

Copper Fouling Removal

The "Ammonia Solution"

The typical "household ammonia" is only 3 percent and does not work very well as a copper remover. However, to remove copper fouling you can use straight "strong ammonia" (9 - 10 percent) carried by many janitorial supply houses and hardware stores. My local ACE hardware carries the 10 percent janitorial strength for about \$1.50 a quart and it works great straight, followed by a thorough cleaning with Ed's Red. Run a wet patch through the bore and allow to sit for about 5 minutes and proceed as usual. **Don't use a brass bore brush or jag!** I have seen no scientific proof that the use of ammonia in any strength will harm bores, **IF** the bore is thoroughly cleaned with bore cleaner after using ammonia to prevent after rust.

If your local ACE hardware store doesn't stock the "10% Janitor's Strength Ammonia," they can order it for you from their master order book. The stock number for the 1 quart size is ACE10183.

If you are worried about its high strength, you can bring it down to the 6 - 8 percent ammonia content of most commercial copper removers by cutting the janitor's strength ammonia with some K1 kerosene or water--try 3.5 to 4 parts 10% ammonia to 1 part water or K1 kerosene. This seems to have little, if any effect, on its copper removal abilities.

Straight 28% ammonia (CAS#7664-41-7) followed by a thorough cleaning with Ed's Red can also be used but 28 percent ammonia may be difficult to get and is VERY strong stuff and potentially aggressive on metal.

Some notes about Ammonia. Ammonia won't harm the rifle's metal, the pH is way down there for even 10% but as you get into stronger solutions (> 10%) the pH becomes basic (>7 up to 14) and is caustic. The problem comes from ammonia being hygroscopic and folks not cleaning it all out of the bore and the attracted water then causes rusting. [As a test I left a polished mild steel strip in straight 10% ammonia for 48 hours and saw no noticeable corrosion or etching.]

Thanks to Roger Rothschild, Chemist, for this information.

...and an Improvement--"Humpy's White Bore Cleaner"

This modification of the "ammonia solution" thickens the liquid and helps to keep it in the bore for more efficient cleaning. You can if you like omit the 1-part sudsy ammonia

- 2 parts - 10% ammonia,
- 1 part - standard household "sudsy" ammonia (optional)
- 1 part - Ivory liquid dishwashing detergent (It has been reported that "Formula 409" can also be used though the resulting mixture is probably thinner.)

This formula yields about a 6.5 percent ammonia solution. If you omit the sudsy ammonia the solution is about 7.75 percent.

Thanks to Mark Humphreville for this solution

It has been reported that Kroils penetrating oil will remove copper fouling with light brushing if the bore is swabbed with it and allowed to sit overnight.

Lead Removal

Liquid Solution

For really stubborn lead removal try a 50/50 mix of 3% Hydrogen Peroxide (the common drug store variety) and white vinegar. Plug the bore, fill it up using a dropper or syringe and let it stand for 2 to 3 minutes. (Do not let it stand for too long.) You may get some foaming so protect the barrel's external finish as this solution is not kind to bluing. Drain and wipe out the black muck that used to be lead and

then immediately clean well with bore cleaner.

One special note. The solution works by changing the lead to lead acetate, which is water soluble, so wear protective eye wear and latex gloves to prevent lead poisoning.

Thanks to Joe Sledge for this recipe.

Note

While most people have used this solution without a problem there have been reports of this solution pitting some mild steel barrels. The factors involved in this seem to be the type of steel, the presence of rust in the barrel, and excessively long soak times leading to chemical changes in the solution. I strongly recommend not letting this solution soak more than 2 to 3 minutes.

Pure turpentine has reportedly also been used as a lead remover.

Lead Removal Cloth

Lead deposits on the face of revolver cylinders and similar places can be removed with a lead wiping cloth prepared as follows.

Mix the following ingredients

- 500 gr - 400 grit or finer aluminum oxide powder
- 450 gr - kerosene or #2 fuel oil
- 4 gr - lemon oil (for a more pleasant smell)
- 5 gr - ammonium chloride

Evenly saturate a soft thick cotton cloth or flannel with the solution and allow to dry. (There is no reason it won't work wet though.)

Carefully remove any very heavy lead deposits with a scraper and then wipe the remainder with the cloth to remove.

Notes: The active ingredient in commercial liquid lead remover products is Ammonium Oleate (CAS 544-60-5). It is however difficult to get. Most of the formulas are basically ammonium oleate, ethanol, and some petroleum distillates as a carrier.

The copper dishwashing pads that are marketed under the brand name "Chore Boy" can be used like a Lewis Lead Remover. Simply cut a 2" x 3" square of this copper mesh, fold in half and roll it onto a .45 cal. bore brush. This works exceptionally well.

Thank to Terry Sanders for this tip.

If the bore is not so heavily leaded that you can't see rifling, it does no harm to fire a cylinder full of full-power jacketed loads, and this will safely and effectively remove the leading without scrubbing. In the case of extremely heavy leading which might constitute a bore obstruction, use a bronze brush and bore cleaner to get out what you can. On very stubborn cases you may need to wrap a worn brush with 00 steel wool. This does no harm as long as you use the wrapped brush wet with lots of bore cleaner. Ruger de-leads revolvers this way at the factory