

GOEX CTG Powder

After 20 years of having the U.S. black powder market to itself suddenly in 1993 Goex was looking at two foreign produced powders coming onto the U.S. market. Those being the 1993 shipment of WANO and the 1993 shipment of Elephant.

At the same time the black powder cartridge shooters and the single-shot rifle shooters had been on something of a nostalgia kick. There was a good bit of discussion of the old Curtis and Harvey #6 powder that was mentioned in late 19th century writings by shooters of that time period. Discussions on grain sizing, moist burn and little bore fouling. Most of what was discussed was pure conjecture fortified by a few who had shot more recent C&H production made prior to 1970. Small amounts of which found its way into the U.S. by way of Canada.

Late in 1994 there were rumors that Goex was working on a black powder produced specifically for cartridge shooters. Entering the market early in 1995.

The following article appeared in Blackpowder Hunting magazine.

Blackpowder Hunting
Spring Issue, 1995

Pages 32 & 33

Traditions in-line rifle and GOEX cartridge blackpowder

Check out the new Traditions in-line with GOEX cartridge blackpowder for a winning combination.

By John Goodwin

I've been wanting to try some of the new Goex Cartridge blackpowder and decided to wring out the Traditions in-line with this new powder. I contacted Mick Fahringer at Goex to find out what makes the new powder different from standard grade blackpowder. He told me that for years Goex has been in the process of developing a new generation of blackpowder and the new cartridge powder was the first introduction of things to come. Mick said that special additives have been included in the new powder and it showed less and softer fouling, adding more shots between cleaning and making for easier cleaning. The velocities were slightly higher without increased pressure. A feature the blackpowder cartridge shooters are raving about.

The granulation size is, for the lack of a better term, 2-1/2 G and seems to have a bit more luster to it.

Mick went on to say that before long all Goex blackpowders will have the new additives, but could not give any definite date when they will be available to the public.

At this point in time Mick Fahringer had been at Goex's Moosic, PA black powder plant since 1993. His father, Frank Fahringer had been running the plant for close to 20 years. His health was beginning to fail so he brought his son Mick into the operation with the idea of retiring in a few years.

We are looking at a point in where the fast-buck artists were starting to take over portions off the black powder shooting market. The idea being that the inclusion of high-tech additives could change a product and all of the problems normally associated with that product would be in the past.

The author of the magazine article states, based on his contact with Goex, that this new cartridge powder has special additives to give reduced fouling and soft fouling. That eventually all Goex powders would use this new technology that Goex had worked on for some years.

The author of this paper had been investigating black powder for about 10 years at the time Goex introduced the cartridge (CTG) powder. Looking at potassium nitrate purity and its effect on the finished powder along with various types of charcoal. Making small batches of charcoal and looking at charcoal properties versus what was required in different types of black powder. Working along with Ron Grosvenor who lives in Australia.

Late 19th century writings on small-arms black powders described some powders as being "moist-burning". In German writings it is seen as "Nass Brand".

Nothing in the writings described how this moist-burning property was produced in the powders cited as being moist-burning.

How this moist-burning property is produced in a powder was a great mystery. Then this author stumbled onto the “secret” while running solvent extractions on charcoal samples prepared in a laboratory. The mystery component of the charcoal being found during an acetone extraction of a batch of Black Alder charcoal. This mystery component then being identified as creosote.

When wood is charred the phenolic-structured lignin is broken down into a series of phenolic-structured chemicals. The most abundant in the charcoal being wood creosote. Readily soluble in acetone.

As long as the charring temperature is not allowed to rise above 320 degrees Centigrade the creosote will be held in the charcoal. As the charring temperature rises above 320 C the creosote will be flashed off and carried out the vent with gases leaving the charring vessel. By 350 C all of the creosote will have been driven out of the char.

Laboratory work showed that when charred under the ideal conditions Black Alder wood would produce about 8% of creosote by weight of char. Maple wood when charred would yield about 6% of creosote by weight of char.

When you burn a solid form of carbon there is almost no water produced during the combustion of the charcoal in the powder. When liquid hydrocarbons burn they usually produce some water as a product of combustion.

To prove or disprove this theory, creosote was extracted from samples of charcoal. Added to powders and shot in a gun. Without the addition of the creosote the powders produced a dry fouling. With creosote added to the same powder the bore fouling would feel moist and oily.

When the Swiss powder arrived on the U.S. market some of it was extracted with acetone and shot in a gun along with un-extracted powder. Velocities were identical. But the acetone extracted powder sample gave a dry fouling in the bore while the un-extracted powder gave the desired moist-oily fouling.

While the author was working on this aspect of charcoal properties he passed the results on to a man who was a curator at the Hagley Museum And Library. Who also doubled as a technical advisor to Goex as long as Goex continued to operate the Moosic, PA black powder plant formerly owned by duPont. Technical backing from the Hagley Museum And Library was part of the sales agreement when Gearhart-Owen purchased the business from duPont. The Hagley Museum And Library having been set up by duPont.

In passing my work on to the gentleman at Hagley there were no restrictions placed on who he could pass the information onto.

So around 1990-91 the information on the creosote in the charcoal being the key, or secret, to a moist-burning black powder was passed onto Goex at Moosic.

When the first production run of the CTG was released to the public it drew a number of comments. Some from those in black powder shooting that I had also shared my findings with. When one opened a can of the CTG powder and took a whiff of what was in the can the nose was assailed with a strong odor of creosote. But not the type of creosote produced by the burning or charring of wood. The type of creosote used as a wood preservative that is derived from petroleum.

As one buckskin clad grizzled buckskinner was heard to comment. "What are you guys using for charcoal these days, old railroad ties?"

Whereas the creosote obtained from wood distillation is a bonus in charcoal destined for use in black powder the petroleum derived creosote has something of an opposite effect. It will not promote moist-burning in a powder and will contribute to a tar-like bore residue in the gun.

Goex quickly pulled the creosote out of subsequent production runs.

That ended the idea of any high-tech magic additives in black powder.

Then there were also claims regarding a new grain coating that would act to improve the accuracy of the powder when shot in a gun.

A quick look at powder grains under the microscope showed that the CTG powder actually had two coatings of graphite on the grains. To look back at the magazine article quoted in the opening of this paper. "The granulation size is, for the lack of a better term, 2-1/2 G and seems to have a bit more luster to it.

This two items sort of go hand in hand.

One part of the author's project involved looking at powder grain edge round and grain surface smoothness. How well a black powder is "polished" will promote better accuracy. That is not to say that a poorly polished powder cannot be made to shoot accurately. Just that the shooter has to work harder at getting the powder to shoot accurately.

When one looks at a can of black powder, at the grain size designation, there will be a small “g” behind the letters F.

Some will tell that this “g” stands for graphite, or graphite coated grains. Another person will tell you that it stands for “glazed” powder. But then they will also think that the graphite coating on the powder grains is the glaze.

The glaze forms on black powder grains when they are dried and polished in a polishing barrel. A large mass of grained powder tumbling in a rotating barrel. Pressure and friction rounds the grains’ edges in addition to smoothing and compacting the surfaces of the grains. This thin skin, or glaze, that is formed on the surfaces of the grains influences the rate at which the charge ignites. Heavier glazes giving slower more uniform flame spreading through the charge.

So the high-tech grain coating that was also claimed for the CTG powder is nothing more than a second coating of graphite applied during a second trip through the polishing barrel.

Graphite coatings are used to keep powder grains free flowing. Without any graphite on the surfaces the grains will begin to slowly bond together during storage even when the powder is dry.

In looking at various lots of CTG from the Moosic plant the CTG was consistently finer than the regular 2Fg production. If you passed them through a 20 mesh screen you normally saw about 5% more of the CTG passing through the 20 mesh screen. In addition, under the microscope, the CTG would be more rounded and with smoother grain surfaces. This suggested that CTG was nothing more than regular 2Fg place back into the polishing barrel for a bit of extra rounding of grain edges and smoothing of grain surfaces and then a second coating of graphite applied. The first coating of graphite is somewhat dull in appearance while the second coat takes on a silvery sheen.

What we see in the original claims made for the CTG powder is a powder manufacturer that does not understand the technology of the product they are producing. This is typical of the black powder manufacturers around the world. They produce powder the way they have done for long periods of time. But lack a basic understanding of the finer points in powder manufacturing. Shooters think that the various black powder manufacturers have a good understanding of the technology of black powder manufacturing which is simply not true.

CTG sells for a dollar a pound more than the regular production powder and think they are getting a premium powder. The CTG never really took over the market for black powder cartridge shooting.