



TOP-CAST® Surface Retarder Application Guide

Guidelines for mix designs, placing and finishing exposed aggregate concrete

GCP Applied Technologies Top-Cast surface retarder is designed to expose a wide range of aggregate sizes on the surface of horizontal concrete.

With 12 different grades, or depth of etches, a contractor, architect or owner can achieve a range of exposed aggregate finishes, depending on their choice of aggregates, mix designs, integral color, finishing techniques, and grade of Top-Cast.

Typically, the level of etch (micro, medium or full-depth) is determined. Next, color if desired, and the appropriate size of aggregate for the finish are established.

It is recommended to consult with a local ready mix company on available aggregates and their recommendations for a mix design to achieve performance requirements and that provide for the desired finish.

Once the mix design is established, it is critical that the concrete contractor understands the proper finishing techniques for the desired level of etch. Finishing Techniques are addressed on following pages.

Finally, the correct grade of Top-Cast must be selected in order to remove the desired amount of surface paste to expose the aggregate.

Top-Cast Surface Retarder is part of the TOPCAST® Decorative Finish System including:

TOP-CAST® Surface Retarder
 TOP-CAST® SS 100 Site Saver
 TOP-CAST® EX 200 Wash-Off Extender
 TOP-CAST® PR 300 Penetrating Protector
 TOP-CAST® CS 400 Cure and Seal

TOP-CAST® HG 500 High Gloss Sealer

Samples and mock-up installations in similar conditions are always recommended. These samples help determine project timing and to ensure desired results.

Product	Aggregate Size to Expose
01 White	Very Light Acid Etch Finish
03 Violet	Acid Etch Finish
05 Light Blue	Sandblast Finish
15 Yellow	Up to ¼" (6.55 mm)
25 Beige	1/8" - 1/4" (3 mm -6.5 mm)
50 Canary Green	1/8" - 3/8" (3 mm -9.5 mm)
75 Blue	1/8" - 3/8" (3 mm -9.5 mm)
100 Gray	3/8" - ½" (9.5 mm- 13 mm)
125 Pink	3/8" - 5/8" (9.5 mm- 16 mm)
150 Green	3/8" - 5/8" (9.5 mm- 16 mm)
200 Salmon	5/8" - 1" (16 mm -25 mm)
250 Orange	1" - 1½" (25 mm -38 mm)

Top-Cast Application Overview:

Mix Design Recommendations

When using Top-Cast, a minimum 3,500 psi concrete mix with a 4"-5" slump should be used to achieve correct etch. Mixes with more or less cement may yield different results.

Micro, Medium, and Deep etches will have different sand and aggregate recommendations for best performance. Refer to the appropriate section.

Placing and Preparing Concrete for Top-Cast

- Prepare Top-Cast for use prior to the pour.
- Place concrete at a 4 inch – 5 inch maximum slump (100mm to 125mm).



- Screed FLAT, this is very important particularly for the Micro Finishes (01-15).
- Bull float with a wooden bull float in both directions.
- Roller Tamp or Jitterbug in both directions. For Micro Finishes Only (01-15).
- Bull float a second time.
- Wait until the bleed water has dissipated
- Complete the edge work next, edge the slab with a metal edger then break the surface again with a wood float.
- Begin the finish of the slab.
- Mag float is optional.

At this point, you need to know how you want the final surface, additional passes with a steel trowel compacts the final surface or tightens the surface. This will help the look of the micro etches.

It is important to ensure that there are no “Bird Baths” or dips in the final surface. The intention is to get a tightly finished “flat” surface.

If you choose to only make one pass, apply the Top-Cast as soon as the finisher comes off the slab. The application timing is the same for one pass as it is for three passes with their skates or kneeboards.



Moisture is needed in the top surface of the slab to react with the Top-Cast. Look for a surface that you can wipe your hand across to feel and see moisture and is “thumb print hard”

This is the key time of the process!

Do not wait too long, early application is far better than too late!

Applying the Top-Cast

Apply the Top-Cast with a commercial grade, high volume, low pressure sprayer such as a Hudson or Chapin. The sprayer nozzle should be a round adjustable nozzle or a fan type with a (.3 or .5 GPM). Apply Top-Cast with a sprayer at a rate of 200-300 sq. ft./gal (4.9 - 7.4 sq.m/L) until the surface has a complete hiding coat. Do not apply too sparingly.

The Top-Cast will dry on the surface in approximately 1 to 2 hours depending on ambient temperature and humidity.

Top-Cast EX 200 may also be used over the Top-Cast Surface Retarder to aide in etch retention, extended wash times, as well as moisture retention in the surface, allowing the retarded matrix to be more easily removed. Apply Top-Cast EX 200 once the Top-Cast is completely dry and refer to the Top-Cast EX 200 current technical data sheet for more information.

Rain & Weather Exposure

The Top-Cast, once dry will resist a light rain. Plastic sheeting (may leave marbling effect) can be used to protect from heavy rain once the Top-Cast has completely dried.

In cooler temperatures you may also place tarps over the slab to maintain heat in addition to protection from standing rainwater. If using insulated tarps, it is advised to first cover with plastic to protect from drag marks.



Removing Top-Cast

Removal of the Top Cast can begin in as little as 4 hours. The concrete surface must be adequately hard to resist the cleaning process.

Generally Top Cast can be removed 12 to 16 hours later. This is dependent upon the mix design, ambient temperatures, job site conditions and the washing procedures used.

Use a power washer with 3000 PSI and a 25 degree fan nozzle. Do not get too close to the slab as you will leave deeper marks the closer you get. Try washing from about 6 to 10 inches away. Short stiff nylon brooms such as deck brushes or an acid wash brush can be used to aid removal. Also, a dobi to rub the areas that do not come off with brush can be used.

Early removal of Top-Cast can be accomplished by the use a stiff bristle brush/broom and a garden hose. Wash until clear water runs from the surface.

The Top-Cast surface may also be removed using a buffer with an 80 grit carbide bristle brush with water. Follow up with a power washer to rinse. This is particularly useful on the lightest grades of Top-Cast and will improve the consistency of the look.

Samples & Mock-Ups

Prior to the project starting, sample installations in similar conditions, with similar mix designs are highly recommended. These samples help determine project timing and to ensure desired results.

During the project, sample installations are also recommended. Smaller mock-ups (2' x 2') that are later easily broken and removed, should be constructed, finished and applied in a similar manner to the main project. This smaller

sample will allow for wash-time checking without disturbing the main installation.

“Micro-Etch” Top-Cast

Placing and finishing guidelines for exposing aggregates smaller than 1/4" (6mm).



Top-Cast 05

Mix Design Recommendations

Mix designs should be heavy on sand contents (60/40). Coarse aggregate should be 3/4" (19 mm) in size if possible. The larger the aggregate, the easier it is to work the stone down from the surface. Avoid small coarse aggregate if possible.

Placing and Preparing Concrete for Top-Cast

Concrete should be placed between 4.5 inches to 5.5 inches (114 mm to 140 mm) in slump.

Screed FLAT, this is very important particularly for the Micro Finishes (03–15).

Concrete should be rolled with roller tamper to ensure that coarse aggregate is pushed down from the surface. Pay attention to the edge areas.



Rolling with tamper should be immediately followed with bull-floating. If possible, for best results, concrete should be bull-floated in both directions.

Remember, the objective when finishing this type of concrete is to get the stone down and away from the surface.

There shall be no trowel, edger or jointer ridge marks on the surface. If ridge marks are visible on the surface prior to application of Top-Cast, then they will show on the final surface after Top-Cast removal.

Concrete should be floated and then troweled to level and smooth surface, additional passes with a steel trowel tightens the surface. Ensure there are no “Bird Baths” or dips in the final surface.

For this level of exposure, Top-Cast 01, 03, 05 or 15 is typically used depending on desired look. (See Top-Cast brochure for chart.)

Follow the instructions in the **Top-Cast Application Overview** for; ***Applying the Top-Cast, Rain & Weather Exposure, and Removing the Top-Cast.***

“Medium Etch” Top-Cast

Placing and finishing guidelines for exposing aggregates 1/4" to 3/8" (6mm to 10mm)



Top-Cast 50

Mix Design Recommendations

These mix designs will typically contain approximately a 50/50 ratio of coarse aggregate to fine aggregate.

Placing and Preparing Concrete for Top-Cast

Concrete should be placed between 4 inches to 5 inches (102 mm to 127 mm) in slump.

Finishing for this level of exposure should be very similar to broomed concrete.

Concrete surface must be free of trowel marks or they will show up after surface removal. When surface is smooth, free of bird baths and firm enough to normally be broomed, apply the Top-Cast.

For this level of exposure, Top-Cast 25, 50 or 75 is typically used depending on aggregate size and desired look. (See Top-Cast brochure for chart.)

Follow the instructions in the **Top-Cast Application Overview** for; ***Applying the Top-Cast, Rain & Weather Exposure, and Removing the Top-Cast.***



“Deep Etch” Top-Cast

Placing and finishing guidelines for exposing aggregates larger than 3/8" (10mm)



Top-Cast 150

Mix Design Recommendations

These mix designs will typically contain approximately a 60/40 ratio of coarse aggregate to fine aggregate

Placing and Preparing Concrete for Top-Cast

Concrete should be placed between 4 and 5 inches (102 mm to 127 mm) in slump.

Concrete should be finished as little as possible, but should still be flat, to ensure that the aggregate stays tight and close to the surface of the concrete. Pushing the aggregate down can result in insufficient exposure of the coarse aggregate.

Concrete surface shall be free of bleed water before placing Top-Cast.

For this level of exposure, one would normally use Top-Cast 75, 100, 125, 150, 200 or 250, depending on aggregate size to be exposed.

Follow the instructions in the **Top-Cast Application Overview** for; **Applying the Top-Cast**, **Rain & Weather Exposure**, and **Removing the Top-Cast**.

Decorative Colored Concrete

Exposed aggregate concrete looks best when enhanced with color, thus showcasing color and aggregate! Great looking exposed aggregate jobs are the result of the right mix design, the right placing and finishing techniques, a high quality surface retarder that will give you a consistent depth of etch, and the amount of detail in washing and cleaning the slab.

Information in this document is intended as a guide. Actual mix designs, finishing and job conditions will impact final outcome.

TOP-CAST® System of Products

TOP-CAST® Surface Retarder is a part of the Top-Cast system including; TOP-CAST SS 100, TOP-CAST EX 200, TOP-CAST PR 300, TOP-CAST CS 400, and TOP-CAST HG 500. Refer to the current technical data sheets for each product for more information including; use, properties, application, and limitations.

TOP-CAST® SS 100 (Formerly Face-Off)

TOP-CAST SS 100 is an innovative surface protectant designed to keep splatter, color, cementitious toppings, cures and retarder overspray from adhering to the surfaces surrounding a concrete placing and finishing operation. The Top Cast SS 100 must be removed within 24 hours, typically when the Top-Cast Surface Retarder is washed.



TOP-CAST® EX 200

TOP-CAST EX 200 is designed to be used with the TOP-CAST Surface Retarder. When properly applied, Top-Cast EX 200 will extend the removal time of Top-Cast several hours depending on application conditions. Using Top-Cast EX 200 will give a more consistent look.

TOP-CAST® PR 300

TOP-CAST PR 300 is an easy-to-use, water-based solution that hardens and dustproofs, requires no rinsing and is VOC compliant in all areas. When sprayed on new exposed aggregate concrete, it makes the concrete more water, stain, and abrasion resistant for easier maintenance and longer life. Top-Cast PR 300 can be applied any time after wash off.

TOP-CAST® CS 400

TOP-CAST CS 400 Cure and Seal is a water based, non-yellowing acrylic copolymer curing and sealing compound that may contribute to LEED Credits. Top-Cast CS 400 cures, seals and dustproofs freshly finished concrete surfaces. Top-Cast HG 500 can be applied over Top-Cast CS 400.

TOP-CAST® HG 500

TOP-CAST HG 500 can be used on new or existing exposed aggregate concrete where a glossy, film forming sealer is desired. Top-Cast

- Only “Non-Absorbent” materials shall be used. Absorbent materials such as wood can leave dark spots in the concrete.
- If impressions are left in fresh concrete by knee boards, impressions should be

HG 500 is non-yellowing, making it suitable for both interior and exterior applications. This ultra-low VOC sealer can be used in all VOC restricted areas in the United States and Canada. Top-Cast HG 500 can be applied 24-48 hours after placement.

Common Mistakes and Troubleshooting:

- Applying Top-Cast too late without sufficient surface moisture being present.
- Not achieving full coverage when applying.
- Not using the proper sprayers. Cheap sprayers are not better or sufficient!
- Using wrong mix designs for desired look.
- Not having enough finishers to complete necessary finishing work in time to apply Top-Cast at the right time.
- Removal issues are commonly caused by late application, not waiting long enough to remove and/or waiting too long to wash off in hot weather.
- Stones showing on the edges of micro-exposed surfaces.

This is normally caused by floating out edger marks with float parallel to the form. After edging the first time, floats should be used to swipe paste back over the edge of the form. This is done by placing float onto concrete surface about 6" to 10" (152-254 mm) out from the form at a 45 degree angle to the form and swiping back to the edge. Float should be kept flat while doing this procedure.

properly repaired before applying Top-Cast.



Summation:

Information in this document is intended as a guide. Actual mix designs, finishing and job conditions will impact final outcome.

Refer to the Top-Cast current technical data sheet for an additional resource.

Sample installations are valuable tools to best determine the timing for local conditions and to evaluate the finished product.

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