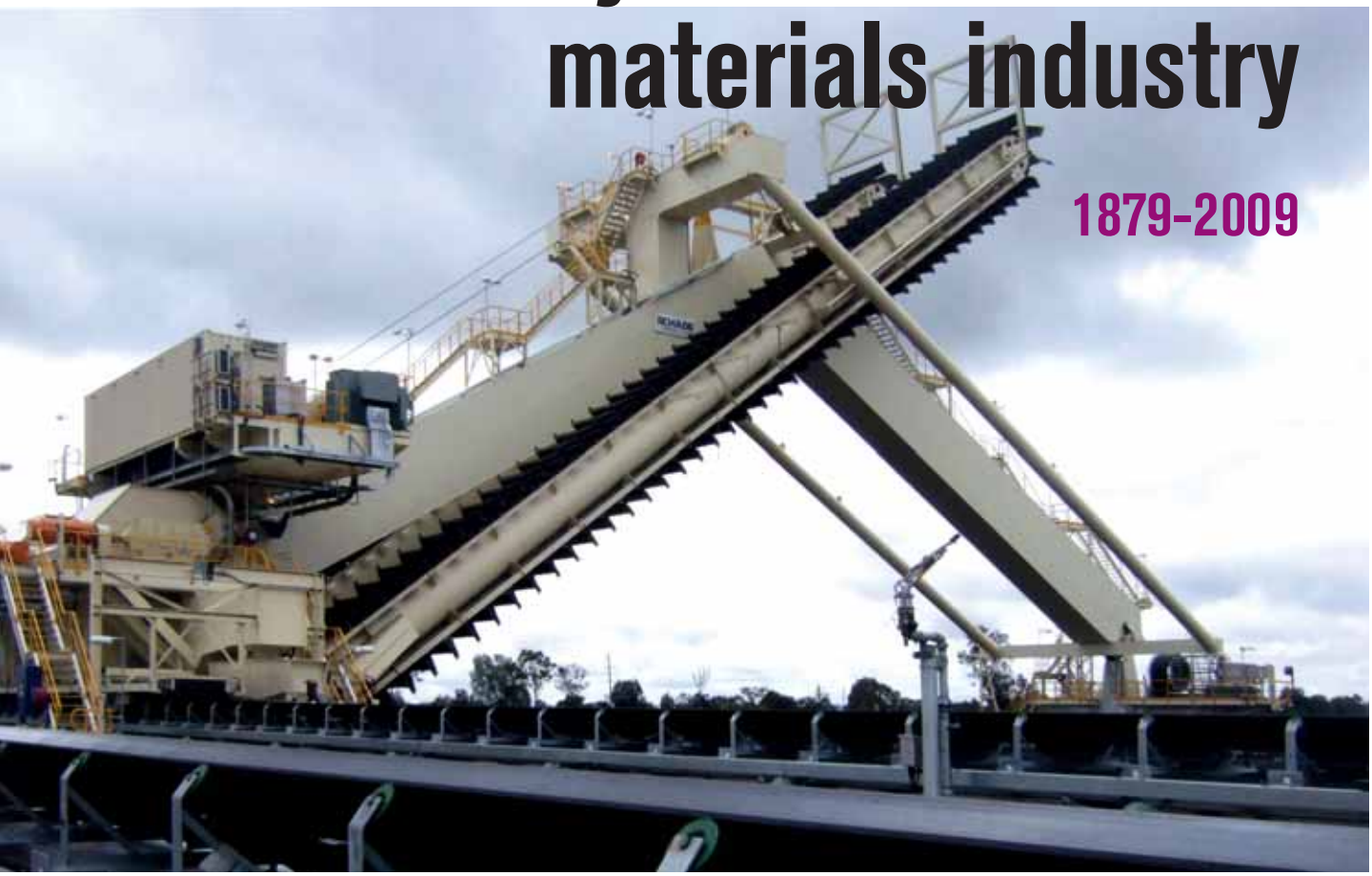
Schade celebrates 130 years in the bulk materials industry

1879-2009



With 130 years experience in the mining and allied industries, and since 1949 focused on the chain reclaimer market, Schade can justifiably claim market leader status with over 600 worldwide references and notably recent successes in China and Australia delivering ground-breaking state-of-the-art equipment to consumer and supplier.

In the picture above, a Schade twin boom reclaimer is seen operating at the recently commissioned Dawson Creek mining complex in Australia, recovering coal from strategic stockpiles with a peak design working rate of 4,000tph (tonnes per hour). From the mine site, the coal is shipped out of Gladstone and on to China to be imported into storage facilities, also from Schade.

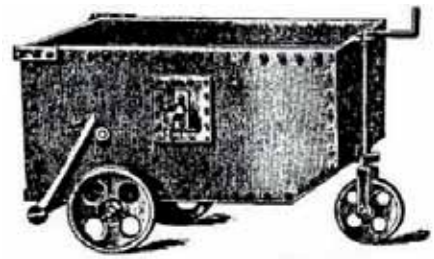
The 19th century saw massive changes in the Ruhr valley in Germany with a transformation from a mainly agricultural community to a vast iron making and coal mining industrial heartland. Such cities as Dortmund, famous today for their huge industrial complexes, in 1800 had populations of only around 4,000. By 1850 the mining industry had grown to employ about 12,000 miners producing some 1.5mt (million tonnes) of coal. However, during the second half of the century the Ruhr mining companies, and the steel-making plants upon which they depended, developed exponentially and by 1910 there were more than 400,000 miners producing some 110mt annually of high-quality steam and metallurgical quality coal. In terms of both quality and quantity, the Ruhr surpassed all others on the European continent.

The Schade Company was born into this fury of industrialization and with two major steel producers in Dortmund at the time, the Dortmunder Union and Hoesch plants, feeding from the vast coal mining complexes there was no shortage of demand for engineering services.

Company founder Gustav Schade.

Gustav Schade formed his new business in Dortmund in 1879 initially as a forge manufacturing wrought iron equipment including gates and other tools but rapidly developed into equipment for the fast expanding mining industry.

At this time coal was transported underground in small wagons often drawn by pit pony or in very low seams by men and for larger operations this equipment was required in large numbers representing excellent business for steel fabrication facilities such as Schade.



From these humble beginnings Gustav Schade developed his business expanding into the area of coal conveying in general.

By 1919 the company had outgrown the original smithy and decide to move to larger premises in the South of Dortmund to a new factory equipped with the latest and most modern machine tools to both expand production and improve efficiency.

During this period, the company developed a product range including heavy steel tracks and winding lift gear for deep coal mines, as well as continuous conveying equipment moving into the modern era of mechanized mining.

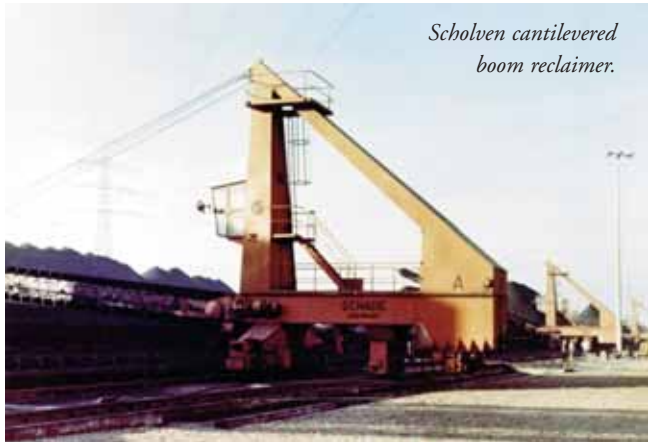
In 1929 Gustav Schade passed away and the company ownership was distributed among the family, but continued as a family-run business. After the Second World War, production was restarted building on the expertise gained in peace time. Not only was Schade active in the coal mining sector but in this post-war period took the opportunity to develop into the fertilizer industry in particular.

It was to the fertilizer industry that Schade introduced its first continuous reclaimer equipment based on the chain scraper technology.

This is a single cantilevered boom design and the major elements of this machine are recognizable in today's designs but much improved in detail and construction.

The next major milestone came in 1965 when Gerhard Fischer joined the business to become a partner shortly afterwards and from this point Schade began a planned market diversification programme which was to lead to considerable success in all major continuous process industries where large volumes of solid bulk materials must be stored and reclaimed.

These developments continued and in 1970 Schade were rewarded with an order for the VKR power plant in Scholven, now operated by E.ON. This design was based on a cantilevered boom system as illustrated below.



Scholven cantilevered boom reclaimer.

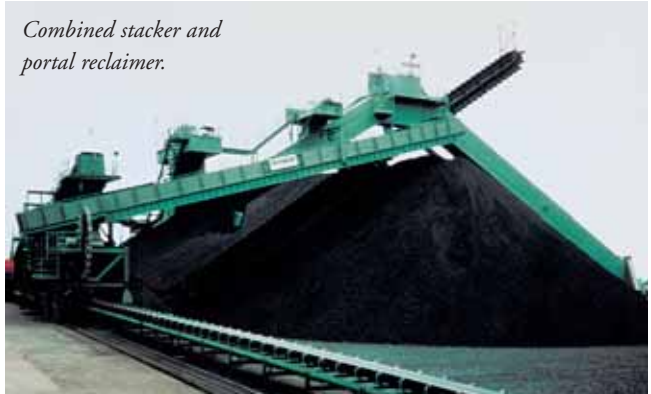
A more recent installation working in a power plant is illustrated below.

Modern cantilevered boom reclaimer.

In this installation a travelling stacker generates the longitudinal stockpile which is then recovered from the stockpile by the travelling reclaimer sharing the same rails.

The particular machine illustrated is similar in principle to the early design concepts but much improved in detail and construction and in this particular example designed with a reinforced scraper boom and drive system to recover coal reliably from frozen stockpiles efficiently under all weather conditions.

Over the years the reputation of Schade grew and for new power plant and coal terminals Schade developed an enviable reputation for reliability and availability and particularly innovation as illustrated below with the first combined stacker and reclaimer introduced in 1973.



Combined stacker and portal reclaimer.

In this case the portal frame carries both the stacker and reclaimer booms sharing common rail bogies and long travel gear.

Not only are both stacking and reclaiming operations integrated to a single machine, including a tripper ramp towed by the stacker/reclaimer, the two functions share a common stockyard belt conveyor for input and output.

The 1980s were exciting times for Schade with several 'firsts' including the then largest bridge type reclaimer with a rail span of 50 metres and a reclaim rate of 1,150tph and in addition the largest portal design with a rail span of 62 metres. During this period Schade also developed the circular storage concept which has proven very popular for modern power plant.

Strategic and blending bed stockpiles.

In parallel with these developments Schade perfected the combination of strategic and blending bed stockpiling and reclaim which formed the core of power plant coal storage and preparation design.

Illustrated above, a typical electricity generating station complex where coal is imported from a small dedicated river berth and transferred by belt conveyor and a Schade travelling stacker to two strategic stockpiles.

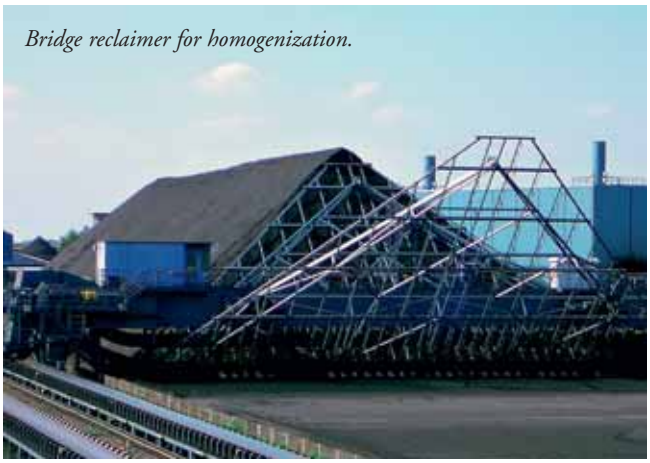
In this section the equipment may lay down individual segregated stockpiles from different sources for subsequent blending.

From the strategic stockpiles the coal is recovered by conventional Schade portal reclaimer and transferred to blending beds where it may be homogenized and the final output quality controlled ready for transfer to the daily use bunkers.

At the blending beds a travelling and luffing boom stacker, as illustrated below, is employed to deposit the material moving continuously along the length of the stockpile back and forth generating thin layers incrementally.

By laying down thin individual layers along the full working stockpile length the section of the stockpile will comprise slices of every material type and when recovered across the full stockpile section the output flow comprises elements of each layer and is fully homogenized.

A typical bridge reclaimer with reciprocating harrows each carrying tines that encourage the coal flow to the reclaimer conveyor.



Bridge reclaimer for homogenization.

Both for the strategic and blending stockpiles the management of the stacker and reclaimer is critical for the effective performance of the system as a whole.

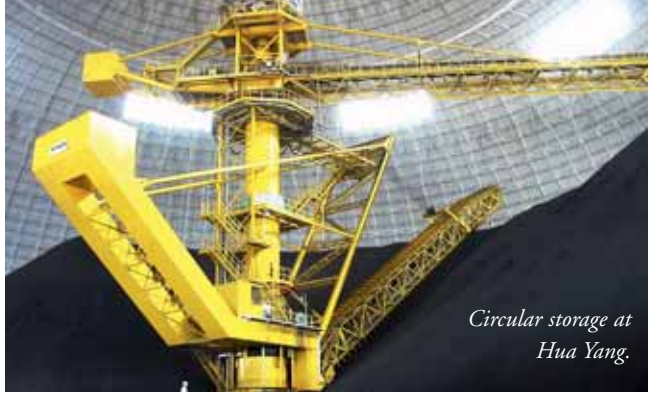
Luffing boom stacker for blending beds.

In addition to conventional longitudinal and circular strategic storages for high capacity stockpiling and reclaim Schade also offer bridge style reclaimers in the circular format achieving similar performance.

The concept is identical to the longitudinal designs except the stockpile must be wrapped around the central column. In this case the bridge reclaimer discharges through the stockpile centre much the same as the conventional circular storage systems as described also herein.

Clearly such a system is easily enclosed within a dome structure giving complete environmental protection, eliminating wind blown fugitive dust pollution and with improved aesthetics suitable for use in environmentally sensitive locations where external stockpiles would be unacceptable.


Circular storage with bridge reclaimer.


Circular storage at Hua Yang.

Schade continued to develop the circular storage concept and in 1997 was awarded the contract to build the first phase of Mai-Liao project in Taiwan.


Circular storage facilities at Mai-Liao (Taiwan).

Between 1997 and 2003 a total of eleven domes were constructed nine of which are for coal storage with two dedicated to salt storage for the plastics process, at 120 metres diameter these were the largest circular storages in existence.

Schade has reinforced its reputation in the fast-expanding China power industry with their latest order for Guangdong Yuedian Jinghai power plant project including two circular storages each of 120 metres diameter and including the Schade circular stacker and reclaimer system now firmly established as the *de facto* solution in this area of application.

This brings the total to 50 Schade storages of this type now operating in China and places Schade as the clear market leader in this sector.


Hua Yan import terminal and storage.

These storage facilities are all linked to local power plants always with a coastal or inland river harbour where ships to Panamax or even Capesize may be discharged using continuous ship unloaders.

The latest order follows a similar format and in this case with a holding capacity of around 250,000m^3 per unit. In common with all circular storages the stacking conveyor is supported to the central column with an independent slew ring allowing full 360° rotation operating automatically to generate the stockpile.

With a conveyor belt width of 2,000mm and speed of 3.5 metres per second the stacker is rated at 4,000tph continuously with a 10% surge overload capability. In this installation the maximum stockpile depth of 33.6 metres is attained by using an external retaining wall of depth 18.5 metres and an effective stacking radius of 40 metres.

These machines are based on the cantilevered reclaimer boom design but there is an alternative based on the Semi-Portal design as illustrated below at the new Ning Hai power plant handling coal with a stacking capacity of 3,000tph and a reclaim capacity of 1,500tph.

The next major milestone came in 2001 when Schade was integrated to the world-renowned Aumund Group located in Rheinberg just a short distance from Schade's home in Dortmund.

Aumund has a sales and service presence worldwide able to support Schade locally through its subsidiary companies in China, Hong Kong, India, Brazil, France, Poland, USA and most recently in Russia. Aumund is famous for its extensive range of bulk materials handling products bringing new opportunities for Schade to deliver integrated equipment packages.

Schade, now integrated to the Aumund Group, celebrates 60 years in the chain scraper reclaimer market with over 40 years of creative developments since the introduction of the first reclaimers to the power industry which really opened the way for high-performance systems in mining, terminals and power plant, a very important industry milestone.

This is not the end of the story since Schade is continually pushing the design boundaries and there is no doubt it is not far away from breaking present records with rail spans increased to over 70 metres and handling rates breaking the 4,000tph barrier.

The Aumund Group has provided the platform from which Schade products may be supported in critical markets worldwide with after-sales and service and spare parts access. Aumund is famous in the cement industry for feeders, bucket elevators and pan conveyors particularly for handling hot materials. Whilst Schade has been operating in the cement industry since 1975, with the first order delivered to Ketton Cement in the UK for a bridge reclaimer for blending limestone, the market coverage provided by Aumund opened new opportunities...

The association with the Aumund Group has given Schade the resources to develop and expand with confidence and maximize its true market potential.

Another Aumund Group success story. DCi


Ning Hai portal type circular storage.