



Press Release 014/2009

New Cement Spares Climate and Resources

Partners Sign Agreement on the Foundation of Celitement GmbH – Pilot Plant Will Be Built at KIT



Hydraulic binders like cement are fundamental materials for the construction and construction materials sector, both of major importance to the world economy. Scientist at KIT found a new family of high-performance hydraulic mineral compounds (“cements”). These new cements are produced by a novel method at temperatures below 500°C, and passed laboratory tests. Celitement GmbH was founded today to scale-up this process to the level of an industrial production plant. In case of success, both greenhouse gas emissions and energy consumption associated with the production of cement-like binders will be reduced significantly.

Cements and other mineral binders are not only applied in mass construction materials like concrete, but also in a number of special applications and formulations, such as plasters, mortars, fillers and tile adhesives, concrete ware or materials similar to ceramics. Four scientists from the KIT Institute for Technical Chemistry (ITC) have now invented and developed a new group of mineral binders. Due to their excellent properties, the new binders have the potential to open up new and improve existing applications. “Vital to the success was the outstanding analytical equipment of KIT that is available on the premises of Forschungszentrum Karlsruhe, such as the ANKA Synchrotron Radiation Source. With its help, we decoded many, so far unknown, details of cement chemistry”, underlines Dr. Peter Stemmermann from the ITC, who developed the basic conception of the environmentally compatible cement and the new process together with his three colleagues.

Meanwhile “Celitement” has been registered as trademark for the new cement, while its composition and manufacturing process have been protected by patents. “Celitement, a high-quality, sustainable product, is expected to replace ordinary cements in challenging and superior applications and in special construction materials at first”, states Dr. Peter Fritz, Member of the Executive Board of Forschungszentrum Karlsruhe for Energy and Environmental Research and responsible for innovation at KIT.

Today, Forschungszentrum Karlsruhe with its four inventors and a well-known partner from the cement sector, the Schwenk group, signed the deed of foundation of the Celitement GmbH. “The joint enterprise by staff having business sense, a renowned industrial partner, and a research institution sets new standards in technology transfer”, explains Dr. Hanns-Günther Mayer from the KIT Innovation Department that is now supporting the development of the product to market maturity. “Our objectives focus on the development and marketing of the ‘Celitement’ intellectual property”.

In order to scale up the production process and test the new construction material in practice, Celitement GmbH intends to build a pilot plant on the KIT Northern Campus (Forschungszentrum Karlsruhe). The plant will deliver up to 100 kg of the new binder per day. It will serve to develop and test all key technologies of the new process. As soon as the materials and technical basis will be available for large-scale production, the industry partner will establish a reference plant at one of his production sites.

“Recently in cement production many ecologically and economically more than questionable ideas to enhance climate protection have been proposed. With Celitement we sense a realistic chance to offer a reasonable and ecological alternative in due time. In the downmarket we will be able to replace traditional mineral binders at least to some extent.” says Dr. Hendrik Möller, who is responsible for the product technology sector of Schwenk Zement.

However, the road towards an implementation of mass production is long and will certainly require several years of extensive development. Thus, the new construction material has to pass a number of practical tests. Certification of a new binder takes several years irrespective of its economic or technical potential, as the failure of buildings or construction materials may have considerable impacts on the life and health of the people affected, the environment, and the enterprises involved. For this reason, legislation has always paid special attention to all fields of the construction sector and established a very tight network of laws, ordinances, and regulations that have to be observed. Consequently, in the short run the new material is expected to be used for special and entirely novel applications. “Future findings will decide whether the new cement will be able to compete with conventional cement on the mass market in the long term”, underlines Dr. Matthias Achternbosch, project head at the KIT Institute for Technology Assessment and Systems Analysis (ITAS) that will accompany the way of the new energy-saving and environmentally compatible cement from innovation to maturity.

“The decision in favor of SCHWENK as our industry partner was taken after several meetings with various enterprises”, says Dr. Alexander Kurz, Deputy Chairman of the Executive Board of Forschungszentrum Karlsruhe and responsible for the staff and legal matters of KIT, “but we succeeded in ideally balancing our diverging interests by constructive negotiations.” The SCHWENK group is known for its extensive research and development activities in the cement sector. It offers a vertically integrated product portfolio covering cement, transportation concrete, filler and mortar systems, pre-fabricated concrete parts, and special construction materials. Finally, Schwenk is cooperating closely with all relevant associations and institutions. With four large integrated cement plants in Germany and a number of other industrial activities, SCHWENK Zement KG also is a major regional industry partner in Baden-Württemberg. “SCHWENK as a family enterprise considers this project a challenge and opportunity to demonstrate initiative and its power to implement this process”, underlines Gerhard Hirth, Managing Director of the SCHWENK group.

The Karlsruhe Institute of Technology (KIT) is the merger of the Forschungszentrum Karlsruhe, member of the Helmholtz Association, and the Universität Karlsruhe. This merger will give rise to an institution of internationally excellent research and teaching in natural and engineering

sciences. In total, the KIT has 8000 employees and an annual budget of 700 million Euros. The KIT focuses on the knowledge triangle of research – teaching – innovation.

The Karlsruhe institution is a leading European energy research center and plays a visible role in nanosciences worldwide. KIT sets new standards in teaching and promotion of young scientists and attracts top scientists from all over the world. Moreover, KIT is a leading innovation partner of industry.

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Photos taken while the agreement was signed today at the Ostendorf-Haus of Forschungszentrum Karlsruhe may be requested by [e-mail](#) or phone (+49) 721 608-7414.