What a history!
Düsseldorf is the state capital of North Rhine Westphalia, the largest federal state in Germany. Its location at the heart of the Rhine-Ruhr region has ensured that it maintains its position as a major international commerce and services centre with over 5000 foreign companies having established branches there, including more than 400 from Japan. It was here in the summer of 1948, in a ruined building, that Ernst Günter Loesche, the grandfather of Dr Thomas Loesche, began rebuilding his company after the expropriation of the Teltow works by the Soviet authorities in Berlin in April of the same year. It was to Düsseldorf, in the newly built Hotel Intercontinental, that 250 delegates from 40 countries were invited to attend the company’s special two-day Symposium.

Of course, the history of the company dates back to 1906 and so it was fitting that the opening paper of the Symposium, presented by Dr Hugo Bolio of Cemex, should provide an interesting insight into the development and growth of this famous German supplier of top quality mills. Through a highly visual presentation, he described how the engineer Curt von Grueber established a company for the design and sale of Kent mills in Berlin, having obtained exclusive European sales rights to this brand new mill. In 1912 the company began manufacturing its own products in Berlin. These included Maxecon mills, Hauenschild rotary grate kilns and other items of machinery such as crushers and screw conveyors. The year 1912 was highly significant for the future of the company, when in July, Ernst Curt Loesche joined as a young engineer. Thirteen years later, he designed the first Loesche mill and by 1937 he had become the sole owner.
of the company. Following the move to Düsseldorf from Berlin, he established the business in 1948, but died in the same year, and his son Ernst Guenter Loesche became Managing Director at the age of 24. As his father had been considered the ‘entrepreneur’, Guenter was the ‘organiser’, as during his lifetime he led the company to foreign expansion, reaching agreements with the United States, Japan, Great Britain, France and others. Under his guidance the company invented the four-roller mill in the early 1970s and introduced a modular mill system. The four-roller mill quickly became a success around the world and subsidiaries were established in Spain and South Africa. By the end of the decade the modular system had been adapted for use in coal mills.

Dr Thomas Loesche became head of the company in 1983 and soon began to develop new business activities, including after sales service and the construction of mills for the iron and steel industry. In the turbulent 1990s, Loesche developed the 2+2 cement clinker mill and this also became internationally successful. The company’s range of products was expanded and there was substantial investment in the development of new technology. The collapse of the economies in South East Asia in 1997 plunged many companies into a crisis situation and Loesche was no exception. A series of rationalisation measures, including a financial guarantee from the state of North Rhine-Westphalia, eventually prevented the company from collapsing and through the introduction of new innovations, including the slide-in mill procedure and the redundancy concept in vertical mills, the company was able to survive. Demand picked up again at the beginning of the new century. In 2002, Dr Joachim Kirchmann joined the company as Managing Director and later became a shareholder.

Dr Christoph Beumer, Chairman and CEO of Beumer GmbH & Co, came to the Symposium straight from a business trip to Moscow. He delivered a highly entertaining presentation on ‘The secret of success in family business’ in which he discussed, among other topics, family members and their roles in running a successful business, shareholdings, the consequences of fragmentation, handing over from one generation to another, and ended up providing a comprehensive summary of the history of the Loesche family from 1920.

Experiences

Three papers by cement producers from India testified to the long association that Loesche has had with the country. Dr S. C Ahluwalia is Executive Director (Operations) of OCL India Ltd. In 1950 his company established a wet process plant which was later converted to the dry process by KHD in 1986. At that time a slag drier was installed, but in 1997 the company purchased its first VRM (LM 46.2.+2) for intergrinding slag and clinker, and afterwards, based on the experience of line one and the

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“Constantly improving.”

Our employees in the research and development department are driven by the pursuit of one goal: to continuously improve the pre-eminent Loesche vertical roller mill technology.

Prime targets for us are permanent improvement of R&D processes and implementation of the latest innovations to generate maximum mill reliability and optimum benefits for our customers. The development of the patented 2+2 and 3+3 roller system for cement and slag grinding is one of the most important examples of successful cooperation during the last decade. More than 100 mills of this system have already been sold; many of them are repeat orders due to satisfied customers. The newly developed 6-roller mill for cement raw material grinding with a capacity of up to 1,200 t/h is another excellent example.

Our R&D department has made it their mandate to constantly look for ways to make our mills even more efficient, safer, and kinder to the environment. The results of their theoretical and practical research lead to improvements in our technology which directly benefit our customers.

Using Loesche’s well proven grinding system with individually guided rollers, introduced under a 2-, 3- and 4-roller arrangement in the 70’s, the new 6-roller mills were designed to achieve the highest possible capacities. Strict reduction of roller mass motion to limit the dynamic loads on the foundation and the vibration level of mills has been achieved. The success of our developments is based on the synergy between theoretical and intensive experimental investigation at our research institute, as well as on industrially sized mills in cooperation with our customers. More information at www.loesche.com

Dipl.-Ing. Michael Keyssner
Head of Research & Development

Loesche GmbH · D-40549 Düsseldorf · Hansaallee 243 · Tel. +49-211-5353-0 · Fax +49-211-5353-500 · E-Mail: loesche@loesche.de
demands of the plant, it purchased another LM 46.2+2 plus Loesche’s first LM56.3+3 mill. The grinding capacity of the plant is 2.3 million tpa. The VRM combines energy efficiency with excellent drying capabilities. Dr Ahluwalia indicated that although increasing the size of the rollers and table still remains a bottleneck in raising the capacities of VRMs, Loesche’s concept of increasing the number of rollers while decreasing their size was a solution in the right direction.

Dalmia Cement (Bharat) Ltd has had 25 years experience of operating Loesche mills. Jayaraman Thirumeni, Deputy Executive Director (Operations), described in detail the operating performances of all the mills that had been supplied, beginning with a 49.20 tph LM 19.20 raw mill for limestone installed in 1981, the country’s first clinker mill, a 189 tph LM 46.2+2 C/S, which went into production in 1997, and other mills on the way up to the latest, the LM 56.3+3 C rated at 277 tph commissioned in March of this year. The author mentioned that while his company were experiencing some what he termed “hurdles” with some of the new mills, many solutions had been worked out with the help of Loesche, while the rest were being dealt with.

The Aditya Birla Group is the world’s number one supplier of viscose staple fibre and insulators, and the world’s largest producer of palm oil. It boasts the world’s most cost efficient producer of aluminium and copper, and is regarded as India’s fourth largest asset management company. The list goes on, but cement is the core business of Grasim Industries, part of the Aditya Group. Grasim manufactures 22% of India’s installed cement capacity in producing 31 million tpa, and is ranked 8th in the world league.

Aditya Cement’s Joint Executive President (Projects), Jagat Singh Rathee presented a detailed report on the Loesche VRMs that were running at three major plants. These included a LM 69.6 raw mill, a 53.3+3C/S for slag, a 53.3+3C for clinker grinding and a LM43.4D for petcoke/coal preparation.

In December 2005, work began on the renovation of Buzzi Unicem’s River 7000 project at Festus in Missouri, USA. A new 5-stage preheater/precalciner kiln system will replace two existing long dry kilns. This will increase the plant’s capacity by 1.4 million tpa up to 2.4 million t but at unchanged total emissions level. Giovanni Battista Auxilia’s paper described the first 100% redundancy concept utilising a Loesche 6-roller mill. The author outlined the requirements for the plant’s new grinding system. It had to be capable of grinding raw materials and cement (and slag). The system adopted had to consist of identical and interchangeable parts, regardless of the material to be ground, and a very low power consumption was required. The capacity of the raw mill had to be 540 tph and that of the finish mill 190 tph, and the system had to be capable of replacing the raw mill gear reducer in 24 h. Flexibility was essential for both the raw mill and the finish mill, with a wide range of numbers of rollers and roller dimensions. The finish mill was required to grind about half of the kiln production. The machines chosen were a LM 60.6 raw mill and a LM 53.3+3 finish mill.

Flexibility of the raw mill is assured by the adoption of the 6-roller mill, as it can also be operated in partial mode with 4 rollers. While nominal production is to be 540 tph, production in partial mode (80% of nominal) will be 432 tph and must be sufficient for feeding the kiln at a rate of 6700 tpd. The components, such as rollers, roller bearings and rocker arms and hydraulics are unified and interchangeable. The slide in slide out (SISO) concept will be used to ensure that the total stop time from failure to restart should not exceed 48 h.

‘Experience with Loesche mills for cement and slag grinding within the Holcim Group - a summary’, by
Hanspeter Fisch of the Holcim Group, provided an interesting appraisal of VRMs by one of the top international cement players. The author confirmed that there were 14 mills now in operation for the Holcim Group, with another six on order, and a number that are being considered at the project stage. Operating experiences of the mills currently running in Vietnam, Morocco, and Canada were given. He then outlined the challenges facing Holcim in using VRM technology. He pointed out that while the Group operated many VRMs for grinding cement and slag, there was still work to be done to improve reliability of the mills. Areas under investigation were:

- Stable mill operation (lower mechanical stresses).
- Mill design and process for stable operation.
- Modification of reducer design.
- Automation of mill including control loops.
- Training in mill operation and maintenance skills.

Suppliers had to actively cooperate in these areas.

**Saving costs**

Slide-in® technology was very much the theme of the paper by Chris Oesch of Loesche America (with co-author Luc Papillon of Ciment Quebec). This dealt with slide-in techniques employed at Ciment Quebec's plant in Canada and at an Eagle Materials plant in the United States. At the Quebec plant it had become necessary to upgrade the raw material grinding facilities. Three solutions were proposed: upgrade the existing mill, install a new mill by employing a new concept, or build a new grinding plant and install a new mill. The second option was chosen and a 3.8 m dia. mill plus high efficiency classifier were installed on the existing foundations using the new Slide-in® technique. The mill building had to be modified to accommodate the new mill. Tight working conditions were also experienced at the Eagle Materials plant, where Loesche America will be supplying a LM35.4 mill rated at 225 tph in November using the same technique. Cost savings made by employing Slide-in® technology were significant at both plants.

**Redundancy concept**

Other papers presented by representatives of the Loesche Group included ‘Redundancy Concept – not the only highlight from Loesche today’, which was a joint piece of work by Michael Keyssner and Dr Caroline Woywadt. The answer to the question, “what is the redundancy concept” was given as: “no kiln shut down even if the mill parts fail, no production loss and 100% safety in feeding the kiln and kiln production”. This is possible provided the mill design contains 100% redundancy in terms of throughput, and the solution is the six-roller Loesche mill. The authors described the advantages of this new mill and then went on to point out what had been the company’s long time seller since 1994. This is the LM46.2+2, while the best sellers for 2006 have been the 3+3 mills (14 x LM 53.3+3, 14 x 56.3+3). They also commented that the proportion of VRMs of all mill types for CS grinding was almost 13% and worldwide total VRMs sold were 185. Loesche has more than 50% share of the market, and up to August of this year the company had sold 107 VRMs.

One of Europe’s most modern slag grinding plants, in which a LM 46.2.2 has been installed, was described by Antoni Nolasco of Atlantica de Graneles y Moliendas A.A. from Bilbao, Spain. Delegates visited this plant during the weekend following the conclusion of the Symposium. Professor Jochem Stark from the Bauhaus-University in Germany produced an interesting paper on ‘Cement hydration, blastfurnace slag cement and concrete’. He began by asking, “what is concrete?”, and then moved on to describe and display illustrations of cement hydration. He also spoke about self-compacting concrete and finished by showing examples of concrete canoes in action!

**Other papers**

Other papers presented included:

- ‘Loesche coal mills in the Dillinger Steel plant for the production of coal dust for the injection into blastfurnaces’, by Dr Walter Hartig and Horst Zewe, Germany.
- ‘Ultra fine grinding petcoke for optimised phosphate drying’, by Jalal, Bouzian, Office Chérifien des Phosphates, Morocco.
- ‘The assessment of vertical roller mills as an alternative to conventional SAG ball milling in the mineral industry’, by Jeremy Mann, Anglo Research, South Africa.

**Post symposium**

As mentioned earlier, over the weekend following the Symposium, a number of delegates and wives/partners, travelled to Bilbao to see the latest slag grinding plant, while the rest were conducted on a scenic wine tour to Rheingau.