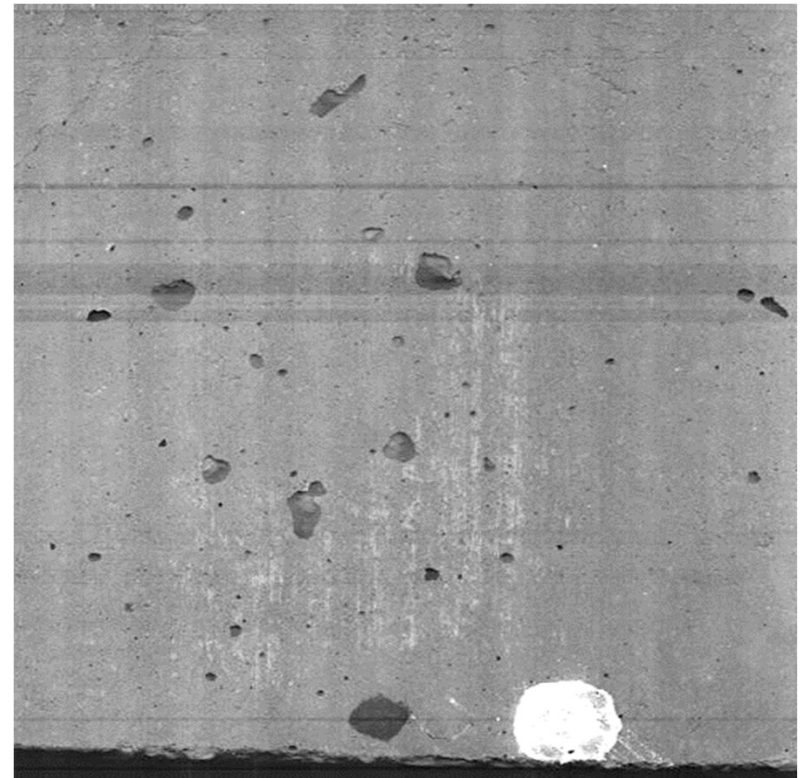


# Bug Hole Comparison

- Product: Short Stuff<sup>®</sup> ESS5F
- Load, typical: 0.6 to 1.0 #/yd<sup>3</sup>



Control (vibrated) 4.4% voids

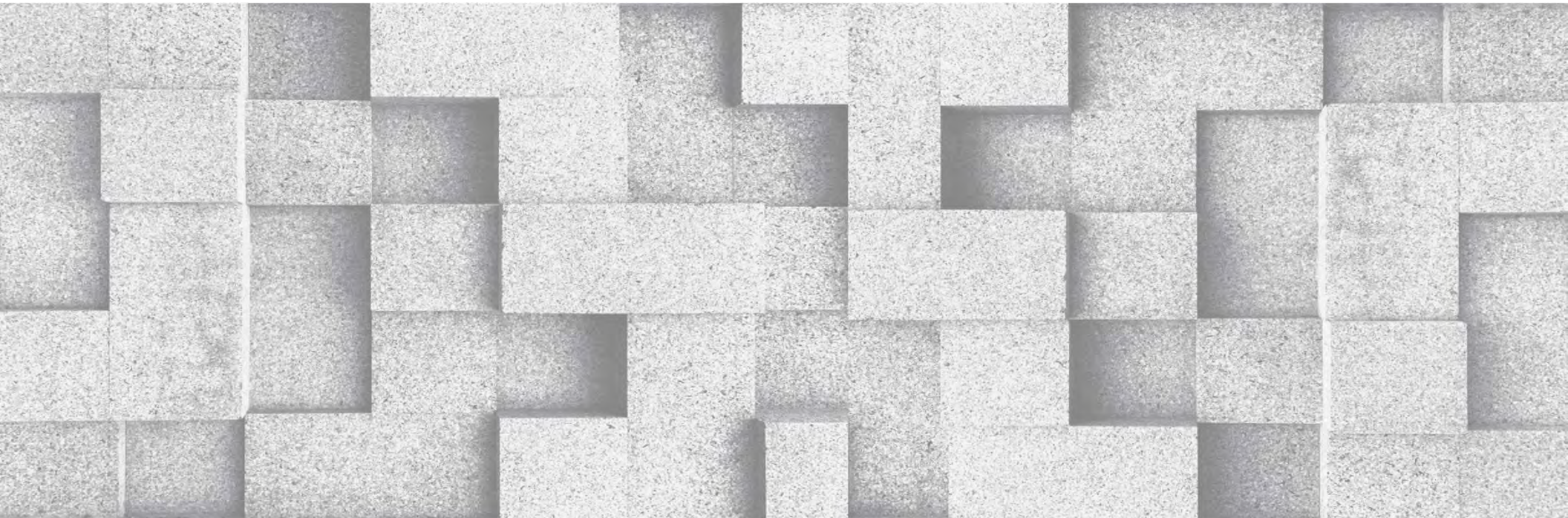


0.5#/yd<sup>3</sup> ESS5F (vibrated) 1.9% voids



# Summary

- **Short Stuff<sup>®</sup> ESS5F** improves early compressive strength
- **Short Stuff<sup>®</sup> ESS5F** significantly reduces bug hole formation



**Short Stuff<sup>®</sup>  
Grade ESS5F  
is available from:**

***MINIFIBERS, INC.***

**Telephone: 423-282-4242  
info@minifibers.com**

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