SHTF Homemade Primers

This document describes how to make homemade ammunition primers in a SHTF situation. This paper only deals with making SP/SR/LP/LR primers.

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Revision Date: March 23, 2020,

Contents

Warning/Disclaimer

This paper discusses the creation and work with chemical compounds and mixtures that present a real risk of serious injury and/or death if mishandled. In addition, some of the chemicals discussed are toxic and present a danger to a person's health if inhaled or ingested. Primer compounds are considered to be "Primary" explosives. This designation is a result of the sensitivity of these materials to percussion, heat, and sparks (both electrical and mechanical) and their intense power during detonation. Therefore, anyone who uses this information to make primer compounds or primers does so at their own risk. The creators of this document will not be held legally liable for any accidents or injuries resulting from this information (this disclaimer for the present time, after the SHTF it will no longer matter).

To avoid serious injury or death, always work with primer compounds in small quantities of less than ~2 grams (~30 grains) at a time. Always wear eye protection and work in a clutter free, well-ventilated area. It is recommended that wood, plastic, or other non-sparking tools be used to avoid accidental ignition of primer compounds and primers. Work on a non-porous surface and carefully clean up all residue and dust from the work area when finished. It is important to wash your hands thoroughly with soap and water after working with primer compounds to avoid accidental poisoning.

Is it Legal

In a SHTF situation, legality is of little concern as most laws will no longer be enforced. More likely, the law of the jungle will exist, and life will be cruel and cheap. The major problem one must overcome in this difficult situation is obtaining the supplies/chemicals needed to make workable primers. Prior planning is worth its weight in gold here, but there are still options if you missed the boat. The more civilization left in place, the easier it will be to get what you need to make primers.

What Kind of Primers Are We Able to Make in SHTF

For the most part we are going to be restricted to making corrosive primers of the type that were common through the end of WWII. Non-corrosive primers are absolutely possible to make on a small scale, but not without having a number of crucial chemicals prior to the SHTF event. Some knowledge in safely doing several simple chemical syntheses will prove most valuable. Most of these unpleasant tasks can be completely avoided if certain chemicals are purchased now and carefully stockpiled for future use. These chemicals are very stable on storage and will last almost indefinitely. Here is a short list of chemicals/suppliers you should consider buying now:

1. Rolls of toy caps, (buy)
2. Strike on the box matches, (buy)
3. Potassium Chlorate*, (buy or synthesize)
4. Antimony Sufide, (buy)

5. Sulfur, (buy)
6. Baking Soda, (buy)
7. Ceramic mortar and pestle, (buy)
8. Pyrex glass crushed and ground to a flour consistency, (make)
9. Fine grained gunpowder (or fine grained blackpowder 4F), Bullseye works well. (buy or make BP)

* Potassium chlorate can be easily synthesized from either household bleach or calcium hypochlorite (pool shock) and potassium chloride (salt substitute).

Reliable Homemade Corrosive Primers

Of all the techniques and methods available to make homemade primers, only three are considered feasible for the average non-chemistry trained reloader. Regrettably, all of these methods produce primers of the non-mercuric/corrosive type and require the tried and true hot water cleanup procedures to avoid damaging your barrel.

Preparation of primer cups

It is entirely possible to make your own primer cups from sheet brass if you are a machinist or are able to have the special dies custom fabricated. The needed technical drawing for making these dies can be found in the “Making Ammunition” reference book noted in the appendix.

It is more convenient to reuse previously fired primers (you have been saving them, right?). However, they must be properly cleaned and prepared for reuse. The steps below show my technique for preparing the primers.

1. Fill a rock tumbler drum about 1/3 full of used primers. Fill with water to about 2/3 full and add a squirt of dish detergent. Seal up the drum and tumble for about 30-60 minutes. Pour off the dirty water, rinse the primers and repeat the cleaning operation 2 more times. This will remove virtually all of the toxic lead salts from the primers and make them clean and shiny.
2. Pour out the clean damp primers onto paper towels, spread them out into a single layer and allow them to drain and dry overnight.
3. Next remove the anvils from the primers by holding the primer with a pair of needle nose pliers and using a sharp pointed awl or similar tool get under a leg of the anvil and pop it out. With a little practice, you can do this quickly and easily without losing the tiny anvils. Remove any paper residue (i.e. the foil) you may find that sometimes remains in the primer cup. Discard any primers that are excessively distorted or flattened. It has been my experience that large rifle primers can rarely be reused due to excessive flattening.

4. Using an appropriate sized flat punch or flattened nail, set the primer on an anvil or other smooth metal block and punch out the firing pin dimple. It is rare for the firing pin dimple to be completely removed during this operation since the metal can flow under the firing pin and be slightly thinner than the surrounding areas. Discard any primers that have an especially heavy primer strike or are pierced.

5. Store the prepared primer cups until ready for reloading.

I recommend keeping SR and LR primers separate from SP and LP primers. This will avoid problems with misfires in pistol cartridges due to the thicker primer cups used in rifle primers. Sometimes they work and sometimes they don't or require multiple strikes to get them to fire. The same issue would exist if you were to use new rifle primers in pistol cartridges. The firing pins in pistols are not able to strike the primers as hard as a rifle does.

Primers made from toy caps

This method is the easiest, safest method if you stockpiled toy caps before the SHTF event. On the other hand, the resulting primers are not very energetic and may fail to reliably ignite slower burning powders. The best toy caps to use are made in Germany and can be found under various brand names at Walmart or at Dollar General. The caps made in China are inferior for use in cap primers. Don't waste your money buying them. Here are the steps for making cap primers:

Materials needed: a) leather punch or handheld 1/8" paper hole punch, b) rolls of good quality caps, c) bamboo skewer, d) fast pistol powder

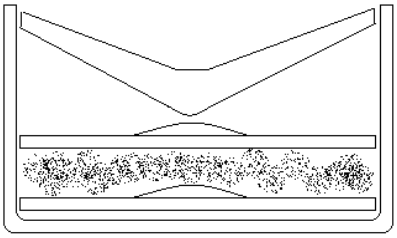
1. Using a leather punch, cut out a number of cap blisters from the roll of caps to the appropriate size to fit inside of the primer cups you are reloading. For SP primers, I have found that hand held paper hole punches that make 1/8" holes will work well. As much as possible, try to center the cap blister in the punched out circle. Expect to accidently set off a few caps while doing this operation. If you do pop off a cap or two, carefully wash the punch when you have finished with hot water or the punch will quickly start to rust from the corrosive cap residue (i.e. just like your gun barrel.)

2. Place one cap circle inside of a prepared primer cup with the blister facing up and carefully pack it down with the end of a bamboo skewer.

3. To give the primer a little more energy, sprinkle a thin single layer of fine gunpowder (or blackpowder) over the cap. Bullseye is an excellent choice, but any fine grained pistol powder will work. I have a cup of scrap gunpowder I use for this purpose that was recovered from live rounds I occasionally find in the brass box at the range.

4. Place the second cap circle, blister side up, over the gunpowder and carefully pack it down with the bamboo skewer.

5. Finally, place a saved anvil over the cup pointy end down and carefully/slowly push it into place using the side of your needle nose pliers. Even being very careful, I typically pop off about 1 out of 20 primers during this operation. If that happens, disassemble the primer, clean the cup and reload with new caps and gunpowder. Once assembled, the primer is ready for immediate use. To avoid accidentally popping the caps, it is recommended to desensitize them by lightly moistening them with 90% isopropyl alcohol before pressing in the anvil. After the alcohol and water evaporates (at least several hours or leave overnight to be sure they are dry) the caps become sensitive again and will work like normal.



6. Save your completed primers in an empty primer box, or use them as normal in making ammunition. Any difficulties in getting the primers to seat properly can usually be traced to a distorted primer cup. The more discriminating you are when sorting out questionable primer cups, the less likely you are to have any problems seating the reloaded primers. It is rare to have a cap primer pop during normal seating in a casing but it does occasionally happen. When made correctly these primers have excellent reliability. With good consistent assembly techniques, less than 1 out of 1000 cap primers will typically be expected fail. In most cases I have analyzed, the cap primer was found to have fired, but was not energetic enough to set off the gunpowder. These primers have successfully set off powders as slow as IMR 4895 used in 223 Remington cartridges.

7. The cost of making cap primers is quite low ($0.003/primer) compared to commercial primers ($0.04/primer), or about a 10:1 cost advantage.

Primers made from strike-on-the-box matches

This method is easy, relatively safe and easy. In fact, this is the most universal method I know of to make primers anywhere in the world. Strike on the box matches made by Swedish Match are available worldwide under a variety of local trade names. This method was developed by a friend who lives in South America. He uses FIAT LUX brand matches in his primer work.

Only the red match head is used to make the primers. It is removed from the match stick by crushing with needle nose pliers. The coarse match powder is then ground to the consistency of talcum powder using a plastic rolling pin or similar plastic cylinder. This is referred to as MH0 (MatchHead 0) compound.

For the paper foils, disks are punched out of the striker strip bonded to the side of the matchbox. For best results, the striker strip surface should be solid and not composed of a pattern of small balls of material. The later type has been proven to not work well in these primers.

Used primer cups are prepared as normal and are filled to the brim with match powder. A paper disk (with striker side facing the match powder) is placed into the cup. Using a button press and a conical pin, compress the match powder to about half of its original volume to create a firm solid pellet that will not breakup with impact (the compound can also be manually packed using a bamboo skewer). Insert an anvil to complete the primer.

Unfortunately, MH0 primers are relatively weak compared to standard commercial primers and do not work well in calibers larger than 380ACP. Also, only paper disks punched from the striker strips from the match box allows this compound to work. Nothing happens when plain paper disks are used.

MH0 compound can be significantly improved with the addition of Sb2S3. A 3:1 blend of MH0 and Sb2S3 gives a strong pop and bright muzzle flash. This compound is called MH1 and has been found to work well in all calibers it has been tried in. In addition, MH1 primers no longer require disks be punched from striker strips but work well with plain paper disks.

MH0 and MH1 priming compounds are corrosive and require the normal hot water cleanup after firing to avoid rusting and corrosion of the steel barrel. Otherwise, these primers work well and can be made almost anywhere. An analysis of the formula of MH1 shows that it is similar to H48 compound.

Primers made with H-48 compound

This method uses a real primer compound and carries some safety risks. The resulting primers are as energetic as commercial primers and should reliably ignite all powders. A few modifications to the formulation can further improve the stability and reliability of the primer. Here are the steps for making H-48 primers:

Materials needed: a) Potassium Chlorate powder, b) Antimony Sulfide powder, c) Sulfur powder, d) finely ground glass preferably pyrex (consistency of flour) or grit, e) Sodium Bicarbonate powder (i.e. baking soda), f) Scale that weighs in grains, g) plastic weighing boats, h) SS or plastic spatula for transferring chemicals, i) plastic spoon, j) bamboo skewer with a flat end and a powder scoop carved on the other end, k) paper disks punched out of ordinary copy paper that will fit inside the primer cup, l) dilute shellac solution in denatured ethyl alcohol (~1 part shellac in 10 parts of alcohol but the exact concentration is not critical), m) Aluminum powder (60-100 mesh) optional, n) needle nose pliers, and o) small rod or tiny screwdriver (diameter of shaft ~1/16” or smaller)

1. Using 4 plastic weigh boats and a suitable scale, weight out the following materials:
    a. Boat 1, 17.0 grains of potassium chlorate,
    b. Boat 2, 9.0 grains of antimony sulfide,

c. Boat 3, 4.0 grains of ground glass, and

d. Boat 4, 3.0 grains of sulfur, 0.2 grains of sodium bicarbonate (helps stabilize the mixture on extended storage) and 0.2 grains of aluminum powder

The aluminum powder is optional, but provides extra incandescent particles to help ignite slower gunpowders. Aluminum powder is commonly used in commercial Magnum primers for this same purpose.

2. Put ingredients "b", "c", and "d" on a plain 8 1/2 x 11 sheet of paper and mix thoroughly using the back side of a plastic spoon. The pile of powder may also be rolled back and forth on the paper to aid in blending the ingredients. These ingredients (and only these ingredients) are safe to mix together without special precautions. *****IMPORTANT: DO NOT ADD ingredient "a" until instructed below*****

3. Collect the thoroughly mixed powder from above into a single pile by lifting up the edges of the sheet. Now pour ingredient "a" into a separate pile on a clean area of the sheet that is beside but not contacting the previous pile. Using the backside of the plastic spoon, crush any lumps in ingredient "a" and make a smooth free flowing powder**. DO NOT MIX ingredient "a" with the other ingredients until this crushing step is completed.**

4. Now, lift up the edges of the paper sheet and roll the two piles of powder into one another. Once these powders are combined, the mixture becomes explosive so be very careful to avoid sparks or any rapid crushing action. Using only this rolling action on the paper sheet, continue to mix the powders until a homogeneous mixture is formed. The backside of the plastic spoon can be used to gently breakup any agglomerated lumps of powder that are found during this blending step. The final result is ~33 grains of light gray powder that is H-48 primer compound. It may be stored in a small plastic condiment cup with a snap on cap until ready for use. This amount of primer compound is sufficient to make ~100 SP primers or ~60 LP primers. The H-48 primer compound can be tested (preferably outside) by placing a small amount (about what fits in a SP cup) on a smooth metal surface and striking it with a hammer. Properly made H-48 compound will explode with a report about like a large firecracker and can make your ears ring for several minutes. With that in mind, consider the potential power of a full 33 grain batch going off (~100 times what you just set off!) Respect the primer material and work safely to prevent accidents. *****WARNING! DO NOT MAKE OR STORE LARGER AMOUNTS OF H-48 PRIMER COMPOUND*****

5. Position 10-25 prepared primer cups onto the edge of a 6" x 6" sheet of waxed paper. In the middle of the sheet, pour out about 1/4 of the batch of primer compound made previously and recap the container. Using the carved bamboo scoop, position an empty primer cup next to the pile and add H-48 primer compound until the cup overflows. Using the side of the scoop, remove the excess powder so that the powder is level with the top of the cup. Move this filled cup to the edge of the wax paper sheet and repeat the operation until all of the cups are filled.

6. Using the bamboo skewer with a flattened end, position a filled cup close to the edge of the wax paper sheet and carefully pack the powder tightly. The cup will be ~1/2 full of packed powder when this step is completed. This is exactly the correct amount of powder that needs to be used in the primer and is why I prefer the dry packing method. It is ~21 mg or ~0.3 grains of primer compound in a SP primer. LP primers will contain ~35 mg or ~0.5 grains of H-48 compound. It is possible to refill the 1/2 full cups with H-48 powder and repack to make them 3/4 full. While this will make a more energetic primer, it is very difficult to install the anvil when the cup is this full. Repeat this operation until all of the cups are packed.

7. Place a paper disk over the packed H-48 compound in each cup and pack the powder one more time. Moisten the primer pellet with dilute shellac in ethyl alcohol solution using a small pointed rod or tiny screwdriver to transfer small drops of solution to the cup until the paper disk just stays moist (don't overdo it.) This step desensitizes the primer compound so that the anvil can be safely installed and binds the powder into a solid pellet once the alcohol dries. This moistening step is critical in making reliable H-48 primers. Place a saved anvil over the cup pointy end down and carefully push it into place using the side of your needle nose pliers. Finally, move the completed primers to a well-ventilated area so that the alcohol can completely evaporate (overnight works well).

8. Save your completed primers in an empty primer box, or use them as normal in making ammunition. When made correctly these primers have excellent reliability and energy (very close to commercial primers.) This same technique can be used to reload berdan primers, minus the anvil step. It takes about 30 minutes to process 25 primers from start to finish. Completed H-48 primers have about the same stability/sensitivity as standard commercial primers.

9. The cost of making H-48 primers is very low ($0.0003/primer) compared to commercial primers ($0.04/primer), or about a 100:1 cost advantage.

With slight modifications, this method is commonly used to make/reload percussion caps. In many cases, the primer mixture is wet loaded into the cups. The alcohol/shellac binding solution is used to moisten the H-48 compound until it is the consistency of toothpaste. The percussion cups are filled ~1/2 way with this mixture and a paper disk installed. Allow the alcohol to dry and the percussion caps are ready for use.

Appendix

Primer chemical suppliers

There are a large number of online chemical suppliers for the closely related fireworks hobby. They carry almost everything you will need. Prices and shipping charges vary widely, so comparison shop before buying. Also, most of these suppliers require that oxidizers (e.g. potassium chlorate) and fuels (e.g. antimony sulfide and sulfur) be shipped (and sometimes even ordered) separately which increases the shipping costs. The more general laboratory suppliers, like CitiChemical and Elemental Scientific also

carry glassware and other laboratory equipment that may prove useful. Also, be sure to checkout Amazon and eBay as they carry a surprising number of chemicals and laboratory equipment. The author has purchased chemicals from Hobby CS, Pastime, Firefox Pyrotechnic, PyroChemSource, Amazon, and eBay. Note that some companies will require a copy of your driver's license and a signed liability release before they will sell to you. One should assume that this information will eventually find its way to various governmental agencies.

Skylighter	http://www.skylighter.com/mall/chemicals.asp
Hobby CS	http://www.hobbychemicalsupply.com/servlet/StoreFront
Thunder	http://www.highqualitychems.com/servlet/StoreFront
PyroChemSource	http://www.pyrochemsource.com/Chemicals-Chemicals-AL/b/4940415011
FireChemical	http://www.firechemical.com/
Pastime	http://pastimepyrochemicals.com/
American Pyro	http://www.americanpyrosupply.com/Products-PYROTECHNIC_CHEMICALS.html
CitiChemical	http://www.chemsavers.com/
Elemental Scientific	http://www.elementalscientific.net/store/scripts/default.asp
Fireworks Cookbook	https://fireworkscookbook.com
Firefox Pyrotechnic Chemicals	http://www.firefox-fx.com/index.htm
Amazon	http://www.amazon.com
eBay	http://www.ebay.com
Ace Hardware	for shellac and denatured ethyl alcohol, also available from Lowes, Home Depot

Primer formulations

H-48 Primer Compound

Potassium chlorate	51.5%
Antimony sulfide	27.3%
Sulfur	9.1%
Glass powder	12.1%
Sodium Bicarbonate	trace (optional)
Aluminum powder	trace (optional)

H-42 Primer Compound (used for almost all WW1 military ammunition)

Potassium chlorate	47.2%
Antimony sulfide	30.83%
Sulfur	21.97`%

This formulation removes the ground glass used in H-48 that was suspected of causing excessive barrel wear. This is an unproven suspicion and probably not true because of the fineness of the ground glass (more likely to act as a polishing agent than an abrasive.)

FA-70 (used from 1917 until mid-1950's by the US military)

Potassium chlorate	53.0%
Lead Thiocyanate	25.0%
Antimony sulfide	17.0`%
TNT	5.0%

Note: a finely ground fast pistol powder can replace the TNT in this formulation.

Lead Thiocyanate is a restricted (and expensive, $45/lb) chemical and must be synthesized to make this formulation. This primer mixture has better storage life than H-48 or H-42 compounds because of the replacement of sulfur by lead thiocyanate.

Synthesis of primer chemicals

The only practical chemical to synthesize is surprisingly the most important, potassium chlorate. For example, it is surprisingly easy to synthesize potassium chlorate from ordinary household bleach and salt.

Method 1

http://chemistry.about.com/od/makechemicalsyourself/a/Potassium-Chlorate-From-Bleach-And-Salt-Substitute.htm

Potassium Chlorate from Bleach and Salt Substitute
How to Make Potassium Chlorate from Household Chemicals
By Anne Marie Helmenstine, Ph.D.

Potassium chlorate is an important potassium compound that can be used as an oxidizer, disinfectant, source of oxygen, and component in pyrotechnics and chemistry demonstrations. You can make potassium chlorate from common household bleach and salt substitute. The reaction is not particularly efficient, but it's something to keep in mind if you need potassium chlorate right away or just want to know how to make it.

Materials for Making Potassium Chlorate

chlorine bleach

potassium chloride (sold as a salt substitute)
filter paper or coffee filter

Prepare Potassium Chlorate

Boil a large volume (at least a half liter) of chlorine bleach, just until crystals start to form. Do this outdoors or under a fume hood, to avoid inhaling the vapor. Boiling bleach disproportionates sodium hypochlorite into sodium chloride and sodium chlorate.

3 NaClO -> 2NaCl + NaClO3

As soon as crystals start to form, remove the bleach from heat and allow it to cool.

In a separate container, prepare a saturated solution of potassium chloride by stirring potassium chloride into water until no more will dissolve.

Mix equal volumes of the boiled bleach solution and potassium chloride solution, taking care to keep solids from either solution out of the mixture. Potassium chlorate will precipitate out, leaving sodium chloride in solution.

KCl + NaClO3 -> NaCl + KClO3

Cool the solution in the freezer to increase the potassium chlorate yield.

Filter the mixture through filter paper or a coffee filter. Keep the solid potassium chloride; discard the sodium chloride solution.

Allow the potassium chlorate to dry before storing or using it.

Method 2, using bleach powder

Required Chemicals:

1200 g H.T.H (calcium hypochlorite 65%)

220g Potassium chloride

Procedure:

In this reaction H.T.H. (calcium hypochlorite Ca(Cl0)2) is mixed with water and heated with potassium chloride (salt substitute). The use of potasium chloride is preferred over sodium chloride due to the easy crystallization of the resulting potassium chlorate. This mixture will need to be boiled to ensure complete reaction of the ingredients.

In a large pyrex glass or enameled steel container place 1200 g H.T.H. and 220 g potassium chloride. Add enough boiling water to dissolve the powder and boil this solution. A chalky substance (calcium

chloride/hydroxide) will be formed. When this chalky substance is no longer formed (~2 hours of boiling) the solution is filtered while boiling hot. If the reaction is incomplete the hot solution will attack the filter paper and eat holes in it. If that happens, return the solution to the flask and boil it for a longer time before filtering. The potassium chlorate will crystallize as flat plates as the clear filtrate cools. The crystals of potassium chlorate are filtered out when the solution reaches room temperature. The crude KClO3 can be purified by recrystallizing from hot water. This will lead to a very pure product because of the high solubility of KClO3 in boiling water.

One other important chemical that can be obtained from an unexpected source is antimony sulfide. A common mineral called Stibnite is composed of this compound. If ground to a fine powder it can be used directly in primers. However, buying this chemical is far more cost effective. It is also sometimes used to make fired pottery glazes which might be another possible source.

Revision History

Date	Revision
March 23, 2020	Original issue