Smarter Mining Needs
Smarter Service

thyssenkrupp

Mixed gear? No problem.

One partner. One plan.

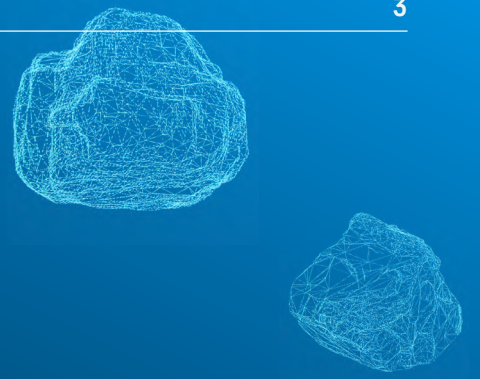
engineering.tomorrow.together.

Smarter Mining Needs Smarter Service

Not because there's a new machine. But because there's a smarter way to rethink everything between the rock and the return.

It starts with understanding the process – through audits that reveal what really holds back performance. It continues with material testing, so decisions are based on data, not assumptions. Service becomes a strategic asset when it's built around real conditions in the field. Durability improves when the right parts arrive at the right time – built to last, built to fit. And even complex, mixed systems turn into opportunities when modernization follows a clear path. Every step is connected. Every improvement is made to last.

This isn't just better support.
This is smarter mining –
and here is where it starts!

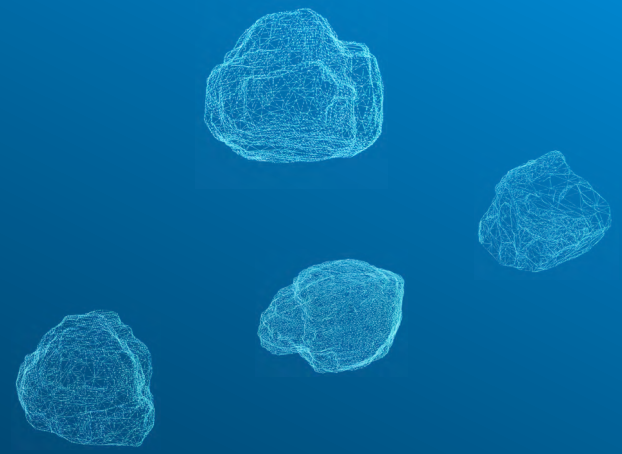


Smarter Mining Offerings

	Audits (process / mech.) and Field Services	Spare Parts	Wear Parts	Modernizations: Revamps	Modernizations: Single Machine Business
HPGR/polycom®	●	●	● ★	●	●
Crusher/Apron feeder	●	●	●	●	●
Tube mills	●	●	●	●	●
Kiln/Drums	●	●	●	●	●
dorol	●	●	●	●	
polab® laboratory automation	●	●	●	●	●

● Our offerings ★ Mobile Service Center

Process audit service packages



Trouble shooting

- **Root cause analysis** for sudden machine or plant issues
- **Expert evaluation** of measurement data and logs
- **Fast localization** of weak point(s)
- **Immediate corrective actions,** if possible
- **Inspection report** with:
  Concrete solution proposals
  Recommendations for further steps

Service package I (SPI) (basic assessment)

- **Assessment** of current conditions in a defined plant section
- **Manual sampling** and review of operation records
- Evaluation of **key process data**
- Creation of **energy and mass balances**
- **On-site discussion** and summary of results **on site**

Service package II (SPII) (advanced study)

- **Detailed report** compiling potential optimization measures based on SPI
- **Feasibility analysis** of implementation options
- **Assessment of expected impact on** process performance
- **Comprehensive material testing** campaign at R&D

» **All-in-One Service.** Backed by **OEM Know-How** and a Strong Engineering Backbone.

Scope of Services – HPGR Process Audit

1. Audit Objectives

- Evaluate the performance of the existing polycom® grinding circuit.
- Identify operational bottlenecks and mechanical limitations.
- Determine the maximum achievable throughput.
- Ensuring optimized operation of the polycom®

2. On-Site Testing and Measurements

Operational investigation to assess and optimize:

- Specific grinding force
- Power draw
- Specific throughput and energy input
- Checking the metal detectors for proper function
- Any other plant specific operational challenges

Adjustment of the polycom® machine setting:

- Spring curve parameters
- Chute width
- Hydraulic pressure
- polycom® internal control loops

Sampling and particle size distribution analysis:

- Sampling for screen efficiency evaluation

Scope of Services – HPGR Process Audit

3. Mechanical Inspection

Visual inspection of the polycom® units:

- Roller wear and condition assessment
- Cheek plates check and adjustment
- Feed chute dimensions and wear
- Overall condition of the machine

4. Laboratory Testing (thyssenkrupp Polysius R&D Center, Germany)

Sample preparation and testing:

- Mineralogical analysis (XRD)
- Abrasion testing (ATWAL)
- High-pressure grinding tests (MAGRO)

5. Data Analysis and Evaluation

Determination of:

- Specific throughput ($\dot{m}$)
- Circulation factor (cf)
- Specific energy input (Wsp)
- Comparison of lab vs. industrial performance
- Evaluation of screen efficiency
- Identification of system bottlenecks:

» **All results will be summarized in a detailed technical report.**