

ABSTRACT

FOAM GENERATOR FOR AN EARTH PRESSURE BALANCE SHIELD TUNNEL
BORING MACHINE AND METHOD FOR CONDITIONING REMOVED SOIL
MATERIAL AS A SUPPORTING MEDIUM FOR AN EARTH PRESSURE BALANCE
SHIELD

The invention relates to a foam generator (14) for an earth-pressure-balance-shield tunnel-boring machine comprising: a mixing chamber, which has a first inlet opening (22) for a foamable liquid and a second inlet opening (23) for a gas and a foam outlet opening (24); a liquid-feeding device connected to the first inlet opening (22); and a gas-feeding device connected to the second inlet opening (23). The mixing chamber contains a tubular flow chamber (28) having the first inlet opening (22) at one end and the foam outlet opening (24) at the other end. A segment of the flow chamber (28) is designed as a gassing section having a gas-permeable porous wall (26) and adjoins a pressure chamber (29) having the second inlet opening (23) in such a way that the gas fed through the second inlet opening (23) under a pressure enters the flow chamber (28) through the porous wall (26) and, in the flow chamber, mixes with the liquid in such a way that foam is formed. The gas-feeding device and the liquid-feeding device are designed in such a way that the pressure of the fed gas can be set in such a way that the pressure of the fed gas is greater than the pressure exerted on the porous wall (26) by the liquid and that a desired ratio of fed gas to fed liquid is achieved. In a method for conditioning removed soil material as a supporting medium for an earth-pressure balance shield, removed soil is fed to an excavation chamber. Depending on the soil quality, foam is provided in that a foam generator having a gassing section of a specified length, of a specified flow cross-section, and of a specified pore size and pore density is provided and the ratio of fed gas to fed liquid is set in such a way that a desired structure and size of the foam bubbles result. The exiting foam is fed to the excavation chamber and mixed with removed soil.

(Figure 2)