

EPN23 primer

(ENPO modified with aluminum & smokeless powder booster)

DDNP *	20%
KCLO3 **	12%
Ba (NO3)2	17%
Ground Glass (Pyrex, ground to flour consistency)	10 %
Lead Dioxide	10%
Antimony Sulfide	26%
Tetrazene	5%

Notes:

*It has been found by experimentation that it is not strictly necessary to re-crystallize DDNP with acetone prior to making a batch of EPNO/23. Recrystallization will give a significantly purified product- at about 8-10% loss in yield- however the small amount of poly- sulfide contaminant present as the brownish powder precipitate from diazotization does not seem to effect primer performance or ignition- as long as the weapon used has a strong hammer strike. If the primers are SPP intended for smaller blow back pistols or striker fired pistols, it is recommended to purify the DDNP with acetone recrystallization to obtain a more sensitive and slightly more powerful batch. Another approach is to increase the DDNP content of the recipe by 3-5%.

** if a non-corrosive primer is desired- omit potassium chlorate entirely and use 29% barium nitrate. Strontium nitrate can also be used or mixtures thereof. The lead dioxide component still makes this compound somewhat toxic, if not non-corrosive. It has not been perfected yet but zinc peroxide or manganese dioxide may be suitable replacements for lead dioxide.

Preparation of EPNO:

All ingredients are individually at a time, finely powdered first before mixing. DDNP should be powdered VERY carefully using a PVC card or plastic knife on a piece of paper, avoid excessive friction (do not use a mortar and pestle) and be mindful of static discharge potential (grounding yourself would be ideal when powdering DDNP).

Other ingredients can be powdered using mortar and pestle (be gentle with the Tetrazene). All ingredients are weighed out in the correct portions-then mixed thoroughly until homogenous. A suitable and safe method for mixing is to use a glass jar or plastic container with tight fitting lid, add all ingredients and then shake the container for several minutes to thoroughly mix the ingredients. It is NOT recommended to use an electric tumbler or brass polisher due to the obvious voltage and static-

electricity as potential ignition sources. It is NOT recommended to prepare more than 10 grams at a time.

Primer cup loading-

1. EPN23 should be loaded dry. It would be safer to load a wet mix or paste however, preliminary test using water to create a soupy paste resulted in deactivating the compound, this is thought to be do to 'floating' of less dense ingredients as the primer mix dries, subsequent stratification/separation of ingredients. A possible solution not yet tested is to prevent stratification of ingredients by mixing EPNO with a dextrin/water/alcohol suspension, thick enough to make it into a paste-the dextrin may prevent ingredient separation and also help to bind the EPNO into a hard pellet once dried.
2. The dry EPN23 mix is loaded in prepared/clean primer cups using a folded card/paper to hold about 0.5 grams of compound at a time. A dental pick/wire/toothpick or similar tool is used to push a small amount (11-12 mg ideally for SPP) into the cup. Cups are loaded approximately 2/3 full. After cups are loaded, the charge is compressed lightly using a chop stick, the end honed to the inside diameter of the cup to make a tight fit. There is no need to press hard to compress the compound and this may actually de-sensitize it somewhat. Light pressure is all that is needed, the aim is to make the charge density consistent and level.
3. After all cups have been loaded with EPN23, a 50/50 by weight mixture of Aluminum powder (80-100 mesh seems to work great) with small grain smokeless pistol powder is added using the same loading technique with folded paper and pick. The calculated amount seems to be a 2.9-3 milligram sprinkling over the EPNO charge. This makes it modified-EPN23. The amount of booster is not critical, essentially a very small amount of this mix is sprinkled over the pre-compressed charge of primer. Win231 and Bullseye seem to give excellent results but any suitable small grain smokeless powder will work, double base with nitro-glycol esters preferred.



Picture shows 'sprinkled' charges at the bottom, charges without at the top.

4. Paper cut out discs are now used to seal the sprinkled charge. Preferred is glossy, coated paper, nothing special-junk mail cards provides a ready supply. Do not use a thicker paper composite as this tends to de-sensitive the mixture to hammer strike/crushing against anvil. The chopstick end is wetted slightly using a small dab of NC lacquer mixed with nail polish, this helps grab the paper disc. It is pushed into the primer cup and pressed down slightly, twisting the chop stick when removing seems to help keep the disc in place and not stick to the chopstick. Try to center the disc well and cover the whole charge evenly.
5. Sealing-after paper discs have been pressed in, a generous drop of NC lacquer/nail polish mix is now added, enough to cover the paper disc. Sealed primers are set aside to dry at room temp for 12-24hrs. They can now be loaded.



Anvils can be seated in the conventional manner or seated during case priming step.

Average charge weight for SPP/SRP is 30-35mg, LRP/LPP 55-60 mg. EPN23 has been tested successfully in 209 shotgun primers and in #10 and #11 percussion caps for muzzle loading weapons.

Ignition example test of EPNO, modified to EPN23 with Al/smokeless powder booster in a large pistol primer:



Video of EPN23 test



modifiedEPN0_Slomo
.mp4

EPN23 cost break down

Ingredients	current cost per unit\$
Aspirin 500cnt	5
De-natured alcohol or 99% IPA	7
500mls 96-98% sulfuric acid	4

135 gr potassium nitrate

4

*the sulfur and potassium/sodium hydroxide and coffee filters needed to produce DDNP from Picric/Picramic acid are for this amount negligible in cost, being common chemicals and easily to produce/procure.

The above amounts are sufficient to product approximately 120 grams of DDNP. Veterinary aspirin for horse and livestock can be found in a more purified form and this makes the alcohol purchase/purification step unnecessary. Either option will be about the same unit cost as vet aspirin is more expensive gram for gram, not as easy to find.

500 gr Barium Nitrate* \$30

454 gr Antimony Sulfide (200/300 mesh) \$20

100 grams of lead dioxide free-easily made by various means

100 grams finely ground boro-silicate glass free-produced from Pyrex, Kimax glassware

50 grams of Tetracene \$25*

*this is based on either buying the amount of AGB needed to make this batch amount, or alternately producing AGB based on urea/calcium oxide/cyanamide/cyanurate reaction with hydrazine sulfite.

(5 lbs urea-\$14, 50 lbs of lime-\$4, cost to produce hydrazine sulfite \$7)

Mixture of 75 grams 80 mesh aluminum powder and 75 grams smokeless pistol powder-\$4.00 US

**approximately 2.9 milligrams of this mixture is used as booster per primer (SPP/SRP)

Total: based on 120 grams of DDNP available (limiting constituent) the above amounts and cost will be enough to produce approximately 600 grams of EPN23 primer compound-at a total cost of \$100.00 USD. Assuming this amount is used to refurbish and reload salvaged primers-(primer cups and anvils supplied at zero net cost) this amount is sufficient to manufacture:

51,000 small pistol or small rifle primers

@ 0.2 cent per primer/ 20 cents per 100/ \$2 per 1000

33,000 large pistol or rifle primers

@ 0.3 cents per primer/ 30 cents per 100/ \$3 per 1000

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