AKILA®

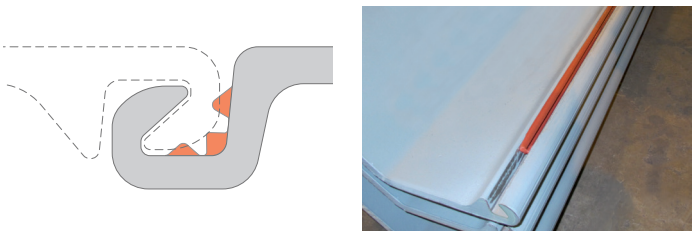
Sealing System

AKILA® | Product properties

AKILA® is an environmentally **friendly high performance sealing system** for ArcelorMittal sheet piles. The system is based on three sealing 'lips' – consisting of a product called MSP-1 – mechanically extruded into the interlock. In the case of double piles, the intermediary (paired) interlock is sealed with a second product MSP-2.

MSP-1 and MSP-2 belong to the family of **silane modified polymers** (also called MS-Polymers) and are single component elastic sealants with a density of 1.41 g/cm^3 and 1.48 g/cm^3 respectively. They are UV-stable and have an **excellent adhesion to primerless steel**.

Both products are resistant to humidity, weathering and temperatures between -40°C and +90°C (even up to 120°C for short periods). They have an elongation at break of at least 380%, a Shore A hardness after complete polymerization of 58 for MSP-1 and 44 (after 14 days) for MSP-2, and are durable in contact with freshwater, seawater, as well as various hydrocarbons, bases and acids (depending on concentration.) A complete list is available on request.



MSP-1 product extruded into the interlock.

AKILA® | Watertightness performance

A series of in situ tests were carried out in stiff clays near Mittersheim (FR) and in soft sandy soil near Zeebrugge (BE), in order to determine the inverse joint resistance value ρ_m.

Single sheet piles and crimped double piles fitted out with the AKILA® system were driven into the ground using an impact hammer as well as a vibratory hammer. In case of vibrodriving, sheet piles were driven continuously at a minimum speed of 3 m per minute. After installation, watertightness was tested at water pressures of 2 and 3 bar, according to a procedure developed by Deltares and ArcelorMittal.

The average inverse joint resistance values ρ_m were determined according to EN 12063.

Testing and results were witnessed and certified by an independent third party ('Germanischer Lloyd').

The results for single and double piles are listed below:

	ρ_m [10^{-10} m/s] for water pressure of	
	200 kPa	300 kPa
Single piles (MSP-1)	0,49	0,86
Double piles (MSP-1 & MSP-2)	0,33	0,47

ArcelorMittal

INVERSE JOINT RESISTANCE OF WATER-TIGHTNESS SYSTEM AKILA® USED IN SHEET PILING STRUCTURES

- SEALING SYSTEM

Field tests in Mittersheim

- TEST DETAILS

- AVERAGE INVERSE JOINT RESISTANCE

Average inverse joint resistance for AKILA® system composed of MSP-1 in the free interlock and MSP-2 in the intermediate interlocks at 2 and 3 bars water pressure

ρ_m (m/s) for 2 bars	ρ_m (m/s) for 3 bars
3.3×10^{-11}	4.7×10^{-11}

Certified test report.

AKILA® | Environmental certification

MS-Polymers are considered environmentally friendly as they are solvent free and – unlike polyurethanes – do not contain isocyanates.

AKILA® is certified by the 'Hygiene-Institut des Ruhrgebiets' as suitable for use in contact with groundwater.

"Considering the fact that [MSP-1] remains effectively embedded within the sheet pile interlocks for typical applications, an appreciable impact on water in contact with the structure can be ruled out." Excerpt from test report of HY (free translation).


Hygiene-Institut des Ruhrgebiets

PRÜFBERICHT

über die Untersuchung

aus grundwasserhygienischer Sicht

Antragsteller: Kömmerling Chem. Fabrik GmbH Zweibrücker Straße 200 66954 Pirmasens

Auftrag vom: 26.05.2008

Inhalt des Prüfauftrages: grundwasserhygienische Prüfung

Probenart/-bezeichnung:

Prüfkörperabmessung: Prüfplatten einseitig beschichtet: 205 mm x 175 mm x 1 mm

Prüfkörperherstellung: übersandte Platten

Probeneingang: 27.05.2008

Prüfbeginn: 03.06.2008

Prüfende: 25.08.2008

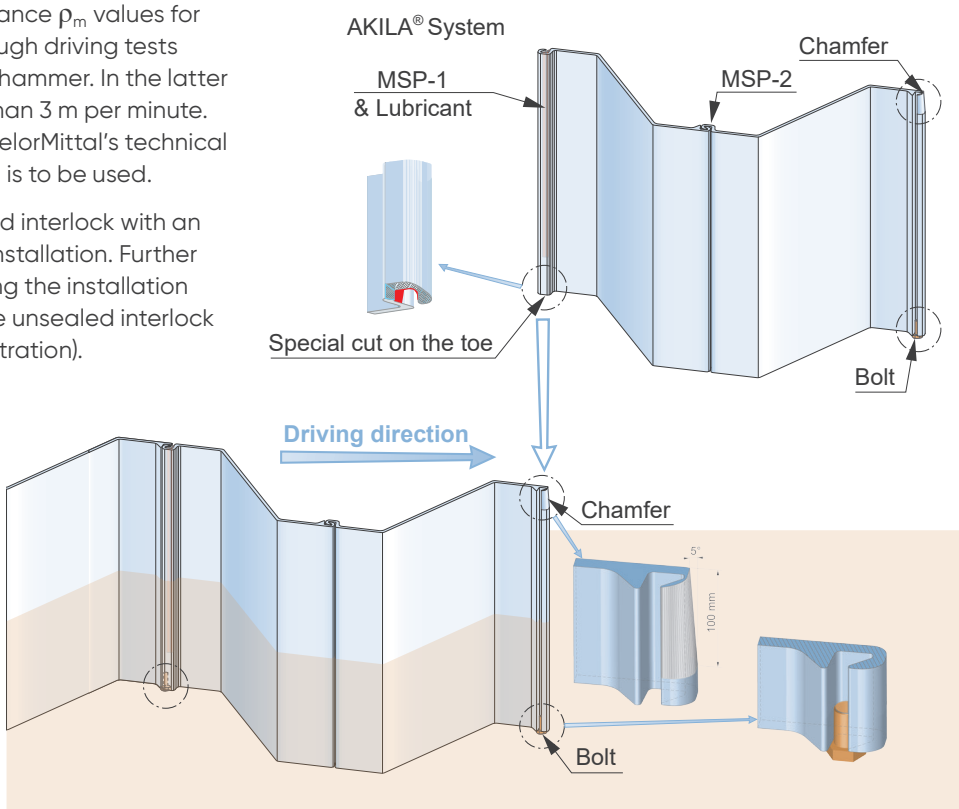
Dieser Prüfbericht besteht aus 5 Seiten.

Test report AKILA.

AKILA® | Driving recommendations

The above mentioned inverse joint resistance ρ_m values for the AKILA® system were determined through driving tests using the impact hammer and vibratory hammer. In the latter case, the driving speed must be faster than 3 m per minute. We recommend prior consultation of ArcelorMittal's technical department in case the press-in method is to be used.

It is recommended to lubricate the sealed interlock with an environmental friendly lubricant before installation. Further information is available on request. During the installation process, it is important to ensure that the unsealed interlock is always in the driving direction (see illustration).
To ease the threading, the interlocks are chamfered at the factory. A bolt or screw is also welded to the leading interlock at the toe of the pile in order to prevent/minimize the penetration of soil material. This all is part of the AKILA system. Ambient temperature during installation should be above 0°C. The arrangement of the piles and the driving direction of the sheet piles should be determined before ordering (delivery of double piles, chamfering of the interlocks, etc.). Our technical office will answer any questions you may have.



Installation recommendations (driving direction, chamfer, etc.)

10.2024 - AKILA® - EN

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