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In the study of shotshells, perhaps the least understood segment of this most interesting subject is that of the all-metal shell. While our modern plastic-tubed shells were preceded by paper-tubed shells, it is not true that all-metal or brass shells preceded those with paper tubes. Early on in the development of breech-loading arms, self-contained ammunition was bound in paper or linen. In shotguns, the earliest shell that the modern shooter would instantly recognize had a brass head, a paper-tubed body and an external primer.

At the same time – the latter half of the nineteenth century – well-traveled sportsmen were taking to the field with 12, 10, 8 and even larger bore rifles that used brass shells. These self-contained shells were sturdy, easily transported and waterproof. “Why?” asked many a waterfowling hunter, “can’t we have a brass shell, too?” Waterfowlers, to a greater extent than most others, felt the need for a waterproof shell. Actually, the paper shells of the day were intentionally moisture-resistant to varying degrees. The absorption of moisture into the shell was a very real concern, as it could dilute the effectiveness of the black powder, and the paper shells could swell to the extent they could not be chambered. Still, the waterfowlers had a point and while manufacturers continued to develop more moisture-resistant paper shells, attention was turned to the development of all-metal shells as well.

There are components galore for loading brass shells with either black or smokeless powder.

The earliest attempts simply substituted drawn brass tubes for the paper tubes, affixed them to the brass heads and turned them in to secure the over-shot wads. Wax or shellac was typically used to waterproof the shell mouth. Drawn, one-piece shells followed as did the use of other metals such as zinc, aluminum and to a lesser extent steel. One particularly interesting attempt employed a thin paper shell with a zinc liner actually longer than the paper. The zinc liner was then crimped in a pie or star crimp that we would recognize today. All these shells, however interesting and effective, had their
This Model 1897 Baker external hammer gun is fairly typical of its ilk.
drawbacks. The brass shells had a larger interior capacity than paper shells and required larger wads. True pie-crimping could only be accomplished by the ammunition factories, and the ever-increasing cost of metals would eventually make the price prohibitive.

The concept of the all-brass shell attracted the attention in England of Dr. Charles J. Heath, at one time president of the British Waterfowlers’ Association. Dr. Heath developed two precepts of shotgunning science that, in differing forms, are still with us today. One was a “chamberless gun” that might be thought of as an early attempt at backboring. Dr. Heath reasoned that with the thin brass tube shotshell there was no need for the heavy forcing cone required of a gun shooting the paper shells of the day and that it could be essentially removed and the bore enlarged to much the same size as the interior of the brass shell. Of course, such a shell would require much larger wads and, for waterfowlers, hold more powder and shot. At the same time such loads would not be suitable, perhaps even unsafe, for use in a gun of standard dimensions. Few chamberless guns, as Dr. Heath envisioned, were ever built.

The second development of Dr. Heath was what today we think of as the “high density-low velocity” principle in which more and larger shot were paired with a lower-than-normal velocity for a very effective and useful load. In the 12-gauge, 2½-inch brass shells, Dr. Heath was able to push as much as 2 ounces of BBs at 800 fps with what he claimed to be astonishing results.

All the above, admittedly a skimming of the highlights of the era, took place in England and Europe. In the U.S. similar activities flourished but with a decidedly American flavor.

In the 1878 E. Remington & Sons catalog of breechloading rifles, shotguns, pistols and ammunition, the company had this to say:

“Of late years, the reloading brass shells for shotguns have come much into use, and we recommend every sportsman to have some of them on hand, as they can always be loaded in places where it might be difficult to obtain paper shells. They are also better at taking a larger wad in the same size chamber, and giving more penetration, and are less liable to injury by wet... We are prepared to furnish metal shells that we know are suitable for our guns. They are made with a solid head, or flange, and fitted with a steel cone, upon which the primer is placed, and exploded by the firing-pin of the gun. These shells are put up in boxes containing twenty-four shells, with primer extractor... for re-
moving exploded caps; also in boxes containing ten shells, without extractor."

In comparing the above, in England and western Europe, shotshells were typically purchased from an ammunition manufacturer or from one’s gunmaker. In the latter instance, the gunmaker purchased empty shells, paper or metal, and loaded them for his customers, often to the customers’ specifications. In the less settled America, the need to be able to load, or reload, one’s own shells far from any settlement was of paramount concern.

Fifty years later, in 1928, Maj. Charles Askins, in his *Modern Shotguns and Loads*, was rather dismissive of both chamberless guns and brass shells: “Whatever the chamberless gun may or may not do in the way of patterns, it is not a practical arm. We are not going back to black powder nor to brass cases, which must be hand-loaded and carefully handled as was true fifty years ago.”

In spite of such feelings, which were no doubt shared by many, the all-metal shell held on. In the first annual edition of *Handloader’s Digest*, edited by John T. Amber of *Gun Digest* fame and published in 1962, are depicted tools for loading brass shells. The

Above left, the CBC shell is drawn brass and accepts a large pistol primer. Right, the RMC shell is turned from solid brass and cut for a 209 battery cup primer.

The RCBS Cowboy Shotshell Die set is designed to handle the CBC shells.
All well and good, you say, but surely this is still the dim past. Not quite. Today there are at least two sources of brass shotshells for U.S. reloaders and two sets of reloading dies. There also are components galore for loading brass shells with either black or smokeless powder.

The first all-brass shotshells are headstamped “CBC (and the gauge)” and are manufactured by Companhia Brasileira De Cartuchos in Brazil and imported into the U.S. by MAGTECH Ammunition Co., Inc. of Minnesota (1-800-466-7191). They are available in 12, 16, 20 and 28 gauges and .410 bore. Other sizes are manufactured but may not be available here. These are drawn brass, one-piece shells with the primer pockets protruding into the shell interior. Shell length is nominally 2 1/2 inches. The 12-gauge shells on hand measure from 2.440 to 2.465 inches. In type, they are very similar to the thin brass shells of Dr. Heath's time and the Remington shells manufactured into the mid-twentieth century. The primer pockets are, or were, sized for the 6.45mm (#56 Tupan) primer. In the early years of their availability, we were informed to use small pistol primers. At some time this changed, at least for those shells imported into the U.S. Current CBC shells take a...
The old Lee Loader kit for shotshells is ideal for reloading brass shells. The Decapper & Base, right front, will remove primers from both the RMC and CBC shells.

large pistol primer. An attempt to learn more about the change was unsuccessful.

The second all-brass shotshell is manufactured by Rocky Mountain Cartridge, LLC of Cody, Wyoming. These shells are turned from solid brass and have the same interior capacity and shape as a typical straightwalled paper shell. Primer pockets are cut for the modern 209-style battery cup primer. Dave Casey, proprietor, makes these shells to order, and gauge or bore and length are up to the customer. Casey will also cut primer pockets to accept large rifle primers, but he does not recommend it. Twelve-gauge shells on hand are 2½ inches (2.625 inches) in length. Headstamp is "RMC (and gauge)."

When it comes to tools available to assist the reloader in loading brass shells, there are two. The first is from RCBS, called the Cowboy Shotshell Die, part number 99060, and is available only in 12 gauge. It consists of a simple aluminum die body with a screw-in steel sizing ring, a removable, steel decapping assembly, a crimping insert and a steel lock ring. The die comes with a shellholder that fits any standard metallic press ram. The die body is threaded 1⅛x12 and will fit most presses with a removable die bushing. This tool is designed to be used with the CBC shell and shot charges only. There is no seating stem for ball or bullet loading. Priming and depriming are done with the die set on one’s metallic press. Powder, wad and shot insertion are either done by hand or on a shotshell reloading press or some combination of both. If the brass shell is to be crimped, the Cowboy Shotshell Die is again employed.

The second reloading tool is from C-H Tool & Die Company of Mt. Vernon, Ohio. This is an old-line reloading tool company now under the able direction of Dave Davidson. The C-H tool is available in most any gauge and shell length. It is a two-die set, all steel with aluminum locking rings. With 1⅛x12 threads it too fits most any metallic press with a removable die bushing. Its shellholder fits standard reloading tool rams. The first die is an inside-tapered, full-length sizing die – as opposed to RCBS’s sizing ring. The second die is a seating and crimp die. It includes an adjustable seating plug to hold the overshot wads, bullet or roundball securely positioned as the shell is crimped, much like a modern metallic seating/crimping die. Probably most C-H customers who purchase this die set are big-bore rifle shooters and their projectiles are roundballs rather than shot. The set will work equally well with CBC or RMC shells, but depriming and repriming of the latter must be done elsewhere, as the standard metallic presses will not accommodate 209 primers nor will the hole in the shellholder allow them to be removed.

Most who use brass shotshells with shot loads will never have a need to size the shells, but the
use of the shellholder when working with the CBC shells is a great help. Those who load bullet or ball will need the C-H tool both for seating and crimping. Here, sizing may become an issue but it is readily handled with these fine dies. Whenever shells are to be sized, they must first be lubed as is done with metallic cases.

Before we proceed, we need to review some general topics in more detail. The first is crimping. Both tools allow for crimping. The RCBS tool has a progressive crimp beginning at five degrees and progressing to 20 degrees. The C-H tool has a .175 inch radius crimp. Most crimp data found in old documents suggests crimps commonly ran from a .125 radius to .175 inch. This all refers to a turn in or slight roll crimp. In metallic cartridges, a turning in of the case mouth is referred to as a roll crimp, where the case mouth grips the bullet at the cannellure, in a crimping groove or sometimes over the bullet ogive. In some rimless handgun cartridges that headspace on the case mouth, a straight taper crimp is employed. In paper or plastic shotshells, a roll crimp is one in which the shell mouth is turned in 180 degrees to secure an overshot wad. The more commonly seen star or pie crimp is one in which the shell mouth folds inward to meet at the center obviating the need for an overshot wad. Neither of these latter two can be used with the brass shells under discussion.

To properly crimp a brass shotshell calls for a consistent brass height, something that might not exist with the CBC shells and might be beyond the capabilities of most case trimmers. Even more important is a consistent wad column height and a means of keeping pressure on the overshot wad as the crimp is being applied. This is easily accomplished with the C-H tool with its seating plug. With the RCBS tool, a dowel or something similar must be inserted through the top of the die and held in place against the overshot wads as the ram is raised and the crimp applied.

When a bulleted round is crimped, as the projectile leaves the case or shell, the crimp is automatically removed. In a brass shotshell, however, as the round is fired, the overshot wad is forced out of the mouth of the shell and the shot follows, but without exerting enough force on
the crimp to remove it. Subsequent reloading of the shells is then compromised as neither reloading tool has the ability to remove any leftover crimp.

In an attempt to remove the crimp, after trying this approach to loading brass shotshells, several methods were tried. A plumb bob, found at any hardware store, can be used. The ones I’ve seen lately were chrome-plated steel, were tapered and of a size to handle anything up to 12 gauge. Ballistic Products, Inc. (1-888-273-5623) makes tools for reshaping paper and plastic shells, but they are made of wood and unsuitable for this purpose. A new hull conditioning tool called a Spin Doctor is made of aluminum and showed some promise, but the brass shells scored the aluminum tool. It was designed to be used in a drill press and still can be – just don’t turn on the press. A rawhide or plastic mallet, gently applied, is better. Perhaps better still would be to cut a short dowel to length and drill a hole to accept the tool shank. Slide the dowel over the shank and tap the dowel with a mallet. After numerous such attempts, the conclusion was reached that if loading shot in brass shotshells, it is best not to crimp at all.

Not only do we put less wear and tear on the shell mouths, but wad column height becomes unimportant. Adhesives ensure that the overshot wads stay in place in the field. In a range environment, a tight-fitting overshot wad may prove sufficient, but gluing in the overshot wads is a much surer approach. I have come to rely on two-part epoxy, applying it to the edge of first one, then another, overshot wad of .025 or .030 inch. Each is seated separately. Epoxy can readily be cleaned up with rubbing alcohol before it hardens. After firing, any residue inside the shell can be removed with a chamber brush or a brass brush of the next larger gauge. Others have employed silicone adhesive or simply a hot glue gun.

A second subject is priming. Most of us first trying brass shotshells will not have access to either reloading tool. We’ll simply do our reloading the old-fashioned way – by hand. Beginning with a hard, flat surface, we place a primer, anvil up, position the shell over it and with a dowel in the shell, tap the shell with a mallet until the primer is seated. This works with either shell, but when priming the CBC shell, because the primer pocket protrudes into the shell interior, the dowel must be drilled to accept the primer pocket.
To effect the removal of the shell from the shellholder in such an eventuality is likely why the RCBS shellholder has a strategically placed trough cut in it. A heavy-handed attempt to seat it pocket. A \( \frac{3}{4} \)-inch hole is sufficient if properly centered. Depriming is another matter. A nail with its point filed down has been used for a century or more. Lee Precision sells a Decapper & Base in .22 and .30 caliber for depriming military cases with crimped-in primers. The .22 caliber (Part No. 90103) is ideal for decapping either of these shells.

Reloaders with a metallic press using the CBC shell may opt to purchase one of the die sets (12 gauge only from RCBS; any gauge from C-H) for on-press priming and depriming. Those with a shotshell reloading press of any gauge can use it for depriming and priming the RMC shell – just remove the sizing ring on the deprime station first, if necessary.

Things can go wrong, however. Seating a large rifle primer in the CBC shell will result in a primer protruding from the shell head. A 5⁄16-inch hole is sufficient if properly centered. Depriming is another matter. A nail with its point filed down has been used for a century or more. Lee Precision sells a Decapper & Base in .22 and .30 caliber for depriming military cases with crimped-in primers. The .22 caliber (Part No. 90103) is ideal for decapping either of these shells.

To effect the removal of the shell from the shellholder in such an eventuality is likely why the RCBS shellholder has a strategically placed trough cut in it. A heavy-handed attempt to seat it anyway (large rifle primers are taller than large pistol primers) or to remove it can have a very unpleasant result. Likewise, there are minor differences in some 209-type shotshell primer diameters, and there is no “give” in the brass RMC shells.

The moral of all this is that until you have perfected your priming and depriming procedures, work with spent primers! With the RMC shells, even a dab of case lube on the outside of the battery cup at first would not be uncalled for.

“Reloading Brass Shotshells” will be continued in Handloader No. 267 with loading procedures and loads.