PADDLEGONIA

NORTHERN ARIZONA UNIVERSITY - PROJECT OVERVIEW AND TECHNICAL ADDENDUM 2017

NORTHERN ARIZONA UNIVERSITY – PADDLEGONIA
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PADDLEGONIA

Tab A – Compliance Certificate

Northern Arizona University - *Paddlegonia*

I, Michael Schubert, 2017 NAU Concrete Canoe Captain, certify the following statements:

- The construction and finishing of the canoe has been performed in complete compliance with the rules and regulations of the National Competition.
- The registered participants at the Conference/National Competition are qualified student members and National Student Members of ASCE, and meet all of the eligibility requirements as specified in the rules and regulations of the National Competition.
- The canoe has been completely built within the current academic year of the competition.
- The team acknowledges that all Safety Data Sheets (SDS) have been read by the project management team.
- The team acknowledges receipt of the Request for Information (RFI) Summary.

Registered participants and corresponding ASCE National Member ID No. are listed in the tables below.

Rgistered Male Participants Name	ASCE National Member ID No.
Bareng, Virgilio	10968838
Leon, Joshua	10156195
Peterson, Branden	10927509
Schubert, Michael	10309636
Vigil, Matthew	10928535

Registered Female Participants Name	ASCE National Member ID No.
Ballard, Sabrina	9850333
Boschetto, Gina	10156186
Dykstra, Kylie	10934536
Marnocha, Ally	10969417
Shurley, Katrina	10968183

A list of canoe and concrete parameters are provided in the tables below.

Canoe Parameters	
Maximum Length	252 in.
Maximum Width	28 in.
Maximum Depth	16 in.
Average Thickness	0.5 in.
Estimated Weight	200 lb

Parameter	Structural	Finishing
Wet Unit Weight	60.3 lb/ft^3	7.7 lb/ft^3
Oven-Dry Unit Weight	53.9 lb/ft^3	64.8 lb/ft^3
28-Day Compressive Strength	1939 psi	3547 psi
28-Day Tensile Strength	218.1 psi	321.9 psi
28-Day Composite Flexural Strength	827.4 psi	N/A
Air Content (%)	11%	19%

By signing below, I certify that the aforementioned information is valid.

Michael Schubert 3/2/17

Michael Schubert Date
Materials Engineer
Contact: (623) 203-0467, Mark.Lamer@nau.edu

03/02/17

Mark Lamer Date
Faculty Advisor
Contact: (928) 523-3435, Mark.Lamer@nau.edu

“How−To” – Mold Construction Photos

PHOTO 1 – WaterJet cutting of the cross sections by third party

PHOTO 2 – Full cross section progression laid out post waterjet cutting

“How−To” – Mold Construction Photos

PHOTO 3 – Mold Construction Related Photograph (with appropriate description)

PHOTO 4 – Mold Construction Related Photograph (with appropriate description)

“How–To” – Mold Construction Photos

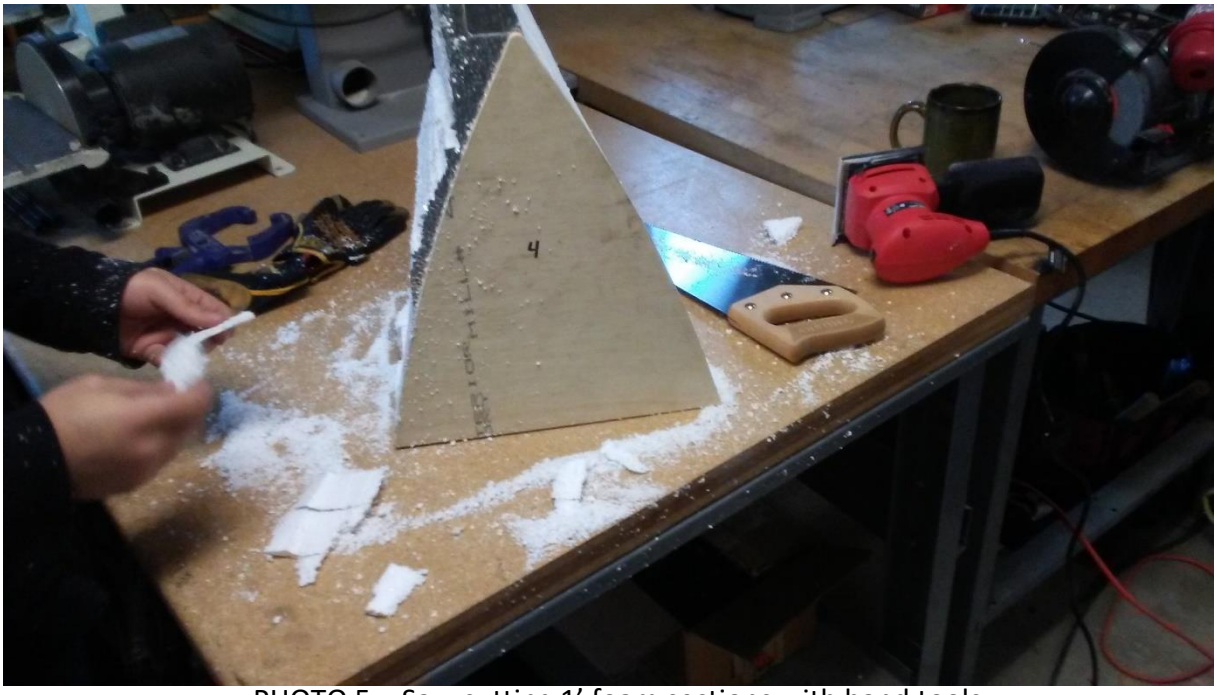


PHOTO 5 – Saw cutting 1’ foam sections with hand tools

PHOTO 6 – Palm sanding the foam to be even with the cross-section design

“How–To” – Mold Construction Photos

PHOTO 7 – Application of shrink wrap

PHOTO 8 – Using heat gun to get the shrink wrap to form to the mold

“How–To” – Canoe Construction Photos

PHOTO 1 – Applying finishing mix to the rib cut outs on the mold

PHOTO 2 – Finishing mix strike off on the 1/8” tile molds

“How–To” – Canoe Construction Photos

PHOTO 3 – Application of finishing mix fabricated tiles

PHOTO 4 – Application of structural mix over mesh placement

“How−To” – Canoe Construction Photos

PHOTO 5 – Placement of two colored finishing to achieve a mountain peak look

PHOTO 6 – Constructed curing chamber with two humidifiers at opposite ends

“How–To” – Canoe Construction Photos

PHOTO 7 – Post-tensioning system with turn buckle and strain gage to monitor tension

PHOTO 8 – Removing the first mold section to make room for the entire form removal

“How–To” – Canoe Finishing Photos

PHOTO 1 – Preparing to overlay end cap floatation with finishing mix

PHOTO 2 – Overlaying floatation with finishing mix

“How−To” – Canoe Finishing Photos

PHOTO 3 – Stamping 3D printed team logo in fresh finishing mix

PHOTO 4 – Team logo stamped into fresh finishing mix after setting

“How–To” – Canoe Finishing Photos

PHOTO 5 – Grinding and sanding down excess outer layer thickness

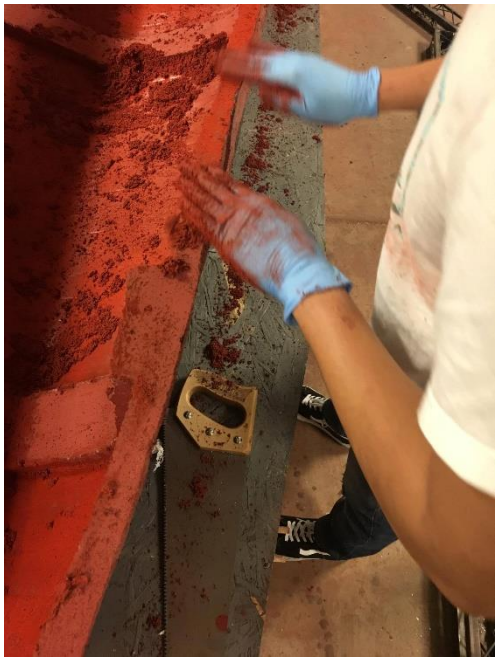


PHOTO 6 – Final patch mixing application

“How–To” – Canoe Finishing Photos

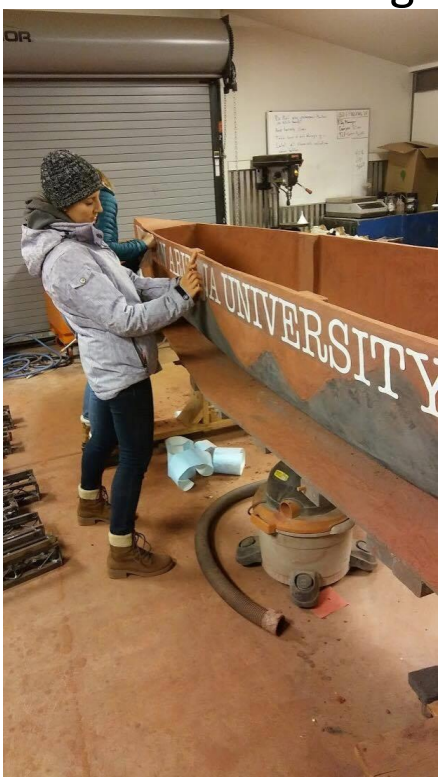


PHOTO 7 – Applying lettering

PHOTO 8 – Applying final seal coat

“How−To” – Other Photos

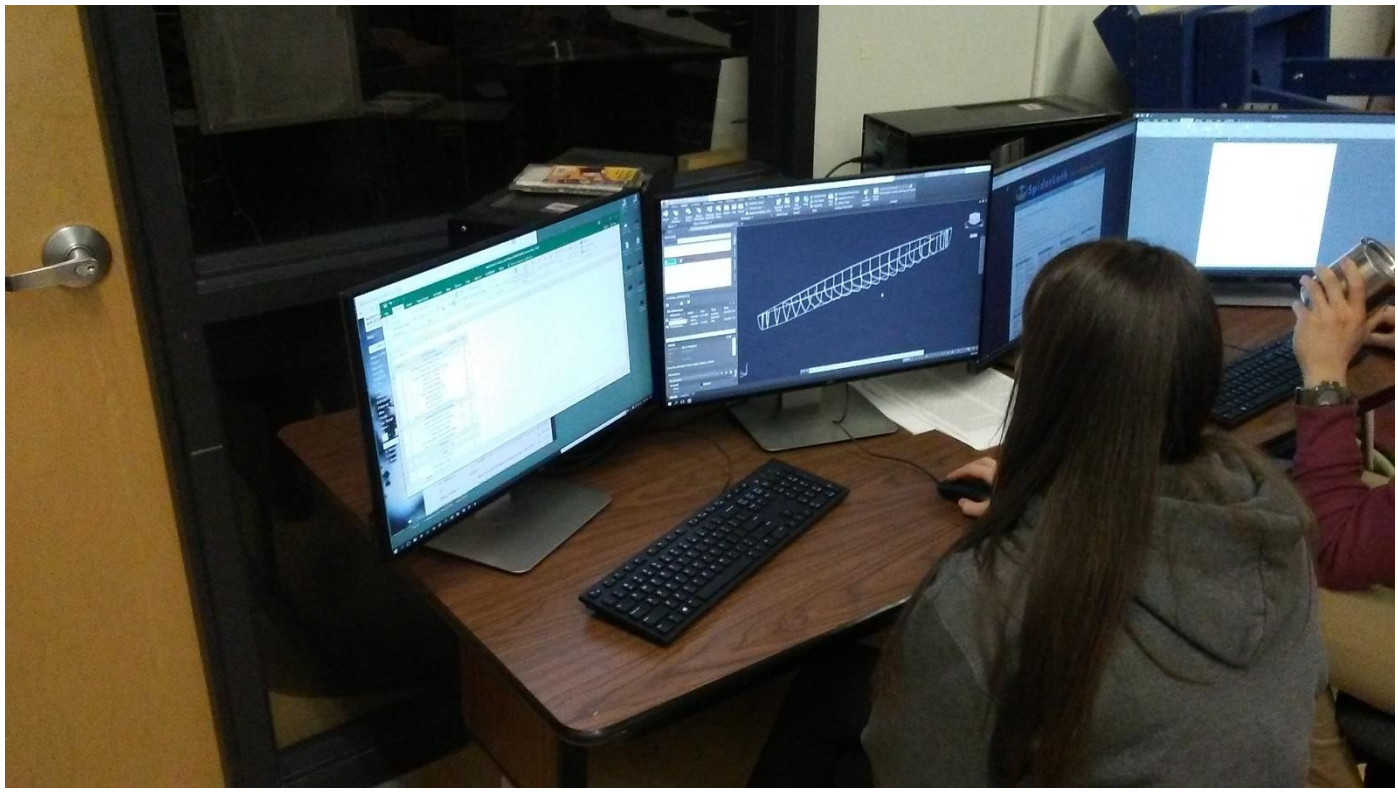


PHOTO 1 – Hull design research determining optimized racing shape

PHOTO 2 – Testing the slump of initial baseline batch mix

“How–To” – Other Photos

PHOTO 3 – Preparing cementitious materials and aggregate for hand mixing in tub

PHOTO 4 – Testing tensile strength of the mesh reinforcement

Tab C – Material Technical Data Sheets

The following section contains Material Technical Data Sheets for all materials used in the construction of the concrete canoe.

Product Data Sheet

CALPORTLAND®

Type I/II/V Low Alkali Cement

General Use Cement/Sulfate Resistance Properties

Highest Quality Products and Superior Technical Support for Cement Types:

IL
I / II
I / II / V
III
Oil Well
(API Class G)
Plastic
VELOZ
Masonry Cement

ADVANTAGE™
EXPECT MORE ... WE DELIVER!®

Manufacturer:

CalPortland Company
2025 E. Financial Way
Glendora, CA 91741
626.852.6200
www.calportland.com

Product Description:

Type I/II/V Low Alkali cement is a portland cement manufactured for general use and when moderate to high sulfate resistance is required.

Product Applications:

Use in all types of concrete construction. General construction such as foundations and slab-on-grade projects. Structural concrete applications such as buildings, bridges, culverts, freeways, water treatment facilities, storage structures as well as other construction applications. Pre-stressed and precast concrete products. Package products such as bagged premix concrete and thin-set mortar and grouts. Masonry mortar when mixed with lime or lime putty. Concrete products including pipe, roof tile, manholes, septic tanks, and others.

Benefits:

Moderate to high sulfate resistance.

Low Alkali cement is required for most construction in the western U.S. where siliceous aggregates create the potential for alkali-aggregate reactions. Low Alkali cement helps mitigate the potential for these deleterious reactions which may occur in concrete especially exposed to continuous moisture.

Quality:

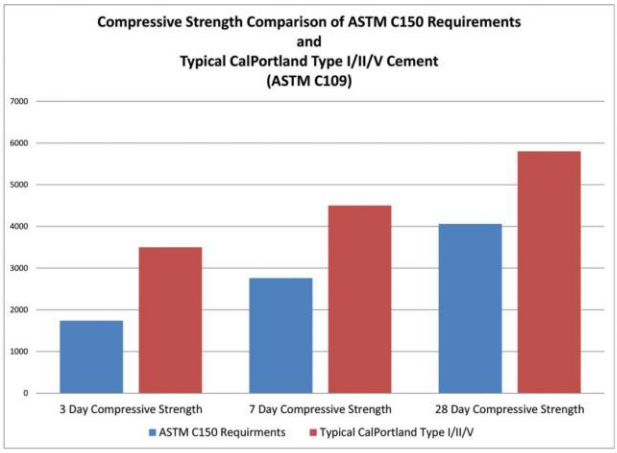
Established in 1891, CalPortland is proudly advancing into its second century of providing unsurpassed quality, with a full product line of superior performing cement products and solutions for your greatest construction challenges.

From our state-of-the-art cement production facilities we manufacture product using only high quality raw materials and strict quality control procedures. CalPortland is recognized as the leader in quality cement production and innovation.

Product Data Sheet

Type I/II/V Low Alkali Cement

General Use Cement/Sulfate Resistance Properties



Standards:

Type I/II/V Low Alkali cement meets the standard requirements of the following:

ASTM C150 / AASHTO M85 for Type I general use.

ASTM C150 / AASHTO M85 for Type II general use when moderate sulfate resistance is required.

ASTM C150 / AASHTO M85 for Type V general use when high sulfate resistance is required.

Product Precautions:

For precise product application it is important to refer to the project specifications.

Contact with cement (including unhardened concrete, mortar, wet cement, or cement admixtures) can cause skin irritation, severe chemical burns, or serious eye damage. Avoid contact with eyes and skin. Seek immediate medical attention if you have persistent or severe discomfort. In case of eye contact, flush with plenty of water for at least 15 minutes. Consult a physician immediately.

For other precautions please refer to the CalPortland Portland Cement SDS Report.

Availability:

Type I/II/V Low Alkali cement is available in bulk quantities at:
9350 Oak Creek Road
Mojave, CA 93509

14909 National Trails Highway
Oro Grande, CA 92368

11115 Casa Grande Highway
Rillito, AZ 85654

Stockton, CA Terminal, National City, CA Terminal, Las Vegas, NV Terminal and Yuma, AZ Terminal

Sacked products are available through select building material suppliers.

Additional Information:

Additional information can be provided by visiting:
www.calportland.com
or by email:
cementsales@calportland.com

Boral Material Technologies

BMT 1136 Printed in USA * Boral Material Technologies Inc. * Date Issued 12/03 * 2.5M

Frazier Park

17410 E. Lockwood Valley Road Frazier Park CA. 93225 661-245-3736

ASTM Light Wieght Analysis **#1 Sand**

Trinity Frazier Park

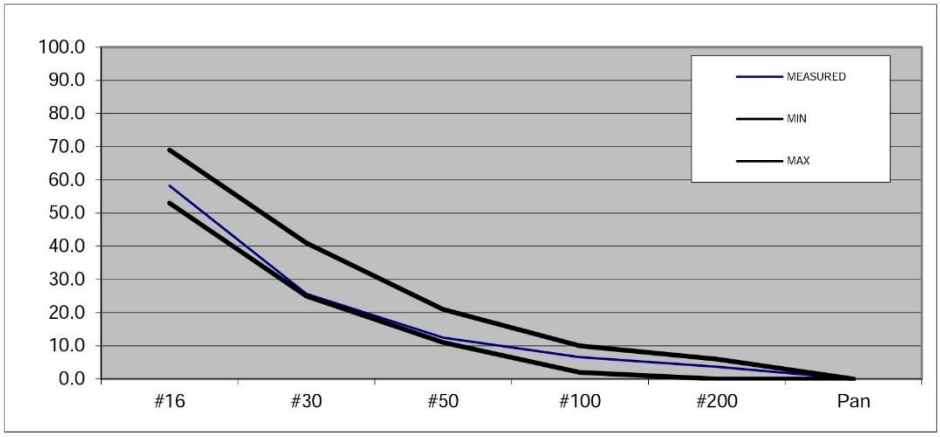
Ticket # _____

Sampler **JJ**

Date: **09/12/14**

TIME: _____

Customer _____



Sieve	MEASURED WEIGHTS	MEASURED C%R	MEASURED C%P	Target MIN	Target MAX
#4	0.0	0.0	100.0	100.0	100.0
#8	34.0	5.5	94.5	96.0	90.0
#16	259.0	41.8	58.2	69.0	53.0
#30	461.0	74.4	25.6	41.0	25.0
#50	543.0	87.6	12.4	21.0	11.0
#100	579.0	93.4	6.6	10.0	2.0
#200	597.0	96.3	3.7	6.0	0.0
Pan	620.0	100.0	0.0	0.0	0.0

% MOISTURE **11.8**

Bucket Weigh	54.6	Lab B/W	52.5	MB
Wet Weight	693			
Dry Weight	620			

September 25, 2014

Trinity Industries, Inc.
11728 Highway 93
Boulder, Colorado 80303
Attention: Mr. Clint Chapman

Job No. 14098-7

REGISTERED PROFESSIONAL ENGINEER
ROBERT J. JOHNSON
No. 27060
Exp. 03-31-17
CIVIL
STATE OF CALIFORNIA

Subject: ASTM C330 Compliance Testing - Revised
Frazier Park Structural Lightweight Aggregate (Hydrolite)

Dear Mr. Chapman:

At your request, CHJ Consultants performed tests on the Trinity Industries Structural Lightweight Aggregate (Hydrolite) to verify conformance with ASTM Designation C330-09 "Standard Specification for Lightweight Aggregates for Structural Concrete". The Trinity Industries Structural Lightweight Aggregate is an expanded clay aggregate produced at the Trinity Industries plant in Frazier Park. The results are as follows.

A. DELETERIOUS SUBSTANCES:

Test	Test Method	Test Result	C330 Requirement
Organic Impurities	C40	Lighter than Standard	Lighter Than Standard
Staining	C641	Stain Index of 20	Stain Index of Less Than 60
Loss on Ignition	C114	0.06 Percent	Less than 5 Percent

B. PHYSICAL TESTS:

Test	Test Method	Test Result	C330 Requirement
Clay Lumps and Friable Particles	C142	1.4 Percent	Less than 2 Percent
Bulk Density Dry Loose Condition	C29	50.7 PCF	55 PCF Maximum
Bulk Density Saturated Loose Condition	C29	58.9 PCF	No Requirement

GRADING - SIEVE ANALYSIS (Test Method C136)		
Sieve Size	**Percent Passing**	**C330 Requirement**
1/2" (12.5 mm)	100	100
3/8" (9.5 mm)	87	80-100
No. 4 (4.75 mm)	29	5-40
No. 8 (2.36 mm)	4	0-20
No. 16 (1.18 mm)	1	0-10

C. TESTS ON CONCRETE MADE WITH LIGHTWEIGHT AGGREGATE:
Concrete Mixture – 3/8" Lightweight Aggregate

Material	Weight (lbs.)	Specific Gravity	Abs. Volume
Cement - Type II	564	3.15	2.87
Water	308	1.00	4.94
Natural Sand	1,375	2.62	8.41
Trinity Frazier Park	972	1.70	9.16
Admixtures:			
Water Reducing (fl. oz.)			
Air Entraining (fl. oz.)	2.8		
Slump (inches)	2.25		
Air Content (%)	6.0		1.62
Plastic Unit Weight (pcf)	121.3		

Test	Test Method	28-Day Test Result (PSI)	C330 Requirement
Compressive Strength	C39	4,310	3000 PSI Minimum
		4,270	
		4,460	
Average		4,350	
Splitting Tensile	C496	505	310 PSI Minimum
		525	
		520	
		525	
		505	
		505	
		515	
		520	
Average		515	

TESTS ON CONCRETE MADE WITH LIGHTWEIGHT AGGREGATE: Cont'd
Concrete Mixture – 3/8" Lightweight Aggregate

Test	Test Method	Test Result	C 330 Requirement
Oven Dry Density	C567-05 (Measured)	107.0 106.9 107.2 107.0	No Requirement
Average			
Approximate Equilibrium Density	C567-05 (Calculated per Section 9.2)	110.0	110.0 PCF Maximum
Drying Shrinkage	C330 (Section 8.4)	0.049	0.070 Percent (Max)
Pop-Out Test	C151	No Pop-Outs	No Pop-Outs

D. CONFORMANCE:

The Trinity Structural Lightweight Aggregate manufactured by Trinity Industries, Inc. at Frazier Park, California, conforms to the requirements of ASTM Designation: C330-09 "Standard Specification for Lightweight Aggregates for Structural Concrete" for the tests indicated.

Thank you for the opportunity to provide materials testing services. If you should have any questions regarding this information, please do not hesitate to contact this firm at your convenience.

Respectfully submitted,

CHJ CONSULTANTS

Brandon Rose
Inspections Manager

Robert J. Johnson, G.E. 443
President

REGISTERED PROFESSIONAL ENGINEER
ROBERT J. JOHNSON
No. 27060
Exp. 03-31-17
CIVIL
STATE OF CALIFORNIA

BR/RJJ:lb

Distribution: Trinity Industries, Inc. (4)
Clint Chapman - email (clint.chapman@trin.net)

poraver® expanded glass

TECHNICAL DATA SHEET

According to ASTM C330, C331, C332

Poraver® expanded glass is available in five standard and two special grain sizes. With this wide variety of grain sizes from 0.04 mm to 4 mm, Poraver® expanded glass granulate offers a suitable lightweight aggregate solution for every field of application.

PROPERTIES		STANDARD	PORAVER® STANDARD GRAIN SIZES					PORAVER® SPECIAL GRAIN SIZES	
									NEW
Grain size	[mm]	ASTM C136	0.1-0.3	0.25-0.5	0.5-1	1-2	2-4	0.04-0.125	0.1-0.5
Particle size	[mesh #]		140-50	60-35	35-18	18-10	10-5	400-120	140-35
Fineness modulus			0.66	1.92	2.72	3.81	4.7	*on request*	0.81
Dry loose bulk density	[kg/m³]	ASTM C9/C29M	400 ± 60	340 ± 30	270 ± 30	230 ± 30	190 ± 20	530 ± 70	380 ± 60
	[lb/ft³]		25 ± 3.8	21.2 ± 3.2	16.9 ± 3	14.4 ± 2.1	11.9 ± 1.8	33.1 ± 4.4	23.7 ± 3.8
Apparent density	[kg/m³]	ASTM C128	850 ± 120	680 ± 50	450 ± 50	410 ± 50	350 ± 40	*on request*	800 ± 60
	[lb/ft³]		53.1 ± 8.4	42.5 ± 5.6	28.1 ± 4.4	25.6 ± 3.6	21.8 ± 3	*on request*	49.9 ± 3.8
Compressive strength	[MPa]	EN 13055-1	2.8	2.6	2	1.6	1.4	*on request*	3.0
	[PSI]		406	377	290	232	203	*on request*	435
Water absorption by mass [1]	[Mass. %]	ASTM C128	35	28	20	20	23	*on request*	32
Water absorption by volume [1]	[Vol. %]	ASTM C128	22	15	9	7	7	*on request*	20
Organic impurities		ASTM C40	no injurious compounds					no injurious compounds	
Staining index (index number)		ASTM C641	0					0	
Loss on ignition	[%]	ASTM C114	~1					~1	
Clay lumps and friable particles	[%]	ASTM C142	-	-	-	< 2	< 2	-	-
Oversize		EN 13055-1	≤ 10% by mass					≤ 10% by mass	
Undersize			≤ 15% by mass					≤ 15% by mass	

[1] *% absorption determined after 5 minutes submerged in water*

The following data are valid for all grain sizes:									
pH value			9-12					9-12	
Moisture content on delivery			≤ 0.5 %					≤ 0.5 %	
Softening point			approx. 700°C / 1300°F					approx. 700°C / 1300°F	
Color			creamy white					creamy white	
Thermal conductivity	[W/m·K]		-	-	-	-	0.07 [2]	-	-
	[BTU·in/hr·ft²·°F]		-	-	-	-	0.486 [2]	-	-

The strength grades may vary within the tolerance range of bulk densities.
The availability and delivery conditions for special grain sizes will be agreed on an individual basis.

[2] *calculated values DIBt according to approval Z-23.11-114*

PORAVER NORTH AMERICA INC. · 2429 Bowman Street · Innisfil, Ontario, L9S 3V6, Canada
Phone +1 705 431 0022 · Fax +1 705 431 2701 · info@poraver.com · www.poraver.com

01/2017 ST

BASF
We create chemistry

3	03 30 00	Cast-in-Place Concrete
	03 40 00	Precast Concrete
	03 70 00	Mass Concrete

MasterAir® AE 90

Air-Entraining Admixture

Formerly MB-AE 90*

Description

MasterAir AE 90 air-entraining admixture is for use in concrete mixtures. It meets the requirements of ASTM C 260, AASHTO M 154 and CRD-C 13.

Applications

Recommended for use in:

- Concrete exposed to cyclic freezing and thawing
- Production of high-quality normal or lightweight concrete (heavyweight concrete normally does not contain entrained air)

Features

- Ready-to-use in the proper concentration for rapid, accurate dispensing

Benefits

- Improved resistance to damage from cyclic freezing and thawing
- Improved resistance to scaling from deicing salts
- Improved plasticity and workability
- Reduced permeability – increased watertightness
- Reduced segregation and bleeding

Performance Characteristics

Concrete durability research has established that the best protection for concrete from the adverse effects of freezing and thawing cycles and deicing salts results from: proper air content in the hardened concrete, a suitable air-void system in terms of bubble size and spacing, and adequate concrete strength, assuming the use of sound aggregates and proper mixing, transporting, placing, consolidation, finishing and curing techniques. MasterAir AE 90 admixture can be used to obtain adequate freeze-thaw durability in a properly proportioned concrete mixture, if standard industry practices are followed.

Air Content Determination: The total air content of normal weight concrete should be measured in strict accordance with ASTM C 231, "Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method" or ASTM C 173/C 173M, "Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method." The air content of lightweight concrete should only be determined using the Volumetric Method. The air content should be verified by calculating the gravimetric air content in accordance with ASTM C 138/C 138M, "Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete." If the total air content, as measured by the Pressure Method or Volumetric Method and as verified by the Gravimetric Method, deviates by more than 1.5%, the cause should be determined and corrected through equipment calibration or by whatever process is deemed necessary.

MASTER® BUILDERS SOLUTIONS

Guidelines for Use

Dosage: There is no standard dosage for MasterAir AE 90 admixture. The exact quantity of air-entraining admixture needed for a given air content of concrete varies because of differences in concrete-making materials and ambient conditions. Typical factors that might influence the amount of air entrained include: temperature, cementitious materials, sand gradation, sand-aggregate ratio, mixture proportions, slump, means of conveying and placement, consolidation and finishing technique. The amount of MasterAir AE 90 admixture used will depend upon the amount of entrained air required under actual job conditions. In a trial mixture, use 0.25 to 4 fl oz/cwt (16-260 mL/100 kg) of cementitious material. Measure the air content of the trial mixture, and, if needed, either increase or decrease the quantity of MasterAir AE 90 admixture to obtain the desired air content.

In mixtures containing water-reducing or set-control admixtures, the amount of MasterAir AE 90 admixture needed may be somewhat less than the amount required in plain concrete.

Due to possible changes in the factors that can affect the dosage of MasterAir AE 90 admixture, frequent air content checks should be made during the course of the work. Adjustments to the dosage should be based on the amount of entrained air required in the mixture at the point of placement.

If an unusually high or low dosage of MasterAir AE 90 admixture is required to obtain the desired air content, consult your local sales representative. In such cases, it may be necessary to determine that, in addition to a proper air content in the fresh concrete, a suitable air-void system is achieved in the hardened concrete.

Dispensing and Mixing: Add MasterAir AE 90 admixture to the concrete mixture using a dispenser designed for air-entraining admixtures, or add manually using a suitable measuring device that ensures accuracy within plus or minus 3% of the required amount.

For optimum, consistent performance, the air-entraining admixture should be dispensed on damp, fine aggregate. If the concrete mixture contains fine lightweight aggregate, field evaluations should be conducted to determine the best method to dispense the air-entraining admixture.

Precaution

In a 2005 publication from the Portland Cement Association (PCA R&D Serial No. 2789), it was reported that problematic air-void clustering that can potentially lead to above normal decreases in strength was found to coincide with late additions of water to air-entrained concretes. Late additions of water include the conventional practice of holding back water during batching for addition at the jobsite. Therefore, caution should be exercised with delayed additions of water to air-entrained concrete. Furthermore, an air content check should be performed after post-batching addition of any other materials to an air-entrained concrete mixture.

Product Notes

Corrosivity – Non-Chloride, Non-Corrosive: MasterAir AE 90 admixture will neither initiate nor promote corrosion of reinforcing and prestressing steel embedded in concrete, or of galvanized floor and roof systems. No calcium chloride or other chloride-based ingredients are used in the manufacture of this admixture.

Compatibility: MasterAir AE 90 admixture may be used in combination with any BASF admixture, unless stated otherwise on the data sheet for the other product. When used in conjunction with other admixtures, each admixture must be dispensed separately into the concrete mixture.

Storage and Handling

Storage Temperature: MasterAir AE 90 admixture should be stored and dispensed at 31 °F (-0.5 °C) or higher. Although freezing does not harm this product, precautions should be taken to protect it from freezing. If MasterAir AE 90 admixture freezes, thaw at 35 °F (2 °C) or above and completely reconstitute by mild mechanical agitation. Do not use pressurized air for agitation.

Shelf Life: MasterAir AE 90 admixture has a minimum shelf life of 18 months. Depending on storage conditions, the shelf life may be greater than stated. Please contact your local sales representative regarding suitability for use and dosage recommendations if the shelf life of MasterAir AE 90 admixture has been exceeded.

Safety: Chemical goggles and gloves are recommended when transferring or handling this material.

Packaging

MasterAir AE 90 admixture is supplied in 55 gal (208 L) drums, 275 gal (1040 L) totes and by bulk delivery.

Related Documents

Safety Data Sheets: MasterAir AE 90 admixture

Additional Information

For additional information on MasterAir AE 90 admixture, or its use in developing a concrete mixture with special peformance characteristics, contact your local sales representative.

The Admixture Systems business of BASF's Construction Chemicals division is the leading provider of solutions that improve placement, pumping, finishing, appearance and performance characteristics of specialty concrete used in the ready-mixed, precast, manufactured concrete products, underground construction and paving markets. For over 100 years we have offered reliable products and innovative technologies, and through the Master Builders Solutions brand, we are connected globally with experts from many fields to provide sustainable solutions for the construction industry.

Limited Warranty Notice

BASF warrants this product to be free from manufacturing defects and to meet the technical properties on the current Technical Data Guide, if used as directed within shelf life. Satisfactory results depend not only on quality products but also upon many factors beyond our control. BASF MAKES NO OTHER WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PRODUCTS. The sole and exclusive remedy of Purchaser for any claim concerning this product, including but not limited to, claims alleging breach of warranty, negligence, strict liability or otherwise, is shipment to purchaser of product equal to the amount of product that fails to meet this warranty or refund of the original purchase price of product that fails to meet this warranty, at the sole option of BASF. Any claims concerning this product must be received in writing within one (1) year from the date of shipment and any claims not presented within that period are waived by Purchaser. BASF WILL NOT BE RESPONSIBLE FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFITS) OR PUNITIVE DAMAGES OF ANY KIND.

Purchaser must determine the suitability of the products for the intended use and assumes all risks and liabilities in connection therewith. This information and all further technical advice are based on BASF's present knowledge and experience. However, BASF assumes no liability for providing such information and advice including the extent to which such information and advice may relate to existing third party intellectual property rights, especially patent rights, nor shall any legal relationship be created by or arise from the provision of such information and advice. BASF reserves the right to make any changes according to technological progress or further developments. The Purchaser of the Product(s) must test the product(s) for suitability for the intended application and purpose before proceeding with a full application of the product(s). Performance of the product described herein should be verified by testing and carried out by qualified experts.

NSF Certified to NSF/ANSI 61

* MB-AE 90 became MasterAir AE 90 under the Master Builders Solutions brand, effective January 1, 2014.

BASF Corporation
Admixture Systems
www.master-builders-solutions.basf.us

United States
23700 Chagrin Boulevard
Cleveland, Ohio 44122-5544
Tel: 800 628-9990 ■ Fax: 216 839-8821

Canada
1800 Clark Boulevard
Brampton, Ontario L6T 4M7
Tel: 800 387-5862 ■ Fax: 905 792-0651

BASF
We create chemistry

3	03 30 00	Cast-in-Place Concrete
	03 40 00	Precast Concrete
	03 70 00	Mass Concrete

MasterSet® DELVO

Hydration Controlling Admixture

Formerly DELVO Stabilizer*

Description

MasterSet DELVO ready-to-use, liquid admixture is used for making more uniform and predictable high-performance concrete. MasterSet DELVO admixture retards setting time by controlling the hydration of portland cement and other cementitious materials while facilitating placing and finishing operations. MasterSet DELVO admixture meets ASTM C 494/C 494M requirements for Type B, retarding, and Type D, water-reducing and retarding, admixtures.

Applications

Recommended for use in:

- Stabilization of concrete washwater
- Stabilization of returned plastic concrete
- Stabilization of freshly batched concrete for long hauls
- 4x4™ Concrete
- Pumped concrete, shotcrete (wet mix) and conventionally-placed concrete
- Plain, reinforced, precast, prestressed, lightweight and normal weight concrete
- Pervious concrete

Features

- Reduced water content required for a given workability
- Retarded setting time characteristics
- Improved workability

Benefits

- Provides flexibility in the scheduling of placing and finishing operations
- Offsets the effects of slump loss during extended delays between mixing and placing
- Reduces waste associated with concrete washwater and returned concrete
- Increased strength – compressive and flexural

Performance Characteristics

Rate of Hardening: The temperature of a concrete mixture and the ambient temperature (forms, earth, air, etc.) affect the hardening rate of concrete. At higher temperatures, concrete hardens more rapidly which may cause problems with placing and finishing.

One of the functions of MasterSet DELVO admixture is to retard the set of concrete. Within the normal dosage range, it will generally extend the working and setting times of concrete containing normal portland cement, fly ash, slag cement and silica fume approximately 1 hour to 5 hours compared to a plain concrete mixture. This depends on job materials and temperatures. Trial mixtures should be made under approximate job conditions to determine the dosage required.

Compressive Strength: Concrete produced with MasterSet DELVO admixture will develop higher early (within 24 hours) and higher ultimate strengths than plain concrete when used within the recommended dosage range and under normal, comparable curing conditions. When MasterSet DELVO admixture is used in heat-cured concrete, the length of the preheating period should be increased until the initial set of the concrete is achieved. The actual heat-curing period is then reduced accordingly to maintain existing production cycles without sacrificing early or ultimate strengths.

MASTER® BUILDERS SOLUTIONS

Guidelines for Use

Dosage: MasterSet DELVO admixture is recommended for use at a dosage of 4 ± 1 fl oz/cwt (260 ± 65 mL/100 kg) of cementitious materials for most concrete mixtures using average concrete ingredients. Because of variations in job conditions and concrete materials, dosages other than the recommended amounts may be required. In such cases, contact your local sales representative. For concrete washwater and returned concrete stabilization, utilize MasterSet DELVO charts to determine the appropriate dosage rates.

Product Notes

Corrosivity – Non-Chloride, Non-Corrosive: MasterSet DELVO admixture will neither initiate nor promote corrosion of reinforcing steel in concrete. This admixture does not contain intentionally-added calcium chloride or other chloride-based ingredients.

Compatibility: MasterSet DELVO admixture may be used in combination with any BASF admixture. When used in conjunction with another admixture, each admixture must be dispensed separately into the mixture.

Storage and Handling

Storage Temperature: MasterSet DELVO admixture should be stored above freezing temperatures. If MasterSet DELVO admixture freezes, thaw at 35 °F (2 °C) or above and completely reconstitute by mild mechanical agitation. Do not use pressurized air for agitation.

Shelf Life: MasterSet DELVO admixture has a minimum shelf life of 12 months. Depending on storage conditions, the shelf life may be greater than stated. Please contact your local sales representative regarding suitability for use and dosage recommendations if the shelf life of MasterSet DELVO admixture has been exceeded.

Packaging

MasterSet DELVO admixture is supplied in specially designed 55 gal (208 L) drums, 275 gal (1040 L) totes and by bulk delivery.

Related Documents

Safety Data Sheets: MasterSet DELVO admixture

Additional Information

For more information on MasterSet DELVO admixture, contact your local sales representative.

The Admixture Systems business of BASF's Construction Chemicals division is the leading provider of solutions that improve placement, pumping, finishing, appearance and performance characteristics of specialty concrete used in the ready-mixed, precast, manufactured concrete products, underground construction and paving markets. For over 100 years we have offered reliable products and innovative technologies, and through the Master Builders Solutions brand, we are connected globally with experts from many fields to provide sustainable solutions for the construction industry.

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* Delvo Stabilizer became MasterSet DELVO under the Master Builders Solutions brand, effective January 1, 2014.

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3	03 30 00	Cast-in-Place Concrete
	03 40 00	Precast Concrete
	03 70 00	Mass Concrete
4	04 05 16	Masonry Grouting

MasterGlenium® 7500

Full-Range Water-Reducing Admixture

Formerly GLENIUM 7500*

Description

MasterGlenium 7500 full-range water-reducing admixture is very effective in producing concrete mixtures with different levels of workability including applications that require self-consolidating concrete (SCC). MasterGlenium 7500 admixture meets ASTM C 494/C 494M compliance requirements for Type A, water-reducing, and Type F, high-range water-reducing, admixtures.

Applications

Recommended for use in:

- Concrete with varying water reduction requirements (5-40%)
- Concrete where control of workability and setting time is critical
- Concrete where high flowability, increased stability, high-early and ultimate strengths, and improved durability are needed
- Producing self-consolidating concrete (SCC)
- Strength-on-demand concrete, such as 4x4™ Concrete
- Pervious concrete

Features

MasterGlenium 7500 full-range water-reducing admixture is based on the next generation of polycarboxylate technology found in all of the MasterGlenium 7000 series products. This technology combines state-of-the-art molecular engineering with a precise understanding of regional cements to provide specific and exceptional value to all phases of the concrete construction process.

- Dosage flexibility for normal, mid-range and high-range applications
- Excellent early strength development
- Controls setting characteristics
- Optimizes slump retention/setting relationship
- Consistent air entrainment

Benefits

- Faster turnover of forms due to accelerated early strength development
- Reduces finishing labor costs due to optimized set times
- Use in fast track construction
- Minimizes the need for slump adjustments at the jobsite
- Less jobsite QC support required
- Fewer rejected loads
- Optimizes concrete mixture costs

Performance Characteristics

Concrete produced with MasterGlenium 7500 admixture achieves significantly higher early age strength than first generation polycarboxylate high-range water-reducing admixtures. MasterGlenium 7500 admixture also strikes the perfect balance between workability retention and setting characteristics in order to provide efficiency in placing and finishing concrete. The dosage flexibility of MasterGlenium 7500 allows it to be used as a normal, mid-range, and high-range water reducer.

MASTER® BUILDERS SOLUTIONS

Guidelines for Use

Dosage: MasterGlenium 7500 admixture has a recommended dosage range of 2-15 fl oz/cwt (130-975 mL/100 kg) of cementitious materials. For most mid- to high-range applications, dosages in the range of 5-8 fl oz/cwt (325-520 mL/100 kg) will provide excellent performance. For high performance and producing self-consolidating concrete mixtures, dosages of up to 12 fl oz/cwt (780 mL/100 kg) of cementitious materials can be utilized. Because of variations in concrete materials, jobsite conditions and/or applications, dosages outside of the recommended range may be required. In such cases, contact your local sales representative.

Mixing: MasterGlenium 7500 admixture can be added with the initial batch water or as a delayed addition. However, optimum water reduction is generally obtained with a delayed addition.

Product Notes

Corrosivity – Non-Chloride, Non-Corrosive: MasterGlenium 7500 admixture will neither initiate nor promote corrosion of reinforcing steel embedded in concrete, prestressing steel or of galvanized steel floor and roof systems. Neither calcium chloride nor other chloride-based ingredients are used in the manufacture of MasterGlenium 7500 admixture.

Compatibility: MasterGlenium 7500 admixture is compatible with most admixtures used in the production of quality concrete, including normal, mid-range and high-range water-reducing admixtures, air-entrainers, accelerators, retarders, extended set control admixtures, corrosion inhibitors, and shrinkage reducers.

Do not use MasterGlenium 7500 admixture with admixtures containing beta-naphthalene sulfonate. Erratic behaviors in slump, workability retention and pumpability may be experienced.

Storage and Handling

Storage Temperature: MasterGlenium 7500 admixture must be stored at temperatures above 40 °F (5 °C). If MasterGlenium 7500 admixture freezes, thaw and reconstitute by mechanical agitation.

Shelf Life: MasterGlenium 7500 admixture has a minimum shelf life of 9 months. Depending on storage conditions, the shelf life may be greater than stated. Please contact your local sales representative regarding suitability for use and dosage recommendations if the shelf life of MasterGlenium 7500 admixture has been exceeded.

Packaging

MasterGlenium 7500 admixture is supplied in 55 gal (208 L) drums, 275 gal (1040 L) totes and by bulk delivery.

Related Documents

Safety Data Sheets: MasterGlenium 7500 admixture

Additional Information

For additional information on MasterGlenium 7500 admixture or on its use in developing concrete mixtures with special performance characteristics, contact your local sales representative.

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	03 70 00	Mass Concrete

MasterLife® SRA 20

Shrinkage-Reducing Admixture

Formerly MasterLife SRA 20*

Description

MasterLife SRA 20 shrinkage-reducing admixture was developed specifically to reduce drying shrinkage of concrete and mortar, and the potential for subsequent cracking.

MasterLife SRA 20 admixture functions by reducing capillary tension of pore water, a primary cause of drying shrinkage.

MasterLife SRA 20 admixture meets ASTM C 494/C 494M requirements for Type S, Specific Performance, admixtures.

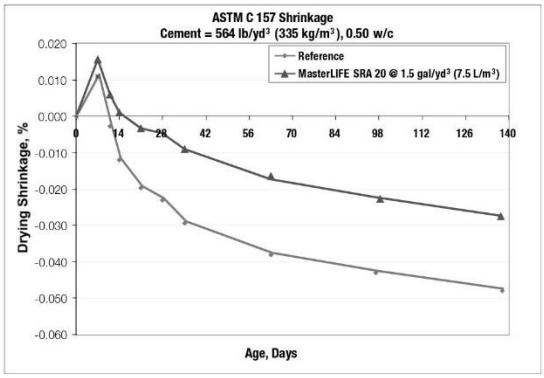
Applications

Recommended for use in:

- Ready-mixed or precast concrete structures requiring shrinkage reduction and long term durability
- Wet mix shotcrete
- Mortars and grouts

Features

- Significantly reduces drying shrinkage by as much as 80% at 28 days, and up to 50% at one year and beyond
- Reduces stresses induced from one-dimensional surface drying in concrete slabs and floors
- Reduces carbonation



Benefits

- Reduces drying shrinkage cracking and microcracking thereby improving aesthetics, watertightness and durability
- Reduction in drying shrinkage minimizes prestress loss
- Minimizes curling

Performance Characteristics

MasterLife SRA 20 admixture does not substantially affect slump. MasterLife SRA 20 admixture may increase bleed time and bleed ratio (10% higher). MasterLife SRA 20 admixture may also delay time of set by 1-2 hours depending upon dosage and temperature. Compressive strength loss is minimal with MasterLife SRA 20 admixture.

For air-entrained concrete applications, truck trial evaluations as detailed in the section titled "Compatibility" must be performed to verify that the specified air content can be achieved consistently. Therefore, contact your local sales representative when concrete treated with MasterLife SRA 20 admixture is being proposed for applications exposed to freezing and thawing environments.

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Guidelines for Use

Dosage: Knowledge of the shrinkage characteristics of the concrete mixture proposed for use is required prior to the addition of MasterLife SRA 20 admixture. The dosage of MasterLife SRA 20 admixture will be dependent on the desired drying shrinkage and the reduction in drying shrinkage required. Therefore, it is strongly recommended that drying shrinkage testing be performed to determine the optimum dosage for each application and each set of materials.

The typical dosage range of MasterLife SRA 20 admixture is 0.5 to 1.5 gal/yd^3 (2.5 to 7.5 L/m^3). However, dosages outside of this range may be required depending on the level of shrinkage reduction needed.

Mixing: MasterLife SRA 20 admixture may be added to the concrete mixture during the initial batch sequence or at the jobsite.

The mix water content should be reduced to account for the quantity of MasterLife SRA 20 admixture used.

If the delayed addition method is used, mixing at high speed for 3-5 minutes after the addition of MasterLife SRA 20 admixture will result in mixture uniformity.

Product Notes

Corrosivity – Non-Chloride, Non-Corrosive: MasterLife SRA 20 admixture will neither initiate nor promote corrosion of reinforcing steel, prestressing steel or of galvanized steel floor and roof systems. Neither calcium chloride nor other chloride-based ingredients are used in the manufacture of MasterLife SRA 20 admixture.

Compatibility: MasterLife SRA 20 admixture is compatible with all water-reducers, mid-range water-reducers, high-range water-reducers, set retarders, accelerators, silica fume, and corrosion inhibitors. For air-entrained concrete applications, MasterAir® AE 200 admixture is the recommended air-entrainer. The dosage of MasterAir AE 200 admixture must be established through truck trial evaluations. The trials should include a simulated haul time of at least 20 minutes to assess air content stability. MasterLife SRA 20 admixture should be added separately to the concrete mixture to ensure desired results.

Storage and Handling

Storage Temperature: MasterLife SRA 20 admixture is a potentially combustible material with a flash point of 198 °F (92 °C) . This is substantially above the upper limit of 140 °F (60 °C) for classification as a flammable material, and below the limit of 200 °F (93 °C) where DOT requirements would classify this as a combustible material. Nonetheless, this product must be treated with care and protected from excessive heat, open flame or sparks. For more information refer to the Safety Data Sheet.

MasterLife SRA 20 admixture should be stored at ambient temperatures above 35 °F (2 °C), and precautions should be taken to protect the admixture from freezing. If MasterLife SRA 20 admixture freezes, thaw and reconstitute by mild mechanical agitation. Do not use pressurized air for agitation.

Shelf Life: MasterLife SRA 20 admixture has a minimum shelf life of 12 months. Depending on storage conditions, the shelf life may be greater than stated. Please contact your local sales representative regarding suitability for use and dosage recommendations if the shelf life of MasterLife SRA 20 admixture has been exceeded.

Packaging

MasterLife SRA 20 admixture is available in 55 gal (208 L) drums and 275 gal (1040 L) totes.

Related Documents

Safety Data Sheets: MasterLife SRA 20 admixture

Additional Information

For additional information on MasterLife SRA 20 admixture or its use in developing concrete mixtures with special performance characteristics contact your local sales representative.

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* MasterLife SRA 20 became MasterLife SRA 20 under the Master Builders Solutions brand, effective January 1, 2014.

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03 40 00 Precast Concrete

MasterColor®

Liquid-Coloring Admixtures

Formerly RHEOCOLOR L*

Description

MasterColor liquid-coloring admixtures are patented, engineered, high quality coloring dispersions producing enhanced decorative concrete. MasterColor liquid-coloring admixtures are ready-to-use integral liquids that come in four base colors:

- Black
- Light Red
- Medium Red
- Yellow

The four base colors can be used to make a wide range of colors including but not limited to the colors depicted on the MasterColor Decorative Concrete Color Selector.

Applications

Recommended for use in:

- Integrally colored decorative concrete
- Imprinted concrete
- Ready-mixed concrete
- Manufactured concrete products
- Stone veneer products
- Precast concrete
- Pervious concrete
- Self-consolidating concrete

Features

- Liquid-coloring admixtures formulated for the automated CAM (Coloring Admixture Measuring) System
- Compatible with BASF admixtures used in the production of durable decorative concrete
- Faster dispersion into concrete

Benefits

- Beautiful, long-lasting integrally colored concrete
- Enhanced finishing characteristics
- Color vibrancy
- Excellent color accuracy
- Batch-to-batch color consistency and verifiable color batching results
- Increased productivity and reduced labor
- Clean and simple batching
- Quality custom color services

MasterColor liquid-coloring admixtures meet the colorfastness testing of 500 hours light exposure per ASTM C 979. In addition, MasterColor liquid-coloring admixtures have successfully completed 1500 hours of aggressive Xenon Arc testing per ASTM G 155.

Typical Properties: Density: 14-16 lb/gal(1.68-1.92 kg/L) [@72 °F (22 °C)]

MASTER® BUILDERS SOLUTIONS

Guidelines for Use

General: Due to the graying effect of most cements, there are some custom colors that can only be produced using very light or white cements. Variations in water content, cement type, color variations in cementitious materials or aggregates, finish texture, timing of operations, curing or forming methods, release agents or surface treatments may produce distinct, though in many cases slight, variations in final color. All standard color matches are completed using a medium shade of portland cement.

Dosage: MasterColor color formulas for standard and other regional colors are programmed into the CAM System upon installation.

MasterColor admixtures are water neutral at loading rates of 5% or less. At loading rates greater than 5%, MasterColor admixtures may provide increased water reduction depending on local concrete materials. Therefore, at loading rates above 5%, laboratory/field evaluations of MasterColor admixtures are recommended to verify desired concrete performance.

Mixing: With the automated CAM System, MasterColor liquid-coloring admixtures are weighed or metered and dispensed prior to or while loading concrete. Product and rinse water are calculated by the CAM System and should be included as total batch water. For best results add coloring admixtures prior to batching concrete. For post addition, mix a minimum of 4-5 minutes at normal mixing speed to assure uniformity.

For best results, truck or mixer should be clean and pre-wet with no standing water. A minimum batch size equal to 1/3 of the mixer capacity should be used as a guideline for efficient mixing. Keeping the addition order, mixing time, materials and water-cementitious materials ratio constant between multiple batches is critical for color consistency.

Concrete Placement and Finishing: Final color and textures should be pre-approved with a cured jobsite mock-up. In accordance with proper construction practices, slabs-on-ground shall be placed over properly compacted and prepared subgrade. Spade formed edges and consolidate and strike off surface as normal. Care should be taken to avoid over-vibration, over-working and over-finishing, or other practices that might cause excessive bleeding or significantly increase the surface mortar content.

Trowelling or broom-finishing decorative concrete should be performed in the same direction to maintain uniform appearance. Do not add additional water to the concrete either by retempering or by adding water to the surface during the finishing process.

Curing: Proper curing of decorative concrete is required to enhance the depth of color, provide a more uniformly colored concrete, and provide surface protection. MasterKure® CC 1315 water-based curing and sealing compound from BASF or a similar, compatible curing and sealing compound is recommended.

Note: Until decorative concrete is fully cured, the color may appear darker than expected. Curing with burlap, plastic sheeting, water or other curing compounds may be detrimental to color uniformity and is not recommended. For more information on curing decorative concrete contact your local sales representative.

Maintenance: Regular cleaning of decorative concrete is recommended. In general, resealing may be required periodically as the sealed surface wears. Maintenance applications will be accelerated in areas of heavy use or frequent or aggressive cleaning. Heavily soiled interior areas may be cleaned by wet mopping or scrubbing with a stiff-bristle brush and properly diluted, high-quality commercial detergent. For large areas, automatic scrubbers may be more efficient and cost effective.

Clean-Up: MasterColor liquid-coloring admixtures are water based and can be cleaned with soap and water.

Product Notes

Corrosivity – Non-Chloride, Non-Corrosive: MasterColor liquid-coloring admixtures will neither initiate nor promote corrosion of reinforcing steel embedded in concrete. No calcium chloride or chloride-based ingredients are used in the manufacture of these products. Complete safety information can be found on the MasterColor liquid-coloring admixture Safety Data Sheets.

Compatibility: MasterColor liquid-coloring admixtures are compatible with most admixtures used in the production of quality concrete. Supplementary cementitious materials may affect color and should be checked for potential adjustments. All admixtures should be dispensed into the concrete separately. The use of calcium chloride accelerators are not recommended in decorative concrete. Final color and texture should be verified with a cured jobsite mock-up.

Storage and Handling

Storage Temperature: MasterColor liquid-coloring admixtures should be stored between 40 and 100 °F (4 and 38 °C) with regular mixing or recirculation. To prevent pigment sedimentation, recirculate the material every 90 days or less. Always mix material well prior to use. Automated recirculation is included with the CAM System. If MasterColor liquid-coloring admixtures freeze, contact your local sales representative.

Shelf Life: MasterColor liquid-coloring admixtures have a minimum shelf life of 12 months if properly stored.

Packaging

MasterColor liquid-coloring admixtures are available in 3,350 lb (1,520 kg) net returnable totes.

Related Documents

Safety Data Sheets: MasterColor liquid-coloring admixture

- Black
- Light Red
- Medium Red
- Yellow

Additional Information

For additional information on MasterColor liquid-coloring admixtures, contact your local sales representative.

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* RHEOCOLOR L became MasterColor under the Master Builders Solutions brand, effective January 1, 2014.

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	03 37 13	Shotcrete
	03 40 00	Precast Concrete
	03 70 00	Mass Concrete

MasterFiber® M 100

Monofilament Microsynthetic Fiber

Description

MasterFiber M 100 product is a high-tensile strength, high modulus of elasticity, ultra-thin monofilament homopolymer polypropylene fiber designed to quickly distribute uniformly throughout the concrete matrix. At the engineered dosage level of 0.50 lb/yd^3 (0.3 kg/m^3) MasterFiber M 100 product outperforms all other plastic shrinkage fiber reinforcements at their typical dosage of 1.0 lb/yd^3 (0.6 kg/m^3).

Applications

Recommended for use in:

- Residential slabs-on-ground
- Commercial slabs-on-ground
- Stucco
- Dry-packaged cement based products
- Precast products
- Pools and pool decks
- Water tanks
- Shotcrete

Features

- 225 million 0.75 in. (19 mm) fibers in one pound (0.45 kg) of product
- Uniform distribution throughout the concrete matrix
- Excellent finishability

Benefits

- Excellent reduction in plastic shrinkage cracking
- Transforms macro-cracks into micro-cracks
- Measurably reduces plastic settlement
- Measurably reduces the concrete permeability, thus increasing the durability and service life of the concrete
- Performs as an excellent companion in blends with macrosynthetic fibers and steel fibers

Performance Characteristics

Physical Properties

Specific Gravity	0.91
Melting Point	320 °F (160 °C)
Ignition Point	1,094 °F (590 °C)
Absorption	Nil
Alkali Resistance	Excellent
Tensile Strength	70 ksi (480 MPa)
Modulus of Elasticity	1,230 ksi (8.48 GPa)
Available Lengths	0.5 in. (13 mm) and 0.75 in. (19 mm)
Equivalent Diameter	0.00047 in. (12 microns)
Denier	1 dpf

MASTER® BUILDERS SOLUTIONS

Guidelines for Use

Dosage: The recommended dosage of MasterFiber M 100 product is 0.50 lb/yd^3 (0.3 kg/m^3).

Mixing: Typically no modifications to the mixture proportions are required when the product is used at the engineered dosage of 0.50 lb/yd^3 (0.3 kg/m^3). MasterFiber M 100 product fibers can be introduced into the mixing system at any time except when the cement is being introduced. Mixing time will vary based on when the fibers are introduced to the mixer. The normal range is 3-5 minutes of mixing with the higher number preferred when the fibers are added after all of the standard ingredients have been introduced and mixed.

Engineering Specifications

MasterFiber M 100 product is a uniquely developed fiber to minimize plastic shrinkage cracking in concrete. With 112.5 million fibers in the engineered dosage of 0.50 lb/yd^3 (0.3 kg/m^3), MasterFiber M 100 product is capable of reducing plastic shrinkage cracking by approximately 85%. Conventional monofilament polypropylene fibers at 1.0 lb/yd^3 (0.6 kg/m^3) typically do not achieve 70% reduction in plastic shrinkage cracking.

MasterFiber M 100 product meets the requirements of ASTM C 1116/C 1116M, Section 4.1.3, Type III and Note 2 as well as ICC ES AC32, Section 3.1.1 when used at the engineered dosage of 0.50 lb/yd^3 (0.3 kg/m^3).

Product Notes

MasterFiber M 100 product is not a replacement for structural steel reinforcement and therefore, should not be used to replace any of the load-carrying steel reinforcement in a concrete element.

Packaging

MasterFiber M 100 product is packaged in pre-weighed 0.50 lb (0.23 kg) and 2.5 lb (1.13 kg) degradable bags to ensure optimum dosing and homogeneous distribution of the product.

Related Documents

Safety Data Sheets: MasterFiber M 100 product

Additional Information

For additional information on MasterFiber M 100 product, contact your local sales representative.

The Admixture Systems business of BASF's Construction Chemicals division is the leading provider of solutions that improve placement, pumping, finishing, appearance and performance characteristics of specialty concrete used in the ready-mixed, precast, manufactured concrete products, underground construction and paving markets. For over 100 years we have offered reliable products and innovative technologies, and through the Master Builders Solutions brand, we are connected globally with experts from many fields to provide sustainable solutions for the construction industry.

Limited Warranty Notice

BASF warrants this product to be free from manufacturing defects and to meet the technical properties on the current Technical Data Guide, if used as directed within shelf life. Satisfactory results depend not only on quality products but also upon many factors beyond our control. BASF MAKES NO OTHER WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PRODUCTS. The sole and exclusive remedy of Purchaser for any claim concerning this product, including but not limited to, claims alleging breach of warranty, negligence, strict liability or otherwise, is shipment to purchaser of product equal to the amount of product that fails to meet this warranty or refund of the original purchase price of product that fails to meet this warranty, at the sole option of BASF. Any claims concerning this product must be received in writing within one (1) year from the date of shipment and any claims not presented within that period are waived by Purchaser. BASF WILL NOT BE RESPONSIBLE FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFITS) OR PUNITIVE DAMAGES OF ANY KIND.

Purchaser must determine the suitability of the products for the intended use and assumes all risks and liabilities in connection therewith. This information and all further technical advice are based on BASF's present knowledge and experience. However, BASF assumes no liability for providing such information and advice including the extent to which such information and advice may relate to existing third party intellectual property rights, especially patent rights, nor shall any legal relationship be created by or arise from the provision of such information and advice. BASF reserves the right to make any changes according to technological progress or further developments. The Purchaser of the Product(s) must test the product(s) for suitability for the intended application and purpose before proceeding with a full application of the product(s). Performance of the product described herein should be verified by testing and carried out by qualified experts.

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www.master-builders-solutions.basf.us

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1800 Clark Boulevard
Brampton, Ontario L6T 4M7
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SPIDERLATH Innovation

SpiderLath is the only complete lathing system that solves all the problems created by other lath systems. Billions of dollars are spent each year in lawsuits and construction costs because of DRY ROT and MOLD. One of the most critical components in the design of your building project is the prevention of dry rot and mold. Building wraps/water barriers are designed to prevent these occurrences when installed properly. All holes and voids must be sealed to prevent moisture from penetration to the substrate. If the wrap is compromised it no longer provides the protection to the wood product behind it.

SpiderLath			Metal Lath	
Square Feet.	Rolls	Weight	Sheets	Weight
300 sf	1	20 lbs	18	90 lbs
600 sf	2	40 lbs	36	180 lbs
1,200 sf	4	80 lbs	72	360 lbs
1,400 sf	8	160 lbs	144	720 lbs

SpiderLath lath system offers the best protection to the water barrier/building wrap. The patent pending strip design will stop water from penetrating due to it's gasket sealing properties. When a fastener is applied through the strip, the strip compresses around the fastener thereby sealing the fastener hole.

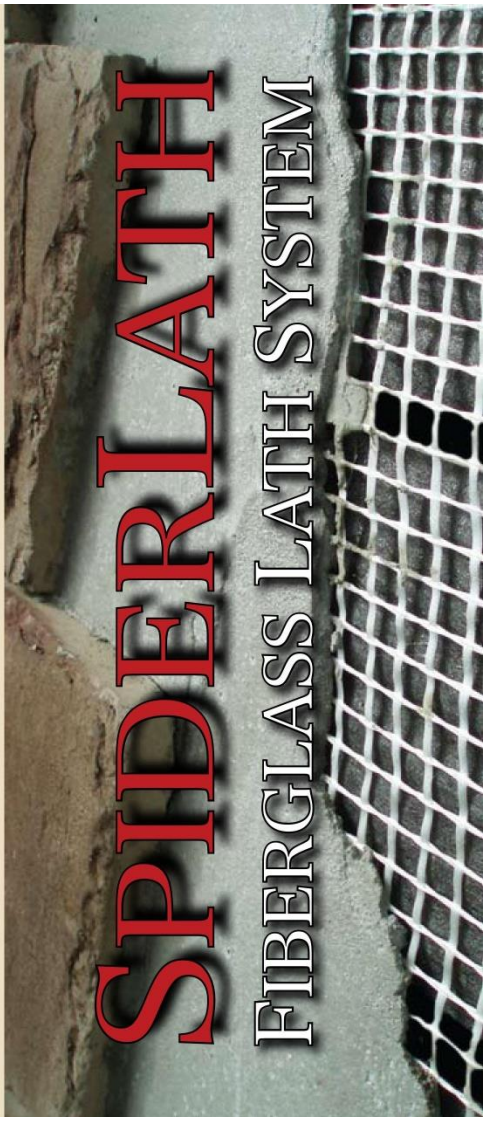
SpiderLath is made from AR fiberglass, eliminating corrosion, keeping the lath system intact for as long as the material being applied to it. Metal lath and cementitious material are not compatible. Metal lath has tremendous tensile strength in and by itself but cannot transfer that strength to the cementitious material because they will not adhere to each other. Because of this non compatibility, the cementitious material may crack and fail. SpiderLath is made of a fiberglass material, is compatible, and does adhere to the cementitious material. By adhering to the material it can transfer its tensile strength thereby eliminating most cracking failures.

The Future of Lath

SPIDERLATH, Inc.
130 Welsco Rd.
Smackover, AR 71762

Telephone: 870.725.3902
E-mail: info@spiderlath.com
www.SpiderLath.com

The most advanced lath system in the world!



SPIDERLATH Technical Data

- Roll size: 4 ft. x 75 ft.
- Rolled up dimensions: 21 in. x 48 in.
- Roll weight: 20 lbs.
- Alkali Resistant (AR) fiberglass containing Zirconium Dioxide (Zr02).
- Three dimensional Leno Weave.
- Mesh weight: 8.82 oz. per sq. yd. (300 gsm).
- Mesh opening size: 0.25 in. (6.35 mm).
- Semi rigid coating.
- Stripping on back is semi rigid.
- Stripping is flexible foam.
- Stripping measurements: 9 equally spaced strips (6 in.). 0.375 in. x 0.5 in. x 75 ft.
- Each roll is wrapped in stretch wrap and contains installation instructions.

SPIDERLATH Testing

The ICC-ES AC 275 is the benchmark "Acceptance Criteria for Glass Fiber Lath Used in Cementitious Exterior Wall Coatings or Exterior Cement Plaster". SpiderLath has equalled or exceeded each of the tests required in the ICC-ES AC 275 and has recieved the appropriate Evaluation Report from IAPMO, accredited by the American National Standards Institute (ANSI).

For complete testing results and technical information, please visit our website at www.spiderlath.com/test.

IAPMO Evaluation #0141

SPIDERLATH Mesh Features

- SpiderLath is designed to be a replacement alternative for metal lath. Listed below are some of the applications used with SpiderLath: manufactured stone veneer, one and three coat stucco, natural stone thin veneer, concrete counter tops, plaster, tile, and water drainage systems.
- SpiderLath offers corrosion free material designed to last the life of the material being applied to it. SpiderLath is made from molten extruded Alkali Resistant fiberglass using Zirconium Dioxide.
- Cutting SpiderLath will not damage the alkaline resistant properties.
- SpiderLath uses a twisted weave to aid in keying the mortar.
- Easy to use, cuts with scissors or knife. Lath scratches and cuts are eliminated.
- SpiderLath adds tensile and flexural strength to the cementitous material providing a stronger bond.
- A thin coat of stiffening material is added to the fiberglass mesh to make the product easier to handle and faster to install.
- Very versatile, allowing it to be installed horizontally, vertically or diagonally.
- Easy to transport. Weighing only 20 lbs. per roll (300 sq. ft.) This is equivalent to 18 sheets of 2.5 metal lath which would weight about 90 lbs.
- Versatile and strong enough to use with heavy weight products such as three coat stucco and natural stone veneer.
- Installation time (labor costs) is reduced significantly because of the size and the ease at which the installer can unroll, stretch, and fasten.

Please visit the SpiderLath web site (www.SpiderLath.com) for information, installation instructions, test results, and more.

SPIDERLATH Strip System

SpiderLath strip system offers these advantages:

- **Nailing guide**. Less waste of fasteners.
- **Mesh Impact system**. Reduces the blow of the fastener, eliminating damage to the glass fibers.
- **Gasket sealer**. Seals around fastener holes, preventing penetration of water to the substrate, thus eliminating dry rot and mold.
- **Stand-off**. Allows mortar material to fill in behind the mesh and hold it on top of the mesh, forming a solid sheet of cementitious material. This allows the fiberglass mesh to be placed in the center of the cementitious material where it provides the optimal strength to assure less cracking and failures.

SPIDERLATH Installation

1. Place SpiderLath with the strip system facing the substrate/water barrier.
2. Stretch lath tight.
3. Fasten SpiderLath using large head nails, washer head screws or wide crown staples or any fastener approved by the local building code. Overlap all edges 2 inches.
4. Apply coat of mortar behind lath to fill in entire inside and coat outside of lath 0.5 inch.

INSTALLATION LABOR COSTS ARE REDUCED SIGNIFICANTLY

Plumbing | Pipe, Tubing and Fittings | Tubing | Nylon Tubing | 50 ft. Natural Nylon Tubing, 1/8" Outside Dia., 3/32" Inside Dia.

EMAIL PRINT

View Product Family

GRAINGER APPROVED

50 ft. Natural Nylon Tubing, 1/8" Outside Dia., 3/32" Inside Dia.

Item# **2VDL5** Mfr. Model# **2VDL5** Catalog Page# **2904** UNSPSC# **31231321**

How can we improve our **Product Images**?

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$11.25 / each

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Deliver one time only

1 ADD TO CART

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Confirm ZIP Code to determine availability.

85001 SAVE

Be the first to write a review

Shipping Weight **0.3 lbs.**

Country of Origin **China** | *Country of Origin is subject to change.*

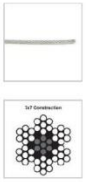
Note: Product availability is real-time updated and adjusted continuously. The product will be reserved for you when you complete your order. More

TECHNICAL SPECS

Item	**Tubing**	Tube Length	**50 ft.**
Tube Material	**Nylon**	Tube Color	**Natural**
Tube Hardness	**Shore D: 60**	Tolerance	**+0.002 to -0.004"**
Inside Dia.	**3/32"**	Temp. Range	**-4 Degrees to 175 Degrees F**
Outside Dia.	**1/8"**	Burst Pressure	**675 psi**
Wall Thickness	**1/64"**	Vacuum Rating	**28 in. Hg.**
Max. Pressure	**267 psi @ 68 Degrees F**	Standards	**NFE 49.100**

Home / Hardware / Chain & Rope / Wire Rope

Model # 11906 Internet #100338232 Store SKU #754670



Crown Bolt

1/16 in. x 1 ft. Galvanized Uncoated Wire Rope

★★★★★ Write the first Review Questions & Answers (1)

$0.23 /feet

Quantity - 1 +

Pick Up In Store

This item must be purchased in store
at Avondale

31 in stock
Aisle 22, Bay 010 Text to Me

Change Pickup Store

We'll Ship It to You

Shipping is unavailable for this product

Your local store: Avondale
Store Details & Services

Product Overview

7 x 7 wire rope is constructed of 7 strands of seven wires and is semi flexible. 7 x 7 uses heavier gauge wire and offers better abrasion resistance than 7 x 19. Superior strength allows for multiple uses, such as guy wires, net suspension, animal leash, tether lines and winches. Warning: Do not use for overhead lifting and never exceed the working load limit. Not intended for use as a safety device or in any application where a failure may result in bodily injury or property damage.
California residents: see Proposition 65 information

- Steel with galvanized finish for good weather resistance
- High performance uncoated wire rope
- Light duty
- Working load limit of 120 lbs.
- Maximum working load limit that shall be applied in direct tension to a new and undamaged wire rope

Specifications

Dimensions

Product Depth (in.)	8.5	Product Length (in.)	12
Product Height (in.)	8.5	Product Width (in.)	3
Product Length (ft.)	1 ft	Rope Diameter (in.)	1/16

Details

Color Family	Metallics	Material	Steel
Double loops	No	Package Quantity	1
Fastener Type	Wire Rope	Product Weight (lb.)	4lb
Gauge	0.062	Returnable	30-Day
Hooks	No	Rope configuration	Twisted
Load limit (lb.)	120	Vinyl coated	0

Warranty / Certifications

Manufacturer Warranty	None

How can we improve our product information? Provide feedback.

PRODUCT DATA

W. R. MEADOWS SEALTIGHT

MasterFormat: 03 39 23

NO. 360

MARCH 2016
(Supersedes May 2008)

DECRA-SEAL™

Non-Yellowing Acrylic Curing and Sealing Compound for Decorative Concrete

DESCRIPTION

DECRA-SEAL is a non-yellowing, acrylic-based, high solids, liquid curing and sealing compound for decorative concrete. The product is clear, transparent and easy to apply. DECRA-SEAL also offers improved resistance to water, alkalis, and petroleum spirits. The product has been formulated to seal and protect decorative colored concrete by producing a hard yet flexible, clear film. This product is specifically formulated for the decorative concrete market.

USES

DECRA-SEAL is designed for various applications, including exterior concrete surfaces, driveways, patios, swimming pool areas, exposed aggregate concrete surfaces, as well as any exterior surface where protection and sealing of concrete is desired. The use of DECRA-SEAL on any exterior concrete surface provides a durable, long-lasting, high-sheen finish that offers improved resistance to chemicals, oil, grease, de-icing salts, and abrasion.

FEATURES/BENEFITS

- Permeable film allows moisture in cured concrete to evaporate.
- Seals all concrete surfaces, providing a glossy, long-lasting appearance and easier cleanup.
- Provides a totally clear membrane that will not yellow, for new or existing concrete.
- Helps minimize spalling of exterior concrete.
- Provides good blush resistance in damp areas.
- Applies easily … dries to the touch in 30 - 60 minutes.
- Provides a clear, tough film that improves abrasion and stain resistance.
- Offers improved resistance to oil, grease, de-icing salts, cleaning agents (except aromatic solvents), and other pollutants.
- Can be recoated after thorough surface cleaning to restore original beauty.
- VOC-compliant.

PACKAGING

1 Gallon (3.79 L) Cans (4/Carton)
5 Gallon (18.93 L) Pails

COVERAGE

300 – 600 ft.^{2}/gal. (7.37 – 14.73 m^2/L)
Coverage may vary due to porosity and condition of the concrete.

SHELF LIFE

When stored indoors in original, unopened containers at temperatures between 40° - 90° F (4° - 32° C), optimum performance and best use is obtained within two years of date of manufacture.

SPECIFICATIONS

- ASTM C 309, Type 1, Class A & B
- ASTM C 1315, Type 1, Class A
- AASHTO M 148, Type 1, Class A & B
- U.S. EPA AIM Regulation 40CFR Part 59 – 700 g/L maximum VOC

TECHNICAL DATA**

The following results were obtained under laboratory conditions:

Drying Time @ 73° F, 50% RH	1 - 2 hours***
Re-coat	2 - 24 hours
Foot Traffic	4 - 6 hours
Wheel Traffic	6 - 12 hours
VOC Content	690 g/L
Adhesion to Concrete	Excellent
Ultraviolet (UV) degradation ASTM C 1315, 8.7 Ultraviolet Resistance Chalk Resistance Check/Peel Resistance	 Non-yellowing No chalking No deterioration
Alkali Resistance	Excellent

**All technical data is typical information, but may vary due to test methods, conditions and operators.
***Low concrete or air temperatures and/or high relative humidity will extend drying times.

APPLICATION

SURFACE PREPARATION

Fresh (New) Concrete … Apply as soon as all surface water has disappeared and the concrete surface will not be marred by walking workers.

CONTINUED ON REVERSE SIDE…

W. R. MEADOWS, INC.
P.O. Box 338 • HAMPSHIRE, IL 60140-0338
Phone: 847/214-2100 • Fax: 847/683-4544
1-800-342-5976
www.wrmeadows.com

HAMPSHIRE, IL /CARTERSVILLE, GA /YORK, PA
FORT WORTH, TX /BENICIA, CA /POMONA, CA
GOODYEAR, AZ / MILTON, ON /ST. ALBERT, AB

Existing (Old) Concrete … Concrete surface must be clean and dry with all stains, oil, grease, dust, dirt, and curing compounds removed prior to application. ULTRITE® DEGREASER from W. R. MEADOWS is recommended for cleaning.

Application Method … Use a sprayer or short-nap roller [1/4" (6.35 mm) is ideal] to apply a uniform film. Avoid puddling in low areas. If puddles occur, brush or roll them out. A standard industrial-grade sprayer, such as a Chapin 19069, equipped with Viton fittings, a 0.5 GPM nozzle, and fan spray pattern, is recommended. Apply over the entire surface; avoid puddling in low areas.

For full application guidelines, please visit http://www.wrmeadows.com/vocapp/.

Mixing … For optimum performance, gentle mixing or agitation is recommended. CAUTION: TO AVOID FOAMING, DO NOT MIX EXCESSIVELY.

Drying Time … Product dries quickly. Drying times will vary depending on application rate, temperature, humidity, and project conditions. Restrict foot traffic for at least four hours. Twelve hours is preferable.

Cleanup … Clean tools after use with a solvent such as xylene, toluene, or SEALTIGHT CLEANER from W. R. MEADOWS.

PRECAUTIONS

FOR OUTSIDE/EXTERIOR APPLICATION ONLY. DECRA-SEAL IS FLAMMABLE. KEEP AWAY FROM ALL OPEN FLAMES, SPARKS, IGNITION SOURCES, etc. Use with adequate ventilation and block all HVAC ventilation ducts which may spread product vapors - vapors are flammable and heavier than air. If product odors are objectionable, W. R. MEADOWS recommends using a water-based product, such as DECRA-SEAL™ W/B or any of the VOCOMP® series products. DECRA-SEAL must be applied without diluting or thinning. Surfaces treated with DECRA-SEAL may become slippery under certain conditions. To increase slip resistance, addition of SURE-STEP™ from W. R. MEADOWS is recommended. DECRA-SEAL should not be applied in direct sunlight, or in high temperature conditions. These conditions cause rapid evaporation, preventing proper film formation, which may cause the dried film to peel, bubble, become hazy, and/or turn white (blush). Surface temperature of the concrete must be between 40° – 90° F (4° – 32° C) at time of application to allow for proper film formation.

DECRA-SEAL should not be applied to concrete exposed to excessive moisture. Entrapped moisture in a solvent-based sealer may cause the film to peel and/or turn white (blush). Improper or over-application may cause the dried DECRA-SEAL film to appear hazy and/or white.

Product may be used on colored concrete, but mottling may occur. Do not use on dense or non-porous surfaces, i.e. brick, stone, etc. Concrete containing calcium chloride will remain dark longer when treated with this product. Concrete floors properly sealed with DECRA-SEAL meet the requirements of ASTM C 1315, Section 8.8 – Adhesion, for ceramic tile adhesives per ANSI A 136.1-1992 requirements. For any other specifications, applications, installations, etc., please obtain approval for use from the manufacturer of the subsequent product/treatment being applied. These products may include, but are not limited to adhesives, mortars, tile cements, paints, coatings, penetrating treatments, etc. The specifier and user shall determine the suitability of product for specific applications and assume all responsibility in connection therewith.

Do not use on exposed aggregate overlays.

HEALTH AND SAFETY

Avoid direct contact with this product, as it may cause irritation of the eyes and/or skin. Inhalation of vapors may result in transient central nervous system depression. DECRA-SEAL is combustible. DECRA-SEAL should not be utilized in locations where food items are present. Refer to Safety Data Sheet for complete health and safety information.

LEED INFORMATION

May help contribute to LEED credits:

- MR Credit 2: Construction Waste Management
- MR Credit 5: Regional Materials

For most recent data sheet, further LEED information, and SDS, visit www.wrmeadows.com.

LIMITED WARRANTY

W. R. MEADOWS, INC. warrants at the time and place we make shipment, our material will be of good quality and will conform with our published specifications in force on the date of acceptance of the order. Read complete warranty. Copy furnished upon request.

Disclaimer

The information contained herein is included for illustrative purposes only, and to the best of our knowledge, is accurate and reliable. W. R. MEADOWS, INC. cannot however under any circumstances make any guarantee of results or assume any obligation or liability in connection with the use of this information. As W. R. MEADOWS, INC. has no control over the use to which others may put its product, it is recommended that the products be tested to determine if suitable for specific application and/or our information is valid in a particular circumstance. Responsibility remains with the architect or engineer, contractor and owner for the design, application and proper installation of each product. Specifier and user shall determine the suitability of products for specific application and assume all responsibilities in connection therewith.

 03/16-3M