

| | |
|----------|-----------------------------------|
| 03 30 00 | Cast-in-Place Concrete |
| 03 37 26 | Underwater Placed Concrete |
| 31 00 00 | Earthwork |

MasterMatrix[®] UW 450

Anti-Washout Admixture

Description

MasterMatrix UW 450 anti-washout admixture is a patented, ready-to-use, liquid cellulose-based admixture that is specially developed for underwater concrete applications. Concrete containing MasterMatrix UW 450 admixture exhibits superior resistance to washout of cement and fines, while impeding the blending of external water into the plastic concrete.

MasterMatrix UW 450 admixture meets the requirements of the U.S. Army Corps of Engineers CRD-C 661-06, Specification for Anti-Washout Admixtures for Concrete.

Applications

Recommended for use in:

- All types of underwater concreting where conventional concrete or placing techniques would result in a high percentage of material loss due to washout
- Mortar and grouting applications where mixtures are typically more fluid and have a higher potential for washout
- Geotechnical grouting and ground improvement

Features

- Reduction in washout of cement and fines
- Reduction in segregation, even with highly fluid, high water-to-cementitious materials ratio concrete mixtures
- Thixotropic action that provides concrete stiffening after placement
- Reduction or elimination of concrete bleeding

Benefits

- Superior and predictable in-place concrete properties
- Dewatering costs reduced/eliminated
- Environmental impact of cement washout in water minimized
- Flexibility in batching procedures

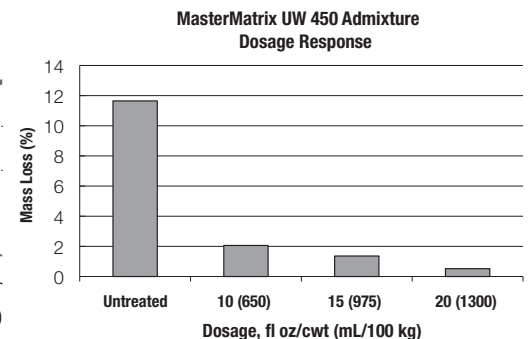
Performance Characteristics

Washout Resistance: Washout is determined by Army Corps of Engineers CRD-C 61, "Test Method for Determining the Resistance of Freshly Mixed Concrete to Washing Out in Water". Test results show that the addition of MasterMatrix UW 450 anti-washout admixture to concrete significantly reduces the washout of cement and fines, compared to untreated concrete.

Concrete Mixture Data (Non-Air-Entrained Concrete)

| | |
|--------------------|---|
| Cement Content | 650 lb/yd ³ (386 kg/m ³) |
| Water-Cement Ratio | 0.49 |
| Slump | 4 ± 0.5 in. (100 ± 10mm) |

Slump: Concrete that is designed for underwater placement applications is typically batched at an 8-10 in. (200-250 mm) slump. After MasterMatrix UW 450 admixture is added, a decrease in slump will be noted. It may be necessary to add additional high-range water-reducing admixture to achieve the slump required for placement. Slump evaluations for a 60-minute period show that MasterMatrix UW 450 admixture does not adversely affect concrete slump retention.



Air Content: A slightly higher dosage of air-entraining admixture may be required to achieve the desired air content when using MasterMatrix UW 450 admixture.

Setting Time: MasterMatrix UW 450 admixture has little to no effect on concrete setting time at commonly used dosages of 4-12 fl oz/cwt (260-780 mL/100 kg). Slight retardation of setting time may be experienced at dosages over 12 fl oz/cwt (780 mL/100 kg).

Compressive Strength: Using test specimens that are cast in air, concrete containing MasterMatrix UW 450 admixture may obtain slightly lower compressive strength when compared to untreated concrete. However, when strength is evaluated using test specimens that are cast underwater, concrete containing MasterMatrix UW 450 admixture achieves higher strength because washout is minimized. In addition, most underwater concrete mixtures that are proportioned in accordance with ACI 304R, "Guide for Measuring, Mixing, Transporting, and Placing Concrete", exceed compressive strengths that are required for underwater applications. If necessary, a lower water-to-cementitious materials ratio may be used to achieve the desired results.

Guidelines for Use

Dosage: MasterMatrix UW 450 admixture is recommended for use at a dosage range of 4-20 fl oz/cwt (260-1300 mL/100 kg) of cementitious materials for most concrete mixtures. Because of variations in concrete materials, jobsite conditions and/or applications, dosages outside of the recommended range may be required.

Mixing: For underwater concrete placements, ACI 304R, Chapter 8, "Concrete Placed Underwater" provides certain basic mixture proportions such as:

- A minimum total cementitious material content of 600 lb/yd³ (356 kg/m³)
- Use of pozzolans approximately 15% by mass of cementitious materials
- A maximum water-to-cementitious materials ratio of 0.45
- Fine aggregate contents of 45-55% by volume of total aggregate
- Air contents of up to 5% are listed as desirable
- A slump of 6-9 in. (150-230 mm) is generally necessary and occasionally a slightly higher slump range is needed

MasterMatrix UW 450 admixture should be added with a water-reducing admixture, such as Master Builders Solutions MasterPolyheed® or MasterSet® admixture lines. For achieving high slump concrete, use MasterMatrix UW 450 admixture in conjunction with a MasterGlenium® high-range water-reducing admixture. This

combination will produce a high-performance, flowing concrete that exhibits superior resistance to washout of cement and fines. MasterMatrix UW 450 admixture should be added after all other concreting ingredients have been batched and thoroughly mixed, either at the batch plant or at the jobsite.

Concrete Placement: Concrete containing MasterMatrix UW 450 admixture is easily pumped throughout the typical slump ranges that are used for underwater concreting. It is recommended that concrete containing MasterMatrix UW 450 admixture is placed by pump or tremie. Concrete placement should be continuous and without interruption. Keep the discharge point of the placement device immersed in the fresh concrete during placement.

It is not recommended that concrete containing MasterMatrix UW 450 admixture be allowed to free-fall through water during placement.

Product Notes

Corrosivity – Non-Chloride, Non-Corrosive: MasterMatrix UW 450 admixture will neither initiate nor promote corrosion of reinforcing and prestressing steel embedded in concrete, or of galvanized steel floor and roof systems. Neither calcium chloride nor other chloride-based ingredients are used in the manufacture of this admixture.

Compatibility: Do not use MasterMatrix UW 450 admixture with naphthalene-based high-range water-reducing admixtures. Erratic behaviors in slump, pumpability and washout may be experienced.

Storage and Handling

Storage Temperature: MasterMatrix UW 450 admixture must be stored at temperatures above 44 °F (7 °C) to avoid dispensing difficulties due to thickening. Do not allow MasterMatrix UW 450 admixture to freeze since it cannot be reconstituted after thawing.

Shelf Life: MasterMatrix UW 450 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 MasterMatrix UW 450 admixture has been exceeded.

Handling: Contact with water in hoses, pumps, tanks or receiving vessels must be avoided to prevent gelling when transferring MasterMatrix UW 450 admixture to other containers.

Dispensing: Consult your local sales representative for the proper dispensing equipment for MasterMatrix UW 450 admixture. If dispensing directly from the 55 gal (208 L) drum, it is recommended that the larger 2 in. (50 mm) opening be used.

Packaging

MasterMatrix UW 450 admixture is supplied in 53 gal (201 L) drums and 264 gal (999 L) totes.

Related Documents

Safety Data Sheets: MasterMatrix UW 450 admixture

Additional Information

For additional information on MasterMatrix UW 450 admixture or its use in developing concrete mixtures with special performance characteristics, contact your local sales representative.

Master Builders Solutions creates technologies for the construction industry inspiring people to build better. We are active in ~40 countries and operate 35 production sites with over 1,600 employees. We develop, produce, and market high-quality chemical admixtures, as well as adjacent core technologies, to master the challenges of today and support a decarbonized future. Our people are pivotal and pair leading technologies and a strong brand heritage to surpass our customers' expectations and drive continuous value creation.

Limited Warranty Notice

Master Builders Solutions Admixtures US, LLC ("Master Builders Solutions") 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. MASTER BUILDERS SOLUTIONS 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 Master Builders Solutions. 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. MASTER BUILDERS SOLUTIONS 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 Master Builders Solutions' present knowledge and experience. However, Master Builders Solutions 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. Master Builders Solutions 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.