



# Seline<sup>®</sup>

## Sealant



The watertightness of a sheet pile wall essentially depends on the number of interlocks and the interlock geometry. Despite the relatively compact nature of the Larssen interlock, which is a feature of all hot-rolled sheet piles from ArcelorMittal, additional interlock sealants are often used to further reduce water penetration.

### Seline<sup>®</sup> | product features

Seline<sup>®</sup> is a completely newly-developed, environmentally friendly sealant for sheet piles from ArcelorMittal. Unlike all other existing sealants, Seline<sup>®</sup> contains a renewable raw material: balsam resin (also known as colophony or gum rosin). This resin is a natural raw material that was used by the ancient Romans and Egyptians. The tree resin is mainly obtained from pine trees by scratching the tree and collecting the balsam that drips out.

Seline<sup>®</sup> is heated in a similar way to bitumen-based sealants and then filled into the sheet pile interlocks. After briefly cooling down, Seline<sup>®</sup> provides an extremely reliable water seal for sheet pile walls.

Seline<sup>®</sup> is ideally suited for temporary and permanent sheet pile wall structures.

### Seline<sup>®</sup> | sealing performance

Before a new sealing product can be launched on the market, its performance must be evaluated in several tests.

ArcelorMittal is the only sheet piling supplier that has implemented a realistic testing procedure to ensure the performance of its products under real-life conditions.

Once the laboratory tests had been completed and validated, the most important step to be followed was installation on site, followed by a direct watertightness test.

For this purpose, the sealed sheet piles were driven into a hard clay soil at the test site in Mittersheim, France, and the watertightness tests were carried out under the supervision of the independent testing institute DNV/GL.

The results showed that, after 24 hours under 100 kPa (1 bar), 24 hours under 200 kPa (2 bar) and again 24 hours under



Photo: Ipswich tidal barrier, UK | ©MGF

300 kPa (3 bar) water pressure, Seline<sup>®</sup> improved the performance compared to the well-established sealants. These results were verified by DNV/GL and thus provide reliable characteristic values for this newly developed product.

Further tests are planned for 2025. The aim is to examine the behaviour of Seline<sup>®</sup> in other soil types and different pile-driving methods in more detail.

The average inverse joint resistance  $\rho_m$  was determined according to EN 12063, see table below:

$\rho_m$  ( $10^{-10}$  m/s) at a water pressure of

	100 kPa	200 kPa
Seline <sup>®</sup>	< 600	< 700

## Seline® | environmental compatibility

Seline® is a natural product and does not contain any substances that have to be listed in accordance with Regulation (EC) No. 1907/2006 (REACH).

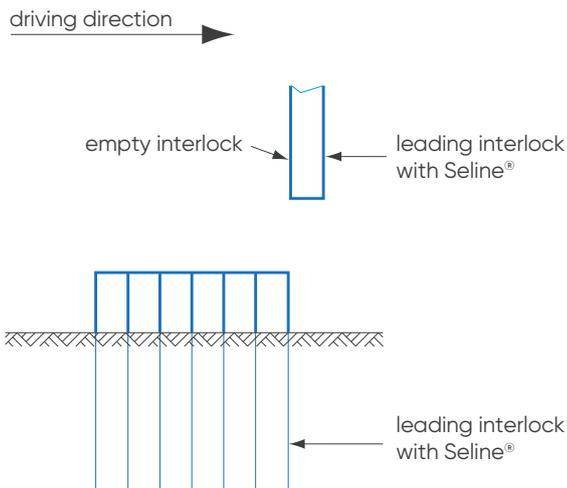
Like all ArcelorMittal sealing systems/materials, Seline® has also been tested by the Hygiene Institute of the Ruhr. The "Ecotoxicological Test" showed that Seline® has

no relevant ecotoxicological impact potential on the soil and existing groundwater and that from a water hygiene point of view there would be no negative impact on the living environment due to soluble ingredients. Consequently, the HY Institute came to the conclusion that the use can be assessed as ecotoxicologically harmless.

## Seline® | installation recommendation

The filling of the interlocks with Seline® in the factory takes place under consideration of the following aspects:

Interlocks must be clean and dry; the sheet piles must be laid out in a perfectly horizontal position. To prevent the hot product from flowing out, the interlock ends must be sealed with putty.



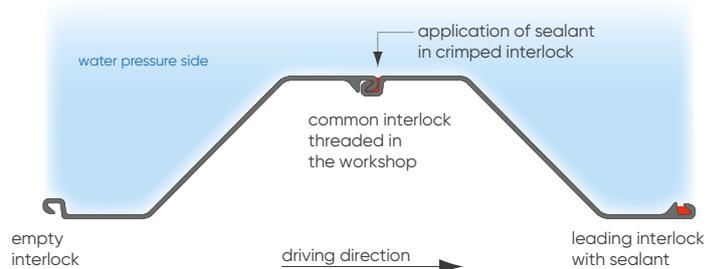
Seline® is heated to processing temperature; stirring ensures the homogeneity of the material; Seline® is then poured into the interlocks using a suitable pouring device.

The driving direction and the position in relation to the waterpressure must be observed: The filled interlock must be installed on the side of the water.

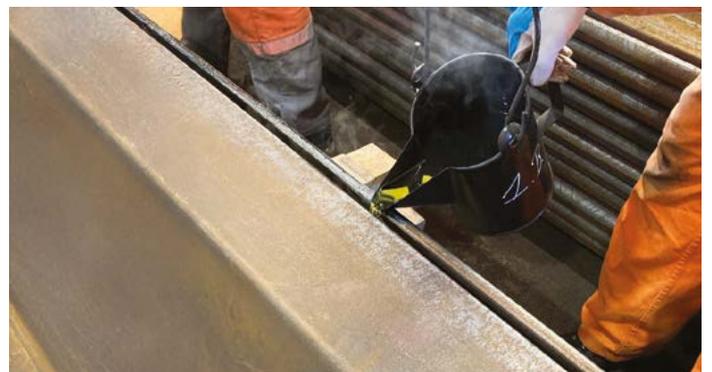
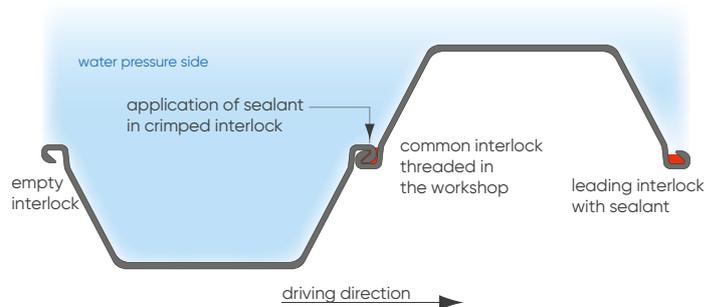
If the piles are supplied as single piles, one free interlock per pile is filled. For double piles the crimped middle interlock and one free interlock are filled.

Seline® is suitable for all sheet pile driving methods (impact, vibration and pressing). The outside temperature should not be below 0°C.

### Detail of application in Z-piles



### Detail of application in U-piles



Interlock filling with a suitable can