



SAR Exclusive Industry Profile

For the first time in history, Bushmaster Firearms of Windham, Maine has allowed outside photographic equipment into their facilities. Small Arms Review was invited to visit Bushmaster Firearms to chronicle portions of the manufacturing process of their famous version of the Black Rifle.

In some parts of the world the word “Bushmaster” will conjure up images of large, venomous snakes. A member of the pit viper family, it is known for its lethality and is found in Central and South America. In circles of firearms enthusiasts and for members of the military and law enforcement, the same word is synonymous with quality AR-15 and M16 type rifles that are manufactured in the northern most state in New England.



Company History

Originally incorporated in 1973, Bushmaster Firearms concentrated their manufacturing efforts on the Bushmaster Arm Pistol, a survival gun designed for pilots during the Vietnam War. The Arm Pistol, along with a companion rifle known as the Bushmaster Assault Rifle utilized some parts from the M16 rifle family while employing an op-rod system similar to that used by the Soviet AK-47.



Above Right: The sign that hangs in the work area in the Quality Control building.

Below, Right: Sights are checked for uniformity and “adjusted.”

Following a company reorganization in 1980, Bushmaster Firearms, Inc. started to focus their efforts in selling AR-15 and M16 parts and eventually began to manufacture their own line of AR-15 and M16 replacement parts for sale. In 1983, the first complete rifles bearing the Bushmaster name were manufactured in Portland, Maine. Five years later the company relocated to their current location in Windham, Maine. Bushmaster Firearms, Inc. now owns a 52,000 square foot facility at their 19 acre business park and employs over 80 people at this location.

In 2002, Bushmaster established their Western Division in Lake Havasu City, Arizona. This division of Bushmaster Firearms, Inc. is dedicated to manufacturing a Carbon Fiber series of the AR-15 and M16 type firearms. This Western division now has over 25 full time employees and occupies 12,000 square feet to house their state of the art injection molding and CNC equipment.

Quality First

With so many companies currently competing in the AR-15 and M16 market, our first question was an obvious one; "What makes Bushmaster stand out in such a large market?" Their answer came as fast as the question was asked and was simple enough: "Q-U-A-L-I-T-Y." Even though they have an extremely diverse product line of quality products, the general feeling at Bushmaster is that their quality control is their best selling point. When we asked for an example, we were directed to their Qual-



Above: The barrel manufacturing process involves several steps. A) The stock material is drilled, button rifled and stress relieved. B) It is then turned and head spaced. C) The barrel is next chrome lined. D) The gas port is drilled and the front sight is indexed. E) After passing several quality control checks between each stage, the barrel is finally phosphate finished.

ity Control (QC) building and allowed to sit in as their barrels underwent their normal series of tests.

Bushmaster barrels are manufactured from Chrome-Moly Vanadium Steel or from 416 Match Grade Stainless Steel. Each process of manufacturing has to undergo numerous levels of testing in order to progress to the next stage of manufacturing. The barrel stock material is first drilled, button rifled and stress relieved. After undergoing a series of QC tests, all barrels that pass are

turned to their intended profile and head spaced. Following another round of QC testing the barrels are chrome lined and tested again. All barrels that pass this stage go on to have the gas ports drilled and front sights indexed followed by a phosphate finishing.

In between each of these steps, the barrels are bore scoped and air gauged. When a barrel is bore scoped a technician runs an extremely powerful microscope all the way down the inside of the barrel. An image is projected onto a



Above: In between each stage of barrel manufacture the barrels are tested using several methods. Left to Right; Air Gauge testing, Bore Scoping and lastly, tested utilizing an Eddy Current.



Above: Final assembly of the Bushmaster rifle is completed in many different stages utilizing several work stations. Bushmaster employs over 80 people in their Windham, Maine facility and they have several people who specialize in each aspect of manufacture, production, quality control, assembly and finishing.

monitor and the technician actually visually inspects the inside of the barrel looking for flaws or abnormalities. In the process of testing the barrels with an air gauge, the barrels are pressurized and an indicator rod is slowly run through the length of the barrel watching for a drop or increase in pressure, indicating either a tight area or loose area not visible to the eye even while bore scoping. Any deviation outside of Bushmasters strict specifications will cause the barrel to “fail” and it will never see the next step in the manufacturing process.

To go a step further, even though the barrels undergo Magnetic Particle Testing they are also checked utilizing an Eddy Current. Magnetic Particle Testing is a process fairly common to AR-15 and M16 Barrel manufacturing and most people may have noticed the “passing marks” on their barrels in the past. The familiar “CMP” mark often seen would indicate Colt Magnetic Particle Testing and “BMP” would indicate Bushmaster Magnetic Particle Testing and so on. Magnetic Particle Testing is a process that checks the integrity of ferromagnetic parts by looking for microscopic cracks. During this testing, when a crack is present, an amount of magnetic flux will gather at that spot attracting magnetic particles allowing the flaw to be discovered. Testing with an Eddy Current goes even farther and allows the operator to electronically “look through” the metal checking for structural integrity, case depth and hardness while also allowing the ability to “see” cracks, pits, seams or otherwise invisible surface flaws. Finally, head spacing is checked on 100% of the Bush-



Above & Below: Initial forgings of Bushmaster upper and lower receiver assemblies on the left with their machined counterparts to the right. After machining is done they still must pass another stage of inspection before being finished with a baked dry-lube film and Hard Anodized with a Nickel Acetate final seal coat.



master barrels rather than just a random sampling.

Bushmaster utilizes a similar quality control regimen on all of their parts including their lower and upper receiver sections as they progress from raw material to the initial forgings to their finished and assembled states.

Once all of the individual parts have passed every step of quality control and final finishing, it is time for their assembly. All firearms assembly is completed in house with each gun going through several "assembly stations." Each station specializes in one specific area of assembly and as the firearms ascend towards completion they end up at the test-firing portion of the facility. Every Bushmaster firearm is laser bore sighted and test fired before being shipped. Every semiautomatic firearm is fired a prescribed number of rounds in rapid succession and every round must feed and fire perfectly in order to pass this final test and go on to inventory for shipping. The test-firing requirement for each full automatic firearm is similar to this, with more rounds fired and the firing is also done in full auto.

A Diverse Product Line

Since the early days of the Arm Pistol, Bushmaster Firearms, Inc. has introduced and currently includes an enormous number of items in their product line, with over 50 different firearms and several hundred parts and accessories available for sale. From the typical AR-15 and M16 style firearms used as the primary service weapon of the United States Armed Services for over 40 years, to the newest Carbon Fiber firearms technology, Bushmaster strives to have something for everyone. Their current offerings range in caliber from .22LR variants all the way up to .308 (7.62x51mm NATO) models and range in size from pistol configurations up to their 24-inch heavy barreled varmint series.

The Bushmaster M17S Bullpup Carbine may be one of the most unique firearms in the Bushmaster product line. The M17S affords the shooter a 21.5 inch barrel on a package with an overall length of only 30 inches. It is a short



Above: Every Bushmaster rifle is test fired prior to being shipped.



Above: Several racks of finished Bushmaster rifles await shipping.

stroke piston, gas operated semiautomatic rifle and is chambered in 5.56x45mm. It utilizes standard AR-15/M16 magazines.

As well as servicing the U.S. commercial firearms market, Bushmaster Firearms, Inc. currently manufactures arms for U.S. law enforcement, governmental agencies and foreign military forces. Short-barreled rifles, law enforcement and post 1986 dealer sample machine

guns are all available with prior BATFE (and at times, State Department) approval.

Bushmaster Firearms Inc.

999 Roosevelt Trail
P.O. Box 1479
Windham, Maine 04062
(800) 883-6229
www.bushmaster.com

