

Lubricant Metal LAM'LCOAT® coating for Mechanical Components

The sub-micron lamellar crystalline structure creates a complex capillary surface environment aiding in fluid lubrication retention providing significant reduction in wear characteristics. The LAM'LCOAT® prevents spalling, reduces friction and noise and is compatible with fluid lubrication. It can be applied to all ferrous and non-ferrous metals.

The low coefficient of friction (0.030 dynamic) reduces drag and wear, and improves significantly lubricity on most engine parts, translating to an increase in performance in most environments. The thickness of LAM'LCOAT® (1 micron, +/- 0.5) gives a completely uniform structure with virtually no dimensional change and is an excellent lubricity coating for tight tolerance components such as gear teeth, bearing races, cages and balls.

Widely used in the racing industry and secondary automobile product market, low coefficient of friction significantly improves lubricity characteristics and reduces wear on most engine parts. It has been successfully utilized for rack and pinion gears, gear box components, pistons, cam shafts and transmission components and can be easily adapted to **automotive**, **aeronautic** and **aerospace** industries, and any other mechanical industries. With a broad operating range between -273°C to +600°C

(-459°F to +1 112°F) and low out gassing characteristics, LAM'LCOAT® is utilized on a wide range of aerospace and aircraft components. The molecular bonded structure is non-migratory, eliminating any potential for particulate contamination. The dimensional buildup of only 1 micron makes the coating ideal for tight tolerance requirements. We certify to all applicable military, customer and industrial specifications.



- Examples of parts coated with LAM'LCOAT®:

- ❖ The LAM'LCOAT® extends Gearbox' life

Applications in races, with 125cc and 750cc motorcycles. As a trial they had a gear box coated with LAM'LCOAT®. They noticed the box running more freely and with smoother gear changing. The new bike for 1997 was not coated and immediately they noticed the level of wear on the new gears. They replaced the new bikes gears with those from last year machine which remained in an "as new" condition.



NB: LAM'LCOAT® benefits for Gearboxes:

- The coating is 0.5 micro thick so no engineering changes are necessary will not chip or peel. No heat is used in its application.
- LAM'LCOAT® is used with usual gearbox oil.
- The coating is porous and has an affinity for oils to ensure you always have a lubricant film (oil and LAM'LCOAT®) between bearing faces.
- LAM'LCOAT® is very low friction so less heat is generated within the gearbox.
- LAM'LCOAT® will extend the life of your gearbox. You may be able to run with less oil onboard.
- Gear shifting will require lower forces and be smoother and faster in operation.
- LAM'LCOAT® delays the onset of micro pitting.
- We are told by our US licensors that the US Army Air force is considering using LAM'LCOAT® to extend gearbox life in the event of small arms damage to helicopter lubrication systems.

❖ Example of use on Machine Tools

A British firm with experience of selling to Ford in the US where LAM'LCOAT® is specified on all machine tool parts. With this experience the company went on to specify LAM'LCOAT® on all the sliding elements of its wide range of tools used in automotive machining centers. These tools are expected to have a service life in excess of 1,000,000 cycles. The parts pictured here are tool slides and spring plates:



❖ LAM'LCOAT® prevents Nut Seizure on Routing Head Spindles

The manufacturer of routing heads reported an occasional seizing of the collets tightening nut on to the head spindle. After coating the threads with LAM'LCOAT® the problem did not re-occur.



❖ LAM'LCOAT® coat Spherical Bearings

These bearings are used as part of very large self-aligning plain bearing systems designed by a major international bearing company. The company wanted to reduce the time and cost of lapping operations whilst ensuring the bearings moved freely throughout their working life. Any bend in the shaft will cause these bearings to work continuously at shaft speed.



❖ Zinc Die-casting

LAM'LCOAT® is also being used to stop galling and pickup in metal die casting. With coated ejector pins one company achieved 25,000 shots without any maintenance on the tool - a record for them!

❖ LAM'LCOAT® is a lubricant in High Vacuum

A company with vacuum and compressor experience supply special purpose machinery for high vacuum research facilities in the UK and abroad. This was a time consuming and costly process. The company has now switched to using coated bearings which provides a quicker and lower cost solution to lubrication at high vacuum.



❖ LAM'LCOAT® Lubricates at Cryogenic Temperatures

An Aerospace laboratory was trying to get a stepping motor to work at 40 K. We were asked to coat the bearings after which it worked quite happily.

- Comparison of characteristics between LAM'LCOAT® and oil on ball bearings

FOUR BALL METHOD (ASTM D-2783)

Ball Bearing	Maximum load point (kg) before tightening up	Welding point (kg)	Load-wear value (kg)
Standard mineral oil SAE 30			
Standard	63	160	26.14
with LAM'LCOAT	80	200	34.27
High performance racing oil SAE 60			
Standard	100	200	41.79
with LAM'LCOAT	160	315	72.49
Oil X-18 MD for gears SAE 90/140			
Standard	126	315	61.93
with LAM'LCOAT	180	620	82.77

TIMKEN METHOD (ASTM D-2782)

Ball Bearing	Maximum load without any damages (Lbs)	Pressure unit (PSI)
Huile Minérale Standard SAE 30		
Standard	126	315
with LAM'LCOAT	160	620



- Its main advantages:

- Is anti-seize and possesses non-stick properties
- Permanently lubricates tools
- Eliminates the hysteresis phenomenon for short movements and improves precision
- Limits the need for maintenance
- Improves the tools' capacity and the quality in general
- Reduces pressure and wear, thus extending the life of tools and accessories
- Enables to increase speeds and production rates while preserving quality, and thus to improve productivity

