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Plasma Spray Coating

A Technical Guide to Masking



Technical Application Series

Save Time and Money with the Right Materials and Methods

Tapes

GBI manufactures pressure sensitive thermal spray masking tapes. These materials must be smoothed and pressed with force/pressure to create a good bond of the masking tape to the component surface.



Applying HVMT Orange Masking Tape to a blade prior to receiving GF-HVOF Coating.

Silicone adhesives are always used for thermal spray applications for two reasons: 1. Silicone adhesives typically resist the continuous high temperatures approaching 500°F/ 260°C that are associated with thermal spray coating, and 2. Silicone adhesive releases cleanly from most surfaces leaving no residual adhesive.

Thermal spray masking tapes are typically constructed with silicone rubber, woven fibreglass, metal foils, and silicone adhesive.

Compounds

GBI masking compounds are provided in two parts, A and B, so that they can remain stable and usable for long durations. Typical shelf life is 2 years. Once the two parts are mixed, moulding putty has now been created that can be used to:

- Plug holes
- Create moulded sleeves and caps



Masking with 170-10s Red Masking Tape, and High Velocity Masking Compound (blue) which is being used to plug holes.

Fabrics

Fabrics, also known as thermal spray masking blankets, are constructed from silicone coated woven fibreglass fabric. Unlike tapes, these fabrics have no adhesive. The lack of adhesive is an important characteristic which allows for the material to be reusable. The material is also highly effective for masking large areas quickly in the form of secondary masking.



S/W 35 Masking Fabric is used to cover larger surface areas.

Pre-Cut or Die-Cut Pieces

Pre-cut or die-cut pieces are pressure sensitive tapes that have been pre-cut on release liners to simplify repetitive masking. Pre-cuts can be produced in sheets using our advanced plotter equipment. Then profiles and drawings are digitally stored for future usage.



PTFE Group provides tapes, fabrics, compounds, and pre-cut or die-cut profiles for masking in various thermal spray coating applications.

Pre-cuts are advantageous for:

- Faster masking leading to time and cost savings
- Creating a safer workplace with less razor blade handling
- Improving accuracy and consistency of masking profiles

Die-cut pieces, or rotary die cut pieces, are usually reserved for high-volume repetitive masking applications. The rotary die-cuts are produced at PTFE Group fabricating centers and then rolled, with liners like tape for easy handling, removal and application. As with the pre-cut advantages listed above, rotary die cutting is more economical for applications involving 1000's of pieces. A proper cost study should be conducted by the customer before deciding which option is most appropriate for a given situation.



Pre-cut and die-cut profiles increase efficiency and safety in the workplace.

Masking Methods and Techniques for Best Results

First determine if the area to be masked is considered Primary or Secondary.

Primary masking is the critical masking area in direct contact with the spray particles as they impact the component surface. Primary masking is crucial as this is the area where masking and coating meet and most operators want well defined, clean coating lines. These perfect edges can be achieved by using GBI plasma spray masking products.

Secondary masking is the non-critical masking area that does not come in direct contact with the spray particles as they impact on the component surface. The secondary masking area is usually furthest away from the primary coating zone but operators still need to protect those areas as they can be impact-

Product Recommendations for Plasma Spray Masking

Tapes

- 170-10s YL – A reliable masking tape for most standard plasma spray applications
- 170-10s Green – For applications that involve higher abrasion. This tape produces cleaner coating lines and may be used with fewer layers (and less quantity) than standard tapes.
- 170-10s Red – Recommended for applications involving higher temperatures and longer dwell times. This tape resists burning and scorching leaving cleaner coating lines and less residue from any scorching that may occur.
- 170-14C – A premium masking solution for applications involving the harshest conditions including high abrasion and high temperatures. This tape can be applied in fewer layers (less quantity) which results in faster masking, less waste and overall savings in terms of time and cost.
- 170-20s YL – Double layer standard plasma spray masking tape
- 170-20s Green – Double layer abrasive resistant plasma spray masking tape

Compounds

- All Purpose and High Velocity Masking Compounds (APMC & HVMC) – Ideal for creating reusable masking moulds, plugs, caps, & sleeves.

Fabrics

- S/W 35 – White silicone coated glass fabric (only use for secondary masking)

Products for Use in Difficult Applications

- 160-5s HT – Economy grade glass cloth tape can be used in multiple layers for masking parts such as journals and piston heads
- 179-25s – Silicone coated aluminum foil tape with excellent resistance to grit blasting and higher temperature spray systems.
- HVMT Orange – Highly conformable premium masking tape best suited for masking against the most demanding high temperature and high abrasion thermal spray applications.
- HVMT Copper - Designed for masking against high temperatures and high abrasion.

ed by stray spray or bounced particles. Because these secondary areas are normally larger than the primary masking area, a good masking solution would improve masking efficiency with products designed to cover large areas more quickly (save time and money).

How to select the correct masking materials for Primary Masking areas



A turbine blade is masked with 170-10s (Red) and 160-5s (white) Masking Tapes as primary and secondary masking.

To select the correct primary masking products, the operator needs to consider what factors will most affect the masking tapes, compounds, and fabrics. There are several issues to consider:

Is the profile of the component intricate or basic?

Basic profiles are easier

to mask and all of the GBI tapes listed in the section above will work. In many cases, operators prefer to apply two layers of masking tape to achieve a reliable primary mask. For example an operator may choose to apply two layers of 170-10s YL. To

achieve time and cost savings, a better option is to apply a single layer of 170-20s Green or 170-20s YL. This strategy can cut masking times by 50% and generate significant cost savings.

Intricate profiles are more challenging and require a good masking plan. Small, intricate parts and profiles will require a flexible masking material of which the 170-10s series of tapes is ideal. The most flexible is the 170-10s YL followed by the 170-10s Red. Therefore, if flexibility is required and dwell time is shorter than 170-10s YL is the appropriate product. If the component is small and there is potential for dwelling of the flame, then the 170-10s Red is the appropriate choice to delay burning or distortion of the masking tape.

Does the grit blast or prep blast require coarse grit or fine grit?

All thermal spray coatings require a prep blast stage to etch the component surface so that the coating will form a strong bond. If the operator is using a fine grit of 60 or greater the abrasion will be somewhat mild. When finer grits are deployed all of the 170 series tapes, the silicone fabric, and both compounds are good to use.

If the operator is using coarse grits of 46 or less, we recommend using either 170-10s Green or 170-14C. Both of these tapes will survive intense grit blast and will maintain clean coating lines as they will resist fraying. GBI products are designed to be applied only once because they survive both the grit blast and the plasma spray coating.

The final consideration for grit blast is the PSA of the grit blast nozzle. For PSA of 60 or less with relatively fine grits we expect all of our 170 series tapes, compounds, and silicone fabrics to survive. For PSA greater than 60 with relatively fine grits we recommend using 70-10s Green and 170-14C (likely in two layers).



Quality masking products such as this 170-10s (Green) Masking Tape will withstand both grit blast and thermal spray coating processes.

Finally, for PSA greater than 60 with grit of 46 or more coarse, we recommend at least two layers of 170-10s Green or 170-14C. If the grit nears 16-24 grit other products should be considered such as HVMT

Orange or HVMT Copper. 179-25 is also an option if flexibility is not a concern.

What type of exposure to the plume of the flame will the masking materials experience, continuous or intermittent?

Plasma spray coating is an extremely hot process and operators attempt to control the temperatures of the substrate in a number of ways. The most common method is to ensure that the spray gun is constantly moving while the component is also moving (for example, a component spinning on a turntable while a robot manoeuvres the gun in a pre-programmed route). From a masking perspective, operators must limit the exposure of silicone tapes, compounds and fabrics to the direct spray. Short intervals are okay because dwells will result in burning and disintegration of the masking material. As general practice, the substrate temperature should not exceed 500°F (260°C).



High Velocity Masking Compound is being used to plug holes.

If proper steps have been taken to avoid the spray dwelling on the masking, then all of the recommended plasma spray options should work well.

If longer dwells (possibly due to the component small size) exist, then the operator should consider using 170-10s Red or 170-14C. If the component surface temperature is expected to exceed 500°F (260°C), then multiple layers of 170-10s Red or 170-14C will be required.

Will air cooling be engaged?

Air cooling, the process of forcing air through a cooling jet towards the surface of the component being coated, is to control the surface temperatures of the component so that the coatings can form and bond correctly with minimal cracking. Fortunately for silicone masking products, the desired temperature range of the surface of most coated parts is well below the 500°F (260°C) threshold. Under normal plasma spray coating operations (APS) all of the recommended plasma spray masking products should work well.

There are situations where air cooling is not possible and/or not practiced which makes masking far more challenging since a lack of air cooling will significantly raise the substrate temperature especially if the component being sprayed is small. The best option for masking smaller parts with no air cooling is the GBI 170-10s Red plasma spray masking tape or HVMT Orange high velocity masking tape. Both of these products will exhibit flame retardant characteristics and self-extinguishing properties. These products, when used in multiple layers (at least two) should be enough to survive the process.



Air cooling reduces substrate temperature and increases masking performance.

Will the parts be sprayed manually or robotically?

Most facilities today utilize gun mounted robots to carry out the coating tasks. Spraying robotically is a safer process for operators compared to spraying manually and is essential for achieving standardized and repeatable results (consistency). In terms of silicone masking products (tapes, compounds, and fabrics) robotic spraying reduces the chance of overheating or burning as the robot has been programmed to follow an effective "route" or "traverse" minimizing dwell times for both the ideal coating properties and the survival of the masking.



Robots are often used to apply thermal spray coatings.

Not every coating task can be achieved by spraying robotically and not every coating facility is set up with robots. In a manual spraying environment the skill of the operator is the key to avoid any excessive exposure to the flame. Unlike robots that can be programmed to continue their routes without pause, humans can inadvertently expose the component and masking to excessive flame (potentially resulting in burning of the masking). If the operator or the supervisor has concerns about excessive flame exposure the customer may want to consider a strategy that includes at least two to three layers of tape or use a flame retardant version of plasma spray masking tape (for example 170-10s Red).



Manual application of combustion spray using a hand-held spray gun.

Will the spraying occur on a 90° angle?

Thermal spray coating technicians universally strive to spray coatings on a 90° angle to maximize coating deposition and to maximize the bond of the coating to the substrate. For situations where plasma spray coatings will be applied on 90° angles, any of the 170 series should work well.

Unfortunately, the geometries of the components do not always allow for 90° angles of spray. In fact, many profiles may be sprayed from 75-90° and in some severe instances, angles

of 45° may occur. From a masking perspective, the further removed from 90° angle of spray the greater the chance of the masking tape being lifted. This lifting could potentially occur as the spray particles impact the edge of the tape which may create a lift of the material from the component surface. To combat



Application of twin wire arc spray at a 90° angle to the target surface.

the lifting scenario, operators are encouraged to use the 170 series tapes which have strong adhesion to metal and strong face-to-back adhesion. These tapes are pressure-sensitive so it is imperative that force (pressure) be applied in order that the strongest bond of the adhesive to the component surface is achieved. If spraying

on a significant angle, we recommend 170-10s YL, 170-10s Green, or 170-10s Red. For the highest conformability, the best choice is 170-10s YL.

What is the coating thickness?

Plasma spray coatings are applied in many different thicknesses depending on the purpose and the style of the coating. In terms of masking, one of the primary concerns is cracking or chipping of the coating as a result of “bridging” (when the coating is built up over the targeted area and the masking simultaneously). Depending on the severity, the coating may chip when the masking is removed.

To avoid catastrophic bridging the operator needs to consider the coating thickness. Generally, if the coating is less than 15-18 mil the 170-10s YL, Green, or Red should work well. Thicker coatings may require multiple 10 mil tape layers or thicker tapes such as GBI double layer tapes (170-20s YL or 170-20s Green).

Another useful strategy involves the application of narrow widths of tape along the critical coating lines.

After grit blasting, this sacrificial layer can be removed exposing fresh un-etched silicone rubber. This fresh surface should prevent bridging of the coating which in turn should provide a clean coating edge upon removal of the masking.

Is the powder (coating) coarse or mild?

Plasma spray coating facilities routinely use a variety of feed-stock or powders. These powders can range in particle size and coarseness which makes it important for the operator to consider the type of powder being used when choosing the masking materials.

For very coarse powders such as carbides or ceramics, it is advisable to use abrasive resistant materials (tapes and compounds) such as 170-10s Green, 170-20s YL/Green, 170-14C, APMC, and HVMC.

How to select the correct masking products for Secondary Masking areas

To select the correct secondary masking products, the operator needs to consider what factors will most affect the masking tapes/fabrics/compounds. The following are some important factors to take into account:

What is the size of the secondary masking zone?

For large areas use of the S/W 35 Silicone Coated Fibreglass (also known as a thermal spray masking blanket) is recommended. This material is a reusable form of masking that can be used to cover large areas quickly and will help to eliminate “excessive tape masking”. Generally this fabric must be mechanically fastened.

Large areas with difficult profiles should utilize fabric and tape together for the most cost effective solution.

Small areas should generally use a strong plasma spray masking tape such as 170-10s Green.



S/W 35 Masking Blanket is used as secondary masking to mask larger areas, and is re-usable.

Is overspray acceptable?

Depending on the work instructions, some jobs will allow for overspray. In those cases, masking in general is not needed.

Most precision jobs will not allow for over spray. In these situations, a strong and precise masking tape such as the 170 series is recommended.

Masking Strategies for Common Profiles and Components

Cylinders, Rollers, Shafts

Most rollers and cylinders have keyways which can be masked with APMC or HVMC. The GBI compounds are a very quick and reliable solution for masking keyways and repetitive masking can often be created.

Journals can be masked quickly with a variety of plasma spray masking tapes or glass cloth tapes and often wider rolls are recommended for convenience. The solution involves turning the roller on a lathe and wrapping the masking using 160-5s HT (with no liner).

Large surfaces of rollers or shafts can be protected by using S/W 35 silicone coated glass fabric as secondary masking with a good quality plasma spray masking tape close to the coating area/critical area.

Reliable masking always involves 170 series plasma spray masking tape.

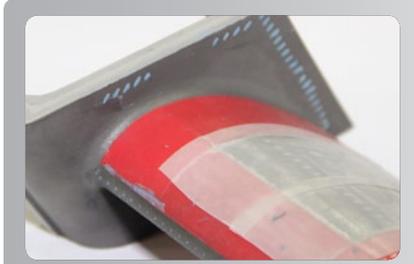
Cooling holes

Many aviation engine vanes and components found in the hot combustion zones of the engine fan blade contain very small holes on the surface to assist with controlling the temperature of that part while in service. Generally, operators try to protect cooling holes so that coating and grit does not penetrate and build up. Masking cooling holes is difficult and time consuming. The best solution for masking cooling holes is using High Velocity Masking Compound (HVMC). This masking technique involves mixing the compound in a 50:50 ratio then fill into the holes. The putty can be trimmed and the surface cleaned after curing is complete (7 minutes). After the compound is cured, grit blast is required to etch and clean the surface of the com-

ponent prior to the application of the plasma spray coating. Once the coating process is complete the putty can be burned out of the hole at 1000°F (540°C) for one hour.

Fan blades

Generally fan blades are masked at the bases of the blades. The bases can have some complex geometries that require flexible masking. We recommend using rolls of 170 series tape for masking. Pre-cut pieces can be used for repetitive complex shapes to save time and money.



The numerous small holes in this turbine fan blade can be quickly and effectively masked using High Velocity Masking Compound.

Some operators may need to protect larger sections of the fan blade with a secondary masking application (away from the primary spray zone). For these applications we recommend using fabricated silicone fabric pouches constructed from S/W 35. This application is not only a fast masking option, but often a multi-use or reusable form of masking.

These circular parts are challenging to mask efficiently as they generally have smaller targeted areas which require coatings along with large areas that must be protected or masked. We recommend that in the critical coating areas where fine coating lines must be produced, a 170 series tape such as the 170-10s Green for abrasion resistance or 170-10s Red for extreme heat resistance. For secondary masking, and to cover a large area, we recommend S/W 35 cut circular to cover most of the component. This masking strategy is fast and economical as the fabric is reusable.

Combustor Casings

These circular parts are challenging to mask efficiently as they generally have smaller targeted areas which require coatings along with large areas that must be protected or masked. We recommend that in the critical coating areas where fine coating lines must be produced, a 170 series tape such as the 170-10s Green for abrasion resistance or 170-10s Red for extreme heat resistance. For secondary masking, and to cover a large area, we recommend S/W 35 cut circular to cover most of the component. This masking strategy is fast and economical as the fabric is reusable.

Biomedical Implants

Precision masking is always required with biomedical implants. The masking material we recommend is generally a plasma spray masking tape (silicone coated fibreglass). Most operators prefer our standard 170-10s YL as the tape has exceptional flexibility allowing the masking to conform to very complex shapes. Since most of the parts are small, some consideration needs to be given to excessive heat. Some operators will elect to use 170-10s Red to achieve the masking.

To improve accuracy and to speed up masking, we encourage the use of pre-cut masking profiles. The pre-cut pieces will use the material listed above, but with the required shapes already kiss cut onto a liner. This pre-cutting allows for a faster masking job with better consistency (and in a safer environment because of reduced blade handling).

Piston heads

Automotive Piston heads are often coated with thermal barrier coatings and/or wear resistant coatings. These coatings tend to be very coarse and for that reason we recommend applying 170-10s Green for masking. An alternate method is to use simple glass cloth tape (such as 160-5s HT) in multiple layers that can be applied relatively quickly to the round component shape.

Pump components

Pump components often used in the gas and oil industry are coated with wear resistant coatings. These coatings can be applied with plasma spray. Given the difficult geometries or profiles, we often recommend the standard 170-10s YL due to its conformability and very strong face-to-back adhesion.

Industrial Gas Turbines Transitions (buckets)

IGT Transition pieces (buckets) require thermal barrier coatings. Quite often, the application of the coating on these pieces involves extreme temperatures approaching or exceeding 500°F. As a solution, GBI recommends masking with 170-10s Red to withstand the high temperatures and to resist burning – the result should be clean coating lines and clean removal of the masking tape.

Z-notches

Some turbine blades have complex Z notch profiles that require critical masking which must protect a portion of the notch area while exposing the area where the coating is desirable. GBI recommends the use of 170-10s Green or 170-10s Red masking tape to achieve precision coating lines. For high volume repetitive applications, operators can maximize time and cost savings by utilizing pre-cut masking profiles.

Recommendations for Heat, Abrasion, and Conformability

Extreme Heat

APS (Air Plasma Spray) is always a hot process. However, some situations exist where the heat generated can be considered extreme such as when applying TBCs (Thermal Barrier Coatings) which are typically ceramic.

The size and profile of the part will also contribute to the heat generated and sustained on the component surface. For example, small parts will generally heat faster and the masking has longer continuous exposure as compared to larger components. Profiles such as inside diameters can also generate tremendous heat.

For extreme heat GBI recommends 170-10s Red, a plasma spray masking tape with modified rubber and adhesive designed to resist burning and distortion along the critical masking lines. The modified adhesive will also remove cleanly from metal surfaces after exposure to extreme heat.

High Abrasion

APS can often be a very abrasive process depending on the powder being sprayed. Before a coating is applied, all parts are subjected to grit blast to etch the surface in preparation for the plasma spray coating (this improves bond). It is common for weaker masking tapes to fray, breakdown, and fail due to abrasion.

For higher abrasion applications, GBI generally recommends 170-10s Green which is a plasma spray masking tape with twice the breaking strength of competing tapes. The style of the glass is effective for maintaining the integrity of the tape leading to perfect coating lines (no fraying) and very clean removal (no adhesive residue).

While 170-10s Green is usually sufficient for high abrasion environments, GBI produces other tapes which can survive extreme abrasion (such as aluminum oxide grit less than 24 grit size). For extreme abrasion, GBI recommends two materials:

- GBI product code 170-14C, a 14 mil modified thermal spray

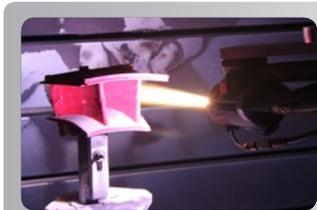
more than just tape!

- masking tape which can be applied in a single layer;
- GBI product code 170-20s YL, a 20 mil double layered plasma spray masking tape which can take the place of the application of two layers of common plasma spray masking tape (resulting in time and cost savings).

Non-tape solutions offered by GBI are our masking compounds APMC (All Purpose Masking Compound) and HVMC (High Velocity Masking Compound). These two part silicone compounds will withstand all forms of thermal spray along with surviving surface etching and blasting.

Conformability

One of the most significant challenges faced by thermal spray masking tapes is the need to be strong, yet flexible. GBI has solutions for components that are difficult to mask due to challenging geometries and profiles. GBI products will conform to the challenging profiles and will not lift during spraying while removing completely clean (leaving no adhesive residue).



A plasma spray coating is applied to a turbine blade component masked with GBI 170-10s Red Masking Tape.

The most common solution is standard plasma spray masking tape 170-10s YL. This material uses a flat glass style that is highly conformable. This conformability combined with GBI's strong adhesion makes this product the best choice for most challenging APS masking jobs involving difficult geometries.

When the element of excessive heat is also introduced, GBI recommends the use of GBI product

code 170-10s Red which offers good conformability and heat resistance.

In some cases, a non-tape solution is the best. GBI's APMC and HVMC can be used to make intricate reusable masking moulds that will take the shape of any profile. A component such as a complicated blade root would benefit from this type of masking solution.

Tape plus Metal: The Combined Solution

In terms of masking materials, there is no one size fits all solution. It is very common to use multiple masking materials for the most effective masking of a component. A common masking strategy involves Metal Masking profiles along with Tape, Compounds, and/or Fabric.

Shadow Masking with Metal and Tape

Shadow Masking is a masking strategy whereby metal plates are used to mask off the area where a coating cannot be tolerated. While effective, shadow masking may often require tape on the component to prevent a blurry section of overspray because tape allows for precision coating lines.

Metal Masking Tooling with Tape

Often metal masking tools are designed to encapsulate a component while exposing only the areas where a coating is to be placed. Not surprisingly, the coating will build up on both the component and the masking. This can be a big problem as the coating will chip and crack when the tooling is removed. To solve this problem, thermal spray masking tape is used where the masking and component meet to act as a buffer to pre-

vent bridging and cracking of the coating and to ensure perfect coating lines.

Strategies to Maximize Thermal Spray Masking Time and Cost Savings

Inspect the Component and Masking Prior to Spraying

Make sure proper pressure has been applied. The operator must remove all air-pockets and ripples to ensure that adhesive is fully engaged with the component surface.

If you are concerned about bridging of the coating, then we recommend prior to grit blast, using a second layer of tape (narrow strips) used where the coating meets the masking. Upon completion of the grit blast, the narrow strips may be removed leaving a smooth surface that will prevent any chance of bridging and cracking of the coating. Also:

- Eliminate any areas where tape is not in contact with the component, for example tape should not be used to cover holes (APMC or HVMC should be used instead).
- Check for surface contaminants (oil, FPI oil using a black light, grease, paint, old coating etc).
- Review coating plan to make sure the component and gun are moving to prevent excessive heat (which of course is bad for both the masking and the coating).
- Make sure (where possible) the air cooling jets are engaged.

Ensure you have the best tools for the job

Utility knives, razor blades, and/or scissors: Tapes and fabrics are usually cut and precision cuts are required as opposed to hand tearing.

Masking tables with protective covers prevent parts from getting scratched and provide surfaces where tape can be cut.

Lighting - All precision masking jobs require good lighting to be able to accurately mask with tapes, fabrics, and compounds.

Smoothing instrument - Most masking operators will utilize objects or tools for smoothing tape. Remember that thermal spray masking tapes are "pressure sensitive" thus they require sufficient pressure to bond well. Smoothing instruments can be fabricated plastic hand held tools but ideally have multiple surfaces to adapt to different profiles.

Rack/bar for holding tape rolls - In the interest of safety and efficiency, masking departments should have racks or bars to contain and dispense tape easily. This is the best way to store various sizes at each work station.

Don't forget these important Health and Safety considerations

Avoid cuts

Unfortunately, cuts to hands and fingers do occasionally occur. Cutting injuries result in down time (not to mention pain and possibly infection). Cuts can be reduced by employing two simple but effective measures:

1. **Pre-Cut Profiles** - Use of pre-cut sheets of masking tape containing pre-cut profiles is not only safer, but it also speeds up masking.
2. **Kevlar gloves** - Where possible, employees should consider using Kevlar gloves to avoid cuts from blades and also from sharp component areas.

Avoid repetitive motion disorders

Some companies perform masking of repetitive shapes. Peeling the liner off of thermal spray masking tapes can sometimes lead to repetitive motion injuries (particularly if breaks, rest periods, or job rotations do not occur). This problem is more often seen with operators who consistently use wider width rolls of masking tape such as 4" and greater. To reduce this potential for injury, GBI recommends pre-cut masking profiles to minimize liner removal and avoid excess strain on wrists. Furthermore, most masking operators are moving towards narrower width rolls such as 2" wide to help reduce repetitive motion disorders.

Contain release liners to minimize trip and fall hazards

Masking departments should be kept clean, especially the floors. Unfortunately, many shops forget to immediately dispose of release liners (which are discarded after the tape is unwound). A good practice is to have several garbage containers beside the masking work space to prevent release liners ending up on the floor which can lead to slipping hazards. This potential hazard is especially common when customers use products with clear polyester release liners (they are very slippery and harder to see compared to yellow PVC release liners).

Additional tips for successful masking

Avoid hand tearing

Even though some thermal spray tapes may have weaker breaking strength, tearing by hand will seriously damage the integrity of the product. Thermal spray masking tapes utilize a base of woven fibreglass and when torn by hand, the fibreglass is exposed as a potential contaminant to the coating. The frayed glass can also shadow the coating line, leading to rework.

Always apply firm pressure to ensure strong adhesion of the tape to the component.

Thermal Spray masking tapes are pressure sensitive, meaning they require force to properly wet out and adhere. A smoothing tool or instrument (even fingers) should be used to create a good bond of the tape to the component.

Avoid use of Solvents.

Where possible solvents should not be used on thermal spray masking tapes or the components to be masked. Strong solvents can break-down and liquefy the adhesives and silicone rubbers. For example, if a strong solvent is used and tape is immediately applied to that surface, the tape will not adhere well. Mild solvents can be used to clean a surface prior to applying the tapes, however the operator should make sure that the solvent has flashed off completely.

Never allow for silicone adhesive tapes to freeze

Freezing of silicone rubber thermal spray masking tapes can interfere with the chemistry of the product leading to poor adhesion values. It does NOT extend the life of the product.

Refrigeration of tapes will not have a negative effect on thermal spray masking tapes. Best storage conditions are at room temperature, but avoid excessive humidity and excessively dry storage.

Protect tapes from dirt and dust contamination

Dirt and dust particles can reduce the tack and adhesion of the tapes as well as potentially becoming a contaminant to the coating so a clean working environment is important.

Where possible, try to avoid narrow strips of masking tape less than 1/4" wide.

Tapes can be manufactured in widths of less than 1/4", however, operators risk tape lifting due to small surface coverage (adhesive coverage) versus the relative force of the spray. In other words, extremely narrow strips of tape have a better chance of lifting, tearing, or moving compared to strips of tape that are 1/4" or greater in width.

Engage forced air cooling to control the surface temperatures.

Remember that temperatures beyond 500° F (260°C) will break down silicone tapes, compounds, and fabrics. The higher the temperature beyond 500°F (260°C) the faster the break down will occur.

Do not use thermal spray masking products for applications such as VPS (vacuum plasma spray)

The only suitable masking material for VPS would be constructed from solid metal.

As with other coating styles, plasma spray masking has varying degrees of challenge depending on factors such as profile of the component, size of the component, coating thickness, coating style, etc. GBI has produced many different options (not just tapes) to solve a variety of masking challenges related to plasma spray coatings. The goal is to mask faster, safer, and more accurately resulting in time and cost savings.

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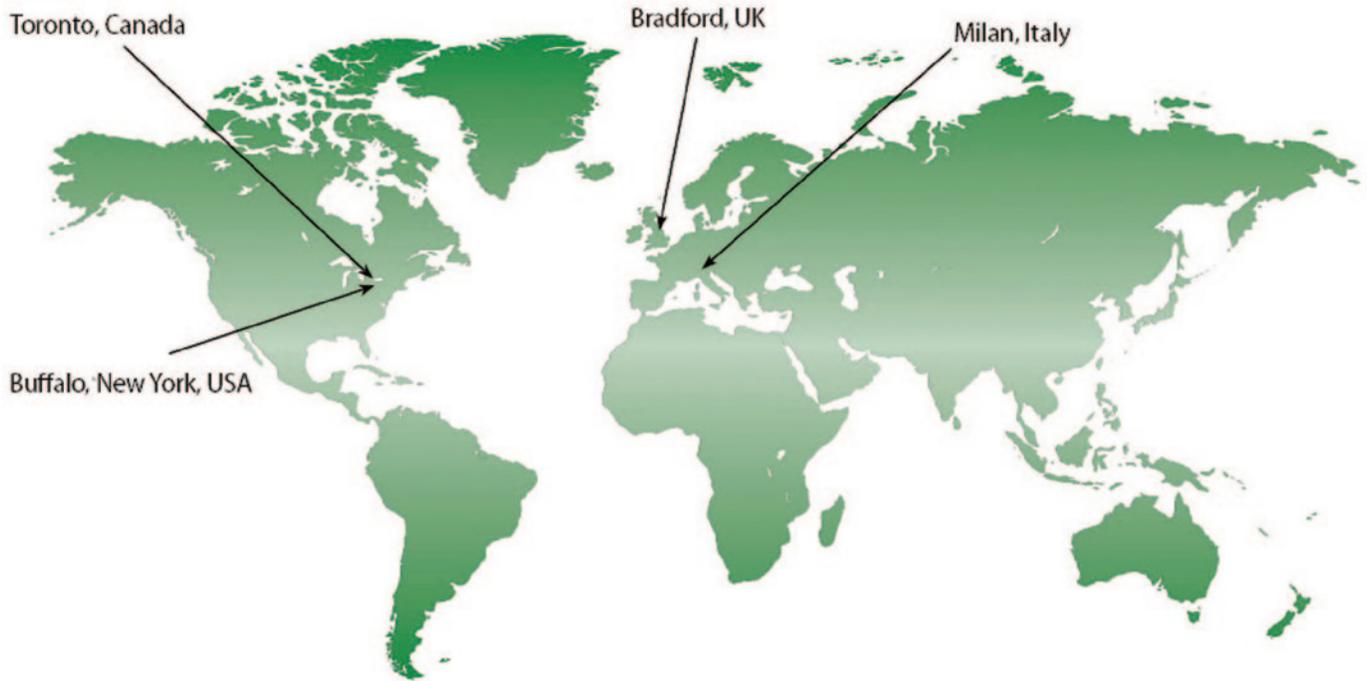
Spectrum of Masking Solutions

Fabrics Compounds Tapes Pre-Cut Profiles

More than just tape!

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