



**GEBR. PFEIFFER**



# **THE CORE 4**

**OF DRY GRINDING WITH MVR MILLS**



Significant lower electrical  
energy consumption

1



Higher recovery even  
at coarser grinding

2



Narrow particle size  
distribution with less fines

3



Reduced water demand,  
even more with dry separation

4



## Significant lower electrical energy consumption

1

A mine's total energy consumption depends on many factors including mining technique, comminution and the ore to waste ratio.

In the MVR vertical roller mill the comminution is achieved by compressive and shear stress on the particle bed. With application of sufficient stress, micro cracks are generated. The opportunity for crack initiation is higher than that in a ball mill where mainly impact and shear stress is applied. The compressive comminution with an adjustable proportion of shear forces results in an energy-efficient size reduction with energy savings between 30 and 40 % compared to ball mills.



## Higher recovery even at coarser grinding



Declining grades and the need to process harder ores require a change in comminution equipment selection.

Due to the comminution principle of the MVR vertical roller mill increased mineral liberation and micro cracks can be realized, resulting in increased recovery compared to conventional systems. A good example is porphyry copper deposits where mineralization typically occurs along grain boundaries, where the comminution process leads to higher target mineral recovery even at coarser grind size.

Such coarser grind size is then also suitable to facilitate the dewatering of tailings.



## Narrow particle size distribution with less fines



The MVR vertical roller mill is a highly flexible machine that simultaneously grinds, dries (if necessary) and classifies. Comminution is able to deliver a uniform size reduction with a narrow particle size distribution. The achievable product liberation size is in the range between P80 of 1 mm down to P99 of 20 micron.

The reduction size ratio of up to 1000 is very high compared to traditional systems. The secondary or tertiary crusher can be replaced by the vertical roller mill due to the large feed size capacity. In combination with the high-efficiency air classifier over-grinding is reduced to a minimum. The proportion of fines in product is considerably lower compared to an AG/SAG milling and pebble/ball mill circuit.



**Reduced water demand,  
even more with dry separation**



MVR Vertical roller mills are traditionally air-swept mills. The material being ground is dried, if necessary, and transported by a stream of air or hot gas during comminution to the classifier mounted on top of the mill. This kind of comminution is able to deliver a narrow particle size distribution and the fines produced by the MVR mill are decreased by 50%, that means 50% less fines in the product for flotation and leaching.

Also, dry grinding is the pre-condition for subsequent downstream dry separation in combination with reduced water consumption.

Dry processing in the complete circuit will minimize the process water tremendously.