

Espey WD500 for sealing the cooling supply of a ball mill



For the production of cement the industry uses ball mills for crushing limestone into cement powder. The Saudi Arabian customer has chosen KHD Humboldt Wedag GmbH as supplier – providing latest crushing technology.

Process description

A ball mill is a horizontal cylinder tube partly filled with small steel balls that rotates around its axis, generating a tumbling action to the balls for grinding pre-treated limestone – fed from one tube front end – to fine cement powder. The temperature inside the mill – generated by the crushing process – must not exceed a process-specific limit, and is therefore continuously monitored. If necessary, the mill is cooled by water injection. Air injected in parallel keeps the water injection nozzles clean.



Ball mill for the cement industry

Problem and challenge

The seal has to take over the water and air supply for the cement mill from stationary to rotating units and minimize water and air leakage.

To avoid any wear on the mill's shaft it must be protected by a shaft sleeve. Both, seal and sleeve, must have a split design to guarantee easy assembly and disassembly without dismantling the ball mill's components even when repairs are needed. The mill's shaft diameter is 610 mm (24"). The seal diameter is 750 mm (29.5"). The operating temperature is 60 °C (140 °F). The shaft rotates with maximum 60 revolutions. The operating pressure is 6.0 bar abs. (87 PSI). The seal must be able to handle axial movements as well as radial movements caused by heavy loads. Long-term operation without maintenance is required.

EagleBurgmann Espey solution

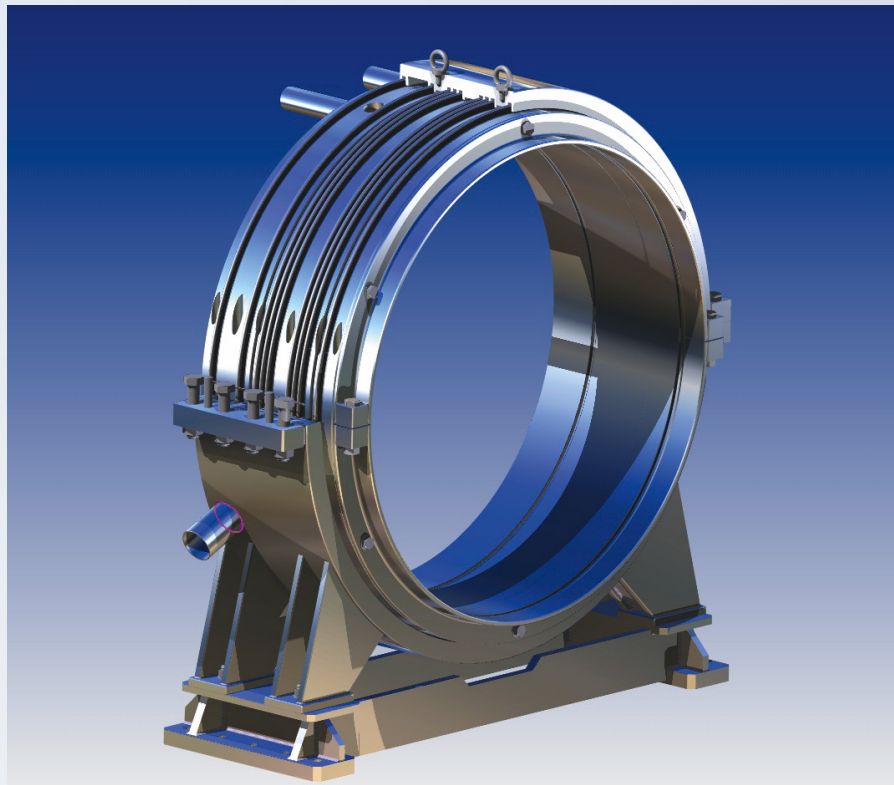
The seal type designed for this process is a carbon floating ring seal Espey WD500 Special with 8 self-adjusting seal rings to minimize water and air leakage. It has a width of only 370 mm (14.6"). Seal, seal rings and sleeve have a split design to guarantee easy and quick assembly / repair.

The seal's housing is installed directly to the mill's basement. The sleeve rotates with the shaft. The housing incorporates connections for water, air and leakage. The stationary supply for water and air enter the seal's housing and continue with grooves in the rotating sleeve and with pipes to the inner mill cylinder.

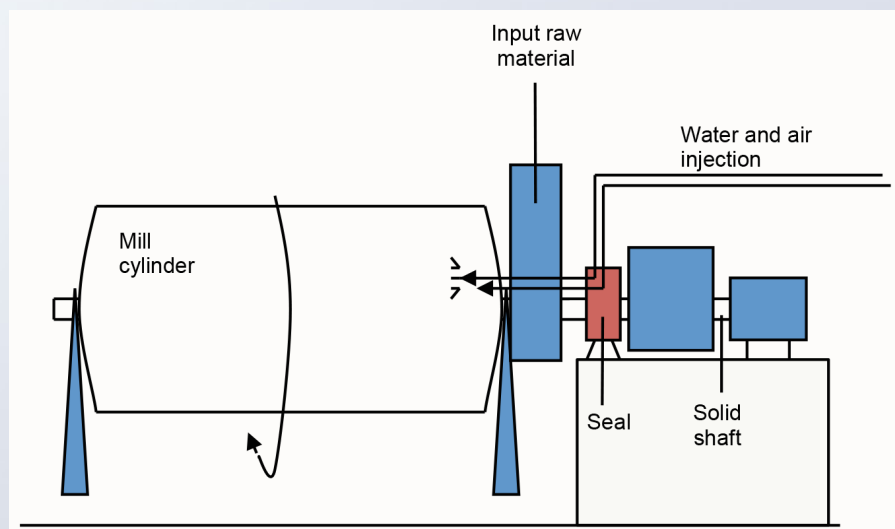
The seal is completely maintenance-free and has a long-term operation time.

Operating conditions

Application: cement mill
Seal type: Espey WD500 Special
Medium: air, water
Operation temperature: 60 °C (140 °F)
Pressure abs.: 6.0 bar (87 PSI)
Revolutions: up to 60 min⁻¹
Shaft diameter mill: 610 mm (24")
Seal diameter: 750 mm (29.5")
Radial and axial play: present



Espey WD500 Special



Cement mill layout