

User's Guide

SBX™ Liquid Emulsion

Sandblast Photo Resist

An inexpensive and accurate system you can process in-house to sandblast glass, wood, mirrors, granite, marble, slate, ceramics, metal and more.

General Information

SBX Sandblast Photo Resist Liquid Emulsion is a two-part system comprised of:

Part 1

A clear or dyed emulsion (store at room temperature).

Part 2

A dry photo-sensitizer powder (keep this small bottle in a freezer until ready to mix with Part 1 — the clear or dyed emulsion).

SBX Processing Requires:

- Yellow lights in work area.
- Masking or transparent tape.
- Coating blade or spray gun.
- Smooth, flat table.
- Paper towels.
- Positive or negative film of artwork.
- Dark drying area.
- Exposure unit.
- Pressure washer.
- Blast cabinet with filtered exhaust and/or personal safety gear.
- Wearing of OSHA approved safety equipment in spraying and blasting areas.*

* MSDS available upon request. Keep away from children.

The sensitizer must be thoroughly dissolved in distilled water and then mixed with the emulsion.

Shelf-life of sensitized emulsion is two weeks at room temperature and two months under refrigeration. SBX Emulsion is available in quarts, gallons, and 3.5 gallons. Larger sizes are available upon request.

Use under yellow lights.


Cautions

- Pressure-pot systems — blast between 20 and 25 psi.
- Siphon systems — blast between 60 and 80 psi.
- Use bottled distilled water for mixing diazo and thinning emulsion.
- Use 150 or finer grit for blasting.
- We recommend you become familiar with SBX by practicing on inexpensive objects.
- **Sensitized SBX Liquid Emulsion may stain clothing, fingers, and certain materials. We recommend a test run before going into full production.** Gloves and aprons will protect you and your clothing. Clear lacquer will protect porous materials.
- Some materials, including iron, copper, marble, stainless steel, granite, and others may destroy SBX sensitizer through a chemical reaction. If more than six hours elapse between coating and image development, pre-coat the material with flat enamel. A strippable enamel may be preferred.

Please see inside for detailed instructions.

PhotoBrasive®
S Y S T E M S

Instructions

 = denotes working under safelight conditions.

1 thru 3 Application Methods

Before applying SBX

- Before application of SBX, the emulsion must first be sensitized. Follow the directions listed on the sensitizer bottle for proper procedure. After sensitizing, let the mixture stand for a minimum of 2 hours (preferably overnight) before using.
- Glass and non-porous materials must be thoroughly cleaned and degreased with glass cleaner or soap and water. Rinse well with water, or optionally with isopropanol (rubbing alcohol).
- Wood and porous objects must be dust and oil free.
- Consult the "Minimum Coating Thickness Guide" for correct emulsion thickness and how to achieve it.

To achieve the dry thicknesses in the chart, use the following formula: Dry thickness desired $\times 3.75$ = wet thickness needed. To achieve wet thickness use standard transparent tape which is typically 2.5 mils thick. Three layers on the object or coating blade will yield a 7.5 mils wet coating ($3 \times 2.5 = 7.5$). When spray coating, one quart will cover 32 square feet, approximately 2.5 to 3 mils dry, including overspray.

Remember: One mil = 1/1000 inch.
Tape thickness = wet thickness.

SBX Minimum Coating Dry Thickness Guide*

| Material | Blast Depth | | | |
|----------|-------------|-------|-------|-------|
| | Frost | 1/16" | 1/8" | 1/4" |
| Glass | 2 mil | 4 mil | 5 mil | 6 mil |
| Wood | ... | 3 mil | 4 mil | 5 mil |
| Granite | 2 mil | 4 mil | 5 mil | 6 mil |
| Acrylic | 3 mil | 6 mil | ... | ... |
| Ceramics | 2 mil | 3 mil | 4 mil | 5 mil |
| Metal | 2 mil | 4 mil | ... | ... |
| Slate | 2 mil | 4 mil | 5 mil | 6 mil |

* Depending on specific materials, greater thicknesses other than shown may be required.

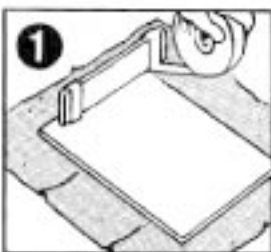
A. Blade Coating Method - Tape on blast object

Apply the desired number of tape layers to the object and outside of the image area (see Minimum Coating Thickness Guide). Pour a bead of SBX Emulsion, then draw it smoothly across the object. The blade must be smooth, rigid and straight. Wet coatings of 15 mils or more should be dried at room temperature. Thinner coatings may be force dried at elevated temperatures.



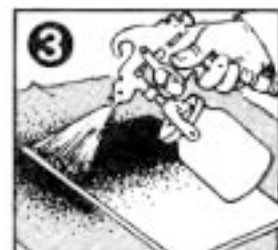
B. Blade Coating Method - Tape on coating blade

Apply the desired number of tape layers to the ends of a smooth, rigid and straight blade (see Minimum Coating Thickness Guide). The distance between the tapes must be wider than the image size. Pour a bead of SBX Emulsion, then draw it smoothly across the object. Wet coatings of 15 mils or more should be dried at room temperature. Thinner coatings may be force dried at elevated temperatures.



C. Spray Coating Method

Use a conventional paint sprayer with a minimum 40 to 50 pounds of air pressure. Dilute SBX Emulsion with 8 to 10 ounces of water per quart. We recommend spraying the object horizontally. Apply enough SBX until "orange peel" disappears and a smooth coating is achieved. Dry at room temperature. When spraying vertical objects, apply several thin coats to avoid drips and runs, and dry between coats. See Minimum Coating Thickness Guide to determine desired thickness.



You may wish to experiment with other coating methods such as brushing (use camel hair brush) or dipping.

4 Drying

- Dry horizontally in a clean, dark place.
- At average room temperature and humidity a 7.5 mil wet coating will dry to 2 mils in one-half hour. Higher relative humidity will extend drying time.

5 Exposure

- Place the emulsion side of the negative or positive film against the dry SBX coating. A vacuum frame, a weighted glass sheet or clear, removable adhesive should be used to assure firm contact of the film and the SBX during exposure.
- When exposing on a transparent object (example: glass) without a vacuum frame, place a sheet of UV opaque material such as black paper on the back side of the object. This will minimize light reflection to unexposed areas by absorbing scattered UV rays.
- Expose to UV; see Minimum Exposure Guide for exposure time.

6 Image Development

- Position the image in an upright vertical position if possible.
- Using lukewarm water (between 75°F – 95°F) quickens the process.
- For very fine detail we recommend a pressure washer that delivers a minimum of 400 psi but less than 3 gallons per minute.
- For less detailed images and very thin coats of SBX (2 mils or less), a pump-type sprayer normally found at a hardware store works well.
- Using either of the above water delivery systems, the spray pattern must be fan-shaped. When spraying keep the nozzle about 2 feet

7 Blast

- Hold the gun 6-8 inches away from the object and perpendicular to its surface.
- Examine the object every 30 seconds or so to check depth of cut.

8 Remove Resist

Strip Resist

- Spray Resist Remover onto the SBX resist or place the object in a dip tank containing Resist Remover. Thin coatings will degrade in approximately one minute. Respray as needed. Avoid allowing the remover to dry. Using a stiff bristle brush will expedite removal.

- Oven drying a 7.5 mil coating requires about 5 minutes. Do not exceed 100 °F (38 °C).
- While wet, SBX looks cloudy and is tacky. When dry, SBX is uniformly transparent and rubbery to the touch.

SBX Minimum Exposure Time

| Lamp | Distance | Time | Dry Coating |
|---------------------|---------------|----------|-------------|
| Metal Halide 5 KW | 40" | 1.25 min | 4 mil |
| Metal Halide 5 KW | 40" | 40 sec | 2 mil |
| Metal Halide 3 KW | 36" | 2.5 min | 8 mil |
| Metal Halide 3 KW | 36" | 2 min | 2 mil |
| Mercury Vapor 1 KW | 18" | 5.5 min | 3 mil |
| Sun | 93,000,000 mi | 1 min | 2 mil |
| Sun | 93,000,000 mi | 2 min | 4 mil |
| Carbon Arc | 40" | 5 min | 4 mil |
| Fluorescent (blue) | 4" | 5 min | 2 mil |
| Fluorescent (black) | 4" | 8-9 min | 2 mil |

1. Determine proper exposure time for your facility through experimentation. Use the information above as a starting point.
2. Excessive exposure time will prevent development of image detail. Inadequate exposure time will cause resist wash-off during image development.
3. As distance and/or dry coating thickness increases, exposure times must be increased.
4. SBX reacts best with ultra violet (UV) light in the 300-400 nanometer range.

from the object and move the spray evenly from side to side.

- During this washout step, it is acceptable to wash the object only partially, dry the object, and inspect the object. If the washout is not complete, you can easily go back and wash again. On the other hand, once the piece is overwashed, detail will be lost and the entire process will have to be started over again. Wash until the image area develops clearly. A very slight "smoky" haze may remain and will not interfere with blasting.
- The developed object may be dried in a heated area, not to exceed 100°F (38°C) or at room temperature. Heat dried images may result in a slightly bubbled SBX texture but should not interfere with blasting. Caution should be taken not to confuse the bubbled texture with "pinholing," which gives a "fish-eye" appearance and goes through to the surface of the object. Pinholing can be caused by not having thoroughly cleaned the object before coating with SBX.

- We recommend 180 grit size for most applications.
- Blast between 20-25 psi using a pressure-pot system. Blast between 60-80 psi using a siphon system.

- Spray the object with water. A pressure washer spray is ideal.
- Dry the object and inspect the finished work. You have now completed all necessary instructions for SBX Sandblast Photo Resist Liquid Emulsion.

Resist Remover quickly strips away SBX Resist after blasting is complete. Resist Remover is packaged in quarts and gallon refills. Both SBX Liquid Emulsion and Resist Remover are non-flammable and biodegradable.