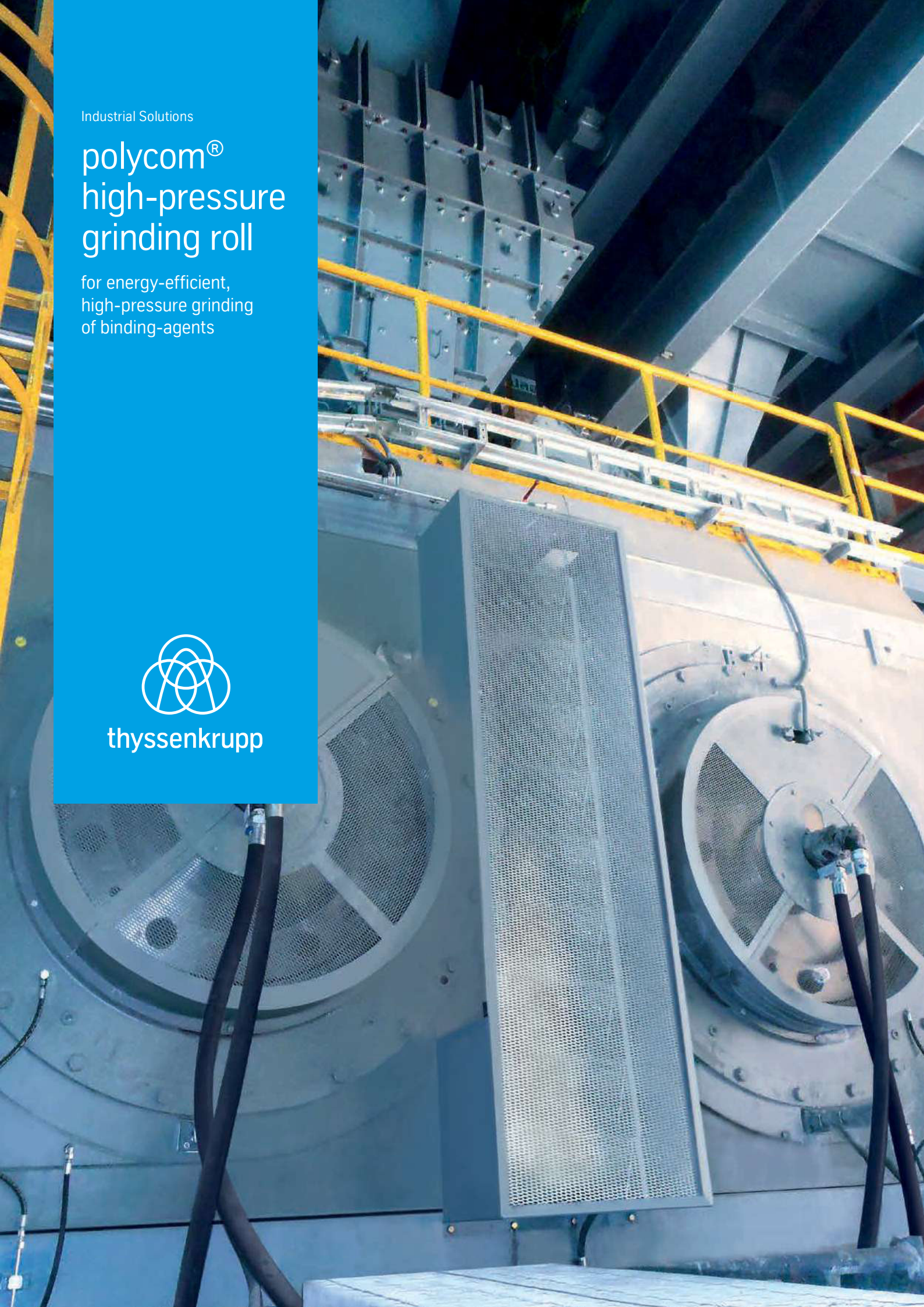
Industrial Solutions

polycom® high-pressure grinding roll

for energy-efficient, high-pressure grinding of binding-agents



thyssenkrupp

Modern polysius® binding-agents grinding plants with polycom® high-pressure grinding rolls are characterized by maximum availability and – in comparison with conventional grinding systems – much lower specific energy consumption. Virtually slip-free grinding in the grinding gap reduces the wear rate to a minimum. Via the separate process-specific steps of grinding, separating and drying, individual process optimization of the grinding plant is possible.

A rolling success

The performance of polycom® high-pressure grinding rolls throughout the world is second to none, even when it comes to the toughest applications in the cement industry.

For decades, polycom® high-pressure grinding rolls have been used successfully in the grinding of raw materials and binding agents. polycom® HPGR grinding is based on the principle of supplying the material to be ground to two counter-rotating rolls via a feed system. These rolls draw the feed material into the gap between them, where it is ground under high pressure. A hydro-pneumatic system generates the required grinding pressure of up to 250 MPa.

The grinding process produces compacted cakes containing a high proportion of fines, as well as coarser particles with cracks in them. These compacted cakes are broken up, separated and, if necessary, subjected to further grinding.

Design of the polycom® high-pressure grinding roll

The polycom® consists of the following main components:

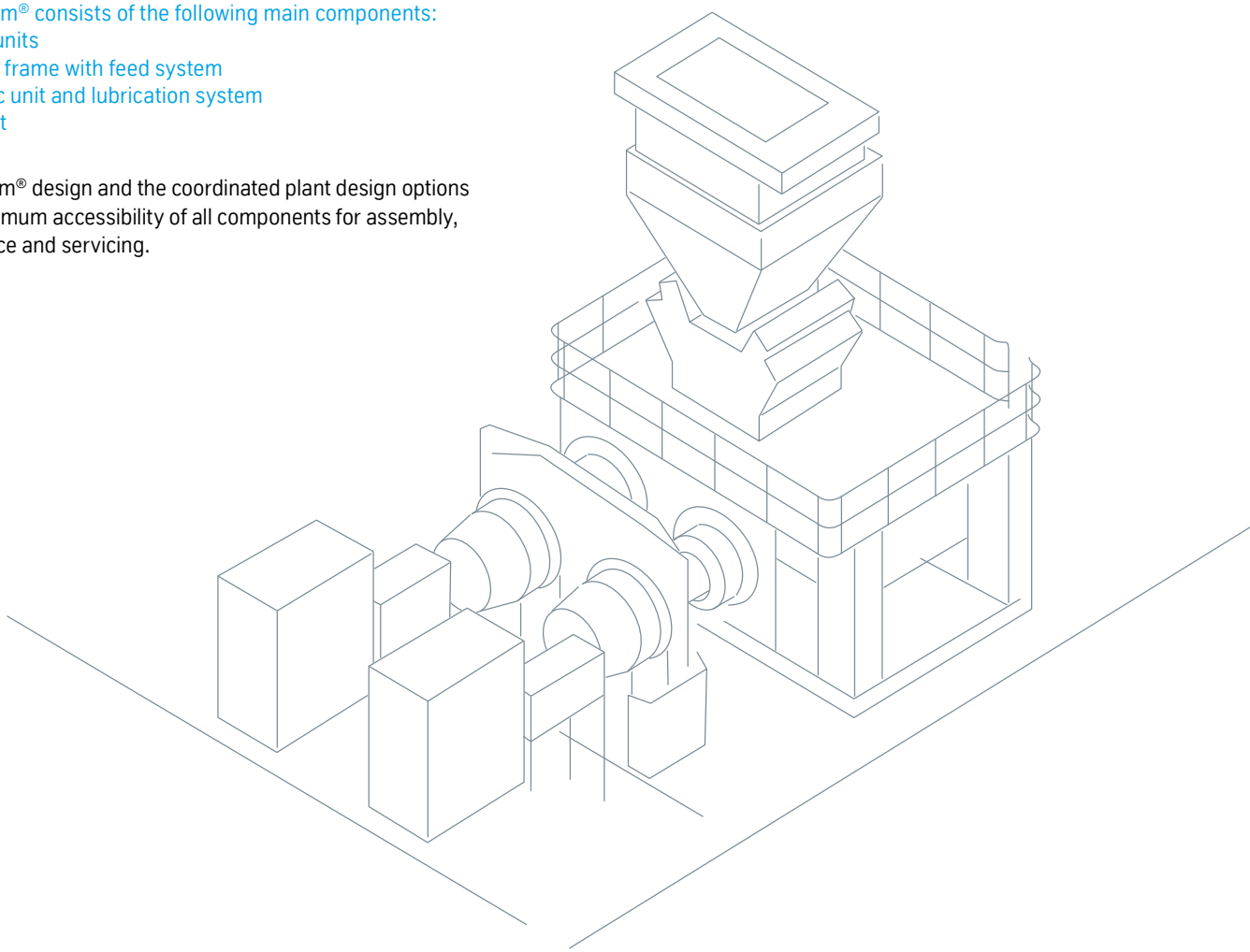
- two roll units
- machine frame with feed system
- hydraulic unit and lubrication system
- drive unit

The polycom® design and the coordinated plant design options ensure optimum accessibility of all components for assembly, maintenance and servicing.

Grinding of binding agents

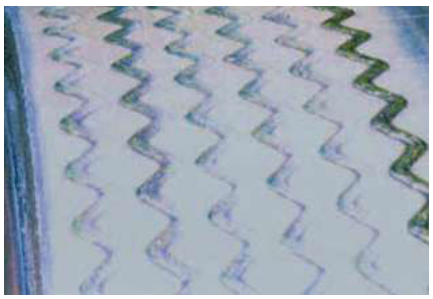
High-pressure grinding of binding agents is suitable for a wide variety of requirements:

In cement manufacturing, polysius® binding-agents grinding plants with polycom® high-pressure grinding rolls are mainly implemented in combination with a ball mill. This combination in conjunction with a static-dynamic sepol® separator allows optimal interaction of the two grinding processes with regard to energy efficiency and product characteristics. The polycom® also makes a convincing choice in the case of applications in the field of granulated blast furnace slag grinding, for example. Via the integration of a feed-specific drying facility in the sepol® separation system, the polycom® can be operated in this case as a finish grinding plant.



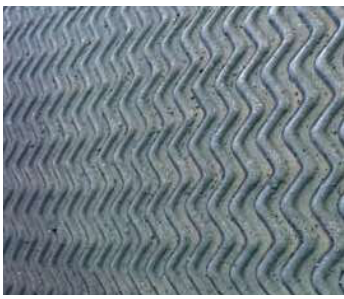
Wear and tear - not with us!

The compact roll units of the polycom® are delivered fully pre-assembled and can be inserted directly into the machine frame. This reduces to a minimum the time it takes to assemble the complete grinding plant. For manufacturing, maintenance and servicing, thyssenkrupp Industrial Solutions has workshops and service centers available throughout the world.



Forged/Welded roll bodies for low capital expenditure

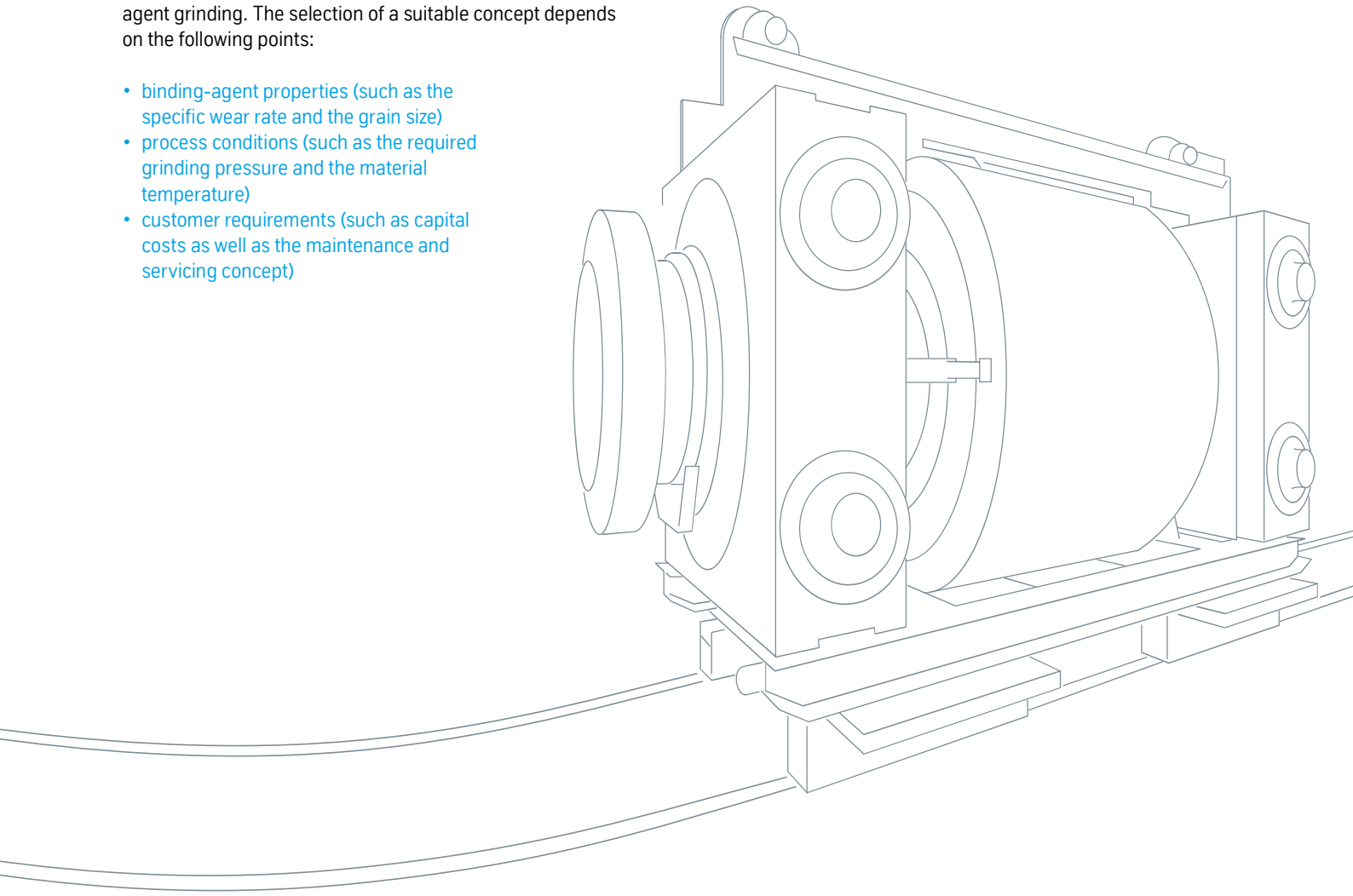
Autogenous wear protection forms between the profiles welded onto the roll body surface. The expected service life of a forged roll body with multilayer welded-on hardfacing is limited due to the material properties.



We are continuously developing the ground-breaking wear protection concept of the roll bodies of the polycom® to constantly keep abreast of ever-increasing demands.

Various wear-protection concepts are available for binding-agent grinding. The selection of a suitable concept depends on the following points:

- binding-agent properties (such as the specific wear rate and the grain size)
- process conditions (such as the required grinding pressure and the material temperature)
- customer requirements (such as capital costs as well as the maintenance and servicing concept)



Premium-quality compound-cast roll bodies for the highest demands

Durable compound-cast roll bodies (ductile main casting with an outer hard layer of extremely high compressive strength) guarantee maximum service life, even in the case of exceedingly high specific wear rates. Maintenance work is limited to maintenance of the profiles welded onto the roll body surface and between which autogenous wear protection forms.

Roll bodies with hard metal studs for low maintenance costs

Roll bodies with hard metal studs can be a useful alternative for binding-agent grinding. They are best suited to low grinding pressures and high specific wear rates. If necessary, individual studs can be replaced.

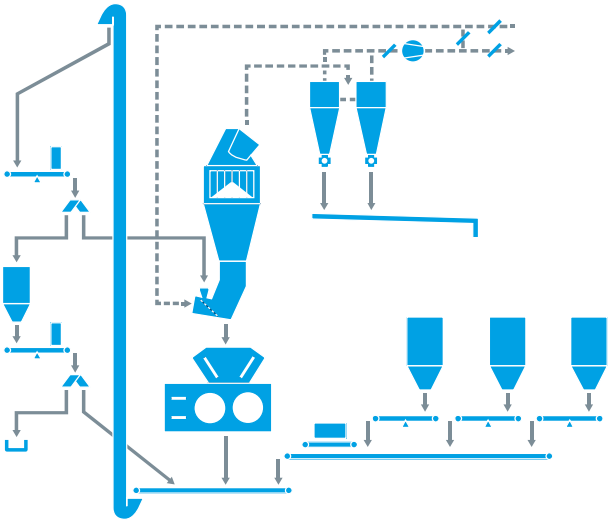
Full of energy – but efficient!

Combining a polycom® high-pressure grinding roll and a static-dynamic sepol® separator in a finish grinding plant for binding agents increases energy efficiency significantly.

As the grindability of the feed materials increases, so does the efficiency of the high-pressure grinding – and the polycom® reveals its full potential. In these cases, compared to a roller mill, up to 20 percent of the energy required for grinding can be saved; compared to a conventional ball mill, savings of up to as much as 50 percent are possible. Use of the high-pressure grinding roll for finish grinding permits maximum energy savings.

When the high-pressure grinding roll is combined with a ball mill, the polycom® achieves energy savings of up to 40 percent in comparison with conventional ball mill systems. In the case of existing plants, output can be increased by more than 100%.

Via the separate process-specific steps for grinding, separating and drying, the overall process can be very easily and quickly adjusted to suit your requirements. Fluctuations in the material to be ground can therefore easily be compensated for, and rapid changeover between different materials or different finished-product requirements is possible.



The polycom® grinding plant can be custom-engineered in accordance with the production requirements and the local conditions.

One design – many options

When grinding binding agents, a wide variety of process-related demands are placed on the grinding system. This is where the polycom® demonstrates its full flexibility.

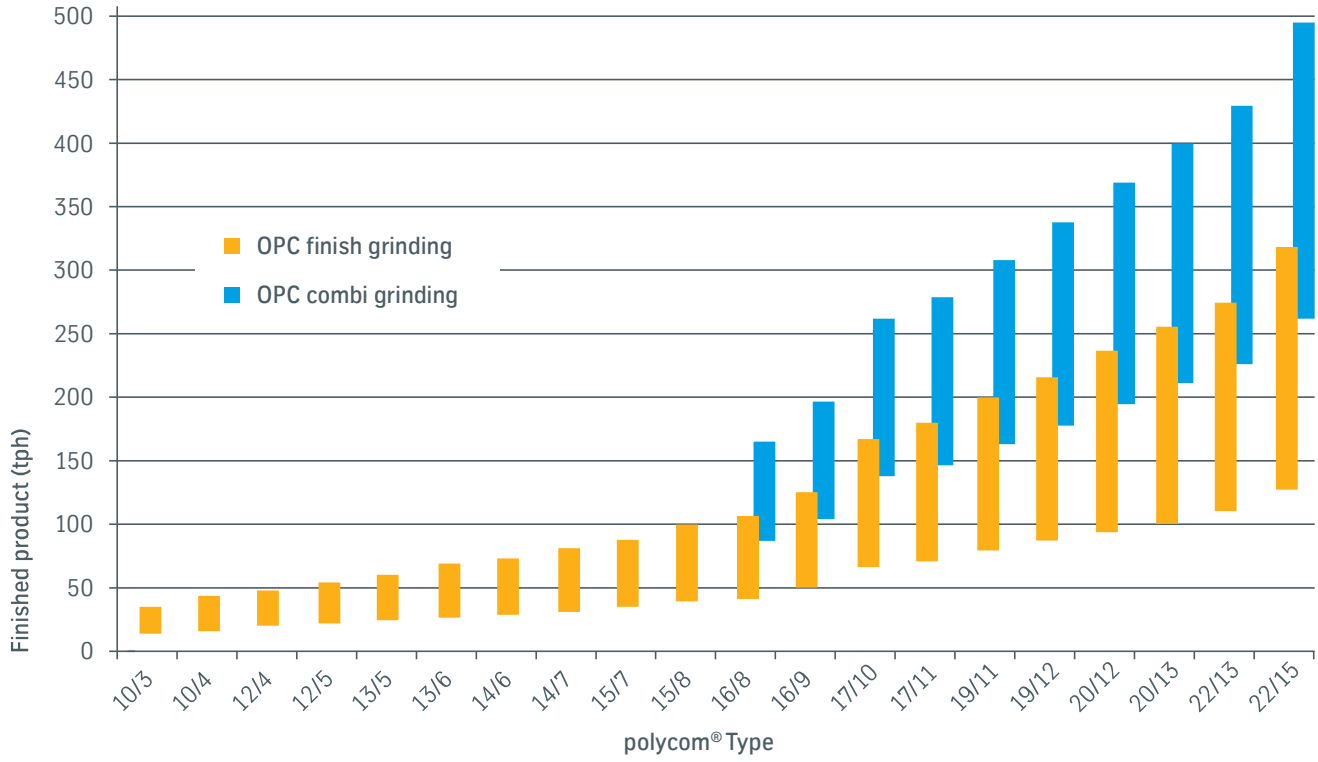
What's more: in addition to the machine, we also consider the entire grinding system during the planning stage, in order to find the most efficient overall solution in terms of capital and operating costs.

The polycom® is individually configured according to the material to be ground and its properties, the grinding process and the specific requirements placed on the finished product.

We tailor the following to the respective application:
- roll body diameter
- roll body width
- roll body circumferential speed
- grinding pressure

Size	1	2	3	4	5	6	7	8	9	10
Type	10/3 10/4	12/4 12/5	13/5 13/6	14/6 14/7	15/8 15/8	16/8 16/9	17/10 17/11	19/11 19/12	20/12 20/13	22/13 22/15
grinding power [kN]	3,400	4,300	5,700	7,000	8,600	11,000	13,500	17,000	20,000	26,000

polycom® high-pressure grinding roll for clinker grinding in finish-grinding mode and combi-grinding mode (with ball mill)



Curious to find out more?
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