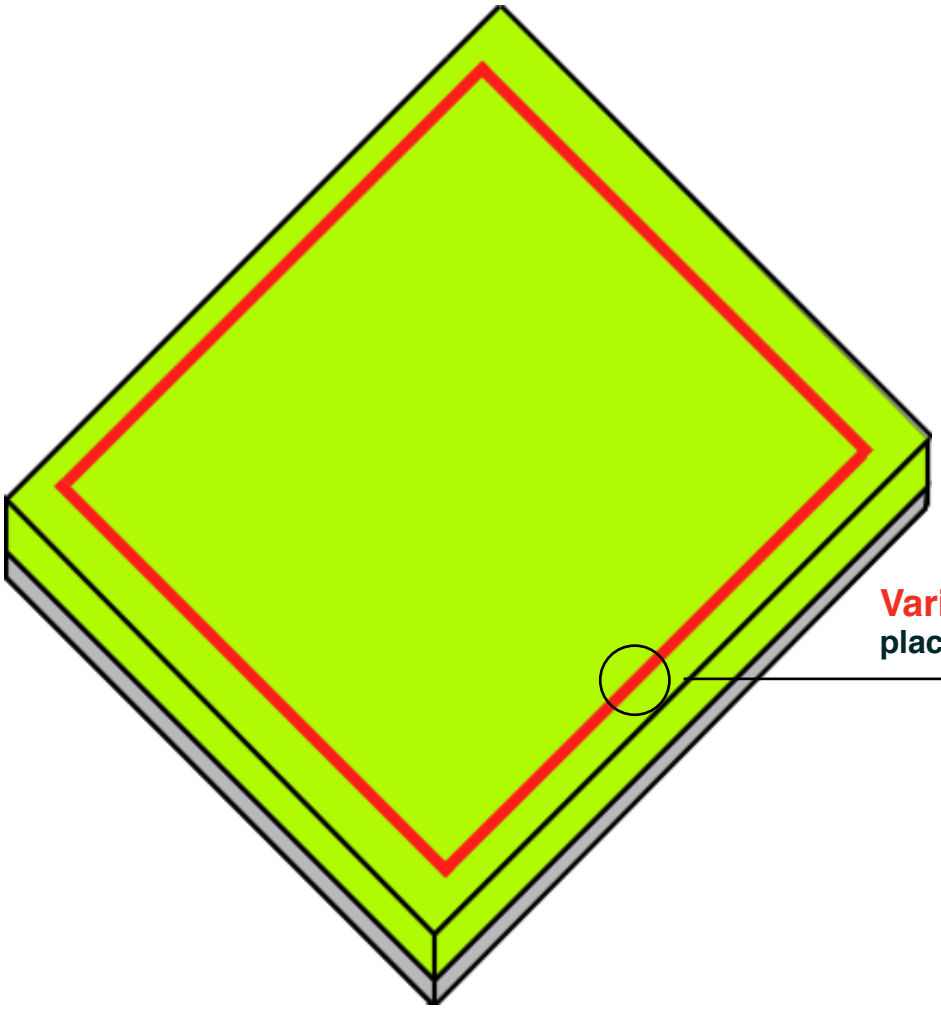
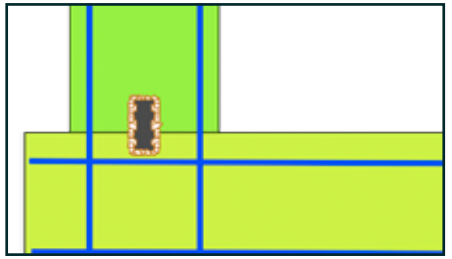
1.1 Raft foundation carried out in one only stage with waterstop

BFL-Mastix for the waterproofing between raft and walls

Variant 1 with BFL-Mastix bands type R4 placed into the fresh concrete

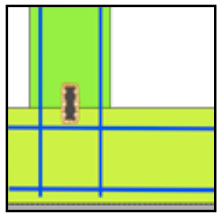




Variant 1 with BFL-Mastix bands placed into the fresh concrete

Variant 1 with BFL-Mastix bands placed into the fresh concrete

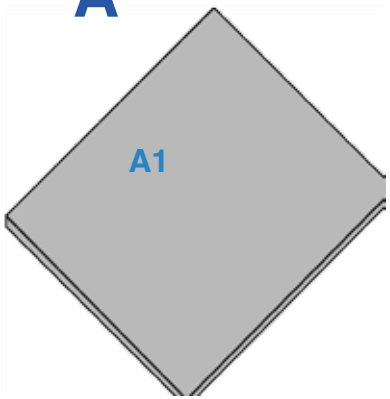
1.1 Raft foundation carried out in one only stage with waterstop BFL-Mastix type R4 for the waterproofing between raft and walls



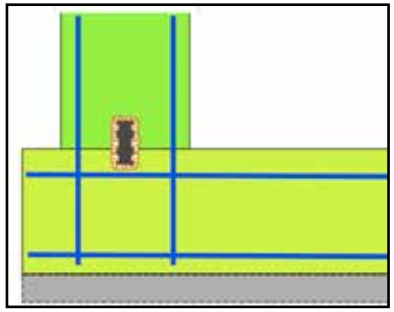
waterproofing of joints between raft and walls

The procedures

A



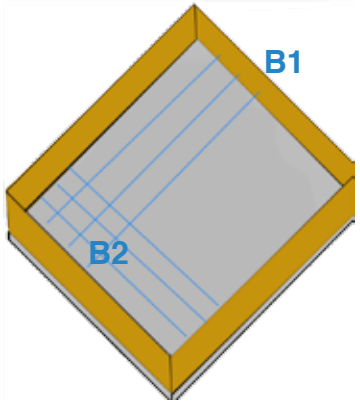
A1 Carrying out of the lean concrete layer



The bands are placed in the wall centreline

In angles, the bands are bent

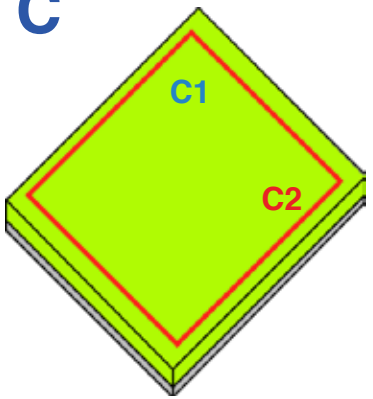
B



B1 Shuttering

B2 Placing of the rebars

C

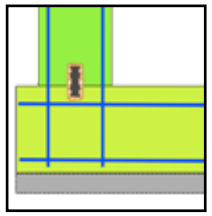


C1 Placing of the concrete

C2 **Introducing the BFL-Mastix bands type R4 into the fresh concrete**

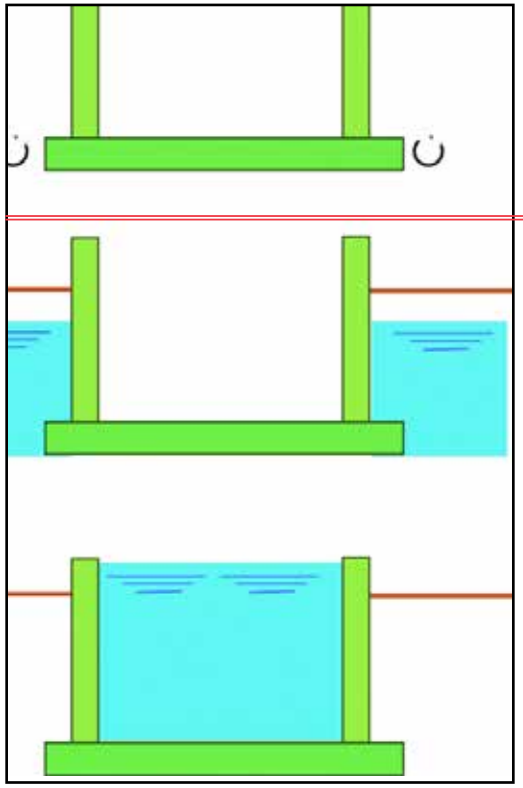
For improving the roughness of the work joint as well as the adherence with the fresh concrete, the work joint should be treated with a high pressure water gun.

1.1 Raft foundation carried out in one only stage with waterstop
BFL-Mastix type R4 for the waterproofing between raft and walls



Choice of a BFL-Mastix band

Risk of water infiltration



subsoil water
- rain — **20/40 R4**
- spring — **30/40 R4**

water level
- permanent — **20/70 R4**
- intermittent — **30/40 R4**

- swimming pool — **40/50 R4**
- basin
- reservoir — **40/70 R4**

text :
BFL-Mastix bands.....R4
placed into the fresh raft concrete

1.1 Raft foundation carried out in one only stage with waterstop BFL-Mastix type R4 for the waterproofing between raft and walls

Procedure for placing BFL-Mastix bands type R4 into the fresh raft concrete

Material

A small propane gas burner - a spatula for cutting the bands - In order to avoid injuries, gloves and protection goggles should be used

Procedure

- **BFL-Mastix bands type R4 are incorporated into the fresh raft** (1) The appropriate moment depends on the workability of the concrete

- For facilitating the placing of the bands, a ruler or a lath can be used to shape a groove in the concrete.

- At the end of the placing work, **a short vibrating around the bands will definitely combine the band and the concrete.**

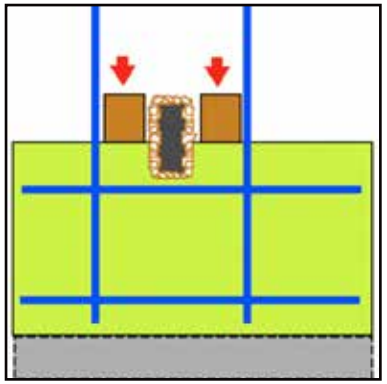
- The connection between bands or between preassembled band parts is done **with a small bottle-gas burner** (2)

- **The BFL-Mastix bands must be protected** in circulation areas (3)

- **For avoiding a loss of cement milk**, it is necessary that the foot of the wall formwork is watertight.
  This, to avoid the formation of gravel nests and a loss of the concrete resistance (4).

1

2



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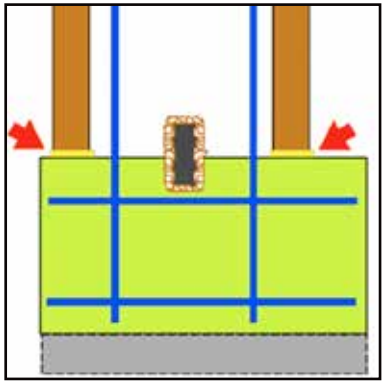

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1.1 Raft foundation carried out in one only stage with waterstop BFL-Mastix type R4 for the waterproofing between raft and walls

Recommendations for placing the BFL-Mastix bands

- **Joining bands is done with the help of a small propane gas burner.** This operation consists of heating rapidly both band ends and press them together **(1,2,3)**. Perpendicular joints are made by scratching off the fine gravel and heating the surface to be glued **(4)**.

- BFL-Mastix bands must be protected in areas where workers are circulating **(5)**.

- **Washing the work joint surface is necessary before placing the wall formwork.** It is also necessary to saturate this surface with water, when it is windy, so that the water in the fresh wall concrete is not absorbed by the dry raft concrete: blotting paper effect **(6)**.

- To avoid that a steel formwork crashes the incorporated bands, some preventive measures are necessary by introducing a space under the formwork **(7)**.

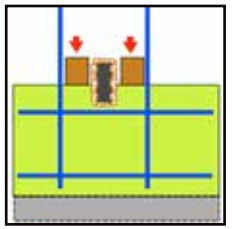
- To avoid the loss of cement milk, the formwork foot must be watertight. This, to avoid formation of gravel nets and a loss of compressive strength in the concrete **(8)**.

1

2

3

4



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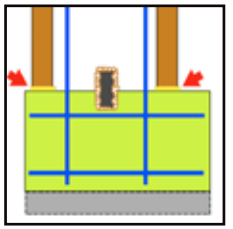

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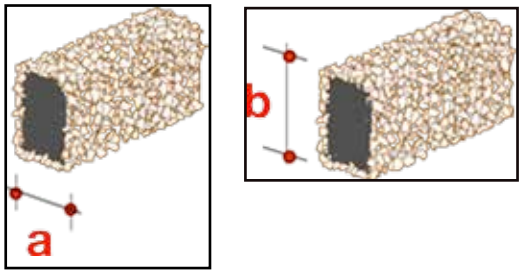
1.1 Raft foundation carried out in one only stage with waterstop BFL-Mastix type R4 for the waterproofing between raft and walls

Catalogue of BFL-Mastix waterproofing bands R4

Bands	Dimensions cm		Length cm	Packaging m'/box	Weight kg/m'
	a	b			
20/40 R4	3.00	6.00	60.00	12.00	2.40
20/70 R4	3.00	9.00	60.00	6.00	4.00
20/120 R4	12.00	3.00	60.00	6.00	5.50
30/40 R4	4.00	6.00	60.00	9.00	3.50
40/50 R4	5.00	7.00	60.00	6.00	5.00
40/70 R4	5.00	9.00	60.00	6.00	5.50
40/100 R4	5.00	12.00	60.00	3.60	7.00

Bands	Dimensions in.		Length in.	Packaging ft./box	Weight lb./ft.
	a	b			
20/40 R4	1.18	2.36	23.62	39.37	1.61
20/70 R4	1.18	3.54	23.62	19.68	2.68
20/120 R4	4.72	1.18	23.62	19.68	3.69
30/40 R4	1.57	2.36	23.62	29.52	2.35
40/50 R4	1.96	2.75	23.62	19.68	3.35
40/70 R4	1.96	3.54	23.62	19.68	3.69
40/100 R4	1.96	4.72	23.62	11.81	4.70



Placing yield

- With two workmen it is generally possible to place some **25 to 30 m'/hour** of **BFL-Mastix bands type R4**

Storing conditions

- covered shelter
- In case of packaging damage, the bands will be put in a new box.

Compatibility of BFL-Mastix bands with concrete

- **Thanks to the gravel coating of the core, the BFL-Mastix bands assure a perfect liaison with fresh concrete.**
- **The fine crushed gravel is not alkali-reactive.**
- **The core of the BFL-Mastix bands ist form-stable in the presence of water, the bands do not swell.**

1.1 Raft foundation carried out in one only stage with waterstop BFL-Mastix type R4 for the waterproofing between raft and walls

Arguments in favour of BFL-Mastix bands type R4

Presentation of the bands

- BFL-Mastix bands are designed for a long term waterproofing of joints in concrete structures.

- The bands of type R4 consist of a deformable core, covered with crushed special fine gravel.

- The core of the BFL-Mastix bands type R4 behave like a liquid of very high viscosity.

- This is a deformable bituminous plasto-elastic polymer.

- The fine crushed gravel has the task to form an adhesion bridge between core and fresh concrete (concrete in liquid stage).

- The company Mastix SA. is certified ISO-2008, quality management.

Adherence in fresh concrete

- The very rough surface of the gravel covered BFL-Mastix band core offers an ideal base to assure a waterproof liaison with the fresh concrete.

- The fine crushed gravel, covering the band core is then enveloped in the same way by the cement milk as the sand/gravel of the concrete.

- **Fresh concrete adheres only on porous surfaces such as hard and clean concrete and the gravel covered core surfaces of BFL-Mastix bands.**

- Fresh concrete cannot adhere on impermeable surfaces, such as plastic, resins or metal.

On the job site

- BFL-Mastix bands type R4 placed into the concrete of a raft, remain insensitive against rain, snow or frost.

- BFL-Mastix bands type R4 can remain, if necessary, uncovered for several weeks.

- In case of intensive sunshine, the bands must be moistened as well as the raft concrete.

1.1 Raft foundation carried out in one only stage with waterstop BFL-Mastix type R4 for the waterproofing between raft and walls

Technical specifications

The core of the BFL-Mastix bands

Bituminous rubber – density 1.28 g/cm3 – grey mat colour –consistency plasto-elastic – smooth surface – slightly smelling – square or rectangular sections – lengthening capacity between 200 and 380 %.

- Elasticity module

- at -20°C	frequency 0,25 s	4,419 Mpa				
- at 0°C	frequency 15,7 s	2,075 Mpa	- at 0°C	frequency 0,25 s	0,477 Mpa
- at 20°C	frequency 15,7 s	0,308 Mpa	- at 20°C	frequency 0,25 s	0,133 Mpa
- at 40°C	frequency 15,7 s	0,120 Mpa	- at 40°C	frequency 0,25 s	0,049 Mpa

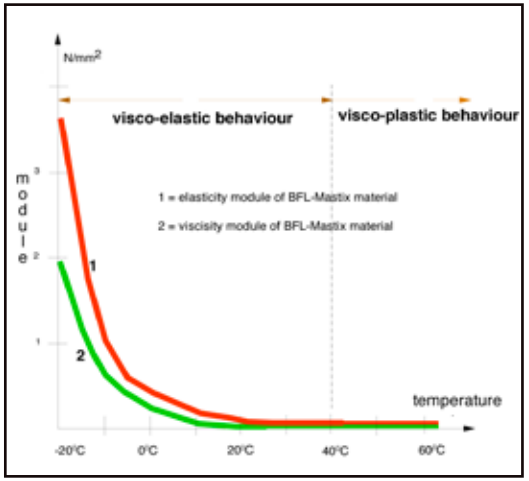
- Viscosity module

- at -20°C	frequency 0,25 s	2,252 Mpa			
- at 0°C	frequency 15,7 s	1,616 Mpa	- at 0°C	frequency 0,25 s	0,309 Mpa
- at 20°C	frequency 15,7 s	0,222 Mpa	- at 20°C	frequency 0,25 s	0,056 Mpa
- at 40°C	frequency 15,7 s	0,074 Mpa	- at 40°C	frequency 0,25 s	0,024 Mpa

The behaviour of the core is comparable to liquid of very high viscosity. It cannot break

- return deformation : medium value of return deformation in % of the initial deformation

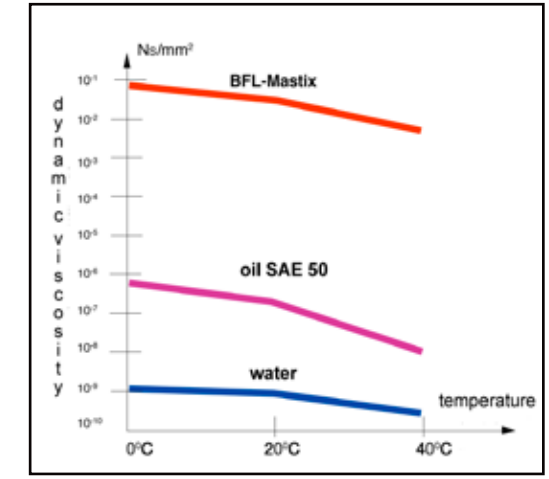
- at -20°C	60.8%	after 15 minutes	- at -20°C	66 %	after 60 minutes
- at 0°C	84.8%	after 15 minutes	- at 0°C	89,2%	after 60 minutes
- at 20°C	96.8%	after 15 minutes	- at 20°C	100 %	after 60 minutes
- at 40°C	98.0%	after 15 minutes	- at 40°C	100 %	after 60 minutes



Temperature influence on the core material

Gravel covered bands

- **The with fine gravel covered core surface is not alkali-reactive.**
- **The fine gravel is of 4/8 mm grain** and mainly of calcareous rock.
- **Integrated in concrete, the BFL-Mastix bands offer** high resistance against chemical aggression and the alkalinity of the concrete.
- **In possible contacts with petrol or hot oil in a basin,** then the bands BFL-Mastix types 40/70 R4 or 40/100 R4 must be used for waterproofing joints between raft and walls.
- **BFL-Mastix bands offer high resistance against** deicing salt, acid water, liquid manure, sulfated or chlored water in swimming pools They offer also a high resistance against ammonium-sulfate 10 g/l, ammonium-chloride 10 g/l, causticsoda 30g/l, ammonia 25 %, sulfuric acid 50 %, pure olein acid and ethyl alcohol (ethanol).
- **Confined in concrete, BFL-Mastix waterstops are well protected against mechanical aggression,** contrary to an external insulation, which in case of maintenance works, repairs or enlargements can easily suffer damages.



Comparison of viscosity modules