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OPERATING INSTRUCTIONS FOR ZP-440
Liquid Zinc Phosphate Concentrate
ZP-440 also meets the following automotive specifications:
Ford M-3B40A, GM4277-M, & Chrysler MS-3328

ZP-440 produces a crystalline zinc phosphate coating for steel and iron surfaces. (Will not adhere to stainless, cooper, brass, aluminum or bronze. If these metals are placed into the bath, the bath will become polluted and will have to be discarded) Du-Lite's Kwikseal® Oil aids rapid break-in of moving parts without scoring or scuffing and provides excellent corrosion resistance from rust. ZP-440 is mainly used on military equipment like M1 Garand, Colt 1911, M 1 carbine and WWII 30 & 50 machine gun and their mounts. ZP-440 produces a light gray color on finished work and may have fine, medium or coarse crystals depending on the pretreatment used. Du-Lite also sells MP-330 Liquid Manganese Phosphate Concentrate which produces a dark gray to black WWII Parkerize finish on your parts.

Equipment: The process tank and piping for use with the ZP-440 solution should be of type 316 series stainless steel. When heating solution with hot water or steam, heating coil should be made of type 316 stainless steel.

WARNING: When phosphating firearms it is important to plug the barrel and receiver part of the firearm to prevent ZP-440 from entering the internal parts of the firearm. If ZP-440 is allowed to enter you can permanently damage the internal surfaces. Barrels can be plugged with silicone rubber plugs shaped to fit snuggly in the end of the barrel and receiver. Silicone rubber plugs are available for an additional cost from Du-lite.

OPERATING CONDITIONS

Solution Make Up: 3% ZP- 440 plus 96% Water
Immersion Time: 10 - 20 minutes normal
Temperature: 170 -190 F
Total Acid: 30 - 40 Points
Free Acid: 5 – 8 Points
Ratio: 5.5:1 – 7:1
Ferrous Iron:0.2 – 0.6% (optimum ran)

Typical Solution Make-Up

PROCESS TANK VOLUME	1 GALLON	5 GALLONS	10 GALLONS	100 GALLONS
ZP-440	4 oz.	19 oz.	1 ¼ quarts	3 gallons
Water	124 oz.	19 ½ quarts	38 ¾ quarts	97 gallons

Make-Up Procedure:

1. Fill clean stainless-steel tank about three-quarters full with water.
2. Heat to approximately 140-160°F, and then add 3 gallons of ZP-440 for each 100 gallons of working solution. *(ZP-440 processing tank can be heated with an electrically heated hot plate or gas burners).*
3. For best results when starting up a new bath – add iron to the solution by:
   a. Hang steel wool or scrap iron in the heated solution for about one hour.
   (Be sure to degrease the oil off the steel wool before hanging it in the ZP – 440 bath.)
   b. Now heat solution to 170˚-190°F and the bath is ready to use.

Preparations for parts to be ZP-440:

1. Disassemble all parts which are made of steel or iron to be ZP - 440.
2. Heavily greased or oiled parts should be degreased by going through a solvent such as mineral spirits, acetone, lacquer thinner or paint remover.
3. Next, clean parts in Du-Lite's #45 Soak Cleaner heated to 150˚, 12 oz. per gallon cleaner for 12 –15 minutes.
4. Rinse cleaner off in overflowing cold water rinse.
5. Dry parts thoroughly.
6. Remove any old zinc phosphate coating, rust, scale, and heat discoloration from welded parts by glass bead blasting them. Zinc phosphate will build up inside the rifle bore and chamber area of firearms being coated. We recommend that you insert a silicone rubber plug at both ends of the barrel before glass bead blasting and going into the zinc phosphate solution. (Silicone rubber plugs are available from Du-lite Corporation if needed.) Never glass bead parts that has heavy oil or grease on them because this will contaminate the glass beads that are used and will redeposit this grease and oil on the next parts that are being processed. Glass bead is a much cleaner process than using ordinary sand in your sand blasting equipment.
After glass bead blasting the parts, do not touch parts with your bare hands. The oil in your fingertips will produce uneven or bare spots on the final zinc phosphate finish. Use white gloves, thongs or hanging wires to remove parts from the blasting cabinet then go directly to your phosphate tanking for processing. Do not let your freshly glass beaded parts sit for more than 1 hour before processing through your ZP - 440 tanks.
7. Immerge rifle barrels with rubber plugs in the bore and receiver area into the ZP-440 solution for approximately 10 minutes.
8. Remove freshly treated parts from ZP- 440 tank and rinse in overflowing cold water tank for 1 minute.

WARNING: DIFFERENT HARDNESSES AND COMPOSITIONS OF THE METALS USED IN THE COMPLETED FIREARM ASSEMBLY, WILL PRODUCE DIFFERENT SHADES TO THE FINAL FINISH OF DIFFERENT PARTS USED ON THE GUN.

9. Place parts in Du-Lite's Kwikseal® Oil Tank for 30 seconds to 1 minute. Hang parts over the Kwikseal tank to allow excess oil to drip off.
10. During the operation of ZP- 440, sludge is formed as a by-product of the chemical reaction in forming phosphate coatings on ferrous metals. This sludge will settle to the bottom of the tank and should not be stirred up while parts are being processed; otherwise dusty coatings may result. Steam or heating coils must be mounted in the sides of tanks to allow for this sludge condition.
11. **DISPOSAL:** Follow Du-Lite's recommendations for disposing an acid based solution.
Also, consult local, state and federal authorities for waste disposal requirements.

The information presented herein, while not guaranteed, is to the best of our knowledge true and accurate. No warranty or guarantee expressed or implied is made regarding the performance of any products, since the manner of use is beyond our control.

THE PRODUCTS MENTIONED IN THESE INSTRUCTIONS ARE FOR INDUSTRIAL USE ONLY

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