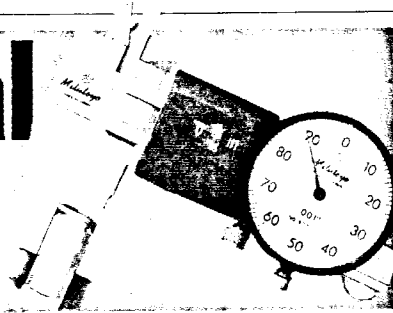


Technical Side

BY BOB GILES



Freezing Barrels for Better Accuracy

Is this New Accurizing Process Revolutionary—or Ridiculous?

About a year ago we heard about a new process to improve barrel accuracy. This one was very different—it involved cooling the barrel to about MINUS 300 degrees F. That's cold, very cold, and the idea is that stresses in the barrel due to manufacturing either the material or barrel itself are relieved by the process. Now various snake-oil treatments for barrels have been around just about as long as guns themselves, so we wondered whether this process was for real or just another promoter's dream.

Let me say right now that it sure looks like there is something good going on here. We had a .223 gun in light varmint weight that has always shot inside an inch for five-shot groups. It's a good gun with a barrel made by the late P.O. Ackley himself. So it wasn't without some trepidation that we agreed to run a test using this gun. After all, we naturally had some worry that we would end up with a ruined barrel.

We spent quite a bit of time trying to devise a test that would be meaningful. One that wouldn't involve more time and ammo than was available, and yet could show us if the cryogenic process had any potential. We ultimately decided to fire five consecutive groups of five shots

with the load that has given this gun the best accuracy in the past (24.5 grains of Accurate 2230 behind a Hornady 52-grain HPBT bullet). We would then remove the barrel from the action and send it off for the cryogenic treatment. When the barrel came back we planned to fire enough shots to be sure that everything was working properly and then shoot five more consecutive five-shot groups to compare with the first string. We were prepared to change ammunition if the results suggested that we might improve the group size, but as it turned out we didn't have to change anything.

The first step in the test procedure went quite well. The five groups fired from a bench rest at 100 yards in our tunnel averaged 0.592 inch extreme spread, with 0.346 inch being the best and 0.775 inch being the poorest. That's about as good as this gun has ever shot and we were worried that it didn't leave much room for improvement. Unscrewing this barrel really took some dedication to the testing process because I really wondered if I would ever see the gun shoot this well again. As I write this I've learned that the barrel can be processed along with the receiver for a small extra charge.

The word cryogenic really applies to any process involving cooling but it is usually reserved for processes involving the very low temperatures produced with liquid nitrogen or other liquefied gases. A company named 300 (degrees) Below Inc. in Decatur, Illinois, handles the work. The treatment process is much more complicated than simply throwing the barrel into a bucket of liquid nitrogen and screwing it back on the gun.

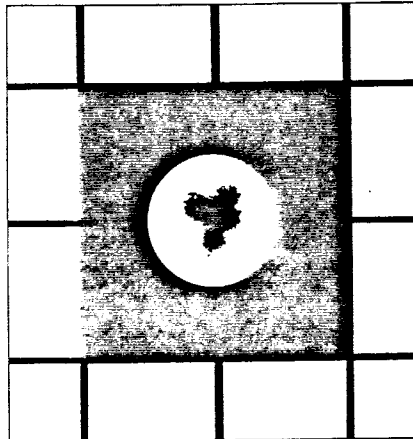
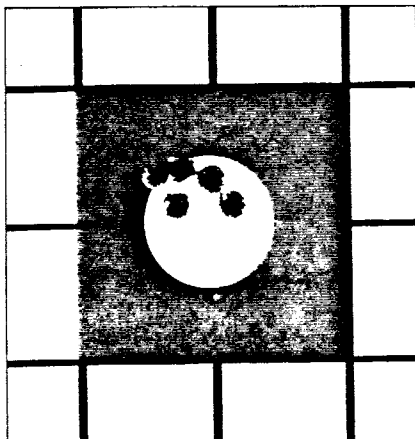
When they get to the processing plant, the barrels are unpacked, put into a protective sock and packed into a deep freeze-like box along with 100 other barrels. The entire processing is computer controlled to a fraction of a degree. A conventional mechanical refrigeration system starts cooling the box (down to about 100 degrees below zero) and then liquid nitrogen is carefully evaporated into the box to continue the cooling process. The liquid nitrogen never comes into contact with the barrels, just the very cold gas. After about 12 hours on a precise cooling schedule, the box reaches minus 300 degrees and is held at that temperature for another 18 to 40 hours. After this cold soak, the temperature is gradually allowed to rise so that after another 12 hours or so the barrels are back to room temperature.

But it isn't over yet. The barrels go into an oven and are reheated to about plus 300 degrees and cooled again to room temperature over the course of another six to eight hours. To put the plus-300-degree temperature into perspective, very few people will keep their hand on a barrel that's 150 degrees. The 300-degree temperature is a lot hotter than the barrel is going to get from shooting.

The barrel then gets packed and is returned to the customer. Our barrel was gone for about three weeks. When it returned, there was nothing in its appearance to show that anything had been done. It didn't LOOK any different at all. Of course, the process isn't for appearance but if the barrel had come back looking like it had been used for prying open manhole covers we wouldn't have been happy.

A short session with the barrel vise had the gun ready for the second half of the test. After 10 or 15 shots we were satisfied that the scope blocks were re-mounted correctly and the metal parts had seated properly in the stock. We were ready to go for "record."

I have to admit that I still was pretty skeptical that this wasn't going to show much. The first group out of the gun measured 0.313 inch and that opened our eyes a bunch. The average for the five



These targets show how cryogenic treatment turned one rifle from a good shooter (left) to a really good shooter.

groups was 0.424 inch, with the worst being 0.707 and the best being a superb 0.156 inch. Three of the five groups after the treatment process were better than the average "before" group. The statistical folks can have a field day with this kind of data, but the results certainly demonstrate that there is something to the cryogenic stress-relieving process.

The folks at 300 Below tell us that they have now treated about 3,000 barrels, including rifles, pistols and even shotguns. Naturally, most of the barrels are from (or for) guns that would be good shooters under any circumstances. I can't see bothering to treat a barrel that won't stay in six inches at 100 yards, but 300 Below has some data that even these barrels can be improved by the process.

The current cost for the treatment process for rifle barrels is about \$49.50. If you strip off the trigger assembly you can send the barreled action and have the whole assembly treated as a unit. That will add \$10 to the cost. Anyone who is interested in more information can contact 300 (degrees) Below, Inc., Cryo-Accurizing Division, Dept GA, 1160 South Monroe, Decatur, IL 62521. Their phone is (217) 423-3070. 🐾

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