# Lubricant Metal **LAM'LCOAT®** coating for Tooling and Cutting dies

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.

The low coefficient of friction (0.030 dynamic) reduces drag and wear, and improves significantly lubrication 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 lubrication coating for tight tolerance components.

LAM'LCOAT® can be applied to all PVD and CVD coatings in addition to all Ferrous and non-ferrous substrates, composites, alloys or plastics. It is compatible with most solvents or fuel/oil agents and doesn't migrate. The extremely low coefficient of friction improves chip evacuation on cutting tooling and significantly reduces galling, material adhesion and residual pickup. It has been used successfully on end mills, saw blades and drill bits. It is also an excellent addition to chucks, tooling holders and die components.



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- Examples of parts coated with LAM'LCOAT®:

❖ Tests have been done in the UK using LAM'LCOAT® as a coating on a HSS broaches. The life of the broach was extended by 5.5 times over an uncoated broach.

❖ A high speed tungsten carbide TicN coated milling cutter used for milling turbine blades was coated with LAM'LCOAT® ; its life was extended by 2.0 times.

❖ A 2.8mm solid carbide drill coated with TiN cutting an aluminium alloy drilled 2200 holes - coating with LAM'LCOAT® extended the life to 7000 holes. These cutters used normal cutting fluids during operation (after coating).

→ In the US LAM'LCOAT® is used to extend the life on a range of cutting tools from gear hobs, broaches, taps, milling cutters & centre drills.



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- Comparison of cutting tools' performances:

  - Advances:

| TOOL | MATERIAL | TiN | **LAM'LCOAT** | IMPROVEMENT | RESULT |
|---|---|---|---|---|---|
| Cutter 3/4" | Aluminium | 17.1 in/mn | 29.5 in/mn | Plus 72 % | Same wear |
| Quick steel | Steel 1018 | 4.3 in/mn | 8.6 in/mn | Plus 100 % | Same wear |
| Drill 1/2" | Aluminium | 11.5 in/mn | 19.1 in/mn | Plus 66 % | Same wear |
| Quick steel | Steel 1018 | 6.5 in/mn | 9.7 in/mn | Plus 49 % | Same wear |
| Drill 1/2" | Aluminium | 16.4 in/mn | 21.6 in/mn | Plus 31 % | Same wear |
| Quick steel TiN | Steel 1018 | 7.6 in/mn | 10.2 in/mn | Plus 33 % | Same wear |

  - Comparison with tools wear life:

| TOOL | MATERIAL | TiN | **LAM'LCOAT** | IMPROVEMENT | RESULT |
|---|---|---|---|---|---|
| Drill | 0.843x3.75" Deep | Copper 110 | 40 holes | 70 holes | Plus 75 % |
| Drill | #43x1.00" deep | Titanium | 60 holes | 150 holes | Plus 150 % |
| Drill | 1/2x1.00" deep | 12L14 | 6000 holes | 10000 holes | Plus 67 % |
| Die | 1/3-13x1.00" deep | SAE 516-Gr 70 | 12 holes | 946 holes | Plus 7883 % |
| Die | 7/16-14x1.00" deep | Cast iron | 150/min | 280 min | Plus 87 % |
| Die | M14x1.25" deep | Aluminium | 300/min | 600 min | Plus 100 % |
| Cutter | 1/4x0.50" deep | Inox 304 | 125 slots | 202 slots | Plus 62 % |
| Reamer | 0.7505"x4.00" deep | Brass | 72 holes | 144 holes | Plus 100 % |

| TOOL | MATERIAL | TiN | **LAM'LCOAT** | IMPROVEMENT | RESULT |
|---|---|---|---|---|---|
| Drill/Cobalt | Blind hole 0.350" deep | Steel CrMoV | 6 holes | 24 holes | 4 times |
| Drill/Cobalt Ø0.159" | Blind hole 0.350" deep | Steel CrMoV | 3 holes | 12 holes | 4 times |
| Cutter 1/2" Quick steel | | Steel 48Hrc | 40 parts | 70 parts | Plus 75 % |
| Cutter 3/8x8" Carbide HIP | | Steel NiCr | 15 parts | 50 parts | 3.33 times |
| Drill 1/8" Quick Steel | Ø0.385" deep | Steel 4140 | 8 holes | 64 holes | 8 times |
| Cobalt blade 7-1/8" | | Aeronautic Aluminium | 70 sq/in | 150 sq/in | 2.15 times |
| Rotary tool 3/4" Carbide | | Aeronautic Aluminium | 1.5 hours | 8 hours | 5.33 times |
| Cutter 3/8x8" Carbide HIP | | Steel NiCr | 4 hours | 13.5 hours | 3.37 times |
| Cutter 3x5/16" | | Inox 304 | 95 parts | 256 parts | 2.69 times |



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- Its main advantages:

- Is anti-seize and possesses non-stick properties

- Facilitates the sliding of the tool during beading operations

- Reduces the beading efforts and the induced deformations of the parts

- Permanently lubricates tools

- The cutting edge remains sharp (ex: razor blades to produce plastic film)

- Limits the need for maintenance

- Enables to reduce shavings

- 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, and thus to improve productivity



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