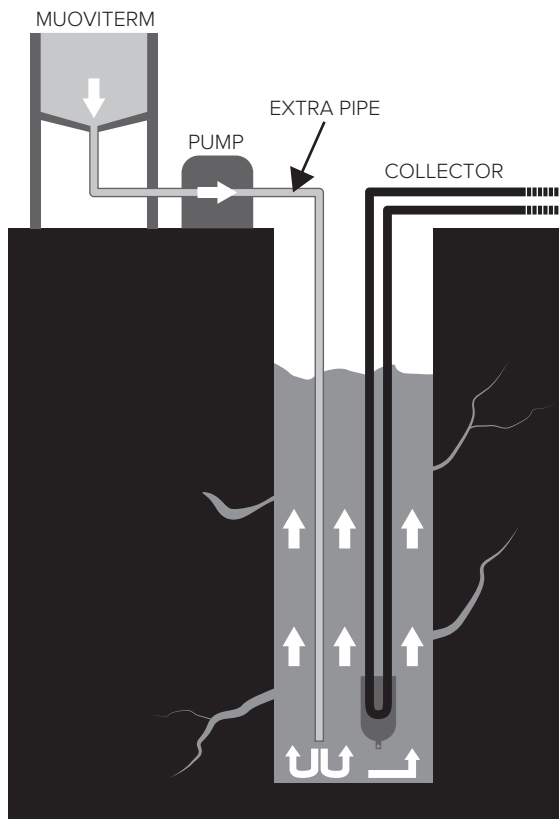


MUOVITERM



VOLUME CALCULATION FOR RE-FILLING MATERIAL FOR BOREHOLE

Calculation programme, for how much MuoviTerm is required:
www.muovitech.com/muoviterm

INSTRUCTIONS FOR FILLING A BOREHOLE

1. The collector and the extra pipe is lowered together into the borehole.
2. Mix MuoviTerm with water according to specifications.
3. Pressurize the collector.
4. Start pumping MuoviTerm, through the extra pipe to the bottom of the borehole.
5. The borehole is filled from the bottom and up by pulling the tremie pipe upwards, while pumping MuoviTerm.
6. Maintain the pressure in the collector for at least 6 hours, until the MuoviTerm has hardened.



MuoviTech®

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MUOVITERM

How to calculate the pressure you should have in the collector when the borehole is refilled.

Density:

Premixed Muoviterm 1.4
 Ethanol mixture in the collector 1.0 (0.95)
 The difference is $1.4 - 1 = 0.4$ in density outside and inside of the collector

What buckling pressure (external pressure) can the collector hose handle?

SDR11 (40x3.7) 4 bar, We recommend SDR11 when refilling
 SDR17 (40x2.4) 1 bar

Pressure class of collector manufactured in PE100

SDR11 (40x3.7) 16 bar, We recommend SDR11 when refilling
 SDR17 (40x2.4) 10 bar

Example of how to calculate the pressurisation of the collector:

Example 1:

Borehole 200m, Water column 0m down.
 Difference in density creates a buckling pressure of 8 bar on the collector (at the bottom)
 $0.4 \times 200\text{m} = 80\text{m}$ water column = 8 bar.
 To counteract the buckling pressure, the hose is pressurised to at least 4 bar.
 The hose can withstand 4 bar in buckling pressure + pressurisation at least 4bar = 8 bar

Example 2:

Borehole 200m, Water column 10m down.
 Difference in density creates a buckling pressure of 8 bar on the collector (at the bottom)
 $0.4 \times 200\text{m} = 80\text{m}$ water column = 8 bar.
 Self-pressure in the hose will be 1 bar, 10m down to the water column
 To counteract the buckling pressure, the hose must be pressurised to at least 3 bar
 The hose can withstand 4 bar in buckling pressure + self-pressure 1bar + pressurisation at least 3bar = 8 bar

Example 3:

Borehole 200m, Water column 70m down.
 Difference in density creates a buckling pressure of 8 bar on the collector (at the bottom)
 $0.4 \times 200\text{m} = 80\text{m}$ water column = 8 bar.
 Self-pressure in the hose will be 7 bar, 70m down to the water column
 To counteract buckling pressure, the hose does not need to be pressurised (see info below)
 The hose can withstand 4 bar in buckling pressure + self pressure 7bar = 11 bar (buckling pressure 8bar)

The above examples are only for gaining an understanding of how to make the calculation.

The collector has a pressure rating of 16 bar, which means that the hose should be pressurised higher than the above example.
 Example 1 means that you can pressurise the hose with max 16bar + self-pressure 0bar = 16bar
 Example 2 means that you can pressurise the hose with max 15bar + self-pressure 1bar = 16bar
 Example 3 means that you can pressurise the hose with max 9bar + self-pressure 7bar = 16bar
 A mean pressure is recommended.

At least 5% more drilling is needed when switching from SDR17 to SDR11.

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