# SCOTT SYSTEM FLEX-LINER APPLICATION GUIDE



2007

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# The Scott System

Scott System, Inc. invented elastomeric form liners in 1969. Please take advantage of our many years' of manufacturing and installation experience by taking the time to read this users' manual.

## **Instructions**

## THE USE OF ELASTOMERIC FLEX-LINER

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FIELD ADVISORY BULLETIN - S2007

## **READ BEFORE USE**

The following recommendations cover the basic use of Scott System form liners in the field. User must comply with the following items to ensure positive results and to make any warranty claims. Additional detailed instructions can be found in our FORM LINER USAGE GUIDE included with each shipment or on our website at <u>www.scottsystem.com</u>.

- 1. Each shipment must be checked BEFORE unloading at jobsite. Note any damage to crate, pallets and form liner on the freight line's delivery ticket. This notation must be made to hold the delivery company responsible for damage claims.
- 2. Liners shipped on rolls must be unrolled and laid flat upon arrival at production site.
- 3. Protect form liners from exposure to UV rays and/or freezing temperatures. Indoor storage is recommended. Store and use form liners at temperatures between 40 degrees F and 140 degrees F.
- 4. Elastomeric form liners will expand or shrink in hot or cold temperatures. Verify lines and levels of formwork and form liner patterns are within allowable tolerances.
- 5. A release agent must be applied to form liners prior to use with concrete. Use only approved release agent, Scott Lease 440 or Cresset 880.
- 6. Thoroughly vibrate concrete to achieve consolidation, and minimize voids. Internally vibrate into previous lift to avoid lift lines. Avoid vibrator contact with the form liner.
- 7. Remove/strip form liners from concrete within 24 hours after pour.
- 8. Proper cleaning and storage of form liners is required to obtain acceptable results. Prevent matrix buildup on the liner surface. Scrub the liner surface with a stiff bristle scrub brush dipped repeatedly in one of the approved release agents. All excess release agent shall be blown or wiped off before the form and liner is put back into service.
- 9. Elastomeric form liners comply with HCLP test and may be disposed of in landfills.

Limited Warranty: Scott System, Inc. warranties its products against defects in materials (materials to be of consistent quality within manufacturing specifications) and workmanship and will perform as represented, provided that the concrete construction methods used are in agreement with the manufacturer's recommendations and installation instructions. Scott System assumes no responsibility for concrete construction or production of structures in the field. Manufacturer's obligation under this warranty shall be limited to replacing or refunding the purchase price of that portion of the materials (provided by Scott System) proven to be defective.

#### SCOTT SYSTEM, INC. 10777 E 45<sup>TH</sup> AVE, DENVER, CO 80239 303-373-2500 WWW.SCOTTSYSTEM.COM

Flex-Liner to Plywood

Type of glue for field use: 2-part Scott #2308

Coverage: 80 square feet per gallon

## **APPLICATION:**

- PREPARE YOUR WORK AREA: Work in a dust-free and well-ventilated area with an environmental temperature between 60 degrees F and 80 degrees F. NOTE: Epoxy must generate heat in order to set up. If the temperature of the form or of the form liner is too hot, cool it down by covering it with a sunscreen and keep direct sunlight off of it. Direct sunlight will also cause the liner to grow, so maintain a temperature between 60°F and 80°F until the epoxy has set; otherwise the liner may expand which may cause bubbles between the liner and the plywood.
- Make sure the plywood form is <u>level</u> and free of DEBRIS, OIL, WATER or DIRT. The plywood form surface must be dry in order for the epoxy to adhere to it. Excess moisture makes the glue frothy in appearance and interferes with the bonding. Glue in a <u>horizontal</u> (never a vertical) position.
- Place the liner face up on the form and position it as you want it, making sure all lines and edges are straight and true.
- 3. Roll back half of the liner onto itself.
- 4. Brush off the form and the rolled back side of the liner to remove all dirt and dust.
- 5. Wipe the plywood and the back of the liner with a cloth dipped in M.E.K. or methylene chloride solvent to remove any grease or oil. Chemical-resistant gloves are required.
- Mix together 1 part A with 1 part B Epoxy in the quantity needed using a <u>flat stick</u> or <u>paddle</u>. Scrape the sides of the container and ensure that the two parts are well blended. <u>Do not use a rod</u> as this will not achieve a thorough blend.
- 7. With a 1/8" or 1/16" serrated trowel (like those used for floor tile adhesive), spread the well mixed adhesive onto the plywood form. Make sure the EDGES of the form have plenty of adhesive as this is the area where most delaminating occurs. Clean the trowel between each use with methelyene chloride solvent to remove any glue build up.
- 8. Roll the liner back onto the wet adhesive. This rolling action eliminates the chance of air entrapment between the liner and the form. NOTE: *The epoxy is NOT a contact adhesive. Do NOT attempt to PRESS the liner and plywood together. The goal is to FLOAT the liner on top of a thin layer of epoxy that is free from air bubbles.*

10. Position the edges and corners where you want them, then use tack strips (1' long pieces of lath strips with nails in them) to hold the liner across the surface of the form. Since the Flex-Liner is flexible, you can stretch or compress it to fit your form. The tack strips will hold it in that position until the epoxy sets.

11. Repeat the process with the other half of the liner.

12. Before the epoxy sets, clean the excess off the joint line along the sides of the form. This will allow a clean, tight fit between the edges of one form to another.

13. DRESS THE FORM LINER EDGES: Use a DISC or a BELT SANDER with 36 grit belts or discs. The liner sands well so work it like you would a table edge. Once the liner is smooth or shaped the way you want it, REMOVE the DUST from the liner surface or you may see it in your wall later!

## Section 2: Release Agents and Form Liner Application

Architectural concrete forms are not going to cycle as fast as smooth faced forms. They will always strip harder and more care must be taken with them. Form liners must be oiled properly with a non-staining and non-reacting release agent. Scott's Flex-Liner form liner requires a release coating between each use. Scott System approves and recommends the following release products for use with our elastomeric form liners:

1.	SCOTT LEASE 440	SCOTT SYSTEM, INC.	303-373-2500
2.	CRETE-LEASE 880	CRESSET CHEMICAL CO.	419-669-2041

If you prefer to use a different release agent, we advise that you avoid products with high solvent concentrations as these tend to cause the form liner to swell.

We also recommend that you do a few test pours to determine how the liner will strip. *NOTE: Using a release that is not approved, will void any warranty protection.* Note: You should apply release as close to pour time as possible.

## **APPLICATION: SMOOTH FLUTED TEXTURES**

1. Spray or use a natural bristle brush to scrub the release oil on both sides of the flute. If you spray in just one direction you will not get any release on the far side of the flute. Apply a LIGHT, even coating ensuring complete coverage on both sides of the flutes.

2. Small flute 1/4"-1/2" etc. require extra care because it is difficult to spread the release between them. Be sure you have both sides covered.

3. A light coating is best. More is not always better.

#### **APPLICATION: WOOD TEXTURES**

1. We recommend the scrubbing method so all the fine grain detail has release scrubbed into it. Use a natural bristle scrub brush.

- 2. Scrub in the direction of the grain pattern.
- Spraying is the second choice for application. Inspect to be sure the release is getting into the detail. Do not overspray!

#### **APPLICATION: HYDRO EDGE LINERS**

Apply Release as you would any other liner according to pattern. Be sure-to apply release to the form liner edges and the form joints as well. This gives you a slipping action from one form to another and every little bit helps to reduce buildup on the form edges and facilitate stripping.

#### **APPLICATION: FRACTURED FIN TEXTURES**

The release should be applied from both sides of the flute to get maximum coverage. The use of the natural bristle scrub brush to SCRUB on the release agent works very well with the fractured liners. This accomplishes two things:

- 1. Removes matrix buildup before it can really take hold.
- 2. Gets the release agent in every nook and cranny of the pattern.

The scrub application is usually only needed every 4 or 5 pours. When the stripping crew begins to notice that the form is coming off harder than it used to, that's the sign to that the release needs to be reapplied. Using scrub brushes to apply the release will keep the liner clean and easy to strip.

- 1. Remember to scrub in the direction of the flute.
- 2. Remember that the EDGES of the liner must be released also.
- 3. Clean off any concrete matrix that adheres to the edges so the liner joints stay tight.
- 4. Remove any dirt that is on the liner surface before you pour or you will see this reflected on your concrete panel.
- 5. If you can only spray the release, do it in this manner:
  - a. Spray from the bottom to the top of the liner in the flute direction.
  - b. Spray at a 45° angle up and underneath the texture.
  - c. Catch both sides of the flute.
  - d. Spray EDGES.

### **APPLICATION: LOW-PROFILE TEXTURES**

- 1. Use the scrubbing method for release application if possible.
- 2. If scrubbing is not an option, spray from the bottom to the top to get into the texture. Remember that this lets the release run back down into the texture below.
- 3. The sandblast texture has a tendency to <u>hold</u> release in the roughened surface pockets. If possible, use a blower (high volume yard leaf-type will work) to get the "puddles" out. Staining of concrete can be a direct result of pouring on an accumulation of release.
- 4. A paint roller may be used to soak up excess release.

#### APPLICATION: BRICK GASKET LINERS

Brick Gasket liners, should be **lightly** coated with release between uses. Use a *SCRUB BRUSH*, a *POWER SPRAYER* or a *FOGGER*. The release acts as a lubricant when placing the bricks into the grids and also assures an easy strip. A retarder or wax coating is applied to the brick <u>face</u> before it is placed <u>face-down</u> in the form liner grid. The retarder or wax must be applied to the <u>face</u> only. This retarder application will not hurt the liner and will help in the high pressure water cleaning of the brick surface. DO NOT allow retarder or wax to get on the sides of the bricks.

## Section 3: General Guidelines & Maintenance

- ALWAYS Strip within 24 hours! The longer you leave the liner on the concrete, the tougher the strip will be. Flex-Liner will strip clean.
- 2. Keep dirt and impurities off the released liner.
- 3. Don't let the liner sit face up in the sun for long periods. Ultra violet rays will deteriorate the urethane.
- 4. If it rains, cover the liner so the release is not washed off.
- 5. Always release the form, the liner edges and the ends.
- 6. Use release between each pour.
- 7. A simple and effective tool for workers in the field is a BENT SCREWDRIVER. Bend a cheap screwdriver so the wedge tip is in line with the handle. The wedge tip inserts easily into the joint and the blade edge will scrape and clean any concrete buildup as the hook is pulled out. This tool replaces the claw of the hammer on the bent double head nail that guys try to use.
- 8. Use Flex-Liner form liners in temperatures between 40°F and 140°F. Steam curing is NOT recommended.
- Flex-Liner with release on it may be flammable. Be cautious of using cutting torches or other power tools near form liners and release agents. On hot days, fumes may build up.

Flex-Liner form liners can SWELL from solvents and distillates found in some release agents. To avoid this problem-

- a. Laminate liner to plywood and stabilize it that way.
- b. Use a very light application of release and blow air across the surface to displace the solvent fumes
- 11. Always strip WITH THE PATTERN DIRECTION of the form liner. Stripping "cross grain" will cause the liner to key onto itself and work against you.
- 12. Flex-Liner form liners will NOT:
  - a. Stain concrete
  - b. Pollute the air
  - c. Cause air holes
  - d. Compress under ultimate liquid head pressures
  - e. Shrink with use (but it will shrink or swell in extreme temperatures and with some solvents)
  - f. Create Form pillowing
  - g. Affect concrete strengths
  - h. Cause Pour lines in concrete

## Section 4: Cutting and Sanding

## **CUTTING**

Flex-Liner is a synthetic rubber and it cuts like rubber. Too much friction will cause the liner to melt and gum-up saw blades so use a slow, steady pace. A Skil or Milwaukee worm drive with water feed attachment or WD40 and air works well to keep the liner cool and minimize gum-up to the blade. If you must use a regular saw, go slowly. Use a lubricant like WD40 in advance of the cut. Let the blade work for you. To cut a THIN liner without plywood, you may use a utility knife. Several deep passes will work better that trying to make one deep, continuous cutting pass.

### TO CUT

- 1. Snap a line.
- 2. Nail a guide down on the liner and into the back up material.

3. Cut or saw along the guide. The guide will also hold the liner down flat on the back up material.

#### Equipment Options:

- a. Carbide tip skill blade with 24 teeth
- b. Utility knife
- c. Fine Tooth or Smooth Edge Saber saw
- d. Hand saw

#### **SANDING**

Flex-Liner can be a challenge to cut, but it is easy to sand. Sometimes it is easier to take off 1/8" with a disc sander than to try and shave it with the Skil. The sander also can help clean up a cut surface if you got careless with the utility knife. After lamination it is easy to dress the edge with a sander. Use a sander to put a bevel on the edge or to "clean" the cut and take off high spots.

Equipment: #36 grit belt or disc sander

### TO DRILL

Steel or wood bits will work. A *HOLE SAW* will cut nice, clean holes for the bigger ties. It is best to drill from the face side. Working from the back can cause delaminating of the form liner in the drilled opening area. Appling silicone to the plywood in the drilled opening will help seal this area and protect the opening from excessive moisture. Tie holes tend to swell up and become ragged after a few pours. Minimize the affect by avoiding moisture contact with the plywood. Also a bottle brush dipped in release will swab out any concrete matrix if used between the pours to clean the tie hole.

## Section 5: Repairing Tears and Cuts

Flex-Liner form liners can be repaired by using commercial rubber adhesives. Scott System recommends:

1. Lawson #90281 Rubber Bonder. This product is a fast-acting glue like a contact adhesive.

E-6000 Rubber Mender. This product will cure to be just as flexible as the form liner itself. It usually cures in about 4 hours and can be sanded after it is fully cured. E-6000 can be used to fill voids and then tooled to shape. This product is also good for re-bonding the form liner to the plywood and small repairs.

Note: Be careful with fingers and other exposed skin areas. 90281 can set up fast and will stick skin to skin.

## Section 6: Lined Forms Stripping and Setting

- 1. A porta-power self-contained jack can be used to start stripping the form away from the concrete.
- 2. Begin slowly by building up some tension against the form. Wait about 30 seconds, and then gently pull the form and form liner away from the concrete. Remember you are working AGAINST SURFACE TEXTURE and SUCTION.
- 3. Add a little more pressure and wait again. The liner will release with a slight tearing noise.
- 4. If a pry bar is needed, be sure not to pry directly against the liner surface. Place something (i.e. a piece of Styrofoam or plywood) between the bar tip and the liner.
- 5. On some deep textures it may help to pour water down into the crack between the liner and the concrete. It acts as wetting agent to help break the suction. In extreme cases you may add a liquid detergent to the water.
- If you need leverage down in the form, don't use bricks or other sharp items. A piece of Styrofoam block jammed into the opening works well. Rock the form back and forth.
- 7. There is a product made in Germany called a "Vetter Bag." It is a pneumatic device that flattens like a pancake but then expands when air pressure is added. They use them to lift railroad engines, etc. Imagine it placed down in the opening, then expanded. It would push the form away from the concrete.
- Architectural forms should be stripped in 24 hours. You can always replace the form back onto the wall for the concrete curing specifications, but the initial strip needs to be within 24 hours. The longer hydration continues, the tighter the suction between curing concrete and rubber liner will be, making for a more difficult strip.
- 9. Once the form has been stripped, prepare it for your next pour:
  - a. Use the bent screwdrivers to clean the joints and form edges of buildup. Check for buildup of pockets in liner face.
  - b. Swab out the tie holes with the bottle brush and release agent.
  - Release should be applied as needed, at least every 4<sup>th</sup> or 5<sup>th</sup> use. For release application process, please refer to Section 2 on pages 5-6.

11. When setting the form into place for the next lift, avoid contact with rebar ends and stubs. Occasionally a kick plate between the form edge and the landing can give some protection against tearing the liner and plywood edges.

- 12. If you need to set a block-out in place against the liner face, you can use finish nails through the liner into the plywood. The nail pulls out of rubber clean and you won't see the hole in subsequent pours.
- 13. Be aware that the following factors can make stripping very difficult:
  - a. Out of range hydration temperatures. This will occur with mass concrete, or some of the new SCL.
  - b. Improper release application.
  - c. Leaving the liner in the concrete for more than 24 hours.
  - d. Not using bent screwdrivers and scrub brushes and letting the buildup get out of hand.
  - e. Steam curing and exceeding temperatures over 140°.
  - f. Incorrectly stripping liner against the grain of the texture.

## Section 7: Shipping and Storing

- Flex-Liner is shipped either on flat pallets or rolled onto cardboard tubes. Although careful measures are taken at the factory to protect your shipment, occasionally freight arrives in poor condition. You have the option to refuse shipment if it is damaged. Contact supplier immediately. If your shipment is damaged upon arrival at the job site, please <u>make a</u> <u>note of it on the driver's delivery ticket</u>. Your note must include the following:
  - a. The nature of the damage.
  - b. What part of bundle is affected.
  - c. Date.
  - d. Your name and phone number.
  - e. Photographs of the damage.

If you don't see the damage until you open the crate or bundle, you then must get the delivering carrier out to your job site to make an inspection. Scott System <u>does not ship</u> torn or damaged goods. Claims need to be made immediately.

- Keep liner stored out of <u>direct</u> sunlight (all rubber and plastics are affected by UV exposure). If it came to you in cardboard tubes, cut the straps and lay pieces <u>out flat</u> for storage.
- 3. If you do plan to laminate, remember that the surface temperature of the liner will effect the time required for the epoxy to set up. Too cold = will set up more slowly. Too hot = will set up very quickly.

- 4. If you have made up the gangs and are stacking them, make sure you put some Styrofoam dunnage between the forms. Don't let rigid metal or wood dig directly into the liner face; it will permanently deform the liner and will reflect in your concrete walls.
- 5. If you band liners together, use edge protectors so you don't cut into the liner.
- 6. Shelf life of Flex-Liner is indefinite if you protect it.

# Section 8: Tolerances

Elastomeric form liners are rubber. They expand with heat and contract with cold. Our manufacturing tolerances are + or - 1/4" in 10°. Since rubber will stretch and compress, form liner is still workable even if it is 1/2" longer or 1/8" wider than ordered. Liners can be stretched or compressed simply by working them around. Shooting some air under the liner while it is being manipulated often makes the job easier.

## Section 9: Helpful Hints

- 1. Flex-Liner form liners glue very well to plywood and moderately well to steel.
- Clean the liner with high pressure hot water and soap. NEVER use a wire brush on the liner. Always use a natural bristle type.
- 3. End to end butt joints of liner to liner will ALWAYS show in concrete.
- 4. Scott System <u>does not</u> stock form liner, but instead makes each order to your specification. Be aware of production times for additions or changes to your liner order.

## Thank you for your purchase of Scott System Flex-Liner.

Please call us at 303-373-2500 for any assistance with our products.