

# The Cement Industry

## How can Kinetrol help your business?

In today's working environment, especially in the Cement Industry, it is essential that all economic and safety issues are addressed. Poor quality equipment leads to faulty equipment, which could have health & safety, environmental, financial or legal implications.

By using inferior equipment, you could see an increase in breakdowns, system shutdowns, material waste and even fatalities.



## Cement Manufacturing Process

Kinetrol units can be used in many process across a Cement Plant. These include vehicle unloading, silo discharge, air cooling dampers, distribution, bagging and emissions control.

### K1 Pneumatic Vehicle Unloading.



Rail and road vehicles can be unloaded using pneumatic conveying systems. Kinetrol can be used to control the flow of material on these systems. Flow into silos needs to be controlled to reduce abrasion and wear as well as prevent product deterioration.



### K2 Silo Discharge.



Flow control gates are used for controlling, metering and shutting off the discharge of material from silos and bins. Kinetrol assemblies give accurate control of gates to give controlled feed of cement.

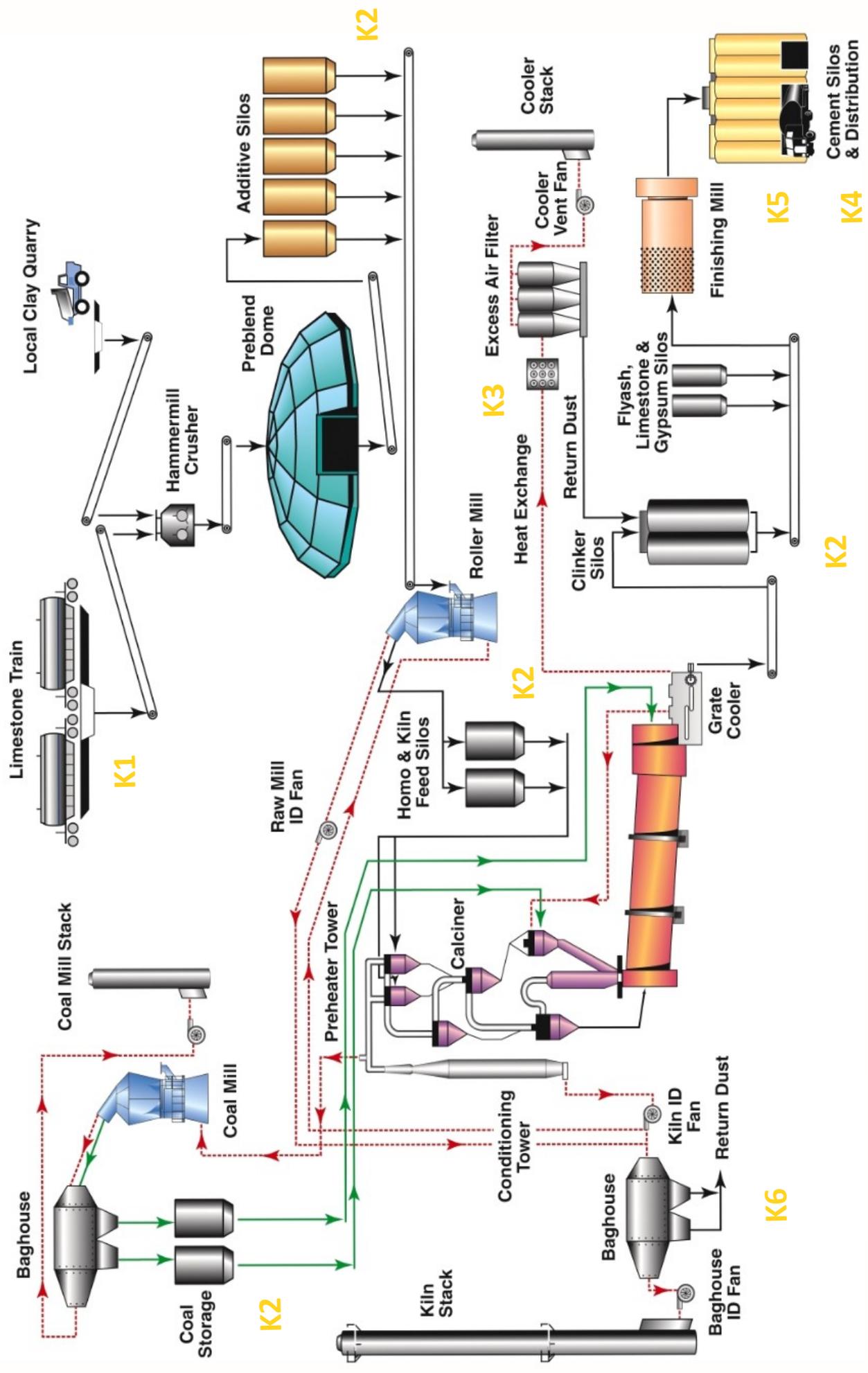


### K3 Air Cooler Dampers.



Damper valves control the air intake into the clinker cooler. Manual handle override exists in case of power failure.





## K4 Distribution Loading.



Flow control gates controlled by Kinetrol actuator and positioner assemblies feed vibratory conveyor that feed the truck loading chutes. The precision and control offered by the Kinetrol assemblies means vehicles can be quickly and accurately filled. The robustness of the assemblies mean they can withstand the harsh dusty environment.



## K5 Bagging.



Controlling the flow of cement to the bagging area allows for better productivity and downtime. Kinetrol positioner assemblies allow for cement flow to be accurately regulated. Kinetrol units are also installed on automated cement sampling units ensuring consistent quality.



## K6 Emission control.



A number of companies use Kinetrol actuator packages in their environment impact solutions. These systems can be used to reduce carbon dioxide and dust levels emitted from a plant.

**Cement Depots** - In addition to cement plants a number of these applications, e.g. silo discharge are replicated in cement depots.

## Why using Kinetrol Rotary Vane Actuators on your valves and gates could prove highly beneficial?

The Kinetrol Rotary Vane Actuator consists of a single moving part. It is therefore the simplest and most reliable unit for quarter turn rotary actuation. It has multiple advantages over standard Rack & Pinion actuators, cylinders and motor drives, especially in terms of durability, reliability, efficiency, accuracy and compact size.



**Durability** - The extremely harsh conditions of heat, fine dust and vibration in a cement plant present numerous problems which affect the performance of equipment.

Rack & Pinion spring return units have small air escape vents. These easily become blocked with debris and the performance of the unit is impaired. Over time, dust attacks the seals and clogs the gearing, causing failure.

Cylinder pistons are exposed to the harsh elements. During operation, dust is drawn towards the cylinder head and seals. Although initially protected, over time these seals perish, allowing dust into the cylinder which leads to the eventual wear of the cylinder liner and thereby unit failure.

With motor gear drives, abrasive cement dust accelerates the wear on tooth flanks, reducing the drive's life. In addition, in extreme cases contaminants can lead to over heating, creating a possible fire hazard.

The Kinetrol actuator, being virtually a sealed unit, suffers from practically no dust ingress. Furthermore the double opposed, lip type polyurethane seals, which are supported by sprung, stainless steel expanders, accommodate any wear to maintain contact during service



**Reliability** - Down time due to maintenance or equipment replacement is costly. However it is not only these actual service costs that need to be considered. On top of this is the cost of lost production, the cost of rejected product and the possible cost of overtime worked to make up lost time. Therefore the real cost of a failure is significant.

Kinetrol's actuator design, being a simple, single moving part, ensures a long maintenance free lifetime. This, coupled with 100% unit testing, means up to 4 million operations, guaranteed.



Rack & Pinion actuators are complex units. Continuous and uneven (due to piston offset) gear tooth wear reduces the unit life. Carbon steel springs on spring return units become corroded. All this leads to a lifetime of only up to 1 million cycles, although many units may fail to reach this figure in a harsh cement plant environment.

A motor gearbox is additionally a complex unit. The gears, thrust plates, roller bearings and lip seals are all areas that can fail. This is especially true where the application demands continuous operation.

Lubrication is the key to maximising a pneumatic cylinder's life, something that could be difficult in the environment of a cement plant. Cylinders not properly lubricated can overheat, damage components and destroy seals, leading to a much reduced reliability.



**Efficiency** – There is a, generally disregarded, cost to compressed air. As with any essential energy resource, if misused and wasted it incurs an unnecessary cost and has an environmental impact.

The air consumption of Kinetrol units is low, approximately 30% less than that of a comparable Rack & Pinion unit. This is because the unit has no linear to rotary motion conversion loss. In addition the large, centrally located air supply ports allow for high air flow, which facilitates the fastest operating speeds.

A cylinder also has a higher air consumption which increases dramatically depending on piston diameter and rod length. Their design means a pause must be taken into account between stroke movements, giving slower response times. In addition the units' common fault of defective seals will result in air leakage.

**Accuracy** – When a valve or gate in the cement process does not seat correctly, both production and profitability could be compromised. The plant may need to reduce output to compensate for 'diverted' product, quality may be affected as 'off-spec' cement leaks into bins and silos and maintenance expenditure may increase, as frequent adjustments on Rack & Pinion actuators, cylinders or motors have to be made.

The piston's tilt & gear tooth geometry in a Rack & Pinion actuator exerts side loads on the cylinder wall, pinion bearings and seals, leading to premature leakage. This, linked with gear tooth wear, means over time the actuator may not achieve full stroke, leading to failure of the valve to fully open or close.

Pneumatic cylinders have a lesser degree of accuracy than an actuator or motor drive. This is especially true when equipment is supposed to be modulating to give an even feed. Cylinder and connector rod wear decreases the chances of gates and valves being fully open or closed.

If a motor gearbox drive is controlling gates or valves, the accuracy of the unit is influenced by a number of components, including gear teeth, bearings and shaft. Again these parts are susceptible to wear and therefore a reduction in accurate control.

The Kinetrol rotary actuator's vane and shaft are an integral casting, giving direct drive to the gate or valve. This means there is no loss of motion, no backlash or dead band. It also has easily adjustable end stops, this gives +/-5 degrees of adjustment at each end of travel, therefore further allowing the precise seating of the gate or valve



**Compactness** - Although not a factor of performance, it is nevertheless still an important point to consider, especially when dealing with restricted space and accessibility.

Kinetrol's 'best torque-to-size' packages mean the units are compact compared to comparatively rated Rack & Pinion actuators and pneumatic cylinders. Motor gearboxes, due to the nature of their design will always require greater space, as well as being significantly heavier.



**The Benefit** - As you have read, there is a real benefit, both commercially and financially, to installing Kinetrol Rotary Actuators. The cost of the equipment may initially be higher, but as explained, poor performance, failures and extra costs, including, but not limited to, additional maintenance and loss of production, soon make the cheaper alternative far more expensive.

Kinetrol has many years of experience in the cement industry, with many thousands of units already installed on equipment such as flow control gates, diverter gates and two way valves.

### **What is quality and reliability worth to your business?**

Please contact us to find out more about Kinetrol and how it can give you the best equipment for your investment.