

HAZEMAG



HAZEMAG Cement industry





Partnership

Cement industry

Cement is essential to maintaining the quality of life around our world. Cement is used and enjoyed in nearly all aspects of our daily lives; residential and commercial construction, roads, highways, bridges, dams, water and sewage treatment plants, airports and tunnels. While the average person pays little attention to its benefit, cement is making a major contribution to improving the quality of life for all of us.

With its process know-how, high quality – reliable machines and services, HAZEMAG plays an important and highly contributing role in the crushing and processing of the raw materials that ultimately result in this essential product we all call **cement**.

Partnership

Behind the operation of every HAZEMAG product is found a wealth of experience, backed by a level of partnership and product support that remains second to none. Our application knowledge, equipment flexibility and market competitiveness puts us in a unique position to react to your precise project needs. We call it “Partnership Unlimited – the HAZEMAG Way”.

Since 1946: Our journey started in 1946 with our introduction of the impact crusher. Today, our customers benefit from an extensive range of HAZEMAG services; realized in our industry knowledge, qualified experts, proven products, financial resources and innovative technologies and solutions. Now, some 70 years later, we have not forgotten our strongest growth asset; our customers that have looked to us as a proven, reliable partner. Your project starts with planning. As your partner we will introduce the correct equipment and systems. Our services con-

tinue with state of the art manufacturing facilities, equipment supply and delivery, on-site installation, commissioning, training and future spare parts support. Simply put, our partnership will be there, supporting your needs through-out the life cycle of your HAZEMAG equipment; be it a single crusher or a complete system.

Going Forward: The continued operation and reliable success of any HAZEMAG component or system is directly related to trained, knowledgeable plant personnel. HAZEMAG’s training concept and support services offer a common sense approach to meeting your needs. Our team of experienced, knowledgeable service technicians are there for you, ensuring that you know and understand your HAZEMAG equipment from every aspect; operation, service needs, safety and optimization.

Material analyses and tests

HAZEMAG offers a range of application support services found in our material testing facility. We have the ability to offer our customers a full scale testing program for the analysis and further understanding of their raw material. For example, we can conduct crushing tests for both fine and coarse grinding. Drying as well as a combination of drying and pulverizing tests can also be carried out with the latest technology and measurements systems. The complete program offers our customers important information and data in regard to through-put rates, wear costs, energy consumption and behavior characteristics for their raw material. These practical and comprehensive results are often looked upon as the basis for the investment decision.



Cement production

For the production of cement, first and foremost a blend of limestone and clay (or marl) is used. In addition, different additives or correction materials, such as quartz sand, materials containing iron oxide, gypsum, schist or similar are applied.

As complex and customized is the process of making cement, so are the systems and technologies that are required. A common factor, however, always remains in place: the basic material must be crushed.

In a vertical roller mill or ball mill, the pre-crushed materials are further ground. The optimum feed grain size for each one of these mills is different; each normally requiring different pre-crushing systems for the production of the correct feed granulation. If not approached correctly, such mistakes can lead to a significant rise in the needed energy costs associated for the comminution or material pulverizing process.

Complexity & Solutions: An important parameter for the production of cement is the LSF (lime saturation factor). The LSF is defined as the rate of the most important chemical component, which has to be kept a constant within narrow limits. By selecting the first stage crushing plant or system the process of influencing the LSF already begins.

Control over the components, such as the limestone and clay (or marl) is indispensable. In many cases, subject to the material characteristics and percentages of each, the limestone and clay can be processed together in a single crusher. Under this condition, a certain level of homogenization is already taking place. To achieve this, the selection of the proper equipment is of vital importance and will further optimize operating costs and the final product. This is ensured by the selection of the complete system, not just a single or individual component. For example, although a compressive type crusher operates with less energy and wear, due to its lower reduction ratio and larger product size, you are faced with the need to include an expensive secondary crushing system to meet the desired product size. Alternatively, under the proper raw material conditions, the flexibility and reduction ratio realized in the primary impactor can produce and offer major advantages. The key is to find that correct solution; at HAZEMAG you will always find what you are looking for – expertise, experience, a trusting partner and the latest proven technology.





Crushing Plant and Hopper Discharge Unit

The Crushing Plant

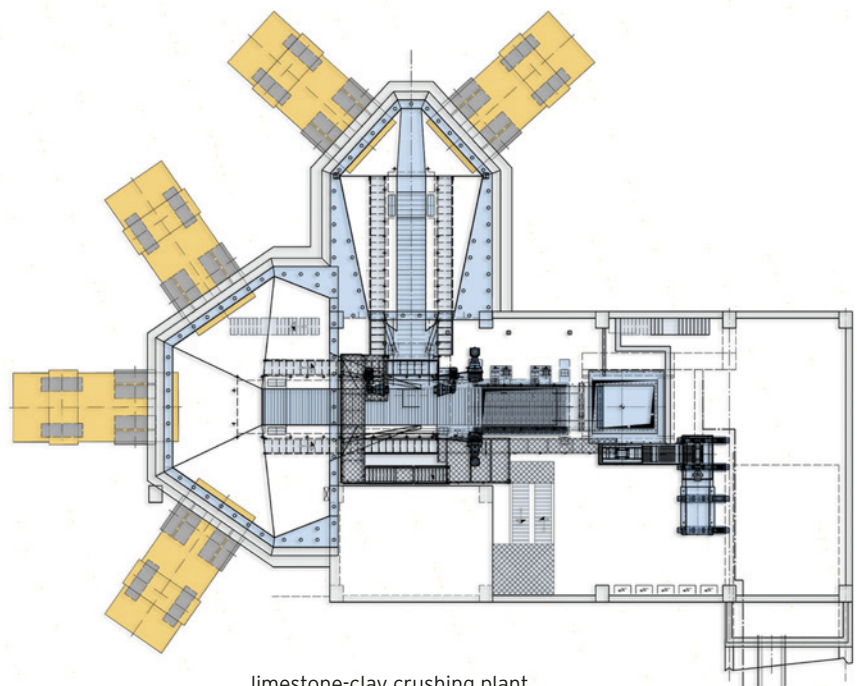
A primary pre-crushing plant normally consists of:

- feed hopper
- hopper discharge unit
- prescreening stage
- primary crusher
- crusher discharge unit

Depending on the characteristics and size of the feed material, these components must be designed in a manner that ensures trouble free operation, reliability and extended service life. These machines must

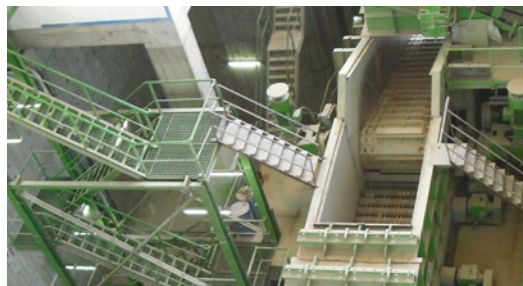
be engineered in a manner that ensures their robust or heavy duty design, allowing them to deal with the possible entry of metallic, foreign materials such as loader teeth, etc.

The characteristics of the raw material, moisture, inclusions of clays, compressive strength and chemical makeup highly influence not only the selection of aggregates, but also and especially the type of primary crusher that will be utilized. The consideration of mobility for the primary crushing plant is mainly influenced by the raw material resources and the associated transport distances.



limestone-clay crushing plant





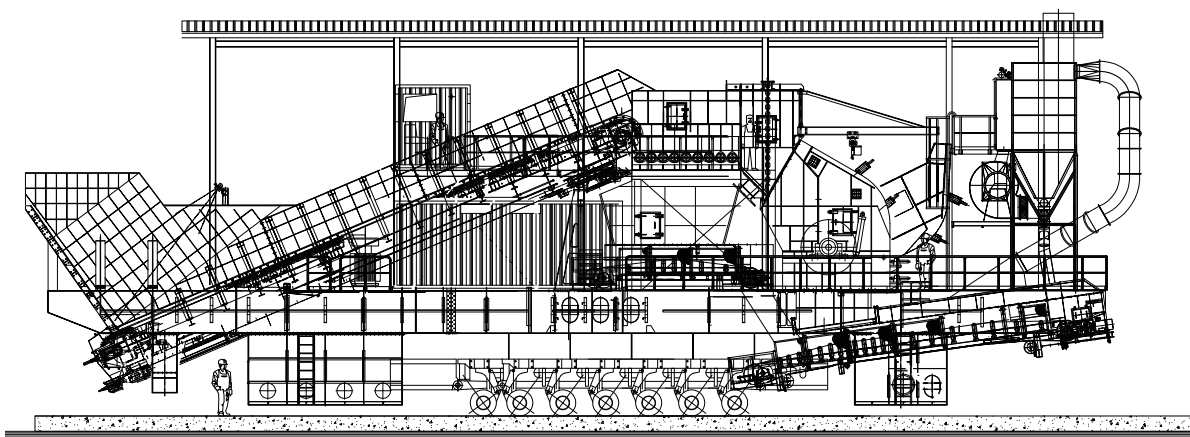
Hopper Discharge Unit

The design of the receiving hopper and its discharge unit play an essential and important role in the overall success of the crushing plant. The geometry of the receiving hopper must be in line with its discharge unit. The discharge unit, such as the

cement industry preferred apron feeder, must be in line and match the flow of the downstream unit. The apron feeder should be designed to convey the material at varying speeds and capable of doing so under varying load conditions.

From HAZEMAG's range of products

	Apron Feeder HAF	For the material transport and/or discharge from a feed hopper, mostly inclined, variable drive by means of planetary gearing with frequency-controlled electric motor.
	Push Feeder HPF	For the material transport and/or discharge from a feed hopper in horizontal conveying direction; infinitely variable control of the conveying capacity via the adjustment of stroke length and speed.
	Chain conveyor HHC	Chain conveyor, heavy or light-weight type; feed or discharge conveyors for feed hoppers, bins and so-called natural feed hoppers. Driven by spur gear and frequency-controlled electric motors.



semi-mobile limestone crushing plant





Prescreening Stage

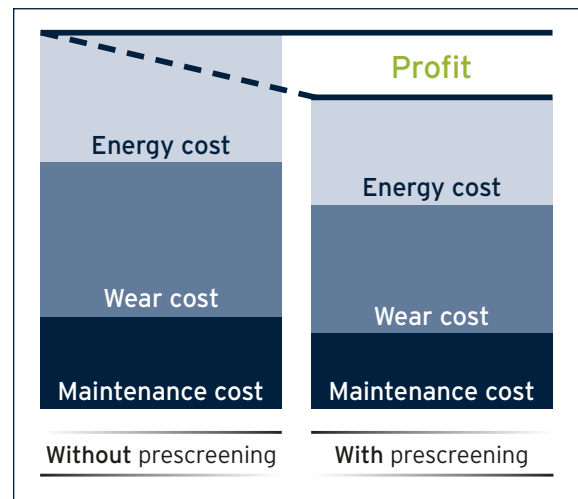
Prescreening Stage

Prescreening is an excellent way to remove lower quality, unwanted contaminations from the raw material stream. In doing so, benefits such as increased end product quality, reduced crusher wear and reduced energy costs are fully realized. Prescreening can also lead to the reduction and cost savings in regard to the size of the primary crusher, as the volume of material that needs crushed is reduced.

The prescreening stage should work independently, thus enhancing its success and high efficiency in removing the finer materials, while allowing it to successfully deal with adverse conditions, such as sticky components. When considering the prescreened material, in some cases blending it back together with the crushed material may be desired. However, under this condition some level of caution should be taken to ensure that the screening size (opening) is not too large, potentially allowing an excessive amount of oversized slabs to pass.

Under difficult raw material conditions, such as high levels of contamination, the flexibility of the scalping system can be enhanced and easily fulfilled by the HAZEMAG **VARIOwobbler**® HVW Roller Screen,

which offers hydraulic gap setting adjustment. The benefits of the **VARIOwobbler**® are easily realized, especially when the raw material contains a high level of variations. Taking everything into account, prescreening and the utilization of the **VARIOwobbler**® can provide the operating company with a very high level of operating benefits, increased product quality and reduced operating costs.



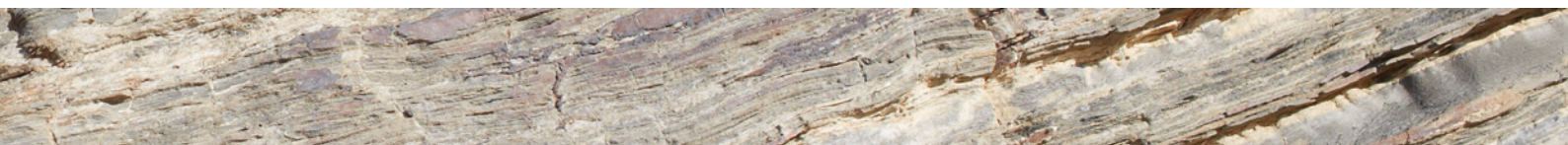
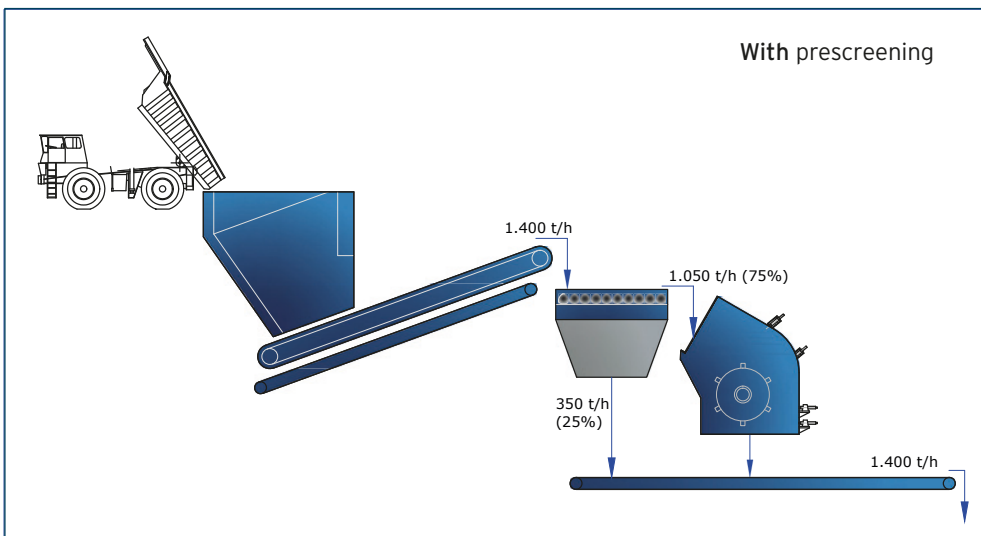
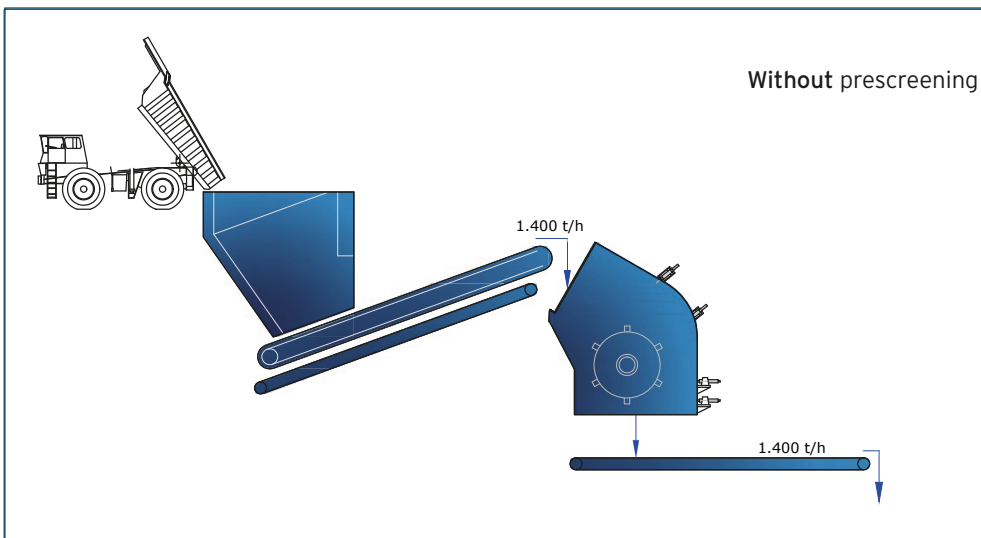
From HAZEMAG's range of products



Roller Screen | HRS,
together with
VARIOwobbler® | HVW,
where appropriate

For screening fines from the material flow; also available with adjustable gaps for different cut sizes (**VARIOwobbler**®). Optimum adjustment to different weather conditions, raw material properties and degree of separation required.











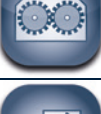


Primary Crusher

Primary Crusher

The main function of the primary crusher is to process the raw material, while reducing it to the desired size so that it can be conveyed and processed downstream in the raw grinding area without any

operating problems. Depending on application parameters, feed material and processing requirement, HAZEMAG has developed a range of crushing solutions.

From HAZEMAG's range of products

	Primary Impact Crusher HPI	For the crushing of medium-hard rock; high crushing degree, large feed size and high throughput rates. Each crusher can be fitted with the optional hydraulic impact apron control system (HAZtronic). This crusher is ideal for the production of a product size that is well matched to the feed requirements for the vertical roller mill.
	Primary Impact Crusher HPC	For the crushing of medium-hard rock; very high crushing degree, large feed size and high throughput rates. Each crusher can be fitted with the optional hydraulic impact apron control system (HAZtronic). This crusher is ideal for the production of a product size that is well matched to the feed requirements for the ball mill.
	Hammer Crusher HDS	For the crushing of medium-hard rock; very high crushing degree, large feed size and high throughput rates. This crusher is ideal for the production of a product size that is well matched to the feed requirements for the vertical roller mill or the ball mill.
	Sizer HCS	For the crushing of lower to medium hard rock; reduced fines in the end product and high ability to deal with wet, sticky material.
	Roll Crusher HRC or HHS	For the crushing of lower to medium hard rock; reduced fines in the end product and high ability to deal with wet, sticky material.
	Impact Roll Crusher HHI	For the crushing of medium-hard rock; excellent solution for high flexibility and simplified set-up (no foundations are needed), large feed size, suitable for sticky materials, true horizontal crushing with at-grade feed point and delivery of the material to the crushing stage by an integrated chain conveyor.
	Gypsum Impact Crusher HGI	For the crushing of gypsum; ideally suited for the production of a product size that is well matched to the vertical roller mill or the ball mill.





Secondary Crusher

Depending on the selection and design of the primary crusher, the addition of a secondary crusher may be required, as a manner of achieving the correct feed size for the vertical roller mill.

Additionally, the secondary crusher can also function on a direct feed basis for the processing of smaller feed sizes. These materials are often found with coal, pozzolana, iron ore, schist, clay and marl.

Another consideration for the secondary crusher has been found in its use to increase the overall plant output and efficiency; achieved by a further reduction of the ball mill feed size. In this case, crushing or drying and grinding has resulted in proven benefits associated with the operation and performance of the ball mill.

From HAZEMAG's range of products

	Secondary Impact Crusher HSI	For the crushing of medium-hard rock with a higher degree of wear intensive materials; each crusher can be fitted with the optional hydraulic impact apron control system (HAZtronic).
	Tertiary Impact Crusher HTI	For the crushing of medium-hard rock with a higher degree of wear intensive materials; reversible rotor; hydraulically adjustable impact aprons and grinding paths.
	Roll Crusher HRC or HHS	For the crushing of lower to medium-hard strength materials; excellent manner of reducing the fines in the final product; well suited for sticky and wet materials.
	Sizer HCS or HFB	For the crushing of lower to medium-hard materials; excellent manner of reducing fines in the final product; well suited for sticky and wet materials.
	Hammer mills HUM or HNM	For the crushing/grinding of lower to medium-hard materials; optional ability for a combination of drying and grinding simultaneously in one work step.





Dryers

Dryers

Depending on the moisture of the raw materials, such as clay, marl, chalk etc., driers are also utilized for reducing the needed drying process in the raw grinding area. If utilized, driers are positioned after crushing and in front of the raw grinding mill.

From HAZEMAG's range of products

	Rapid Dryer HRD	Convection dryer with hot gas as drying medium in direct current method with a short dwell time and a high heat economy.
	Hammer mills HUM or HNM	For the crushing/grinding of lower to medium-hard materials; optional ability for a combination of drying and grinding simultaneously in one work step.
	Rotary gate valve HGV	Continuously conveying feed and discharge unit for processes which are carried out under a "slight" low pressure, such as dryers, filters, classifiers, hammer mills etc.
	Pendulum flap gate HPV	Feed and discharge unit for processes which are carried out under a "slight" low pressure, such as dryers, filters, classifiers, hammer mills etc.





Service/Parts Support

Spare parts service

The availability of machines and plants has a significant influence on the profitability of a company. Achieving this is the result of knowledge, preventative service programs and the application of high quality, HAZEMAG original spare parts, always in stock and backed by an experience team that is always available to help. In our modern, DP-controlled spare parts inventory in Dülmen, current HAZEMAG machines and customers are supported by an extensive inventory, well over 20,000 different spare and wear parts.

In this regard, HAZEMAG's delivery service guarantees a short-term availability of all spare parts. If a service technician is required for the professional installation of the spare parts or if a qualified consultation is desired, you are at the right place at HAZEMAG.

Inspection Contracts

The continued operation and reliable success of any HAZEMAG component or system is directly related to trained, knowledgeable plant personnel. In this regard HAZEMAG offers customized inspection contracts, ensuring that our customers have the very latest input and assistance from a factory point of view. Depending on the need of the customer, these contracts can vary, but are normally structured to provide a periodic inspection of your HAZEMAG equipment. Preventative and condition based maintenance inspections are performed by qualified HAZEMAG technicians, contributing to reduced downtime and the avoidance of major repairs.

This partnership ensures that the HAZEMAG machine is providing the maximum yield and that our customers have the advantage over the competition.

Repairs – Modifications – Assemblies

When needed, repairs and machine modifications can be carried out by HAZEMAG professional service technicians, if necessary in shift work around the clock. These highly-trained and motivated service technicians are at your disposal 24 hours every day.

Don't take a risk, always insist on genuine HAZEMAG support: spare parts, service, on-site inspection contracts and around the clock assistance.



HAZEMAG



HAZEMAG – for better cement.

HAZEMAG & EPR GmbH
Brokweg 75 · 48249 Dülmen, Germany

+49 2594 77-0
+49 2594 77-400

info@hazemag.de
www.hazemag.com