THE MASTIX TECHNOLOGY

ISO 9001 : 2008

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Joints in concrete structures

- **Joints in concrete structures appear as fissures or cracks**

- **A volume reduction of a concrete element causes the formation of a fissure.**
  This reduction is due to water evaporation, following the shrinkage phenomena, proper to material concrete.

- **Movements in concrete structures result in an opening of fissures.**
  These movements follow soil settlements, earthquake incidents, vibrations, overloads, etc.

- **The steel reinforcement, connecting the concreting stages, leads to a reduction of the fissure openings, but cannot avoid them.**

- **Temperature variations provoke the opening and closing of the fissure spaces.**
  In winter the fissures will open, in summer they will close. In winter the concrete elements will contract and in summer they will dilate.

- **The long term watertightness of the joints is very important. The strength of the structure is essential**

- **In the presence of water or other liquids, the designers of concrete structures are obliged to solve the problem of assuring waterproof construction joints. The most common joints are :**

  - **concrete or work joints or constructive joints**
  - **shrinkage or control joints**
  - **connection joints between precast elements**

BFL-Mastix bands are the guarantee for a long term watertightness of the joints

BFL-Mastix bands are compatible with fresh concrete, thanks to the fine crushed gravel coating of the core.

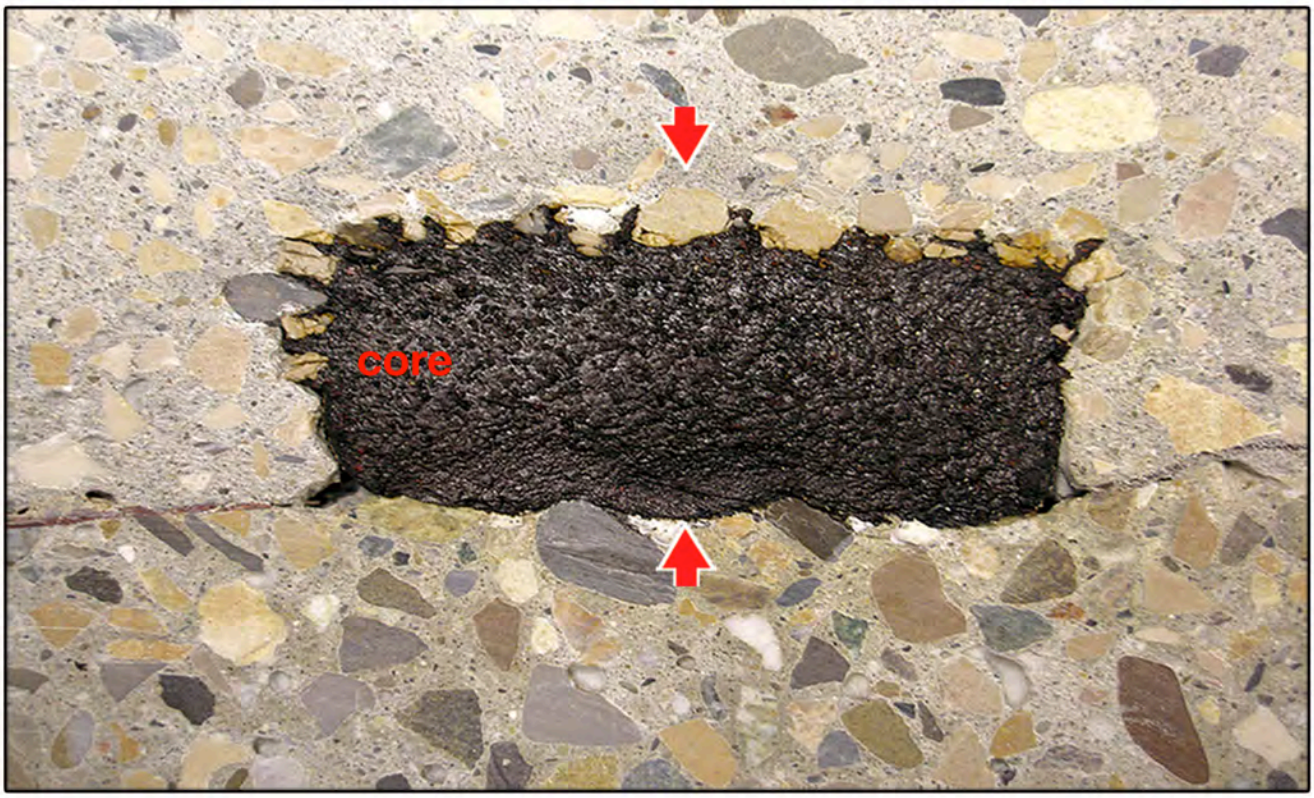
BFL-Mastix bands adhere to hard concrete, to metal and synthetic materials.

BFL-Mastix bands adapt themselves to movements occuring in the structures

BFL-Mastix waterproofing bands

- The core of the BFL-Mastix waterptoofing bands is a mixture of rubber, elastomere, mineral oil, bitumen and additives.
- The faces of the band core is partly or totally coated with fine crushed special gravel.
- BFL-Mastix bands assure a long term watertightness of the joints.
- The adherence of BFL-Mastix bands in fresh concrete is assured by the fine gravel coating of the core.
- The adherence of the BFL-Mastix bands on hard concrete, metal and synthetic supports is assured by gluing.
- BFL-Mastix waterproofing bands have a high deformation capacity in case of structural movements.

Adherence of the fine crushed gravel in fresh concrete



Adherence by gluing the core on hard concrete

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Adherence in fresh concrete

- The adherence of the BFL-Mastix bands in fresh concrete is assured by the special gravel coating, tightly pressed on the core

- The gravel coating forms an anchor bed that integrates like the usual concrete aggregates into the cement paste of the fresh concrete.

- The adherence of the BFL-Mastix bands in fresh and water saturated concrete is assured in this way.

Crushed gravel coating on the core

Concrete aggregates

Adherence on hard concrete, metal and plastic material

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Adherence on hard concrete, metal and plastic material

- **The core of the BFL-Mastix bands adheres by gluing** on all mineral, metallic and plastic materials.

- **The thermal gluing with the help of a propane gas burner** consists of heating the mineral support up to at least 100 °C (212°F).
  When the bands get into contact with the heated support, their surface becomes liquid and penetrate into the pores of the support. In this way a mechanical anchorage is carried out.

- **For the chemical gluing a 2-components epoxy resin** is used and spread on a clean, dry or wet mineral support or on a clean metal surface.

- **The chemical gluing with a cyanoacrylate glue** is needed for the gluing on plastic surfaces, on hard PVC and on PE membranes.

Before each gluing stage it is recommended to proceed to an adherence control.

thermal gluing

gluing on hard concrete with preliminary primer coating

chemical gluing

gluing with epoxy glue on hard concrete

gluing with epoxy glue on rock

gluing with cyano-acrylate on PVC membrane

gluing with cyano-acrylate on PVC or PE tubes

Aptitude to deformation

From -20°C (-40 °F) to 40°C (104°F), the core of the BFL-Mastix bands reacts under constraint by an elastic deformation.

Thanks to this property, the BFL-Mastix band core adapts to the movements and assures the watertightness of the joints, without rupture.

Table of medium deformation values in % of the initial deformation.

temperatures		15 minutes later relaxing of constraint	60 minutes later relaxing of constraint
°C	°F		
-20	-4	60,8%	66,0%
0	32	84,8%	89,2%
20	68	96,8%	100,0%
40	104	98,0%	100,0%

Aptitude to deformation

From 40°C (32°F) to 100°C (212°F) and more, the elasticity limite of the core is transgressed.

Thanks to this property, the BFL-Mastix band core adapts, after gluing, to the relief of the support surface.

BFL-Mastix bands glued chemically on rock

The gluing surface has been preliminarily heated and the bands have been flamed, so that the BFL-Mastix bands adapt perfectly to the rock relief.

Characteristics of the core

- The core is a rot resistant material, insensitive to the concrete alkalinity.

- The behaviour of the core is comparable to a liquid of very high viscosity.

- Apparent density of the core = 1.28 g/cm3

- The core presents an excellent resistance against :
  -water charged with deicing salts
  -sulphated water
  -chloric water
  -ammonium sulphate 10 g/l
  -ammonium chloride 10 g/l
  -caustic soda 30 g/l
  -ammonia 25 %
  -pure sulphuric acid
  -pure olein acid
  -ethylic alcohol

Watertightness

The watertightness of the BFL-Mastix bands core is total.

height		hydrostatic pressure				
m'	ft	kg/cm²	bars	KPa	psi	
2	6.56	0.2	0,2	19,6	2,84	fwaterproof
5	16,40	0,5	0,5	49	7,11	waterproof
10	32,81	1	1	98	14,2	waterproof
20	65,62	2	2	196	28,45	waterproof
50	164,04	5	5	490	71,12	waterproof
100	328,08	10	10	980	142,25	waterproof

Compatibility

- **The BFL-Mastix bands stick firmly to fresh concrete thanks to the fine crushed gravel coating on the core.**

- **The fine crushed gravel coating on the BFL-Mastix band core is not alkali-reactive.**

- **The BFL-Mastix band core remains stable in the presence of water and does not swell.**

fissure in a concrete work joint

Concrete of a hydroelectric dam

BFL-Mastix bands are compatible with the concrete of a dam

Concrete with aggregates 0/32 mm

BFL-Mastix bands are compatible with concrete made with aggregates 0/32 mm

fissure in a concrete work joint

Concrete with aggregates 0/16 mm

BFL-Mastix bands are compatible with concrete made with aggregates 0/16 mm

fissure in a concrete work joint

BFL-Mastix waterproofing bands

are characterized by two essential properties

- their adherence in fresh and on hard concrete, on metal and on plastic materials

- their long term capacity to absorb movements in concrete structures