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Focus on the Wilhelm Dyckerhoff Institute (WDI)

SEVENTY-ONE YEARS AFTER ITS FOUNDING, WE TAKE A CLOSER LOOK AT THE DYCKERHOFF CENTRAL LABORATORY, WDI, ONE OF THE MOST CUTTING-EDGE LABORATORIES IN THE SECTOR THAT HAS RECENTLY BEEN UPGRADED TO SUPPORT BUZZI IN THE DECARBONIZATION CHALLENGES.

The Dyckerhoff Central Laboratory (Haupt-Laboratorium) was inaugurated in Wiesbaden in the Villa Dyckerhoff on Biebricher straÙe, 180, on May 10, 1954 with a group of 11 employees who formed the core of the facility. The laboratory was created to develop new products in the hydraulic binders sector, support the establishment of plant laboratories and conduct training programs. These were years of great developments within the construction industry in Germany, particularly in Wiesbaden with the Amöneburg cement plant that achieved a record production of 1 million tons of cement on 31 Dec. 31, 1953, thereby establishing itself as one of the largest plants in Europe.

The concrete technology laboratory (BTA, Betontechnologische Abteilung) was subsequently established in the Amöneburg plant on Feb. 1, 1958 to support cement applications and develop concrete technology, particularly in interaction with additives.

In parallel with important German political changes in the 1980s, Dyckerhoff diversified its business activities into the technical mortar sector with the founding of the company Sopro (Sonder-Produkte, now part of the



1. AERIAL PHOTO OF THE AMÖNEBURG PLANT, WITH THE WDI BUILDING IN THE FOREGROUND



2

Mapei group). These events helped reinforce the need to expand as a research organization, so the company decided to join the two existing organizations within a new, modern and functional building named after Wilhelm Dyckerhoff, who was technical director of the company for many years.

The Wilhelm Dyckerhoff Institute (WDI) began its work in 1988 under the direction of Dr. Volkert Rudert, whose strategic vision and innovative spirit drove its mission. With a strong focus on basic research, WDI aimed to develop new products for industrial applications. The building was meticulously

designed with large, well-organized laboratory spaces that allowed for the optimal management of samples, analyses, tests and disposal. The façade elements of the building were constructed by the Dressel company (from Stockstadt am Main).

In the years that followed, the facility operations were driven by qualified personnel, top-class instrumentation and a future vision that would address issues still relevant today, such as the interaction between setting regulators, additives and hydration of cements, predicting the mechanical characteristics of cements through mathematical models based on the chemical-physical properties of clinkers, the development of rapid mortars and self-leveling systems. In June 1998, the Dyckerhoff Forum technical event was organized with over 300



3

8

2. GROUP PHOTO OF WDI EMPLOYEES
3. THE BIODIVERSITY PROJECT IN THE OUTDOOR GREEN AREA



SCAN THE QR TO SEE THE RECENTLY MADE WDI PRESENTATION VIDEO

property, as well as all the new technologies developed by start-ups.

Research projects are currently highly focused on CO₂ reduction objectives and strengthening good circular economy practices in the cement and concrete sector, including the development of new supplemental cementitious materials (natural pozzolans, calcined and activated clays), the exploitation of industrial waste (steel mill slag, demolition waste), CO₂ capture and storage, the applications of concrete made with low-clinker cements, studying the interactions of additives (grinding and fluidization) with cement hydration and the development of high-performance products (UHPC).

Quality Support colleagues also work within the institute and use the laboratories to assist customers and deal with problems that may occur in the production and use of cements.

Investments are made every year on both analytical instruments and people, allowing the facility to remain at the forefront even during the most challenging years within

4. HAUPT LABORATORY (MAIN LABORATORY) IN VILLADYCKERHOFF IN BIEBRICHER STRASSE, 180 IN A PHOTO FROM 1990

4

participants. In 2002, the WDI became the benchmark laboratory for routine testing of cements (chemical analysis and mortar tests) produced by German plants. Today, WDI is a laboratory with strong analytical skills and a focus on research projects and product development activities aimed at industrial applications. The laboratory operates within a more international context now than it did at the beginning, with strong ties, interactions and exchanges

with Built in Vercelli, Buzzi's other Research and Development facility, and is very open to new technologies developed either internally or externally by start-ups, research networks or universities. The laboratory is supported by a group of people dedicated to research and development and supporting special products (Solidur, UHPC, CSA binders, White Cement). It pays close attention to monitoring competitor patents and supports internally-generated intellectual



5

5. CEREMONY FOR LAYING THE FOUNDATION STONE OF THE NEW WDI BUILDING IN SPRING 1995. IN THE FOREGROUND, FROM LEFT TO RIGHT DR. VOLKHARD RUDERT (INSTITUTE DIRECTOR), DR. HANS OTTO GARDEIK (GENERAL MANAGER CEMENT) AND VERONIKA DYCKERHOFF, WIFE OF WILHELM DYCKERHOFF

the construction sector. A strong continuity among the employees who have rotated through over the course of these 70 years of activity and the continued investment in training have led to the transfer of knowledge over time. Some of the instruments in use that deserve a mention include the X-Ray diffractometer, a scanning electron microscope, hydraulic presses for concrete tests to determine the bending strength of fiber-reinforced or UHPC concretes, instruments for analyzing trace elements, as well as a wide range of apparatus for thermal and rheological analysis and durability testing in concrete to support analyses and testing for the various group departments. Last but not least, the concrete laboratory is certified by VMPA (Verband der Materialprüfungsanstalten), an organizations that certifies the quality assurance of testing centers in the concrete sector.

Over the past four years, significant investments have been made to enhance the building's energy efficiency, including the installation of a new ventilation and air conditioning system based on a heat pump. The common areas (offices, laboratories, and social area) have also been updated to make them more modern and functional with the use of colors and adhesive decals on the walls. A project has also been initiated to enhance the outdoor areas, removing outdated structures, and making space in the outdoor green area to encourage the presence of pollinating insects, to promote biodiversity and also create a pleasant environment where you can spend your lunch break. Frequent workshops with customers or university students are held in both the laboratory and the classroom. The laboratory has been driven by technical expertise, pragmatism,

future vision and the search for knowledge for its 70 years, creating the conditions for it to continue supporting the company in its future decarbonization challenges.