GLÖTZL Baumeßtechnik

OVERCORING PROBE

System BGR - Hannover

Type: UEBS-2D-46

Art. No.: 78.50.01.04

Figure: Overcoring probe for installation in a 46 mm pilot boring

Overcoring probe UEBS

- Manufactured of rust- and acid-resistant stainless steel
- Pressurized watertight model
- Suitable for boring procedures with compressed air- and water flushing
- Small total length
- Application of up-to-date semiconductor components
- Digital data transmission
- Position control by integrated inclination sensors
- 4 radial measuring directions 0/45/90 and 135°
- Centered position in borehole by 3-point forced-guided reels

Functional principle „overcoring“

If a borehole is drilled into a non-contaminated rock body which is loaded afterwards, then the borehole is changing its shape. Although it is originally perfectly circular, it will now get a smaller cross section, and furthermore in case of different lateral pressures, an elliptic one.
The diameter change is here a function – among others – of stresses, the E-modulus and the Poisson's figure.
The appropriate is valid for the reverse case:
If a borehole is drilled into a loaded rock area which is afterwards unloaded, then the borehole cross section will also change its shape, however now in a reverse direction. A complete unloading of the borehole surrounding area can be achieved very easily by coaxial overcoring of the borehole to be measured by a core drilling crown.

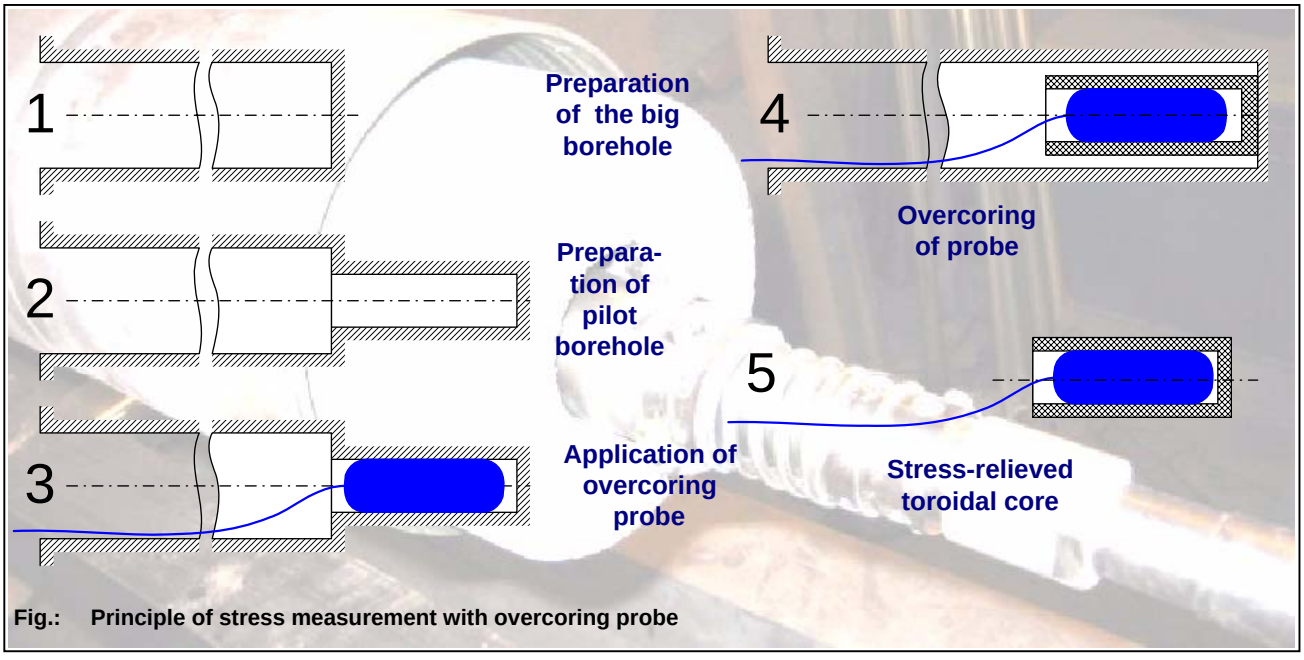


Fig.: Principle of stress measurement with overcoring probe

Sequence of an overcoring measurement:

After executed pilotting, the overcoring probe is installed with the settlement rods through the drill-rods.
While doing this, the displacement transducers of the overcoring probe are laying themselves closely at the borehole wall of the pilot drilling and are measuring at four directions – displaced by 45° one to each other – their diameters.
With the integrated inclination sensors, the overcoring probe is aligned in the correct position in the pilot drilling.
The marking unit of the overcoring probe is marking the borehole wall of the pilot drilling.
By this, a later adjustment with the drawn hollow core is possible.
After installation of probe, the settlement rods are notched out of the overcoring probe and then demounted.
Now the real overcoring procedure can be started.
The transfer cable is led under light tension in the centre of drill-rods through the drilling head.

Figure: Installation of the overcoring probe

Figure: Settlement rods with depth stop and bayonet catch

Figure: Marking unit

Marking unit:

By elastic force the marking unit is pressed against the borehole wall of the pilot boring.
By this, a later adjustment between drawn hollow core and position of the over-coring probe is possible.
The marking pencils can be exchanged.

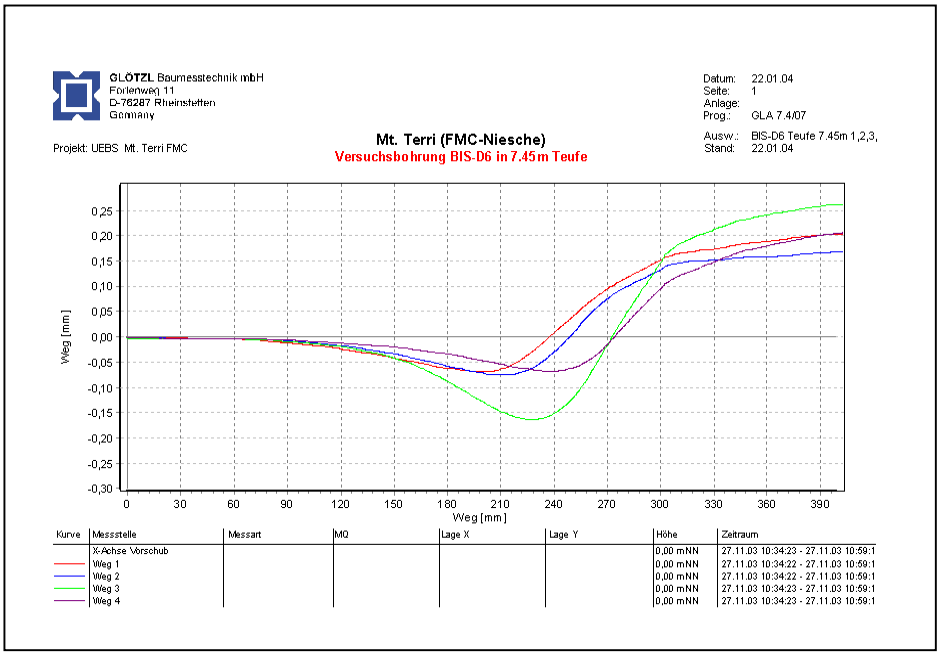
Figure: Drawn hollow core

Procedure of overcoring:

During overcoring procedure, the following measured values are online made available to the user (boring staff) in form of a bar diagram and stored:

- Diameter change of the pilot boring at 4 positions
- Passed boring depth
- Actual drilling speed
- Horizontal inclination
- Vertical inclination
- Temperature

All bar diagrams can be configurated acc. to requirements.
The setting of alarm limits, e.g. at transverse inclination, enables the recog-nition of a breaking of boring core imme-diately by colour change of the bar.



Evaluation:

Evaluation of a measurement with overcoring probe by the special evaluation software GLA 7 of Glötzl.
The diagram is showing the relative change of pilot borehole diameter in dependence on passed overcoring depth.
All evaluations can be configurated by the user according to his requirements.

Screen structure:

All functions / measuring values of the overcoring probe are transferred and displayed online. The bar diagrams are enabling the engine operator to visually record quick changes and to make corresponding decisions. The single bars are updated every 0.3 second.

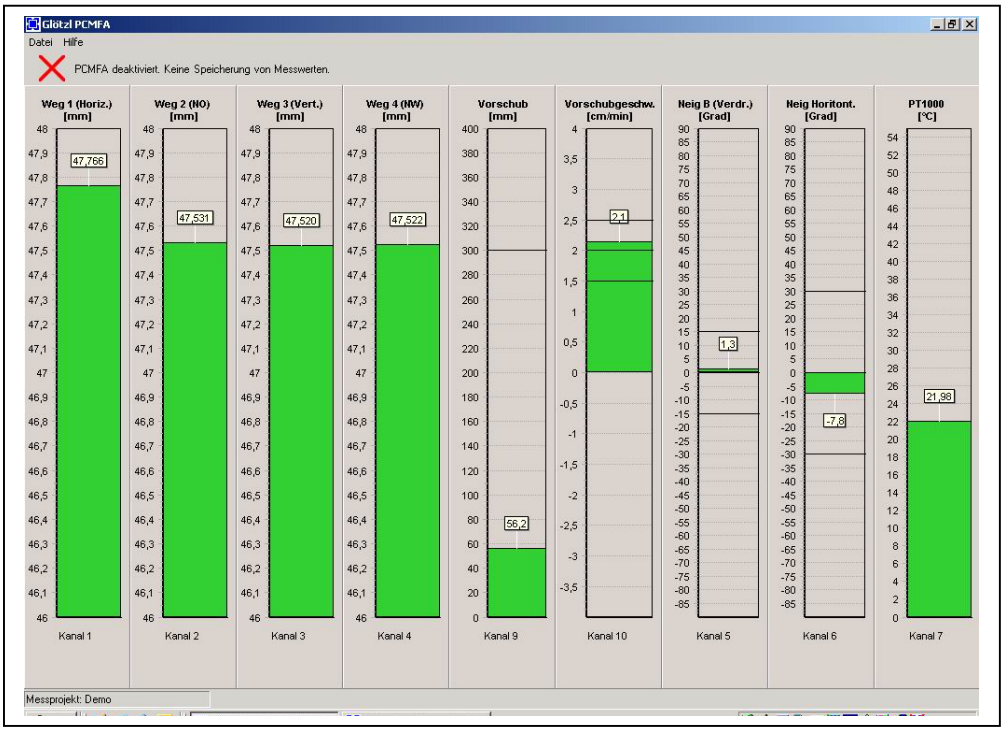


Fig.: Cable reel for overcoring probe type NMK UEBS

Fig.: Transfer cable of the overcoring probe led through the drilling head under tension

Cable reel

Special cable reel for overcoring probe with pressurized watertight plug connector for connection to the overcoring probe.
The plug connector for connection to the supply unit can be drawn through the drilling implement on account of its small outer diameter.

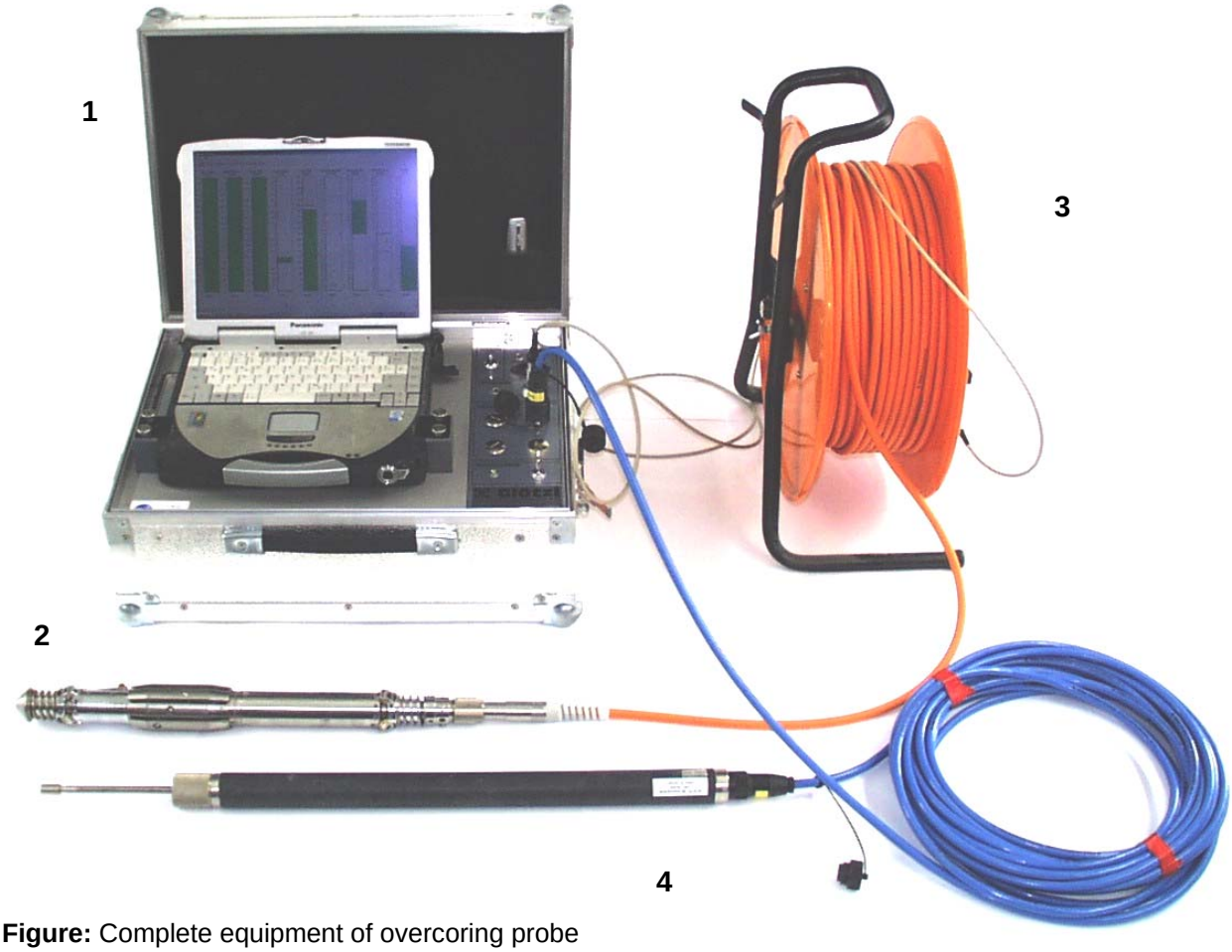


Figure: Complete equipment of overcoring probe

Complete equipment: Overcoring probe – Meas. system:

1. Supply unit for overcoring probe with integrated Laptop, accu and charger **78.50.90.01**
2. Overcoring probe with 4 displacem. transducers, 2 inclin. sensors and temper. sensor **78.50.01.04**
3. Cable reel for overcoring probe **78.50.90.21**
4. Displacem. transducer w. connection line, mounted at drilling unit, for recording of passed overcoring distance **78.50.90.81**

Fig.: Supply unit for overcoring probe

Technical data of overcoring probe:

- Weight 2.6 kgs
- Length 490 mm
- Meas. range 45 up to 50 mm
- Borehole diameter 46 – 47 mm
- Resolution 0.001 mm
- Linearity 0.012 mm
- Transm. rate 25 meas. values/sec
- Temperature range –5 °C up to 60 °C

Further measuring ranges on request

Technical data of supply unit:

- Dimensions (LxWxH) 470x370x170mm
- Weight 30 kgs
- Connections for overcoring probe – cable reel and max. four further sensors
- Integrated accu (12 V/25 Ah) and charger
- RS485 interface for communication with the overcoring probe
- Overcoring probe
- RS232 interface for communication with Laptop
- Recording speed 25 meas. values/sec

Concept and idea: BGR Hannover • Bundesanstalt für Geowissenschaften und Rohstoffe **Manufacturer: Glötzl GmbH**

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