



The Chemical Company

## **Application Guides for BASF Floor Products**

Installation of

**Mastertop**

**Anvil Top ® 300**

**Heavy-Duty Floor Topping**

### ***Important: Read This First:***

These suggestions may be followed, modified, or rejected by the owner, engineer, contractor, or representatives since they, and not BASF Building Systems, are responsible for planning and executing procedures appropriate to a specific installation.

When the planned procedure differs from that discussed in this document, the user is urged to contact the local BASF Building Systems Representative before proceeding.

It is the responsibility of the user of this document to establish health and safety practices appropriate to the specific circumstances involved with its use. BASF Building Systems does not make any representations with regard to health and safety issues and the use of this document. The user must determine the applicability of all regulatory limitations before applying the document and must comply with all applicable laws and regulations, including but not limited to, United States Occupational Safety and Health Administration (OSHA) health and safety standards. Product users can acquire current Material Safety Data Sheets at our web site, BASF Building Systems.com.

Read all applicable documents published by BASF Building Systems; confirm the documents are the most current available.

At the start of your placement on site service is available with five days notice to suggest methods of application for Anvil Top ® 300.

This field service does not constitute supervision, as only the contractor/applicator can supervise their work force. The presence of BASF Building Systems personnel does not relieve the installer of the need for qualified testing personnel, experienced engineering advice, or compliance with specified quality control.

BASF Building Systems strongly recommends that a pre construction meeting be held at least seven days prior to the planned installation. The owner's representative, installing contractor, general contractor or construction manager and the engineer of record should attend. A BASF Building Systems representative should attend and will require ten days notice of the meeting. (See pre-job checklist section of this guide.)

### ***Application Limitations***

#### **Do not use for:**

- Applications where steel plate has worn through in less than one year.
- Areas where the floor surface is exposed to acids, their salts, or to other materials which are known to attack rapidly cement or iron.

### ***General Information***

Anvil Top ® 300 topping may be applied over existing hardened concrete or new concrete. The application procedures on the following pages are divided into three sections: application over existing concrete and application over "green" concrete, and over "fresh" concrete.

### ***Related products***

The following products may be part of the installation process. Data sheets are available at [www.buildingsystems.basf.com](http://www.buildingsystems.basf.com)



The Chemical Company

Confilm ®  
Liquid Surface Etchant ®  
Kure-N-Seal ® 25 LV  
Epolith P ®  
TF 100.

### ***Tools and equipment:***

Depending upon the application being used and whether the Anvil Top ® 300 is being placed over “green” or hardened concrete, some of the items that could be needed at the job site include:

- Concrete Saw
- Polyethylene sheeting
- Chipping hammers with chisel bits
- Stiff bristle brooms
- Mortar Mixers (4-8 cubic foot (0.11 to 0.17m3))
- Wheelbarrows and/or concrete buggies
- Appropriate screeds, trowels, floats, finishing machines
- Manual pressure spray equipment
- Water hose
- Pressure washer
- Portable lights
- Water measuring device
- Appropriate safety equipment
- Transit

Note: Under rapid drying conditions Confilm ® evaporation reducer should be spray applied to freshly placed Anvil Top ® 300 to prevent rapid surface drying.



Figure 1: Applying Confilm ®

### ***Mixing:***

Anvil Top ® 300 can be mixed in a mortar mixer or a Ready-Mix concrete mix truck (see appropriate section of this guide for more details. Small batches (one bag at a time) can be mixed with a drill, paddle mixer and bucket.

Mixing in standard mortar mixers:

With a calibrated measuring device, add  $\frac{3}{4}$  of the mixing water (see on-bag instruction), followed by Anvil Top ® 300. Add the Anvil Top ® 300 in a slow steady stream to the operating mixer. Mix for two-three minutes. Add remaining water and mix for five minutes. Mix thoroughly to the desired slump, not to exceed six inch. The use of cold or ice water will reduce the amount of water necessary for a given slump, and increase the working time. Do not use water in quantities that will cause segregation or bleeding.

### ***Mixing bulk bags in a Ready-Mix truck:***

Caution, bulk bags weigh 3300 pounds (1,500 kg) each. Be certain to use equipment with sufficient reach and balance to raise the bag over the hopper of a transit-mix truck safely.

Cranes, “cherry-picker” boom trucks, or very heavy-duty forklift trucks have been used successfully.



Figure: 2 bulk bags

### Bulk Bag Mixing

1. Wash out Transit-mix truck with clean water. Washing out with clean water and up to one yard of washed  $\frac{3}{4}$ " aggregate can provide improved drum efficiency when charged with Anvil Top®.

2. Back all wash water out of clean drum.

3. Charge the drum **(with a precise measuring method or water meter)** with eighty percent of the recommended water at the ready-mix plant or job-site. Use approximately thirty-eight (38-gal.) gallons (143 liters) of water per bulk bag. Do not mix more than five bulk bags at one time in ten-yard capacity mixers.

4. If increased working time is desired due to hot weather or rapid drying conditions, shaved or crushed ice can be substituted for water. Cold water will reduce the quantity of water needed for workability. Use care not to cause as-mixed temperature to fall below 45 °F or to cause segregation. Limit Ice for water substitution to 50% for the first batch or until temperature and water/ice quantity control is established. Approximately 8.33 lbs. of ice equal one U.S. gallon of water.

Starting water quantities shown are only suggested, as job conditions will affect water demand. Determine quantities by slump cone

method for Anvil-Top 300. When adequately mixed a slump of approximately six inches is desirable.

5. Secure each of the four lifting straps:

A.: To rigging rated for the 3300 lb. Load. Attach to crane hook.

B.: To lift truck forks, use caution to prevent cutting the straps or slide pipes over the forks to prevent damage to the lifting straps. NEVER stand beneath raised bags.

6. Open top of bags by untying the closure straps located in the top center of the bag. This is to prevent formation of a vacuum inside the bag during discharge.

7. Equip a qualified worker with adequate safety harness, safety glasses, respirator or dust mask high power flashlight and cutting device such as a razor knife or cutting blade with extension wand. The worker will need to climb to the truck platform, stand at the drum loading hopper, untie the bottom of the bag and possibly cut open a circle around the bag discharge chute to open (wind direction can effect this operation, park transit truck so worker is not facing prevailing wind.) Safety is the responsibility of the Contractor/operator. A harness is recommended.

8. After the contents of the last bulk bag per batch are loaded into truck, and have been mixed for not less than 70 revolutions at maximum mixing speed, have the driver reverse drum. Then, using high power flashlight observe the consistency and efficiency of the mix. Add the remaining twenty per cent of measured mix water if required. Mix not less than thirty revolutions of the mixer drum at mixing speed (12-15 rpm) - or for three (3) minutes.

9. Have the driver reverse drum and use the high power flashlight to recheck the consistency and efficiency of mix. If acceptable, move the truck as close as

possible to the job discharge point and place mixed product.

Be certain that your pre-planning for this operation is complete; avoid delays in discharging the mixed product.

### **Mixing with drill and bucket:**

Read on bag instructions.

Use industrial ½" or greater drill with Jiffy<sup>®</sup> type mixer.

Measure 2/3 of water into bucket; slowly add one bag of Anvil Top<sup>®</sup> with mix paddle in place. As material is fed into the bucket, run drill at slow speed for two minutes, add

remaining water and mix for three additional minutes.

### **Placement methods:**

There are three placement methods for Anvil Top<sup>®</sup> 300. Each requires a different method of addressing the surface to receive the topping

### **Placement Over Existing Fully Cured Slab**



Figure 3: Preparing existing slab

### **Surface Preparation**

- For proper bond, the surface must have minimum ¼-inch amplitude. ICRI profile

equivalent CSP 7 or greater.

- Extensive coarse aggregate must be exposed. The surface must be free of chemical contaminants, rough to the touch, dry and clean (free of dust/loose materials) and structurally sound.
- The perimeter should be square cut to the specified depth of placement and provide 90 degree angles.
- Existing concrete should be removed to the specified depth using low or no impact methods. Do not use impact hammers rated over 30 lb. Do not use pavement breaker tips or bush hammers. Chisel tips or milling are acceptable.



Figure 4 Milling existing concrete surface

- Follow chipping or milling with shotblasting to clean the roughened surface and remove any bruised or micro fractured aggregate. If all preparation is to be done by shotblast, use #480 shot or greater



Figure 5 Shot blast equipment



- Clean the roughened surface thoroughly, using oil-free compressed air or water blast with pressure washer, and allow thorough drying.
  - Check and recheck that all prepared areas are at specified depth.
  - Use Concreive® LPL Liquid epoxy bonding agent or approved bonding agent to bond the topping to the prepared existing slab.
- Mix bonding agent as per the product instructions and spray, roll, or brush onto the prepared concrete surface.
- Apply only over as much area as can be covered with topping while the epoxy is still tacky. (Epoxy open time is effected by temperature, humidity and application rate.) The base slab (substrate) must comply with Section 4.2 of ACI 503.5R-92.



Figure 6 apply bond

### ***Curling prevention***

At all perimeter and construction joints, install fasteners in a staggered pattern 4-6 inches (101-152 mm) from the edge. Place fasteners 12 inches on center. Use Tapcon®, Hilti®, Raw®, or similar. Test for solid embedment. Do not use powder actuated fasteners.

Fastener pattern 12 inch centers

```

* * * * * 6 "from edge
* * * * * 4" from edge
* * * * * 4" from edge
* * * * * 6" from edge
  
```

Test the prepared surface as per ASTM D-4263. Excessive moisture must be force dried to prevent vapor movement from interfering with the bonding agent.

It is recommended that all existing cracks in the prepared surface be treated by gravity feed or pressure injection of epoxy to prevent reflective cracking of the topping. Contact the BASF Building Systems local representative or Technical Service department for more information.

### **Placement Over Recently Placed Concrete (Green concrete)**

#### **Surface Preparation**

- The base concrete must be less than 72 hours old.
- The preferred age is not more than 24 hours old.
- Install specified reinforcing as per plan.
- Place the base concrete following the recommendations of ACI 302.1R-01 with minimum design strength of 5000 psi compressive strength at age 28 days. Place at a water slump of not greater than 4 inch.
- Insert continuous rebar supports into the freshly placed concrete at all perimeters and on each side of any planned control & construction joints. Invert the supports so the base is up; leave the base exposed with ¼ -½ inch clearance above the fresh concrete surface.



Figure 7 continuous rebar support

- Bullfloat the surface with a wood bullfloat. As soon as possible after bullfloating, apply Liquid Surface Etchant ® (a surface texturing agent) to the surface as per product instructions.



Figure 8 apply Liquid Surface Etchant ®

- Cover the treated surface with polyethylene sheet and fasten the sheet in place.
- Two-Six hours prior to placement of Anvil Top ® 300 remove the Liquid Surface Etchant ® as per product instructions. High pressure washers are typical for this purpose
- Apply a slurry bond coat of mixed Anvil Top ® 300 to the prepared surface using stiff brushes, brooms, or power scrubbing machines equipped with stiff bristle brushes. Caution; do not apply more slurry than can be covered with topping before drying. If the slurry coat dries before application of the topping the bond will fail.

## Continuous Two Course Application Over Fresh Concrete

### Surface Preparation

- Place base concrete
- Install continuous rebar supports as per “Placement Over Recently Placed Concrete” section of this document.
- After the base concrete has been placed and the water sheen has disappeared, just prior to initial set (when a finisher with knee boards will leave an impression of approximately ¼ inch) float the concrete with a power trowel machine equipped with float shoes. Hand float edges with wood hand floats. Immediately place Anvil Top ® 300 over floated surface.
- Note: this method of placement requires the installer be experienced, highly skilled and has adequate labor available. Placement of Anvil Top ® 300 over fresh concrete calls for very close control of timing. If the timing and steps are not carefully controlled, bond failure will result.

### Placement and Finishing:

1. Discharge from mixer and place as quickly as possible.
2. Place Anvil Top ® 300 via chute, conveyor, or buggy.
3. Screed with pipe screed, magnesium straight edge or roller screed. If vibratory screeds are used, set vibration and amplitude as low as possible.



Figure 9: screed

4. Test depth of placement frequently.
5. Immediately following screeding apply Confilm ® to the surface. Float surface with a wood bullfloat. Obtain a void free surface with this operation.



Figure 10: bullfloat

6. As soon as the Anvil Top ® 300 will support a finisher and float machine without disturbing the level or working up excess fines, float the surface with a walk behind mechanical float machine equipped with float shoes. Floating operations may require multiple passes. Skilled finishers must use judgment to control timing of floating operations and provide a uniform, compacted, void free surface.
7. Follow floating operations with troweling.
8. Initial steel troweling operations should be done with trowel

blades as flat as possible.

9. After the initial flat steel troweling, finishers should raise the trowel blade angle in increments. The objective is achieving a smooth-troweled, uniform surface. Avoid burnish trowel finishes in hot, dry weather.

### ***Curing and Protection:***

Wet cure for seven days, (96 hours). Insure that the topping surface is not allowed to dry at any time during the wet curing period. Use extra precaution at edges.



Figure11: Wet cure with poly sheet

If a seven day wet cure is not possible, contact BASF Building Systems Technical Service department.

After the wet curing period, allow all standing water to disappear and apply Kure-N- Seal 25 LV or Kure 1315 curing compound to the surface at 300 square feet per gallon (28 square meters) application rate.

### ***Joints:***

Joint placement should mirror existing and planned joints in the base slab if new construction. Saw control joints as per plans to 1/3 the combined topping and base slab depth. (Load transfer devices are recommended at all joints, control and construction.

When the slab has fully cured, install Epolith P or TF 100 semi-rigid joint filler as per product instructions.



Figure 12: Joint filling

Note: Timing of semi-rigid joint filler installation should be reviewed with your local BASF Building Systems representative or BASF Building Systems Technical Service office (800 433 9517).