LAEIS - 150 Years as a Partner for the Ceramics Industry

Review

The LAEIS history begins in Berbourg/Luxemburg. Just 3 km away from the company’s current headquarters in Wecker, Eduard Laeis (Fig. 1) began his working career as head of the smelting shop at the blast furnace and forge, before setting up the iron foundry Eduard Laeis & Co in Trier in 1860. Closely linked to smelting equipment used, in 1878 the first shaping line for the production of refractory chamotte bricks was supplied to the steel industry. In 1881 this was followed by a press line for the production of dolomite bricks for the Dortmunder Union. From the outset, production was export-oriented. In 1881 half of the produced machines were supplied to Belgium and France, later also to Italy and South America. In 1890 Denmark, Sweden, Norway, Hungary and East India were added to the export list. Eduard Laeis & Co had already become a machine supplier for widely different segments of the ceramics industry. The company became a partner for the clay brick, roofing tile, ceramics tiles, and drain pipe manufacturers. But refractories was always a mainstay of the business, often inspiring ideas for other applications in ceramics or related industries (terrazzo). By 1900 the company already employed 300 people. The 150-year history of LAEIS is naturally closely tied to German history. The events of the First and Second World Wars were reflected in the company’s fortunes (e.g. the company’s links to world trade broke off with start of the First World War, global economic crisis in 1930).

Later, however, LAEIS was able to profit again from the internationalization of the markets. In 1960, with the development of the first oil-driven hydraulic press, which Laeis-Werke AG premiered at the Hannover Trade Fair, the way was paved for the company’s entry into other whitewares sectors in addition to ceramic tiles, for which Laeis had been supplying equipment since its founding, including a range of water-hydraulic presses after the Second World War. This ultimately led to the development of plate presses for the ceramic tableware industry.

With the involvement of the Swiss Bucher Holding in 1989, a very active period began. Market partners were taken over (SGP/AT; Horn/DE) and kiln suppliers integrated (Heimsoth Keramischer Ofenbau, KERABE-DARF). Under LAEIS BUCHER not only were numerous technological innovations driven forward, the ceramics laboratory was strengthened with its relocation from Ismaning to Aachen, where a cooperation with RWTH University of Aachen was initiated. The company excelled with outstanding success, for example, in the engineering of presses for ceramic tiles (in 1992 and 1993, over 200 presses per year). The collapse of business in the tiles sector did, however, lead to difficulties from 2001 (sales fell by 40 % compared to the mid-1990s), and other segments also struggled. It was necessary to streamline the production range. The core expertise in press engineering was kept, as were the competences in kiln and plant engineering. The Bucher Group prepared for the sale of the LAEIS business, which was completed in 2004 with the company’s integration into the Sacmi Group. In 2005 with the move into the offices and the inauguration of an assembly hall in Wecker/Luxemburg, LAEIS returned to its roots.

Laeis and the Refractories Industry

Even before 1900, the refractories presses were exported. In 1908 one of the first automatic dolomite presses was built. For the LAEIS-Werke AG, after the Second World War, production was based mainly on presses and processing machines for the refractories industry and in addition, especially presses for the production of terrazzo and artificial stone tiles. In the refractories sector, initially mainly shuttle mould presses were used. With these four-column presses, the
Statement from LAEIS Management Marking the Company’s 150th Anniversary

Since April 2007, Ralph Lutz (formerly Engineering Manager) and Horst Schmitt (formerly Sales Manager) have been managing the business of LAEIS GmbH in Wecker/LU, which has been a member of the SACMI Group/IT since 2004. The Engineering Division includes the departments Development and Design, Plant Engineering, Purchasing, Installation and Customer Service, while the Commerce and Administration Division covers Sales, Finance and Accounting, Human Resources and Business Development. Ralph Lutz (MD Engineering) and Horst Schmitt (MD Sales), long-serving LAEIS employees, have briefly commented on their current operations, building a bridge to the review of LAEIS’ 150-year history.

Ralph Lutz pointed out a particular milestone in the company’s recent history, the inauguration of the new assembly facility in Wecker in March 2006. This not only enabled final assembly on site, but also parts storage, final inspection and the development of larger size machines. “We can’t just work like an engineering office, we need the continuous flow of information for new developments and standard machines, which are explained to the customers by our own fitters. Experience with our equipment in continuous operation is, however, just as important to steer the further development of our product range in the right direction. We permanently employ 10 fitters, who bring back with them the experience they have collected while working at the customers’ facilities and then bring themselves up to date on our engineering developments within the company,” explained Ralph Lutz. Horst Schmitt added, “Only in this way we can permanently stabilize our close customer relationships. We have the good fortune that with LAEIS we are able to carry into the world a globally recognized name for quality not only in the refractories market. What counts however is ultimately the success our customers have with LAEIS machines, with these giving them a competitive edge. That is the secret of our success, a secret we have to guard. We achieve that with specific problem solutions for customers and ongoing improvement of our machine models. Particularly important are currently the markets in China (where we are represented with the LAEIS Service and Sales Centre) and India, both of which have quickly overcome the financial crisis. In South America and in Eastern Europe, capacities are being increased. Besides individual consultations for new equipment, the spare parts service or the rebuild of machines, which have been years in service, are core elements in our range of activities.”

“Our 100-% subsidiary ALPHA CERAMICS GmbH in Aachen has another important objective,” added Ralph Lutz. It works on new fields where LAEIS technology can be successfully applied. This includes widely diverse areas of technical ceramics (sputtering targets, ballistic protective components, solar applications, etc.), which will lead to long-term growth supplementing the steady business of the refractories market. Special applications such as production lines for kiln furniture or anodes for aluminium smelting already form part of the range today. We have worked out concepts for roofing tiles and applications outside of ceramics such as salt licks are also part of our portfolio.” “Our intention,” explained Horst Schmitt, “is to establish hydraulic presses in other applications, where with our know-how of this complex shaping technology we can help customers economically manufacture new products or products that have not yet been produced with this technology with great precision.”

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two moulds were arranged to the right and the left. The moulds were filled and the products ejected outside the press. Filling was done either by hand with weighed body or with an automatic volumetric filling device. The press could also be equipped with two brick removal devices with pneumatic brick grippers and a conveyor belt at the side. In front of and behind the press there were moveable pressure pads with the upper dies. The presses were able to take two different sizes and were therefore extremely flexible. Even a mould change was possible on one side while production continued on the other side. On account of this flexibility, these presses were still able to hold their own for a while despite the advent of the oil-hydraulic era.

The sliding mould presses were all double ram-type presses in order to realize higher filling heights. The pressure went from 500 – 2000 t. Up to 1970 around 100 shuttle mould presses were built. In addition, however, turntable presses were also used for dolomite brick production. By 1977 LAEIS had built around 150 presses. Besides shaping, preparation equipment naturally accounted for a large part of the business. In this context, the pan and muller mills should be mentioned. Depending on the requirements, the pan base could be heated (e.g. for dolomite). Versions exist with stationary pans and rotating runners as well as with rotating pan and stationary runners. For dry preparation, there were also dry screening pan mills, which could directly screen off the ground product. In contrast to previous versions, they operated continuously. For the intensive mixing of fine and coarse bodies, the PZM 150 to 1000 series of planetary type compulsory mixers were used. The mixing trough was fixed in position with a rotating planetary mixer, which shifted the mixing curve on every rotation. The mixer could be optionally equipped with electric oil bath heating. From 1946 to 1969 around 85 screen pan mills and 120 dolomite pan mills were manufactured.

The next step in press technology was the introduction of oil hydraulics. At the Hanover Trade Fair in 1960, the first oil-hydraulic re-
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tommation, it was marketed as the "robot press". The pressure ranged from 500 – 2000 t. A total of around 60 HVAKP were built up to 1970s. Under Rheinmetall, from 1972 – 73 the double-pressure HPF principle with fixed bottom die and moveable mould wall was introduced. Initially, the frame presses HPF 200, 300 and 400 were developed. In 1973 the four-column press HPF 1250 followed, in 1976 the HPF 1600 and 2000. Common to them all was the advanced arrangement of the post-suction tank above the ram, which is filled by means of a filling valve. For control, either a contactor control or the "modern" CMOS control was available.

In the Jagenberg era from 1981, the presses in particular underwent further development. The HPF became Generation II, the special features of which were the new charge box mixer and the new Hydrofast rapid mould change system. Both under Rheinmetall and Jagenberg, plant engineering for the refractories industry was an important part of the company's business.

Under LAEIS BUCHER, the Sigma 1000 (Fig. 4) was developed for the refractories sector in 1992. The four-column press made from spheroidal cast iron already boasted many features of the later HPF III generation. The hydraulic tank is integrated in the head beam. The ram is designed as a plunger and has auxiliary cylinders for quick traverse motion. The primary valve block is positioned at the top on the head beam, near the energy consumers. The filling slide has a rotatory drive and closes dust-tight between the charger box mixer and the material disintegrator.

The vacuum press system presented back in 1983 gained ground and more and more presses were built for compaction under vacuum. First the presses were equipped with large vacuum bells at the bottom and top dies. The vacuum pump station was correspondingly large. Later (in 2004) an innovative compression or bellows-type seal was introduced. On account of the smaller vacuum chamber to be evacuated, the pumping station became much smaller, which was favourable for the wider use of the vacuum technology. Under LAEIS BUCHER the integration of kiln builders for refractories was important too because KERABEDARF as a specialist for high-temperature kilns and furnaces (continuous and intermittent) came to the Group, as did Heimsoth Keramischer Ofenbau, a kiln manufacturer that was more geared to the ceramic tiles and sanitaryware segments.

Since the takeover by Sacmi in Imola, two key innovations can be reported. First the HPF presses with 2000 t and 2500 t were upgraded to Version IV and the HPF IV 1000 added to the range. Around 610 HPF presses have been built from 1971 to date. At the end of 2009, with the Mega 1600 AV (Fig. 5 a, b), the first press for the production of anodes for aluminium smelting was completed. It can press anodes with a filling height up to 1200 mm and with a size of 1700 mm x 700 mm. Such an anode weighs around 1000 kg. The mould too with almost 42 t in weight is also impressive. The anode is filled by means of gravimetric pre-metering and subsequent body feed with a charger.

Now we have arrived back in the present day, if you review this diversity of products and know-how, then you can gauge the potential for the future that can be found in this company and its employees.