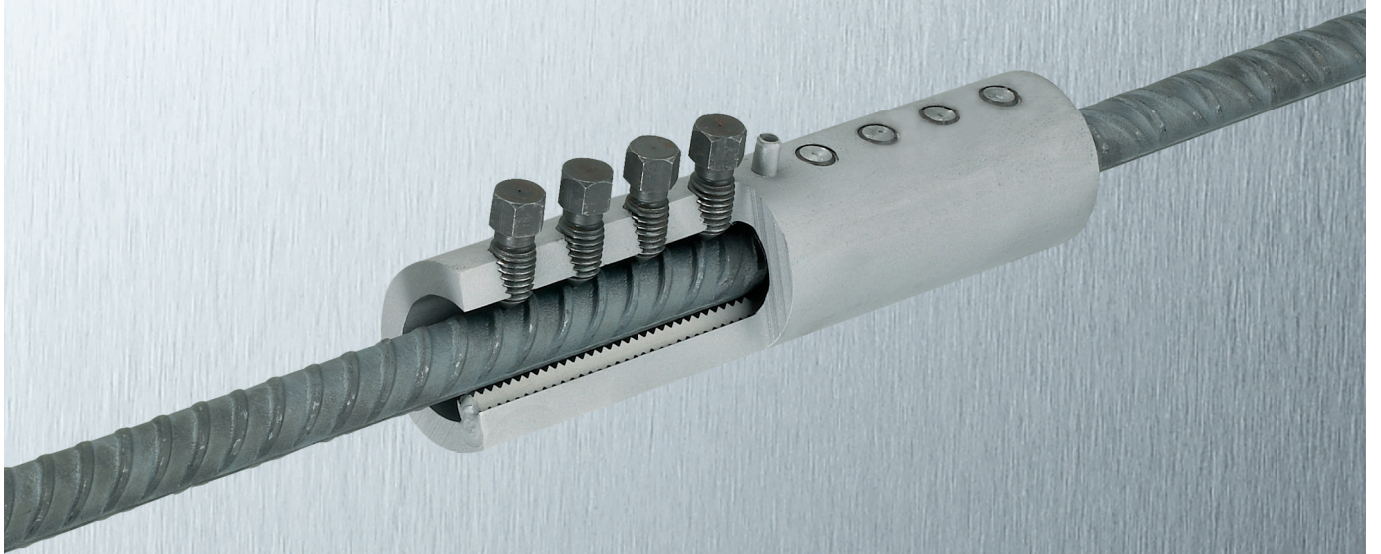


HALFEN MBT REINFORCEMENT COUPLER

TECHNICAL PRODUCT INFORMATION



MBT REINFORCEMENT COUPLER

MBT 16-E

CONCRETE

NEW!

Existing Structures:
DIBt-Approval Z-1.5-10
also valid for connections of
B500 with old reinforcement
BSt 420S



HALFEN
YOUR BEST CONNECTIONS

HALFEN MBT REINFORCEMENT COUPLER

System overview and benefits

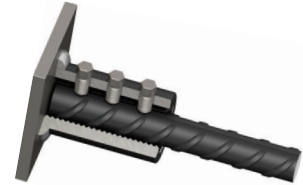
HALFEN MBT – System overview



MBT Standard coupler



MBT Transition coupler



MBT Head coupler

The benefits

- officially approved by the German Building Authority DIBt, Berlin
- also approved for non-predominant static loads
- no preparatory work needed on the rebar ends
- using shear-off screws means fast and safe installation
- efficient and cost-effective installation using standard tools and with low screw shear-off moments
- wide range of standard-, transition- and head-couplers allows planning reliability and flexibility in diverse applications
- ideal for renovation/restructuring and for building extensions projects
- numerous country-specific approvals confirm compliance with international norms for structural analysis



HALFEN MBT REINFORCEMENT COUPLER

System description

System description

The HALFEN MBT Reinforcement coupler is a mechanical connector for 10 to 40 mm diameter reinforcing-steel B500B.

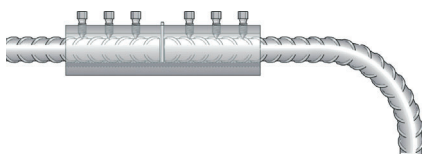
The positive transfer of tension and pressure forces from one rebar to the other is achieved via a self-regulating impacting-lock in the coupler.

No preparatory rebar work required:

- no thread cutting
- no ramming
- no crimping
- no welding

The standard reinforcement coupler is approved by the German Building Authority DIBt, Berlin number Z-1.5-10. According to the approval, same diameter rebars from 10 to 28 mm can be connected.

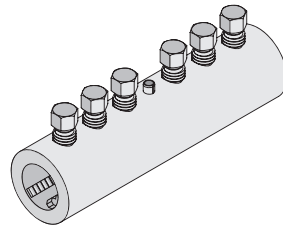
As it is not necessary to rotate the rebar during installation; making assembly easier, especially for long, bent or curved rebars.



Standard use tools are sufficient for installation. However, for efficient and easy installation, special power or electric screwdrivers can be used.

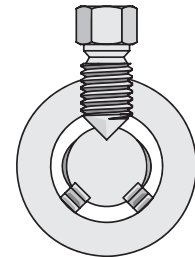
You can purchase or hire specialist tools from HALFEN.

The standard coupler consists of a seamless tube with integrated serrated runners and a set number of shear-off screws. The number of screws depends on the diameter of the rebar.

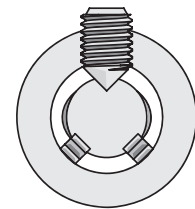


To install; slide the rebar ends into the coupler. A stop-pin is located at the middle of the coupler. Turn the screws in as far as possible. While screwing in the shear-off screws, the special hardened tip digs into the rebar, simultaneously pressing it against the serrated runners. This creates a positive connection between screw-tips and the rebar and between rebar, serrated runners and inner surface of the coupler.

The shear-off screws are turned until each shears off at the predetermined breaking point located outside the coupler.



Coupler with screwed-in shear-off screw



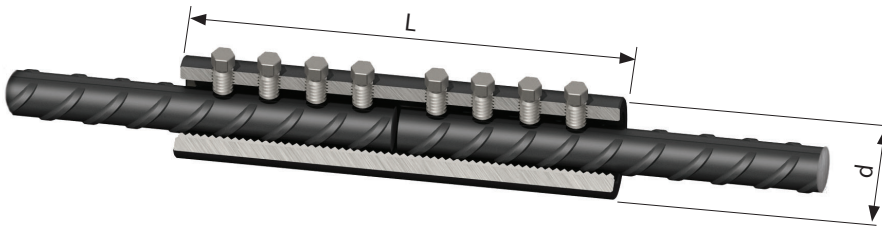
Coupler with sheared-off screw head

This exact shearing off allows an easy visual confirmation of correct installation; this saves costs and time.

HALFEN MBT REINFORCEMENT COUPLER

HALFEN MBT Standard coupler

MBT Standard coupler – type selection and dimensions



The batch number and the rebar diameter are imprinted on all standard couplers.
E.g. T12 is for a rebar diameter of 12 mm.



Dimensions of MBT Standard coupler

Identification	T10	T12	T14	T16	T18	T20	T22	T25	T26	T28	T30	T32	T36	T40
Rebar Ø [mm]	10	12	14	16	18 ①	20	22 ①	25	26 ①	28	30 ①	32 ①	36 ①	40 ①
Order no.	0710.010-00002	00003	00004	00005	00012	00006	00013	00007	00014	00008	00015	00009	00016	00010
Outer coupler Ø d [mm]	33.4	33.4	42.2	42.2	48.3	48.3	48.3	54.0	66.7	66.7	71.0	71.0	85.0	81.0
Coupler length L [mm]	100	140	160	160	204	204	248	258	312	312	312	312	484	484
Socket size [mm]	13	13	13	13	13	13	13	16	16	16	16	16	19	19
Number of screws	4	6	6	6	8	8	10	8	10	10	10	10	14	14
Weight [kg]	0.52	0.72	1.25	1.25	2.0	1.96	2.38	3.00	5.91	5.80	6.68	6.50	15.30	11.30

① Couplers for these diameters are not covered in the approval (Z-1.5-10).

Application notes for the MBT Standard coupler

General

The requirements stated in DIN EN 1992-1-1 are applicable for planning and dimensioning. All rebars of the same diameter can be connected. According to DIN EN 1992-1-1 section 4.4.1 or 8.2., the same values are required for concrete cover and lateral spacing for couplers as for un-buttet rebars.

Old reinforcement can easily be replaced when requirements demand. The process of coupling rebars between old buildings and new construction is just as simple. It is also very easy to connect in-situ, still intact, rebar to new rebar.

DIBt-Approval Z-1.5-10 is also valid for splices of new reinforcement B500 with old reinforcement type BSt420S on the edge between new and old constructions.

Predominantly static loads

With predominantly static tension and compression loads, standard couplers can be 100% stressed.

In case of connections between B500 and BSt420S the lower resistance of the old BSt420 has to be taken into account.

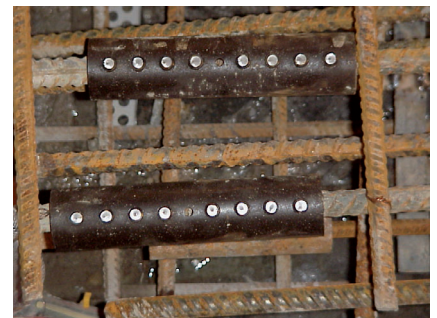
Non-predominantly static loads

When dimensioning according to DIN EN 1992-1-1, section 6.8 requires that the effects of possible fatigue is taken into account.

The parameter for fatigue-limit is a stress range of $\Delta\sigma_{Rsk} = 95 \text{ N/mm}^2$ with $N = 2 \times 10^6$ assumed load cycles. The Wöhler curve stress exponents have to be assumed as follows:

$k_1 = 3$ and $k_2 = 5$ with $N^* = 10^7$.

For existing structures splicing of B500 and BSt420S is not allowed for fatigue load.



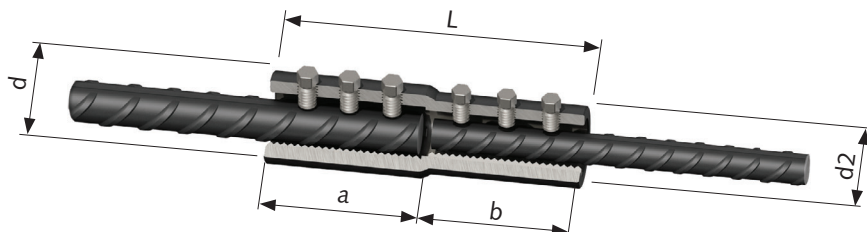
Join of a longitudinal reinforcement using standard couplers

HALFEN MBT REINFORCEMENT COUPLER

HALFEN MBT Transition coupler

MBT Transition coupler – type selection and dimensions

Using a transition coupler, rebars of different diameters can be connected.



Dimensions of MBT Transition coupler

Identification	RDZ 16/12	RDZ 16/14	RDZ 20/12	RDZ 20/16	RDZ 25/16	RDZ 25/20	RDZ 28/20	RDZ 28/22	RDZ 28/25	RDZ 32/20	RDZ 32/25	RDZ 32/28	RDZ 40/32
Rebar Ø [mm]	16/12	16/14	20/12	20/16	25/16	25/20	28/20	28/22	28/25	32/20	32/25	32/28	40/32
Order no.	0710.020-00005	00006	00007	00001	00008	00002	00003	00009	00004	00010	00011	00012	00013
Outer Ø coupler d [mm]	42.2	42.2	48.3	48.3	54.0	54.0	66.7	66.7	66.7	71.0	71.0	71.0	81.0
Outer Ø coupler d2 [mm]	26.4	42.2	33.4	48.3	42.2	54.0	48.3	41.7	54.0	48.3	54.0	66.7	71.0
Coupler length L [mm]	160	160	150	160	155	180	204	253	258	177	231	286	335
Length a-b [mm]	80-80	80-80	80-70	80-80	75-80	90-90	102-102	129-124	129-129	75-102	102-129	130-156	178-157
Socket size a-b [mm]	13-13	13-13	13-13	13-13	16-13	16-13	16-13	16-13	16-16	16-13	16-16	16-16	19-16
Number of screws a-b	3-3	3-3	3-3	3-3	2-3	3-3	3-4	4-5	4-4	2-4	3-4	4-5	5-5
Weight [kg]	1.30	1.25	1.13	1.56	1.51	2.23	2.94	3.61	3.98	2.55	3.70	5.71	7.47

Application example of MBT Transition couplers

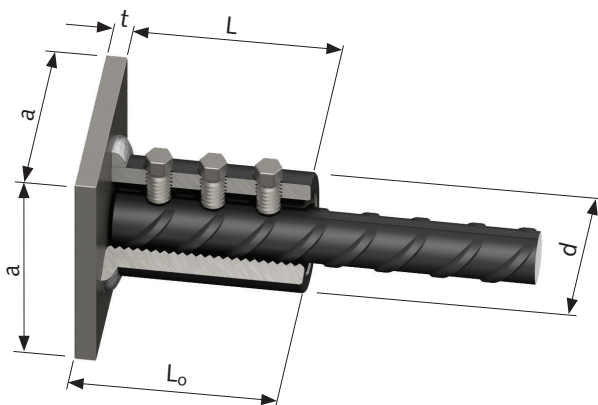


Support column with transition couplers

HALFEN MBT REINFORCEMENT COUPLER

HALFEN MBT Head coupler

MBT Head coupler – type selection and dimensions



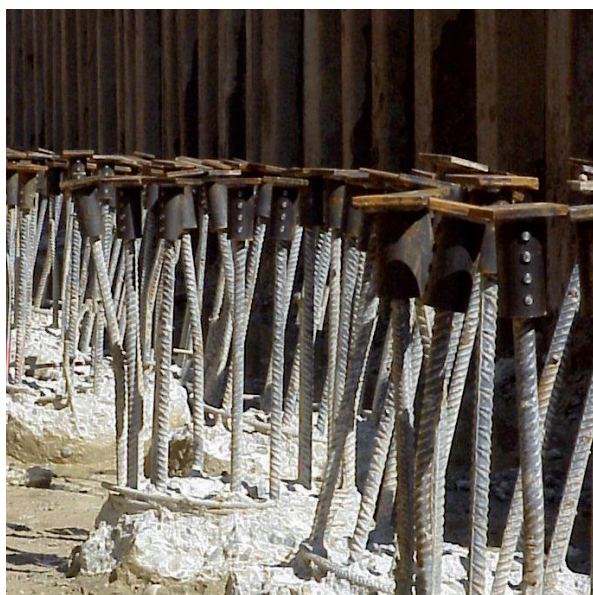
Head couplers are particularly suitable for the following fields of application:

- end zones of reinforcing steel
- end zones in pile cages
- slack rock anchors
- pressure distribution plates
- weld-on end-sockets

Dimensions of MBT Head coupler

Identification	EV 10	EV 12	EV 14	EV 16	EV 18	EV 20	EV 22	EV 25	EV 26	EV 28	EV 30	EV 32	EV 34	EV 36	EV 40
Rebar Ø [mm]	10	12	14	16	18	20	22	25	26	28	30	32	34	36	40
Order no. 0710.040-	00001	00002	00003	00004	00005	00006	00007	00008	00009	00010	00011	00012	00013	00014	00015
Outer coupler Ø d [mm]	33.4	33.4	42.2	42.2	48.3	48.3	48.3	54.0	66.7	66.7	71.0	71.0	75.0	85.0	81.0
Coupler length L [mm]	55	75	82	82	104	104	126	129	156	156	156	156	215	247	247
Total length L ₀ [mm]	65	85	92	92	114	114	136	139	168	168	171	171	230	262	262
Plate thickness t [mm]	10	10	10	10	10	10	10	10	12	12	15	15	15	15	15
Plate a x a [mm]	70	70	70	80	90	90	90	100	110	110	130	130	130	150	150
Socket size [mm]	13	13	13	13	13	13	13	16	16	16	16	16	19	19	19
Number of screws	2	3	3	3	4	4	5	4	5	5	5	5	6	7	7
Weight [kg]	0.64	0.74	1.01	1.07	1.58	1.58	1.72	2.29	3.81	4.14	5.08	4.72	5.17	9.13	8.30

Application examples of MBT Head couplers



End zones in multiple piles



End zone detail in one pile

HALFEN MBT REINFORCEMENT COUPLER

Corrosion protection and installation

Corrosion protection

If the couplers are installed in building component exposed to more extreme environmental conditions than those stated in DIN EN 1992-1-1, exposition classes X0 or XC1, i.e. the environment is not permanently dry, then fill the coupler with an appropriate corrosion protection agent e.g. Denso-Fill paste.

Article name	Order no.
Denso-Fill paste 250 g cartridge	0711.010-00001
Denso-Fill paste 20 kg container	0711.010-00002

The coupler has to be filled with the paste on-site prior to installation. The rebar has to be inserted into the coupler so that the paste seeps out of the coupler. Excess paste has to be wiped off and the filled gap between coupler and rebar smoothed off. The manufacturer's product information and application note have to be observed.

Following quantity of the corrosion protection paste is needed for filling the inside of standard couplers:

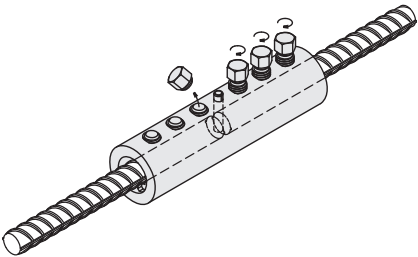
Reinforcement coupler	Rebar Ø [mm]	Net weight [g]
MBT T10	10	approx. 25
MBT T12	12	approx. 30
MBT T14	14	approx. 55
MBT T16	16	approx. 55
MBT T20	20	approx. 80
MBT T25	25	approx. 120
MBT T28	28	approx. 205
MBT T32	32	approx. 220
MBT T40	40	approx. 250

Installation

The HALFEN MBT Reinforcement coupler is a mechanical coupler for connecting reinforcing-steel B500B.

The threads in the drill hole and the shear-off screws have to be clean and free of rust.

During installation, the coupler is slid on the free end of the rebar. A pin marks the middle of the coupler and provides a stop.



If the pin is missing, mark half the of the coupler length on the rebar and slide the coupler on the rebar up to said mark.

The shear-off screws can be sheared off manually. For this purpose we recommend using a MBT power screwdriver

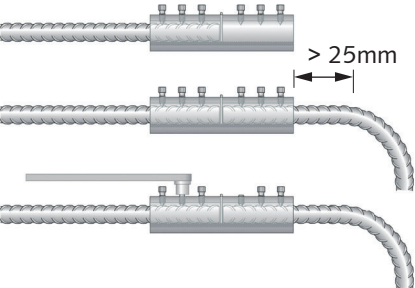
with a 1" ratchet and socket: Appropriate sockets can be purchased from HALFEN. No torque wrench is necessary.

We recommend using a special electric screwdriver for a larger number of couplers.

Using impact tools or extension for the ratchet is not permitted.

Once all shear-off screws are sheared off as planned, the reinforcement coupler is correctly installed.

No bends or curves are permitted in the rebar less than 25 mm distance from the coupler.



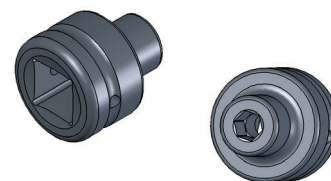
HALFEN MBT REINFORCEMENT COUPLER

Installation tools



Selecting an appropriate tool

We recommend using an electric screwdriver for maximum efficiency when shearing off the screws. Up to a rebar diameter of 22 mm, the screws of the corresponding coupler can be sheared off using a manual 1" ratchet.

A power screwdriver is the ideal tool to manually tighten MBT Couplers for rebar diameter of 25 to 40 mm. All tools and appropriate sockets can be purchased or hired from HALFEN.



MBT Special socket

Tool selection				Number of couplers							
Coupler	Number of shear-off screws	Socket size	Torque [Nm]	5	10	15	20				
				 <p>Ratchet</p>				 <p>Electric screwdriver</p>			
MBT T10	4	13 (1/2")	55								
MBT T12	6	13 (1/2")	55								
MBT T14	6	13 (1/2")	108								
MBT T16	6	13 (1/2")	108								
MBT T18	8	13 (1/2")	108								
MBT T20	8	13 (1/2")	108								
MBT T22	10	13 (1/2")	108								
MBT T25	8	16 (5/8")	275								
MBT T26	10	16 (5/8")	275								
MBT T28	10	16 (5/8")	275								
MBT T30	10	16 (5/8")	360								
MBT T32	10	16 (5/8")	360								
MBT T36	14	19 (3/4")	600								
MBT T40	14	19 (3/4")	525								
				 <p>Power screwdriver</p>							

Manual installation with a ratchet

For a small number of screws, a ratchet can be used for shearing off the screw heads. For installing MBT Couplers with a rebar diameter of 25 to 32 mm a ratchet is sufficient. Ratchet extensions are not permitted. We recommend a power screwdriver or an electric screwdriver for these sizes to ensure even pressure over all screws.



Article name		Order no.
MBT Ratchet 1", 600 mm long		0711.020-00008

Rebar Ø [mm]	Article name	Order no.
10 to 22	MBT Socket 1" square to 1/2" hexagon, size 10 up to 22	0711.020-00002

HALFEN MBT REINFORCEMENT COUPLER

Installation tools

Manual installation with a power screwdriver

For maximum efficiency, it is recommended to use a power screwdriver to shear off a moderate number of size 25 to 40 mm rebar diameter. A complete tool kit contains the appropriate sockets and a special brace. The power screwdriver is operated manually - no electric power connection is required. Because of the integrated gear high torques are possible with only little physical effort.



Rebar Ø [mm]	Article name	Order no. (rental device)
25 to 40	MBT Power screwdriver tool kit, rental device, MBT 25-40	0711.025-00002

Installation with an electric screwdriver

For a high number of screws or a large MBT Coupler diameter, using one of the MBT Electric screwdrivers is recommended. The side-brace on the screwdrivers ensures a correct smooth torque transmission to the screw-head. Using a MBT Electric screwdriver, the installation process is efficient and safe. The tool kit includes the required sockets for installing MBT Couplers. If requested, it is also possible to purchase an electric screwdriver from HALFEN.

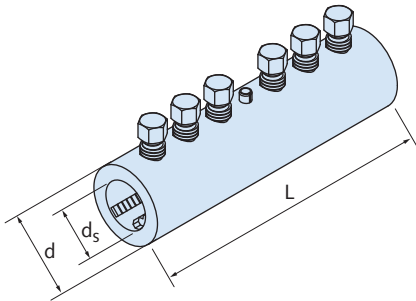


Rebar Ø [mm]	Article name	Order no. (rental device)
10 to 40	MBT Electric screwdriver tool kit type Baier BSA 720 or Lösomat including sockets	0711.025-00001

HALFEN MBT REINFORCEMENT COUPLER

Tender specifications for MBT

Pos. 001 – HALFEN Reinforcement coupler type MBT T (Standard coupler)



HALFEN Reinforcement coupler type MBT T 12, standard coupler for connection of reinforcing steel diameter $d_s = 12$ mm.

Officially approved by the German Building Authority DIBt, Berlin, approval no. Z-1.5-10 for use under predominantly static loads and non-predominantly static loads,

type MBT T 12

with T = standard coupler,

with coupler length $L = 140$ mm,

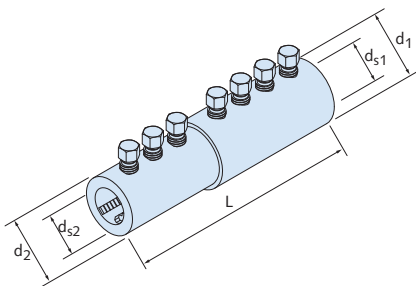
outer coupler diameter $d = 33.4$ mm and 2×3 shear off screws,

12 = B500B reinforcing steel diameter d_s [mm]

or equivalent, deliver and install according to the General Certificate of Approval and the manufacturer's instructions.

Observe the manufacturer's instructions on using appropriate tools to shear off the screws.

Pos. 002 – HALFEN Reinforcement coupler type MBT RDZ 16/14 (Transition coupler)



HALFEN Reinforcement coupler type MBT RDZ 16/14, transition coupler for connection of reinforcing steel with different diameters $d_{s1}/d_{s2} = 16/14$ [mm].

type MBT RDZ 16/14

with RDZ = transition coupler,

with coupler length $L = 160$ mm,

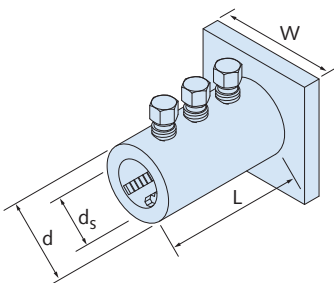
outer coupler diameter $d_1/d_2 = 42.2/42.2$ [mm] and $3 + 3$ shear off screws,

16/14 = B500B reinforcing steel diameter d_{s1}/d_{s2} [mm]

or similar, deliver and install according to the manufacturer's instructions.

Observe the manufacturer's instructions on using appropriate tools to shear off the screws.

Pos. 003 – HALFEN Reinforcement coupler type MBT EV 25 (Head coupler)



HALFEN Reinforcement coupler type MBT EV 25, head coupler for reinforcing steel diameter $d_s = 25$ mm.

type MBT EV 25

with EV = head coupler,

with coupler length $L = 129$ mm,

outer coupler diameter $d = 54.0$ mm,

4 shear-off screws and anchor plate $100 \times 100 \times 10$ [mm],

25 = B500B reinforcing steel diameter d_s [mm]

or similar, deliver and install according to the manufacturer's instructions.

Observe the manufacturer's instructions on using appropriate tools to shear off the screws.

Further tender specifications can be downloaded from our homepage
www.halfen.com

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