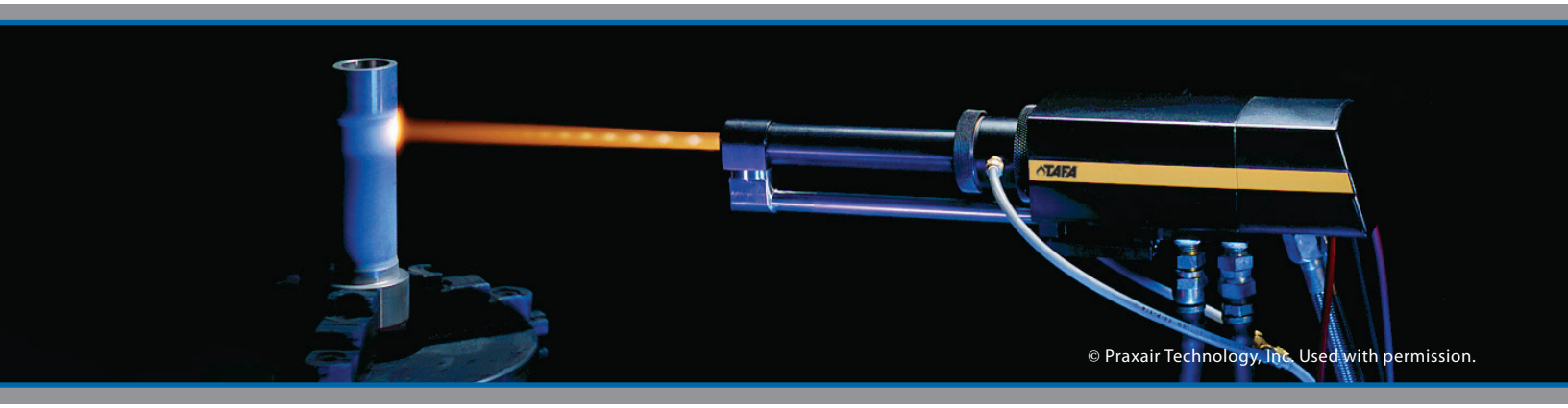
green belting

Masking for Liquid Fueled HVOF

More than just tape!



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Save Time and Money with the Right Materials and Methods

Liquid-Fueled High Velocity Oxy Fuel coating (LF-HVOF) is a form of thermal spray that is used to deposit very dense coatings onto a component surface. Various metal and carbide powders are melted and propelled at a component surface to build up the dense coating. LF-HVOF coating is the most effective method for applying wear coatings. Common LF-HVOF coatings are tungsten carbide, chrome carbide, stainless steel as well as blended alloys. There are two main categories for HVOF coating systems: Gas Fuel Systems (Hydrogen, Propylene, Propane, and Natural Gas) and Liquid Fuel Systems (Kerosene).

Advantages of Engineered Masking Solutions from Green Belting

Specifically for LF-HVOF masking applications, Green Belting Industries thermal spray masking materials are engineered for:

- **Abrasion Resistance** – High abrasion resistance keeps tape intact, resulting in clear coating lines and edge definition. HVMT Orange can be used together with High Velocity Masking Compound (HVMC) or sheet metal for a reliable mask.
- **Strong Adhesion of Tapes** – Adhesion to metal is a critical requirement for any tape used for LF-HVOF. HVMT series of tape has excellent adhesion to metal and resists the high kinetic force of LF-HVOF, which helps it to hold fast during the spray process. Strong adhesion to metal, as well as front to back adhesion, is also key in keeping the tape firmly in place with no lifting or flagging.
- **Resistance to Heat Transfer** – Green Belting Industries HVOF tapes and compounds are designed not only to withstand extreme heat but also limit the amount of heat transfer through the material. This is an especially important feature with HVMT Orange masking tape as protection of the adhesive is a key factor in the survival of the masking tape. When used correctly, the HVMT Orange leaves no residual adhesive upon removal of the masking.
- **Highly Conformable** – Effective LF-HVOF masking often depends on the ability of the material to conform to more complex shapes and profiles. Competing tapes are very stiff which limits their effectiveness while the recommended tapes and compounds are highly conformable making it easier to mask more difficult profiles. HVMT Orange can also be used underneath complex metal masking to prevent bridging and to assist with superior edge definition.
- **Clean Release** – Green Belting Industries tapes and compounds leave no residue upon removal after blasting and spraying which eliminates the need for extra clean up and/or rework. Adhesive residue can be a major problem for some competing thermal spray masking tapes.

The Need for Masking

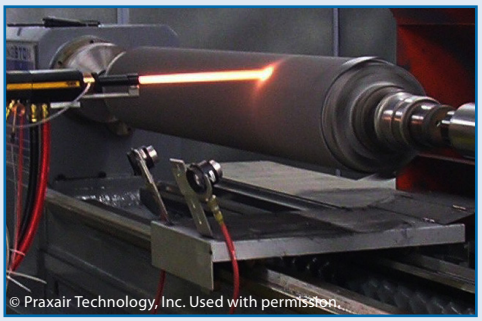
LF-HVOF coating process presents unique masking challenges.

Unlike other forms of thermal spray, masking against HVOF coatings can be very difficult and expensive. In the past, the options for masking against liquid fueled HVOF systems were limited. Put simply, the only reliable masking material was solid metal masking fixtures or plates (for shadow masking).

The problems that operators typically encounter with LF-HVOF are:

- Extremely high abrasion (more than gas fueled systems).
- Fast transfer of heat through the masking materials (faster than gas fueled systems).
- High Kinetic energy or force (much higher than gas fueled systems).

The three factors above often limit what materials can be effectively employed as masking options for gas fueled HVOF coating applications. Fortunately, GBI produces and offers some unique solutions to tackle these challenges.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LF-HVOF spray coating being applied to a rotating cylindrical part.

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Opportunities for Time and Cost Savings

Consider that most companies are forced to engineer and fabricate metal masking fixtures or tooling (often very complex) to achieve their masking solutions. These metal masks are often time consuming and expensive to produce. Often, metal masks are not a permanent solution. Metal masking also requires regular maintenance to strip excess overspray. Finally, another drawback may be the tendency of the coating to bridge to the masking which increases the chances of cracking the coating upon removal of the metal mask.

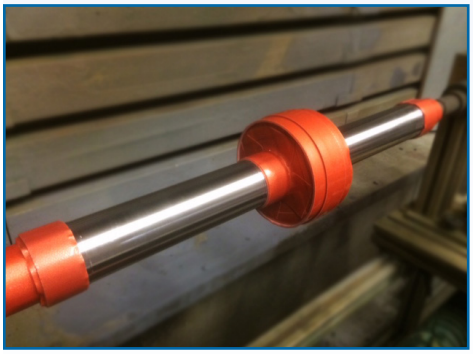
To date, most "HVOF" masking tapes have been ineffective in masking against LF-HVOF systems. While recommended for Gas Fuel systems, the HVMT Orange can sometimes be used as a primary masking material for large components (where dwell time is not continuous).

HVMC (High Velocity Masking Compound) is quick to apply, easy to cleanly remove, and in many cases is reusable. This compound, when deployed correctly, will resist all forms of HVOF coatings including the most high energy liquid fuel systems. This material is ideal for making reusable masking plugs, moulds, caps, and sleeves. The compound will also bond to the surface of HVMT Orange to produce a very solid mask that can be used for complex shapes as a primary masking option.

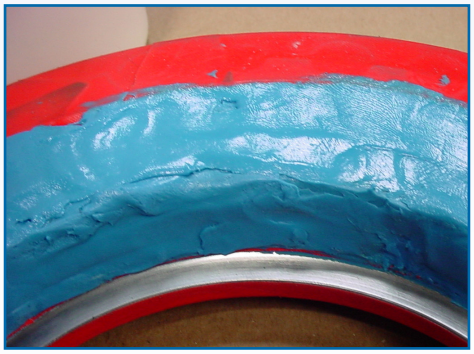
HVMT series tapes such as **HVMT Orange (High Velocity Masking Tape)** are a reliable form of secondary masking against LF-HVOF systems. The tape can generally be applied in 1 layer with metal masking to achieve a masking method that is faster, more economical and reliable compared to designing and fabricating an engineered metal fixture. This strategy will also prevent bridging and cracking of the coating.

Product Recommendations for LF-HVOF Masking

- **HVMT Orange** – A reliable secondary LF-HVOF masking tape used for the purpose of precision masking for challenging applications. Best results will be achieved on large components as a primary mask, or as a secondary masking to be used in conjunction with metal masking or HVMC.
- **HVMC** – An aviation engine approved High Velocity Masking Compound suitable for use with all gas fuel and liquid fuel HVOF coating systems.



HVMT Orange Masking Tape



HVMC – High Velocity Masking Compound

HVMT Orange Masking Tape

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