

# Applications and adaptability

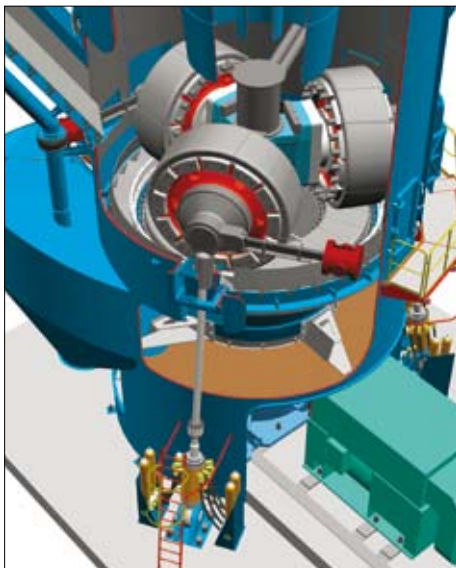
The ATOX raw mill has demonstrated to be suitable for grinding virtually all types of raw materials.

- Grindability varying from very easy to grind to very hard to grind, say from less than 3 kWh/t to more than 11 kWh/t for the mill drive
- Moisture in feed material varying from less than 1 % to more than 20 %
- Materials varying from being non-abrasive to very abrasive
- Feed materials varying from being non-sticky to very sticky

Raw materials that are easy to grind, i.e. high capacity for the specific mill size, or with high moisture content may require an increased air flow through the mill. The ATOX mill is simply adapted to this situation being provided with an oversize nozzle ring and an oversize separator.

## Basic design concept

The grinding table of the ATOX raw mill has a flat horizontal grinding track encircled by



The three cylindrical rollers are rigidly connected to a common centerpiece.

an adjustable dam ring and an adjustable nozzle ring equipped with an air guide cone.

The dam ring is made of stacked bolted on segmented rings and is simply adjusted by adding or removing one or more segmented rings. The height of the dam ring determines the depth of the grinding bed on the table.

The roller assembly is kept centered on the grinding table and prevented from rotating by three torque rods attached to the mill housing. The grinding pressure is exerted hydraulically through three pull rods attached to the outer ends of each roller shaft. By this unique ATOX roller suspension the grinding forces are transmitted by the tension rods directly into the foundation

## Design advantages

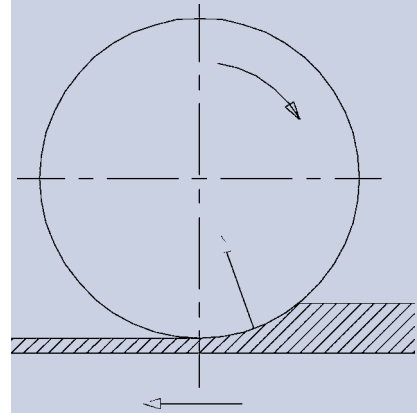
With grinding track being horizontal and the center of gravity of the roller system only moving vertically all impact forces and dynamic reactions are mainly vertical and thus easy to accommodate.

The extremely low mass of the roller suspension system means low total inertia and thereby low dynamic forces. In case of excessive vibrations of the roller system the lower inertia also limits the dynamic loads on the grinding table and trust bearing in the gear box as well on the surroundings.

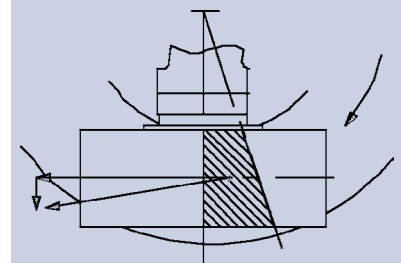
During grinding the force of reaction on the roller is located in front of the vertical line below the roller shaft, see a). In that position, however, the velocities of the roller and the table have different directions, see b), if the roller is placed traditionally, resulting in large axial loads on the roller bearing.

Due to a patented toe-in of the rollers of the ATOX mill, the axial load is eliminated, see c), and the roller bearings are thus only exposed to well defined radial load ensuring significantly longer life of the spherical bearings.

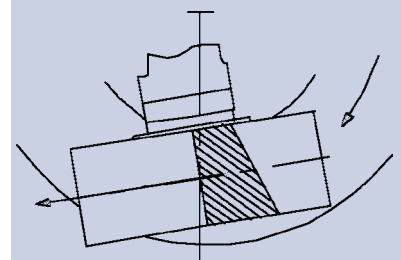
## Toe-in of grinding roller



a) Reaction force from grinding bed



b) Traditional design  
Roller tangential to grinding table.  
Significant axial force on roller bearings.



c) Patented toe-in of grinding roller.  
Axial force on roller bearings eliminated.