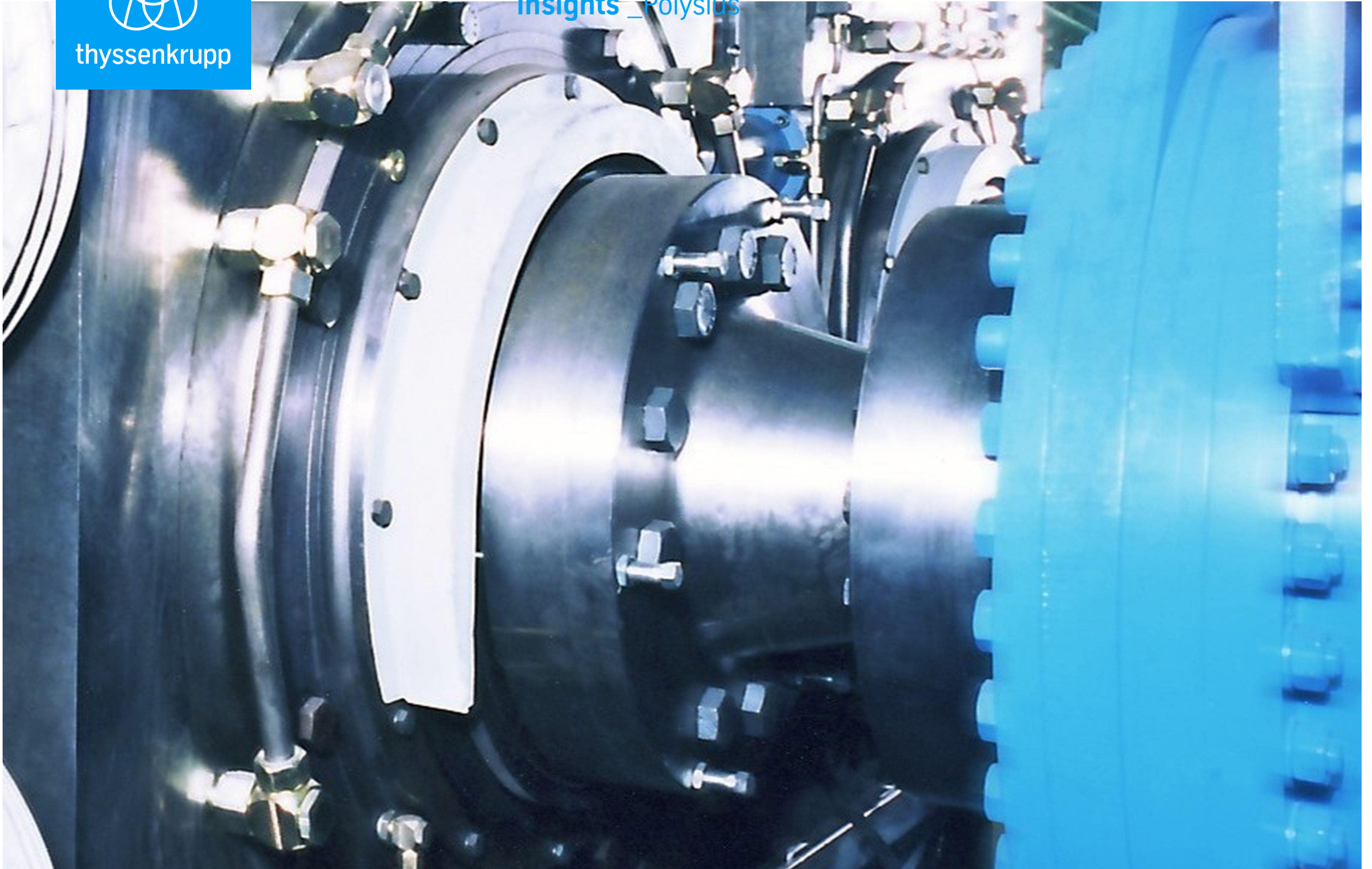




thyssenkrupp

Insights _ Polysius



polycom® HPGR - cutting-edge technology in the cement industry

In the cement industry, high-pressure grinding rolls have proven their worth - not least due to their low energy requirements - and have been used worldwide for decades for grinding cement raw material, cement clinker, and granulated blastfurnace slag. The efficiency of the polycom® HPGR is outstanding! Compared to a roller mill, it can save up to 20 percent of the energy required for grinding, and even up to 50 percent compared to a conventional ball mill. Since it does not require water injection for grinding bed stabilization, valuable resources are saved. The

polycom® HPGR is not only convincing in new plants, it can also be installed in existing cement plants - capacity increases of existing ball mills between 25 % and more than 100 % are possible.

These advantages convince cement producers all over the world. In recent decades, more than 250 polycom® high-pressure grinding rolls have been commissioned in the cement industry as an integral part of a polysius® grinding plant - in the current fiscal year alone thyssenkrupp has already received eight orders about further polycom® grinding plants.

The polycom® HPGR grinds the raw materials and binders with the help of two counter-rotating roll bodies. Between these rolls, even the hardest material is efficiently ground at high pressure. In addition to its energy efficiency, the polycom® HPGR impresses with its high availability and a very low wear rate of the roll body surfaces.

The compact roll units of the polycom® HPGR are supplied completely pre-assembled and can be inserted directly into the machine frame at plant side. This reduces the time required for the assembly of the entire grinding plant to a minimum. For production, maintenance and servicing, thyssenkrupp Industrial Solutions has several workshops and service centers worldwide.

“The polycom® HPGR is designed in such a way that all components are optimally accessible during assembly, maintenance and servicing. In addition to optimizing the wear protection concept of the roll bodies and a new bearing lubrication system, we are also continuously developing the process technology of the entire polycom® HPGR grinding plant.”

Dr. Stefan Diedenhofen, Senior Project Manager, Grinding Technology

The polycom® HPGR is configured individually, depending on the material to be ground and its properties, the grinding process, and the specific requirements of the end product. In addition to the machine, the entire grinding system is also considered during the planning phase. This makes it possible to find the most efficient overall solution for the customer in terms of capital and operating costs.

The separate process steps of grinding, classifying, and drying are a decisive advantage, as the overall process can be quickly adapted to specific customer requirements. Fluctuations in the ground material can thus be easily compensated and different requirements for the end product can be quickly implemented.

Flexible design takes customer requirements into account

High-pressure grinding is particularly suitable for brittle raw materials with high grindability, moderate moisture and high abrasiveness. The outstanding wear protection concept of the polycom® roll bodies can be selected to meet the constantly increasing requirements at any time:

- Forged/welded roll bodies (low capital expenditure)
- Composite cast roll body (premium quality for maximum service life)
- Roll body with carbide pins (low maintenance costs)

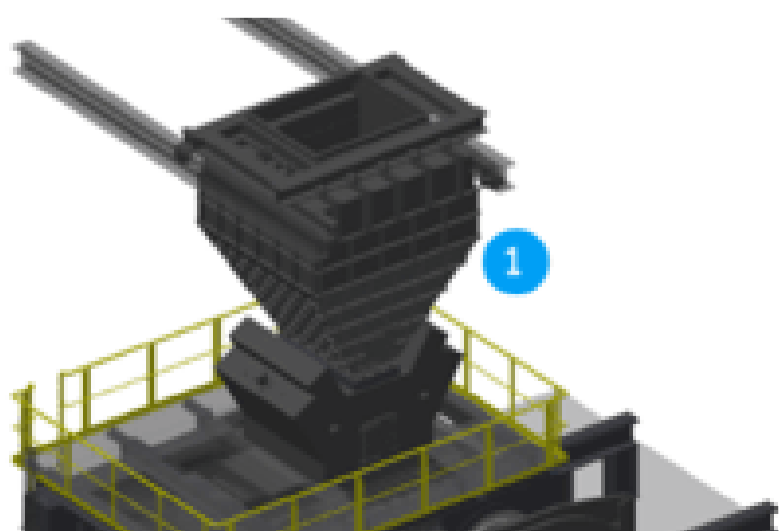
The selection of the appropriate approach depends on the following factors:

- Properties of the material used (specific wear rate, grain size)
- Process conditions (application, grinding process, required grinding pressure)
- Customer requirements (capital costs, maintenance and repair costs)

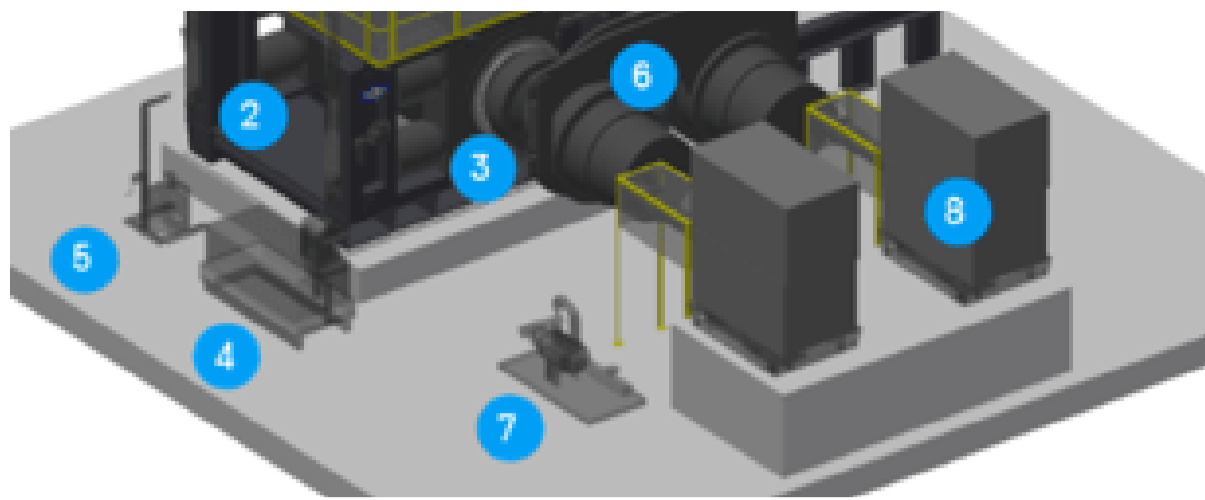
polycom® HPGR + sepol® classifier - combi- grinding system for cement clinker saves up to 40% energy

Modern polysius® grinding systems for cement applications are often designed as combi- grinding systems consisting of a polycom® HPGR, a static-dynamic sepol® separator, and a ball mill. This design enables an optimal interaction of both grinding processes in terms of energy efficiency and product properties.

The greater the grinding work performed by the polycom® HPGR, the greater the energy savings. The efficiency of high-pressure grinding also increases as the grindability of the material increases. Therefore, a combi-grinding system can save up to 40 percent of the required energy compared to a conventional stand-alone ball mill system.



- 1 Mill feed system
- 2 Machine frame
- 3 Roll unit
- 4 Hydraulic system
- 5 Grease lubrication unit
- 6 Gear box with torque support



- 7 Oil cooler / lubrication unit
- 8 Main drive

Design of the polycom® HPGR

The bottom line: The polycom® HPGR has - under suitable conditions - a technically as well as economically superior concept compared to conventional systems. As a central component of a modern finish grinding plant, the high-pressure grinding roll mill consumes only 40 to 50 percent of the energy compared to the classic ball mill and is thus the most efficient grinding system available on the market. The efficiency of the polycom® HPGR and a grinding and classifying system optimized for the respective application reduce energy consumption by up to five kilowatt hours per ton produced, for example, in cement raw material grinding. The outstanding wear protection concept of the polycom® roll bodies reduces the wear rate on their surface to a minimum. Within the scope of rebuild or expansion projects of existing ball mills, the polycom® HPGR can be used to extend the existing system to a pre- or combi-grinding.
