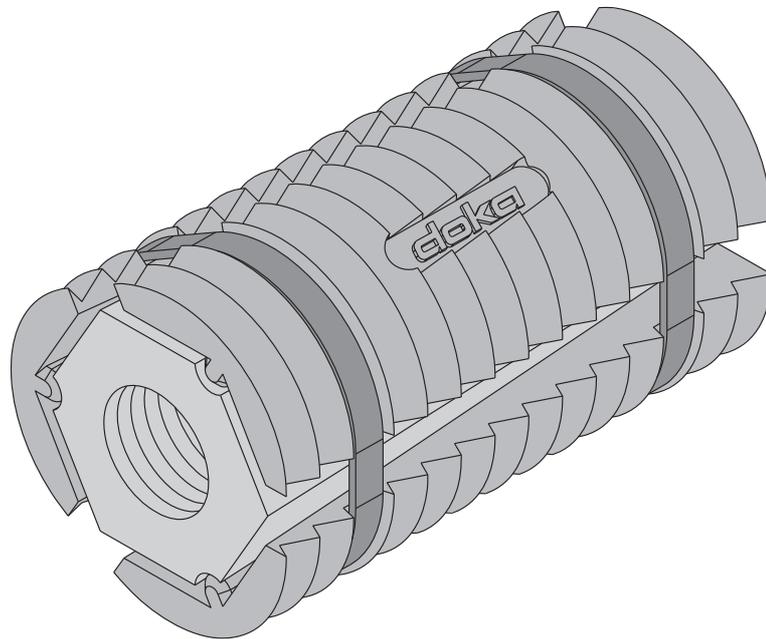


The Formwork Experts.

Rock anchor spreader unit 15.0

Art. n° 581120000

Fitting instructions



Product description

The Rock-anchor spreader unit 15.0 is used to make single-sided formwork anchoring points in concrete.



- ▶ It is strictly forbidden to use the spreader unit more than once, and to take the load off the anchoring points during use and then re-apply a load! (Except where using a "Suspension cone 15.0 with collar", and during the acceptance test.)
- ▶ When planning the anchoring point, remember that it is only permissible to subject it to tensile forces.
- ▶ The maximum period for which an anchoring point may in use is 6 months.



If using the Rock anchor spreader unit 15.0 in concrete in Germany, **Approval n° Z-21.6-1850** must also be observed.

Items needed

Note:

Only use approved tie-rods!

After work is completed, the tie-rod can be re-used, while the "Rock anchor spreader unit" remains in the drilled hole.

To make an anchoring point, the following items are needed:

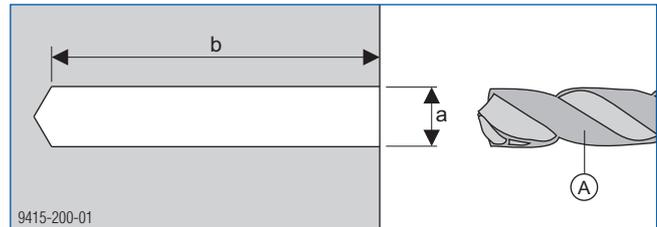
Item	Item name	Art. n°
(A)	Rock drill-bit 37x250mm Suitable for HILTI hammer drills with TE-Y, TE-F and SDS-MAX connection-ends.	581124000
(B)	Tie rod 15.0 (length as required)	
(C)	Rock-anchor spreader unit 15.0	581120000
(D)	Rock anchor installation tube	581123000
(E)	Spanner for tie-rod 15.0/20.0	580594000
(F)	Tensioning instrument 300kN	581815000
(G)	Super-plate 15.0	581966000

Drilling the hole



▶ **It is not permitted to use diamond tipped hollow core-drills (trepanning cutter).**

These cut through reinforcement steel in the concrete, leaving behind a smooth steel surface which causes slippage and deformation of the spreader segments. This prevents the rock-anchor from functioning as it should.



a ... Nominal diameter 37 mm

b ... Depth of drilled hole min. 210 mm

A Rock drill-bit diam. 37 mm

(if only a diam. 38 mm rock drill-bit is available, this is also possible)



▶ Check the diameter **a** of the drilled hole.

▶ Be sure to leave at least the minimum gap between the drilled hole and the edge of the structure, and between one drilled hole and the next (rupture cone).

▶ The depth of the hole **b** will depend upon the characteristics of the rock or concrete ($b_{min.} = 210$ mm). To determine the actual load-bearing capacity of the join (depth of hole), loading tests are necessary.

▶ Carefully clean the drilled hole, and blow out all the drill cuttings.

Installation



NOTICE

Make sure that you fit the Rock anchor spreader in the correct mounting position, as shown here.

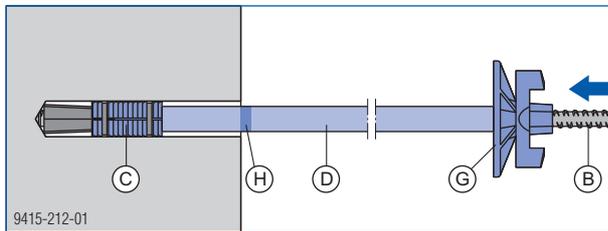
Variant 1

- 1) Screw the tie rod (length e.g. 750 mm) flush into the spreader cone of the Rock anchor spreader unit.
- 2) Push the Rock anchor installation tube over the tie rod and fix it with a Super plate.



Make a chalk mark on the Rock anchor installation tube to give you an easy-to-see check of the placement depth.

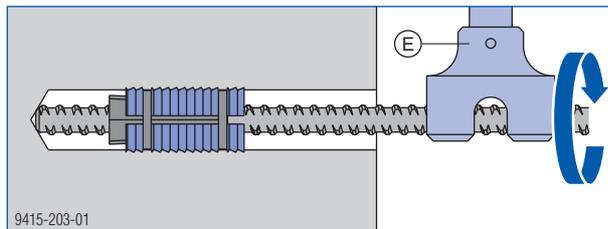
- 3) Push the assembled anchoring point all the way into the cleaned drilled hole, i.e. until it reaches the bottom of the hole.



- B** Tie rod 15.0
- C** Rock anchor spreader unit 15.0
- D** Rock anchor installation tube
- G** Super plate 15.0
- H** Depth mark made with e.g. chalk

- 4) Firmly tighten the Super plate. This forces the segments to spread so that they bite into the walls of the drilled hole.
- 5) Remove the Super plate and the Rock anchor installation tube.
- 6) Turn the tie rod with the tie-rod wrench - the spreader segments now press hard into the walls of the drilled hole.

Required tightening torque:
approx. 400 Nm (40 kgm)



- E** Tie-rod wrench 15.0/20.0



This job can be made easier by attaching a tube-extension to the tie-rod wrench, e.g. 40 kg for a 1.00 m long extension.

- 7) Alternatively, instead of using the tie-rod wrench you can also pre-tension the anchoring point with the tensioning instrument (see the section headed "Carrying out the acceptance test").

Required load on tie rod: min. 60 kN

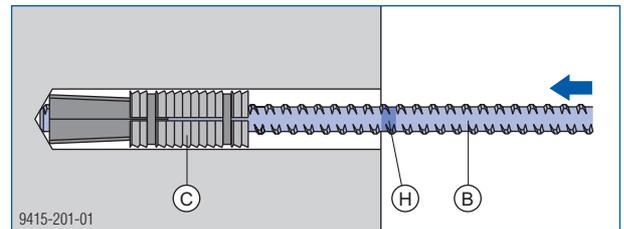
Variant 2

- 1) Screw the tie-rod (length e.g. 750 mm) flush into the spreader cone of the Rock anchor spreader unit.



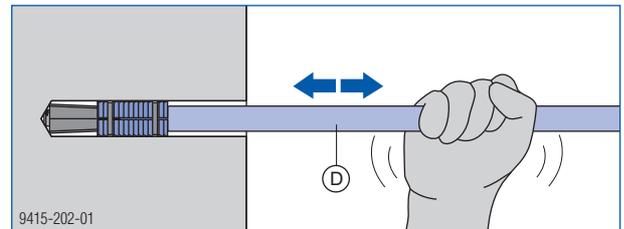
Make a chalk mark on the tie-rod to give you an easy-to-see check of the placement depth.

- 2) Push the assembled anchoring point all the way into the cleaned drilled hole, i.e. until it reaches the bottom of the hole.



- B** Tie-rod 15.0
- C** Rock-anchor spreader unit 15.0
- H** Depth mark made with e.g. chalk

- 3) Push the Rock anchor installation tube over the tie-rod and bang it against the Rock anchor spreader unit several times. This forces the segments to spread so that they bite into the walls of the drilled hole.



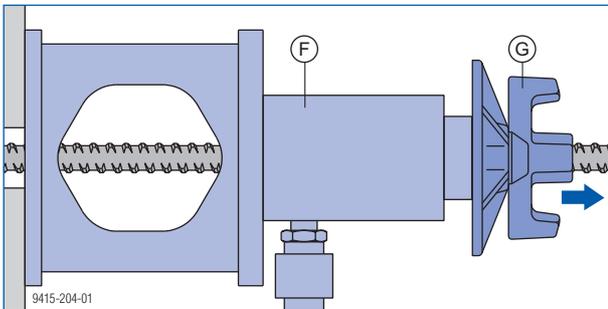
- D** Rock anchor installation tube

- 4) All other steps are the same as from Point 6 of Variant 1 onwards.

Carrying out the acceptance test

WARNING

- ▶ The load-bearing capacity of the anchoring point will depend upon how well the rock-anchor was fitted.
 - ▶ The test-loading tests the load-bearing capacity of the anchoring point.
 - ▶ If the material into which the rock-anchor has been fitted does not have sufficient bearing capacity, the tensioning instrument may suddenly loosen during the suitability test and/or acceptance test.
 - ▶ For this reason, it is forbidden to stand beneath or behind the testing equipment.
 - ▶ Secure the tensioning instrument so that it cannot drop.
- ▶ For the acceptance test, push the "Hollow-piston cylinder with pressure support" (F) onto the tie-rod and mount the Super-plate 15.0 (G) .
- ▶ Apply the test force by operating the hand pump.



Trial test to determine the permissible load, based on DIN 4125

Suitability test

- ▶ On every building site, test at least 3 anchors at a location where unfavourable results may be expected.
- ▶ Load these test anchor-points until they fail, but not to more than **max. 135 kN**.
- ▶ The permitted anchor force is determined from the load at failure with a **safety factor of 1.5**.

Permitted capacity of the tie-rod to DIN 18216:

90 kN

Specimen calculation:

- Load at failure: 80 kN
- Permitted anchor force: $80 \text{ kN} / 1.5 = 53.3 \text{ kN}$

- ▶ With reference to the permitted anchor force, space out the anchors and determine the anchor force actually encountered (e.g. 50 kN).

Acceptance test

- ▶ Every anchoring point must undergo acceptance testing.
- ▶ The test load is 1.25 times the anchor force actually encountered.

Specimen calculation:

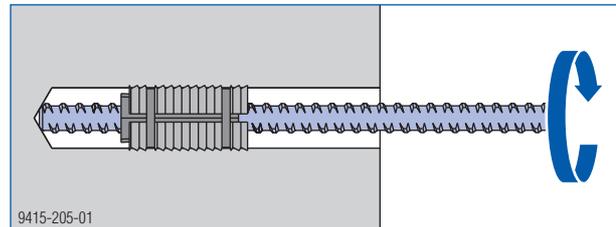
- **Test load:** $50 \text{ kN} \times 1.25 = 62.5 \text{ kN}$

Re-tightening the tie-rod



▶ In this situation, the rock anchor is very sensitive to knocks.

- ▶ Detach the tensioning instrument.
- ▶ Re-tighten the tie-rod all the way in to the bottom of the drilled hole.



The anchoring point is now ready for use.

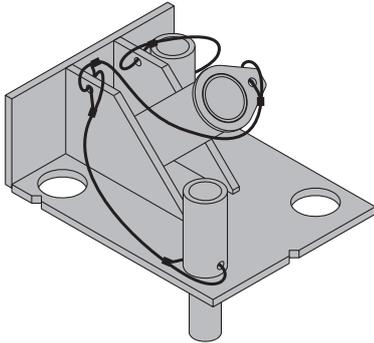
After use

- ▶ Unscrew the tie-rod and close off the anchoring point so that it cannot be re-used.

Testing truss for diagonal anchors 15.0/20.0

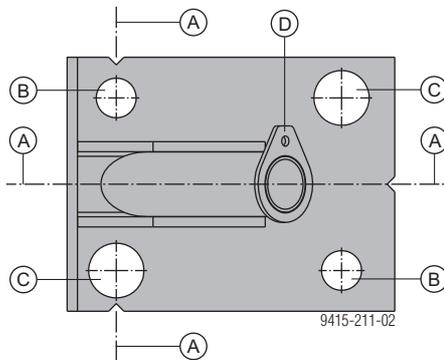
Is used for preparing an anchoring point at a 45° angle.

Art.n° 580514000



Positioning

- ▶ Align the notches of the testing truss to the guide-lines (A).

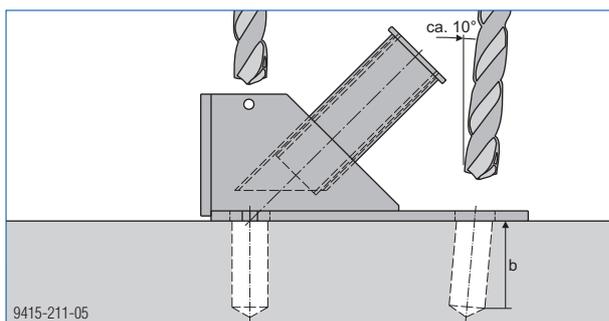


- A** Guide-lines for the desired anchor position
- B** Holes drilled for the pegging-tubes, when a Rock anchor 15.0 is to be used (drill bit diam. 37 mm)
- C** Holes drilled for the pegging-tubes, when a Rock anchor 20.0 is to be used (drill-bit diameter as specified by the manufacturers, DSI or SAH)
- D** Adapter tube for Rock anchor 15.0

Fixing the testing truss

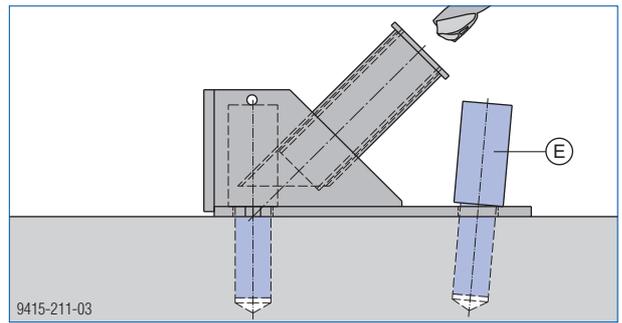
Variant 1: using pegging-tubes

- ▶ Drill 2 holes, diagonally opposite one another, for the dimension of rock-anchor that is going to be used.



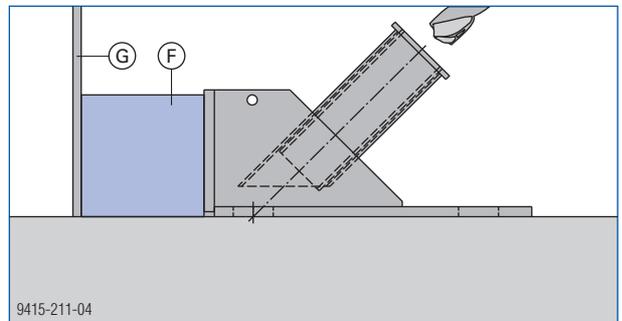
b ... Depth of drilled hole min. 5 cm

- ▶ Push in the pegging-tubes (E) and drill the hole in the diagonal.

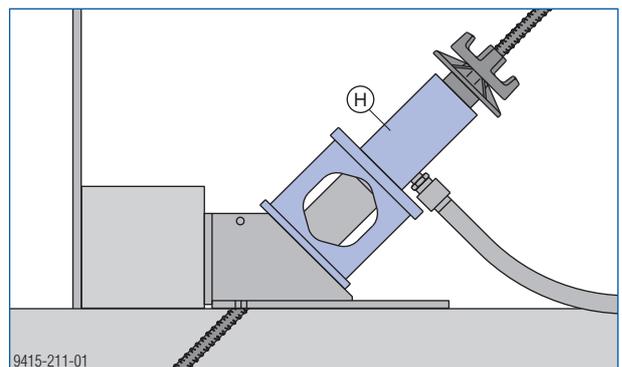


Variant 2: using a squared timber spacer

- ▶ Use a site-provided squared timber (F) as a spacer between the reinforcement (G) and the testing truss. Then drill the hole in the diagonal.



- ▶ The testing truss is now finally positioned. The procedure from now on is the same as for installing the Rock anchor spreader unit 15.0.



H Hollow-piston cylinder with pressure support