

# **MOMENT BAR BOX**

# We are one team. We are Leviat.

Leviat is the new name of CRH's construction accessories companies worldwide.



Under the Leviat brand, we are uniting the expertise, skills and resources of Halfen Moment and its sister companies to create a world leader in fixing, connecting and anchoring technology.

The products you know and trust, Moment Bar Box will remain an integral part of Leviat's comprehensive brand and product portfolio.

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Our product brands include:

**Ancon**

**[H]  
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**MOMENT**

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## MOMENT BAR BOX

The Moment Bar Box is a quick and easy to install method of maintaining continuity of reinforcement at construction joints in concrete. It consists of a galvanised steel casing with a ribbed surface to provide an effective concrete bond. Pre-bent bars are housed within the casing and are enclosed by a protective cover. Each end of the unit is sealed with a foam material in order to prevent the ingress of concrete.

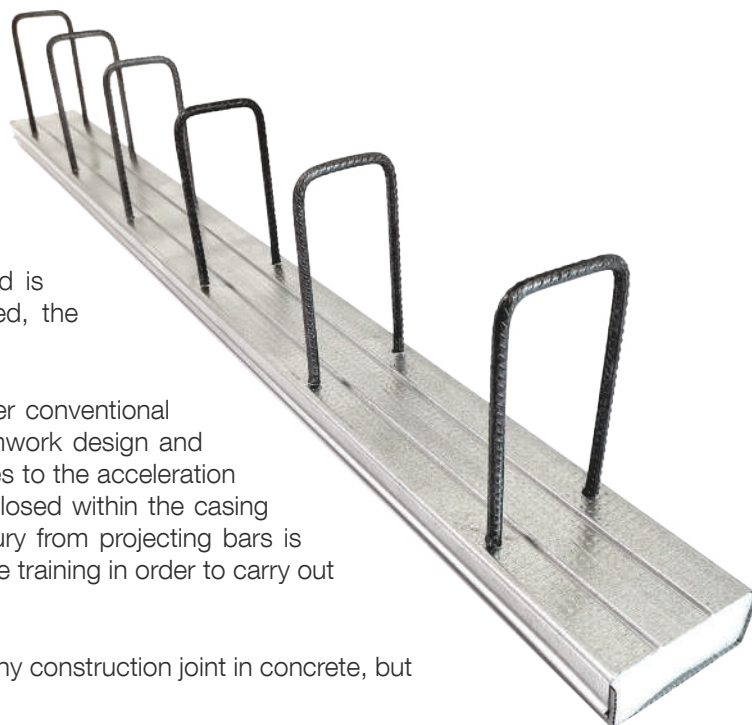
The complete unit is nailed to the formwork. Alternatively it can be wired back to the main reinforcement cage. The concrete is then cast. After removing the formwork, the cover is removed and the bars are straightened, ready for lapping onto the main reinforcement, using a Bar Box re-bending tool.

The steel casing remains embedded in the wall and is filled with concrete when the next section is poured, the dimpled surface providing an efficient key.

Use of the Bar Box system offers many benefits over conventional joint construction, including the simplification of formwork design and removal of the need to drill shuttering. This contributes to the acceleration of the construction process. As the bars remain enclosed within the casing until required, they are protected and the risk of injury from projecting bars is minimised. Easy to use, the system requires no on site training in order to carry out installation.

The Bar Box system is potentially suitable for use in any construction joint in concrete, but the most commonly found applications include:

- Floor slabs
- Walls
- Stairwells
- Corbels
- Diaphragm walls
- Jumpforms



## QUALITY

Bar Box Reinforcement Continuity System are manufactured using reinforcing bar which meets the requirements of the local reinforcing bar standard.



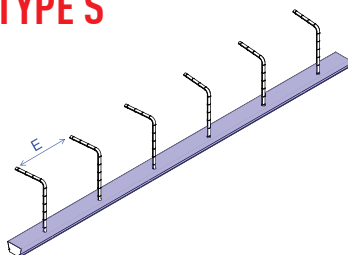
Due to the exclusive profile, specially designed to anchor itself in the concrete, the Moment Bar Box is capable of forming an anchoring which can transfer significant forces across construction joints.



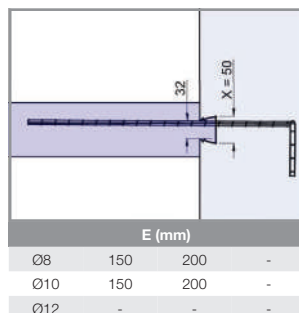
- The **external dovetail shape** guarantees a tongue and groove connection between the two concreting phases.
- The **rib shaped pattern** on the surface of the casing improves the bond and allows the transfer of shear forces.
- The **profiled edges** on the sides prevent displacement of the casing when the lid is removed, improving the quality of the anchoring.
- The **back cover** is easy to remove under all conditions because of the double longitudinal perforations present.
- The **foam material** does not get damaged or crushed easily and stays in one piece, reducing cleanup work after use. It is perfectly adapted to the shape of the casing, prevent the penetration of cement slurry along the sides of the casing.
- Environmentally friendly.
- Sustainable as the back cover could easily be recycled.
- Save costs as formwork could be reused.



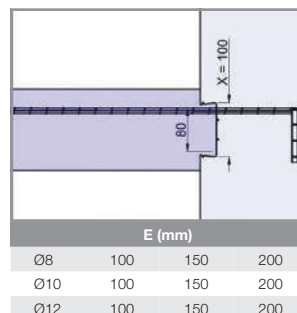
## TYPE S



## 50S

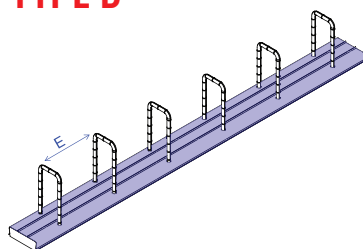


## 100S

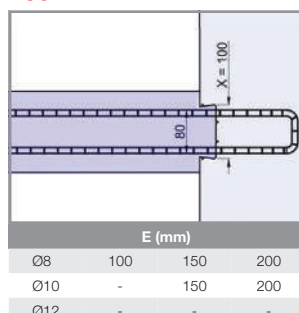


\*Dimension (E) also called pitch.

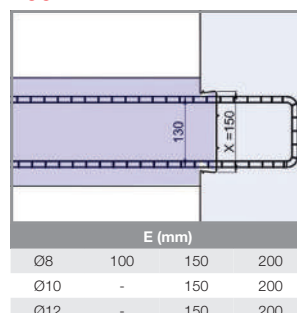
## TYPE D



## 100D



## 150D

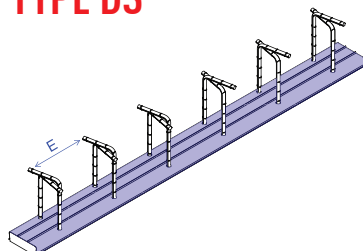


\*Dimension (E) also called pitch.

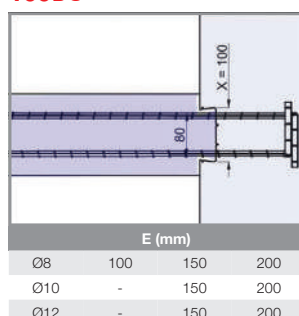
\*Wider rebar width version also available, named 'DW' type. Rebar width will increase from 80 to 90, for 100 DW and 130 to 140, for 150 DW.

Also available in the U-version (or upside down rebar), whereby the U-shape will be embedded inside the profile.

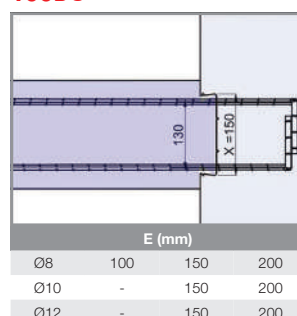
## TYPE DS



## 100DS



## 150DS



\*Dimension (E) also called pitch.

The concept of the product is based on the calculation and the structural application as applied in the following standards and guidelines: EN1992-1-1. Generally two different cases of shear load are examined: shear load transverse and longitudinal to the concrete joint.

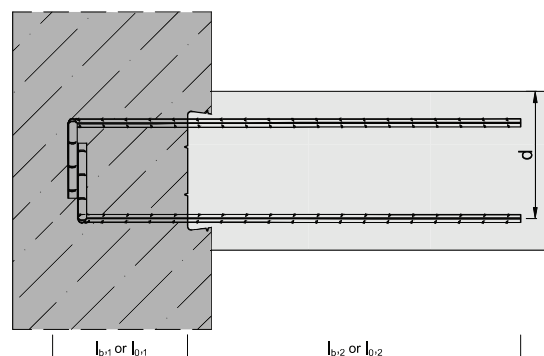
According to the theory, due to the product characteristics the shear loads transverse to the joint can be classed as 'indented' and shear loads longitudinal to the joint can be classified as 'rough'.

**Material: Rebend reinforcement B500B with bar diameters of 8, 10 and 12mm.**  
**Normal concrete ≥ C20/25**

The maximum load bearing capacity of the rebend connection must be limited to 90% of the ultimate limit state; the following applies to the tensile strength:

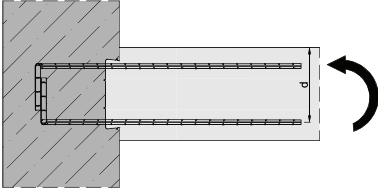
$$f_{yd,red} = 0.8 \cdot \frac{f_{yk}}{\gamma_s}$$

Existing anchorage lengths and overlap lengths must be taken into consideration for the calculation. These can be calculated from the back surface of the case. Verification of the anchorage lengths and overlap lengths is according to Eurocode 2, taking the bonding characteristic into account.

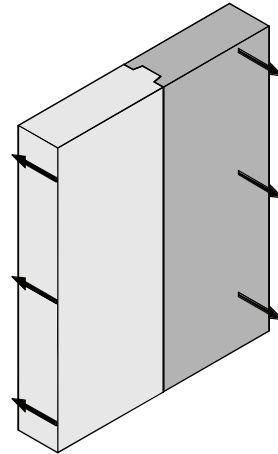


## SHEAR LOAD, TRANSVERSE TO THE CONCRETE JOINT

Calculation is according to EN 1992-1-1, section 6.2 for monolithic produced building components; whereby the following additional provisions must be observed.

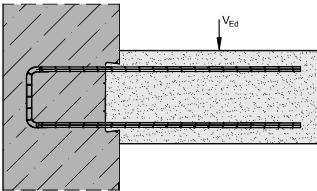


Tension zones: Upper and lower component edges



### SHEAR RESISTANCE WITH NO SHEAR REINFORCEMENT

The decisive resistance  $V_{Rd,c}$  for the calculation is according to EN 1992-1-1, section 6.2.2; whereby a reduction in the reinforcement ratio  $\rho_l$  is not required (caused by the reduced yield strength of the rebend reinforcement).



### SHEAR RESISTANCE WITH SHEAR REINFORCEMENT

The decisive resistance for verification results from 30% of the shear load resistance  $V_{Rd,max}$  according to DIN EN 1992-1-1, section 6.2.3:

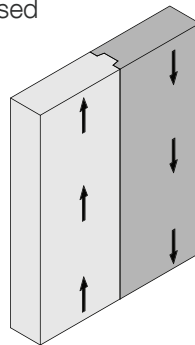
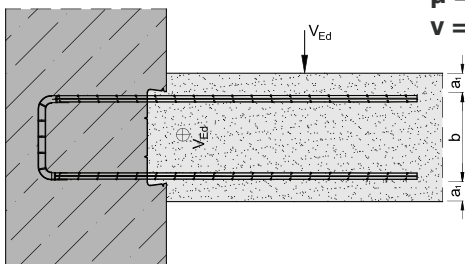
Tension zones: Upper and lower component edges

An additional load in the longitudinal reinforcement caused by shear forces must be verified assuming a compression strut angle of  $45^\circ$  ( $\cot \theta = 1.0$ ). The required shear reinforcement is calculated using  $\cot \theta = 1.0$

## COMBINED SHEAR LOAD, LONGITUDINAL TO THE CONCRETE JOINT

Static verification is according to EN 1992-1-1, section 6.2.5 whereby the following additional provisions are to be observed. Factors to be used calculate the shear load resistance:

$$\begin{aligned} c &= 0.4 \\ \mu &= 0.7 \\ v &= 0.5 \end{aligned}$$



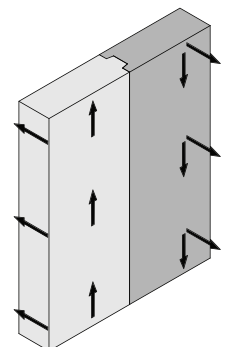
If the spaces between the bar box cases are additionally subjected to shear load, then these must be designed as rough or suitably indented in accordance with EN 1992-1-1. The edge areas can also be assumed as load bearing if  $a_1 \geq 50$  mm.

The concrete cover  $c_{nom}$  is according to EN 1992-1-1. In addition for the rebend reinforcement the following must be observed.

$$c_{nom} \geq \max. \{3 \varnothing, 30 \text{ mm, max. aggregate diameter } d_g\}$$

## COMBINED SHEAR LOAD, TRANSVERSE AND LONGITUDINAL TO THE CONCRETE JOINT

If the connection is subjected to combined shear load (longitudinal and transverse to concrete joint), each load direction can be verified separately.



### Technical Consultation

Please contact our local Technical Support Desk for any additional information

We offer a wide range of standard bar box connections for the most common applications.

There is also a wide product range with corresponding profile width and rebar shapes to choose from.

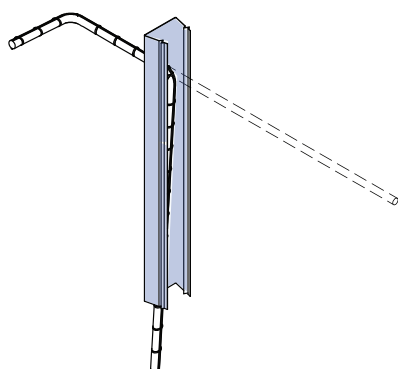
Rebar dimensions and element lengths are generally fixed, but can be adjusted on a case by case basis. Do enquire when placing order.

## CODE FOR ORDERING

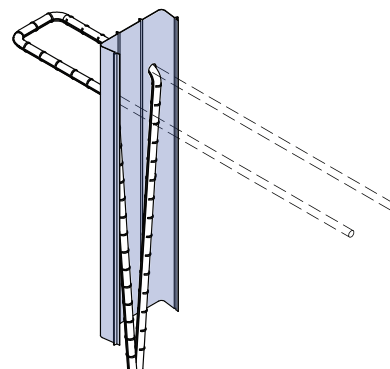
MBB A BBB (L) TCCxDDD

Example: MBB D 100 (L=1200) T10x200

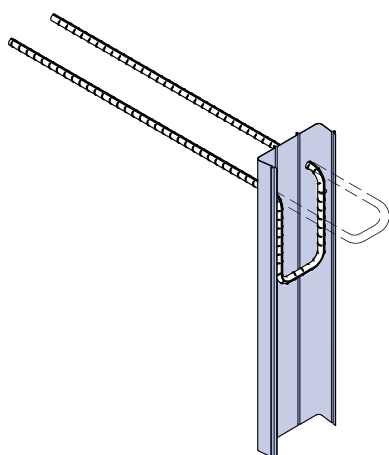
1	MBB	Moment Bar Box
2	A	Rebar Configuration. S, D, DU, DW, DWU, DS. For box only (with holes, no rebar), leave blank.
3	BBB	Box Width. 50, 100 or 150
4	L	Box Length. Default is 1200mm
5	CC	Rebar Diameter
6	DDD	Spacing Between Rebar (Dimension 'E')



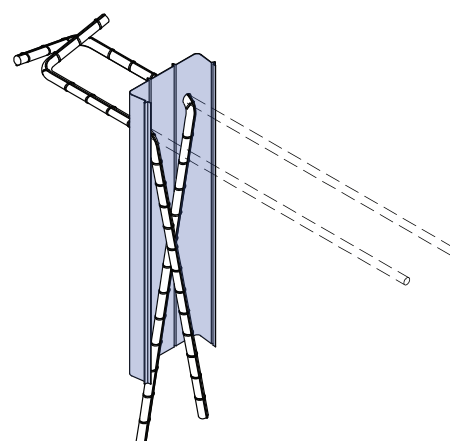
Type S (Single)



Type D (Double) /  
DW (Double Wide)



Type DU (Double Upside Down) /  
(DWU) Double Wide Upside Down

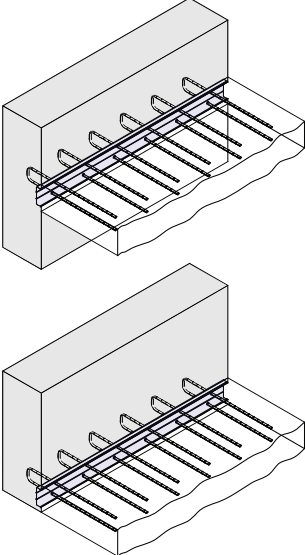
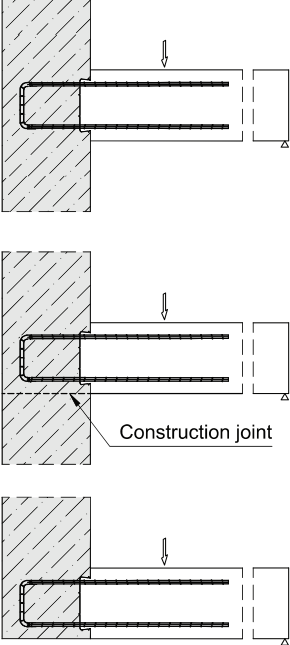
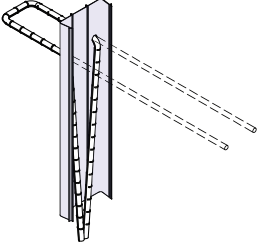


Type DS (Double Single)



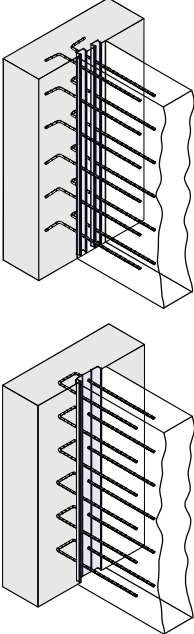
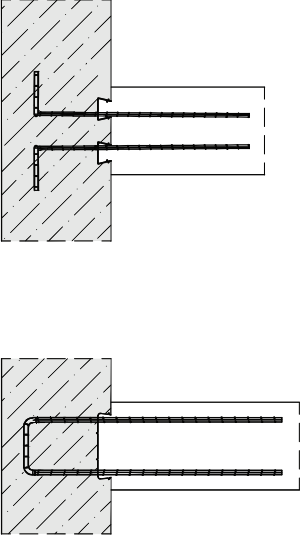
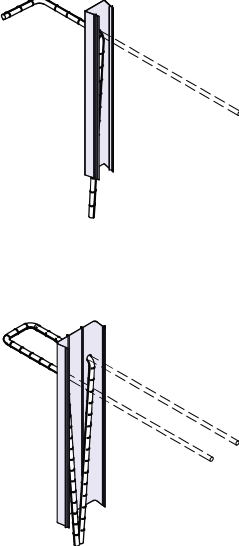
TYPE OVERVIEW / APPLICATION EXAMPLES

Shear Load Transverse Application. E.g. Floor, Slab

Application	Vertical Section	Rebar Type
		

TYPE OVERVIEW / APPLICATION EXAMPLES

Shear Load Longitudinal Application. E.g. Wall

Application	Horizontal Section	Rebar Type
		



**1.** Nail the bar box through the casing to the formwork or alternatively securely tie the projecting anchorage reinforcing bars back to the main reinforcement. In both cases the bar box should be securely fixed to avoid displacement during concreting. The casing should be tight against the formwork. Pour concrete.



**2.** Strike the formwork to reveal the cover and after striking the formwork, remove the back cover to expose the pre-bent bars.



**3.** Straighten the bars using a bar box re-bending tool. The bars should be straightened only once. To avoid damage to adjacent concrete, it is prudent to allow a concrete curing period of seven days. See 'Bar Straightening' for more information.



**4.** Once the bars are straightened and aligned they are ready for lapping.

## BAR STRAIGHTENING

The bars must be straightened using the appropriate sized Moment Bar Box re-bending tool. This is a steel tube designed to fit over the bar, the internal diameter being slightly larger than the maximum dimension of the ribs on the bar. One end of the tube has a section cut away; this provides support to the outside of the bend during straightening of the bar and limits the point contact of the tube on the bar.

Use of the tool allows the re-bending process to be carried out in a smooth continuous action (avoiding jerky action), the tube being moved along the bar and around the bend as it is straightening.

To enable the re-bending tool to be fitted onto the bar, the bar should be pulled the minimum distance from the bar box steel casing. The re-bending tool should then be slid along the bar to the start of the bend radius.

The bar straightening process should be smooth and progressive with the tube allowed to move along the bend towards the metal casing as it is straightening. The tool should contact the bar box steel casing at the completion of the straightening process.

The tube is then removed and the straightening bar checked for alignment and cover with the adjoining reinforcement.

Bar Box reinforcing bars should not be straightening when the temperature of the steel is below 5°C. Where straightening is necessary below 5°C, indirect warming of the steel to a temperature not exceeding 100°C is permitted.

Scaffold tubes or similar must not be used to straighten bar. Inappropriate tools will result in excessive kinks in the region of the bar bend and result in undesirable work hardening which may damage the bar and affect the strength. Bending the bar in excess of the recommendations will also result in work hardening of the rebar and should therefore be avoided.



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