

HY-PRO

Cement Industry

CONTAMINATION SOLUTIONS



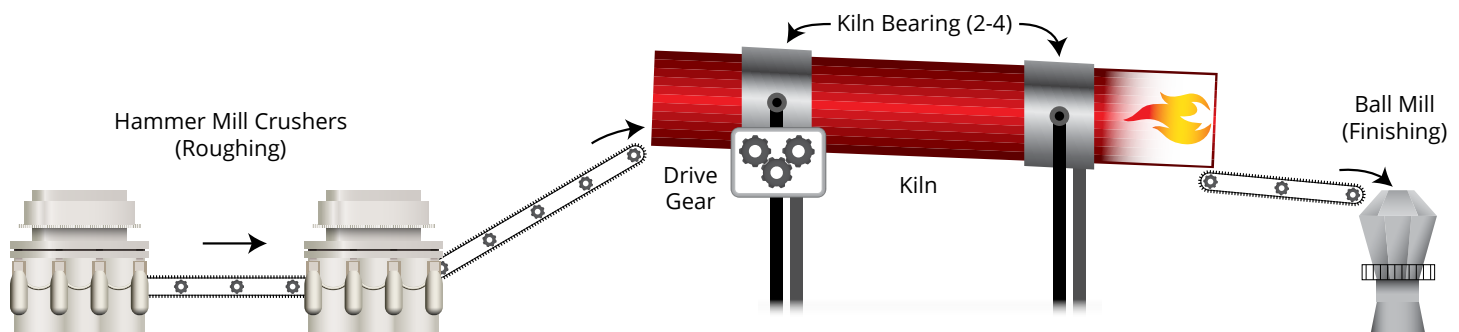
Cement Industry Contamination

At the heart of cement plants are critical-to-operation kiln bearing, kiln drive gear and milling/crushing lubricating systems. High-viscosity lubricants are commonly used, which means these critical components usually have insufficient, coarse mesh filters or -- worse yet -- no filtration at all. The standard maintenance routine can include frequent premature oil changes driven by high contaminant load from the product getting into the lube oil. However, frequent oil changes won't protect the equipment, as ingressed and internally generated wear debris will continue to damage the equipment, since dirt makes more dirt. Each step is critical to the whole process in cement production, and if one link in the chain breaks, the whole unit can go down.

And, whether the ambient temperature is subzero cold or equator-hot, Hy-Pro has the contamination solutions to ensure your critical equipment and lube oil last beyond rated life to avoid unnecessary oil consumption and the catastrophic failure all cement mills dread.



OUR PRODUCTS PUT INTO PLACE



Before the clinker enters the kiln dryer and after drying raw product is roughed, separated and finally milled to size by cone, roller, hammer, or ball mills. The critical on-board bearings are often lubricated with expensive synthetics ISO VG220-460, and are vulnerable to shaft seal leaks resulting in high clinker and ambient contaminant ingress. Material is moved throughout the mill by oil lubricated impeller and rotary claw blowers that each require a contamination solution.

The kiln dryer features a bull drive gear, usually unfiltered, that rotates the kiln and 2-4 lubricated tower bearings per kiln where extra-high viscosity lubricants ISO VG1000 are in service because of high kiln temperatures. In-service oil is often found to be operated at an ISO code of 24 for particles $\geq 4\mu_{[q]}$. Hy-Pro's extra-high-viscosity specific side loop solutions allow you to filter the oil with high-efficiency filters and achieve always-clean oil all the time. Our FSL, FSLD, FPL, and FSW turn the reservoir several times a day to achieve world-class fluid cleanliness.





Kiln Bull Drive Gear Lubrication Upgrade

A kiln bull gear drive lube system was fitted with an FSLD2 designed for cold weather service featuring a slower rotating pump and oversized DFE rated filters in series to handle the high operating viscosity of 8200 cSt.

8200 cSt	ISO Actual	$X \geq 4\mu_{[c]}$ /ml	$X \geq 6\mu_{[c]}$ /ml	$X \geq 14\mu_{[c]}$ /ml
Mesh Strainer	27/25/24	2,000,000	240,000	120,000
FSLD2 / $\beta_{16[c]} > 4000$	19/17/12	3,750	960	30
Improved Cleanliness	4 μ = 8 codes 6 μ = 8 codes 14 μ = 12 codes	533X	250X	4,000X
Contaminant Reduction		99.9%	99.6%	99.9%

A **reduction of 99.9% or 533X in particles 4 μ and larger** is a remarkable improvement and will deliver a **\$2,500,000 cost avoidance savings** for a drive gearbox replacement including downtime and reduced oil consumption over a 10-year period. The oil life extension beyond rated life pays for the FSLD upgrade in the first year.



Kiln Bearing Lubrication Upgrade

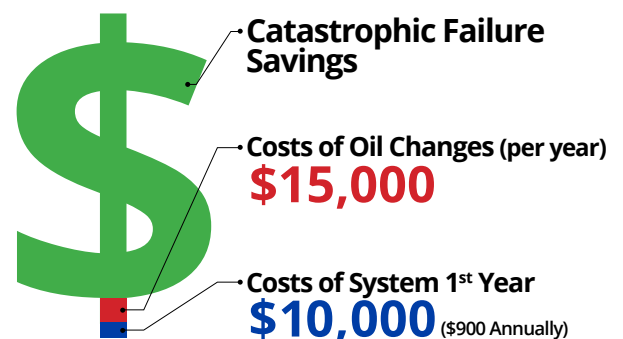
Kiln bearing lube systems were fitted with a compact FSL2 designed for cold weather service featuring a slower rotating pump and one DFE rated filter to handle the high operating viscosity of 6000 cSt. A kiln has 2-4 piers which have 4 bearing lubrication systems. Each bearing lube system should have a dedicated FSL or FPL to ensure fluids are 100% in spec.

ISOVG 1000 cSt	ISO Actual	$X \geq 4\mu_{[c]}$ /ml	$X \geq 6\mu_{[c]}$ /ml	$X \geq 14\mu_{[c]}$ /ml
Mesh Strainer	24/23/22	120,000	60,000	30,000
FSL1 / $\beta_{11[c]} > 4000$ winter FSL1 / $\beta_{7[c]} > 4000$ summer	17/15/12 winter 16/13/10 summer	960 winter 480 summer	240 winter 60 summer	30 winter 8 summer
Improved Cleanliness	4 μ = 7, 8 codes 6 μ = 8, 10 codes 14 μ = 10, 12 codes	125X winter 250X summer	250X winter 1,000X summer	1,000X winter 3,750X summer
Contaminant Reduction		99.2% - 99.6%	99.6% - 99.9%	99.9% - 99.98%

After achieving a **99.6% / 250x reduction in particles 4 μ and larger** the FSL was taken off-line to test the dirt ingress rate, and after just **5 days the ISO code had returned to 24/23/22**. This is no place for unfiltered oil or to rotate a filter cart. The Hy-Pro contamination solution delivers a **\$1,500,000 cost avoidance savings per bearing** including bearing replacement, crane rental x 2, downtime and reduced oil consumption over a 10-year period. The oil life extension beyond rated life pays for the FSL upgrade in the first year.

SAVINGS AFTER ONE YEAR

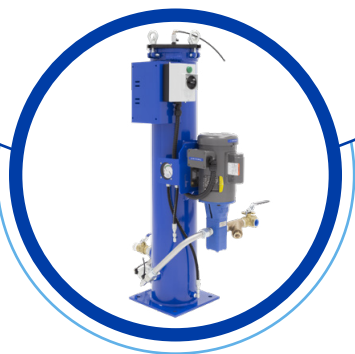
The risk of unchecked contamination isn't worth the reward. For less than 1% of the cost of a failure and unit down, you can have clean oil all the time, components that exceed rated life and fewer oil changes. The reduced oil consumption pays for the upgrades.



FSL

High Viscosity Filter Systems

A dedicated contamination solution for bulk oil handling and fluid transfer. Designed to excel in filtering particulate from heavily contaminated oil up to ISO VG 1500, the FSL keeps gearbox lubricant clean and equipment running efficiently.



DFE

Dynamic Filter Efficiency

DFE goes further than current industry standards to quantify capture and retention efficiency in real time by inducing dynamic duty cycles, measuring real-time performance during dynamic changes and the filters ability to retain particles.



FSW

Wall Mounted Filter Systems

A compact, dedicated off-line contamination solution ideal for small reservoirs and gearboxes conditioning. Low flow rate to high media area ratio means your fluids get cleaner, faster.



Tackle the toughest cement plant contamination.



LF

High Viscosity Filter Assemblies

Low pressure filter assemblies optimized for high flow hydraulic, high viscosity lube and heavily contaminated fuel applications. Add to existing auxiliary cooling or side loops for the perfect in-line contamination solution.



Hy-Dry Breathers

Desiccant Breathers

Protect your uptime, critical hydraulic & lube assets and fluid life. Hy-Dry breathers are critical in Hy-Pro's Total System Cleanliness approach as a barrier preventing airborne particles and water from entering reservoirs and gearboxes.



VUD

Vac-U-Dry Vacuum Dehydrators

The optimized balance between heat, vacuum, process design and an easy, user friendly operating system for removal of water and particulate from hydraulic and high viscosity lubricating oils. Equipped with generously sized high efficiency filtration, it's the ultimate oil purifier.

Want to find out more? Get in touch.

hyprofiltration.com

info@hyprofiltration.com

+1 317 849 3535

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