

# Homemade Firearm Cleaners & Lubricants

Here by popular request is some information on alternative products and information on making up your own cleaning, lubricating, and related items for shooting and reloading. These products work as well as or frequently better than the commercial products, and the "product of the month" and cost less. (Every penny you save means more components or ammo you can buy!) In addition, many of the brand name proprietary cleaners and lubes are repackaged commercially available compounds and with a little research one can sometimes figure out what they are. If you have any favorite "home brews" that you use and find effective, or can offer any suggestions or improvements send me an email by [clicking here](#) and maybe you'll see them here with attribution.

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## SAFETY NOTICE

Some of the chemicals suggested here, particularly acetone, MEK, and ammonia are "hazardous materials" and can pose a significant health or fire hazards if not used correctly. Mix outdoors or with appropriate ventilation and respiratory protection, avoid flames or sparks, and avoid skin contact. Do not consume or use as a mixer. Keep them away from pets and stupid people. Wear eye protection when mixing.

As with the use of any chemicals, wash your hands thoroughly after using. Note that many of the formulas suggested here will remove skin oils, so you may want to consider using some kind of skin lotion after washing your hands.

Wear eye protection when using any of the solutions below.

If in doubt about proper safety measures obtain the appropriate Material Safety Data Sheets (MSDS) which can be obtained on line through:

<http://hazard.com/msds/index.php>

<http://www.MSDS.com>

**I strongly suggest that you download, read, and heed them!**

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## Bore Cleaners

### Ed's Red

As a general bore cleaner, plastic wad remover, and carbon solvent the following formula, a creation of C.E Harris, and dubbed "Ed's Red" works quite well. In fact many folks claim it is better than anything they've tried. The original formula is:

1 part Dexron II, IIe or III Automatic Transmission Fluid - GM Spec D20265 or later  
1 part K1 Kerosene  
1 part Aliphatic Mineral Spirits federal spec TT-T-2981F (CAS# 64741-49-9) or Stodard Solvent/Varsol (CAS#8052-41-1), a.k.a "oderless mineral spirits"  
1 part Acetone (CAS#67-64-1)

#### Formula Addendum

It has been reported that methylethylketone/MEK (CAS#78-93-3) can be satisfactorily substituted for the acetone if desired.

It has been reported that Turpentine can be satisfactorily substituted for the Mineral Spirits if desired. The original Frankford Arsenal formula upon which Ed's Red is based used turpentine rather than mineral spirits which were substituted for lower cost. Turpentine also tends to leave a gummy residue.

It has been reported that Kroil penetrating oil can be satisfactorily substituted for the kerosene if desired.

It has been reported that the lower numbered "JP" jet fuels can be used in place of kerosene.

It has been reported that Goo-Gone (a commercial citrus based solvent) can be satisfactorily substituted for the mineral spirits if desired.

It has been reported that commercial automotive "engine flush" can be substituted for the ATF (but you lose the red color and the lubrication qualities).

For each gallon of Ed's Red produced you can also add 1 pound of anhydrous lanolin (CAS#8006-54-0), which helps to neutralize fingerprints but it's really not necessary and current formulations generally omit it. You can also leave out the acetone but then it doesn't remove plastic wad fouling or caked smokeless powder residue as well. Store in airtight chemical-proof containers as the acetone, if used, will evaporate. Two sources for bulk anhydrous lanolin are <http://www.selectoils.com/item--Lanolin--SO-Lanolin.html> and <http://www.thesage.com/>.

According to Ed, "Ed's Red" will flow at -65°F and won't carbonize at 600°F. It has seen use by both the FBI and the Army Marksmanship Training Units.

#### MIXING INSTRUCTIONS

Mix outdoors, in good ventilation. Use a clean 1 gallon metal, or chemical-resistant, heavy gage NFPA approved plastic gasoline storage containers. Do **NOT** use light weight, thin, high density polyethylene (HDPE), which is breathable,

because the acetone will gradually evaporate. Don't use PVC containers as they will dissolve. A possible online source for metal 1 pint and 1 quart screw top metal containers suitable for storing Ed's Red is <http://www.taxidermy.com>. This site appears to be some sort of frames based design that does not allow you to link directly to containers, but you can find them via the following site links Products | Molding and Casting | Containers, Cups and Tools. The Blitz USA line of approved gasoline containers can be obtained at Auto Zone, Home Depot, Walmart, Target, and other retailers and are what I use. ([www.blitzusa.com](http://www.blitzusa.com)).

Add the ATF first. Use the empty container to measure the other components, so that it is thoroughly rinsed.

You can divert a small quantity, up to 4 ounces per quart of the 50-50 ATF/kerosene mix for use as an "Ed's Red-compatible" gun oil. This can be done without impairing the effectiveness of the mix.

#### INSTRUCTIONS FOR USING

a) Ensure that the firearm is unloaded and that all magazines are removed. Cleaning is most effective when done while the barrel is still warm to the touch from firing. Saturate a cotton patch with Ed's Red, wrap or impale on a jag and push it through the bore from breech to muzzle. The patch should be a snug fit. Let the first patch fall off and do not pull it back into the bore.

b) Wet a second patch, and similarly start it into the bore from the breech, this time scrubbing from the throat area forward in 4-5" strokes and gradually advancing until the patch emerges out the muzzle. Waiting approximately 1 minute to let the bore cleaner soak will improve its action.

c. For pitted, heavily carbon-fouled "rattle battle" guns, leaded revolvers or neglected bores a bronze brush wet with bore cleaner may be used to remove stubborn deposits. This is unnecessary for smooth, target-grade barrels in routine use.

d) Use a final wet patch pushed straight through the bore to flush out loosened residue dissolved by Ed's Red. Let the patch fall off the jag without pulling it back into the bore. If you are finished firing, leaving the bore wet will protect it from rust for up to 30 days. If the lanolin is incorporated into the mixture, it will protect the firearm from rust for up to two years.

e) *Wipe spilled Ed's Red from exterior surfaces before storing the gun. While Ed's Red is harmless to blue and nickel finishes, the acetone it contains is harmful to most wood finishes and it could damage some plastics if left in prolonged contact.*

f) Before firing again, push two dry patches through the bore and dry the chamber, using a patch wrapped around a suitably sized brush or jag. First shot

point of impact usually will not be disturbed by Ed's Red if the bore is cleaned as described.

It has been reported that when Ed's Red is used exclusively and thoroughly, that hot water cleaning is unnecessary after use of Pyrodex or military chlorate primers. However, if bores are not wiped between shots and are heavily caked from black powder fouling, hot water cleaning is recommended first to break up heavy fouling deposits. Water cleaning should be followed by a thorough flush with Ed's Red to prevent after-rusting which could result from residual moisture. It is ALWAYS good practice to clean **twice, two days apart**, whenever using chlorate primed ammunition, just to make sure you get all the residue out.

Thanks to Jim Dodd for the above instructions

An unusual use for Ed's Red. Several correspondents report that an application of Ed's Red to an ant hill, especially fire ants, kills 'em dead.

Got a glued on label? Saturate with Ed's Red (roughen the surface first if it is a coated label), let soak for a couple of minutes, and the labels will come off.

Also, Ed's Red is very penetrative and makes a superior penetrating oil for loosening rusted parts. In fact in some testing by a machinist's magazine a couple of years ago it beat *all* the commercial products by a wide margin. A dedicated Ed's Red penetrating solution can be made by just using a 50-50 mix of ATF and acetone.

A historical note about Ed's Red. When Ed Harris first cooked it up, it exceeded the then current Mil Specs for bore cleaner and CLP. Ed and a cohort were able to test it at a defense contractor's quality lab after hours with chrome-moly and stainless samples provided by Kreiger Barrels.

### **Eds Red Plus**

This variation on the Ed's Red formula gives it a copper removing ability similar to the commercial bore cleaner Marksman's Choice MC-7. You will need:

- 11 ounces of basic Ed's Red
- 2 ounces of 10%-20% industrial strength ammonia
- 2 ounces of Rustlick WS-11 cutting oil or suitable alternative
- 1 ounce of Murphy's Oil Soap

Mix the oil soap and ammonia in a separate container. In a suitable 1 pint container containing 11 ounces of Ed's Red, add the cutting oil and mix together. Then add the oil soap/ammonia mixture to Ed's Red/ cutting oil and shake the container to mix the ingredients. You will end up with a pink opaque liquid that for the most part remains in solution, but some components may settle out over an extended period. It is always best to shake well before using. The resulting solution will remove mild copper deposits in bores if allowed to work about 15-20 minutes.

Water soluble cutting oils and rust inhibitors can be obtained online from <http://www1.msdirect.com/cgi/nnsrhm> or locally from your industrial supplier. NAPA auto stores carry a soluble oil listed as NAPA Soluble Cutting and Grinding

Oil," part number SL SL2512. Metal screw top containers can be obtained from <http://www.taxidermy.com> under | Products | Molding and Casting | Containers, Cups and Tools.

Thanks to Bill Mecca for this information.

You can link directly to that frame by using this URL <http://www.taxidermy.com/cat/18/tool.html>, but there's no link back to their home page from there.

Thanks to Patrick Larkin Jr. for this tip.

In a pinch you can use straight mineral spirits, automotive engine cleaner, Gumout carb cleaner, straight ATF, K1 kerosene, and "citrus" cleaners (oil after use) as a rather good substitute bore cleaners.

### **...And For Historical Reference--The Original Hoppes No. 9**

The original "Eau de Gun." If you don't like this smell you ain't a real shooter! This formula came from Hatcher's Notebook and the amounts are rounded from the original formula to make 1 quart. Any resemblance to the current "environmentally correct" No. 9 is accidental.

Original component	Notes
Ammonium oleate (CAS #544-60-5) aka Oleic Acid CAS #112-80-1	5.0 oz (also known as ammonium soap) Could substitute lanolin but this would sacrifice its mild copper removal qualities
Amyl Acetate (CAS#544-60-5)	8.5 oz ("banana oil")
Nitro-benzene	2.0 oz (the racing fuel additive)
K1 Kerosene	8.5 oz
Neutral Saponifiable Oil	8 oz (Not identified, probably sperm oil, but ATF could be substituted



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### **Citrus Cleaners**

The hot new commercial products are now touted as being citrus based. Basically this means they contain either an orange oil based product or more commonly d-Limonene, in a mineral spirits base. They work well on carbon and bore fouling and smell very good.

One formula that has come to my attention is a mix of

- d-Limonene
- Odorless mineral spirits
- Paraffin Oil (STP Universal Power Steering Fluid, or Quaker State Power Steering Fluid, or Mercury Marine U-Joint and Gymbal Bearing Lubricant)

No proportions were given but try 2 parts each of d-Limonene and mineral spirits, and 1 part of the power steering fluid. I haven't had time to experiment but if you want to play around and report back to me you can get orange oil and d-Limonene in small quantities from Citrus Depot (<http://www.citrusdepot.net>).

For your information the composition of a well known commercial industrial cleaner/degreaser is basically what is shown below.

<b>Ingredient</b>	<b>CAS Number</b>	<b>% Weight</b>
Water	7732-18-5	40 - 60
d-Limonene	5989-27-5	30- 40
Sodium Dioctyl Sulfosuccinate	577-11-7	5 - 10
Sodium Dodecyl Benzene Sulfonic acid	251550-30-0	5 - 10
Diethanolamine	111-42-2	4 - 7
Tetrasodium EDTA	64-02-8	< 2
Isopropyl alcohol	67-63-0	< 1

### **Corrosive Ammunition Cleaning**

Corrosive primers contain potassium chlorate ( $KClO_3$ ) and leave a residue of potassium chloride (KCl) salt in the bore after a cartridge is fired. This residue is hygroscopic and attracts and holds moisture from the humidity in the atmosphere which causes rusting. This can cause serious damage to both the bore and action of the firearm unless they are cleaned carefully after firing.

Because the corrosive salts are hydroscopic the best cleaning agent for them is hot soapy water, but even plain water works as well as any cleaner that has some water in it. You don't have to pour water down the bore or over the action, simply use the soapy water as you would normal bore/firearms cleaner and follow with a cleaning with normal bore cleaner to prevent any after- rust. "Murphy's Oil Soap" and water is commonly used. Any of the above formulas containing water should do just fine. The thing is to ensure that you thoroughly clean and lubricate ALL surfaces.



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### **Storage & Rust Preventative**

For long term storage one of the best and simplest products to use is Lee Liquid Alox. This is actually the same material used by the Ziebart Co. to rustproof automobiles, and is a mixture of 45% calcium soap and 45% mineral spirits (petroleum distillates). According to Alox/Lubrizol Corp. ([www.lubrizol.com](http://www.lubrizol.com)), who sell the product under the stock #606-55 in 5 and 55 gallon drums this material was intended to be sprayed on to protect naval machinery on the decks of ships against salt spray.

It is supposedly available in smaller quantities from <http://www.lsstuff.com/lube/liquid-x.html> or <http://dragonbulletlube.com/products.php>

Thanks to William Josephson for the availability info.

The only drawback is that it dries hard and is somewhat difficult to remove, but the material does come off readily with military rifle bore cleaner (Mil-C-372B) or CLP (Mil-L-63460), or with ordinary firearms cleaners such as Ed's Red. It must be removed from the bore prior to firing, as would any grease or wax, because it would constitute a bore obstruction. If you wanted to secure a gun in a container for several years, and have it ready for future use, clean and lubricate it normally and then apply an even coating of Liquid Alox to all metallic surfaces. Store in a sealed storage bag with about 100g of silica gel.

A note about cosmoline. When subjected to high heat and then cooled this stuff turns into a varnish. I had a friend who neglected to thoroughly clean a new SKS and after firing about a hundred rounds and being put away the secondary gas piston glued itself in place making the rifle a single shot. It took heavy use of Ed's Red, over night soaking, and a judicious application of "impact force" to loosen things up to the point where the gunk could be washed out and proper operation restored.

If you need to be able to fire the weapon soon immediately after taking out of the container, do not put Alox in the bore as the normal lubricants will protect it.

As an aside, [click here](#) for information on ammunition storage.

### **Silicone Wiping Cloths**

Silicone wiping cloths are easy to make. Use a clean piece of old flannel shirt about 12 x 12 inches to 18 x 18 inches. Lay it on a plastic sheet and evenly spray both sides with a commercial silicone spray lubricant. Allow the carrier fluid to evaporate and then roll up, place in a plastic bag and allow to sit overnight so the silicone evenly disperses. A caveat--I have noticed that some brands of silicone spray seem to have more carrier than silicone and have a distinct kerosene odor. The Liquid Wrench brand is particularly vile in this respect. Try to avoid these. I have had excellent results with the ACE hardware brand "Pure Silicone Lubricant," part no. 12293.

### **Desiccants (Moisture Remover)**

You can make a very good home made desiccant for sealed storage containers by cutting pieces of plaster board to fit inside your storage container, and then drying the pieces in a 250 degree oven for about 2 hours. Remove and wrap lightly (don't seal) in aluminum foil, and place in your container before sealing. Works great in GI ammo boxes.



## **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.

### **Electronic Fouling Removal**



## A Caveat

The Outers FoulOut operates at a very low voltage (.3 V - three-tenths) at the cleaning electrode. Higher voltages can start to etch the bore, and even at the lower voltage the Outers can do so if there is rust in the bore. While the simple designs given here can be used safely there exists the possibility of bore etching due to their higher voltages. This is a particular concern if you use the Outers solutions. The electrical problem with all the home-brew series current limited (by the short indicating lamp) devices is that they apply voltages that will start taking iron into the solution, according to the FoulOut patent information which has expired. This aspect of the circuitry deceives those without electrical backgrounds. They look at the batteries or the wall adapter voltage used to operate a FoulOut and assume it must be safe to apply that much voltage between the barrel and the rod. Not so. The voltage regulation schemes inside a FoulOut are designed to hold a 0.3V limit regardless of how many volts the power supply has.

Most shooters are familiar with the Outers FoulOut™ electronic copper fouling remover that will remove unbelievable amounts of crud from a "clean" barrel. It is quite easy to build your own simple version of this handy device.

### A Current and Voltage Limited Homemade Electronic Copper Fouling Remover

While this design is a little work to build it provides current and voltage limitation to prevent etching. You can download the article which is a 340K PDF document, by [clicking here](#). This unit is designed to use the Outer's solutions or their homemade equivalents below.

It is best to remove the barreled action from the stock for cleaning. ***For best results clean and then degrease the bore with a commercial "gun scrubber" or automotive brake cleaner.*** Plug the chamber with the rubber stopper and carefully insert the rod down the bore and ensure it is seated in the hole in the stopper. Using a dropper or a syringe fill the bore with the cleaning solution and then attach the black wire to the rod and red wire to the gun. If the gun is dirty the flashlight will glow but not at full power. If the flashlight immediately glows full power the rod is not centered in the bore and has caused a short. Allow the unit to work for 45 min or so, disconnect the leads and carefully pull the rod out of the bore. The accumulated copper fouling can be removed from the rod with fine steel wool. Drain the barrel, remove the stopper and dry the bore and chamber. Run a couple of patches with bore cleaner on them through the bore and chamber to prevent any after rust and you're done. Those of you with a background in metal plating may want to contribute your own solution recipes. Send them to me by [clicking here](#).

36" long TIG welding rod in stainless steel are available from local welding shop. Get 3/32" and 1/8" diameters at a cost of about \$1.25 each. Ideally you want a rod about 1/2 to 2/3 of the bore diameter.

Thanks to Robert Schaedel, et. al. for this tip.

### Some Interesting Information.

Just for those of you with curious minds, the Outers CopOut Plus solution contain approximately 0.6 percent cupric acetate and 2.5 percent ammonium acetate (3.62 grams/ liter of copper acetate

and 38.5 grams/liter of ammonium acetate) in distilled/deionized water. The LeadOut Plus contains approximately 2 percent lead acetate and 5 percent ammonium acetate (6.50 grams/liter of lead acetate and 38.5 grams/liter of ammonium acetate ) in distilled/deionized water. A good basic solution for either would be

Copper Solution

562.3 grains Ammonium Acetate

51.3 grains Copper Acetate or 58.3 grains Cupric Acetate Monohydrate

Add distilled (or high megohm deionized) water to make 1 Qt.

Lead Solution

562.3 grains Ammonium Acetate

95.0 grains Lead Acetate or 110.8 grains of Lead Acetate Trihydrate

Add distilled (or high megohm deionized) water to make 1 Qt.

Note that since the Outers FoulOut unit limits the voltage and current in the electrolysis process and runs at about .3 volts ( $\frac{3}{10}$  volt)-- at typically a max of about 20 milliamps.

Possible sources for these chemicals in small quantities are:

Post Apple Scientific, Inc. <http://www.postapplescientific.com>

Sigma-Aldrich (800-325-3010) <http://www.sigmaaldrich.com>

This company lists 100 grams of Copper (II) Acetate for about \$19 and 500 grams of Ammonium Acetate for about \$17. If you assume \$1.00 per gallon for distilled water, you can make the solution for copper removal for \$1.60 per quart. This does not include shipping costs on the chemicals.

The Science Company <http://www.sciencecompany.com>

The following is from Outer's Q&A page.

**Q.** Why has the solution become discolored during use?

**A.** You need to check the solution about every 30 minutes to see if it has changed color. Pour all the chemical into a clear container to see if there may be a color change. Sometimes there may be sediment or a color change but it isn't apparent by simply looking at the chemical in the barrel.

If chemical is orange or orange/brown you may have some rust. If chemical is black you may be lifting iron from the barrel or its oxidized copper salts. It could also be some powder fouling being removed from the barrel. The unit may have been on too long without checking the solution color often enough.

Black/Gunky chemical could mean that in the first 30 minutes you hit a lot of lead and lead started to settle set the bottom of the barrel as well as on the rod. It could also mean the unit was left unchecked too long and rust has formed.

Green colored chemical could mean that you may be pulling out iron, blueing or rust. Sometimes new barrels will have blueing and its removing that.

**Q.** What do I do if the chemical changes color?

**A.** Dispose of the chemicals according to local and state laws. Clean the barrel using regular gun cleaning methods. Degrease the barrel and rod with Outers Crud Cutter. If you can't find Crud Cutter, you can use Birchwood Casey Gun Scrubber or household rubbing alcohol. On a scale of 1 to 10, alcohol rates as a 2 and Crud Cutter rates as a 10. After cleaning and degreasing the barrel and rod, start the Foul Out III according to the instruction book. *[Automotive brake cleaner is the same as the Birchwood or Outers products and cheaper. - Fr. Frog]*

**Q.** The unit isn't cleaning fast enough.

**A.** To speed up the process, after cleaning for two hours, change the solution and you should obtain faster results.

**Q.** Can I Use Cop Out Plus and Lead Out Plus with my Foul Out II Unit?

**A.** Yes, You can use the Cop Out Plus and Lead Out Plus with Foul Out I and Foul Out II units. Because these are more potent chemicals than regular Cop Out and Lead Out, the customer needs to be more cautious and check the chemical for changes more often. The new chemicals will clean faster than the old.

## **Military Copper Fouling Removal Solution (c.1917)**

Described in the US Military publications for the 1903 and M1917 rifles was the following "heavy duty" copper removal formula.

1 oz Ammonium persulfate  
200 grains Ammonium carbonate  
6 oz 28% ammonia  
4 oz water

Finely grind the persulfate and carbonate, dissolve in the water and then add the ammonia. Allow to stand for 1 hour before using. Plug the breech and slip a piece of rubber hose over the muzzle. Fill the cold barrel and the section of hose with the solution. Allow to stand for 30 minutes. Dump the solution and clean the bore normally and oil.

## **Mac's Red**

A modification of Ed's Red that is claimed to *remove* copper fouling was developed by Richard McQuisten and published in *The Cast Bullet* #113, Jan-Feb, '95.

1 part Dexron II, IIe or III Automatic Transmission Fluid  
1 part K1 Kerosene  
1 part Mineral Spirits or Stodard Solvent/Varsol  
1 part Acetone  
1 part GM Carburetor/Upper Cylinder Cleaner

## **Oxynate S**

Brownells sells a product called Oxynate S (pn 082-029-016) which is used to remove copper from bluing tanks. It can be used straight or mixed into a bore cleaner, say about 5%, to remove copper bore fouling.

Thanks to Ken Mollohan for this tip.



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## **Carbon / Crud Cleaner**

For cleaning carbon and dried grease in tight places try generic commercial non-chlorinated aerosol automotive brake cleaner. Just as good, more readily available, and MUCH cheaper than the gun stuff. Carburetor cleaner like

GumOut™ can also be used and in some cases may be superior. Note that brake cleaners remove any preservative oil or grease coatings on the metal and may be preferred if you are going to touch up the bluing. You should lightly coat things with your favorite oil or preservative when done cleaning. Carburetor cleaners are not quite as degreasing but you should still coat with preservative when done. Ed's Red is great in this role too and it leaves an oily coat.

**WARNING: Spray degreaser like brake and carburetor cleaners are not only flammable but can also be toxic in closed environment. Use them only outdoors or in well ventilated area..**

Dawn dishwashing detergent is a terrific grease cutter. Brushed on with a toothbrush and then immediately rinsed off with very hot water it will leave metal very clean. However, be careful with dishwashing liquid and steel as Dawn (as well as Joy and Ivory) will attack steel if left undiluted and with contact time measured in hours. The clear versions of all three of these detergents can pit even 316L, given enough time. (FYI, Dawn is the best grease cutting formula on the market. It is routinely shipped in by tank truck to clean oil spills. Just be aware of how corrosive it can be.)

I have heard some good reports about Sea Foam Motor Treatment as a carbon removing solution. Available at most auto stores in 16 oz cans. In addition Stihl "Engine DEcarbonizer" pn 0781-313-8018 (available from Stihl dealers and apparently listed as 0781-313-8019 in their database) has gotten excellent marks for removing heavy burnt on carbon in AR platforms. A case of 6 8oz bottles is about \$26. I have been told that Chevron's Techron gas additive makes a very good carbon remover. Another commercial product is called "Piston Clean" from Orison Marketing.

[www.orisonmarketing.com/pistonkleen.html?  
gclid=ClqrjlbC87YCFUzhQgodRnwAZQ](http://www.orisonmarketing.com/pistonkleen.html?gclid=ClqrjlbC87YCFUzhQgodRnwAZQ)

It appears to be THE carbon cleaner in the automotive rebuilding circuit. It comes in a gallon size for about \$25, but if you ask nicely they will send you a quart sample for a couple of dollars. I have used this and it is VERY good. They also offer several other products that may be of interest.

All of the carbon removers work best if warmed and allowed to soak for a while.



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## **Humpy's Bullet Cleaner**

### **Soaking Method**

Those of you who used surplus pulled M118 / M72 173 gr Match or other pulled GI bullets have probably been baffled about how to removed the asphaltic sealant from the bullets. The safest way is to get a bottle of Orange Clean Concentrate.

[http://www.greatcleaners.com/ogi\\_retail/product.asp?catalog%5Fname=ogi&product%5Fid=17101](http://www.greatcleaners.com/ogi_retail/product.asp?catalog%5Fname=ogi&product%5Fid=17101)

Mix it 1/100 with water, drop bullets in, and allow to sit for 24 hours. The following day agitate the jar and the mouth lacquer will literally fall off in flakes leaving the bullets not only clean but nice smelling. Unlike lacquer thinner which actually doesn't work very well, this method is not flammable nor a breathing hazard.

### **Tumbling Method**

You will need: a carton of BBs. (costs about five bucks from Walmart), a rock tumbler (flea markets, ebay, and commercial vendors), and a bottle of Ultra Ivory dishwashing detergent.

With a small rubber drum ( 1 1/2 lb size) tumbler add maybe 200 BBs, 100 pulled 173s, fill with hot water to just above bullet/BB level. Add about a tablespoon of ivory liquid and seal the drum with the screw lid on and put on tumbler and let it tumble for about an 45 minutes and check. (Mine come out looking better than new Sierra Matchkings) Take the bullets out with your fingers and dump in rinse water. Add another hundred bullets and tumble the next batch. Solution good for a number of cycles. When you finish dump the solution in a big jar and save it for washing your tires or something real greasy down the road. When you are not tumbling remove the BBs and dry them. If you have a bigger tumbler you can tumble more bullets.

Making up a Pre Tumble Dip with Ivory and letting the bullets soak a bit before putting them in tumbler might cut down the operation to less than thirty minutes.

Thanks to Mark Humphreville for these tips.



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## **Gun Oil Substitutes**

**Keep in mind that no matter what lubricant you use, you should use the minimum amount of lube possible, in the correct places. You want it well lubricated but not an oil field.**

### **Synthetic Automotive Oils**

Synthetic automotive oils (such as Quaker State High Performance Synthetic, Castrol, and Mobil 1) work well as general lubricants and because of their detergent capabilities they will help to remove "crud." (Synthetic oils handle low temperatures better than regular oils.) However, they tend to oxidize in the open air and are not very corrosion resistant. Just remember, as with any lubricant, not to over lube things. Valvoline Semi-Synthetic Power Steering Fluid has also been used with great success by many folks as their normal lubricant.

Straight synthetic ATF make an excellent lube if you don't mind the red color and slight odor.

### **Slick Stuff**

This very "oily", (i.e. slick, greasy) lubricant appears to adhere very well to metal, with little or no creep. Thus it does not appear to drain from slides and parts during extended storage. From the formula it appears that it might not be suitable at very low temperatures.

- 2 parts Dexron II or III automatic transmission fluid
- 1 Part Mobil-1 Synthetic Oil, 30 weight, or 10W-30
- 1 Part STP Oil Treatment (the stuff for "old" cars w/ over 30,000 mi.)

Thanks to John Nichols for this tip

### **Amsoil**

Another excellent home brew lube is Amsoil Synthetic ATF with some lanolin added to make it even slicker. A synthetic grease from TS Moly ([www.tsmoly.com](http://www.tsmoly.com)) called Arctic Grade TS-67 also makes a great lube especially for cold weather. It is a totally synthetic moly grease with the consistency of chocolate mousse. It does not run, weep or smell (very important for the SAF (spousal acceptance factor)). It is reported to work fine at -30 degrees.

Thanks to Roger Rothschild and Mike Gieger for this tip.

### **Slippery Stuff**

Try 80 percent Marvel Mystery Oil mixed with 20 percent Slick 50, or just mix ATF and STP oil treatment in a 1:1.5 ratio.

Thanks to Jim Conway for this tip.

### **Ed's Red Oil**

See the ER recipe for an ER compatible oil. Just a 50/50 mix of ATF and K1 kerosene.

### **Lanolin**

We've mentioned lanolin in several places as an ingredient, but liquid lanolin also makes a very good warm weather, lubricant for high pressure wear spots like sears and other wear point all by itself. It also is an excellent preservative/rust proofer (well known to marine users in that role). It has also been used as a bore conditioner for .22RF barrels by running a lanolin soaked patch through a clean bore, followed by dry patches until nothing remains on the patches.. An Australian company called Lanotec ([www.lanotec.com.au](http://www.lanotec.com.au)) sells liquid lanolin in an aerosol can but I'm not sure if it's available in the US.

Thanks to Dave York for reminding me of lanolin as a lube.

### **Automotive "moly" Grease**

Excellent for sears and hammer notches - just use a little.

**NOTE: WD40 is NOT a satisfactory lubricant for firearms as it tends to become gummy as it dries.**

An excellent discussion of firearm lubricants is available at <http://www.grantcunningham.com/lubricants101.html>



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## 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.

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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.

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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.

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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.



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## **Bore Paste**

An excellent bore polishing paste that works as well as JB's can be made from equal parts of BonAmi™, paste wax (like Johnson & Johnson or Butchers), and light oil. The BonAmi is the "doesn't scratch" product. Regular abrasive cleansers may be too harsh for use in a bore.

Another old standby is to use a hand type automobile rubbing compound and a larger than normal sized bore brush (say, one size larger-- .25 in a .22 bore, .33 in a .30, etc.).

For both of these methods you will need a rod that allows the tip to rotate as it passes through the bore.

To use either of these solutions strip the action and clamp horizontally in padded vise jaws. Clean the barrel normally. Then, run the rod through the bore from the breech end, attach the oversized brush and coat with the compound. The pull it back through the bore to the chamber (don't allow it to clear the chamber, to help keep "stuff" out of the action) and repeat this 25 or 30 times. Then with the brush outside the muzzle remove the brush and then pull the rod out of the barrel. Then attach a proper sized jag and a clean patch to the rod and from the breech work



the patch back and forth several times. Repeat this with clean patches until the patch comes out clean.

Thoroughly flush the chamber and action with solvent to remove any grit, and then reclean the bore and chamber with normal bore cleaner. Your bore will be noticeable cleaner and smoother.

I recently tested some MAAS Metal Polishing Creme made by MAAS International. While not designed as a bore paste it did a very nice job on smoothing out several barrels and left them very clean and shiny. First clean the barrel normally with both regular bore cleaner and a copper remover. Then coat a patch with the MAAS and using a tight fitting jag work it through the bore using a series of short strokes. Repeat several times with a new patch and polish and then final clean with bore cleaner to remove any residue. It is not as aggressive as JB or the above homemade stuff so it may not work as well on a really rough bore. The MAAS Polishing Creme is available at some Walmart, Home Depots, Walgreens, ACE, Tru-Serv, others in a 2 ounce size for about \$4 and on line at [www.maasinc.com](http://www.maasinc.com) in a 4 ounce size for about \$12.



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## Case Tumbling Media

Many pet stores carry ground corncob media for small pet bedding. It is usually a little coarser than most normal tumbling media but it should still be perfect for tumbling cases (and not get stuck in flash holes). Prices at my local Petsmart were about 2/3 of the shooting stuff. For ground walnut shells many pet stores sell it in the same grit size as the shooting stuff as "lizard litter" or "bird cage litter." The local price seems to be about a 30 percent cheaper than the shooting product.

You can also try your phone book's yellow pages for an industrial abrasives dealer. While you'll have to buy the corn cob or walnut media in 50 pound bags from them the price is usually about half (or less) of the price from firearms related sources, and it should keep you in clean tumbling media for the next several years. For an extra high polish add a small amount of non-ammonia containing automotive rubbing compound to the corn cob media and run your tumbler for a few minutes before adding the cases.

If you mix up a solution of about 10% rubbing compound and 90% mineral spirits (by volume) you will have less problem with clumping and wind up with what is effectively the commercial product.

Thanks to Benjamin Hall for this tip.

**A word to the wise. If you share your home with furpeople keep your tumbling media covered or you may find some strange "cases" in it. Cats think its a dandy litter box filler.**



Who? Me?  
You mean that's  
NOT a litter box?

Another case cleaning method that works well in rotary tumblers, like the 1-gallon Thumblers Tumblers, is to use the following media.

2 lb yellow or white corn meal  
1 cup plain table salt  
1/4 cup corn starch  
5 or 6 pieces of scrap 2 x 2 or smaller wood cut into small blocks

Add everything to the tumbler, close up the drum, and turn it on for a couple hours. Remove cases from tumbler, shake out the media from cases. You can blow them clean with an airgun or rinse them off if you like. The wooden blocks seem to knock the brass around and keeps media moving in and out of cases. They also seem to add a little extra friction to help polish and clean. Note that corn meal does not clog the flash holes, it's dirt cheap, and lasts for hundreds of rounds!

Thanks to Ron Martinsen for this tip.

Common table salt can also be used as an inexpensive tumbling media for small batches. From reports it seems to work best in a rotary type tumbler.

Thanks to Gary Gonzales for this tip.

Cheap bulk rice also works as a tumbling media.

Thanks to Ron Smith for this tip.



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## **Chemical Case Cleaning Solutions**

While tumbling cases in an abrasive media provides the best finish, extremely dirty cases can be decapped first (using a non-sizing die) and then washed in one of the following solutions. The final rinse in soapy water helps prevent tarnishing. All of these methods were approved by Frankford Arsenal and will not weaken your brass.

- A 5 percent solution of citric acid (available from your drugstore) and warm water for about 10 minutes. If your water is very hard increase the amount

of citric acid. You can add some Dawn™ or Cascade™ dishwasher liquid soap (which does not contain ammonia--be careful some do), 409, or Awsome to the solution for extra grease cutting ability. Follow with a rinse in hot soapy water (Ivory™ works well) and allow to dry. Don't overuse the citric acid or the brass may discolor.

- A solution of 1 quart of white vinegar and 2 tablespoons of salt. Soak with some agitation for 15 to 20 minutes and follow with a rinse of soapy hot water and allow to dry.
- A solution of 1 quart of water, 1 cup white vinegar, 1/2 cup lemon juice, 1/4 cup laundry or dishwashing detergent, 1/8 cup salt. Soak with some agitation for 15 to 20 minutes and follow with a rinse of soapy hot water and allow to dry. This may leave brass with a slight pinkish cast which will disappear with a short tumble in media.
- Military arsenals use a heated 4 percent sulfuric acid dip with a little potassium dichromate added. The solution is heated until bubbles rise slowly without it boiling and the cases are dipped into it for 4 -5 minutes using a basket of copper screening or plastic. A final rinse using plain hot water is followed by hot water with Ivory™ soap in it and the cases are left to drain and dry. Because of the use of heated sulfuric acid this method is probably impractical for home use but is given here to show what can be safely used.

Cases which have been fired several times and which show signs of carbon build up internally can be rinsed in straight paint & varnish makers (P&VM) naphtha available at any paint store. Decap, soak for 5 - 10 minutes, drain, allow to air dry and then tumble as usual. Cases will be sparkling clean inside and out but not any shinier.

An interesting idea is to use an "air stone" and a small air pump from a fish aquarium tank to agitate the liquid cleaning solutions.

Thanks to Randy Wood for this tip.

Another case cleaning method is the use of an ultrasonic cleaning unit. These units are available from several online sources and the biggest problem is finding a reasonably priced unit with about a 2 liter capacity. While you can only clean small quantities of cases at a time this way they will be clean as new, inside and out. Once you've acquired the unit you'll need to also acquire a glass beaker of sufficient size for your use and make a cover and beaker holder.

Cut a piece of Plexiglas to cover the tank and cut a hole the size of your beaker (use a fly cutter and a drill press or jigsaw it out). Make a collar for the beaker out of plastic foam that fits very snugly so the beaker can be raised or lowered. You want the beaker to *not* sit on the pan of the cleaner.

Fill the cleaner tank with water and by adjusting the level of water in the tank, the liquid in the beaker, and depth of the beaker in the water it can be "tuned" so that

the liquid in the beaker appears to boil while the water in the tank is calm. This has a major effect on how long it takes to clean the cases.

For cleaning you can use either of these procedures but the second one leaves the cases the shiniest.

- |                                                                                                                           |                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| 24 minutes - 50-50 Vinegar and water + 1 drop dish soap per 8 ounces water <b>Use cool water. Do not use hot water!!!</b> | 24 minutes - 50-50 Vinegar and water + 1 Drop Dish Soap per 8 ounces water <b>Use cool water. Do not use hot water!!!</b> |
| 8 minutes - Baking Soda & water (1 grain BS per ounce of water)                                                           | 6 minutes - Birchwood Casey Case Cleaner*                                                                                 |
| 8 minutes - Hot Water                                                                                                     | 6 minutes - Hot Water                                                                                                     |
| 8 minutes - Distilled Water                                                                                               | 6 minutes - Distilled Water                                                                                               |

\* The Birchwood Casey case cleaner is listed as their "Brass Cartridge Case Cleaner # 33845"

This idea was originally presented on the 6 mm Benchrest site at <http://www.6mmbr.com/ultrasonic.html> by Jason Baney, and more info and test results are published there.

### Steel Pin Media Information

The steel pin media is probably the neatest thing to come along in a long while but it has to be used in a rotary tumbler with a liquid cleaning solution. There are lots of pricey additives available to make the solution, but in reality they are simply a detergent and citric acid.

To make your own cleaning solution take 1 gallon of water and add 1 - 2 tablespoons of Dawn and rounded 1/4 teaspoon of Lemi Shine dishwasher additive (powder, not tabs). Do not over add the Lemi Shine as the brass may discolor. Lemi Shine is available at food stores, Walmart, and from Amazon for about \$4 for 12 ounces (which is enough for about 75 - 80 gallons of solution. This cleaner should also work well in ultrasonic cleaners. In a pinch you can also use about 1/4 teaspoon+ of cream of tartar.

With pin media the best results seem to come by using a proportion BY WEIGHT of 1 part brass, 1 -1.5 parts media, and 2 parts liquid. (A gallon of water weighs about 8 pounds.)

- "Escaped" pins can be retrieved with a magnet wrapped in a plastic bag. (The bag will enable you to peel the pins from the magnet.)
- To help keep the brass shiny you can add about a teaspoon of Ivory liquid to the final rinse water and then allow to dry.
- If you decap and /or swage primer pockets before tumbling the primer pockets will get cleaned and all sharp edges deburred.
- You can store the media either wet or dry.

You can substitute Turtle Wax "Wash & Shine" for the soap. It will leave a very slight coating on the brass that will help to prevent tarnishing.

Thanks to Ray Pilgrim for this tip.



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Speaking of case tumblers ... My buddy made up this rotary tumbler from a Harbor Freight cement mixer on closeout. (Had to replace the cheap motor that burned out.)

Easily handles 40+ pounds of brass. We run the steel pin media, with the cleaning solution described above. Takes a couple of hours and cases, even grungy ones, are bright and shiny inside and out.

While it's an extra step, we have settled on depriming all cases in a deprime only die (to avoid scratching a sizing die with the dirty cases) and this way the primer pockets, as well as the inside of the cases, get bright and shiny. This also has the benefit of removing any swaged fragments from swaged GI primer pockets.

The first picture is the unit with a sprayed on coating of truck bed liner inside the drum, and the second picture shows the separating basket used to dump out the pins. The cases are dumped from the tumbler into a bucket and rinsed. The separator is inserted, the cases dumped into it and the tumbled to remove any media and water. After tumbling and separating the media and cases, rinse the now clean cases in a bucket with warm water with a little Ivory detergent in it, and allow to dry to help prevent tarnishing.



A "manly" case tumbler



Draining / media separating basket



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## Case Sizing Lubricants

One of the advantages of using sprayed on lanolin as a case lube is that, in the quantities used, any residual lube has no effect on powder or primers.

### Spray Lube

The spray-on case lubes are probably the best thing to happen to reloading in years. You can make

your own spray case sizing lube in bulk by mixing liquid lanolin and 99% isopropyl alcohol. (While you can (kind of) use 91% isopropyl alcohol, its higher water content causes the lanolin to settle out and it must be shaken frequently during use.

**NOTE: The more common 70% isopropyl "rubbing alcohol" will not work at all as its water content is much too high, nor will denatured alcohol work. You need to use pure liquid lanolin as the fatty solids in anhydrous lanolin will settle out in the alcohol**

Liquid lanolin, which is a refined lanolin oil with the solid fats removed (the reason why solid anhydrous lanolin doesn't work well in this application) is available from health food stores and sources specializing in ingredients for cosmetics. You want to get pure liquid lanolin without additives. Online sources include VitaGlo (<http://www.vitaglo.com/7730.html>) or try "Amazon.com" for other suppliers.

I just recently discovered that my local Safeway store carries 99 percent isopropyl in their drug/cosmetic aisle for about \$2.50 for a 16 ounce bottle. Ninety-nine percent isopropyl alcohol is also available from many large paint stores (used for some finishes), some electronics stores (it's used for cleaning electronics) or local industrial chemical suppliers.

A solution of 1 part liquid lanolin and 4 to 5 parts 99 percent isopropyl alcohol (4 oz of liquid lanolin to 16 - 20 oz of isopropyl) works well. When mixing you may find that the lanolin mixes better if you warm both the alcohol and lanolin in a bath of warm water to about 105 - 110 degrees F before mixing. **DO NOT WARM EITHER OF THEM OVER AN OPEN FLAME!** Once the solutions are warm, pour together, mix thoroughly, allow the mix to cool (mix occasionally as it cools) and store in an air tight container to prevent water from being absorbed by the isopropyl.

For a spray bottle you can use an old commercial spray lube bottle or an old pump hair spray bottle that has been thoroughly cleaned. To apply the lube, spread the cases in a single layer on a clean surface like an oven tray (those disposable aluminum oven liner trays are great and prevent the wrath of your chef when it is discovered that the cookie trays were used) and lightly and evenly spray the cases. Allow the cases to sit for a couple of minutes, roll the cases around and lightly spray again. Wait until the alcohol has evaporated (about 5 minutes) and start sizing. Properly lubed cases will have a slightly greasy feel to them without feeling slimy.

Another neat idea for spraying the cases is to put them in a plastic bag, spray, and then mix the cases, dump out on some newspaper, and let dry. Less messy than putting the cases on an oven tray and less likely to get you in trouble with the head chef.

Thanks to Steve Dzupin for this tip.

If you have a hard time finding liquid lanolin you can mix a small tub of Hornady Unique case lube and 16 ounces of 91% or 99% isopropyl. If you use the 91% isopropyl you'll need to shake the mix to keep it suspended.

Thanks to Daniel Cocanour for this tip.

### **Solid "Wipe On" Lubes**

You can also use plain anhydrous lanolin straight from the can (but not as conveniently) for sizing by

putting a *little* bit on your fingers (just lightly rub your fingers across the lanolin) and then rubbing the cases. "Mink Oil," a refined lanolin leather preservative also works well as a case lube.

Many large drug stores have bulk anhydrous lanolin or they will order it for you, or you can order in it 4, 8, or 16 ounce containers, from Majestic Mountain Sage, 2490 South 1350 West, Nibley, Utah 84321, Phone: 435-755-0863, or online at: <http://www.thesage.com/catalog/FixedOil.html#Lanolin>.

Many people have reported that they have used a little bit of STP oil treatment on their fingers or commercial water based silicone cable pulling lube as a sizing lube.

You can also use plain petroleum jelly as a case lube. As with any of the resizing lubes use very little. You want the cases slippery, but not greasy.

Thanks to Joe Regina for this tip.

If you are still using pads to roll your cases on for resizing you can simply use regular undyed dishwashing liquid. Reports are that it works as well as some commercial liquid case lubes. Simply put a very small amount on your pad and rub it in with your fingers. Roll your cases across the pad and resize.

Thanks to Denis Allen for this soap tip.

### **The "Ballistol Baggy"**

Put 2 or 3 drops of Ballistol in a quart size "baggie" then rub the bag sides together so there are no droplets (you want to be able to feel the oil on the brass but not see any drops). Then put in the brass and mix it around. Works very well with 223 and 308 and does not leave dents after sizing.

Thanks to Jim Clark for this tip.

### **Cooking Sprays**

Cooking sprays like Pam tm can be used as a case lube. Dump cases in a plastic bag, spray on some, and shake the bag to lube the cases. Rises off easily.

Thanks to Joe Regina for this tip

## **WARNING**

**Many of these sizing lubes, especially the spray on types, can migrate deactivate primers. It is strongly suggested that after sizing and depriming lubed cases that you wash them in a mild detergent to remove the lube if you spray the case**



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## **Rust Removal**

***Before trying to remove rust with any of these methods it is helpful to thoroughly degrease the item and remove any paint so the rust remover can get to the rust.*** After the rust is removed, rinse in warm water, dry, and coat with a light oil to prevent after-rust.

### **Brake Fluid**

For rust removal, try automotive brake fluid. For light rust rub it on liberally with a patch, allow it to sit for a couple of minutes and wipe off. For heavily rusted items swab liberally with brake fluid and allow to sit over night. Burnish the finish with a wool pad or #0000 steel or bronze wool. Brake fluid may be damaging to some wood finishes so make sure you keep it on the metal.

### **Electrolysis Rust Removal**

You can remove rust from metal using electrolysis, and it will not harm the bluing. The main advantage to this method is it gets all the rust in hard to reach places. You will need

- A plastic container that will hold the part and electrolysis solution.
- Steel rod. DO NOT USE STAINLESS STEEL AS THIS WILL PRODUCE HARMFUL BYPRODUCTS.
- Water
- Arm & Hammer Washing Soda (not baking soda. Washing soda can be found in your local grocery store with the laundry detergent. If you cannot find washing soda, pour some baking soda--sodium bicarbonate into a pan and heat it over low-medium heat. Water and carbon-dioxide will cook-off leaving washing soda-sodium carbonate. ) Another source is swimming pool "PH Increaser." which is labeled 100% sodium carbonate. [Thanks to Bob Head for this hint]
- Battery charger or other high amperage power supply.

***Cautions:*** Wear eye protection and rubber gloves when working with this solution is very alkaline and can cause irritation. The electrolysis process breaks down water into its component parts, hydrogen and oxygen, which can be explosive. Work outside or in a very well ventilated area. Be sure your battery charger/power supply is unplugged before attaching or touching the leads.

In the container, mix 1 tablespoon of washing soda for each gallon of water to make up your solution. Be sure the washing soda is thoroughly dissolved. Place a steel rod either through the part to be cleaned (use o-rings to prevent the part from touching the rod), or numerous rods around the inside of your container. Connect these rods with wire; these will be the anode. You must be sure that the part to be cleaned is not touching the rod(s). Suspend the part in the solution with steel cable or wire so that it makes a good electrical contact with the part; this will become the cathode. Connect the negative lead (black) to the part being cleaned, connect the positive (red) lead to the rod(s), then plug in the charger. You will immediately begin to see bubbles; this is hydrogen and oxygen as the water breaks down. Allow the part to "cook" for 3-4 hours. The time is dependent on the size of the part, amount of rust, and the current of the power supply. After you



remove the part, immediately clean and dry it off, then coat it with a good quality gun oil or rust preventative oil.

Thanks to Roy Seifert for this tip

Roy reports that he used this process on a 1911 frame that had a lot of surface rust all throughout the inside. He set the frame upside down on wooden blocks in the electrolysis solution and placed a rod with o-rings through the magazine well. He used a 1.5 amp trickle charger and left it for about 4 hours. When finished, the frame was completely free of rust, and the bluing was intact.

### Bon Ami

For light rust on stuff including mold blocks, soak with Ed's Red and then make a paste of Ed's Red and Bon Ami (see the bore paste section) and rub until rust is removed. Clean with Ed's red or whatever cleaner you like and relube. For mold blocks, degrease before using.

### Molasses(!)

Molasses can be used to remove rust. Start with a plastic container of appropriate size, stainless will also work, a piece of plastic or string with which to suspend the item to be cleaned. Mix one part molasses with 6 to 10 parts ordinary water, and hang the item in the solution, derusting can take anywhere from a few hours to several days depending on the severity of rust, check occasionally. When the item is clean, rinse with water, dry and immediately apply a rust preventative as a light surface rust will soon form on the clean unprotected metal. When done you can simply dispose of the solution OR seal the container with a tight fitting lid, store it away from your house as the solution, although still effective, will develop an odor that will not endear you to those in your household.

Thanks to Robert Liegel for this tip

### Citric Acid

A solution of citric acid crystals (available from health food and some ethnic stores as well as places that sell canning supplies in 8 oz or so bags) in enough warm water to dissolve the amount of citric acid used. Depending on the amount of rust it may take 24 hr. Check frequently.

### Phosphoric Acid

This is available from many hardware stores. Simply soak the item in it and check frequently. It will also remove zinc plating.

### Commercial Solution I Like (Not homemade but it works so well I use it)

The best thing I have found for rust removal is the commercial product Evapo-Rust sold by Orison Marketing (<http://www.orisonmarketing.com/evapo-rust.html>). It is environmentally safe and non-corrosive to steel. It does not harm brass, copper, aluminum, gold, lead, titanium, steel, cast iron, chrome, solder points, vinyl, plastic, rubber, silicone, glass, cork, or wood. It can be used over and over until it absolutely stops working. (They claim that one gallon de-rusts up to 300 pounds of light to moderately rusted steel.). Depending on the level of rust it works in 30 minutes to 24 hours. Heating the solution to about 80 deg F speeds the process.



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## Stock Finish Repair

This tip isn't quite a cleaner/lube but it is worth while. To repair scratches on varnished or epoxy finished stocks try automotive "clear coat" touch up paint available at auto parts stores in little bottles with a brush in the touch up paint section.

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## Black Powder Stuff

### Patch Lube

An excellent patch lube for black powder can be made with 1 part anhydrous lanolin or saddle soap, 2 parts "rust inhibiting water soluble oil,"\* and 1 part Murphy's Oil Soap. Shake well and apply to patches before loading. Cleaning is much easier when using this lube.

\*Arco Emulsiplex or NAPA Soluble Cutting and Grinding Oil (765-1525), Trimsol, Lyondell Satisol, or Tooltex cutting fluid can be used.

Thanks to George Stantis for this tip.

### Bore Cleaners

Many black powder shooters swear by Simple Green™ and of all things Windex™ "glass cleaner with vinegar."

**\*\*\* WARNING! DO NOT USE SIMPLE GREEN TO CLEAN ALUMINUM OR ANODIZED ALUMINUM ITEMS. \*\*\***

If you will be using Ed's Red mostly for black powder and old chlorate primed military ammo, there is a modification to ER that may be of interest. Substitute a "fire retardant hydraulic fluid concentrate," or "rust inhibiting water soluble oil" suited for water hydraulics for four fluid oz. of the ATF in a gallon mix of ER. The resulting mix will form a stable emulsion when mixed in a 50-50 ratio with **distilled** water (**NOT** tap water). The resulting mix is very similar to "Moose Milk", though it may actually be better. To do this, mix the ER as usual, substituting the water soluble oil for 1/8 of the ATF in the mix, or 4 oz. if you are adding a quart of ATF to mix a gallon of ER. Once the ER is mixed, heat the distilled water just short of the boiling point, steaming with bubbles just beginning to form, and pour this SLOWLY into the Ed's Red while stirring. It should form a pink, soapy looking liquid like Pepto Bismol. Arco Emulsiplex or Trimsol, Lyondell Satisol, or Tooltex cutting

fluid concentrate, or other water soluble cutting oils are suitable, as long as they DO NOT contain any chlorine or sulfur. That's also why you should use distilled water instead of tap water.

Another black powder cleaner that is being used by Civil War re-enactors is composed of 1 part rubbing alcohol (70% or 91%) 1 part hydrogen peroxide (typical 3 percent drugstore kind), and 1 part Murphy's Oil Soap or a generic equivalent. It cuts Black Powder (even caked on residue that has been left from one event to the next) very quickly. Because of the alcohol, it does tend to eliminate most of the oil it comes into contact with, so be sure to lightly oil everything unless you are going to be firing immediately.

Thanks to Warren Harrison for this recipe

Here's another BP cleaner

- 4 -6 Oz. of Murphy's Oil Soap
- 4 drops of regular Dawn dish washing soap
- 2-4 caps full (about 3/4 ounce) of drug store hydrogen peroxide (3%)
- Distilled water to make 1 quart.

You can use more Murphy's Oil Soap for really dirty barrels.

Thanks to Darrell Vibbert for this one

Another recommendation is aerosol engine degreaser. Spray on, let soak, wipe off, and final clean with your favorite cleaner. This should also work on cosmoline coat firearms too.

Thanks to Don Peebles for this tip.



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## **Plastic Wad Fouling Removal**

While many commercial cleaning products claim to "dissolve" plastic wad fouling, the plastic used in most wads, HDPE (high density polyethylene), isn't easily dissolved with common or safe chemicals. (Xylene at temperatures above 75 deg C/167 deg F and THF (Tetrahydrofuran) are typically mentioned solvents.) Remington claims their wads are a "polymer material" and claims that their "Action Cleaner" (which is nothing more the naphtha, CAS #64742-48-9, according to the MSDS sheet) will dissolve their wad fouling.

Try soaking a wad in your cleaner and see what happens. What does help to remove plastic fouling are solvents that have great penetrating abilities and which get under the plastic fouling allowing it to be removed. Acetone, Kroils, Ed's Red, and even WD40 have been reported as good plastic removers when coupled with a tight new brush or fine steel wool. I once cleaned a shotgun barrel that wad material melted into the surface when a sight was removed. I thoroughly wet the

wad mark area with Ed's Red, let it stand during lunch, and it disappeared with two passes of a 10 ga brush spun in a drill.

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### **Ultrasonic Cleaner Solutions**

For general parts cleaning in a ultrasonic cleaner you can use Ed's Red or the citrus based cleaner mentioned above. Also recommended are:

- Straight odorless mineral spirits
- 1 part Simple Green and 6 parts water (Don't use on aluminum)
- 1 part Dawn detergent (without the bleach) and 4 to 6 parts water.

Note that with the exception of Ed's Red these solutions will remove ALL oils and grease so you MUST coat all parts with a light oil after cleaning and drying.

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### **Handling Static Electricity**

Annoying "static cling" can be a real problem with powder handling, especially in dry areas like Arizona or other places when the normal humidity drops. There are several ways to beat this that can be used by themselves or together.

- Wipe powder hopper, powder handling equipment, and your work surface with a fragrance free dryer sheet.
- Electrically ground your powder hopper and reloading machine. If you have a Formica covered table, ground it too.
- Spray the floor in your work area with a mix of 1 part fabric softener to 3 parts water and let dry.
- Install a portable humidifier in your reloading area.



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### **Some Miscellaneous Tips**

This section will contain odds and end that you may find helpful. Submit your tips by [clicking here](#).

#### **Cleaning Aluminum From Files.**

Ever file a piece of aluminum and get the file's teeth clogged with aluminum? While sometimes you can get it out with a "file card", it is usually almost impossible to remove. If this is the case, find a short piece of copper tubing. Split one end, flatten it out, and square it. Take the flattened end, and on an area where the file is clean run the copper flat in the direction of the file teeth (across

the file), generating small teeth. Then use the tool to scrape out the aluminum by running it across the file.

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## **If you have read this far, here are some non- gun related formula that you will appreciate.**

### **Eye Glass Cleaner**

First of all, DO NOT (**EVER**) wipe your dirty lenses with a dry cloth of any type. You will eventually scratch the lenses. Always clean them "wet."

Tired of paying those ridiculous prices for a small bottle of eye glasses cleaning solution? Make your own! This is the "Ed's Red" of eye glasses cleaners.

3 oz - water (tap is ok, distilled is preferred)  
1.5 oz - 91% or 99% Isopropyl alcohol  
5 - 10 drops "liquid detergent\*" (10 drops is approximately 0.5cc or a little less than 1/8 teaspoon per 4 or 5 oz of the water/alcohol mix.

Call it 1 part isopropyl, 2 parts water, and add 1/8 tsp of Dawn per 4 oz of the mix

\* Non-ionic detergents, such as Ivory Liquid or Joy (Proctor & Gamble) are preferred for this formula, but the blue Dawn detergent or "Softsoap" brand "antibacterial" clear liquid hand soap work OK too. *Start with the smaller amount of detergent and work up as too much detergent (especially Dawn) may leave a film .*

Fill your old spray bottle and shake well. Allow to sit till the foam dissipates before using . To clean your glasses, rinse them with warm water to remove heavy grit and dust, spray with the cleaner, let sit a couple of seconds, rinse with water again (this removes the lifted residue and soap), and wipe dry with a clean, soft cloth (the micro-fiber cloths are particularly good). If your lenses haven't been well cleaned in awhile you may want to repeat this process.

Thanks to Dr. John for this tip.

**NOTE: While you can use this solution on camera and scope lenses DO NOT spray directly on the lenses.**

**Blow any heavy dust off the lens and then spray the solution on a soft lint free or micro-fiber cloth, and then clean.**

**I have been asked "why rinse before and after before drying?" This ensures that all the junk gets removed before you wipe and scratch the lens.**

If you have *REALLY* grimy, greasy, glasses, use warm running water to rinse off any gritty smutz (a technical term for crud on eye glasses) and put a couple of drops of Dawn detergent on each side of the lens, add a couple of drops of warm water, and using your *clean* fingers *gently* rub the lens surfaces, the edges of the lens, and frame and nose pieces (you'd be surprised how much stuff is on the edges of the lenses and frames) for a couple of seconds. Rinse *thoroughly* with warm water, and reclean with your spray cleaner, and dry with a micro-fiber cloth.

In a pinch Windex can be used to clean your glasses. Spray a little on both sides of your lenses and rinse off. If your lenses are very greasy spray and rinse and then respray and gently wipe with your finger paying attention to the frame around the lenses. Rinse and dry with a clean micro fiber cloth. This was recommended to me by my optometrist to my surprise.

As an alternative (my favorite), fill a small plastic container, about 1½ to 2 inches deep with very warm water and a teaspoon or so of blue Dawn. Mix well. Fold the ear pieces and let soak for about minutes. Rinse well with warm water and dry with a soft clean cloth. You won't believe how clean your glasses will be, and it also gets all the oil and grease on the nose pieces, lens edges, and frames..

Speaking of micro-fiber lens cloths. Don't forget to wash them occasionally to remove any embedded dirt. I just put them in a jar with some warm water and a few drops of detergent, shake well, rinse well, and air dry. If I have a lot of them I wash them in batches, sorted by how dirty they are) in the washing machine. (Don't use bleach or fabric softener.)

### **Soap Scum Remover**

Ever try to clean a tub or shower that is coated with soap scum? While you can use expensive commercial cleaners the following works just as well and maybe even better.

- 1 part - Dawn "blue" dishwashing liquid
- 1 - 2 part - White vinegar (5% or greater)

Mix together in a spray bottle and shake well before each use.

Spray on all surfaces and allow to stand for a minute or two. Scrub with either a "magic eraser" or a non scratch type of ScotchBrite™ pad (usually red or blue). Respray and then rinse well and dry the surfaces. Really stubborn spots may need additional treatments. Once everything is clean, clean weekly to avoid buildup.

### **Window Cleaner**

In a pinch, generic automotive windshield washer fluid (particularly the solutions with "bug remover") works great. Fill your spray bottle and clean away.

For a truly do-it-yourself recipe try:

- 1 cup 91% Isopropyl alcohol (rubbing alcohol)
- 1 cup water (use distilled water if you live in a hard water area)
- 1/4 cup distilled white vinegar
- 1/2 teaspoon blue Dawn detergent

### **Pet Odors**

While you can buy commercial products (such as Orison Marketing's [EXPEL](#) which is probably the best commercial product) to eliminate "oops!" odors, in a pinch you can use white vinegar either straight or diluted 2 parts vinegar to 1 part water. First blot up any wet spots and then THOROUGHLY soak with the vinegar solution, and allow to sit for several minutes (It has to completely reach the source-all the way to the bottom-not just the top layer-as do any other products). Then suck up the liquid with a carpet cleaner or a wet/dry vac. Allow to dry (the vinegar smell will go away.)

## **Deep Cleaner**

This works wonders on dirty fabric car seats and seat belts and bad spot stains on carpets.

In a spray bottle add;

- 6 oz Dawn Ultra
- 6 oz 91-99% Isopropyl alcohol
- 1-2 oz (about 30 "squirts) OxyClean Max Spray
- Hot water to make 32 oz

Spray on area thoroughly soak the stain and area around it. Gently work into the stain with the back of a spoon. Let stand for a minute or so. Then using another spray bottle with warm water and using your wet/dry shop vac, spray on the water generously and suck up with the vac. Or you can use an extractor (the wand attachment with sprayer on a carpet cleaner will do) and use it to spray the water and suck up the liquid. Repeat as needed. Wipe with a soft cloth and let dry.

## **Weed Killer**

A quite good weed killer can be made with simple ingredients.

- 1 tsp Dawn
- 1 Gallon white vinegar. If you can get the 12 to 20 % strong vinegar, even better.
- 1 cup table salt.

Mix thoroughly and spray on weeds. Don't leave the solution in your pump sprayer as the salt will corrode the metal in the pump. Flush with water before storing.

## **Bug Killer**

This is instant death on flies but takes a little longer on other bugs.

- 2 tsp Dawn
- 16 oz water

Can be sprayed on vegetables.

## **Garden Bug Repellant**

This works very well on vegetables too.

- 1 tsp 3% Hydrogen Peroxide
- 16 oz water

## **Dawn "Saver" Adapter**

Since we've been talking about Dawn, have you ever gotten frustrated trying to get the last of the Dawn out of the bottle. Here's a tip. Save two tops from Dawn bottles, and cut/sand the snap cap and spout off of them. (I chucked them in a lathe.) Sand them flush and glue together using a glue that works on plastic. (I used a product called "GOOP."). To use screw the old bottle into one side and the other goes on the new bottle. Let stand for a couple of hours until everything is transferred.

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