



CROWN USA INC

Tuff-Mark®
available with
Tuff-Grip®

Application Procedures

General Requirements

(For all applications shown below)

- **Equipment:**

Powered Blower or Broom

Tape Measure

Crayon, Chalk Sticks, and Chalk Line

Utility Knife, Putty Knife

Tuff-Max® (Custom or some color applications and non-asphalt applications requiring sealer. Consult your local sales representative or customer service.)

EX255/EX256 (Aged asphalt standard non-colored applications that need sealer.)

Tuff-Max® sealer dispenser gun (For Tuff-Max® only.)

Sprayer (Optional for EX255/EX256.)

Foam Paint Roller (Only for sealer.)

Propane fueled torch

Supply of Propane

Hammer and Mason Chisel

Water Sprayer (optional)

- **Material:**

Tuff-Mark® and Tuff-Mark® with Tuff-Grip® can be used either as a no preheat material or a preheat material. Tuff-Mark® and Tuff-Mark® with Tuff-Grip® must remain dry at all times. It should be stored indoors in an area that is 35°F – 90°F (2°C – 32°C). The boxes should be stacked flat and no more than 30 boxes high. Do not drop or throw Tuff-Mark® and Tuff-Mark® with Tuff-Grip® in temperatures below 50°F (10°C), as Tuff-Mark® and Tuff-Mark® with Tuff-Grip® will be less flexible in colder weather. Use the plastic sheets contained in the box to keep the Tuff-Mark® and Tuff-Mark® with Tuff-Grip® pieces separate as they can bond together especially in hot weather. Shelf life is one year. EX255/EX256 sealer should be used for any standard non-colored aged asphalt applications and Tuff-Max® sealer is required for any non-asphalt, color or, specialty/custom marking. Tuff-Mark® and Tuff-Mark® with Tuff-Grip® do not have any minimum temperature requirements for application.

All Tuff-Mark® and Tuff-Mark® with Tuff-Grip® lines are packaged as whole sheets of material. These sheets have evenly spaced factory-made score lines in them (exact spacing depends on the specific line width). Before application these sheets should be separated into the individual lines by pulling them apart along the score mark.



- **Surface Preparation:**

Be sure that the application surface is thoroughly clean and moisture free. Do not apply Tuff-Mark® and Tuff-Mark® with Tuff-Grip® on top of ANY existing markings other than thermoplastic. When applying on top of existing thermoplastic, remove any loose thermoplastic, then heat and scrape the top surface to reveal fresh material.

New Asphalt: Tuff-Mark® and Tuff-Mark® with Tuff-Grip® can be applied to new asphalt once the asphalt has cooled and the surface is “non-tracking” due to tack or oils.

Aged Asphalt: Tuff-Mark® and Tuff-Mark® with Tuff-Grip® standard non-colored applications can be done on aged asphalt using EX255/EX256 sealer.

Concrete: Any Tuff-Mark® and Tuff-Mark® with Tuff-Grip® concrete applications as well as other non-asphalt, color, or specialty/custom applications require using Tuff-Max® sealer. Tuff-Mark® and Tuff-Mark® with Tuff-Grip® can be applied to new concrete once the surface has hardened for 30 days, curing compound has been removed, and the surface is free from any moisture. Concrete surfaces must be porous. Sprinkle some drops of water onto the surface. The concrete surface is not porous enough if the water drops are not promptly absorbed into the surface.

- **Safety Precautions:**

Be sure to read the Tuff-Mark® and Tuff-Mark® with Tuff-Grip® Safety Data Sheet (SDS) before starting application. During the application of Tuff-Mark® and Tuff-Mark® with Tuff-Grip®, protective clothing should be worn. The clothing should consist of work boots, long pants, gloves, and safety goggles or a face shield. Be sure to read the Safety Data Sheet (SDS) for EX255/EX256 sealer or Tuff-Max® sealer, prior to use.

Tuff-Mark® Rumble Bar Applications

1. Follow notes and steps 1 – 6 of the applications requiring Tuff-Max® sealer.
2. Position the Tuff-Mark® base material.
3. Heat one section of the Tuff-Mark® base material until the material is molten and the indents have closed.
4. Immediately place the Tuff-Mark® Rumble Bar on the molten 3’ section of Tuff-Mark® base material with the proper alignment shown below.



5. Push the Tuff-Mark® Rumble Bars into the molten 3’ Tuff-Mark® base material.
6. Heat the Tuff-Mark® Rumble Bar section carefully until the edges start to become molten. The nozzle of the torch should be parallel with the path of the material to direct the flame at the edges of the Tuff-Mark® Rumble Bar sections and to avoid overheating the Tuff-Mark® Rumble Bars. The edges of the Tuff-Mark® Rumble Bar sections will look glossy when they begin to melt. The edges of the Tuff-

Mark® Rumble Bar sections have been heated sufficiently when they have sealed with the Tuff-Mark® base material. The two pieces of material should have no visible gaps between them.

7. Repeat steps 3 – 6 until all of the Tuff-Mark® Rumble Bars have been installed.
8. After the Tuff-Mark® base material has cooled check the bond to the surface. Using a mason chisel and hammer, cut a small “V” shape into the material. Lift the point off of the pavement surface. Properly bonded Tuff-Mark® will bring up some of the asphalt with it, or it will leave some residue on concrete. If bonding is not adequate, continue heating until the material is properly bonded. Do not leave until proper bonding has been achieved. Reheating at a later date will not work due to moisture trapped beneath the Tuff-Mark® base material.
9. After the Tuff-Mark® Rumble Bar section has cooled check the bond to the Tuff-Mark® base material at the most defined edge between the bar and the base. Using a mason chisel and hammer, cut a small “V” shape into the Tuff-Mark® Rumble Bar section. Lifting the point attempt to pry the bar off of the base material. Make sure that the two materials have fused. If the bar comes loose and is shiny on the bottom repeat step 6 as necessary.
10. Tuff-Mark® will cool within a few minutes of application. A spray of cool water may be used to accelerate cooling time. Do not allow foot or vehicle traffic until material has cooled and hardened.

New Asphalt Single Layer Applications

1. Thoroughly clean the application area of any loose particles and ensure that there is no moisture in the application area.
2. Position all pieces on the surface with the bead side up. Make sure all connecting pieces of the marking are properly aligned, with no gaps, using the diagram in the package before heating the material.
3. After pieces are aligned, heat the material by moving an approved heating device slowly and steadily over the material. The heating device should be moved in a sweeping motion over the material at a height of 6” to 10” for even heating of the material. Applying heat closer than heights of 6” and/or without using a sweeping motion (i.e. Direct Heat) may cause the material to scorch causing discoloration during and after application. Heat-Marks (notches) have been factory manufactured into the surface of the material at regularly spaced intervals. As the material is heated these notches will close providing a visual indication that the material has reached a state that will grant a proper bond and bead embedment. Application of heat is to continue, until the Heat-Marks close, the material seams flow together and, the material edges curl. **NOTE:** Overheating the material will cause the marking to be less retroreflective and/or skid-resistant in the beginning from over-embedment. Inadequate heat will cause the bond to fail. Non-surface treated markings do not have Heat-Marks. If any surface treatment is required for a non-surface treated marking, it should be applied to the material surface right after heating while the material is molten for proper embedment.
4. After the Tuff-Mark® or Tuff-Mark® with Tuff-Grip® has cooled check the bond to the surface. Using a mason chisel and hammer, cut a small “V” shape into the material. Lift the point off of the pavement surface. Properly bonded Tuff-Mark® and Tuff-Mark® with Tuff-Grip® will bring up some of the asphalt with it, or it will leave some residue on concrete. If bonding is not adequate, continue heating until the material is properly bonded. Do not leave until proper bonding has been achieved. Reheating at a later date will not work due to moisture trapped beneath the Tuff-Mark® or Tuff-Mark® with Tuff-Grip® material.

5. Tuff-Mark® and Tuff-Mark® with Tuff-Grip® will cool within a few minutes of application. A spray of cool water may be used to accelerate cooling time. Do not allow foot or vehicle traffic until material has cooled and hardened.

Aged Asphalt Standard Non-colored Single Layer Applications

1. Follow step 1 of the new asphalt single layer applications.
2. Create outline of marking pattern on surface with chalk or crayon for guidance to aid with sealer application.
3. Add equal parts of EX255 and EX256 to a larger container and mix thoroughly. Once mixed, the sealer has a pot life of 12 hours at 68°F (20°C). Allow mixed sealer to set for 10 – 15 minutes before applying.
4. Apply EX255/EX256 within the marking outline with a sprayer or a foam roller. If a sprayer is used, even out the coverage with a foam roller. Cure time at 77°F (25°C) is 5 – 7 minutes. Once the EX255/EX256 sealer is slightly tacky, positioning of the Tuff-Mark® or Tuff-Mark® with Tuff-Grip® pieces can begin.
5. Continue with steps 2 through 5 of the new asphalt single layer applications.

Applications Requiring Tuff-Max® Sealer

Notes before starting application: Any Tuff-Mark® and Tuff-Mark® with Tuff-Grip® concrete applications as well as other non-asphalt, color, or specialty/custom applications require using Tuff-Max® sealer. Surface and air temperatures must be 45°F (7°C) and rising to use Tuff-Max® sealer. Working times are approximate, may be linearly interpolated between listed temperatures and are based on cartridge/nozzle performance. At temperatures around 45°F (7°C) Tuff-Max® may dispense at a slower rate. Keep unopened Tuff-Max® cartridges inside the work vehicle or insulated in a material heater blanket so the sealer stays closer to room temperature until it is needed. Until Tuff-Max® cures, Tuff-Mark® and Tuff-Mark® with Tuff-Grip® will not completely bond with the surface.

Base Material Temperature	Working Time
°F [°C]	
50 (10)	45 min
75 (24)	30 min
100 (38)	22 min

Wait longer to check the bond in the cooler temperature ranges since Tuff-Max® will take longer to cure at those temperatures. At the lowest allowable temperature Tuff-Max® should cure within one hour. At temperatures above 100°F (38°C) Tuff-Max® will cure even faster. When applying markings that cover a large area (Interstate Shields, Route Shields, Colored Bike Lanes, etc.), do not apply Tuff-Max® sealer to an area bigger than can be heated in the appropriate curing time.

1. Thoroughly clean the application area of any loose particles and ensure that there is no moisture in the application area. The surface of worn polished concrete should be roughed up.
2. When applying on new concrete, all curing compounds should be removed before sealer application.
3. Tuff-Mark® and Tuff-Mark® with Tuff-Grip® multicolor applications are sections of linked individual pieces. DO NOT move or lift a whole section by holding onto a single piece, as it may come apart. The sections should be moved on the plastic sheets they are packed with until placed in their final positions.
4. Create outline of marking pattern on surface with chalk or crayon for guidance to aid with sealer application. Carefully move the symbol from the outline and set to the side for application of Tuff-Max® sealer.
5. **Shake the Tuff-Max® cartridge vigorously for 60 seconds**, then stand cartridge upright for at least 1 minute allowing any bubbles to rise to the top. Fit the Tuff-Max® cartridge into the sealer dispenser gun. Point upwards at about a 45° angle. Remove the plastic cap and plugs from the top of the cartridge. (Optional: Find the flow control inside the threaded end of the mixing nozzle. While still holding the dispensing gun upwards, insert the flow control into the two holes at the top of the cartridge.) Install the mixing nozzle onto the cartridge and make sure it is properly secured. Hold the dispensing gun straight up and slowly squeeze the handle until the sealer is about 2 inches from the end of the mixing nozzle. If the mixed sealer is not used within 10 minutes, remove the mixing nozzle, reseal with the plugs and cap the cartridge. Try to dispense an entire cartridge at one time with no interruption of flow to prevent the sealer from hardening in the mixing nozzle. If you have any problems dispensing sealer, replace the nozzle. The sealer may have begun to cure in the nozzle which will affect the mix ratio. Never transfer a used nozzle to a new cartridge. Repeat the cartridge balancing steps listed above after replacing the nozzle.
6. If properly applied one cartridge of Tuff-Max® sealer will cover 50ft². The sealer must not cure before Tuff-Mark® or Tuff-Mark® with Tuff-Grip® can be heated down so do not apply the sealer to an area bigger than can be heated in the appropriate curing time. Holding the dispensing gun over the application area, squeeze out the right amount of sealer for the application. Spread the sealer within the outlined area with a foam roller.
7. Immediately position all pieces of the Tuff-Mark® or Tuff-Mark® with Tuff-Grip® on the surface with the bead side up. Make sure all sections of the marking are properly aligned, with no gaps, using the diagram in the package. Begin heating immediately.
8. Heat the material by moving an approved heating device slowly and steadily over the material. The heating device should be moved in a sweeping motion over the material at a height of 6" to 10" for even heating of the material. Applying heat closer than heights of 6" and/or without using a sweeping motion (i.e. Direct Heat) may cause the material to scorch causing discoloration during and after application. Heat-Marks (notches) have been factory manufactured into the surface of the material at regularly spaced intervals. As the material is heated these notches will close providing a visual indication that the material has reached a state that will grant a proper bond and bead embedment. Application of heat is to continue, until the Heat-Marks close, the material seams flow together and, the material edges curl. **NOTE:** Overheating the material will cause the marking to be less retroreflective and/or skid-resistant in the beginning from over-embedment. Inadequate heat will cause the bond to fail. Non-surface treated markings do not have Heat-Marks. If any surface treatment is required for a non-surface treated marking, it should be applied to the material surface right after heating while the material is molten for proper embedment.

9. After the Tuff-Mark® or Tuff-Mark® with Tuff-Grip® has cooled check the bond to the surface. Using a mason chisel and hammer, cut a small "V" shape into the material. Lift the point off of the pavement surface. Properly bonded Tuff-Mark® and Tuff-Mark® with Tuff-Grip® will bring up some of the asphalt with it, or it will leave some residue on concrete. If bonding is not adequate, continue heating until the material is properly bonded. Do not leave or start applying adjoining rows until proper bonding has been achieved. Reheating at a later date will not work due to moisture trapped beneath the Tuff-Mark® or Tuff-Mark® with Tuff-Grip® material.
10. When applying a large marking with many sections (Interstate Shields, etc.) **DO NOT** heat uncovered areas of Tuff-Max® sealer, as this will cause it to cure too soon. Leave several inches closest to the continuing edge unheated. Repeat steps 1 – 10 until whole application is complete.
11. Tuff-Mark® and Tuff-Mark® with Tuff-Grip® will cool within a few minutes of application. A spray of cool water may be used to accelerate cooling time. Do not allow foot or vehicle traffic until material has cooled and hardened.

Multi-Layer Applications

1. Follow notes and steps 1 – 6 of the applications requiring Tuff-Max® sealer.
2. Immediately position all Tuff-Mark® base pieces (no design cut outs) on the surface. Make sure all connecting pieces of the Tuff-Mark® base material are properly aligned, with no gaps, using the diagram in the package before heating the material.
3. After pieces are aligned, heat the material by moving an approved heating device slowly and steadily over the material. The heating device should be moved in a sweeping motion over the material at a height of 6" to 10" for even heating of the material. Applying heat closer than heights of 6" and/or without using a sweeping motion (i.e. Direct Heat) may cause the material to scorch causing discoloration during and after application. Heat-Marks (notches) have been factory manufactured into the surface of the material at regularly spaced intervals. As the material is heated these notches will close providing a visual indication that the material has reached a state that will grant a proper bond and bead embedment. Application of heat is to continue, until the Heat-Marks close, the material seams flow together and, the material edges curl. **NOTE:** Overheating the material will cause the marking to be less retroreflective and/or skid-resistant in the beginning from over-embedment. Inadequate heat will cause the bond to fail. Non-surface treated markings do not have Heat-Marks. If any surface treatment is required for a non-surface treated marking, it should be applied to the material surface right after heating while the material is molten for proper embedment.
4. After the Tuff-Mark® base has cooled but is still soft, position the Tuff-Mark® or Tuff-Mark® with Tuff-Grip® top (with design cut outs) over the Tuff-Mark® base. Make sure all connecting pieces of the Tuff-Mark® or Tuff-Mark® with Tuff-Grip® top material are properly aligned, with no gaps, using the diagram in the package and apply slight pressure to them before heating the material.
5. Heat the Tuff-Mark® or Tuff-Mark® with Tuff-Grip® top at a slower rate (hold the heating device a few inches further away) than the Tuff-Mark® base to avoid smearing the design. Heat-Marks (notches) have been factory manufactured into the surface of the material at regularly spaced intervals. As the material is heated these notches will close providing a visual indication that the material has reached a state that will grant a proper bond and bead embedment. Continue applying heat until the Heat-Marks close, the material seams flow together and, the material edges curl. **NOTE:** Overheating the material will cause the marking to be less retroreflective and/or skid-resistant in the beginning from

over-embedment. Inadequate heat will cause the bond to fail. Non-surface treated markings do not have Heat-Marks. If any surface treatment is required for a non-surface treated marking, it should be applied to the material surface right after heating while the material is molten for proper embedment.

6. After Tuff-Mark® or Tuff-Mark® with Tuff-Grip® has cooled check the bond to the surface. Using a mason chisel and hammer, cut a small "V" shape into the material. Lift the point off of the pavement surface. Properly bonded Tuff-Mark® and Tuff-Mark® with Tuff-Grip® will bring up some of the asphalt with it, or it will leave some residue on concrete. If bonding is not adequate, continue heating until the material is properly bonded. Do not leave until proper bonding has been achieved. Reheating at a later date will not work due to moisture trapped beneath the Tuff-Mark® or Tuff-Mark® with Tuff-Grip® material.
7. Tuff-Mark® and Tuff-Mark® with Tuff-Grip® will cool within a few minutes of application. A spray of cool water may be used to accelerate cooling time. Do not allow foot or vehicle traffic until material has cooled and hardened.

This package was boxed by

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