TF Structural Concrete Repair Mortar
Two-component structural repair mortar and overlay

Description

TF Structural is a two-component, interior/exterior concrete overlay and structural repair mortar. Typically installed as a stand-alone overlay for concrete substrates, it provides an economical solution that has excellent abrasion resistance properties and very good durability against mechanical damage. TF Structural is used for spall repairs, complete resurfacing, large structural rebuilds, or almost anywhere concrete is in need of repair.

Where to Use

TF Structural is a versatile repair mortar, designed for use on properly prepared concrete substrates. It can be used for spall repairs, complete resurfacing, large structural rebuilds, or where damaged concrete is in need of repair.
While not limited to specific applications, the following list gives a general guideline for where TF Structural is typically installed.
•As a thin overlay to replicate concrete finishes.
•Garages, parkades, warehouse floors, loading docks, structural columns and rebuilding concrete structures.
•Areas that require a fast return to service with minimal downtime.
•Sub-zero application with TF Heat additive.
•Concrete surfaces in need of re-sloping, rebuilding, re-leveling or re-surfacing.
•Large overlays where concrete cannot be used.
•Used to repair concrete in preparation for polymer coatings.

Features and Expected Benefits

TF Structural requires no primers, no scrub coats, no curing procedures, and has variable mixing ratios. Its unique chemistry gives the worker from 10-40 minutes of working time, while still capable of generating strengths higher than concrete after 4 hours. Refer to application and cure time sections.
TF Structural offers an extremely fast return to service, even in cold weather applications. It can be applied as thick or as thin as the user desires, while still maintaining its excellent mechanical properties.
TF Structural is highly resistant to freeze thaw, salt scaling, abrasion, impact, UV, salts, oil, gas and many other damaging environmental effects.
•No minimum or maximum thicknesses.
•Can be used in thick applications for structural rebuilding.
•Fast curing. Return to service in under 30 minutes, if needed.
•Easy to mix, variable mix ratios between powder and Part B activator.
•Superior bond strength to prepared concrete.
•High early strength gains; can be stronger than concrete in 2 hours.
•Odorless.
•Zero VOC's
•Excellent long term wear resistance.
•Economical and easy to apply.
•Working time and cure time can be adjusted with accelerators and retarders.
•Excellent for deep screeding and leveling projects.
•Can be used in vertical applications.
•Can be placed into forms with proper technique.

Properties at 23°C (73°F) and 50% R.H.

Compressive Strength	
ASTM C109	
4 Hours	3778 psi (26.1 MPa)
24 Hours	4778 psi (33.0MPa)
28 Days	7417 psi (51.2MPa)
Tensile Strength	
ASTM C307	
24 Hours	186 psi (1.3MPa)
28 Days	537 psi (3.7MPa)
Slant Shear Bonding	
ASTM C882	
4 Hours	1507 psi (10.4MPa)
Salt Scaling (25 cycles)	
ASTM C672	Loss 22.52 g/m^2
	Very slight scaling
Dry Shrinkage	
ASTM C596	
28 Days	-0.07%
Coefficient of Thermal Expansion	
ASTM C531	
Expansion (per °C)	1.4183x10^{-5}
Restrained Plastic Shrinkage	
(Detailed report available)	
24 hours in drying chamber	zero cracking was observed
Water Absorption	
ASTM C642	
Modified for Alberta Transportation Specification B391, Section 3.5	
14 Days	2.31% 24 hour submersion

Packaging

Part A – 22.68 kg (50 lbs) Bag
Part B - 5 gallon (19L) pail, 1 gallon (4L) jug.

Yield

Approximately 0.45 ft^3/bag. This will cover approx. 30 – 55 ft^2 between 1/8" – 1⁄4" of coverage. (These figures do not allow for surface porosity, profile or wastage) Can be extended with clean dry aggregate up to 30% by volume. Do not use limestone. Extended yield approximately 0.60ft^3/bag.

Shelf Life
Components A+B: 12 months in original unopened packaging. Store dry between 3°C - 30°C (50°F - 77°F). Protect Part B from freezing. Avoid storing Part A in humid conditions.

Application Temperature
5°C (41°F) min. / 35°C (95°F) max.
With TF Heat Accelerator: -5°C (23°F) min. / 15°C (59°F) max.
With TF Ice Retarder: 15°C (59°F) min. / 40°C (104°F) max.
If installing at the low or high temperature limits, or outside this temperature range, please contact Terrafuse Inc.

Cure Time
Cure to foot traffic 30min to 2 hours at 23°C (73°F)
Cure to full traffic 2 hours to 5 hours at 23°C (73°F)

Surface Preparation
Concrete surfaces must be clean and sound. Remove all dust, dirt, existing paint films, efflorescence, exudates, laitance, form oils, hydraulic or fuel oils, brake fluid, grease, fungus, mildew, biological residues, frost or any other contaminants which may prohibit a proper bond to the substrate.
Prepare the surface by using a diamond grinder, shot blaster, or by any other appropriate mechanical means in order to achieve a porous, clean surface, with a recommended CSP surface profile of 2 or greater, as per ICRI technical guidelines No.03732. Acid washing is not a recommended preparation method. All existing sealers must be removed to allow even penetration.
Ensure the concrete has a vapor pressure that is at or less than 3 lbs./1000 ft^2/24hr. For information on performing this simple test, and where to obtain the testing equipment, please contact Terrafuse Inc directly.
High vapor pressure can lead to loss of adhesion over time, and it is always recommended to ensure the vapor pressure is within limits. Although TF Structural has been specially formulated to retain its moisture without the use of primers or bonding agents, it is recommended to obtain a saturated surface dry (SSD) treatment of the concrete prior to application. An SSD condition will give the user more working time, and the product will be easier to spread, especially when the application is thinner.

Mixing Ratio
TF Structural can be mixed in a wide range of consistencies. It is recommended to use a ratio from 2.2L – 2.7L of Part B to one full bag of Part A. Full bags do not have to be mixed at one time. Do not exceed 3.3L of Part B per bag.
Mixer can adjust ratios to get desired consistency for job site conditions. When doing deeper applications, it is recommended to use less Part B. When doing thinner overlays, it is recommended to use more Part B. The installer should only mix what they are comfortable working with in 10 – 15 minutes.

Mixing
Add desired amount of Part B to mix pail. Gradually add Part A (powder) and mix for at least 30 seconds, or until all powders are wetted out. Use a low speed mixing drill (300-450 rpm) and mixing paddle (recommended to use a heavy duty rectangle metal mud paddle) suited to the size of mixing container. We recommend mixing in five gallon pails. The mix consistency can be adjusted according to job requirements, by adding more Part A or Part B at any time during the mixing. Small amounts of Part B will make a large difference in mix consistency. TF Structural will cure quicker in thicker applications. This product is designed to be installed as soon as mixing is finished. Once mixed, remove from pail and use as soon as practical. Do not mix more than can be applied within 10-15 minutes.

TF Heat & TF Ice (Cure time adjustments)
Terrafuse Inc. manufactures additives to speed up and slow down the cure times of TF Structural. TF Heat will speed up the cure time and reduce the working time. TF Ice is used to slow down the cure time and extend the working time. There are many factors that will influence when and how much additive to use, mainly temperature and thickness, but the user must select an amount based on site conditions.
As a recommendation, a ratio of 1 cup (250 ml) of additive can be used, for every full bag of mixed material. Once the first mix is made, the working time and cure time will let the user know how much more or less additive to use. TF Heat is used to speed up the cure when the weather is cold and the application is thinner. It can also be used when an immediate return to service is required. TF Ice is used for thicker applications and when the temperatures are higher. This will give the user longer working times with the material. Please contact Terrafuse Inc. for more clarification if required.

Application
Apply TF Structural to the substrate using steel trowels or screeds. An SSD condition will give the user more working time, and the product will be easier to spread, especially when the application is thinner. After application, apply broom finish for non-slip and to replicate concrete finish as soon as possible. Do not overwork the product once it begins to set.

If product is to be applied in applications thicker than 1”, it can be extended with clean aggregate (do not use limestone). Thicker applications require less Part B.

When installing TF Structural, it is important to maintain and honor all expansion and control joints. TF Structural is a very rigid material, and cannot be used to connect different slabs of concrete and is not intended to fix cracks. Ensure when installing TF Structural that you do not cover over any of these moving joints. When installing on larger areas, the user must mix and install in a continuous manner. To avoid cold seams, trowel the new mix into the previously installed mix before it has started to set. Work from one end to the other, finishing as you go.

Safety
TF Structural contains ingredients that are considered hazardous. Do not get the product on your skin or eyes. Always read the container label warning and Material Safety Data Sheet prior to use.

Clean Up
Clean all tools, equipment, and surrounding work area with water while material is still wet. Once hardened, product can only be removed mechanically.

Disclaimer
This Data Sheet was created as a guide for using and installing TF Structural. While we attempted to address most major areas, this sheet cannot cover the entire scope of installation methods and techniques, and all the beneficial properties of TF Structural. When engaging in highly technical applications, or projects involving large scale structural restorations, it is advised to seek the recommendations of a structural engineer, specializing in restoration applications. Terrafuse Inc. encourages you to contact us directly for any clarifications or specific questions about using this product.

Warranty
Terrafuse Inc. warrants that all products are free from manufacturing defects. The data provided is believed to be reliable and is offered solely for evaluation. Datasheets are updated on a continuous basis and subject to change. Please ensure you have the most recent datasheet by contacting Terrafuse Inc. There is no warranty expressed or implied as related to any issue which is deemed to be a direct result of improper concrete preparation or cleaning, application over concrete which have not reached full cure out, those having excessive hydrostatic pressure, workmanship or application, or any other cause and effect which is not related to defective material. This warranty is limited to potential replacement of any Terrafuse Inc. product determined to be defective.

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