

## MAC Spheri Valve – Low Maintenance, Long Life Technology for the Cement Industry

### Introduction

In today's challenging economic environment, where cash is king, the cement industry, like many other commodity-based markets, are seeking ways in which to maximize investment plans to ensure their processes operate efficiently and achieve optimum productivity.

The process technologies that cement producers utilize in their operations are required to function reliably and effectively in an effort to generate the output required to meet their customers, and their own businesses demands. Reduced downtime, increased maintenance and operating costs are issues that the industry is eager to avoid.

At MAC Equipment we have engineered a material handling valve, the Spheri Valve®, which has been developed to deliver high levels of reliability and performance, as well as driving down costs and the environmental impact of the raw materials used in the production of cement.

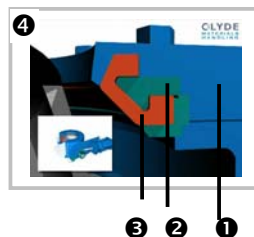
In this article we will highlight the unique design features of the Spheri Valve and the ways in which this solution is generating rapid economic and environmental returns for the cement industry.

### Spheri Valve® Overview

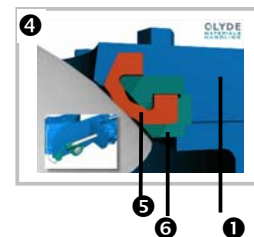
MAC Equipment are the pioneers of the Spheri Valve®, widely regarded as one of the most reliable, low maintenance, long life material handling valves in the cement industry.



**Spheri Valve®**



- ① Top Plate
- ② Insert Ring
- ③ Deflated Seal



- ④ Dome
- ⑤ Inflated Seal
- ⑥ Seal Retaining

The Spheri Valve® was developed and built by MAC over 30 years ago and continues to be an integral part of the pneumatic conveying and pneumatic dosing/injection solutions supplied to the cement industry.

The Spheri Valve® has the ability to cut through static or moving columns of material through the use of its innovative inflatable seal mechanism, ensuring that a consistent pressure tight seal is created when the valve is in the closed position, but in the open position, it provides an unrestricted, full bore opening for the best product flow characteristics possible.

The Spheri Valve® is recognized as a low maintenance, long life solution that can last at least 1 million cycles between maintenance inspections. The Spheri Valve® is used to control material flow, airflow and vessel pressures in both conveying and injection solutions.

The Spheri Valve's® core features for the cement industry include:

- Full bore unobstructed material flow
- No components in material flow to wear
- Simple, fully proven design
- Can cut through moving or static columns of material

- Wide range of valve sizes: 2" (50mm) to 20" (500mm)
- Forms pressure tight seal when closed
- Can cope with pressures up to 450 psi (30 bar)
- Can handle material temperatures from -4°F to 900°F (-20°C to +480°C)
- Long operating life
- Up to 1,000,000 cycles between major overhauls with most materials
- Low maintenance
- Ready availability of spare parts

### **Spheri Valve® for Cement – A Reference Story**

As well as acting as a key component in a pneumatic conveying and/or pneumatic dosing/injection system, the Spheri Valve® can be utilized a standalone solution to material handling issues.

The Spheri Valve® can be deployed on greenfield sites but has, more typically, been used for retrofit purposes where existing material handling systems have become problematic and unreliable.

For example, a cement plant, operated by one of the world's leading producers was experiencing continual problems with a pneumatic conveying system that was transporting cement from finish mills to storage silos. The pneumatic conveying system was experiencing severe valve wear, which was leading to increased system downtime, increased maintenance costs and material contamination. The typical life of the existing pneumatic conveying system's valves was 3 months.

The pain felt by the cement producer from this problem was so critical that they turned to the Spheri Valve® to help eradicate this issue. As a result, 44 Spheri Valves® were installed throughout the pneumatic conveying system, which transported cement from 4 mills to 10 silos on their plant.

The Spheri Valve® had an immediate positive impact on the performance of this system, helping the cement producer achieve between 30 tph and 40tph output per mill, utilizing 10 pipe runs of 5" (125mm) and 6" (150mm) to convey cement at 30 psi (2 bar) and at 265°F (130°C).

More significantly, the engineers on the plant estimated that the valve life of the Spheri Valve® would extend to 2 years (compared to 3 months). At this 2 year point, all the cement producer would effectively have to replace would be the inflatable inner seal. One engineer on the plant commented that the Spheri Valve® was *"robustly constructed, easy to maintain and very reliable"*.