Concrete Admixture (CADD) Evaluation of:

Fritz-Pak Corporation

Fritz-Pak NCA

CADD-2025-01-031

April 29, 2026

Submitted to:

AASHTO Product Evaluation & Audit Solutions
555 12th St NW, Suite 1000
Washington, DC 20004

Attn: Keegan Visser
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Submitted by:

SGS TEC Services
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James G. McCants III
General Manager, Chemist

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Product Information

Product Name: Fritz-Pak NCA

Product Type: Type E

DataMine Number: CADD-2025-01-031

Manufacturer: Fritz-Pak Corporation

Manufacturer Address: 4821 Eastover Circle, Mesquite, Texas 75149

Manufacturer Contact: David Ojeda

Manufacturer Email/Phone: dot@fritzpack.com / (214) 221-9494

Date Received by Laboratory: April 4, 2025

NOTE: AASHTO Product Evaluation & Audit Solutions makes no judgement on evaluated products. AASHTO Product Evaluation & Audit Solutions conducts independent third party testing and provides the results of this testing to our state members. Any decision on product acceptability will be made by the individual state agencies, based upon their own internal specifications. Participation in the program does not guarantee acceptance to any state APL/QPLs.

AASHTO PRODUCT EVALUATION & AUDIT SOLUTIONS

Summary

Dear Mr. Visser:

SGS TEC Services is an AASHTO R18, ANS/ISO/IEC 17025:2017 and Army Corps of Engineers accredited laboratory. SGS TEC Services is pleased to present this interim report of our compliance verification testing of Fritz-Pak NCA an ASTM C494-19 *Standard Specification for Chemical Admixtures for Concrete*, Type E *(Water Reducing and Accelerating)* admixture. Our services were performed in accordance with CADD Testing Agreement AS 25-0029 dated November 21, 2024.

Sample preparation and testing was performed in accordance with applicable sections of AASHTO M194-23 *Standard Specifications for Chemical Admixtures for Concrete*, ASTM C494 and documents referenced therein. Material and procedures outlined in AASHTO M194 were used. Based on our results to date, Fritz-Pak NCA complies with the requirements in AASHTO M194 and Table 1 of ASTM C494. These test results pertain only to the samples tested.

The compliance verification was performed by SGS TEC Services in Lawrenceville, Georgia. Concrete batching was performed on three different days in April of 2025. One control mixture and one test mixture containing Fritz-Pak NCA both meeting the requirements of AASHTO M194 and ASTM C494 for fresh concrete properties, were produced each day. One 2-bags sample of Fritz-Pak NCA was supplied to SGS TEC Services by Fritz-Pak Corporation. The air-entraining agent used in this testing was a commercially available vinsol resin meeting the requirements of AASHTO M154-12 (2020) *Standard Specification for Air-Entraining Admixtures for Concrete*.

Testing of the concrete's plastic properties, time of setting, compressive strengths, flexural strengths, length change, and freeze thaw resistance were performed by SGS TEC Services. Mixture proportions and results of our testing are given in Tables 1 to 3. Information and test data on fine and coarse aggregates are listed in Tables 4 to 6. Table 7 contains information on Fritz-Pak NCA. Product information and test data on the Type I/II cement is included in Table 8. Test results for each of the six batches prepared for this report are included in Tables 9 thru 12.

We appreciate the opportunity to provide our services to you on this project. Should you have any questions or comments regarding this report, please feel free to contact us at your convenience.

Sincerely,

SGS TEC Services, Inc.

James G. McCants III
General Manager, Chemist

Testing Results

Table 1: Fritz-Pak NCA performance and ASTM C494 requirements for a Type E admixture.

Test Results	Fritz-Pak NCA	Specification Requirements
Water content (percent of control)	93	95 (max)
Time of setting, deviation of control		
Initial (hr:min)	-1:20	-1:00 to -3:30
Final (hr:min)	-1:47	-1:00 (min)
Compressive strength (percent of control)		
3 days	128	125 (min)
7 days	121	110 (min)
28 days	117	110 (min)
56 days	115	110 (min)
90 days	118	n/a
6 months	115	100 (min)
1 year	113	100 (min)
Flexural strength (percent of control)		
3 days	109	110 (min)
7 days	107	100 (min)
28 days	110	100 (min)
56 days	110	100 (min)
Length change (increase over control)	+0.003	+0.010 (max)
Relative durability factor	96	80 (min)

*Provisional Requirement

Table 2: Mixture proportions, fresh concrete properties, and ASTM C494 requirements for Type E admixture.

Average of Three Separate Tests	Control Mixture	Fritz-Pak NCA	Specification Requirements
Cement factor (lb/yd^3)	514	516	517 ± 5
Water (lb/yd^3)	285	266	
Water-cement ratio	0.553	0.515	
Coarse aggregate	1841	1845	
Fine aggregate	1149	1199	
Fine aggregate-total aggregate ratio	0.38	0.39	
Fritz-Pak NCA (% cwt)	0.00	2.35	
Vinsol Resin (oz/cwt)	0.85	0.83	
Slump (in.)	3.50	3.00	3 ½ ± ½
Air content (%)	6.0	5.8	5-7 (± 0.5 of control)
Density (lb/ft^3)	140.3	141.6	
Time of setting			
Initial (hr:min)	4:04	2:44	
dev. of control (hr:min)		-1:20	-1:00 to -3:30
Final (hr:min)	5:43	3:56	
dev. of control (hr:min)		-1:47	-1:00 (min)

Table 3: Properties of hardened concrete.

Test Performed	Control Mixture	Fritz-Pak NCA
Compressive strength (psi)		
3 days	2810	3600
7 days	3820	4610
28 days	4910	5750
56 days	5330	6130
90 days	5460	6450
6 months	5490	6330
1 year	5580	6300
Flexural strength (psi)		
3 days	520	565
7 days	600	640
28 days	630	695
56 days	660	725
Length change (%)	-0.037	-0.040
Durability factor (%)	96	92

Table 4: Properties of fine and coarse aggregates.

Aggregate Information	Fine aggregate	Coarse aggregate
Manufacturer	**Lambert Sand, Shorter**	**Vulcan, Lithonia**
Aggregate Type	Natural sand	Crushed Granite
Specific Gravity $_{SSD}$	2.628	2.631
Absorption (%)	0.62	0.37

Table 5: Gradation of fine aggregate and ASTM C494 requirements.

Percent passing		
Sieve	**Fine Aggregate**	**Specifications Requirements**
No. 4 (4.75 mm)	100	100
No. 16 (1.18 mm)	72	65 to 75
No. 50 (300 µm)	17	12 to 20
No. 100 (150 µm)	2	2 to 5

Table 6: Gradation of coarse aggregate and ASTM C494 requirements.

Percent passing		
Sieve	**Coarse Aggregate**	**Specifications Requirements**
1.5 in. (37.5 mm)	100	100
1.0 in. (25.4 mm)	98	95 to 100
0.5 in. (12.5 mm)	36	25 to 60
No. 4 (4.75 mm)	1	0 to 10
No. 8 (2.36 mm)	0	0 to 5

Table 7: Admixture information.

Information	Admixture Information
Brand Name	Fritz-Pak NCA
Manufacturer	Fritz-Pak Corporation
Lot Size	500 lbs
Solid content (%)	98.969
pH	7.52
Chloride Content (%) per BS EN 480-10:2009)	0.023

Table 8: Cement information and test data.

ASTM C 150 Type I/II cement			
Brand name		Portland Type I/II	
Manufacturer		Cemex Clinchfield Plant	
Chemical Analyses by Mass (%)			
Silicon dioxide (SiO_2)	20.4	Sulfur trioxide (SO_3)	3.3
Aluminum oxide (Al_2O_3)	4.8	Loss on ignition (950ºC)	2.5
Iron oxide (Fe_2O_3)	3.3	Insoluble residue	0.29
Calcium oxide (CaO)	65.0	Alkalies as Na_2O	0.46
Magnesium oxide (MgO)	0.9		
Calculated Potential Compounds as per ASTM C 150-05 (%)			
Tricalcium silicate (C_3S)	62	Tricalcium aluminate (C_3A)	7.0
Dicalcium silicate (C_2S)	11	Tetracalcium aluminoferrite (C_4AF)	10
Physical Testing and Results			
Fineness Specific Surface (Blaine)	426 m^2/Kg	Air Content (%)	6.5
Setting Times (Vicat) Initial	88 minutes	Autoclave Expansion (%)	0.00
Compressive 3 Day Strength (psi)	3640	Compressive 7 Day Strength (psi)	4970
C1038 Expansion @ 4.20% SO_3 (%)	-0.019	Density of Hydraulic Cement (g/cm^3)	3.13

Table 9: Yield adjusted mixture proportions, fresh concrete properties, and time of set for three control batches.

Materials & Plastic Properties	Control 1	Control 2	Control 3	Average
Cement factor (lb/yd^3)	515	513	515	**514**
Water (lb/yd^3)	283	285	286	**285**
Water-cement ratio	0.550	0.555	0.555	**0.553**
Coarse aggregate (lb/yd^3)	1843	1837	1843	**1841**
Fine aggregate (lb/yd^3)	1155	1144	1147	**1149**
Fine aggregate-total aggregate ratio	0.385	0.384	0.384	**0.384**
Fritz-Pak NCA (% cwt)	0.00	0.00	0.00	**0.00**
Vinsol Resin (oz/cwt)	0.85	0.85	0.85	**0.85**
Slump (in.)	3.50	3.75	3.50	**3.50**
Air content (%)	5.9	6.2	5.9	**6.0**
Density (lb/ft^3)	140.6	140.0	140.4	**140.3**
Time of setting				
Initial (hr:min)	4:00	4:05	4:08	**4:04**
Final (hr:min)	5:40	5:45	5:44	**5:43**

Table 10: Yield adjusted mixture proportions, fresh concrete properties, and time of set for three test batches containing Fritz-Pak NCA.

Materials & Plastic Properties	Test 1	Test 2	Test 3	Average
Cement factor (lb/yd^3)	517	514	516	**516**
Water (lb/yd^3)	265	265	267	**266**
Water-cement ratio	0.513	0.515	0.517	**0.515**
Coarse aggregate (lb/yd^3)	1850	1839	1845	**1845**
Fine aggregate (lb/yd^3)	1205	1195	1196	**1199**
Fine aggregate-total aggregate ratio	0.394	0.394	0.393	**0.394**
Fritz-Pak NCA (% cwt)	2.35	2.35	2.35	**2.35**
Vinsol Resin (oz/cwt)	0.80	0.85	0.85	**0.83**
Slump (in.)	3.00	3.25	3.00	**3.00**
Air content (%)	5.5	6.1	5.8	**5.8**
Density (lb/ft^3)	142.1	141.2	141.6	**141.6**
Time of setting				
Initial (hr:min)	2:48	2:41	2:44	**2:44**
Final (hr:min)	3:57	3:56	3:55	**3:56**

Table 11: Properties of hardened concrete from three control test batches.

Test Age	Control 1	Control 2	Control 3	Average
Compressive strength (psi)				
3 days	2710	2780	2940	**2810**
7 days	3740	3880	3840	**3820**
28 days	4550	4870	5320	**4910**
56 days	5180	5030	5770	**5330**
90 days	5360	5440	5580	**5460**
6 months	5520	5400	5560	**5490**
1 year	5530	5560	5640	**5580**
Flexural strength (psi)				
3 days	535	490	540	**520**
7 days	590	565	640	**600**
28 days	580	610	695	**630**
56 days	620	645	715	**660**
Length change (%)	-0.038	-0.035	-0.037	**-0.037**
Durability Factor (%)	96	96	96	**96**

Approximate Total Cycles Completed	Fundamental Transverse Frequency, kHz			Relative Dynamic Modulus (%) Average of 2 Beams per Mix			Average
	Control 1	Control 2	Control 3	Control 1	Control 2	Control 3	
0 cycles	2.086	2.041	2.041	NA	NA	NA	NA
32 cycles	2.086	2.041	2.041	100	100	100	100
66 cycles	2.086	2.041	2.041	100	100	100	100
96 cycles	2.086	2.041	2.041	100	100	100	100
128 cycles	2.086	2.041	1.997	100	100	96	99
162 cycles	2.086	2.041	1.997	100	100	96	99
192 cycles	2.086	2.041	1.997	100	100	96	99
220 cycles	2.086	1.997	1.997	100	96	96	97
253 cycles	2.041	1.997	1.997	96	96	96	96
287 cycles	2.041	1.997	1.997	96	96	96	96
300 cycles	2.041	1.997	1.997	96	96	96	96

Table 12: Properties of hardened concrete from three batches containing Fritz-Pak NCA.

Test Age	Test 1	Test 2	Test 3	Average
Compressive strength (psi)				
3 days	3640	3300	3870	**3600**
7 days	4650	4410	4770	**4610**
28 days	5510	5320	6430	**5750**
56 days	6430	5710	6250	**6130**
90 days	6560	6270	6510	**6450**
6 months	6440	5970	6590	**6330**
1 year	6460	6150	6280	**6300**
Flexural strength (psi)				
3 days	565	540	585	**565**
7 days	635	630	660	**640**
28 days	690	670	730	**695**
56 days	730	675	775	**725**
Length change (%)	-0.046	-0.036	-0.038	**-0.040**
Durability Factor (%)	92	96	88	**92**

Approximate Total Cycles Completed	Fundamental Transverse Frequency, kHz			Relative Dynamic Modulus (%) Average of 2 Beams per Mix			Average
	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3	
0 cycles	2.130	2.086	2.130	NA	NA	NA	NA
32 cycles	2.130	2.086	2.130	100	100	100	100
66 cycles	2.086	2.086	2.130	96	100	100	99
96 cycles	2.086	2.086	2.086	96	100	96	97
128 cycles	2.086	2.086	2.086	96	100	96	97
162 cycles	2.041	2.086	2.041	92	100	92	95
192 cycles	2.041	2.086	2.041	92	100	92	95
220 cycles	2.041	2.086	2.041	92	100	92	95
253 cycles	2.041	2.041	1.997	92	96	88	92
287 cycles	2.041	2.041	1.997	92	96	88	92
300 cycles	2.041	2.041	1.997	92	96	88	92