

Controlled Soil Conditioning for Earth Pressure Balance Shields

MC-Foamliquid 04 and MC-Foam Generator

Recipient of the Innovation Award
from the Austrian National Committee of the
International Tunnelling and Underground
Space Association (ITA)



A Major Innovation in Tunnel Boring

Controllable soil paste quality to suit any geological mix

In earth pressure balance (EPB) tunnel boring machines, excavated soil must be fed as fluidised “muck” into a pressurised head chamber to apply a support pressure to the tunnel face during excavation. This is achieved primarily through the use of conditioning agents with which the requisite soil paste is created in the chamber. As tunnelling proceeds, the consistency of the paste needs to be continuously adapted to the changing soil types.

During the tunnel heading operation, foam lances create a foam using the conditioning agents provided, and this is fed into the head (excavation) chamber. With conventional methods, however, the foam generation process cannot be effectively controlled. So even under consistent geological conditions, varying foam mixtures and corresponding changes in soil paste quality will inevitably occur.

Tuning for your TBM:

MC-Foamliquid 04 and MC-Foam Generator

With the new system from MC you can generate foam with adaptable properties for accurately controlled soil paste consistency. The foaming medium is ducted by compressed air through a gasification section into the MC-Foam Generator, a unit specifically designed to ensure the required foam consistency by adapting the density and size of the foam bubbles in line with the geology of the area currently being bored.

Economic benefits

The optimised soil paste in the head chamber can also reduce the torque required to turn the cutting wheel, thus significantly decreasing energy consumption. Abrasion at the head is also reduced, leading to improved cutting tool lifetimes.

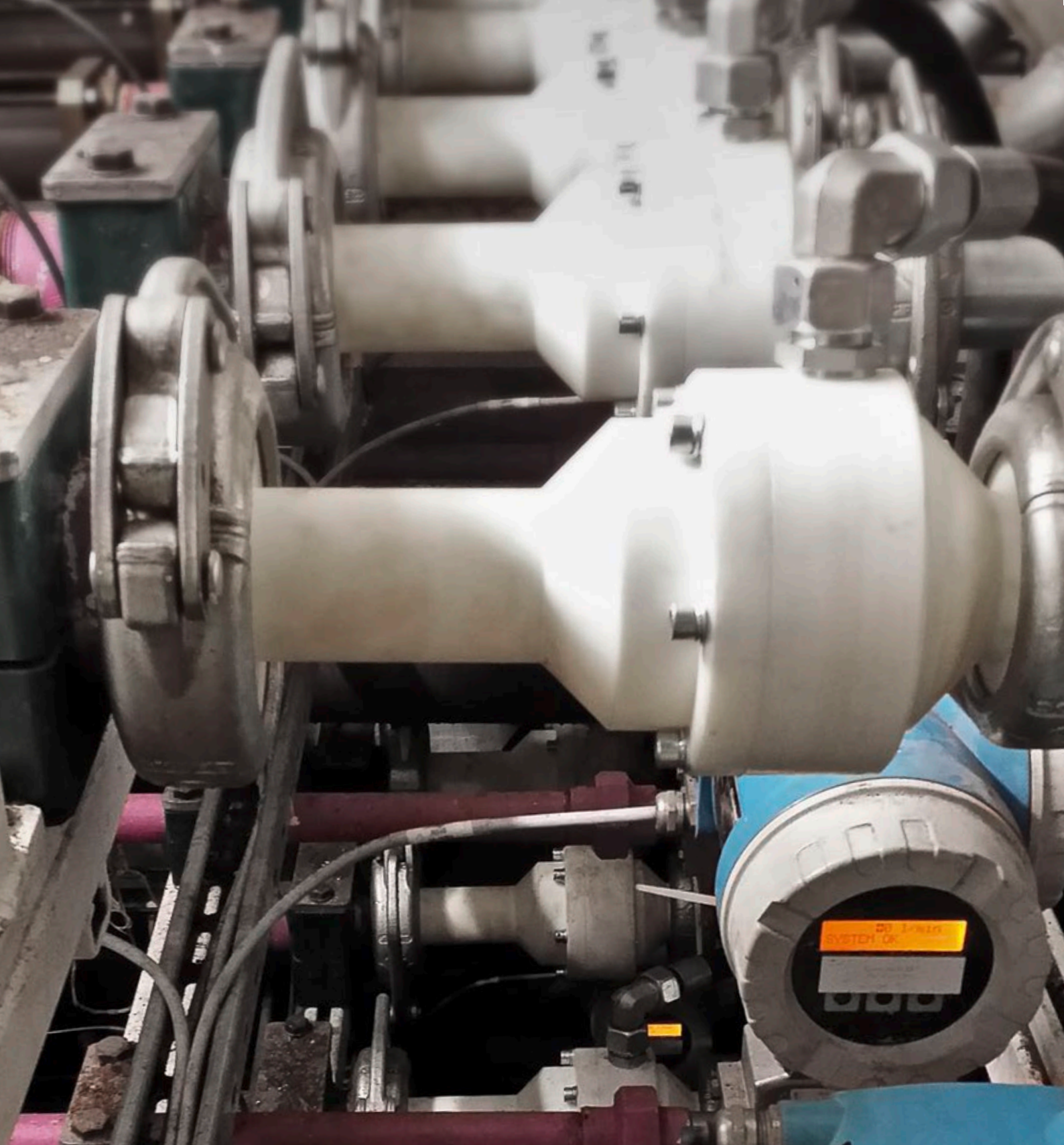
Ecological benefits

This new integrated system results in savings of up to 50% of the conditioning agents otherwise required by conventional solutions. The environmental compatibility – including the biodegradability – of MC-Foamliquid 04 has been verified by Germany’s “Hygiene-Institut des Ruhrgebiets” (Hygiene Institute of the Ruhr Region).

Your partner in tunnel construction: MC

Make the most of our decades of experience in tunnel construction projects around the world! Aside from controlled soil conditioning, we also offer solutions for tubing production, annular gap grouts, final lining concrete, injection technology, and products for concrete repair and surface protection – with all the added benefits of single-source supply.





Advantages of the integrated system

- One tunnelling machine for different geologies
- Complete system comprising conditioning agent and foam generator
- Adjustable foam properties for definable soil paste consistency
- Reduction in energy consumption possible
- Environmentally sound technology



Controlled Soil Conditioning for Earth Pressure Balance Shields MC-Foamliquid 04 and MC-Foam Generator

- Reliable solution even under difficult geological conditions
- Accurate control for consistent quality
- Energy savings possible
- Environmentally sound

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