

Ultra-Blak™ 466

Black Chemical Conversion Finish for Nickel

Ultra-Blak 466 is a non-nickel, two component concentrate used in water. The acidic solution is used at 70° to 160°F to produce a decorative and durable black finish on plated bright Watts nickel, sulfamate nickel or Wood's nickel. **It does not** work on electroless nickel.

Solution Make-up

Calculate the volume of the tank, leaving 6 inches free board. Determine the total gallons required using 25% by volume of **Ultra-Blak 466-A** liquid and 2% by volume of **Ultra-Blak 466-B**. Fill the tank half full with cold water. Do not apply heat. **A full face shield, rubber gloves and rubber apron must be worn while mixing the solution.** Slowly add the liquid concentrates to the water while thoroughly and continuously stirring the solution. After the total amount of liquid has been added, the tank should be filled with water to within 6 inches of the top while stirring continuously.

Once the tank is filled, heat is applied and the solution is stirred to ensure a thorough mixing and a uniform temperature throughout. When the temperature reaches 140° to 160°F, or whatever operating temperature has been determined for your bath, the solution is ready for blackening work. Small periodic additions of water and replenishment of **Ultra-Blak 466-A** and **B** to compensate for drag-out and solution depletion will provide a continuous, trouble-free operation.

Ultra-Blak 466-A & Ultra-Blak 466-B concentrate is added as needed when the blackening reaction slows down. Operating the solution at the maximum recommended concentration (25% by volume of **Ultra-Blak 466-A** and 2% by volume of **Ultra-Blak 466-B**) and temperature (160°F) will produce a faster blackening reaction. Frequent small additions of **Ultra-Blak 466 A & B** will produce more uniform and more consistent results than large amounts added less frequently. This is also true for water replenishment to compensate for evaporation loss.

Minimum nickel plating thickness is 0.0003 to 0.0005”.

NOTE: If you make up an **Ultra-Blak 466** tank and do not use it for 1-2 weeks, you will find that you will need to boost it with **Ultra-Blak 466-B**. Analyze for the **Ultra-Blak 466-B** component and add the required amount (about 0.50% to 2.0%) to recharge the bath.

Finishing Procedure for Freshly Plated Nickel Surfaces

1. Rinse in bottom-fed, overflowing cold water rinse following plating.
2. Rinse in bottom-fed, overflowing cold water rinse.

3. Blacken by immersing parts, while still wet from preceding rinse in the **Ultra-Blak 466** solution (70°F to 160°F) until a uniform, deep black color is developed. Immersion times will range from 1 to 3 minutes, depending upon the concentration and temperature of the solution, the mass of the parts and the condition of the nickel surface.

For best blackening results a minimum of 8-12 microns (0.0003-0.0005 inches) of nickel plating are required to achieve a uniform black color.

4. Rinse in bottom-fed, overflowing cold water rinse.
5. To displace the rinse water, enhance the depth of black, impart corrosion resistance and seal the finish, immerse parts in **EPI's E-Tec 501** for an oily finish, **E-Tec 504** for a soft "dry to the touch" finish, **E-Tec 522** for a waxy finish or **E-Tec 520** for a hard, clear finish. The ultimate depth of black will not develop until a sealant is completely absorbed into the **Ultra-Blak 466** surface.

* *Nap develops after blackening. If left alone it will harden in 24-48 hours.*

Finishing Procedure for Passive Nickel Surfaces

1. Thoroughly clean and degrease surfaces in a 90° to 150°F solution of **EPI's E-Kleen 163** or **E-Kleen 148-E** alkaline soak cleaner (refer to the appropriate **E-Kleen** Technical Data Sheet for complete operating instructions). Immersion times will range from 1 to 3 minutes.
2. Rinse in bottom-fed, overflowing cold water rinse.
3. Activate the nickel surface with a 30 second to 2 minute immersion in a room temperature, 2 to 5% by volume Sulfuric Acid solution.
4. Rinse in bottom-fed, overflowing rinse.
5. Blacken and seal as in Steps 3, 4 and 5 above.

Solution Maintenance

The **Ultra-Blak 466** solution should be operated at its optimum concentration of 25% by volume for **Ultra-Blak 466-A** and 2% by volume of **Ultra-Blak 466-B** in water by utilizing the following two titrations.

Ultra Blak 466-A Titration

The chemical strength of the **Ultra-Blak 466-A** working solution may be determined with the following titration procedure:

1. Pipette 5 ml sample of the **Ultra-Blak 466** production bath into a 250 ml Erlenmeyer flask.
2. Add 50 ml distilled water.
3. Add 8 to 10 drops Phenolphthalein Indicator. Swirl flask a few times.
4. Titrate with 0.1N Sodium Hydroxide to a bright pink endpoint.

Calculate: % by volume of Ultra-Blak 466-A = ml of 0.1N NaOH x 1.22

Ultra-Blak 466-B Titration

1. Pipette a 2 ml sample of Ultra-Blak 466 working solution
2. Add 50 mls. of DI Water
3. Add 2 ml Sulfuric Acid concentrate 66 Baume
4. Add 5 ml Ferric Ammonium Sulfate solution (2% by weight). Solution should be reddish-brown.

5. Titrate with 0.1 N Silver Nitrate until the reddish-brown turns a white color.

Calculate: % by volume of Ultra-Blak 466-B = X ml of 0.1 N Silver Nitrate x 1.28

Equipment

Pieces to be blackened may be processed in acid-resistant baskets, tumbling barrels, or hung on acid resistant racks or hooks.

The **Ultra-Blak 466** tank, acid pickling tanks and rinses after these acid containing tanks should be constructed of rigid polypropylene, rubber lined steel or other acid resistant material. Cleaning tank and rinse tank following the cleaner may be constructed of mild steel, plastic, rubber-lined steel or rigid polypropylene. Refer to appropriate **E-Tec** Technical Data Sheet for recommended tank material,

Quartz or Teflon coated electric immersion heaters are recommended for use with the **Ultra-Blak 466** solution.

Hot alkaline cleaning, acid pickling and the **Ultra-Blak 466** solutions should be exhausted. The duct work may be of the same materials as recommended above for the tanks.

Your **EPI** representative is available to assist you in selecting and installing the proper controls as well as the complete tank system required for the process.

Caution

The **Ultra-Blak 466** blackening solution and the **Ultra-Blak 466-A** concentrate are acidic. Avoid contact with eyes, skin and clothing. Do not mix **Ultra-Blak 466-A** with strong alkaline materials or any other chemicals or materials. (However, caustic may be used for neutralizing the **Ultra Blak 466** bath and its rinse waters.) When handling, wear goggles or face shield, protective gloves and aprons. Do not take internally. Do not work with the **Ultra-Blak 466** bath or the **466 A** and **466 B** concentrates, **E-Kleen** or **E-Tec** or other materials without first reading and understanding the **Material Safety Data Sheet** furnished by **EPI**.

Packaging

5-Gallon pail and 55-Gallon non-returnable drums.

IMPORTANT NOTICE! For Industrial Use Only

The following is made in lieu of all warranties, expressed or implied, including the implied warranties of merchantability and fitness for purpose: Sellers and manufacturers only obligation shall be to replace such quantity of the product as proved to be defective. Before using, user shall determine the suitability of the product for its intended use, and user assumes all risk and liability whatsoever in connection therewith.

Neither seller nor manufacturer shall be liable either in tort or in contract for any loss or damage, direct, incidental or consequential, arising out of the use or the inability to use the product.

11/02/20