



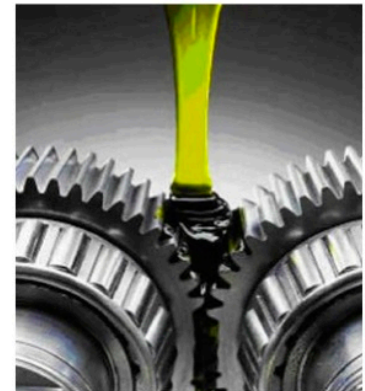
## UPGRADING TO CERMA STM-3 LUBRICATION SYSTEM IN INDUSTRIAL EQUIPMENT AND FLEET VEHICLES

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**Cerma STM-3 lubrication systems greatly reduces operating and maintenance costs, carbon footprint, and fuel costs for heavy-duty equipment and semi-trucks.**

Proper lubrication is continuously necessary for a vehicle to run at peak performance. Oil does not stay in any part of an engine, it continues to flow through the entire system. In the case of light and heavy-duty equipment, fleet vehicles, transportation vehicles, and construction or mining equipment at a facility, the necessity to properly lubricate becomes a vital component in operating and fuel costs.

At its most microscopic layer, no matter the piece of equipment, lubrication is simply trying to separate two opposing moving metal surfaces with a very thin layer of oil. When the lubricant flows and is contaminant-free, equipment is protected and lasts longer. It's a simple concept and when applied correctly can provide a wealth of benefits to keep critical assets protected and keep equipment running at maximum potential.



Implementing the Cerma STM-3 Lubrication System in the equipment and vehicles at a facility is a safe and reliable system for guaranteeing proper lubrication and implementing major costs savings. This white paper discusses the Cerma STM-3 proprietary technology, the Cerma benefits, and the cost savings associated with implementation.

### **What is Cerma STM-3?**

Cerma STM-3 is a revolutionary technology, which is added to the oil. Once added, Cerma STM-3 will restore engine performance, increase horsepower and torque, prolong operational life, and keep internal components clean.



Cerma STM-3 is applicable to all vehicles and equipment. The Cerma STM-3 Lubrication System, in all applications except fuel, is a two-step process (fuel treatment - see page 4).

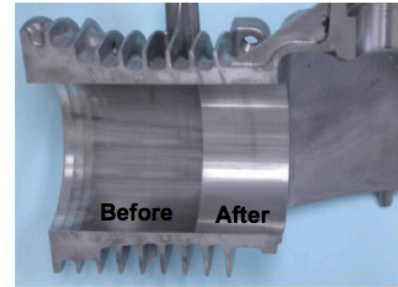
**Clean, Restore and Prep:** The first step is to add a Cerma STM-3 Treatment to the system. The initial treatment is a metal catalyst (does not mix with the present oil in the system) that uses the oil as a carrier to treat the metal surfaces inside the system with a thin (1 to 6 micron) coating. During this coating process, there is a massive clean out of all dirt, lacquer, carbon, and acid that has built up inside the system over time. After treatment, the vehicle runs for a specified period of time so that the Cerma process can penetrate the metal surfaces and prep for the next step in the process.

**Lubricate and Protect:** The second step is to change out the oil/fluid with appropriate CermaX brand oil/fluid. All CermaX STM-3 brand oils and fluids provide the maximum amount of protection to keep vehicles operating at peak performance. In addition, all CermaX STM-3 brand oils and fluids are Self-Cleaning, meaning that after Cerma STM-3 Motor Oils are added, the oil will continuously clean itself and force any "dirt" out through the filter system.



## The Science - Self-Cleaning Silicon Carbide Matrix

Cerma STM-3 is a revolutionary technology as it chemically creates a permanent Silicon Carbide, "SiC", coating at a micron level within the valleys of the surface of all metal parts in which the lubrication is introduced. By introducing silicon into a carbon atmosphere Cerma STM-3 permanently treats the metal surfaces within the engine and will continuously utilize the acids and carbon within the engine oil to clean the engine.



Cerma STM-3 does more than just coat. Cerma STM-3 penetrates the internal metal parts of the engine to eliminate destructive harmonics, noise and vibration, increase performance, and improve fuel economy. By creating a smoother, more durable surface without changing factory tolerances, Cerma STM-3 simultaneously cleans and protects both new and worn parts.

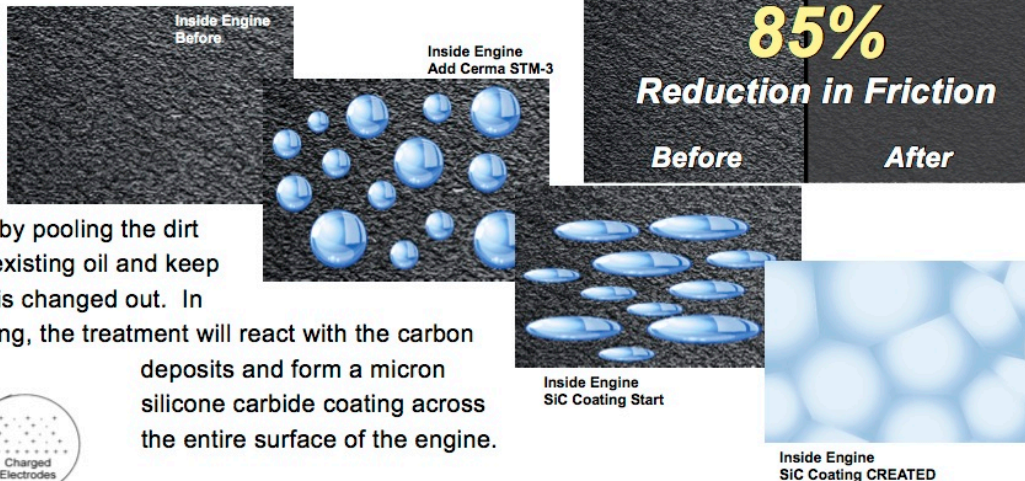
Cerma STM-3 effectively optimizes performance while reducing friction and wear. As the vehicle is driven, the 100% active ingredient, STM-3, applies a permanent nano Silicon Carbide (SiC) matrix seal within the sub-surfaces of the engine, 1 to 6 microns deep. As Cerma STM-3 penetrates, this matrix is lapped to create a perfect surface on the metal sub-surfaces of the engine.

It is well known that Silicon Carbide, SiC, is used as a high-end surface protector due to its properties of being able to withstand extreme temperatures. High performance parts and equipment manufacturers utilize SiC in some of their most expensive equipment. Typical uses of SiC are stationary or dynamic turbine components, seals, bearings, process equipment, engine components, and custom coating for professional racing engines.

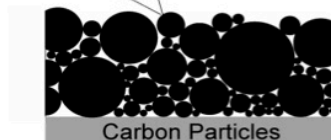
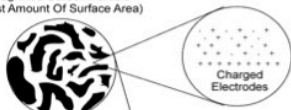
Chemical purity, resistance to chemical attack at high temperatures, and strength retention at high temperatures has made SiC very popular as a metal treatment. Although the process of producing and coating materials with SiC is normally very expensive and involves many steps to achieve the final product. Cerma STM-3 achieves the properties of a SiC coating in a simple one-time application.

By reducing friction and heat, Cerma STM-3 provides similar benefits as traditional lubricants but works in a completely different way. Cerma STM-3 does not modify the engine oil in any way. Instead, it modifies the surface structure of the metal to make it act like a ceramic surface -- hence the name STM-3: Surface Tension Modifier.

**In treatment format,** the STM-3 technology coats, cleans and preps the metal surfaces and acts as an emulsifier by pooling the dirt and lacquer into the existing oil and keep it flowing until the oil is changed out. In addition to this cleaning, the treatment will react with the carbon



Magnified Carbon Particle (Vast Amount Of Surface Area)



deposits and form a micron silicon carbide coating across the entire surface of the engine.

**In oil format,** STM-3 technology lubricates and cleans while continuing to prevent contaminants from agglomerating and depositing on metal surfaces. The SiC technology works by attracting the carbon and lacquer into masses that are large enough for the system filtration to catch and filter out of the system. In other words, STM-3 creates a full self-cleaning lubrication system, combining a superior lubrication with the technology to clean for the life of the oil.



## Maintenance Savings with Cerma STM-3

Today we are seeing a lot more engine performance problems caused by 1) government mandated reductions on Zinc and Calcium within today's motor oils, and 2) carbon and lacquer deposits.

**Zinc and Calcium:** Government mandated reductions on Zinc and Calcium levels in motor oils has gradually removed a major component of engine protection. The same weight, brand, and oil type produced from manufacturers as late as 2012, are vastly different in 2014 and are not protecting engines in the same manner. ILSAC GF-5 specifications for motor oils call for as much as 50% less zinc. Zinc is used to provide a protective anti-wear film and Calcium is used as an oxidation inhibitor and to neutralize acids formed in combustion engines.

Cerma STM-3 technology does not depend on zinc, calcium or other chemicals the government has deemed hazardous. Cerma STM-3 is an eco-friendly organic technology that relies on its SiC technology to provide protection to the engine and keep the engine clean and operating at peak performance.

**Carbon and Lacquer Deposits:** Many factors conspire to reduce the efficiency of an engine, by reducing fuel flow, distorting fuel spray patterns, decreasing fuel atomization and reducing combustion efficiency. While a certain amount of carbon build up is normal, over time the build up increases. The engine now is compromised of its power, fuel economy and exhaust emissions. This can happen so gradually that the operator does not notice it until the condition causes an engine performance problem.

Cerma STM-3, which is designed to thoroughly clean the fuel system and engine components, will not only result in faster, easier starting, it will improve acceleration, restore fuel economy, reduce harmful exhaust emissions, and correct engine performance problems related to carbon and other contamination.

**Better performance** directly equates to longer engine life and less maintenance costs. On an engine rebuild basis, this can result in significant savings with reports of extending rebuilds by double regular intervals.

From a Cerma User: "The trans was shifting so poorly I was driving in 3rd all the time. The dealer wanted \$4000 for a trans rebuild. After 10 minutes of putting in Cerma the car drove like new, maybe better!! The engine runs so smooth I tried to start it while it was running –oops! I'm a customer for life – THANK YOU!!!"



## Oil Savings with Cerma STM-3

The benefits of extending service intervals are significant. Extending a service program with Cerma STM-3 will reduce maintenance costs, fluid consumption, waste fluid disposal, time, and manpower. Most importantly, vehicles and equipment are kept on the road more, which drives profit. One important fact about motor oil -- it does not go bad! So why change motor oil? Because it becomes contaminated with carbon and lacquer. The Cerma STM-3 Lubrication System minimizes the contamination that occurs within your engine by agglomerating the carbon so that the oil filter will capture virtually all damaging materials.

In a perfect world, facilities would operate the same vehicles, of the same age, under the same operating conditions. But as we know, that's not reality. Most facilities have mixed vehicles, which means they have trucks and equipment of multiple ages, from different OEMs, all of have different service intervals. The Cerma STM-3 Lubrication System can extend oil change intervals by up to 5 times current service intervals depending on the equipment, vehicle, and usage. Additionally, the Cerma STM-3 Lubrication System can smooth out the complex process of managing oil service across different equipment with different ages and service intervals.

## Fuel Savings with Cerma STM-3

Cerma STM-3 will enhance the performance of the system, the vehicle will run more efficiently, and the vehicle will last longer running at its maximum potential. But how does this translate to savings for the user?

Cerma fuel savings focuses on the reduction of friction inside the engine (parasitic drag), and the enhancement of the fuel system. The combined fuel savings can be dramatic in both vehicles and equipment. Specifically with heavy-duty machinery and vehicles where loads continue to stress the system at a variable rate, Cerma STM-3 works to even out the system and maximize the fuel economy.

Fuel savings are immediate. In SAEJ1321 testing verified by the Canadian ETV Program (an environmental consortium of developed countries including the U.S.), initial fuel savings occur in just under 100 miles.





## Applications of the Cerma STM-3 System

- Engines
- Transmissions and Differentials
- Hydraulic Systems
- Fuel Systems
- Drivetrains, Trans-Axels, Hubs and Transfer Cases
- Air Conditioning Systems
- Power Steering Systems
- Cerma STM-3 Multipurpose and Hi-Temp Grease

Engine RPM	Measured HP w/o Cerma with STM-3	Corrected HP w/o Cerma with STM-3	Measured HP with Cerma with STM-3	Corrected HP with Cerma with STM-3
4500	138.5	139.5	142.7	144.2
4750	139.0	139.9	139.9	141.2
Average	125.4	126.3	133.4	134.7
Maximum	139.0	139.9	142.7	144.2



Engine RPM	Measured HP w/o Cerma with STM-3	Measured HP with Cerma with STM-3	Measured Torque w/o Cerma with STM-3	Measured Torque with Cerma with STM-3
4758	220.95	229.6		
4023			262.7	276.5

Engine RPM	Measured HP w/o Cerma with STM-3	Measured HP with Cerma with STM-3	Measured Torque w/o Cerma with STM-3	Measured Torque with Cerma with STM-3
4758	220.95	239.6		
4023			262.7	
2846	Max Torque reached 1,177 rpm less w/ Cerma with STM-3			283.3



### Note on Cerma STM-3 Fuel Treatment

The Cerma STM-3 Lubrication System in all cases is built on utilizing a treatment, which is a one-time treatment, and then switching out to an oil. However, Cerma STM-3 Fuel Treatment is the one treatment that is a continuous use treatment. Why a continuous treatment for the fuel system? Because fuel (gasoline, diesel, CN gas, and LP gas,) encapsulates the lubrication inside the fuel molecules (encapsulates within the hydrocarbon matrix). Therefore, when the injectors spray the fuel into the system, the lubrication burns off along with the fuel. Cerma STM-3 releases the lubrication trapped inside the fuel, and allows the fuel system to properly lubricate. In addition, Cerma STM-3 Fuel Treatment adds a "SiC" component to the system which lubricates the upper engine, cleans the fuel system, removes water and moisture, conditions the fuel pump, cleans the fuel injectors and fuel tank, and acts as an octane booster. Cerma STM-3 Fuel Treatment is added to diesel fuel in a ratio of 4 ounces to 160 gallons for the first and second fill up, and monthly thereafter to maintain performance.

### Emissions Savings with Cerma STM-3

Cerma STM-3 significantly reduces the concentration of hydrocarbons, carbon monoxide and NOx emissions in vehicles. Test results from ASM emissions testing show dramatic improvements across the board. In addition, testing from EPA certified lab, California Environmental Engineering LLC, under a CVS (FTP) -75 test protocol not only calculated savings in harmful emissions, but also showed fuel economy improvement of close to 5% after only 150 miles. The results support the conclusion that Cerma STM-3 improves engine efficiency, which thereby reduces emissions.

Going green increases the bottom line. In addition to potential "carbon credits", facilities that lower their carbon footprint with regard to emissions utilizing Cerma STM-3 can increase production and run times by increasing number of vehicles allowed to operate at the same time.

Emission Type	Before Cerma with STM-3 Application at 2110 RPM	After Cerma with STM-3 Application at 2149 RPM	Total Reduction with Cerma with STM-3 Use
Hydrocarbon (HC)	68 ppm	3 ppm	95.60%
Carbon Monoxide (CO)	0.54%	0.04%	92.60%
Nitrogen Oxide (NOx)	377 ppm	107 ppm	71.60%

Emission Type	Before Cerma with STM-3 Application at 1451 RPM	After Cerma with STM-3 Application at 1440 RPM	Total Reduction with Cerma with STM-3 Use
Hydrocarbon (HC)	7 ppm	0 ppm	100.00%
Carbon Monoxide (CO)	0.04%	0.00%	100.00%
Nitrogen Oxide (NOx)	131 ppm	68 ppm	48.10%

Emission Type	Before Cerma with STM-3 Application at 1717 RPM	After Cerma with STM-3 Application at 1871 RPM	Total Reduction with Cerma with STM-3 Use
Hydrocarbon (HC)	931 ppm	82 ppm	91.20%
Carbon Monoxide (CO)	1.20%	0.17%	85.80%
Nitrogen Oxide (NOx)	319 ppm	370 ppm	-16.00%

### Conclusion

The innovative Cerma STM-3 Lubrication System represent a technological breakthrough that offers the potential to cut costs while increasing efficiency, productivity, and profitability. Specifically as companies look to reduce costs related to motor oils and fluids, maintenance costs, fuel costs, and emission of their vehicles, trucks and equipment, Cerma STM-3 will save hard costs and increase profitability.

For more information, please contact:  
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