

Description:

MM-500 is a multipurpose admixture for concrete. It is an organic material, white in color, liquid to paste like mass depending on temperature and soluble in water. The product is non-flammable, non hazardous and eco friendly, which can be used in all types of construction where concrete mixture is involved.

Features and Benefits:

- ✓ 12+ years of history.
- ✓ Self-seals surface hairline cracks up to 0.5 mm (0.02 in).
- ✓ Reduces concrete shrinkage and cracking.
- ✓ Moderate level of permeability reduction .
- ✓ Dependable self-sealing performance .
- ✓ Damp proofing agent.
- ✓ Provides resistance to air and waterborne corrosive chemicals .
- ✓ Reduces honey comb, porosity and cracks.
- ✓ Anti-salinity .
- ✓ Allows monolithic bonding of blocks in new and old joints of concrete .
- ✓ Allows perfect compaction (no segregation due to excessive vibration) .
- ✓ Allows easy release of formwork.
- ✓ Achieves linear polymerization between lumps and noodles of concrete mass .
- ✓ Extends life of concrete .
- ✓ Protects rebar against corrosion.
- ✓ Partial auto curer .
- ✓ Reduces cost of maintenance and repairs .
- ✓ Lowers waterproofing costs.
- ✓ Fair face effect.
- ✓ Safe for contact with potable water.
- ✓ Easy to use on site and can be directly added to ready-mix trucks.

Recommended Uses:

- ✓ RCC Roads – Highways, Bridges and Dams.
- ✓ Water treatment plants (WTP), ETP, UTP, sewage, and manholes.
- ✓ Storm surge barriers, docks, levees, jetty & dikes for diversion of rising sea water.
- ✓ Multi-structures, airport runways.
- ✓ Concrete homes including basements, foundations, swimming pools, water reservoir, decks, bathrooms, garages, rooftops & exteriors.
- ✓ Below-grade parking structures, basements, elevator pits and foundations of high-rise towers.
- ✓ Recreational facilities such as aquatic centers, aquariums, zoos, water parks and marinas.
- ✓ Architectural water features: fountains and waterfalls.
- ✓ Traffic tunnels, below-grade pipelines and subway tunnels.

Plastic Properties:

- ✓ **MM-500** minimizes air entrainment.
- ✓ **MM-500** has water reducing properties.
- ✓ **MM-500** has superplasticizer properties.
- ✓ **MM-500** allows concrete lubrication.
- ✓ **MM-500** has workability properties.
- ✓ **MM-500** allows fluidity.
- ✓ No segregation by excessive vibration allowing better compaction.

Setting Properties:

- ✓ Controls the temperature.
- ✓ Prevents rapid dehydration, hence density of concrete increases durability (HPC).
- ✓ Hairline crack reducer.

Hardened / Performance Properties:

- ✓ Permeability is reduced. (void porosity)
- ✓ Physical and chemical properties and appearance are the same as for normal concrete.
- ✓ Achieves smoother surface allowing application of paints and easy placement of tiles or other desired finishes

Properties:

Physical properties:

Appearance	Liquid to paste
pH value	8.6
Bulk density	1.02

Plastic properties:

Slump	120 to 150 mm
Plastic density	1.05 (g/cm ³)
Air content	2 to 3 %

Setting times:

Initial	60 to 70 mins
Final	10 hours

Compressive Strength:

After 7 days	2800-3000 psi (19-21 MPa)
After 28 days	4500+ psi (31+ MPa)

Property	MM-500
Water Permeability BS/EN 12390-8	Reduced 90%
Concrete Durability	High
Drying Shrinkage	Reduced 70%
Wetting Expansion	Reduced 70%
Absorption	Minimal
RCPT ASTM C1202	Very Low

Tests performed according to ASTM standard by B.U.E.T, M.I.S.T, H.B.R.I & BETON(USA)

According to the ASTM C1202 rating, concrete without admixture was of category “ High Permeability “ even at 90 days of age. But **MM -500** mixed concrete just reached the “ Medium Permeability” range at the age of 28 days and the trend shows the chloride permeability is decreasing. (B.U.E.T & BETON)

Example of Mixing Design Optimization (1 Cubic Yard)

Material	Control Mix	MM-500
Cement	300 kg.	300 Kg.
1.8 To 2.5 FM Sand	450 Kg.	450 Kg.
¾” Downgrade High Density Bolder Stone Chips	900 Kg.	900 Kg.
MM-500	N/A	1.80 Liter
Water	135 Liter (36 Gal)	135 Liter (36 Gal)

W/C RATIO : 45% MIX DESIGN 1 : 1.5 : 3 SAND / AGGREGATE DAMP OR MOIST SSD

*** PLEASE USE THE CALCULATION SHEET FOR ACCURATE DOSAGE FOR SPECIFIC AREA OF THE WORK TO ACHIEVE IDEAL PERFORMANCES & RESULTS.

Concrete Properties:

Property	Control Mix	MM-500
Slump	50 mm.	85 mm. To 160 mm.
Air Content %	4.7 %	2 % To 3 %
Initial Setting Time	30 To 45 minutes	60 To 70 minutes
Final Setting Time	10 hours	10 hours
Compressive Strength (7 Days)	21 Mpa. (3000 Psi)	21 Mpa. (3000 Psi)
Compressive Strength (28 Days)	28 Mpa. (4000 Psi)	31 Mpa. (4500 Psi)

- Concrete is made of locally sourced materials to achieve different properties like strength, workability and durability.(Both in USA & overseas). Results of testing will always vary based on the unique mix design. Testing listed is over a control and is a compilation of different tests in which **MM-500** is best in class. MMCL highly recommends consulting the technical team for extensive support with all design specifications to the clients requirements to achieve the ultimate result and success of the product usage whether in field tests or lab tests to the final site performance.
- MMCL does not recommend eliminating standard shrinkage control joints. Follow ACI guidelines and **MM-500** literature for waterproofing joints.
- Do not assume strength increase will occur rapidly but due to the effectiveness and chemical reaction within the curing process of **MM-500**, while the plastic state holds the properties initially for best results: the ultimate hardened state will suffice the required strength eventually.

Recommended Dosage:

The maximum dosage is 400 ml / 13.52 oz of **MM-500** for every 50 kg / 110 lb of cement but may vary as per the client's specific need. The table below illustrates an in-depth breakdown of the recommended dosages based on the desired structure.

Piling	250 ml/ 8.45 oz with 50 Kg/ 110 lb of Cement
Superstructure	200 ml to 250 ml/6.76 oz to 8.45 oz with 50 Kg/ 110 lb of Cement*
RMC (Ready mix concrete)	0.5% to 0.8% of Cement Weight
Cement/ Mortar	250 ml/8.45 oz to 400 ml/13 oz with 50 Kg/ 110 lb of Cement*
Bridge/Culvert/Dam	250 ml/8.45 oz to 400 ml/13 oz with 50 Kg/ 110 lb of Cement*
Basement	250 ml/8.45 oz to 400 ml/13 oz with 50 Kg/ 110 lb of Cement*
Water Tank	300 ml/10 oz to 400 ml/13 oz with 50 Kg/ 110 lb of Cemen*
Swimming Pool	300 ml/10 oz to 400 ml/13 oz with 50 Kg/ 110 lb of Cement*
Roof	250 ml/8.45 oz to 400 ml/13 oz with 50 Kg/ 110 lb of Cement*
Others	As per MMCL's Recommandations / Consultations

* Depending on applications and site/concrete materials conditions.

Certifications & Standards:

Certified by BETON, B.U.E.T, M.I.S.T and HBRI.

ASTM C-39	Compressive Test
ASTM C-143	Slump
ASTM C-1794	Water Absorption
NT-Build 492	Concrete Durability
ASTM C-1202	Rapid Chloride Penetrability Test
BS EN 12390	Water Penetration Test

Applications:

A pre-pour meeting and consultation with the general contractor, concrete supplier, ready-mix company, finisher, material testing engineers or laboratory technicians are strongly recommended. Treat construction joints, dosage and mixing in accordance to recommendations & instructions. Dose **MM-500** up to a maximum 400ml to 110 lbs of cement in consultation with an authorized MMCL representative. Trial batches are required to determine actual plastic properties.

When mixing MM-500

Mortar mixing machine – Dilute MM 500 in water for the batch, mix with cement & aggregates. For proper inclusion, 6-10 revolutions recommended.

Ready Mix Truck – Add MM 500 directly into the truck at site. For proper inclusion, 24 revolutions recommended.

Ready Mix / Batching Plants – Normal procedures as any other admixture during the mixing at the plant. Consulting MMCL Technical team for accuracy of usage and dosage is highly recommended.

Place and finish concrete in accordance with ACI guidelines. Proper placement and curing are essential to achieve the performance and benefits of **MM-500**. Curing influences the overall quality of the concrete structure; thus, proper curing techniques are important to prevent the concrete from shrinking, drying, and cracking especially at the surface. Other than standard procedures no other special curing methods are required. **MM-500** helps the concrete to hold the water for self-curing.

To achieve monolithic bonding of blocks between new and old joints of concrete

- ✓ Make cement grout by mixing 12.25 kgs / 27lbs of cement, 12.5 liters / 3.30 gallons of water,
- ✓ then add 1 liter / 33.80oz of **MM-500**.
- ✓ Pressure-wash the joint key thoroughly if needed.
- ✓ Thoroughly brush on **MM-500** grouting to the surface.

Misc Recommendations:

- ✓ To achieve leak proof for high performance concrete (HPC), it is suggested to use strong formwork. This will enable proper compaction as extra vibration can be applied.
- ✓ To achieve stronger bonding and leak proof the concrete, it is recommended to follow the construction joint drawing as per fig: 1, 2 & 3 as shown in the swimming pool applications.
- ✓ Before using **MM-500** Cement Grout, please thoroughly clean the surface with water pressure or with a steel brush.
- ✓ After using **MM-500** with the cement grout, it is suggested to apply proper vibration to compact the concrete to get high performance concrete (HPC). Excessive vibration will not cause segregation; thus, it will not be required to use PVC water stoppers or any form of liquid felts at the joints.
- ✓ Plastering & Stucco : Waterproofing & Damp proofing can be achieved for new, pre existing walls or repair works. In the case of old repair , simply sizzle the old mortar plaster and recast a new layer plaster with **MM-500**. The dosage would be 400ml for 110 Lbs of cement. Thickness minimum 12mm to maximum 18 mm. Recasting a new layer of concrete over old floors or walls is possible as well. Please consult MMCL's technical team's recommendation to follow precise methods.

The Plaster and Stucco Details Are Given Below:

** The Plaster and Stucco thickness should be 12 mm. to 18 mm.

** Mix design ratio of mortar for Plaster & Stucco should be

1:4 (Cement : Sand)

1. PLASTER: MM-500 suitable for plaster because **MM-500** increases mortar smoothness and flexibility thus helping a mason to finish the work efficiently. **MM-500** also creates membrane which helps the plaster waterproof.

Dosage of **MM-500**

A. Exterior Plaster = 400 ml. per 50 kgs. Cement.

B. Interior Plaster = 250 ml. per 50 kgs. cement.

2. STUCCO : MM-500 is suitable for Stucco since **MM-500** increases mortar smoothness and flexibility thus helping a mason to allow texture of stucco quickly. **MM-500** creates a membrane which helps the Stucco waterproof.

Dosage of **MM-500**

A. Exterior Stucco = 400 ml. per 50 kgs. Cement.

B. Interior Stucco = 250 ml. per 50 kgs. cement.

Limitations:

This Concrete Admixture, **MM-500**, is provided without any representations or warranty, OTHER THAN THOSE THAT ARE CONTAINED IN THE **MM-500** PRODUCT PROFILE, that has been provided to customers. It is the customer's responsibility to review the Product Profile.

Variations or deviations from the specifications, recommended usage or dosages in the product profile may adversely impact the effectiveness of **MM-500**. Multi Mix Company, LLC makes no warranties, representations or guarantees of any kind if the specifications, recommended usage and dosages are not complied.

Health & Safety:

- ✓ Non – Hazardous.
- ✓ Non – Flammable.
- ✓ No Special clothing or equipment needed.
- ✓ Precautions to be taken in Handling and
- ✓ Spilled material is slippery .

SAFETY: Material Safety Data Sheet (MSDS) for this product. For professional use only. Avoid contact with skin or eyes.

Respiratory protection	Not Required
Eye protection	Chemical Goggles Recommended
Protection Gloves	Recommended
Ventilation	General ventilation is recommended
Other Protective equipment	Not Required

Technical Service:

MMCL Technical Services are available on request for onsite support to assist in the accurate use of **MM-500**.

Packaging:

25-liter Canister. 50-liter Drum. 20-liter Bucket. Bulk upon buyer's request.

Packaging:

MM-500 has a minimum shelf-life of 2 years in sealed conditions to be kept within a temperature of 15°C to 40°C in normal & dry places.

Warranty:

Multi Mix Company warrants that MMCL products are free from manufacturing defects and comply with the specifications given in their respective technical data sheet, because conditions of use, such as site conditions, surface preparations, workmanship, concrete materials, weather, structural issues and other factors are beyond the control of MMCL, no warranty can be given as to the results of use unless the client consults on site supervision by MMCL.

Purchaser agrees to seek the advice of qualified professionals and to determine for themselves the suitability of **MM-500** for their intended purpose and assumes all risks.

Purchaser's sole remedy is limited to replacement of any product proven defective. THIS LIMITED WARRANTY CONTAINS THE ENTIRE OBLIGATION OF MMCL. NO OTHER WARRANTIES, EXPRESS OR IMPLIED, SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. MMCL SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. No representative of MMCL has the authority to make any representations or provision except as stated herein.

MMCL reserves the right to change the properties of its products without notice