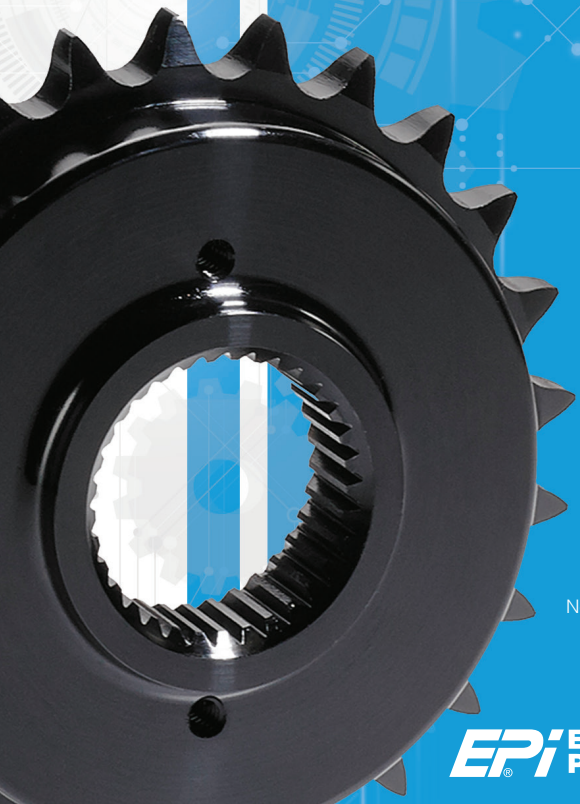
Insta-Blak® 333/333 GEL User Guide

Swab-On / Immersion Application



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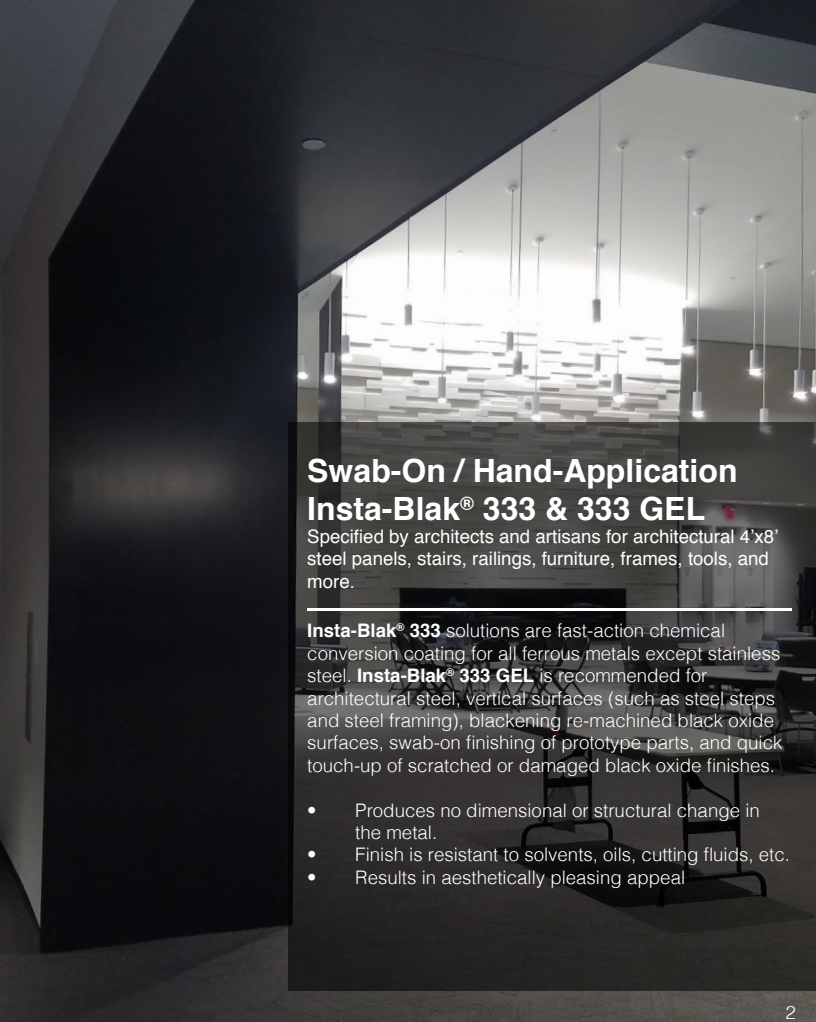

Swab-On / Hand-Application Insta-Blak® 333 & 333 GEL

Specified by architects and artisans for architectural 4'x8' steel panels, stairs, railings, furniture, frames, tools, and more.

Insta-Blak® 333 solutions are fast-action chemical conversion coating for all ferrous metals except stainless steel. **Insta-Blak® 333 GEL** is recommended for architectural steel, vertical surfaces (such as steel steps and steel framing), blackening re-machined black oxide surfaces, swab-on finishing of prototype parts, and quick touch-up of scratched or damaged black oxide finishes.

- Produces no dimensional or structural change in the metal.
- Finish is resistant to solvents, oils, cutting fluids, etc.
- Results in aesthetically pleasing appeal

Insta-Blak® 333 GEL is used for many types of architectural finishes for interior applications. For exterior architectural finishes, EPi recommends stainless steel & **Insta-Blak® SS-370 GEL** as the steel might rust, depending on the performance of the lacquer. For better results, EPi recommends using high-performance lacquers such as automotive or exterior powder coat clear.

SAVE MONEY

Swab-on applications reduce the expenses related to black oxide lines, and are ideal for on-site blackening options. Another advantage of on-site finishing is no touch-up is required from transportation and installer scratches.

Turnkey blackening lines are also sold by EPi!

Insta-Blak® 333 GEL SWAB-ON FINISHING PROCEDURE

Steel alloy, hardness, and surface finish all affect the speed/uniformity of blackening and affect the final appearance of the blackening. To prep the steel, you may wish to use an orbital sander, blasting with aluminum oxide grit, Scotch Brite pad, or polish. A darker finish is easier to attain when using a satin/matte steel.

Acid-resistant plastic containers MUST be used to contain both liquid and gel Insta-Blak® 333 *solutions*. A gallon of solution will blacken approximately 100 sqft (GEL) or 400 sqft (liquid).

1. **Clean.** Degrease the area to be refinished with alcohol, chlorinated solvents, vapor degreasing, a liquid detergent or EPi's **E-Kleen 163**, a room temperature spray/swab-on. Do not use petroleum solvents. Let the cleaner work 1-3 minutes. If the part(s) has been sand blasted or mechanically prepared, then the cleaning step can be skipped as long as the parts are free from any oils, lacquers, finger prints, or other soils. If this is the case skip ahead to step #3.
2. **Rinse** under running water, and use a damp sponge or cloth. If water breaks occur during rinsing, try using **E-Kleen 163** again. Water breaks indicate the substrate is not clean. Remove any rust with steel wool or abrasive paper. A steel scribe works well for narrow scratches.

Insta-Blak® 333 GEL SWAB-ON FINISHING PROCEDURE (CONTINUED…)

3. **Blacken.** Apply full strength **Insta-Blak® 333 GEL** generously with a cotton swab, sponge or brush using a light rubbing action. Use care to ensure a smooth and even coverage. Continue light rubbing action for 1 to 3 minutes. If the reaction has stopped, you may add more blackening solution. The depth of blackness is controlled by the length of time the solution is left in contact with the metal surface. *Note: If Insta Blak 333 is reacting too quickly, dilute with 2-4 parts water to one part Insta Blak 333 to slow down the blackening reaction*
4. **Rinse** with running water for 30-60 seconds, a damp cloth or damp sponge several times to remove residual blackening solution. Adding a small amount of baking soda to the rinse water will help ensure the complete removal and neutralization of the residual acidic Insta-Blak® 333 GEL solution.
5. **Dry.** Wipe the surface dry, or force dry with a heat gun or walk-in oven for big sheets. Do notuse compressed air to dry. Rub the surface with a soft cloth or brush. If the residual solution is not completely removed, the surface may begin torust as it dries.
   Note: The depth of blackness will be enhanced as the sealant in the next step isabsorbed into the finish, and may require 24 hours to set in. You may repeat steps 3, 4, and 5 if a darker finish is desired.
6. **Seal.** To enhance the depth of blackness and impart corrosion resistance, the finish must be sealed with one of **EPi's E-Tec** brand of corrosion inhibitors. **E-Tec 502** will leave a slightlyoily finish, **E-Tec 505** a soft, non-tacky dry finish, **E-Tec 520** a hard clear acrylic finish and **E-Tec 521** a clear wax finish. For architectural interior finishes use **E-Tec 520**, **E-Tec 521**, **RENWAX** or **E-LAQ 525**. For architectural exterior finishes use high performance exterior automotive lacquer or exterior powder coat.

The Insta-Blak® finish in itself imparts very little corrosion resistance. However, its porous structure will absorb the sealant, promoting long term corrosion resistance.

Insta-Blak® 333 Immersion Blackening

No more waiting on unpredictable parts from outside vendors–you'll be able to make your own smut free parts with a solid black finish.

Tired of the high labor costs of swab-on finishing? Is your business for blackening growing too quickly? Install a turnkey blackening line from EPi. An Insta-Blak® 333 room temperature blackening line will produce more uniform results in 10-20 minutes, saving you time and labor. A 24"x24"x24" seven-tank system costs $15,000-$20,000.

Insta-Blak® 333 IMMERSION FINISHING PROCEDURE

The steel alloy, surface hardness, and finish of the steel play a role in the blackening reaction and the ultimate depth of blackness.

1. Clean
In a steel container, thoroughly clean the parts in a 10% by volume solution of **E-Kleen SR 148-E** and 90% by volume of water at 120-150ºF. The cleaning time will depend upon the type and degree of soil present on the metal surfaces and the concentration and temperature of the **E-Kleen SR-148-E** solution.

2. Rinse
Using an overflowing polyethylene/polypropylene tank, rinse the parts for 1-2 minutes in clear tap water.

***(Optional)* Activate**
Using a polyethylene/polypropylene tank, activate the surface of the parts in a 20% by **volume E-Prep 258** solution and 80% by volume water for 2 minutes for optimal activation at room temperature

*Note: Leaving parts in **E-Prep 258** for too long may turn the parts green-black at the end of the finishing procedure. If this occurs, cut back activation time to 30 seconds in future use.*

***(If Activated)* Rinse**
Rinse the parts as in step 2 above.

3. Blacken
In a polyethylene/polypropylene tank, blacken the parts in a 10% by volume solution of **Insta-Blak® 333** and 90% by volume of water for 2-5 minutes. Longer bath life can be achieved using a 50 micron filter. Agitation and/or solution movement can accelerate blackening time.

4. Rinse
Rinse the parts as in step 2 above.

5. Seal & Finish
In a steel container, seal the finish and enhance the depth of blackness. For an oily finish, use **E-Tec 501**. For a semi-dry finish, use **E-Tec 503**. For a soft and non-tacky finish, use either **E-Tec 504** or **E-Tec 505+**. (For other **E-Tec** options, see the Insta-Blak® 333 Technical Data Sheet.)

Place the blackened parts into the **E-Tec** solution of your choice, and agitate 6-12 times up and down (about 1-2 minutes). Then, air dry for 15-30 minutes.

Typically, 24 hours later, the part will be a deeper black as topcoat absorbs into the blackened finish.

Be sure to read and understand the Technical Data Sheets and Safety Data Sheets for each of these products before using them. Please see the Insta-Blak® 333 Technical Data Sheet for more detailed processing instructions.

Insta-Blak® 333 Trouble Shooting

Problem	Reason	Solution
Spotty and non-uniform blackening	Poor cleaning	Increase temperature of **E-Kleen 148-E** to 150˚F. Increase dwell time. Make sure solution concentration is 10-12% by volume.
Spotty and non-uniform blackening	Poor rinising	Rinses must be clean. Blackening residue must be removed. Check to see if there are any water-breaks on parts.
Bluish cast on parts or grayish finish	Insufficient activation	Carbon steels, 4130, and parts that result in grayish finish may require more time in **E-Prep 258**. Longer time in blackening may also be helpful.
Excessive rub-off	Improper blackening	Blackening solution too strong or excessive time in blackening solution. Check again if parts are clean prior to blackening.
Parts rusting after blackening	Poor rinsing. Insufficient time in sealant excessive water in sealant	Rinse must be clean to remove residues of blackening solution. Increase dwell time in sealant making sure water is displaced off parts. Do not let parts dry after rinse prior to sealant. Drain water from bottom of sealant tank.

Metal Blackening Processes

Insta-Blak® S334
Swab-on or touch-up finish for iron and steel.
Insta-Blak® Z-360
For zinc surfaces; replaces expensive black chromates.
Insta-Blak® SS-370 & SS-370 GEL
For blackening stainless steel.
Insta-Blak® A-380
Immersion process for aluminum.

With Mid Temp Oxide Formulation:
Kool-Blak 225
Save energy, blackens 225-235°F, no caustic fumes. Meets military spec MIL-C-13924C, Class 1.

With Hot Oxide Formulations:
Ultra-Blak 400
A premium grade salt mixture that actually costs less to apply. Used at 285°F to produce a black oxide (magnetite) finish per military spec Mil-C-13924C, Class1.

With Hot Oxide Formulations Continued:
Ultra-Blak 400-L
A highly concentrated liquid version of Ultra-Blak 400.
Ultra-Blak 404 & 404-L
Ready-to-use black oxide salts for cast and malleable iron at 250°F.
Ultra-Blak 407 & 407-L
Blackens stainless steel at 250°F per military spec. Mil-C-13924C, Class 4.
Ultra-Blak 420
Blackens copper and brass at 200°F.
Ultra-Blak 460
Black chemical conversion finish on zinc, 160°F.
Ultra-Blak 466
Black chemical conversion finish for nickel and high nickel alloys, 160°F.

Rust Preventives & Corrosion Inhibitors

Water Displacing Calcium Based Formulations:
E-Tec 501 Leaves a slightly oily finish. Heavy duty.
E-Tec 503 Leaves a very slightly oily finish.
E-Tec 504 Leaves a dry-to-the-touch finish.
E-Tec 505 Leaves a dry, soft, non-tacky finish.
E-Tec 505+ Heavy duty version of E-Tec 505. Leaves a thicker film.

Water-soluble (Emulsifiable) Formulations:
E-Tec 510
Diluted to 3-5% with water, leaves a dry finish.
Diluted to10% with water, a slightly oily finish.
Diluted to 20% with water, an oily finish.
E-Tec 515
Heavy duty formulation with a higher degree of corrosion resistance than the E-Tec 510.
E-Tec 512
Formulation with emulsifiers and waxes and used fullstrength or diluted with up to 50% water. It providesan extremely thin, waxy, dry-to-the-touch film with superior salt spray resistance of 150 hours.

Specialty Formulations:
E-Tec 520
Clear acrylic lacquer, low corrosion protection
E-Tec 522
Satin wax emulsion, low corrosion protection
E-LAQ 525
High corrosion resistance, clear air-dry water-based gloss lacquer.
E-Tec 527
Water-based formulation for temporary rust protection of steel.
E-Tec 527-B
Same as E-Tec 527 but also protects brass and aluminum.E-Tec 528 rinse aid for plating processes
E-Tec 528
Rinse aid for plating processes.
E-Tec 529
Corrosion inhibitor and anti-tarnish for copper, brass and silver.

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