
READ BEFORE USING THIS PRODUCT

Read all information prior to using TechCrete-R (“TC-R”) or TechCrete-TBR (“TC-TBR”): 1) Product Data Sheet, 2) Safety Data Sheet, 3) Installation Instructions and 4) Patcher Equipment Safety Manual.

PAVEMENT PREPARATION

- Mark out the area to be repaired and use suitable equipment (saws, planers, pneumatic hammers, etc.) to remove the defective pavement.
- Remove sufficient pavement to ensure TC-R and TC-TBR is bonding to sound intact pavement.
 - The maximum size of the repair should be determined on an individual basis with information on pavement structural integrity, maximum size for workability with the TC-R and TC-TBR and any surface treatments that may be involved.
 - **For A) Cracking (Corner breaks, Longitudinal and transverse cracking)**
 - TC-R without structural aggregate is designed to treat wide cracking with a minimum width of 1.5 inches (38 mm) and up to 4 inches (100 mm) wide and up to full-depth repairs. No additional pavement depth is required beyond assuring the pavement is intact.
 - TC-R with structural aggregate is designed to treat wide cracking greater than or equal to 2 inches (50 mm) wide and up to full-depth repairs. A minimum depth of 2 inches (50 mm) is required to use TC-FM.
 - TC-TBR is designed to treat wide cracking greater than or equal to 2 inches (50 mm) wide and up to full-depth repairs. A minimum depth of 1.5 inches (38 mm) is required to use TC-TBR.
 - **For B) Joint Deficiencies (Spalling of longitudinal and transverse joints)**
 - TC-R without structural aggregate is designed to treat wide joint deficiencies with a minimum width of 1.5 inches (38 mm) and up to 4 inches (100 mm) wide and up to full-depth repairs. No additional pavement depth is required beyond assuring the pavement is intact.
 - TC-R with structural aggregate is designed to treat wide joint deficiencies greater than or equal to 2 inches (50 mm) wide and up to full-depth repairs. A minimum depth of 2 inches (50 mm) is required to use TC-FM.
 - TC-TBR is designed to treat wide joint deficiencies greater than or equal to 2 inches (50 mm) wide and up to full-depth repairs. A minimum depth of 1.5 inches (38 mm) or more is required to use TC-TBR.
 - **For C) Surface Defects (map cracking and scaling, pop outs) and D) Miscellaneous Distresses (Blowups, Faulting of transverse joints and cracks, Lane-to-shoulder drop-off, Lane-to-shoulder separation, and Patch/Patch deterioration).**
 - TC-R without structural aggregate is designed to treat wide repairs up to 0.75 inch (19 mm) deep. Assure that the pavement is intact before applying. Neat feather edging can be made without a defined edge. However, to achieve optimum performance, install TC-R in a recess with straight vertical edges of at least 1/8 inch (3mm)
 - TC-R with structural aggregate is designed to treat wide and deep repairs. A minimum depth of 2 inches (50 mm) is required to use TC-FM so if the area to repair is less than 2 inches (50 mm) the pavement must be removed to a depth of 2 inches (50 mm) or more.
 - TC-TBR is designed to treat wide and deep repairs. A minimum depth of 1.5 inches (38 mm) is required to use TC-TBR so if the area to repair is less than 1.5 inches (38 mm) the pavement must be removed to a depth of 1.5 inches (38mm) or more.
- For deeper repairs, while not required, TC-R or TC-TBR can be bulked with additional aggregate - contact your CrafcO representative. Repairs deeper than 2 inches (50 mm) require layering, so the structural aggregate is effectively distributed.
- TC-R or TC-TBR can be placed next to (to abut) an existing non-working joint as long as the existing joint surface is sound and properly cleaned.
- When TC-R with structural aggregate or TC-TBR is applied across a joint, a minimum of 4 inches (102 mm) width of material is required to be placed on each side of the joint measured perpendicularly from the joint.
- At untied construction, butt or expansion joints, excessive pavement movements can occur which may exceed product performance capabilities. In these types of joints, which can experience high movements, the product installation geometry must be modified so that the TC-R with structural aggregate or TC-TBR is installed across the joint a minimum of 10 inches (254 mm) on each side of the joint instead of the 4 inches (102 mm) on each side stated above.
- Remove all loose debris from the work site.
- Clean and dry the repair area with a CrafcO hot air lance (CrafcO part No. 45650) capable of producing a continuous stream of clean, dry compressed air, free of oil and moisture, at a minimum of 90 psi (620 kPa) to remove dust, debris, or loose pavement fragments.
- Pavement must be clean and surface dry.

- Immediately prime the entire repair area, side, and bottom surfaces, with TechCrete Primer/Surface Conditioner (Part No. 34295) with a brush or spray applicator and allow the primer to dry before applying TechCrete. Primer/Surface Conditioner should not be applied below 40°F (4°C).
 - To prime cracks, prime the vertical walls, as priming the bottom may not be possible.
 - Primer is dry when lightly touched with one's finger and there is no transference or pick up of primer residue.
 - Puddled or pooled primer in the repair area should be brushed out to speed drying and prevent bubbling from occurring. Do not use an open flame to dry the primer.
 - Drying time varies; typically, from 15 minutes at warm, dry conditions, to several hours at cooler damper conditions.
- The perimeter of the repair area may be masked with a fabric tape to ensure no excess material will be on the surface of the pavement. TC-R and TC-TBR shall be installed on the same day that primer is applied. If there is a delay between primer application and TC-R or TC-TBR application which is more than 24 hours, the primer must be re-applied. If TC-R or TC-TBR is installed on primed areas that are not cured sufficiently, adhesion may be reduced.
- Quite often diamond grinding is scheduled as part of the maintenance project after the application of TC-R or TC-TBR. If diamond grinding is scheduled to occur, follow the Diamond Grinding recommendations below.

PAVEMENT TEMPERATURES Install TC-R or TC-TBR when pavement temperature is greater than or equal to 40°F (4°C).

MELTING and HEATING TC-R or TC-TBR must be melted in an appropriate indirectly heated melter with sufficient agitation to uniformly mix the product and with an effective product delivery system. Heat transfer oil temperature should not exceed 525°F (274°C). Recommended melter is a Crafcro Patcher I or II. Contact Crafcro for suitability of other melters. Prior to starting, assure that the Patcher is in good working order and clean and free of any residual material or contamination. Do not remove TC-R or TC-TBR material from the bag. Place the bag containing TC-R or TC-TBR into the melter. Do not mix different types of TechCrete materials together. Heat TC-R or TC-TBR to between the minimum application temperature of 330 °F (166 °C) and the maximum heating temperature of 400°F (204°C). It is recommended that a secondary device be used to measure temperature of material (i.e., non-contact infrared thermometer, handheld thermometer, etc.) prior to application. Do not heat TC-R or TC-TBR continuously for longer than six (6) hours.

SAFETY PRECAUTIONS Since these materials are heated to elevated temperatures, it is essential that operations be conducted in manners which assure safety of personnel. All individuals associated with use of the material need to be aware of the hazards of using hot-applied materials and safety precautions. Before use, the crew should read and understand product use and safety information on each bag of TechCrete and the product Safety Data Sheet. This sheet, which is supplied with each shipment, describes the characteristics of the product as well as any potential health hazards and precautions for safe handling and use. User should check D.O.T. requirements for transportation of TechCrete at elevated temperatures above 212°F (100°C).

TRAFFIC CONTROLS Place appropriate traffic controls in accordance with Part 6, of the FHWA Manual on Uniform Traffic Control Devices (MUTCD) to protect the work site for the duration of the repairs.

INSTALLATION

- Prior to beginning application examine surfaces to be repaired to ensure that (1) new concrete has cured a minimum of 7 days and (2) that the pavement surface is sound - tapping with hammer and noting dull or hollow sounds according to ASTM D4580.
- Plan ahead:
 - Deep repairs need to be installed in multiple layers.
 - TC-R or TC-TBR should be applied in multiple layers not to exceed 2 inches (50 mm) thickness.
 - Allow TC-R or TC-TBR to cool to 200°F (93°C) or less between each layer.
 - Allow TC-R or TC-TBR to cool to 120°F (49°C) or less prior to installing the top/final layer.
 - The top/final layer TC-R should use only TC-R or TBR without structural aggregate and not be greater than 0.75 inch (19 mm) deep. For deep repairs (> 1.5 inches (38 mm) overfill slightly ~ .125 inch (3 mm) above the surface. If you are Diamond Grinding, see the Diamond Grinding recommendations below.
- Gravity feed the heated TC-R or TC-TBR directly into the repair area or into an appropriate transfer container such as the Crafcro TechCrete Bucket (Part No. 32263) and then immediately pour into the repair area. TC-R or TC-TBR that has cooled while in the container to below the minimum application temperature shall be emptied back into the melter to reheat.
 - A repair less than or equal to 0.75 inches (19 mm) depth shall start by pouring TC-R without structural aggregate into the repair.
 - Work the TC-R into the edges of the repair and level the surface with a heated iron such as the Crafcro Ironing Wand (Part No. 32243). Allow bubbles to expel from the applied TC-R material.
 - Surfacing aggregate shall be applied to completely cover the patch surface as noted below.
 - A 1.5 inches (38 mm) deep repair shall start by pouring 1.5 inches (38 mm) single layer of TC-TBR.
 - Work the TC-TBR into the edges of the repair and overfill slightly ~ .125 inch (3 mm) above the surface using a heated iron such as the Crafcro Ironing Wand (Part No. 32243). A slight overfill allows for shrinkage as TC-TBR cools from application temperature to ambient conditions. Allow bubbles to expel from the applied TC-TBR material. Be careful not to over-float or over-work the material because the aggregate may settle to the bottom of the repair layer and thus not maintain consistent aggregate

- dispersion.
 - Surfacing aggregate shall be applied to completely cover the patch surface as noted below.
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 - A 2-inch (50 mm) deep repair shall start by pouring a 1.25-inches (32 mm) single layer of TC-FM with structural aggregate.
 - Work the TC-R into the edges of the repair and level the surface with a heated iron such as the Crafcro Ironing Wand (Part No. 32243). Allow bubbles to expel from the applied TC-FM material.
 - Apply the structural aggregate evenly distributed in a single layer thickness on top of the TC-R – The applied quantity of structural aggregate should range between 15% - 30% by volume of the completed lift or as called out in the project specifications. The usage rate is in the range between 3 - 8 pounds (1.3 – 3.6 kg) per square foot.
 - Tamp and work the aggregate down and into the TC-R for proper bonding.
 - Cover the aggregate layer with up to 0.75 inch (19 mm) top layer of TC-R.
 - Work the TC-R into the edges of the repair and overfill slightly ~ 0.125 inch (3 mm) above the surface using a heated iron such as the Crafcro Ironing Wand (Part No. 32243). A slight overfill allows for shrinkage as TC-R cools from application temperature to ambient conditions. Allow bubbles to expel from the applied TC-R material. Be careful not to over-float or over-work the material because the aggregate may settle to the bottom of the repair layer and thus not maintain consistent aggregate dispersion.
 - Surfacing aggregate shall be applied to completely cover the patch surface as noted below.
 - Deeper repairs shall consist of multiple layers as noted above.
- The top/final layer is then covered with a specific surfacing aggregate (Crafcro Part No. 33375SA), or a surfacing aggregate specified in the project plan and approved by Crafcro. Prior to applying the surfacing aggregate, quickly expose the TC-R or TC-TBR surface to a flame to remove any surface bubbles and to heat the surface to adhere to the surfacing aggregate.
 - Apply dry surfacing aggregate when the TC-R or TC-TBR surface temperature cools to 225°F ± 25°F (107°C ± 14°C), as measured with a non-contact infrared thermometer. TC-R and TC-TBR cools around the perimeter surface of a repair before the center surface. Where practical, the surfacing aggregate should be applied around the perimeter first and then applied to the center, after the temperature falls into range.
 - When the surfacing aggregate must be applied at one time, the center surface of the TC-R or TC-TBR should be allowed to cool to 225°F ± 25°F (107°C ± 14°C) before application. The perimeter surface temperature will have cooled below the aggregate application temperature range and must be gently heated back to the recommended patch surface temperature range using a torch, before application of the surfacing aggregate.
 - Surfacing aggregate shall be applied to completely cover the patch surface. The usage rate for the surfacing aggregate is approximately 2 pounds per square foot.
- If there is a need to cool the material rapidly, use ice or cool water to lower the temperature.
- Once TC-R or TC-TBR has cooled to the surrounding pavement surface temperature, final cleaning with a sweeper or vacuum is performed to remove any surplus surfacing aggregate prior to opening to traffic. Excess surfacing aggregate can be reused if kept clean, not contaminated, and dry.

HAZARDS ASSOCIATED WITH HOT APPLIED MATERIALS Skin contact with hot applied materials causes burns. Over exposure to fumes may cause respiratory tract irritation, nausea, or headaches. Appropriate precautions need to be taken to prevent contact with the hot material and to avoid inhalation of fumes for everyone in the vicinity of the work area operation. Safety precautions should include: 1. Protective clothing to prevent skin contact with hot material. 2. Care when adding product to melters to reduce splashing. 3. Careful operation and control of tools which are used to apply product. 4. Traffic and pedestrian control measures which meet or exceed MUTCD requirements to prevent access to work areas while product is still in a molten state. 5. Avoidance of material fumes. 6. Proper application configurations with a minimum amount of excesses of material. 7. Appropriate clean-up of excessive applications or product spills.

DIAMOND GRINDING Two concerns to be aware of are (1) “gumming-up” the diamond-head blades and (2) achieving the best results on the profilograph, if you are using one. A profilograph and light-weight profiler may be used as the measure of quality when repairing and resurfacing a pavement in need of preservation. Diamond grinding of surfaces greatly improves the profilograph results. What can you do to assure the best outcome?

- Repair the spalls with TC-R or TC-TBR a minimum of 24 hours before diamond grinding.
- Assess the size and frequency of repairs to be made. For large spalls where it is possible for more than 1 grinder wheel to be simultaneously on TC-R or TC-TBR it is important to fortify the final layer of material. The top layer of the repair may be TC-R or TC-TBR. To fortify the top layer, add 20-30% structural aggregate (Crafcro Part No. 33033) to the TC-R or TC-TBR. It is acceptable to leave the top rough since the Diamond Grinding will smooth the surface.
 - If the structural aggregate has evidence of moisture, heat and dry the aggregate to 300°F (149°C) in a vented barrel mixer before application. The structural aggregate can be applied after the aggregate has been heated or when the aggregate is at ambient temperature. If you choose to increase the structural aggregate volume from 20 to 30% you may need to heat the aggregate prior to application to adequately coat the aggregate, eliminate trapped air and ensure adhesion. Use of cold structural aggregate will help reduce the time needed to cool the overall repair. Use Crafcro structural aggregate or if using other materials, they should come from one source and be approved by Crafcro.
- Make sure the final layer of TC-R or TC-TBR is covered with surfacing aggregate (Crafcro Part No. 33375SA)

- Reducing weight and time grinding on the TC-R or TC-TBR repair will improve results. TC-R and TC-TBR is a durable, flexible material and a heavy, downward-load applied by the grinder may remove too much TechCrete material from large-width repairs.
 - Assure that all or most of wheels on the grinder are on solid pavement when grinding – minimize the load on TC-R or TC-TBR when grinding.
 - When grinding large TC-R or TC-TBR repairs, float the grinding head to remove the downward load. It is important to have the head or wheels just skim the surface of the TechCrete material to level and smooth the surface without sinking into the TechCrete material and creating excessive fins.
- Grind over TC-R and TC-TBR repairs during the coolest temperatures possible, try to minimize high-ambient temperatures.
- Keep the grinding head as cool as possible.

CLEAN OUT For the best performance and appearance, CrafcO recommends that you place all the melted TC-R or TC-TBR by the end of the day and remove all excess material from the melter at the completion of each day's repair, using the CrafcO Chute Scraper (Part No. 32246) and the CrafcO Tank Scraper (Part No. 32258). As long as the left-over TC-R or TC-TBR has not been over-heated, heated too long or otherwise damaged, you can leave it in the melter and reheat it the next workday and use it. If tools have TC-R or TC-TBR on them you can clean them by heating them with a torch until they are very hot, and then scrape the tool clean. The use of solvents is not required.

STORAGE Pallets of bagged TC-R and TC-TBR are protected with a weather resistant covering and can be stored outside. During storage, the protective wrap must be kept on the pallets to prevent bags from getting wet. If bags are subjected to moisture, the material may get wet which could create foaming and boil-over of the product from the melter tank during heat-up. If rips in the pallet covering occur during handling, they should be repaired to help maintain packaging integrity. Pallets should be stored on a level surface which is dry and has good drainage. Pallets should not be stacked. Material properties are not affected by packaging deterioration.