

NRMCA Lab Evaluation – Nano catalyst

In this limited study the performance of concrete made with 28 oz/cwt. of a nanocatalyst (NC) was evaluated. The control mixture had a 3 oz/cwt. of a water reducing admixture. The target w/cm , and the total cementitious content were 0.50, and 550 lb/yd³ respectively.

Experimental Results

Designation	0.50FA20	0.50FA20NC
Yield Adjusted Proportions		
Total Cementitious	550	546
Low Alkali Portland cement, lb/yd ³	440	437
Fly Ash, lb/yd ³	110	109
GGP, lb/yd ³	0	0
Coarse Agg. (No.57), lb/yd ³	1885	1867
Fine Aggregate, lb/yd ³	1367	1354
Mixing Water, lb/yd ³	294	255
Water Reducer, oz/cwt	3.00	0.00
Nanocatalyst (NC), oz/cwt	0.00	28.00
w/cm	0.53	0.47
Fresh Concrete Properties		
ASTM C1064, Temperature, °F	77	77
ASTM C143, Slump, in.	6 1/2	6 1/4
ASTM C138, Density, lb/ft ³	151.8	149.0
ASTM C138, Gravimetric Air, %	0.6	3.8
ASTM C231, Pressure Air, %	1.7	4.9
Strength (ASTM C39)		
2 day avg, psi	1,892	2,299
8 day avg, psi	3,325	3,688
28 day avg, psi	4,309	4,543
56 day avg, psi	4,955	5,451
Moist cured Bulk Resistivity (Modified ASTM C1876)		
28 day avg, Ω-m	90.1 ¹	98.6
56 day avg, Ω-m	92.4 ¹	116.2

¹ Bulk resistivity was not measured. This value is from a similar mix with different aggregate sources

Observations

The NC mixture had 13% higher water reduction compared to the control mixture with a Type A WR. The nanocatalyst entrained air and the mixture had 3% more air than the control mixture. A detrainer was not used. Compared to the control mixture, the NC mixture had higher compressive strength, and slightly higher bulk resistivity at tested ages.

This is a limited study as opposed to a comprehensive evaluation. These results are applicable only for the materials evaluated. This report should not be taken as an endorsement for any product.