



## Improving efficiency and energy use in mining processes through dynamic modelling of HPGRs

**High Pressure Grinding Rolls or HPGRs play an important role in the raw material processing industries, for both the mining industry and the cement industry. The technology was patented in the 80ths but is still not fully understood.**

The HPGR utilizes an energy efficient form of breakage (particle bed compression) and is a key part of improving the sustainability of the mining industry. However, The state-of-the-art modelling of the equipment is limited, and better fundamental models are needed for optimizing their performance. The HPGR is a huge processing machine (7MW) able to handle up to 3000 tph. The rock material is crushed between two rollers that are supported by a hydraulic system. Most common applications include cement production and minerals processing of platinum ores.

The aim of this project is to create better fundamental and mathematical models of the operation of an HPGR. The model can be used stand-alone or in a dynamic (quasi-static) process simulation. Large dataset are available and interaction with equipment developers and manufactures will be arranged during the project. Main focus will be on modelling and Matlab/Simulink but other approaches will also be explored.

Supervision is supported by international experts in the field.

### Literature recommendation:

A Review of the Modelling of High Pressure Grinding Rolls, Rashidi, Rajamani and Fuerstenau, KONA Powder and Particle Journal No 34 (2017). DOI:10.14356/kona.2017017

<https://www.thyssenkrupp-industrial-solutions.com/en/products-and-services/mineral-processing/grinding-plants/polycom-high-pressure-grinding-roll-hpgr>

### Målgrupp

t.ex. M, E, Z, F

### Grupstorlek

Mellan 3 och 6

### Speciella förkunskaper

Matlab, Python etc

### Förslagsställare

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### Kan det dubleras?

Ja