TUFFLEX®, INC.
UNIQUE ELASTOMERIC SURFACING SOLUTIONS

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ADVISORIES

MAINTENANCE AND CLEANING GUIDELINES FOR SURFACING SYSTEMS

- **TUFFLEX®** overlay systems require Only minimal care and maintenance to preserve their appearance and longevity, but some must inevitably be done.

- Cleaning can usually be accomplished by using a long-handled stiff bristle brush with household detergent and water to loosen the dirt, then a forceful hose stream to wash the surface off. In some neglected cases, it may be necessary to use an abrasive cleaner or a solvent such as Xylene or M.E.K.

- The sooner stains are removed, the easier and more successful will be their removal. The longer stains are unattended to, the more they can penetrate into microscopic pores and become “set”.

- Special care should be taken that potted plant and planter box runoff is not allowed to cause deep staining from their soil-salts, plant foods and fertilizer.

- Make sure that patio furniture, both hard plastic and metal, has protective caps where they contact the deck surface. Use coasters or some other method of protection if the original caps are missing. **TUFFLEX®** overlays are tough and flexible, but can be cut by sharp edges or careless physical abuse.

- The use of Astro-Turf or other outdoor carpets is not advised, since they hold moisture and stains against the surface below for long periods of time, allowing deep penetration and near-impossible removal of the stains.

- Physical damage to the deck that affects its waterproof integrity should be immediately brought to the attention of your **TUFFLEX®** Approved Applicator.

- **TUFFLEX®** overlays can have an unlimited longevity if they are given reasonable care and maintenance. For the best results, contact your **TUFFLEX®** Approved Applicator at three-year intervals for a free inspection, needed repairs or, eventually, a renewal or color change of the surface. Contact him immediately, of course, if there is an obvious Problem.

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TUFFLEX® WATERPROOF MEMBRANES ON FRESHLY PLACED CONCRETE

Caution:

At a bit over sixteen years of age, **TUFFLEX®** has already proved itself to be a true 'break-through' in the flexible coatings industry, by dominating every niche market it's competed in, But, regarding **TUFFLEX®** vs fresh concrete, not everything has been learned yet and a reliable background of experience is still being accumulated. Because of that and the unlimited variables involved, no "one fits all" advice is possible and caution is advised to "make sure" by testing to personal satisfaction before undertaking a big project. With awareness of the cautions, it's obvious that every new usage found for **TUFFLEX®** with fresh concrete opens up entirely new approaches and opportunities for concrete and waterproofing professionals.

Introduction:

Both lab tests and field work indicate that, whether on concrete flatwork, gunite, shotcrete or irregular man-made landscaping shapes, **TUFFLEX®** fluid-applied urethane rubber waterproofing membranes can be successfully placed without regard to the traditional 28 day concrete curing period. Some jobs that previously required up to a month to complete, can now be accomplished in as little as a single day with better results. This is possible because **TUFFLEX®** is a urethane technology break-through, where a 25% proportion of plain tap water is mixed into, and catalyzes, **TUFFLEX®®** Resin Binder Concentrate (RBC). That water content in the resulting Base Membrane Mixture (BMM), renders the 8MM compatible with wet concrete to the extent that there is more attraction than repulsion when the two come together. BMM can even be mixed directly into concrete or mortar, resulting in their increased flexibility. Being catalyzed throughout by its water content allows any thickness of **TUFFLEX®** membrane to be applied in a single pass and, when cured to walkability, possibly within a couple of hours, it can be completely covered immediately by other product layers. After that, its only change will be a gradual increase in toughness overtime. After curing, **TUFFLEX®** membranes become inert slabs of urethane rubber, which appear to have no natural enemies or longevity limitations, as evi-denced by their performance for over sixteen years in such hard usages as ski area decks, zoo hoofed animal floors, rooftop vehicle parking, ship, fishing boat and work-boat decks.

Example #1: **TUFFLEX®** membranes as waterproofing inter-layers between fresh **concrete** slabs:

TUFFLEX® membrane mixtures can be successfully spread or sprayed, at any thickness desired in a single pass, onto freshly placed horizontal concrete which has a low enough water/cement ratio to avoid bleed-water and laitance and enough initial set to provide a firm work platform. The top slab of concrete can then be placed as soon as the **TUFFLEX®** membrane has cured enough to walk and work on, possibly within a couple of hours, depending on weather conditions and whether an available chemical catalyst was also used in the mixture to speed its cure. Based on its many years of longevity and performance in much harder usages, the membrane should remain permanently waterproof, barring physical damage during construction or "acts of God."

None of the previously available "moisture barrier" products for between-slab use in building construction can claim to be anything near to "permanently waterproof". It's well known that 10 mil polyethylene will flake and deteriorate in time, hot mopped asphalt will become brittle and crack, and rolled or single-ply products leak at their seams. But they've been used because they're cheap, available, out of sight, out of mind and nobody is liable to find out for several years. In contrast, **TUFFLEX®** has none of their problems and none of its own. That and every other piece of credible evidence indicates that **TUFFLEX®** membranes can provide a truly permanent and reliable solution to that serious waterproofing problem.

Example #2: TUFFLEX® as a waterproof coating on irregular man-made shapes and vertical walls:

TUFFLEX® water-catalyzed Base Membrane Mixture (8MM), initially consists of a low-viscosity fluid, which thickens gradually, becomes un-spreadable within 1/2 hour and can become fain, and walkable within a couple of hours. This gradual curing permits an applicator to just wait a few minutes, until the mixture cures to a viscosity that will "stay put" for his usage without the need for additives. The tendency to run off of sloped surfaces can also be mitigated by adding sand, rubber granules or Cab-A-Sil. For instance, finely ground black rubber granules can be added in varying quantities to thicken 8MM as needed, even up to 1 3/4 proportion to 1 part of RBC and 1/4 part of water, for a "stay put" coving or vertical wall mixture. Three other mixtures useful for smoothing out transitions from one level to another, or for sloping for proper drainage, are: (1), 1 part RBC, I part 30-60 mesh sand, 1/4 part water, (2), 1 part RBC, 2 parts sand, 1/2 part water and (3), 1 part RBC, 3 parts sand, 3/4 part water (extra water, because bagged sand is so dry). Pick a mixture, or vary one, to achieve a viscosity that is best for the intended job.

Some advantages that **TUFFLEX®** can bring to the landscaping industry:

1. As irregular shapes such as man-made rocks, waterfalls or ponds are waterproofed, a desirable mechanical bond can be added by roughening substrates and sprinkling sand onto sticky membranes.
2. **TUFFLEX®** is solvent free and odorless, making work either inside or outside more pleasant than when using other products that have obnoxious odors.
3. Most **TUFFLEX®** projects can be completed more quickly, even in a single day, which previously took up to a month of waiting for concrete to cure and for waterproofing products to be applied in several coats with hours or days of waiting between coats, before their next coat could be applied.
4. Man-made rocks or other shapes could be completely fabricated ahead of time without water-proofing, then installed onto a fresh over all membrane bed of **TUFFLEX®**, or installed onto a dry membrane, but set into fresh **TUFFLEX®** under their contacting perimeter for secure embedment.
5 When either natural or man-made rocks are used in man-made stream beds, waterfalls or pools, a preliminary and complete waterproofing membrane, over the entire landscaped area, with the rocks set after troweling **TUFFLEX®** mixture onto their bottoms for permanent bonding, would assure no water leakage.
6. If applying **TUFFLEX®** over damp, packed, shaped earth, first apply enough shotcrete or concrete to allow total adherence of the membrane to a firm base, so that its 3% to 5% lateral shrinkage cannot be manifested.
7. Spray units, specially made for **TUFFLEX®** products are available.

Example #3: Some damp-slab situations demand a maximum of membrane longevity:

When landscaping fill-dirt covers an important waterproof membrane, hopefully the membrane will perform as claimed. For instance, 200,000 square feet of **TUFFLEX®** membrane protects the hundred-fifty year old concrete cotton loading docks at the site of the Aquarium of the Americas in New Orleans, It was imperative that the concrete reinforcing bars never corrode and fail, as would be bound to happen if their protective membrane allowed moisture from the constantly damp three foot thickness of landscaping dirt on top to reach them. Because of a potential for significant structural problems in the event of membrane failure, the characteristics and longevity experience of many products were carefully evaluated and **TUFFLEX®** was chosen. This membrane was applied at 1/16 inch thickness on concrete that was soaked from a constant mist, 100% ambient humidity at 100 degrees, without priming or other special attention. Here, as in other maximum security situations, it's fortunate that the cured **TUFFLEX®** urethane rubber membrane apparently has no natural enemies or longevity limitations.

Example #4: TUFFLEX® waterproof membranes under tile:

TUFFLEX® membranes have been laboratory tested and found to exceed the "ANSI A118.10, 1993 standards for load bearing, bonded, waterproof membranes for tile and stone installations." Copies of the test results, specification sheets and job histories will be sent upon request. Briefly, on a plywood or dry concrete substrate, with pedestrian usage intended, the **TUFFLEX®**

mixture (BMM) is spread onto the primed substrate at any thickness desired in one operation. In a few minutes, when curing reaches the point where 16 mesh sand will remain on its tacky surface without sinking, more sand than can possibly bond is broadcast onto its surface. When the membrane is walkable, all excess sand is removed, leaving a surface to which tile grout can attain a reliable bond. A significant saving of time can then be achieved if the tile person takes advantage of that prompt **TUFFLEX®** membrane curing, which can be as little as a couple of hours, after which tile grout can be spread and tile laying begun on that same day.

Example #5: TUFFLEX® waterproof membranes under plaza deck or vehicle surfaces:

The potential exists for 1 day completion of slab, waterproof membrane and brick or paving stones.

1. Concrete slabs can be waterproofed by a **TUFFLEX®** membrane either below a single slab or between two slabs, if sufficient bulk of concrete is kept above the membrane to withstand the stresses of traffic.

2. If the membrane is to be placed between two slabs, follow the advice in **Example #1**, page #1.

3. If job circumstances make it practical to apply a membrane below its slab, the entire concrete slab can then be placed at once, with obvious savings of time and labor. The ground must be dampened and well packed, then a tightly woven fiberglass or polyester fabric is placed and kept tight to the earth by anchors into the ground. The intentions are, to avoid any disruption of the fluid membrane by dust or dirt clods, to stabilize over substrate unevenness and to keep the membrane in place until concrete placement is completed.

4. **TUFFLEX®** membranes can be applied on top of fresh concrete or shotcrete when limited to certain non-traffic or low impact usages. A reliable pedestrian-capable bond between them could only be achieved by providing sufficient “mechanical bond” or “attachment by foothold,” to resist membrane disruption by the intended usage. In some cases, this could be provided by making diamond-saw cuts or concrete-drill holes from 1/4 inch to 3/8 inch deep, or punch-holes from a sharp pointed tool, with spacing to suit the intended usage, but extreme care and awareness of the intended usage is advised.

Surface blisters and how to avoid them: (Also consult the TUFFLEX® Advisory with same title)

1. Lack of sufficient water to properly catalyze the Resin Binder Concentrate (RBC): The recommended proportion of catalyzing water is 25%, which is 1 quart of water per gallon of RBC. Never, EVER, mix in less than 1 cup of water per gallon of RBC, or “gassing” below a surface skin may occur.

2. Careless Base Membrane Mixture (BMM) mixing practices: Carelessly whipping air into the BMM may cause bubbles that stay in the partially cured membrane, which heat of the sun can expand into blisters.

3. When preparing thickened mixtures, avoid rubber granule clumps bringing air into the BMM, which heat of the sun can expand into blisters.

4. Air can be trapped in substrate depressions, which heat of the sun can expand into blisters. All screw slots, previous nail holes, or concrete voids must be filled to level before spreading a membrane.

5. Trapped moisture or air, when exposed to heat of the sun, can expand and cause surface blisters. Apply in decreasing afternoon temperature, shade the affected area, or cool by applying water by fog-nozzles, blown by fans if necessary. Blisters which have already shown up on the surface can often be made to completely disappear when cooled by a water fog. Fine fogging should not damage even a fresh membrane.

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CAUSES OF SURFACE BLISTERS AND HOW TO AVOID THEM

Every **TUFFLEX®** Approved Application Contractor and his crew must understand the conditions that can cause blisters to appear on a membrane surface, so that each can recognize those conditions and avoid them. There is nothing inherent in properly batched and spread **TUFFLEX®** base membranes that causes surface blisters. What can cause them usually involves someone's carelessness in one of the situations identified below:

Because **TUFFLEX®**, *Inc. has no control over the end-use and application of its products, and because Application Contractors do have that control, the responsibility for blisters that occur on their installations must rest with the Application Contractor.*

Causes of base membrane surface blisters

1. Lack of sufficient water to properly catalyze the base membrane.
2. Careless base membrane mixing practices.
3. Unbroken dry lumps of rubber granules allowed into the base membrane mixture.
4. The expansion of air trapped in substrate depressions.
5. The conversion of substrate moisture into water vapor.
6. Substrate surface contamination.

In the same sequence as above, the six conditions known to cause surface blisters are explained in more detail below, along with suggestions for determining their cause and methods of repair.

1. The water proportion in a base membrane mixture formula is the catalyst for the Resin Binder Concentrate (R.B.C.). Some water must always be in the mixture, within the recommended range of from 1/16 part to 1/4 part water to each 1 part of R.B.C.

The approved method of mixing is to simply dump all ingredients into a container and mix everything at once. If the pre-measuring or pre-mixing of several batches is done prior to their actual use, the water proportion of each must be held out until the batch is ready to be spread, since thickening begins as soon as water is added. The method is efficient, but what sometimes happens is that the mixer-person can get so busy that he forgets to add the very important catalyzing water.

Without its water catalyst, the R.B.C. must revert to curing from only what moisture it can get from the air, just as "old technology" urethanes must do, which is why they can only be applied in thin paint-like layers. With the normally thicker **TUFFLEX®** base membranes, the top air-exposed surface would soon cure to a hardening skin. Below the skin, curing would slowly continue from what air could get through the skin, with the result that the by-product of urethane curing, small carbon dioxide mini-bubbles, would be trapped below the skin with no way out. These can accumulate into blisters and the blisters can even merge into large areas of delamination from the substrate.

2. The careless whipping-in of excessive air during mixing must be avoided. It is recommended that mixing paddle speeds be kept low, preferably at 300 rpm or less, and that the mixing head be kept immersed as much as possible. It is difficult to eliminate all air during mixing, but it should be kept to a minimum. The best practice is to keep base membrane mixtures fluid enough to spread easily, to self-level and erase all spreading marks and to allow an easy rise through the mixture and release to the air of whipped-in air bubbles, or bubbles of air from any other source.

If a too viscous membrane does not allow the rise-and-release through it of bubbles of air, a temperature rise can expand the air and cause blisters to appear on the surface.

3. Dry granule lumps contain air. Not only can large lumps make a physical bulge at the membrane surface, but lumps are also bound to contain air which will expand in a rising temperature and cause blisters. (See the advisory sheet on vac/blowers)

4. The careless troweling of base membrane mixtures across the top of unfilled substrate holes can trap air that may expand to cause blisters. Substrates should always be prepared, primed and detailed to smoothness before applying the base membrane.

5. It is important to recognize and avoid the combination of water-soaked substrate and rising temperature that could change the water to water-vapor of greater volume. Water vapor wanting to "out gas" from a substrate that has just been overlaid with a fluid base membrane (no matter what product), will tend to cause blistering. As soon as sufficient membrane curing and toughness develops, usually by the next day with **TUFFLEX®,** only the most extreme 'out gassing" pressure will be able to cause a problem.

6. A failure to remove any contaminants and/or 'bond-breakers" from the substrate surface could prevent a secure **TUFFLEX®** Primer or base membrane bond in those contaminated spots or areas. Where there is no bond, there is delaminations. If there is air in the area of delamination, a rising temperature can expand it into a blister.

Bond-breakers may consist of a variety of materials spilled or applied by other trades, concrete form-release oils, paint, or previously applied overlay systems that have failed. A crude, but practical test of whether the **TUFFLEX®** Primer can penetrate and bond, is to sprinkle water onto the substrate and observe its penetration. If it beads up, that is an indication that a bond-breaker is present. If water can penetrate, then it is probable that the **TUFFLEX®** Primer can penetrate also. A test-patch is always recommended where there is any doubt that a secure bond can be achieved.

Areas of delamination in previous overlays can usually be detected by the changes in sound that are audible when a "drag chain" is dragged across the surface (One to two feet of 1/2 inch diameter chain attached to a two or three foot long wood handle).

Determining what caused the membrane blister:

1. If too little catalyzing water, or none at all, was added to the base membrane mixture:

A foam-like interior may develop within the base membrane, with some thickening similar to the rising of yeast-bread. The interior may be slow to cure, with mini bubbles down on the substrate that can accumulate into blisters. There is no good solution except to remove all of that bad mixture and replace it with a proper mixture.

2. If whipped-in air was trapped within the membrane:

The mixture was too viscous to allow air bubbles to rise to the surface and release their air. The blisters will develop just below the surface, with some base membrane above them and some below them. They must be cut out and repaired before Colorcoating. If only a few blisters develop, they can be punctured and a weight placed to flatten them, in which case the still-sticky interior may allow re-bonding.

3. If an unbroken lump of rubber granules remained in the mixture:

The lump will be visible when cut and exposed. Cut out and repair before Colorcoating.

4. If air was trapped in a substrate depression:

When cut out, a bulge upward into the bottom of the base membrane will be visible directly above the hole in which air was trapped. Cut out the blemish, fill the hole, make repairs, then colorcoat.

5. If Wet-substrate "out gassing" has occurred:

When a temperature rise has changed substrate dampness into water-vapor of a greater volume before the base membrane has cured to enough toughness to resist the pressure, half-sphere indentations should be visible on the underside of base membrane sections that have been cut out and examined. Possibly, the overlay will have to be removed and the substrate dried before proceeding, or repair only may be sufficient.

6. If substrate contamination has caused delaminations:

Lifting of the delaminated base membrane will show the same texture and contours on its bottom as on the substrate.

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AGGRESSIVE TEXTURED TUFFLEX® OVERLAY SURFACES

Most surface texture requirements can be accommodated with one of the rubber granules presently available with a size range of fine (30 mesh or below), medium (20 to 30 mesh) and large (16 to 20 mesh) Because textures are usually a compromise between slip resistance and clean-ability, larger granules than these should seldom be required.

There are exceptions, such as for ski-lodge sun decks, where the surface must endure brutal usage by thousands of ski boots each Winter and do it In the extremely severe ice-and-snow climate where ski-slopes are always located, and also where an extra degree of slip-resistance would be desirable for the deck surface around swimming pools, where there can be carelessness, running and “horseplay” injuries.

It would be prudent for anyone responsible for surface usage’s that are prone to slip-and-fall accidents, not just those above, to consider the legal liability factor and minimize it by providing a surface that could withstand possible legal liability challenges, however remote the possibility may seem while the users are at play.

By the method below, it is easy to achieve extra-aggressive slip resistant surfaces:

After the usual variables of preparation work, the standard **TUFFLEX®** overlay system consists of (1) primer, (2) base membrane, (3) texture granules and (4) colorcoat. in the aggressive-texture system, step (3) would consist of broadcasting the finest mesh-size of texture granules available, since their main purpose would be to mitigate surface tackiness, thus allowing earlier foot traffic and faster job completion. Also, the small texture granules would require only a minimum of (step 4) colorcoat to give a uniformly colorcoated background for the **newly added step (5).**

Step (5) is a “splatter texture”, usually applied with a hand-held hopper-gun such as the Goldblatt “Pattern Pistol”. A suggested medium-texture mixture formula is 1 part TUFFLEX® Colorcoat to 1/2 part 1-3 mm texture granules, to be splattered” through the 3/16 inch orifice at a pressure of 15 p.s.i. The number of “splatters” per sq. ft. is easily controlled by uniformly moving the hopper gun to achieve the desired effect.

A **less** aggressive texture could be achieved by increasing mixture fluidity with a small proportion of solvent, by increasing psi., or decreasing granule size.

A **more** aggressive texture could be achieved by increasing orifice size, granule proportion (slightly thickening), or granule mesh size, or decreasing psi.. Another method would be to dribble” a mixture of large granules and colorcoat from their mixing tub onto the surface, then trowel.

Colorcoats are intended to withstand hard usage, so their splatters will naturally have a relatively hard surface. A method of achieving softer splatters and even more slip-resistance, is to use the “Regular Outdoor” Resin Binder Concentrate in place of a Colorcoat. If this mixture needs to be tinted, some **TUFFLEX®** colored pastes are available or dry pigments may be used. If the desired color is to be gray, it could be achieved by using finely ground black mixture granules instead of the white E.P.D.M., which would require the addition of a black paste or pigment to become gray.

Because Resin Binders do not have the same ability to resist UV discoloration that Colorcoats have, their use may have to be restricted to utility-type surfaces, or wherever else some color change would not be objectionable.

The hopper-gun should be well cleaned as soon as possible after use, but this is a relatively simple operation. Remove the hopper with its gooseneck from the gun and drain both. Place the hopper outlet into a container that holds a few inches of solvent and wash its inside surface with a paint brush of a size that will fit all the way through the neck. Do not leave the gooseneck soaking in solvent, to avoid damaging it. Remove the orifice plate from the gun to clean it and the gun exterior with a paint brush and solvent. To clean inside the gun, use a small (1/2” to 3/4”) paint brush with plenty of solvent to clean under and around the air tubing and its flexible rubber boot.

Blow through the air tube to remove any wet material before it hardens.

Although “splatter-texturing” is not difficult, it is strongly advised that there be a reasonably long familiarization period, with test runs that include a variety of mixtures, before making any job commitment.

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REMOVING RUBBER GRANULE LUMPS AND BROADCASTING TEXTURE GRANULES

The finely ground black rubber granules that are sometimes added to **TUFFLEX®** mixtures to thicken or extend them and those which are broadcast onto freshly applied base membrane mixtures to achieve a slip resistant texture, are acquired from independent granulation companies and made available to **TUFFLEX®** customers as an accommodation, with a small handling charge but no profit added. The granules may come to us in a lumpy condition that is due to a combination of conditions that are unavoidable and completely out of our control. As everyone soon learns, the existence of lumps when bags of granules are opened is intolerable, especially when out on the job without the equipment to de-lump them property.

Fortunately, inexpensive equipment is now widely available that can remove granule lumps quickly and easily, then also broadcast the texture granules for a considerable distance, eliminating the need to "chicken feed" by hand and giving much better results. Here are several brands of vacuum-blowers available, but the one to choose should have a powerful blower motor for high air speed to broadcast texture granules, or even sand granules, an accessory leaf-bag and adequate vacuum capability.

LUMP REMOVAL:

Finely ground black rubber granules seem to be the worst offenders at lumping, with an entire bagful being one big lump at times. Still, a vacuum/blower can reduce the entire bagful of worst-case lumping to individual granules in only a few minutes by the following method.

Step #1, Prepare the lumpy bag: Lay the entire bag flat on a clean floor and cut the bag to expose the entire top surface of granules. With a sharp straight shovel or similar tool, cut vertically through the granules to the floor below, in both directions, at 3 to 4 inch spacing, depending on the size of the blower intake tube. This should result in chunks that will easily drop through the tube into the blower impellers, where all lumping is quickly broken up into individual granules and blown into the leaf-bag.

Step #2, Prepare the blower-vacuum: Remove all the blower outlet tubing and attach the leaf-bag directly to the blower unit outlet. Make sure the long dumping-zipper at the other end of the bag is fully closed. Lay the blower motor on its side, with the impeller guard up. Remove the impeller guard and attach the first section of tubing in its place.

Step #3, Shredding, the granules: With the variable speed control set on high" if there is one, drop the granule chunks into the tube, where they will fall by gravity into the impeller and be blown, as individual granules, into the leaf bag. Most leaf-bags will only hold about 25 pounds of granules, so will need to be emptied twice for each granule bag, into empty **TUFFLEX®** pails or a 30 gallon plastic trash containers. Any loose granules on the floor can be swept into a pile and vacuumed normally.

Broadcasting slip-resistant texture granules: Texture granules, particularly the E.P.D.M. granules, have fewer troublesome lumps, so there should be no need for the de-lumping procedure described above. Normally it is convenient to dump granules from their bag into 30 gallon size plastic trash containers for transport to the job. There, empty 5 gallon pails will be more convenient to carry granules and vacuum out of, and for broadcast onto the still-tacky top surface of **TUFFLEX®** base membranes. Texture granules should always be broadcast to excess, more that could ever bond, so that an even carpet will result, instead of an irregular "chicken-feed" look. Most units have an end-tube with a curve nozzle tip. When the tip is pointed up, granules can land more softly than when directed directly at the surface, where the windstream may cause ripples in the membrane. After the membrane cures to walkability, recover unbonded granules for reuse.

Blower/vacuum units soon pay for themselves through increased efficiency and a better looking job.

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RESIN BINDER CATALYST & COLORCOAT CURE ACCELERATOR

OPTIONAL CHEMICAL CATALYST FOR TUFFLEX RESIN BINDER CONCENTRATE (R.B.C.)

The usually sufficient method of achieving a prompt and even cure throughout any thickness of **TUFFLEX®** base membrane, is normally accomplished by adding from 1/16 to 1/4 part of plain tap water to each 1-part of **TUFFLEX®** Resin Binder Concentrate (R.B.C.) in the base membrane mixture formula.

There may be times, however, when it becomes important to expedite curing even more, such as when persons who require early access into their one-entrance occupancy must be accommodated, or when a business may suffer economic loss during the time its main entrance is shut down. For situations like those and for use during the colder temperatures of Winter, when all urethanes take longer to cure, **TUFFLEX®**, Inc. has developed a chemical catalyst which will additionally speed the cure of its R.B.C.

The chemical catalyst may also be useful to more quickly eliminate the tackiness that can remain on a base membrane surface for several hours, or even overnight, if no texture granules are broadcast. Texture granules eliminate the effects of that normal tackiness and allow early foot traffic access onto fresh membranes. Because texture granules are often omitted from interior floor surfaces to allow easier cleaning, and where the resultant lingering tackiness would interfere with prompt completion of the job, the chemical R.B.C. catalyst will be strategically useful.

The chemical catalyst for **TUFFLEX®** R.B.C. (Sometimes labeled Quick-N-Cure') is available in one-quart cans and I-ounce vials. It is recommended that no more catalyst ever be used than is necessary, depending on conditions, with the maximum proportion limited to three 1 -ounce vials per 5 gallon pail of R.B.C.

OPTIONAL TUFFLEX COLORCOAT CURE ACCELERATOR: (May be labeled "Colorcoat Hardener")

Important: There is a very important difference between R.B.C. catalyst and Colorcoat Cure Accelerator and they must never be mistakenly interchanged. Whereas a mixed-in catalyst will hasten R.B.C. curing throughout its entire container, Cure Accelerator acts only on the air-exposed Colorcoat surface to help pull curing moisture out of the air at a much faster rate than the Colorcoat could do by itself

TUFFLEX® urethane rubber Colorcoats have superior capabilities, but they do not share the advanced technology enjoyed by the **TUFFLEX®** Resin Binder Concentrate (where an added amount of catalyzing water cures it promptly throughout any thickness). The Colorcoats derive their curing moisture only from the air and are at the mercy of such conditions as humidity, temperature, wind and sun or shade. Depending on the variety of conditions, Colorcoat curing to tack-free can take up to 24 hours, or even more. Often, this slow curing is no problem, but where early access or speedy job completion is of importance, the optional Colorcoat Cure Accelerator can make a big difference by causing a cure to tack-free in as little as one to three hours.

Colorcoat Cure Accelerator is packaged in one-quart cans, with one quart to be added and mixed well into each five-gallon pail of Colorcoat. There should be no concern that leftover Colorcoat will be unusable. If the pail is properly sealed, any leftover Colorcoat will merely skin over on the surface. The remaining Colorcoat, not being air-exposed, will be accelerated and ready to use when the surface skin is later removed.

Exception: When the **TUFFLEX®** Colorcoat "AR" is specified, it may be shipped with a separate 1/2 pint can of modified catalyst. This is not to be confused with Colorcoat Cure Accelerator. In order to extend the shelf-life of the "AR" Colorcoat, some catalyst, that would ordinarily have been added during manufacture, has been held out and sent along with the Colorcoat separately, for addition nearer to the time-of-use when it should be added. There should be no inconvenience from adding the 1/2 pint, or from adding the quart of Cure Accelerator when it's used, since the entire pail of Colorcoat needs careful mixing anyway, to blend in all pigments that may have settled out on the bottom of the pail.

TUFFLEX®, INC.
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COVING TUFFLEX® MIXTURES AT A VERTICAL WALL

TUFFLEX® mixtures of the proper viscosity can be shaped to form a cove up vertical walls without slumping. Uniquely, the **TUFFLEX®** Resin Binder Concentrate (R.B.C.) accommodates itself to an unlimited number of mixture formulas, where ingredient proportions can be varied over a wide range to achieve nearly any result that's desired. For coving, advantage is taken of the mixture-thickening effect of finely ground rubber granules, as in the formula below. This is a starting formula, subject to slight modifications of the rubber granule proportion as changing conditions may require.

TUFFLEX® Cove Mixture Formula
1 part **TUFFLEX®** R.B.C.
1-3/4 parts fine rubber granules
1/4 part water

From each 1 gallon of R.B.C., the formula should yield between 1-3/4 and 2 gallons of cove-mixture, depending on the measuring care taken, which will provide approximately 80 lineal feet of 2-1/2"X 5" cove if applied with the cove tool recommended below. (Available at the plant, when possible)

A cement-mason's inside comer step tool is commonly used for coving and most are constructed either with both wings about 5" or both wings about 2-1/2". For shaping concrete steps, these usually have a cove radius of 1/2".

After an evaluation of several types and sizes, the tool chosen as most efficient for **TUFFLEX®** work is described as follows: Manufactured in Los Angeles by Harrington Tool Co., the tool of choice is 6" long and of stainless steel with 5-1/2" and 2-1/2" wings, so that the one tool can make either a high cove or a low cove. To allow a greater thickness of cove mixture at the cove angle, a 3/4" radius has been deemed preferable to the usual 1/2" radius, especially where movement potential is high, such as up and around square railing posts.

An important advantage not found on all cove tools, is that the 2-1/2" wing of the recommended tool can be bent to slightly more than its original 90 degrees, so that featheredging onto both the wall and the deck can be accomplished in the same operation. To achieve this, with the 5-1/2" wing flat on the deck, the 2-1/2" wing should be sprung outward so that, with its top touching the wall, a point 2" down on the wing where the radius begins to curve will be about 1/8 inch from the wall.

To create a straight line at the top of a cove, 2" wide masking tape is usually applied to the wall, with the coving mixture featheredged onto it. This tape should always be removed before the **TUFFLEX®** mixture cures, otherwise a ragged edge will probably result. It's a tedious operation to remove the tape, then have to reapply it prior to colorcoating, but it's possible, with careful planning, to apply the masking tape only one time and still achieve both masking purposes. To accomplish this, the coving is done first, after its own needed surface preparation and priming. While preparation work and detailing is being done on the rest of the deck, the cove is beginning to cure. It may still be slightly damp, but if cured enough so that a soft paint brush will not disrupt its surface, a band of colorcoat can be painted on the top inch or so, overlapping onto the masking tape. The masking tape can then be removed, with no need during the later over-all colorcoating to either re-apply masking tape or tediously try to cut in a straight line. Colorcoat drips should be painted out flat to avoid the gassing that is common to thick droplets, but otherwise there is no problem with the base membrane later covering up incompletely cured colorcoat.

For some jobs, it's efficiently faster to unroll masking tape along the top of a spacer, such as a straight 2" X 4" board moved progressively along.

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TUFFLEX® SAND SLURRY "YIELD RATIO" EXAMPLES

TUFFLEX® Resin Binder Concentrate (RBC) is uniquely alone among all other flexible coatings, in that it is *concentrated*. That means it can accept large proportions of fillers, such as sand and/or rubber granules along with the 25% plain tap water which catalyzes the RBC. To the best of Tufflex, Inc.'s knowledge, no other flexible product in existence can accomplish this and achieve such extremely useful thickened mixtures as the Sand Slurries and Sand Mortars below, Of controllable consistency, these mixtures are spreadable at any thickness desired for such diverse problem-solving uses as sloping for balcony drainage, filling metal mesh for distressed sun-deck repair and to shape rooftop drainpipe flashing cones, all of which cure promptly and remain permanently tough and flexible.

FORMULAS: (Their point is to show how consistencies can be varied and that total yield is less after mixing has allowed the fluids to fill all voids between the sand grains.)

TEST MIX #1: (Yields a "Sand-Slurry" which is much more fluid than a "Sand-Mortar")
1 cup "TUFF" RBC
1 cup 30-mesh sand
1/4 cup water
Yield after mixing approximately 2.11 cups

TEST MIX #2 (Yields a "Sand-Slurry/Mortar," between a "Slurry" and a "Mortar")
1 cup "TUFF" RBC
2 cups 30-mesh sand
1/2 cup water
Yield after mixing approximately 3.04 cups

TEST MIX #3 (Yields a "Sand-Mortar" of "stay-put" consistency soon after mixing)
1 cup "TUFF" RBC
3 cups 30-mesh sand
3/4 cup water
Yield after mixing approximately 3.93 cups
(Sand Slurry mixtures with over 3 parts sand to 1 part RBC are possible, but are *not recommended.)*

*Add more RBC to increase mixture fluidity, add more sand to thicken, or wait for self-curing to thicken.
*Cups were used in the three test mixtures above as a control test in the lab, Use these measuring ratios when larger quantities are required.

EXAMPLE: 1 quart of RBC. 2 quarts of sand and 1/2 quart of water yields 3.04 quarts of #2 mIx Sand Slurry. Even that could be doubled, but be aware that thick Sand Slurry requires a husky mixing motor and a 12 gage cord that's not too long, Overloaded mixing motors may burn out!

EXAMPLE: Combining 2 1/2 gallons of RBC, 5 gallons of sand and 1 1/4 gallons of water keeps the same proportions as Test Mix #2 and should yield very close to one 7 1//2 gallon cubic foot after mixing.

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PREPARING FOR AND APPLYING A NEW COLOR COAT

When re-coating a previously coated urethane deck, the following steps should be taken:

1. Thoroughly clean the deck surface by pressure washing with clean water. If heavy soiling is present, you may use light cleaning agents, such as TSP. These cleaners must not leave any residue on the surface that can act as a de-bonding agent.
2. Surface must be dry to more than 10% moisture on a moisture meter.
3. For problem areas solvent wipe deck surface with either MEK, Toluene or Xylene (do not use any solvent that has an alcohol base). This may be accomplished by using a lightly dampened paint roller or a rag wrapped around a push broom. (NOTE: Do not pour solvent directly onto the deck surface. Always use caution when using solvents around water heaters or any open flames). Make sure that no solvent is allowed to pond. Wipe up any residual solvent. Allow to dry completely.
4. Mix the primer selected for use and apply sparingly. Primers work best when applied thin. Let primer cure as per the technical bulletin of chosen primer.
5. When primer has set, mix and apply a thin coat (8 mil to 10 mil or approximately 180 sq.ft. per gallon) of chosen Color Coat. This may be any of the TUFFLEX®, Inc. System color coats. See Specification Book for the proper color coat selection. While applying this coat, you may desire an added texture. Some times multiple coats of color coats and primer will diminish the texture and cause your surface to be slick. The added texture may be installed by light, even broadcast the “16/20 Texture Rubber” or a 20/30 grit sand into the wet color coat and using the back-rolling technique. This technique is after a thin layer of color coat is applied, you broadcast the desired texture at a rate of 20% to 30% coverage into the wet color coat. Extending and then placing your roller cover away from yourself, then pull (not applying any pressure) back towards your direction. (NOTE: Do not push the roller cover away from your body, this will cause clumping of the texture and will not be aesthetically appealing. If not experienced in back-rolling, you should practice first.) Let this coat set over night.
6. Mix and apply the final color coat at an approximate rate of 160 sq.ft. per gallon for “AL” and “AL-Ester”, and approximate rate of 300 sq.ft. per gallon for “Tuff-Shield”. Let cure 24 hours for light foot traffic, 48 hours for heavy traffic. To speed up cure time, use the “Color Coat Accelerator”.

Final Notes:

Always read the manufactures “Specification” and “Technical Bulletin” sections for each product you have chosen for your re-coat.

When doing any recoat, it is extremely important to have a clean, dry, sound surface. Having these will give you long lasting, durable surface. So take care how you prepare your surface.

Adding a little more texture into a 1st coating is always suggested, especially when traction in slip-fall situations are critical. A new color coat may look good but is it going to be safe?