

5.0 TTM AND TTM-F ANCHORAGES



7TTM anchorage



7TTM-F anchorage



The **TTM** anchorage is made of an anchor plate, it is equipped with wedges and an under plate for load transferring. In the permanent version the anchorage is equipped with a protection cap. The anchorage can no longer be tensioned over time after wire strands are cut.

The **TTM-F** anchorage is made of an anchor plate, which is threaded on the outside, it is equipped with wedges and an under plate for load transferring. In the permanent version the anchorage is equipped with a protection cap. The anchorage can be retensioned over time by connecting the jack to the outside thread on the anchoring block and shimming the residual thickness.

Wedges are supplied in airtight polyethylene cans, provided with an identification tag indicating: lot, type and material. The wedges are part of a device qualified according to the guidelines ETAG013 **B.T.E. ETA-09-0013**



Permanent TTM anchorage



Permanent TTM-F anchorage

TTM permanent non-retensionable anchorage, equipped with a cap and a sealing gasket. The distribution plate is supplied to suit the surface, with protective coating and holes for the cap. Permanent ground anchors are defined as those which must guarantee a design life of more than two years.

TTM permanent non-retensionable anchorage, equipped with a cap and a sealing gasket. The distribution plate is supplied to suit the surface, with protective coating and holes for the cap. Permanent ground anchors are defined as those which must guarantee a design life of more than two years.



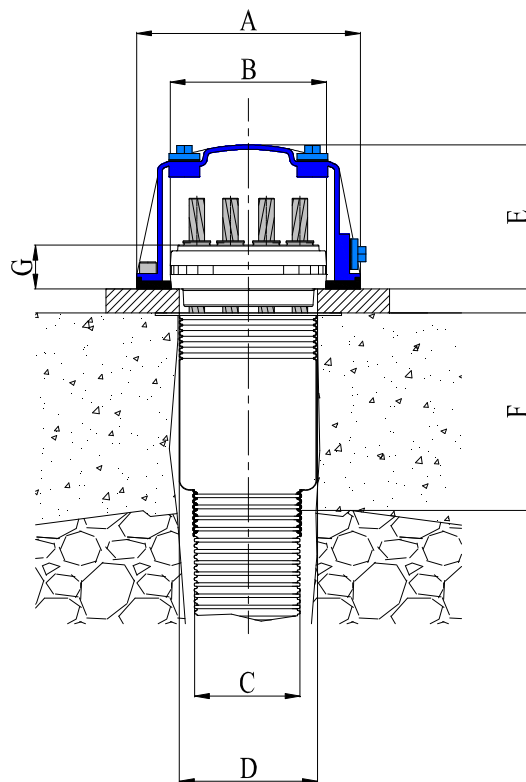
The TTM (temporary) anchorage is equipped with a cap and its gasket

The **TTM** (temporary) anchorage is equipped with a cap and its gasket.

5.1 TTM anchorages



TTM anchorage for permanent ground anchors which can no longer be tensioned after wire strands are cut. The plate is provided with a cap with a gasket and can be injected with grease/cement to protect the anchorage over time. The distribution plate is supplied coated and with holes to connect the cap.



<i>Anchorage type</i>	<i>A</i> (mm)	<i>B</i> (mm)	<i>C</i> (mm)	<i>D</i> (mm)	<i>E</i> (mm)	<i>F</i> (mm)	<i>G</i> (mm)
4TTM	150	105	110	83	145	85	45
7TTM	180	125	110	102	145	85	45
9TTM	230	146	110	123	145	335	45
12TTM	230	160	110	140	145	510	45
15TTM	260	176	110	150	145	510	45

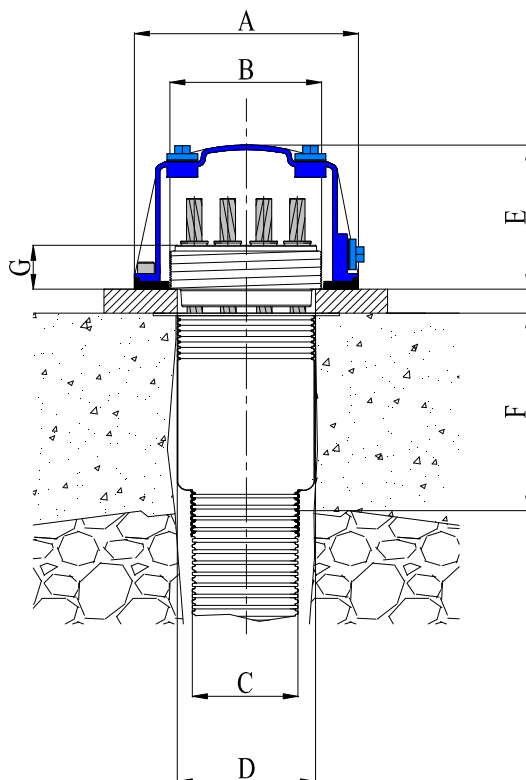
Subject to change

Further data available on request

5.2 TTM-F anchorages



TTM-F anchorage for permanent ground anchors which can tensioned after wire strands are cut. The plate is provided with a thread to allow its connection and retensioning. It is provided with a cap with a gasket and can be injected with grease/cement to protect the anchorage and the thread over time. The distribution plate is supplied coated and with holes to connect the cap.



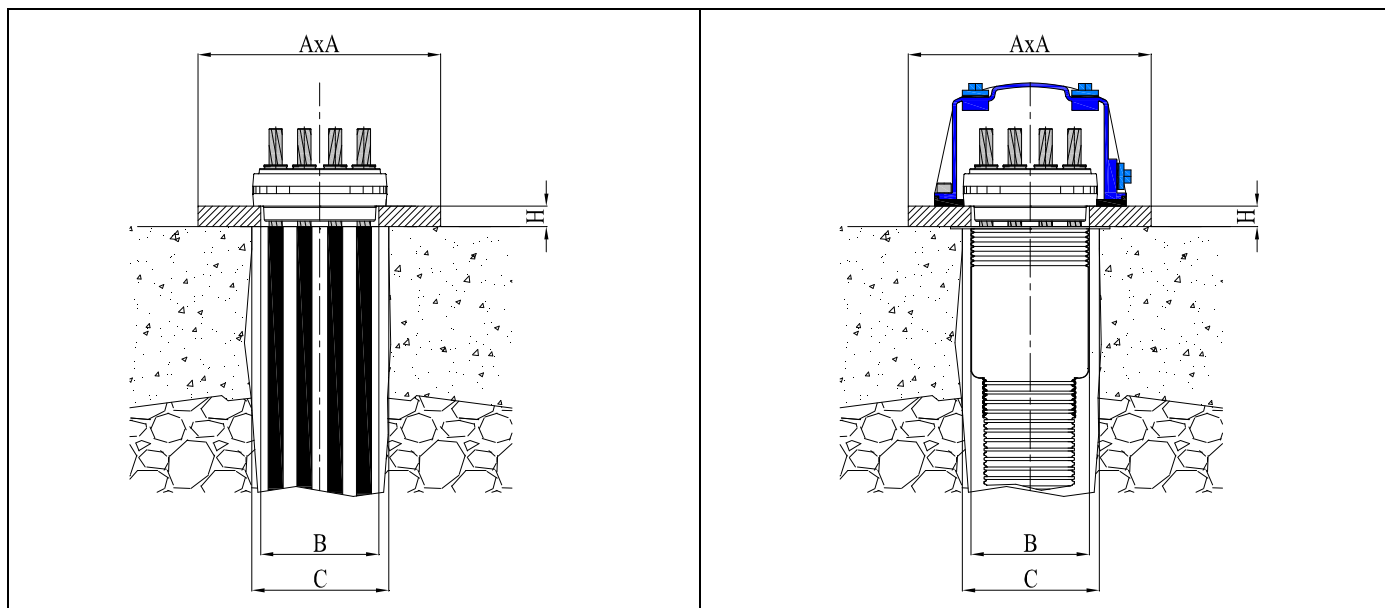
<i>Anchorage type</i>	<i>A (mm)</i>	<i>B (mm)</i>	<i>C (mm)</i>	<i>D (mm)</i>	<i>E (mm)</i>	<i>F (mm)</i>	<i>G (mm)</i>
<i>4TTM-F</i>	150	103	110	83	145	85	45
<i>7TTM-F</i>	180	123	110	102	145	85	45
<i>9TTM-F</i>	230	143	110	123	145	335	45
<i>12TTM-F</i>	230	158	110	140	145	510	45
<i>15TTM-F</i>	260	173	110	150	145	510	45

Subject to change

Further data available on request

5.3 Distribution plate for TTM-F and TTM anchorages

The plates are made of CE sheets in S275JR EN 10025 or S355JR EN 10025, which are protected for PE (permanent) applications by means of a powder polyester protective coating. For applications on temporary ground anchors the coating is only provided upon Client's request.



A: Dimensions for a square plate (AxA) (mm)

B: Hole in the oxy-fuel cut plate (mm)

C: Drilling diameter (mm)

H: Plate thickness (mm)

The dimensions in red are recommended as a first choice. The application of the distribution plates requires a properly plane surface to guarantee a perfect load transfer without punctiform transfers of the plate to the structure, or a resin layer is to be inserted between the plate and the structure to compensate for any imperfection and seal the two parts.

Dimensions of the distribution plates

Application with T15 wire strand

Section 139 mm² diam. 15.2 mm F_{PTK} 1,860 MPa

Distribution plate for 4TTM15 anchorage (max. working load 63,628 kg) A x A x H mm

Diam. C (mm)	Diam. B (mm)	RcK 20 MPa AxA	RcK 25 MPa AxA	RcK 30 MPa AxA	RcK 35 MPa AxA	RcK 40 MPa AxA	RcK 45 MPa AxA	S275JR H (mm)	S355JR H (mm)
90 mm	83.00	210	190	180	170	160	150	20.00	15.00
100 mm	83.00	220	190	180	170	170	160	25.00	20.00
120 mm	83.00	230	200	190	180	180	170	35.00	30.00
150 mm	83.00	240	220	210	200	190	190	40.00	35.00
180 mm	83.00	260	240	230	220	210	210	45.00	40.00
200 mm	83.00	280	250	240	230	230	220	45.00	40.00
220 mm	83.00	290	260	250	250	240	240	45.00	40.00
250 mm	83.00	310	280	280	270	270	260	50.00	45.00

Further data available on request

Distribution plate for 7TTM15 anchorage (max. working load 111,349 kg) A x A x H mm

Diam. C (mm)	Diam. B (mm)	RcK 20 MPa AxA	RcK 25 MPa AxA	RcK 30 MPa AxA	RcK 35 MPa AxA	RcK 40 MPa AxA	RcK 45 MPa AxA	S275JR H (mm)	S355JR H (mm)
105 mm	102.00	280	240	220	210	200	190	15.00	15.00
110 mm	102.00	280	240	230	210	200	200	20.00	20.00
125 mm	102.00	290	250	230	220	210	200	35.00	30.00
150 mm	102.00	300	260	250	230	220	220	45.00	40.00
180 mm	102.00	310	280	260	250	240	240	50.00	45.00
200 mm	102.00	320	290	270	260	250	250	55.00	50.00
220 mm	102.00	340	300	290	280	270	260	55.00	50.00

Distribution plate for **9TTM15** anchorage (max. working load 143,163 kg) $A \times A \times H$ mm

Diam. C (mm)	Diam. B (mm)	ReK 20 MPa AxA	ReK 25 MPa AxA	ReK 30 MPa AxA	ReK 35 MPa AxA	ReK 40 MPa AxA	ReK 45 MPa AxA	S275JR H (mm)	S355JR H (mm)
130 mm	123.00	320	280	260	240	230	220	20.00	20.00
140 mm	123.00	320	280	260	250	240	230	30.00	25.00
150 mm	123.00	330	280	270	250	240	230	35.00	30.00
180 mm	123.00	340	300	280	270	260	250	45.00	40.00
200 mm	123.00	350	310	290	280	270	260	50.00	45.00
220 mm	123.00	360	320	300	290	280	280	55.00	50.00
250 mm	123.00	380	340	320	310	300	300	60.00	55.00
280 mm	123.00	400	360	340	330	320	320	65.00	55.00

Further data available on request

Distribution plate for **12TTM15** anchorage (max. working load 190,884 kg) $A \times A \times H$ mm

Diam. C (mm)	Diam. B (mm)	ReK 20 MPa AxA	ReK 25 MPa AxA	ReK 30 MPa AxA	ReK 35 MPa AxA	ReK 40 MPa AxA	ReK 45 MPa AxA	S275JR H (mm)	S355JR H (mm)
150 mm	140.00	370	320	300	280	270	260	25.00	20.00
180 mm	140.00	380	330	310	290	280	270	40.00	35.00
200 mm	140.00	390	340	320	300	290	280	45.00	40.00
220 mm	140.00	400	350	330	320	300	290	50.00	45.00
250 mm	140.00	420	370	350	330	320	310	55.00	50.00
280 mm	140.00	440	380	360	350	340	330	60.00	55.00

Further data available on request.

Distribution plate for **15TTM15** anchorage (max. working load 281,737 kg) $A \times A \times H$ mm

Diam. C (mm)	Diam. B (mm)	ReK 20 MPa AxA	ReK 25 MPa AxA	ReK 30 MPa AxA	ReK 35 MPa AxA	ReK 40 MPa AxA	ReK 45 MPa AxA	S275JR H (mm)	S355JR H (mm)
160 mm	150.00	370	320	300	280	270	260	30.00	20.00
180 mm	150.00	380	330	310	290	280	270	45.00	30.00
200 mm	150.00	390	340	320	300	290	280	50.00	40.00
220 mm	150.00	400	350	330	320	300	290	55.00	45.00
250 mm	150.00	420	370	350	330	320	310	60.00	50.00
280 mm	150.00	440	380	360	350	340	330	65.00	50.00

Further data available on request.

Application with T15S wire strand
Section 150 mm² diam. 15,7 mm F_{PK} 1,860 MPa

Distribution plate for **4TTM15** anchorage (max. working load 68,277 kg) $A \times A \times H$ mm

Diam. C (mm)	Diam. B (mm)	ReK 20 MPa AxA	ReK 25 MPa AxA	ReK 30 MPa AxA	ReK 35 MPa AxA	ReK 40 MPa AxA	ReK 45 MPa AxA	S275JR H (mm)	S355JR H (mm)
90 mm	83.00	210	190	180	170	160	150	20.00	15.00
100 mm	83.00	220	190	180	170	170	160	25.00	20.00
120 mm	83.00	230	200	190	180	180	170	35.00	30.00
150 mm	83.00	240	220	210	200	190	190	40.00	35.00
180 mm	83.00	260	240	230	220	210	210	45.00	40.00
200 mm	83.00	280	250	240	230	230	220	45.00	40.00
220 mm	83.00	290	260	250	250	240	240	45.00	40.00
250 mm	83.00	310	280	280	270	270	260	50.00	45.00

Further data available on request

Distribution plate for **7TTM15** anchorage (max. working load 119,486 kg) $A \times A \times H$ mm

Diam. C (mm)	Diam. B (mm)	ReK 20 MPa AxA	ReK 25 MPa AxA	ReK 30 MPa AxA	ReK 35 MPa AxA	ReK 40 MPa AxA	ReK 45 MPa AxA	S275JR H (mm)	S355JR H (mm)
105 mm	102.00	280	240	220	210	200	190	20.00	15.00
110 mm	102.00	280	240	230	210	200	200	25.00	20.00
125 mm	102.00	290	250	230	220	210	200	35.00	30.00
150 mm	102.00	300	260	250	230	220	220	45.00	40.00
180 mm	102.00	310	280	260	250	240	240	50.00	45.00
200 mm	102.00	320	290	270	260	250	250	55.00	50.00
220 mm	102.00	340	300	290	280	270	260	55.00	50.00

Distribution plate for **9TTM15** anchorage (max. working load 153,624 kg) A x A x H mm

Diam. C	Diam. B	RcK 20 MPa	RcK 25 MPa	RcK 30 MPa	RcK 35 MPa	RcK 40 MPa	RcK 45 MPa	S275JR H	S355JR H
(mm)	(mm)	AxA	AxA	AxA	AxA	AxA	AxA	(mm)	(mm)
130 mm	123.00	320	280	260	240	230	220	25.00	20.00
140 mm	123.00	320	280	260	250	240	230	30.00	25.00
150 mm	123.00	330	280	270	250	240	230	35.00	30.00
180 mm	123.00	340	300	280	270	260	250	45.00	40.00
200 mm	123.00	350	310	290	280	270	260	50.00	45.00
220 mm	123.00	360	320	300	290	280	280	55.00	50.00
250 mm	123.00	380	340	320	310	300	300	55.00	50.00
280 mm	123.00	400	360	340	330	320	320	60.00	55.00

Further data available on request

Distribution plate for **12TTM15** anchorage (max. working load 204,833 kg) A x A x H mm

Diam. C	Diam. B	RcK 20 MPa	RcK 25 MPa	RcK 30 MPa	RcK 35 MPa	RcK 40 MPa	RcK 45 MPa	S275JR H	S355JR H
(mm)	(mm)	AxA	AxA	AxA	AxA	AxA	AxA	(mm)	(mm)
160 mm	140.00	370	320	300	280	270	260	25.00	20.00
180 mm	140.00	380	330	310	290	280	270	40.00	35.00
200 mm	140.00	390	340	320	300	290	280	45.00	40.00
220 mm	140.00	400	350	330	320	300	290	50.00	45.00
250 mm	140.00	420	370	350	330	320	310	55.00	50.00
280 mm	140.00	440	380	360	350	340	330	60.00	55.00

Further data available on request.

Distribution plate for **15TTM15** anchorage (max. working load 256,041 kg) A x A x H mm

Diam. C	Diam. B	RcK 20 MPa	RcK 25 MPa	RcK 30 MPa	RcK 35 MPa	RcK 40 MPa	RcK 45 MPa	S275JR H	S355JR H
(mm)	(mm)	AxA	AxA	AxA	AxA	AxA	AxA	(mm)	(mm)
180 mm	150.00	380	330	310	290	280	270	35.00	30.00
200 mm	150.00	390	340	320	300	290	280	40.00	35.00
220 mm	150.00	400	350	330	320	300	290	45.00	40.00
250 mm	150.00	420	370	350	330	320	310	50.00	45.00
280 mm	150.00	440	380	360	350	340	330	55.00	50.00

Further data available on request.

Application with T15C wire strand
Section 165 mm² diam. 15.2 mm F_{PTK} 1,860 MPa

Distribution plate for **4TTM15** anchorage (max. working load 75,130 kg) A x A x H mm

Diam. C	Diam. B	RcK 20 MPa	RcK 25 MPa	RcK 30 MPa	RcK 35 MPa	RcK 40 MPa	RcK 45 MPa	S275JR H	S355JR H
(mm)	(mm)	AxA	AxA	AxA	AxA	AxA	AxA	(mm)	(mm)
90 mm	83.00	210	190	180	170	160	150	20.00	15.00
100 mm	83.00	220	190	180	170	170	160	25.00	20.00
120 mm	83.00	230	200	190	180	180	170	30.00	25.00
150 mm	83.00	240	220	210	200	190	190	40.00	35.00
180 mm	83.00	260	240	230	220	210	210	40.00	35.00
200 mm	83.00	280	250	240	230	230	220	45.00	40.00
220 mm	83.00	290	260	250	250	240	240	45.00	40.00
250 mm	83.00	310	280	280	270	270	260	50.00	45.00

Further data available on request

Distribution plate for **7TTM15** anchorage (max. working load 131,477 kg) A x A x H mm

Diam. C	Diam. B	RcK 20 MPa	RcK 25 MPa	RcK 30 MPa	RcK 35 MPa	RcK 40 MPa	RcK 45 MPa	S275JR H	S355JR H
(mm)	(mm)	AxA	AxA	AxA	AxA	AxA	AxA	(mm)	(mm)
105 mm	102.00	280	240	220	210	200	190	20.00	15.00
110 mm	102.00	280	240	230	210	200	200	25.00	20.00
125 mm	102.00	290	250	230	220	210	200	35.00	30.00
150 mm	102.00	300	260	250	230	220	220	45.00	40.00
180 mm	102.00	310	280	260	250	240	240	50.00	45.00
200 mm	102.00	320	290	270	260	250	250	55.00	50.00
220 mm	102.00	340	300	290	280	270	260	55.00	50.00

Further data available on request

Distribution plate for **9TTM15** anchorage (max. working load 169,043 kg) A x A x H mm

Diam. C	Diam. B	RcK 20 MPa	RcK 25 MPa	RcK 30 MPa	RcK 35 MPa	RcK 40 MPa	RcK 45 MPa	S275JR H	S355JR H
(mm)	(mm)	AxA	AxA	AxA	AxA	AxA	AxA	(mm)	(mm)
130 mm	123.00	320	280	260	240	230	220	25.00	20.00
140 mm	123.00	320	280	260	250	240	230	35.00	30.00
150 mm	123.00	330	280	270	250	240	230	35.00	30.00
180 mm	123.00	340	300	280	270	260	250	45.00	40.00
200 mm	123.00	350	310	290	280	270	260	55.00	50.00
220 mm	123.00	360	320	300	290	280	280	55.00	50.00
250 mm	123.00	380	340	320	310	300	300	60.00	55.00
280 mm	123.00	400	360	340	330	320	320	65.00	55.00

Further data available on request

Distribution plate for **12TTM15** anchorage (max. working load 225,390 kg) A x A x H mm

Diam. C	Diam. B	RcK 20 MPa	RcK 25 MPa	RcK 30 MPa	RcK 35 MPa	RcK 40 MPa	RcK 45 MPa	S275JR H	S355JR H
(mm)	(mm)	AxA	AxA	AxA	AxA	AxA	AxA	(mm)	(mm)
150 mm	140.00	370	320	300	280	270	260	30.00	20.00
180 mm	140.00	380	330	310	290	280	270	45.00	35.00
200 mm	140.00	390	340	320	300	290	280	45.00	40.00
220 mm	140.00	400	350	330	320	300	290	50.00	45.00
250 mm	140.00	420	370	350	330	320	310	55.00	50.00
280 mm	140.00	440	380	360	350	340	330	60.00	55.00

Further data available on request.

Distribution plate for **15TTM15** anchorage (max. working load 281,737 kg) A x A x H mm

Diam. C	Diam. B	RcK 20 MPa	RcK 25 MPa	RcK 30 MPa	RcK 35 MPa	RcK 40 MPa	RcK 45 MPa	S275JR H	S355JR H
(mm)	(mm)	AxA	AxA	AxA	AxA	AxA	AxA	(mm)	(mm)
180 mm	150.00	380	330	310	290	280	270	45.00	30.00
200 mm	150.00	390	340	320	300	290	280	50.00	35.00
220 mm	150.00	400	350	330	320	300	290	55.00	40.00
250 mm	150.00	420	370	350	330	320	310	60.00	50.00
280 mm	150.00	440	380	360	350	340	330	65.00	50.00

Further data available on request.

The dimensions in red are recommended as a first choice. The application of the distribution plates requires a properly plane surface to guarantee a perfect load transfer without punctiform transfers of the plate to the structure, or a resin layer is to be inserted between the plate and the structure to compensate for any imperfection and seal the two parts.