



thyssenkrupp

Insights _Polysius

thyssenkrupp Polysius and SCHWENK Zement have jointly developed a new process and technology that enable the activation of any type of clay without thermal energy and fossil fuels. The two companies presented meca-clay at this year's FutureCem Conference and Exhibition in Brussels.

News | 12.12.2023

Breakthrough technology for

further CO2 reduction:

thyssenkrupp Polysius presents

pioneering solution for the

cement industry with polysius®

meca-clay in Brussels

thyssenkrupp Polysius and SCHWENK Zement have jointly developed a new process and technology that enable the activation of any type of clay without thermal energy and fossil fuels. The two companies presented meca-clay at this year's FutureCem Conference and Exhibition in Brussels.

Dr Hendrik Möller, Member of the Management Board of SCHWENK Zement GmbH & Co. KG: “In order to achieve climate neutrality in cement production, completely new technological approaches for the mass production of binders must be scaled to an industrial level in the shortest possible time. The meca-clay project shows how fast and successful even technologically demanding projects can be implemented when cement manufacturers and plant manufacturers cooperate in real partnership. Instead of the usual supplier-to-customer relationship, SCHWENK and POLYSIUS have shared their knowledge and experience in an unbiased and open manner and cooperated for the benefit of both partners. I am convinced that the upcoming technological and economic challenges in the transformation of our industry will only succeed in an extremely trusting cooperation between cement manufacturers and equipment suppliers and engineering companies. This is what meca-clay stands for, as it proves what is possible when the risks and costs of new developments are shouldered together. With mechanochemical activation, we have an emerging and innovative technological approach to explore in a completely new way the chemical, mineralogical and physical knowledge of building materials and to open up a sustainable new business case.”

“Thanks to meca-clay, our industry gets the chance for the first time in its history to produce hydraulic binders without thermal energy but with decarbonized electrical energy only.”

Luc Rudowski, Head of Innovation at thyssenkrupp Polysius GmbH


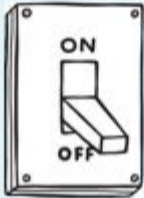



Luc Rudowski, Head of Innovation at thyssenkrupp Polysius GmbH: "Thanks to meca-clay, our industry gets the chance for the first time in its history to produce hydraulic binders without thermal energy but with decarbonized electrical energy only. We have been pioneering the industrial development of activated clay. Thanks to the trustful and very efficient partnership with SCHWENK, with such a technology breakthrough, we are convinced that the industrial development of a greener activated clay will be boosted together with further reduction of cement and concrete carbon footprint”.

Based on SCHWENK's experience to produce their novel cement called Celitement through mechanochemical activation and Polysius' booster mill technology, semi-industrial tests were conducted that showed very promising results on cement and concrete quality using meca-clay. The potential of the

new process and technology results in SCHWENK Zement investing in a demosc scale plant to industrially produce meca-clay. It will be installed in Schwenk's Allmendingen cement plant and be commissioned in 2025.

Innovative solutions for key challenges

The newly developed meca-clay process enables the activation of all types of clay using only electrical energy, without the use of fossil fuels. With meca-clay, the potential of mechano-chemistry – that aims at making green chemistry beyond classical grinding – can be unlocked and developed to an industrial level. The polysius® charger enables the necessary increase of the internal free energy of natural clays to transform them into a reactive binder. It is scalable to sizes that cope with the cement industry requirements.

any clay	all-in-one	green chemistry	scalable	product quality
<p><u>works with any clay</u></p> <p>Kaolinite content not critical</p> <p>All 2:1 or 3:1 can be activated</p> <p>calcareous clay as well with not CO₂ emission</p> 	<p><u>simple process & plant</u></p> <p>No separate grinding</p> <p>Color control (patent pending)</p> <p>No gas cleaning</p> <p>No solid fuel / AFR storage</p> 	<p><u>fully electrified</u></p> <p>No fossil fuel</p> <p>Renewable energy can be stored</p> 	<p><u>staggered Capex</u></p> <p>Plant size following market demand</p> <p>Modular and flexible</p> 	<p><u>activity</u></p> <p>Less water demand</p> <p>Higher early strength</p> <p>Tuned reactivity through energy input</p> 

Selected Advantages of meca-clay

The bottom line: The technology not only sets new standards in terms of environmental friendliness, but also in terms of efficiency and product quality. With a planned complete electrification of the process, we aim at zero CO₂ emissions of industrial production of meca-clay.
