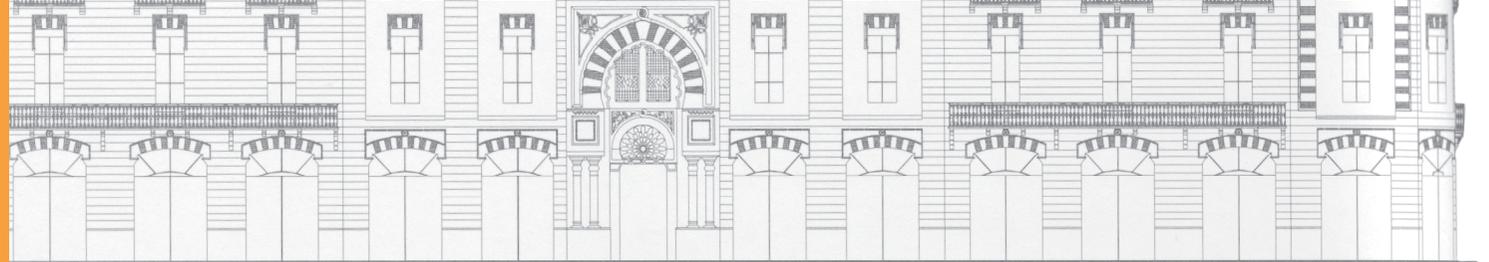
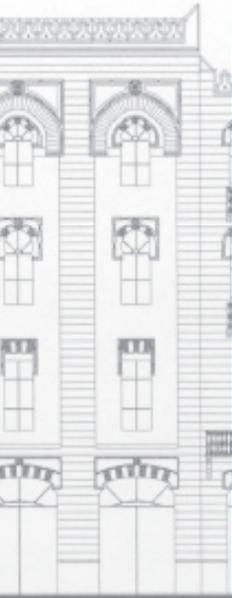
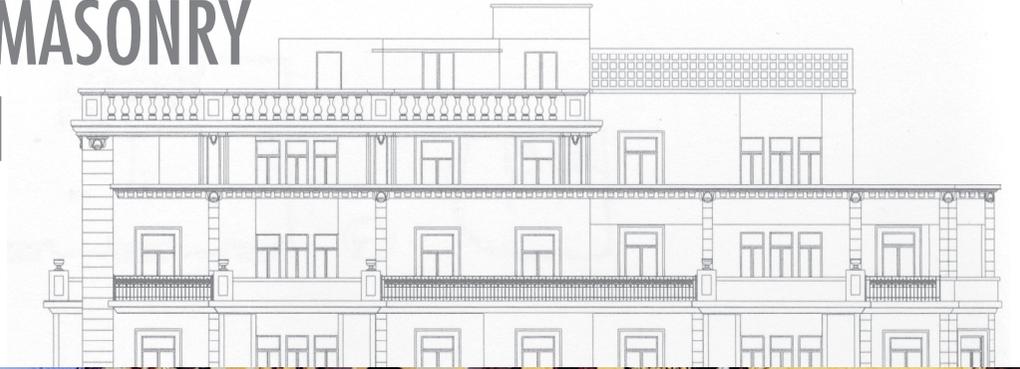


# HYDRAULIC BINDERS & READY-TO-USE MORTARS FOR MASONRY CONSTRUCTION

**batimix**<sup>®</sup>



## Company Overview

Holderchem Building Chemicals S.A.L. was founded in 1994 as a joint venture with Holcim, the world's leading Portland cement producer. It has since developed by virtue of technically innovative ideas, dedicated customer service, and highly skilled staff to become a main independent supplier to the cement and construction industries in Lebanon as well as Middle East and Gulf countries.

A wide and full range of products is available at Holderchem Building Chemicals S.A.L. meeting the most challenging requirements of modern construction. This includes concrete admixtures, masonry binders, ready-to-use mortars, tile adhesives, curing and sealing compounds, epoxy adhesives, injection grouts, concrete repair and waterproofing products, protective coatings, and miscellaneous other specialty construction materials. Holderchem Building Chemicals S.A.L. provides complete laboratory support and specification assistance as well as on-site service for proper usage and application of all supplied products.

# Introduction

Holderchem Building Chemicals S.A.L. is pleased to introduce its **batimix** range of cementitious-based products for use in masonry construction. The dry-mixed binders and mortars are specifically designed and tested to meet all relevant EN and/or ASTM standards for masonry. The R & D work is being carried out by a qualified team of professionals in close coordination with clients to meet the various masonry construction requirements and site-conditions. The aim is to constantly improve the performance of existing products by using high-quality raw materials together with the latest available production processes and technologies.

A full line of masonry products available in different strength properties can be supplied, as summarized in **TABLE 1**. These include masonry hydraulic binders, ready-to-use mortars for block fixing, key coating, and plastering/rendering, as well as specialty mortars for decoration of exterior façades with improved resistance to water permeability. All these products are manufactured under controlled conditions and strict tolerances, and thorough quality control procedures are implemented prior to each product delivery.

TABLE 1

## Summary of **batimix** masonry products and their applications

### batimix

Hydraulic masonry binders	MASONRY BINDER 10	EN 413-1 MC 5 and ASTM C 91 Type N	All these hydraulic binders are not ordinary Portland cements, and therefore cannot be used for concreting works. They are designed for:
	MASONRY BINDER 20	EN 413-1 MC 12.5 ASTM C 91 Type S	<ul style="list-style-type: none"> <li>• Assemblage of masonry units</li> <li>• Spatter-dash slurry key coats</li> <li>• Plastering and patching mortars</li> </ul>
	MASONRY BINDER 30	EN 413-1 MC 22.5 ASTM C 1328 Type M (id.)	
	MASONRY BINDER 40		
Ready-to-use mortars in two different strength properties	BLOCK FIX 220	EN 998-2	<ul style="list-style-type: none"> <li>• Assemblage and laying of masonry units and stones in interior/exterior partitions</li> </ul>
	BLOCK FIX 230	ASTM C 270	
	KEY COAT 240	N/A	<ul style="list-style-type: none"> <li>• Spatter-dash slurry coats for increasing roughness of smooth substrates</li> </ul>
	KEY COAT 250		
Specialty ready-to-use mortars	PLASTER 260	EN 998-1 Grade GP	<ul style="list-style-type: none"> <li>• Interior/exterior plastering and rendering works, whether manually or spray machine applied</li> </ul>
	PLASTER 270		
	FIBER PLASTER 280	ASTM C 887	<ul style="list-style-type: none"> <li>• Patching mortars for restoring integrity of non-load bearing masonry elements.</li> </ul>
	FIBER PLASTER 290		
	MONOUCHE 300	EN 998-1 Grade OC	Decorative/textured façade plaster coating, available in various natural colors. Applied in one coat, yet fulfills all the functions of multi-coat systems for external rendering works
	PLASTER W-330	Exceeds EN 998-1 requirements	Hydrophobic plaster which minimizes the rate of water absorption, suitable for exterior plastering and/or patching of structures subjected to high degree of moisture.

# batimix® masonry binder products

Four different types of hydraulic masonry binders are available at Holderchem Building Chemicals S.A.L. Their physical properties are summarized in **TABLE 2**.

- **batimix**. Masonry Binder 10 (or 20) are mixtures of Portland cement, fillers, and chemical additives such as plasticizing, water retaining, and air entraining agents. They are basically recommended for producing mortars for assembling masonry units and block fixing. Alternatively, they can be used for key coat and plastering applications, provided small quantities of Portland cement are added to the mortar mix.

- **batimix**. Masonry Binder 30 is recommended for proportioning spatter-dash slurry coat mortars used for increasing roughness of smooth substrates before plastering works. It incorporates Portland cement in relatively high quantities, fillers, and chemical additives such as plasticizing, air entraining, and viscosity-enhancing agents for minimizing rebounds during mortar application.

- **batimix**. Masonry Binder 40 is formulated to perfectly suit all interior/exterior plastering works, whether hand or spray machine applied. It is composed of Portland cement, fillers, and a combination of

chemical additives such as plasticizing, air entraining, shrinkage-compensating, and water-repelling agents. Plaster mortars made with this product exhibit high surface quality characterized by lower crack development and water permeability.

### Directions for use

At the job-site, these binders are mixed with sand and water in the right proportions to obtain mortars suited for the specific masonry application. For example, for block fixing, one part of **batimix**. Masonry

TABLE 2

Properties of **batimix**. masonry binder products

	Masonry Binder 10	Masonry Binder 20	Masonry Binder 30	Masonry Binder 40
Specific gravity (ASTM C 188)	2.69	2.78	2.96	2.92
Fineness # 325 sieve (ASTM C 430), %	14	16	15	18
Gillmore setting (ASTM C 266), Initial, minutes	150	140	115	130
Final, minutes	300	290	240	270
Autoclave expansion (EN 196-3), mm	2	0.5	0.5	1
Water retention test (ASTM C 91), %	90	92	85	87
Air content (ASTM C 185), %	9	10	8.4	9.5
Compressive strength (ASTM C 109), After 7 days, MPa	10.9	13.2	19.6	17.5
After 28 days, MPa	13.9	19.3	28.5	25.3
Flexural strength (ASTM C 348) at 28 days, MPa	1.9	2.4	3.0	2.8
Blaine specific area (ASTM C 204), m <sup>2</sup> /kg	405	385	355	370

Binder 10 is mixed with 2.25 to 3 parts of well graded sand. The water should be clean and just enough to obtain a workable consistency. Similar proportions are recommended when using the **batimix**.Masonry Binder 20 to obtain higher strength mortar.

For spatter-dash slurry coat and plastering applications, one part of **batimix**.Masonry Binder 30 or **batimix**.Masonry Binder 40 should be mixed with 2 to 3 parts of well graded natural and/or crushed sand depending on the type of element and desired strength. Alternatively, the **batimix**.Masonry Binder 10 (or 20) can be used for such applications, provided some Portland cement is added to the mortar mix.

The key benefits of using such binders compared to ordinary Portland cement are quantified in **TABLE 3** and stand as follows:

- Reduction in the overall cost
- Better workability and water retention
- Greater air content for easier spread of mortar and better freeze/thaw resistance
- Increased coverage per m<sup>2</sup>, due to the lower density compared to cement
- Lower shrinkage, therefore enhanced durability and quality of the finished product
- Lower level of water permeability
- Relatively similar compressive and pull-off strengths at 28 days

### P.03 BATIMIX masonry binder products

TABLE 3

Typical mortar's properties made with Type I Portland cement vs. **batimix**. Masonry Binder 10

	Proportions of cementitious binder		Properties determined on mortars made with 25% cementitious binder & 75% of well-graded sand								
	<b>batimix</b> . Masonry Binder 10, %	Type I Portland cement, %	Workability	Water retention, % (ASTM C 91)	Air content, % (ASTM C 185)	Coverage, kg/ m <sup>2</sup> / cm	Pull-off strength, MPa (E N 1015-12)	Shrinkage, mm/m (E N 1015-13)	Compression, MPa (ASTM C 109)	Water absorption, g/m <sup>2</sup> (ASTM C 1403)	Approx. cost reduction relative to Type I Portland cement %
Masonry works with Type I Portland cement	N/A	100	+	81	3.5	16-18	0.6	1.50	30	0.93	0
Block fixing mortar	100	N/A	+++	92	8.3	14.5 - 16	0.25	0.85	15	0.86	20
Block fixing mortar with higher properties	75-85	15 - 25	+++	90	9.1	15 - 16.5	0.3 - 0.4	0.93	15 - 20	0.73	15
Mortars made with BATIMIX Masonry Binder 20 give relatively small results.											
Spatter-dash slurry coat before plastering	30 - 50	50 - 70	++	86	7.2	16 - 17.5	0.5 - 0.6	1.10	25 - 30	0.70	8
Mortars made with BATIMIX Masonry Binder 30 give relatively small results.											
Plastering mortar in interior/exterior elements	40 - 60	40 - 60	++	88	8.5	15.5 - 17	0.4 - 0.5	0.62	20 - 25	0.32	10
Mortars made with BATIMIX Masonry Binder 40 give relatively small results.											
Packaging and health	All BATIMIX masonry Binder products can be supplied in grey or white colors in bulk or bags of 25 kg. They should be stored in a closed dry place, and their shelf lives are six months from the production date. For health and safety directions, refer to the corresponding MSDS.										

+++ Excellent  
++ Very Good  
+ Good

# Ready-to-use

## batimix® masonry

### mortars

Holderchem Building Chemicals S.A.L. offers four types of ready-to-use mortars which can be supplied in two different per-

formance levels. These include mortars for block fixing, spatter-dash slurry coating, and plastering with or without fiber reinforce-

ments. Their compositions, application, and curing methods are summarized in **TABLE 4.**

**TABLE 4** General description of ready-to-use **batimix**® masonry mortars

	Block Fix	Key Coat	Plaster	Fiber Plaster
<b>Composition</b>	Cement, fillers, natural sand 0 – 2 mm, additives (plasticizer, air entraining, water retaining, etc)	Cement, fillers, natural/crushed sand 0 – 4 mm, additives (plasticizer, rebound-reducing, etc)	Cement, fillers, natural sand 0 – 2 mm, additives (plasticizer, air entraining, shrinkage-compensating, etc)	Cement, fillers, natural sand 0 – 2 mm, additives (fibers, plasticizer, air entraining, shrinkage-compensating, etc)
<b>Water required per bag of 50 kg</b>	7 to 8,5 liters	8 to 10 liters	7 to 8,5 liters	7 to 8,5 liters
<b>Coverage</b>	For 50 kg / 10 mm thick: <ul style="list-style-type: none"> <li>• 3.5 m<sup>2</sup> for 10-cm block</li> <li>• 2.5 m<sup>2</sup> for 15-cm block</li> <li>• 2.0 m<sup>2</sup> for 20-cm block</li> </ul>	10 to 14 m <sup>2</sup> / bag of 50 kg / 5 mm thick	15 to 17 kg / m <sup>2</sup> / 10 mm thick	15 to 17 kg / m <sup>2</sup> / 10 mm thick
<b>Maximum applied thickness</b>	40 mm	10 mm	15 mm	20 mm
<b>Application</b>	Manually with a masonry trowel on damp and clean surfaces	All substrates must be sound, thoroughly cleaned, and moisturized. The application can be made manually with a masonry trowel or mechanically using a mortar-projection machine. For detailed instructions, refer to the product's Application Guidelines		
<b>Curing</b>	N/A	The applied mortars must be protected from extreme temperature, wind, and sunshine by moist curing for a minimum of 3 days. Curing compounds can be purchased separately from Holderchem Building Chemicals S.A.L.		
<b>Packaging and health</b>	All BATIMIX masonry mortars are delivered in bags of 50 kg. They should be stored in a closed dry place, and their shelf lives are six months from the production date. For health and safety directions, refer to MSDS.			

## I- ADVANTAGES AND PROPERTIES OF BLOCK FIX MORTARS

**batimix.** Block Fix mortars are specifically designed for assemblage and fixing of masonry units, stones, pavers, hollow and concrete blocks in interior and exterior partitions. They can also be used as blinding mortars for preparing horizontal surfaces before construction. Their physical properties are given in **TABLE 5**.

To avoid quick drying of **batimix.** Block Fix mortars during application, users may retemper with added water to restore workability, if needed. These mortars are characterized by their ability to:

- Spread easily (workability)
- Cling to vertical surfaces (adhesion)
- Resist flow during placement of masonry and block units (cohesion)
- Stiffen at constant rate (water retention)

## II- ADVANTAGES AND PROPERTIES OF KEY COAT MORTARS

**batimix.** Key Coat mortars are used for increasing roughness of smooth substrates before plastering works. Typical physical properties are summarized in **TABLE 6**. Substrates on which **batimix.** Key Coat mortars can be applied include fair-faced concrete, masonry blocks, and old cement-based plasters.

**batimix.** Key Coat mortars are characterized by the following:

- Uniform properties from the first batch to the last one, derived from pre-blending
- Strong adherence to vertical surfaces and ceilings
- Minimum amounts of rebound during mortar projection
- Excellent strength and durability

**TABLE 5** Properties of **batimix.** Block Fix mortars

	Block Fix 220	Block Fix 230
Water retention (ASTM C 91), %	88	90
Air content (ASTM C 185), %	6.1	5.8
Setting time (ASTM C 191), hours	5 to 7	5 to 7
Compressive strength at 28 days (ASTM C 109), MPa	27.9	34.5
Flexural strength at 28 days (ASTM C 348), MPa	4.2	5.1
Pull-off strength at 28 days (EN 1015-12), MPa	0.4	0.55

**TABLE 6** Properties of **batimix.** Key Coat mortars

	Key Coat 240	Key Coat 250
Setting time (ASTM C 191), hours	5 to 6.5	5 to 6.5
Compressive strength at 28 days (ASTM C 109), MPa	53.5	62.2
Flexural strength at 28 days (ASTM C 348), MPa	7.3	8.6
Pull-off strength at 28 days, as plaster, (EN 1015-12), MPa	0.95	1.3

### III- ADVANTAGES AND PROPERTIES OF PLASTER MORTARS

**batimix.** Plaster mortars are used for carrying out traditional plastering works, whether in interior or exterior elements. Their physical properties are summarized in **Table 7**. Compared to traditional plastering mortars in-situ prepared, **batimix.** Plaster mortars offer major advantages including:

- Masonry works can be achieved in a clean and speedy manner, while ensuring

consistent fresh and hardened properties

- Easier spread resulting from the use of plasticizing and air entraining agents
- Stronger bond because of the excellent contact of mortar and substrate
- Lower degree of shrinkage, even under difficult ambient and application conditions
- Better durability, freeze/thaw resistance, and surface quality of the finished product

### IV- ADVANTAGES AND PROPERTIES OF FIBER PLASTER MORTARS

**batimix.** Fiber Plaster mortars are particularly suitable for plastering of exterior masonry elements. They can also be used as patching mortars for restoring or improving appearance of structures which do not contain steel reinforcements and do not have load-bearing functions. Their physical properties are presented in **TABLE 8**. In addition to the advantages associated with

the **batimix.** Plaster mortars enumerated earlier, the incorporation of fiber reinforcements contributes in achieving:

- Higher cohesiveness within the mortar enabling the application of coats up to 20 mm
- Limited amounts of rebound when applied using a mechanical spraying machine
- Reduced shrinkage as fibers result in more frictional resistance
- Increased durability and lower level of water permeability

**TABLE 7** Properties of **batimix.** Plaster mortars

	Plaster 260	Plaster 270
Water retention (ASTM C 91), %	84	88
Air content (ASTM C 185), %	4.3	4.6
Setting time (ASTM C 191), hours	5 to 7	5 to 7
Compressive strength at 28 days (EN 1015-11), MPa	35.2	43.7
Flexural strength at 28 days (EN 1015-11), MPa	5.6	6.4
Pull-off strength at 28 days (EN 1015-12), MPa	0.55	0.7
Water permeability after 48 hours (EN 1015-21), mL/cm <sup>2</sup>	0.83	0.71

**TABLE 8** Properties of **batimix.** Fiber Plaster mortars

	Fiber Plaster 280	Fiber Plaster 290
Water retention (ASTM C 91), %	86	91
Air content (ASTM C 185), %	4.1	4.5
Setting time (ASTM C 191), hours	3 to 5	3 to 5
Compressive strength at 28 days (ASTM C 349), MPa	44.8	50.1
Flexural strength at 28 days (ASTM C 348), MPa	6.6	7.5
Pull-off strength at 28 days (EN 1015-12), MPa	0.75	0.95
Water permeability after 48 hours (EN 1015-21), mL/cm <sup>2</sup>	0.60	0.52

# Specialty **batimix**<sup>®</sup> masonry products

Two types of specialty mortars are available at Holderchem Building Chemicals S.A.L. for decoration and damp-proofing of exterior façades in masonry construction. The composition and properties of these products along with their application methods are given below.

## I- **batimix**. Monocouche 300

Single layer ready-to-use cementitious-based mortar for decorative façade coatings. Its physical properties are summarized in **TABLE 9**. This product can be produced in a variety of natural colors, thus giving the appearance of a textured or granular rendering, stone, or brick.

**batimix**. Monocouche 300 is a blend of hydraulic binders, fillers, carefully graded natural/crushed sand (0 - 2.5 mm), and selected additives such as:

- Plasticizer for lower mixing water demand, thus enhanced mechanical properties
- Air entraining for easier spread and better freeze/thaw resistance
- Water retaining for consistent rate of stiffening and hardening
- Rebound-reducing for limited amounts of rebound during application
- Water-repellent for minimizing water absorption, carbonation, and efflorescence

### Directions for use

All surfaces must be sound, cleaned, and thoroughly moisturized prior to application. For smooth surfaces, a spatter-dash slurry coat should be applied to increase friction and improve adhesion.

Each 50-kg bag of **batimix**. Monocouche 300 should be mixed with 7 to 8.5 liters of clean water until a homogeneous paste is obtained. The mortar can then be applied manually using a masonry trowel or mechanically with a mortar-projection machine in layers not exceeding 20 mm.

The wet mix life is around 1 hour at 23°C. and the average consumption rate varies from 15 to 17 kg/m<sup>2</sup>/cm. After reaching the initial set, the surface of the applied mortar can be worked with a specially roughened stainless steel trowel to give the desired textured appearance. When finishing, the plaster should be protected from extreme temperatures, wind, and sunshine by moist curing for a minimum of 3 days.

**batimix**. Monocouche 300 is delivered in bags of 50 kg. It should be stored in a closed dry place with a shelf life of 6 months.

**TABLE 9**

### Properties of **batimix**. Monocouche 300

Water retention (ASTM C 91)	92%
Setting time (ASTM C 191)	5 to 7 hours
Air content (EN 1015-7)	5.1%
Flexural strength at 28 days (EN 1015-11)	5.8 MPa
Compressive strength at 28 days (EN 1015-11)	38.7 MPa
Pull-off strength at 28 days (EN 1015-12)	0.65 MPa
Drying shrinkage (EN 1015-13)	0.73 mm/m
Capillary water absorption (EN 1015-18)	0.25 kg/m <sup>2</sup> .min <sup>0.5</sup>
Water permeability after 48 hours (EN 1015-21)	0.22 ml./cm <sup>2</sup>

## II- **batimix**. Plaster W-330

Pre-packaged ready-to-use mortar with hydrophobic properties which protects masonry surfaces against the ingress of water and moisture. Its physical properties are given in **TABLE 10**.

**batimix**. Plaster W-330 is a mixture composed of hydraulic binders, fillers, carefully graded sand (0 - 2 mm), and selected additives such as plasticizing, air entraining, shrinkage-compensating, and active compounds of hydrophobic agents. Upon request, synthetic fibers can be added to the mix to increase friction.

**batimix**. Plaster W-330 is primarily suitable for plastering exterior surfaces and/or patching of structures which are exposed to a high degree of moisture and rain. Its relative rate of water absorption is around 10 times lower than reference mixtures made without hydrophobic agents. It is chloride-free and can be applied to all structurally sound surfaces, whether old or new. Typical areas of application include residential buildings, walls and partitions above or below grade level, potable water tanks, swimming pools, containers, garages, and parkings.

### Directions for use

For patching of structures, all surfaces must be sound, cleaned, and thoroughly moisturized prior to application. In case of plastering, it is advisable to apply a spatter-dash slurry coat to increase adhesion.

Each 50-kg bag of **batimix**.Plaster W-330 should be mixed with 7 to 8.5 liters of clean water until a homogeneous paste is obtained. The plaster can then be applied manually or mechanically in layers not exceeding 20 mm. The wet mix life is around 1 hour at 23°C, and the coverage varies from 15 to 17 kg/m<sup>2</sup>/cm. In case multiple

layers are required, subsequent ones should be applied after at least 24 hours from the first application. Care should be taken to roughen the previous layer slightly while still damp in order to provide maximum adhesion between various layers. When finishing, the plaster should be protected from extreme temperatures, wind, and sunshine by moist curing for a minimum of 3 days.

**batimix**. Plaster W-330 is delivered in bags of 50 kg. It should be stored in a closed dry place with a shelf life of 6 months. For health and safety directions, refer to MSDS.

**TABLE 10**

### Properties of **batimix**. Plaster W-330

Water retention (ASTM C 91)	86%
Setting time (ASTM C 191)	3 to 5 hours
Air content (EN 1015-7)	4.3%
Flexural strength at 28 days (EN 1015-11)	5.2 MPa
Compressive strength at 28 days (EN 1015-11)	34.5 MPa
Pull-off strength at 28 days (EN 1015-12)	0.6 MPa
Drying shrinkage (EN 1015-13)	0.83 mm/m
Water permeability after 48 hours (EN 1015-21)	0.08 mL/cm <sup>2</sup>

### Referenced EN & ASTM standards

**EN 413-1** Masonry cement, Part 1: Composition, specifications and conformity criteria

**EN 998-1** Specification for mortar for masonry, Part 1: Rendering and plastering mortar

**EN 998-2** Specification for mortar for masonry, Part 2: Masonry mortar

**ASTM C 91** Standard specification for masonry cement

**ASTM C 270** Standard specification for mortar for unit masonry

**ASTM C 887** Standard specification for packaged, dry, combined materials for surface bonding mortar

**ASTM C 1328** Standard specification for plastic (stucco) cement

### Important notes

- For more information and detailed application instructions on any specific product, users may consult the corresponding "Technical Data Sheet" or "Application Guidelines" by visiting the website at [www.holderchem.net](http://www.holderchem.net).
- All of the reported values in this brochure are given for indication purposes only. They are averages of several tests under laboratory conditions of 23° C and 50% R.H. In practice, these values may be significantly affected by the type of substrates, applications methods, and climatic variations.
- Pull-off strengths at 28 days greater than 0.3 MPa are generally recommended for durable masonry applications.

### Statement of responsibility

The information and application advice presented in this brochure are provided with no warranty, implied or otherwise, as to its completeness or accuracy. Since methods and conditions of application and use are beyond the control of Holderchem Building Chemicals S.A.L., the company makes no warranties as to the merchantability or fitness for ordinary or particular purposes of its products and excludes the same.

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