

TECHNICAL INFORMATION
LASER MARKING PRODUCT

CerMark™



LMM-5001 Bright Metal Marking Spray

1.0 Product description

LMM-5001 is a laser marking material for producing bright, oxidation resistant marks on metals. LMM-5001 is ethanol based, which allows for a fast drying time. It can be used on a variety of bare metal substrates including stainless steel, brass, aluminum, titanium, tin, nickel, and many more including proprietary, high performance alloys. LMM-5001 will not work on metals with a lacquered coating.

2.0 Product characteristics

2.1 Physical Properties	
Appearance	Beige to black colored, thick, pancake batter-like consistency.
Density	15.8-16.0 pounds/gallon
Flash Point	<66°F / <18.9°C
Drying Rate	Fast
2.2 Strengths of Product	
Versatility and ease of application. Sharp, high quality, bright metal marks can be made on a variety of metal substrates. The marks are oxidation resistant and retain their metallic luster even after thermal cycling that can cause darkening of the substrate. High contrast marks can be made on inherently dark substrates such as cobalt bonded tungsten carbide.	
2.3 Recommended Application Parameters	
Application Methods	Spray gun, airbrush, paintbrush, Bird applicator, draw down bar or foam brush.
Application	Clean surface of metal so that it is free of any lubricants or oils. LMM-5001 must be in intimate contact with the metal surface. LMM-5001 must be applied with a thin, even coat to ensure a consistent mark.
Wet Film Thickness	0.5-2 wet mils.
Thinner	Ethanol, denatured alcohol or grain alcohol is preferred.
Recommended reduction	For brushing applications, a 4:1 mix of LMM-5001 to thinner. For spray applications, a 2:1 mix of LMM-5001 to thinner.
Suggested Cleaning Solvents	Wash up with water or ethanol.
2.4 Curing/Drying of Product	
Drying Method	Air dry, radiant heat, hair dryer or convection oven.
Drying Parameters	Typically air dries in about 2 minutes, can be sped up by force drying.

2.5 Laser Marking of Product	
Laser Marking Method	CO2 or YAG laser
Recommended Starting Point for Settings	CO2: 90-100% power (35 watt laser) 1-15% speed 500 DPI / 500 PPI YAG: 20-25 watts 5-20 inches/sec speed

2.6 Application Notes

For optimum mark quality, a thin, even covering of LMM-5001 should be used. If the marking material is applied too thickly or the laser power settings are too high, this can leave a mark with a dull, blistered appearance.

LMM-5001 is formulated to be viscous to prevent settling. It may be necessary to thin the paste before using. The ratios recommended above should be sufficient. Keep in mind that the more the material is thinned, the less active ingredients are being applied. Overthinning will result in a lighter mark than properly thinned and applied LMM-5001. All marks should be cleaned of excess LMM-5001 as soon as possible after marking. LMM-5001 left on the metal surface for prolonged periods of time can cause some tarnishing.

2.7 Marking Notes

One very effective method is to give the mark two passes under the laser beam at a medium power setting. The first pass completes most of the mark without blistering but may leave a dark or dull surface. The second pass burns out the residual carbon and "polishes" the surface to yield a mark that is very bright and smooth. If your laser has the option of operating in either the continuous wave or pulsed mode, try using the pulsed mode at about 30 kHz. Repeated passes can be used.

You will need to experiment to determine the optimal settings for your equipment and substrate. In general small, single stroke fonts or line drawings require higher energy or slower scan rates than larger raster scanned marks. In raster scanning a beam overlap of 20-40% is recommended. Since LMM-5001 requires a relatively high temperature to react, substrates with high thermal conductivities and/or thick cross sections will require higher laser power input.

3.0 Product Preparation

Insure that the product has been well mixed prior to use. Some settling may occur during long storage. Material dried onto the wall of the container should stir in with the addition of thinner and moderate stirring. Paste temperature should be equalized to room temperature prior to application.

4.0 Storage Recommendations

Product must be stored in cool and dry conditions. The storage temperatures should not be below 5°C and not exceed 35°C. Settling could occur if stored for long periods of time. Before use, products must be stirred thoroughly. Partly used containers must be tightly sealed after use. If stored as recommended, a minimum shelf life of six months after the production date is guaranteed.



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