

TherMark LMM14 Black for Metal (General Purpose)



Recommended use:

LMM14 is one of TherMark's two general purpose laser marking inks and is recommended for creating a black mark on most metals. The combination of its flexible process window and wide range of applicable substrates makes LMM14 an extremely easy product to use. In general, if you are looking for one laser marking product to keep on your shelf, we recommend LMM14.

LMM14 dries quickly as a light-gray powder coat and is extremely easy to wash after laser marking. This coat should not be extensively handled prior to laser marking, however, so LMM14 should be marked shortly after application.

If you are interested in a general marking product which dries in a more durable hard coat, please check out our LMM6000.



Recommended substrates:

LMM14 is an extremely flexible product which is recommended for almost any metal. The following list is made up of substrates on which LMM14 works well. This list is not exhaustive, however, so if your substrate does not appear on the list, this does not mean LMM14 will not mark it.

Stainless Steel
Stainless Steel - Bright Annealed
Galvanized Steel
Brass
Aluminum
Copper

Chrome Plating
Nickel Plating
Gold Plating
Silver Plating
Titanium
Pewter

Lasers that work:

LMM14 works equally well with CO₂ and solid state lasers.

Dilution:

LMM14 will need to be diluted differently depending on how you plan to apply it.

- **Air brush application:** Ratio of 1:1 (1 part in volume of LMM14, 1 part in volume of denatured alcohol) is recommended. Please refer to your air brush manual for information about material thickness for your model type.
- **Foam brush (hand) application:** Ratio of 2:1 (2 parts in volume of LMM14, 1 part in volume of denatured alcohol) is recommended.

For more detailed information on dilution, please visit www.thermark.com.

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Application methods:

Please make sure that the surface to be marked is free and clear of oils, cleaning agent films, dust, and lacquer coating.

- **Aerosol application:** Shake the aerosol can thoroughly before use to achieve a homogenous suspension of marking material inside the can. When applying LMM14 from an aerosol can, the resulting coating of LMM14 should be about 1 mil thick (~25 μm). Spray uniformly at a 10" distance from the surface and move the nozzle from one side to the other covering the whole substrate area. Start spraying away from the area to be marked and move towards the opposite side and past the target area. Over-spraying before and after the target area allows constant velocity of movement and will help provide an even coating on the substrate. Make sure the bare metal is not visible underneath. If necessary spray one or two more times. In general 2-3 strokes are enough to generate the desired coating.
- **Air brush application:** When airbrushing use the above mentioned procedure for aerosol application.
- **Foam brush (hand) application:** When hand applying LMM14 the resulting coating of LMM14 should be 1-2 mils thick (~25-50 μm). Use about a 1" wide foam brush and soak less than ¼" of the brush with LMM14. There is no need to soak more than that, otherwise the ink may splash and result in an uneven coat thickness. Apply with smooth, even strokes.

Note: Aerosol and air brush application are both preferred over foam brush application. It can be challenging to achieve the smooth, even coating of laser marking material necessary for optimal marks when using a foam brush. We only recommend foam brush application if you do not have an air brush or are coating a small surface area.

For more detailed information on application, please visit www.thermark.com.

Drying time & methods:

If left to air dry, LMM14 is normally fully dry within about two and a half minutes. If air drying takes too long, however, a hair drier or forced air heater may be used to speed up the process. LMM14 can be fully dried with an average household hair dryer in 5-7 seconds.

Laser settings:

Power and speed are the two most important variables to control when using TherMark laser marking materials with any laser, but there are other relevant variables depending on which laser you are using, such as length of lens, PPI, DPI, frequency, or hatch spacing. Please visit www.thermark.com to read more about laser settings and to download an LMM14 laser settings chart.

Product Appearance:

LMM14 liquid will often separate and needs to be well-stirred prior to use. The dense, heavy part of the marking material containing frit and pigment is silver/gray in color, while the thin, light part of the marking material containing mainly thinning agent may be yellowish green or greenish blue.

Once applied to the substrate and dry, LMM14 will be a light-gray powder coating.

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Shipping options:

- LMM14 aerosol is considered by the US Department of Transportation (DOT) to be “ORM-D” or “Consumer Commodity”. This product may be shipped via ground or air. TherMark does not add any additional charges for ground shipping of this product, but LMM14 aerosol is subject to an additional \$40 hazardous materials packing fee if shipped via air. This is due to regulations around the shipping of pressurized cans on airplanes.
- LMM14 liquid is a non-hazardous, water-based product and can be shipped via ground or air with no additional charges.

Product storage:

All LMM14 products should be stored between 40°F (5°C) and 95°F (35°C) in a dark, dry place. Aerosol cans should be stored on their side rather than their bottom, as the LMM14 material can settle and clump together inside the can. Side storage makes it easier to achieve even dispersion when the cans are shaken.

Disposal:

LMM14 is a water-based material and is environmentally safe and non-hazardous. After laser bonding, any excess, un-bonded material can be washed off the substrate and down the drain into your normal water/sewer waste area.

Unused aerosol cans that are still pressurized should be de-pressurized in a well-ventilated area (the propellants should be completely expelled from the can) and then can be disposed of in your regular trash and solid waste area.

Unused containers of liquid ink/paste can be safely disposed of in your regular trash and solid waste area.

Availability:

LMM14 comes in 5 sizes: for price and availability, please contact TherMark.

LMM14.TM.A6	6oz aerosol, up to 900 sq/in
LMM14.TM.50	50gm liquid ink, up to 1,200 sq/in
LMM14.TM.250	250 gm liquid ink, up to 6,000 sq/in
LMM14.TM.500	500 gm liquid ink, up to 12,000 sq/in
LMM14.TM.1000	1,000 gm liquid ink, up to 24,000 sq/in

* Product coverage in above table assumes proper application (dilution/coating thickness).