

POLYMER-MODIFIED TILE ADHESIVES AND GROUTS FOR MODERN CONSTRUCTION

batimix[®]





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

Tiles are important covering materials for walls and floors as they provide aesthetically decorative surfaces that are water resistant, tough, long-lasting, hygienic, and easy to clean. Nowadays, tiles are applied using the thin-bed technique based on polymer-modified mortars. This technique leads to better fulfillment of state-of-the art technical requirements related to workability, adhesion, and durability. On the other hand, polymer-modified grouts are used to fill the joints between tiles, thus providing an optically attractive colored surface with adequate resistance against abrasion, water absorption, and shrinkage.

Holderchem Building Chemicals S.A.L. is pleased to present its line of products for tiling and grouting applications. Marketed under the **balinix** name, the products are specifically formulated to satisfy relevant European standards. The R & D work is carried out by a qualified team of professionals in close coordination with clients to offer products that combine desired performance and cost-effectiveness. The manufacturing plant is well equipped with extensive production facilities and modern laboratories to support production programs.

Classification and designation

European standards EN 12004 for Tile Adhesives and EN 13888 for Tile Grouts identify various classes and subclasses to designate special properties and features of the finished products. For example, EN 12004 class C1 or C2 refer to tile adhesives with tensile adhesion strength greater

than 0.5 or 1 MPa, respectively. EN 13888 class CG1 is used for standard tile grouts, whereas class CG2 refers to improved characteristics such as resistance to abrasion or water permeability. Typical classifications used in this brochure along with their respective descriptions are summarized in TABLE 1.

TABLE 1

Nomenclature according to EN 12004 and EN 13888 standards

	Class	Description of the class
EN 12004 for Tile Adhesives	C1	Standard cementitious adhesive with tensile strength greater than 0.5 MPa
	C2	Improved cementitious adhesive with tensile strength greater than 1 MPa
	C1 E	Standard cementitious adhesive, extended open time
	C2 T	Improved cementitious adhesive, normal setting, reduced slip
	C2 FT	Improved cementitious adhesive, fast setting, reduced slip
	R2 E	Improved reaction resin adhesive, normal setting, extended open time
EN 13888 for Tile Grouts	CG1	Standard cementitious tile grout, normal setting
	CG2 W	Improved cementitious tile grout, reduced water absorption
	CG2 Ar	Improved cementitious tile grout, higher abrasion resistance
	RG	Reaction resin tile grout, normal setting

batimix® tile adhesive products

The range of **batimix** tile adhesives available at Holderchem Building Chemicals S.A.L. is summarized in TABLE 2 along with the corresponding class of EN 12004 and guide for selection.

I – ONE-COMPONENT CEMENTITIOUS-BASED TILE ADHESIVES

Three **batimix** cementitious-based tile adhesives (NS-400, HS-410, and HP-420) having different performance levels are offered. These products are designed from a blend of Type I Portland cement, filler, fine-graded sand together with a combination of various grades and concentrations of synthetic polymers. Their physical properties and application guidelines are reported in TABLE 3.

Tiling applications made with **batimix** tile adhesives can be achieved in a clean and speedy manner, while ensuring consistent properties of the fresh and hardened material. Mixed with water, these products become easy for trowelling and can be applied vertically without sagging or slippage. They harden without noticeable shrinkage, and form a good bonding layer between the substrate and tiles. Admissible substrates include concrete, cement-based plasters, hollow blocks, and gypsum boards.

TABLE 2

Summary of **batimix** tile adhesives and their applications

batimix EN 12004* Guide for selection

	Product	EN 12004 Class	Guide for selection
One-component products	NS-400	C1	Cementitious-based normal strength adhesive for fixing tiles smaller than 600 cm ² in inside areas.
	HS-410	C1 T	High strength adhesive for fixing tiles smaller than 1500 cm ² in inside and outside areas. Reduced slip, suitable for vertical applications.
	HP-420	C1 TE	High performance adhesive for fixing all types of tiles, including large-size and heavy ones. Damp-proof, flexible, reduced slip, and extended open time.
Liquid admixture	L-430	various	Latex-based admixture used as "mixing water" with ready-to-use or in-situ prepared cementitious-based mortars. Recommended whenever improved adhesion and flexibility are needed. Mortars mixed with this product fulfill C2 requirements with tensile adhesion strength greater than 1 MPa.
Two- or three-component specialty products	WE-440	C2 T	Two-component cementitious / elastomer-based adhesive with improved flexibility and waterproofing. Suitable in areas subjected to vibrations, deforming problems, and moisture attack.
	F-450	C2 FT	Two-component cementitious / latex-based adhesive with accelerated setting and improved bonding. Suitable in cold weather applications or areas to be ready for use within short periods of time.
	R-460	R2 E	Ultra high performance three-component epoxy-based adhesive. Recommended whenever special waterproofing and high resistance to abrasion and chemical attack are required.

* Additional products complying with different classes of EN 12004 can also be supplied, upon request.

TABLE 3

Properties and guidelines for use of one-component **batimix tile adhesives**

	Tile Adhesive NS-400	Tile Adhesive HS-410	Tile Adhesive HP-420
Application temperature	5 to 35 °C	5 to 35 °C	5 to 35 °C
Open time at 23 °C	20 min	25 min	30 min
Adjustability time	40 min	40 min	45 min
Mixing and application	One 20-kg bag must be mixed with approximately 3.8 liters of water for a minimum of 3 minutes with a slow-speed electric mixer. Do not spread more than 1 m ² at a time. The coverage is around 2.5 to 6 kg/m ² .		
Installing the tiles	There is no need to dampen the tiles prior to installation. The substrate must be cured and thoroughly cleaned. All products work well on dry surfaces, but also can be applied on lightly dampened ones. Apply a firm pressure to ensure good contact with the adhesive. In case a surface dried skin has formed on top of the adhesive, it is advisable to re-trowel the mortar which would help restore the open time.		
Adhesion strength			
• Initial	0.8 MPa	1.2 MPa	1.4 MPa
• After heat ageing	0.75 MPa	1.0 MPa	1.1 MPa
• After water immersion	0.6 MPa	0.8 MPa	0.85 MPa
Packaging and health	All products are delivered in bags of 20 kg. They should be stored in a closed dry place with shelf lives of six months. For health and safety directions, kindly refer to MSDS.		

II – LIQUID ADMIXTURE FOR HIGHER ADHESION STRENGTH

batimix.Tile Adhesive L-430 is a synthetic-rubber latex-based admixture used as “mixing water” with in-situ prepared or ready-to-use mortars such as **batimix**.Tile Adhesive NS-400, HS-410, and HP-420 for bonding tiles onto substrates. It is blended with elastomer resins for improved flexibility, making it suitable for areas with slight movements. An approximate 30% to 50% increase in adhesion can be achieved when using this product in comparison with mortars mixed with ordinary water.

The dosage of **batimix**.Tile Adhesive L-430 to be incorporated is directly dependent on the formulation and consistency of the cementitious-based mortar. The prepared mortars should be applied using a toothed trowel at a surface not exceeding 1 m². at a time. The tiles may, or may not, be dampened prior to installation. This product can be delivered in pails of 4, 10, or 20 kg. It may cause eye, skin, and respiratory irritations. For additional safety information, refer to MSDS.

III – SPECIALTY TWO- OR THREE-COMPONENT TILE ADHESIVES

The physical properties and guidelines for use of the specialty tile adhesives are summarized in TABLE 4.

batimix.Tile Adhesive WE-440 is a two-component cementitious-based product with improved flexibility (EN 12002 Type S1) and waterproofing properties. The powder component (A) is designed from a blend of Type I Portland cement, fillers, fine-graded sand together with a combination of special additives and sealing compounds for improved waterproofing. The liquid component (B) is based on elastomer and synthetic-rubber latex resins for enhanced flexibility and bonding strength.

This product is recommended for use in structures likely to be subjected to vibrations or extreme flexing problems as well as in external facades where thermal or dimensional variations are expected. It is also ideal whenever active or passive moisture penetrations have to be eliminated.

batimix. Tile Adhesive F-450 is a two-component cementitious-based product with accelerated setting properties. It is recommended for use in cold climates or in structures that have to be ready for use within short periods of time (around 5 hours). The powder component (A) is designed from a blend of Type I Portland cement, fillers, fine-graded sand together with a combination of synthetic resins and special additives introduced to accelerate setting and reduce slip. The liquid component (B) is based on synthetic-rubber latex blended with elastomer resins for improving bonding strength and flexibility.

batimix. Tile Adhesive R-460 is an ultra high performance three-component epoxy product. The powder component (A) is designed from a blend of fillers and fine-graded sand; whereas the liquid resin (B) and liquid hardener (C) components are specifically proportioned to yield extraordinary bonding strength and durable product. Under the most difficult conditions, this product can be successfully applied to bond all types of large-size and heavy tiles. It is ideal whenever special waterproofing and high resistance to abrasion, great impacts, vibration, or chemical attack are required.

TABLE 4

Properties and guidelines for use of specialty two- or three-component batimix tile adhesives

	Tile Adhesive WE-440	Tile Adhesive F-450	Tile Adhesive R-460
Approximate mixing ratio	Parts A / B = 82 / 18	Parts A / B = 82 / 18	Parts A / B / C = 78 / 15 / 7
Application temperature	5 to 35 °C	0 to 35 °C	0 to 35 °C
Pot life	1.5 hours	50 min	2 hours
Open time at 23 °C	25 min	15 min	50 min
Adjustability time	35 min	20 min	80 min
Mixing and application	Mix the entire components with a slow-speed electric mixer for a minimum of 3 minutes. A more workable consistency of the WE-440 and F-450 products may be ensured by adding small amounts of clean water. For the R-460 product, a more workable consistency may be achieved by using 90% of the A-powder component. The mortars should be adjusted to the desired thickness using a toothed trowel at an average coverage ratio of 2 to 5 kg/m ² .		
Installing the tiles	There is no need to dampen the tiles prior to installation. Apply a firm pressure to ensure good contact with the adhesive. Constant checks should be done to determine if a surface dried skin has formed on the top of the mortar; in such a case, re-trowel the mortar to restore the open time.		All tiles must be perfectly dry. Use spacers when fixing large-size and heavy tiles on vertical surfaces with wide joints.
Adhesion strength			
• Initial	1.5 MPa	1.3 MPa	> 3.0 MPa (substrate failure)
• After heat ageing	1.1 MPa	1.0 MPa	> 3.0 MPa (id)
• After water immersion	0.85 MPa	0.8 MPa	> 3.0 MPa (id)
Kit packaging	Part A: bag of 20 kg Part B: pail of 4.5 kg	Part A: bag of 20 kg Part B: pail of 4.5 kg	Part A: bag of 20 kg Part B: pail of 4 kg Part C: pail of 2 kg
Storage and health	All products should be stored in a closed dry place with shelf lives of six months. The liquid components may cause eye, skin, and respiratory irritations. For health and safety directions, refer to MSDS.		

batimix® tile grout products

For grouting between tiles, Holderchem Building Chemicals S.A.L. offers two cementitious-based mortars, a liquid admixture for improved adhesion and flexibility, and a three-component epoxy-based grout. A product selection guide specifying compliance to EN 13888 is provided in TABLE 5.

I – ONE-COMPONENT CEMENTITIOUS-BASED TILE GROUTS

Two ready-to-use **batimix** cementitious-based grouts (HS-415 and HP-425) with different performance characteristics are offered for filling up joints between tiles. Available in a variety of colors, these products

are designed from a blend of Type I Portland cement, fillers, fine-graded sand together with a combination of various grades and concentrations of synthetic additives. Their physical properties and guidelines for use are summarized in TABLE 6.

At the job-site, **batimix** Tile Grout HS-415 and HP-425 are mixed with clean water to provide smooth and consistent lump-free workability perfectly suited for grouting of floors and walls. Upon hardening, non-stain and UV-stable grouts are obtained with increased resistance against efflorescence, discoloration, and carbonation over time and use. The products provide adequate mechanical strengths with limited shrinkage ensuring absence of cracks and fissures.

The coverage (C) of **batimix** Tile Grout HS-415 and HP-425 varies depending on the tile thickness and size as well as on the joint width. The following formula can be used for calculation:

$$C \text{ (kg/m}^2\text{)} = 1.6 \times h \times e \times \frac{L + W}{L \times W}$$

L = length of tile (mm)
W = width of tile (mm)
h = thickness of tile (mm)
e = width of joint (mm)

TABLE 5

Summary of **batimix** tile grouts and their applications

batimix	EN 13888*	Guide for selection
HS-415	CG1	High strength cementitious-based grout for filling up 1 to 6 mm tile joints. Improved resistance to shrinkage, non-stain, suitable for inside and outside applications.
HP-425	CG2 W	High performance cementitious-based grout for filling up 2 to 15 mm tile joints. Improved mechanical strengths and resistance to water permeability, particularly recommended in areas in permanent contact with water (swimming pools).
L-435	Various	Polymer-modified liquid admixture used as "mixing water" for tile grouting. Suitable whenever enhanced bonding, flexibility, and resistance to abrasion and water permeability are required.
R-465	RG	Ultra high performance three-component epoxy tile grout. Recommended whenever special waterproofing, durability, and high resistance to abrasion and chemical attack are required.

* Additional products complying with different classes of EN 13888 can also be supplied, upon request.

TABLE 6

Properties and guidelines for use of one-component *batimix* tile grouts

	Tile Grout HS-415	Tile Grout HP-425
Water per 10-kg bag	From 3.5 to 4 liters	From 3.5 to 4 liters
Application temperature	5 to 35 °C	5 to 35 °C
Finishing times	20 to 40 min	20 to 40 min
Set to light foot traffic	After 24 hours	After 24 hours
Joints preparation	All joints must be thoroughly cleaned and emptied to a depth of at least 2/3 of the tile thickness. Dampen the interior of the joints prior to application.	
Mixing and application	Depending on the desired consistency, one 10-kg bag must be mixed with the right quantity of clean water for a minimum of 3 minutes. Do not mix more grout that can be used within a 20-minutes period at 23 °C and do not re-wet the mix. The joints must be well filled making sure that they are completely compacted with no unevenness.	
Finishing	When the grout loses its plasticity (20 to 40 minutes), clean excess of grout with a wet sponge working diagonally to the joints. Rinse the sponge frequently with clean water.	
Flexural strength	4.3 MPa	5.3 MPa
Compressive strength	28.5 MPa	35.2 MPa
Abrasion resistance	825 mm ³	720 mm ³
Shrinkage	1.3 mm/m	1.5 mm/m
Water absorption at 4 hr	3.9 g	2.8 g
Packaging and health	All products are delivered in bags of 10 kg. They should be stored in a closed dry place with shelf lives of six months. For health and safety directions, refer to MSDS.	

II – LIQUID ADMIXTURE FOR TILE GROUTING

batimix. Tile Grout L-435 is a polymer-modified liquid admixture that is used as “mixing water” with any cementitious-based grout for filling up joints between tiles of all dimensions. It is based on synthetic-rubber latex, elastomer resins, and hydrophobic agents to enhance bonding, flexibility, and resistance to water permeability. Grouts mixed with this product are ideal for use in inside/outside areas likely to be subjected to vibrations or dimensional variations as well as permanent moisture contact.

The dosage of **batimix** Tile Grout L-435 to be incorporated depends on the formulation of the cementitious-based grout and desired consistency. For joints preparation, mixing, application, and finishing, kindly follow the instructions for use given in **TABLE 6**. This product can be delivered in pails of 4, 10, or 20 kg. It should be stored in a closed dry place. Avoid breathing vapor, wear suitable gloves, and follow safety instructions detailed in the MSDS.

III – THREE-COMPONENT EPOXY-BASED TILE GROUT

batimix. Tile Grout R-465 is an ultra high performance three-component product for filling up tile joints. The powder component (A) is designed from a blend of fillers and fine-graded sand; whereas the liquid resin (B) and liquid hardener (C) components are specifically proportioned to yield extraordinary resistance to abrasion, chemical attack, and water permeability.

batimix. Tile Grout R-465 is mixed at A/B/C ratio of 77/15/8. Empty entire contents of the B- and C- liquid components into a clean container, then add the A-powder component while mixing continuously for a minimum of 3 minutes. The grout is applied with a trowel rubber spatula, making sure that the joints are completely filled with no unevenness. Clean excess with a wet sponge. Traces of epoxy-grout should not be left as this will be difficult to remove. This product is delivered in a kit packaging of 10, 2, and 1 kg. Kindly refer to MSDS as this product may cause eye, skin, and respiratory irritations.



Important notes

Referenced EN standards

EN 12004 Adhesives for tiles - Definitions and specifications
EN 13888 Grouts for tiles - Definitions and specifications

Important notes

- For proper use of any specific product, users may consult the corresponding "Technical Data Sheet" by visiting our website at 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. In practice, these values may be significantly affected by the characteristics of materials and mixing conditions.

Statement of responsibility

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