

 **BEKAERT**

better together

# Murfor® Compact Manual



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# INTRODUCTION

## Murfor® Compact

### ETA 18/0316 CERTIFIED PRODUCT

Murfor® Compact is certified through ETA 18/0316 for structural use, which allows for CE marking of the product. By marking their products, manufacturers declare compliance with the obligations laid down for marking and their responsibility for free movement and sales throughout the European Economic Area (EEA).

The marking proves that the product has been evaluated and meets the European requirements for safety, health and environmental protection. It applies to products manufactured in the EEA as well as to products that are manufactured outside and then marketed in the EEA.

### Murfor® Compact: the new standard in masonry reinforcement

Controlling crack formation in masonry is one of the many challenges of a construction project. Masonry has a high compressive strength, but the tensile strength is limited.

#### **Reinforce your masonry with Murfor® Compact to add strength and prevent cracks.**

Murfor® Compact enhances the structural performance of the wall by reinforcing the masonry, which significantly increases the in plane and out of plane capacities of the structure. This allows for greater moment capacities without alterations to the materials used or the dimensions of the panel.

You can rely on this new generation of reinforcement in all applications:

- Structural applications
- Crack control

Bekaert offers two types of Murfor® Compact:

**Murfor® Compact I** for use in a dry environment (MX1).

**Murfor® Compact E** for masonry exposed to a damp environment (MX3 and MX4).

## TWO TYPES OF MURFOR® COMPACT



**Murfor® Compact I** for masonry with concrete and ceramic blocks in a dry environment. (MX1)



**Murfor® Compact E** for masonry that is exposed up to MX4



## THE ADVANTAGES OF MURFOR® COMPACT

- ① **Fast and simple installation:**  
Unroll the reinforcement onto the masonry joints and cut to size; no overlap needed, no material lost. Each roll contains 30 m of reinforcement and weighs only 3 kg, about 1/10 of the weight of regular masonry reinforcement.

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- ② **Efficient and durable crack control:**  
Murfor® Compact controls cracks and strengthens masonry. The composition of the steel cords has an exceptionally high yield strength.

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- ③ **Structural use:**  
Murfor® Compact increases the lateral load capacity when used as bed joint reinforcement by increasing tensile strength within the panel.

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- ④ **Simple to stack and transport:**  
Murfor® Compact rolls are packed in boxes of 30x30x30 cm that can be easily stacked, stored and transported.

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- ⑤ **Suitable for any wall width:**  
Murfor® Compact is available in two convenient widths that can be combined to reinforce any wall width..

## PRODUCT RANGE

Murfor® Compact	Exposure class*	Masonry type
Murfor® Compact I-50	MX1	Ceramic and concrete blocks
Murfor® Compact I-100		
Murfor® Compact I-50 x2		
Murfor® Compact E-35	MX2, MX3, MX4	All facing bricks
Murfor® Compact E-70		

\* According to Eurocode 6 – EN 845-3

### Exposure classifications

MX1 – Dry environment

MX2 – Exposure to a damp environment

MX3 – Exposure to a damp and frosty environment

MX4 – Exposure to chlorides in the environment



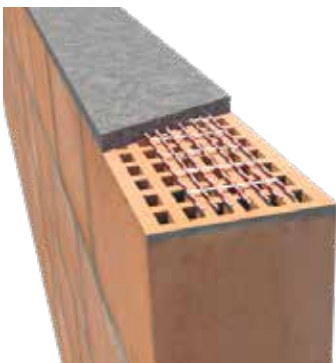


## MURFOR® COMPACT I

### 1. Types

There are two types of Murfor® Compact I:

- **Murfor® Compact I-50:** mesh of 7 steel cables
- **Murfor® Compact I-100:** mesh of 14 steel cables



$\leq 130$  mm

Wall width of  $\leq 130$  mm:  
Murfor® Compact I-50



$> 130$  mm  $< 200$  mm

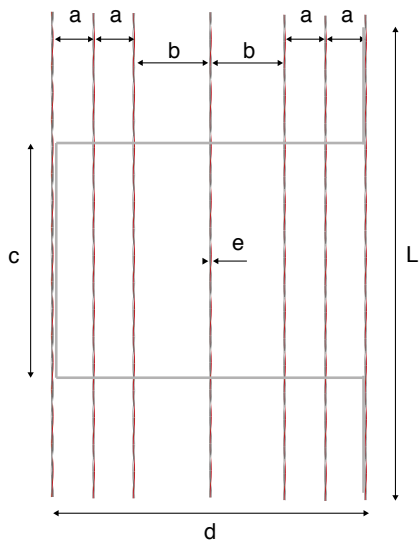
Wall width of  $> 130$  mm  
 $< 200$  mm: Murfor®  
Compact I-100



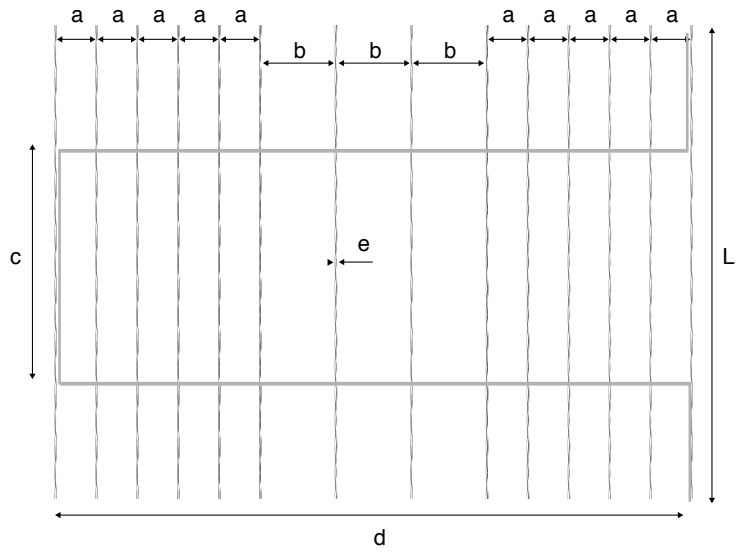
$\geq 200$  mm

Wall width of  $\geq 200$  mm:  
2x Murfor® Compact I-50

## 2. Geometry



Murfor® Compact I-50.



Murfor® Compact I-100.

## 3. Measurements and weight

			Murfor® Compact I-50	Murfor® Compact I-100
Step <sub>short</sub>	mm	a	7,5	7,5
Step <sub>long</sub>	mm	b	10	10
Step <sub>transverse cord</sub>	mm	c	33	33
Width	mm	d	50	100
Diameter	mm	d	1,7	1,7
Length	m	L	30	30
Weight	kg/roll		1,40	2,77



#### 4. Technical specifications

		Murfor® Compact I-50	Murfor® Compact I-100
A* <sub>long cable</sub>	mm <sup>2</sup>	0,69	0,69
A* <sub>total</sub>	mm <sup>2</sup>	4,83	9,66
Yield strength	MPa	> 1770	> 1770
E-modulus	GPa	180	180
Agt	%	> 2,20	> 2,20
Zinc	g/m <sup>2</sup>	40	40

\*A = steel section

#### 5. Packaging

- 36 boxes on a 900 x 1200 mm wooden pallet
- Identification on the box

		Murfor® Compact I-50	Murfor® Compact I-100
Per box	amount	6	3
	meter	180	90
Per pallet	boxes	36	36
	meter	6480	3240





## MURFOR® COMPACT E

### 1. Types

There are two types of Murfor® Compact E:

- **Murfor® Compact E-35:** mesh of 7 Stainless steel chords
- **Murfor® Compact E-70:** mesh of 14 Stainless steel chords



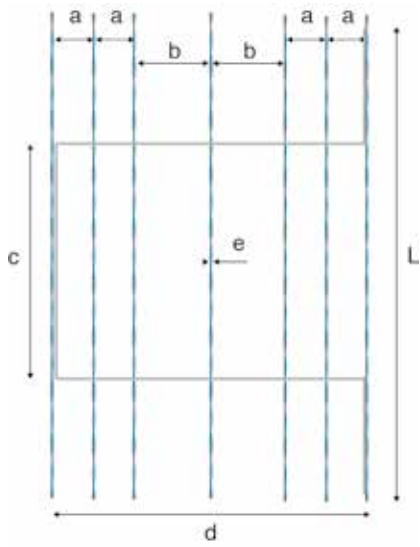
Murfor® Compact  
E-35



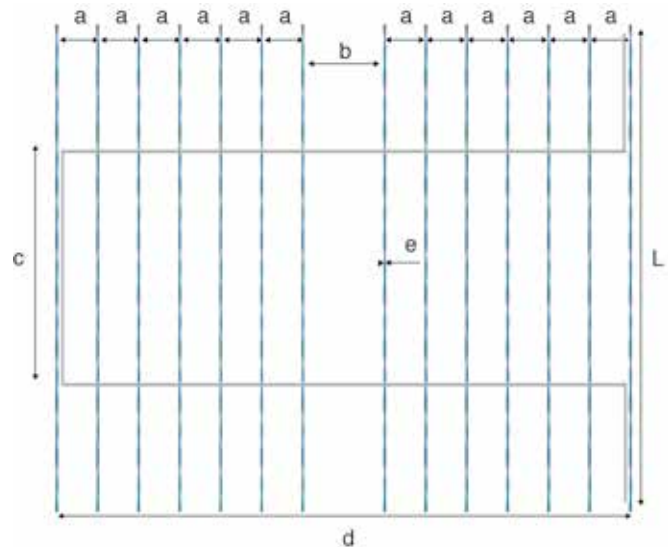
Murfor® Compact  
E-70

The type of Murfor® Compact E that needs to be used is depending the brick width. Contact us for more detailed information.

## 2. Geometry



Murfor® Compact E-35.



Murfor® Compact E-70.

## 3. Measurements and weight

			Murfor® Compact E-35	Murfor® Compact E-70
Step <sub>short</sub>	mm	a	5	5
Step <sub>long</sub>	mm	b	7,5	10
Step <sub>transverse cord</sub>	mm	c	33	33
Width	mm	d	35	70
Diameter	mm	d	1,7	1,7
Length	m	L	30	30
Weight	kg/roll		1,32	2,63

#### 4. Technical specifications

		Murfor® Compact E-35	Murfor® Compact E-70
A* <sub>long cable</sub>	mm <sup>2</sup>	0,69	0,69
A* <sub>total</sub>	mm <sup>2</sup>	4,83	9,66
Yield strength	MPa	> 1300	> 1300
E-modulus	GPa	150	150
Agt	%	> 2,00	> 2,00
Stainless steel		R1	R1

\*A = steel section

#### 5. Packaging

- 36 boxes on a 900 x 1200 mm wooden pallet
- Identification on the box

		Murfor® Compact E-35	Murfor® Compact E-70
Per box	amount	6	3
	meter	180	90
Per pallet	boxes	36	36
	meter	6480	3240



## APPLYING MURFOR® COMPACT I



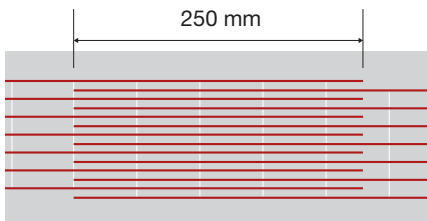
Apply Murfor® Compact I to the blocks.



Apply a layer of mortar.

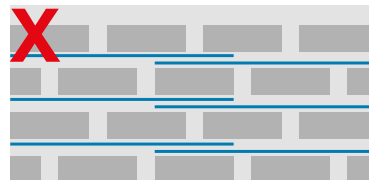


Put the blocks in place.



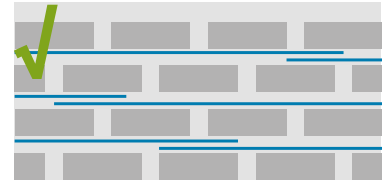
(overhead view of the wall)

Use a minimum overlap length of 250 mm.



(side view of the wall)

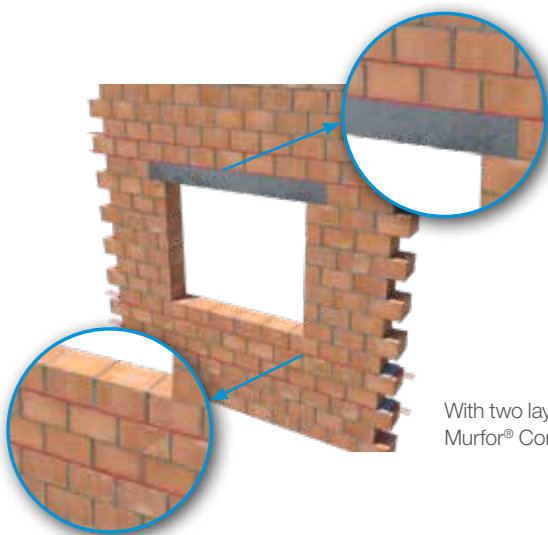
Avoid positioning the overlap on the same vertical face.



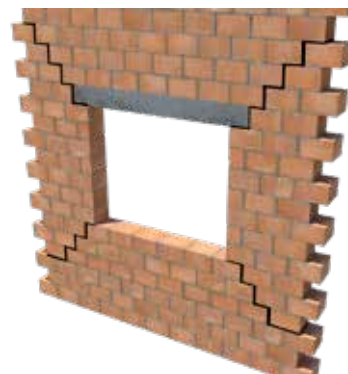
## MURFOR COMPACT I - INTERIOR APPLICATIONS (MX1)

### 1. Stress concentrations

Stress concentrations around window openings can be absorbed by applying two layers of Murfor® Compact I above and below the window.



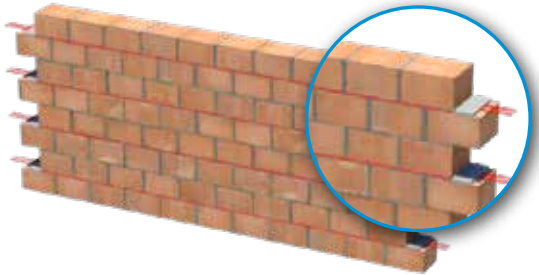
With two layers of Murfor® Compact I



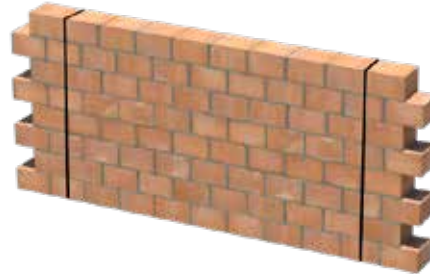
Without two layers of Murfor® Compact I

## 2. Long walls

Shrinkage or expansion of materials can lead to cracks in the masonry. Murfor® Compact I allows for larger gaps between movement joints.



With Murfor® Compact I



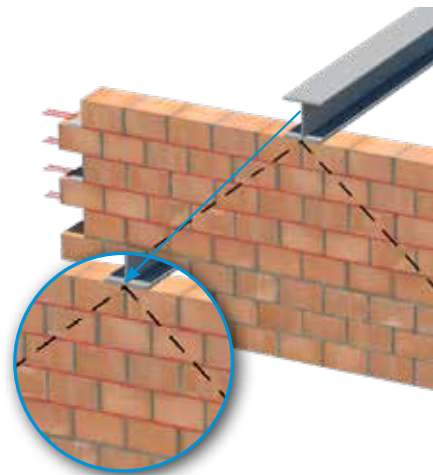
Without Murfor® Compact I

Contact us for more information on the maximum distance between movement joints.

## 3. Point loads

Point loads, e.g., ball joints, are highly concentrated loads that cause tensile stress and cracks in the masonry. Using a concrete beam as support interferes with the homogeneous character of the masonry.

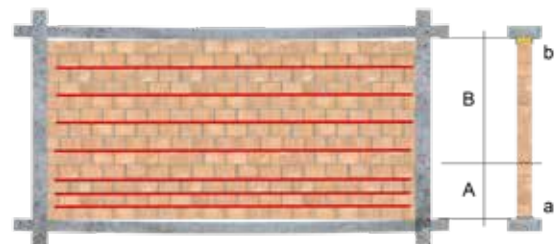
Depending on the volume of the load, three to five of the underlying joints can be reinforced with Murfor® Compact I. The reinforcement ensures the even distribution of the load. It is important to check that the contact stress between the point load and the masonry is not greater than the calculated value of the compressive strength of the masonry.



## 4. Partition walls susceptible to deformation

Partition walls that are laid on a floor plate will start to crack in different places where there is too much sagging. To prevent this, you can reinforce and isolate the wall from the support with Murfor® Compact I.

Contact us for more details on the number of joints to be reinforced in Zone A as functions of the wall length and height.



a. Bond breaking layer

b. Intumescent strip

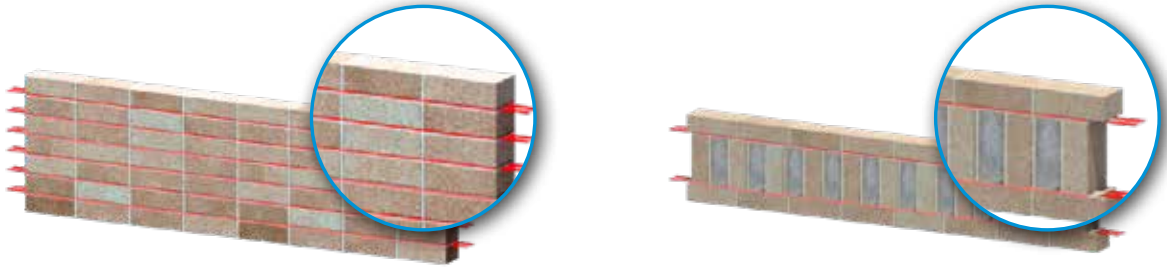
Zone A: Partition walls susceptible to deformation

Zone B: the bedjoint reinforcement is applied every two joints

## 5. Stack bonded masonry

Murfor® Compact I guarantees stability of the masonry with and without a stack bond.

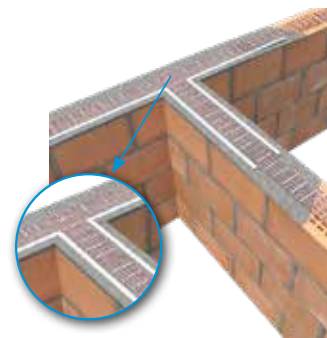
For masonry with a stack bond, the bricks are placed directly above each other, meaning reinforcement is essential for wall stability. With masonry without overlaps, reinforcement is required to compensate for insufficient bending bonding.



## 6. Corner and T-connections

Murfor® Compact I reinforcement, combined with Murfor® EFC/Z wall angle elements provide the perfect corner connection.

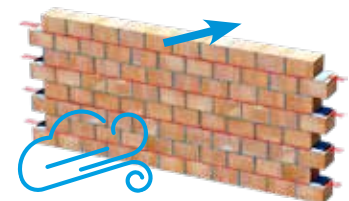
Finish corners with 140 mm wide blocks with Murfor® Compact I-100. Corners with 200 mm wide blocks should be finished with 2 x Murfor® Compact I-50.



## 7. Laterally loaded wall panels

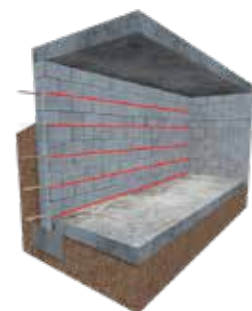
### • Wind loaded walls

Murfor® Compact allows longer or thinner wall partitions that can withstand high wind loads.



### • Retaining walls

Cellar walls, retaining walls or silo walls are exposed to considerable stresses from lateral loading. Murfor® Compact increases the loading capacity of the wall span between the columns.



## APPLYING MURFOR® COMPACT E



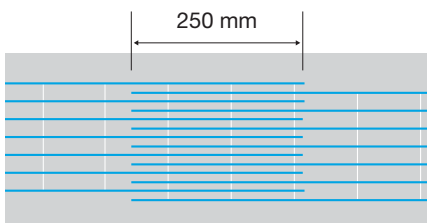
Apply Murfor® Compact E to the facing bricks.



Apply a layer of mortar.

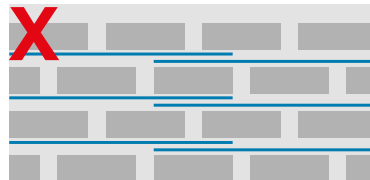


Put the blocks in place.



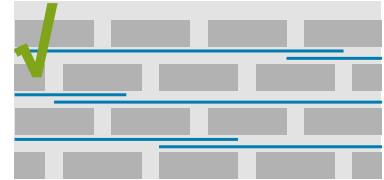
(overhead view of the wall)

Use a minimum overlap length of 250 mm. (overhead view of the wall)



(side view of the wall)

Avoid positioning the overlap on the same vertical face.

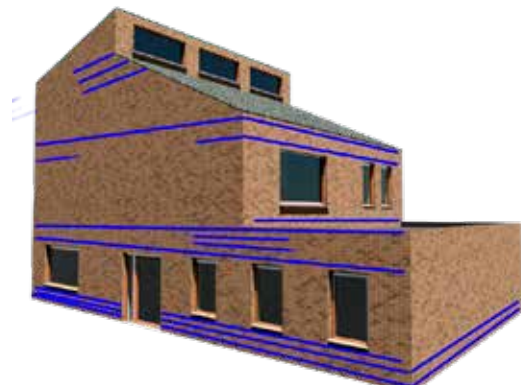
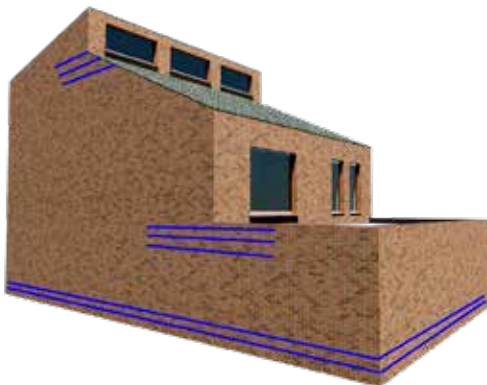


## MURFOR COMPACT E - EXTERIOR APPLICATIONS (MX3 AND MX4)

### 1. Stress concentrations

Murfor® Compact E provides additional reinforcement in places having a high stress concentration:

- With level differences
- At the wall base
- Above window and door openings
- Under window sills

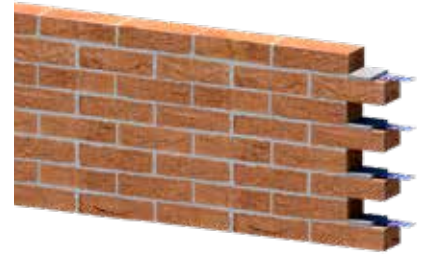




## 2. Long walls

Shrinkage or expansion of materials can lead to cracks in the masonry. Murfor® Compact E allows for larger gaps between movement joints. These larger distances are dependent on:

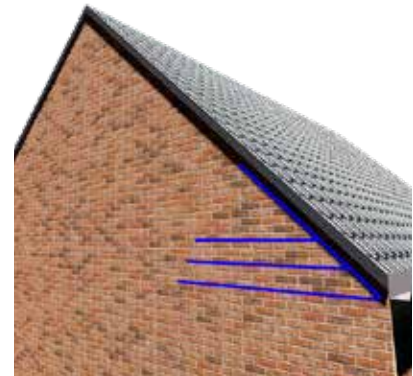
- Type and color of the facing brick
- Type of mortar or glue
- Type of joint
- Age of the bricks
- Orientation
- Temperature at implementation
- Type of obstacle



## 3. Gables

Improve the stability of gables by reinforcing a joint every 300 mm with Murfor® Compact E.

If gables are more than 8 meters high it is recommended to reinforce every 200 mm with Murfor® Compact E. Always take the recommendations for long walls into account.

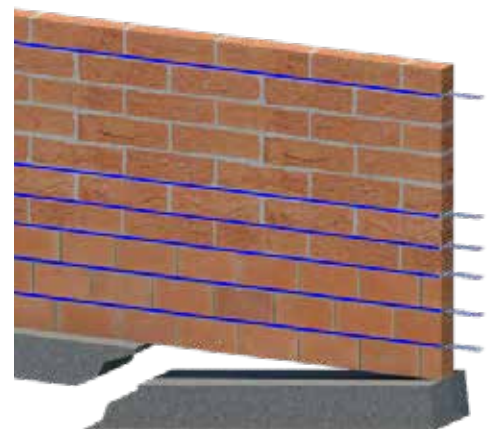


## 4. Differential settlement (such as garden walls)

Masonry on partly hardened soil or uneven terrain is susceptible to deformations and stresses. This is why it is recommended to reinforce the masonry.

### Recommended reinforcement:

- Reinforce the first 5 joints and foundation with Murfor® Compact E.
- Reinforce masonry located higher up every 400 mm.



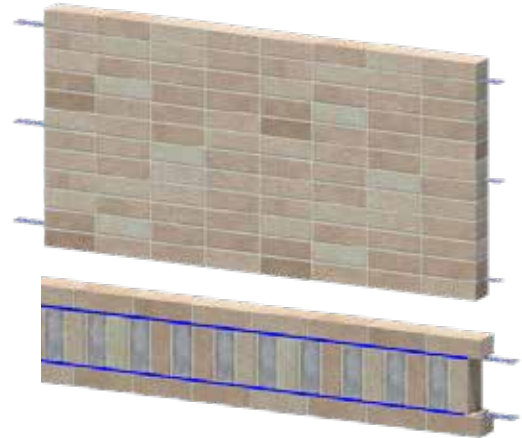
## 5. Facade support

Prevent cracks by reinforcing one or two joints above the facade support with Murfor® Compact E.



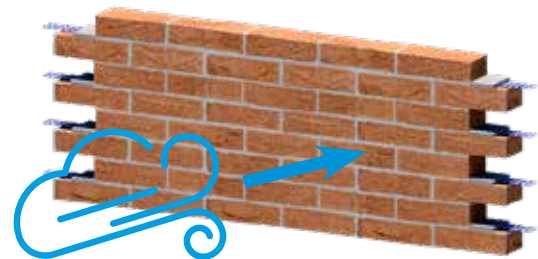
## 6. Stack bonded masonry

Reinforce the masonry every 300 mm with Murfor® Compact E to compensate the insufficient bonding in stacked masonry.



## 7. Laterally loaded wall panels

Murfor® Compact allows longer or thinner wall partitions that can withstand high wind loads.



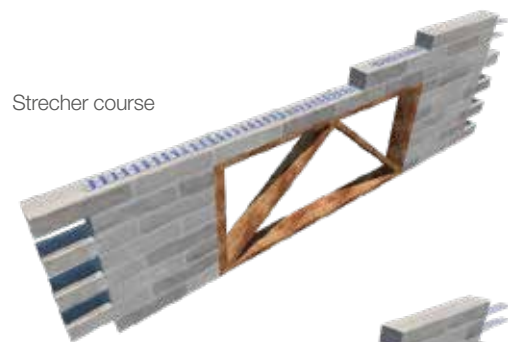
## 8. Masonry beam design

Murfor® Compact E is a cost-effective and esthetic solution to reinforce prefabricated lintels. Murfor® Compact E masonry beams absorb the bending moments over windows and door, and they can be used with soldier- or stretcher course.

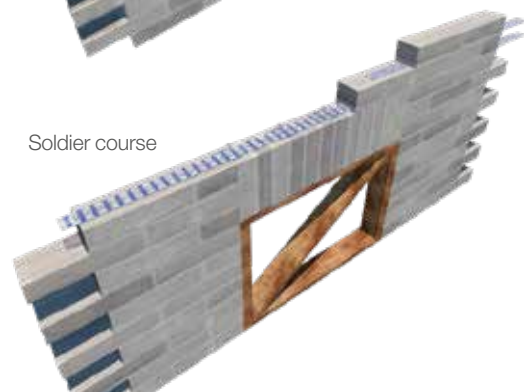
**Note:** There are restrictions to using Murfor® Compact E in lintels:

- Only suitable for non-bearing masonry, using normal masonry bonding.
- The mortar quality requires minimal compressive strength of M5 and a minimal bond strength of 0.20 N/mm<sup>2</sup>.

Streicher course



Soldier course

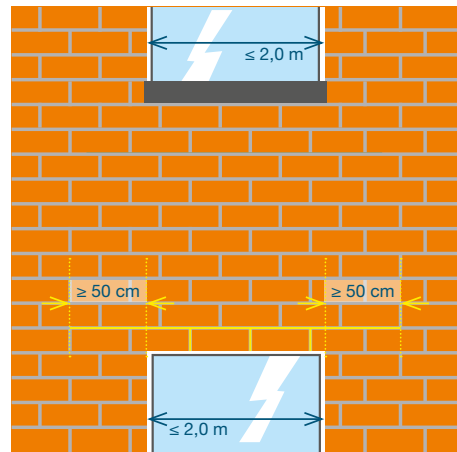


### Use of Murfor® LHK/S lintel hooks

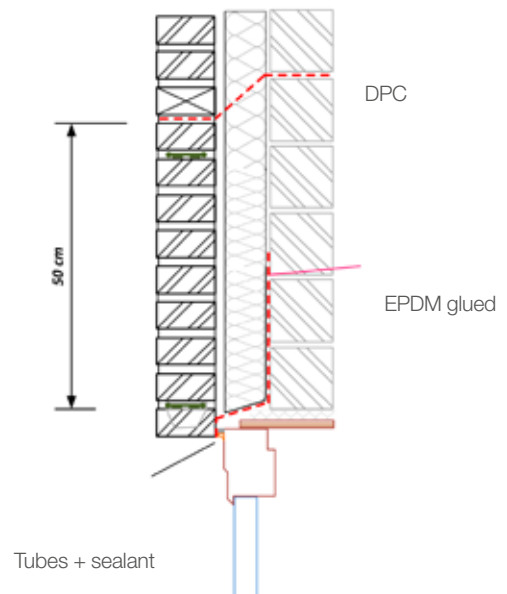
	Height of the joint (mm)	Height of the brick (mm)	Type	Number
Stretcher course	12	± 50	LHK/S-40	1 hook/every Butt joint
Soldier course	12	± 100 - 150	LHK/S-85	1 hook/every 3 Butt joints
Soldier course	12	± 170 - 240	LHK/S-150	1 hook/every 3 Butt joints
Soldier course	12	± 290 - 365	LHK/S-270	1 hook/every 3 Butt joints
Stretcher course	6-8	± 50	LHK/S TJ-40	1 hook/every Butt joint
Soldier course	6-8	± 170 - 240	LHK/S TJ-150	1 hook/every 3 Butt joints

### Anchorage to masonry

- Create an anchor of at least 50 cm long.
- Apply at least 15 mm of mortar below and on top of Murfor® Compact when placing it on the joint.



### Correct placement of the water retaining membrane.



## 9. Clastra Masonry

Murfor Compact® E is available in different widths and it is extremely flexible in use, which means that it is the perfect reinforcement for Clastra masonry.



[INFOBUILDING@BEKAERT.COM](mailto:INFOBUILDING@BEKAERT.COM)

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