

MasterMatrix[®]

Family of Viscosity-Modifying Admixtures

Overview

MasterMatrix viscosity-modifying admixtures (VMA) are engineered and formulated to enhance concrete performance by modifying the viscosity and controlling the rheological properties of the concrete mixture. Concrete containing a VMA exhibits superior stability, even at high levels of fluidity, thus increasing resistance to segregation and facilitating easy placement.

Uses for MasterMatrix VMAs

MasterMatrix VMAs can be used in virtually every concrete application. Concrete contractors can benefit from using concrete containing MasterMatrix VMA at low dosages to provide “more body” to facilitate pumping and finishing procedures. At higher dosages in self-consolidating concrete (SCC), MasterMatrix viscosity-modifying admixtures provide stability and serve as an “insurance policy” against segregation. The use of a VMA also increases the number of applications for SCC because more mixtures can be proportioned for a wider range of applications.

Variations in aggregate moisture content, in particular that of the fine aggregate, and mixture ingredient batching can lead to segregation, excessive bleeding and SCC performance inconsistency. The use of a VMA in an SCC mixture can improve consistency and control segregation and bleeding in mixtures with excessive water contents, depending on VMA type.

MasterMatrix VMAs are also recommended for use in concrete containing “gap-graded” aggregates, lean concrete mixtures, and concrete containing coarse, manufactured sand as bleeding is controlled and rheological properties are improved to facilitate pumping and finishing, and improve surface appearance.

MasterMatrix VMAs are also ideal for use in concretes containing high coarse aggregate contents. An architectural exposed-aggregate precast panel is difficult to produce using



conventional SCC because a high loading of coarse aggregate will have a tendency to segregate. This can cause a non-uniform appearance in the final product. The stabilizing effect of a VMA provides cohesiveness to the mixture and facilitates the use of higher coarse aggregate contents [$> 1750 \text{ lb/yd}^3$ (1038 kg/m^3)] in this type of application. The net effect is a uniform exposed-aggregate finish.

The Technologies Behind MasterMatrix VMA Products

VMAs can be categorized under two main groupings based on the mechanism by which they function; thickening-type or binding-type.

Thickening-Type VMA – Viscosity-modifying admixtures in this group function by thickening the concrete, making it very cohesive without significantly affecting the fluidity of the mix. By modifying the viscosity of a very fluid concrete mixture such as SCC, it becomes more stable and less prone to segregation during and after placement.

Binding-Type VMA – These VMAs function by binding water within the concrete mixture. This mechanism results in an increase in the viscosity of the mixture, while reducing or eliminating concrete bleeding. This type of VMA is more potent in modifying the viscosity of a SCC mixture compared to a thickening-type VMA. Concrete treated with a binding-type VMA also takes on a thixotropic characteristic, which means that fresh concrete may gel up if left in a mixing vessel, truck, or form without agitation. Simply re-mixing the concrete can restore workability. This characteristic in the plastic state will be apparent until the concrete begins to gain rigidity due to hydration.

MasterMatrix Viscosity-Modifying Admixture Products

MasterMatrix products are formulated to provide enhanced performance attributes in concrete. The MasterMatrix family of viscosity-modifying admixtures is comprised of three products. As a concrete producer or contractor, you have your choice of MasterMatrix VMA to meet your specific needs.

MasterMatrix VMA 358

- Thickening-type viscosity modifier
- Easy-to-dispense
- Controls bleeding

MasterMatrix VMA 362

- Thickening-type viscosity modifier
- Easy-to-dispense
- Controls bleeding
- Imparts thixotropic characteristics

MasterMatrix VMA 450

- Binding-type viscosity modifier
- Controls bleeding
- Imparts thixotropic characteristic to concrete mixture.

MasterMatrix VMA Features and Benefits

Whether you are meeting a daily concrete production schedule or developing high-performance concrete for a specific application, the premier line of MasterMatrix viscosity-modifying admixtures provides you with the additional flexibility and confidence to meet industry demands and challenges for quality concrete.

With MasterMatrix VMA admixtures, concrete producers and contractors can achieve desirable performance characteristics such as:

- Enhanced concrete viscosity
- Thixotropic properties
- Improved stability during transport and placement
- Enhanced pumpability
- Enhanced finishability
- Controlled bleeding

The unique features of MasterMatrix viscosity-modifying admixtures provide the following benefits for the entire construction team:

- Provides flexibility in mixture proportioning and batching
- Provides superior and predictable in-place concrete properties
- Reduces sagging helping plastic concrete maintain its shape on slopes and arches
- Facilitates production of highly-fluid concrete mixtures such as self-consolidating concrete
- Enhances surface appearance

Overall, a VMA can provide flexibility in mixture proportioning, enable the use of more normal mixture proportions without the need to increase fines content in SCC mixtures, and assure stability with varying mixture ingredients.

About Master Builders Solutions

Master Builders Solutions is a leading global manufacturer of concrete admixtures, as well as other sustainable solutions for the construction industry, focussed on delivering its vision: **Inspiring people to build better.** Master Builders Solutions provides value-added technology and market-leading R&D capabilities to improve the performance of

construction materials and to enable the reduction of CO2 emissions in the production of concrete. Founded in 1909, Master Builders Solutions has ca. 1600 employees operating 35 production sites globally, supporting their customers in mastering their building challenges of today – for a decarbonised future.

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