Metal Injection Molded Breech Face of a Taurus Revolver

By: Evan Thompson, Arizona Department of Public Safety, Flagstaff, AZ 86001 United States

Keywords: bead blasting, breech face, casting, individual characteristics, MIM, metal injection molding, subclass characteristics

ABSTRACT

A .357 Magnum caliber Taurus revolver was submitted to the laboratory along with a fired cartridge case. The revolver's pebbled breech face raised the question -- was this particular surface unique or was it was another example of class or subclass characteristics? Information from Taurus regarding the manufacturing processes indicated that the characteristics were not subclass.

A Taurus model "Protector Poly" revolver (**Figure 1**) was submitted to the laboratory in like-new condition along with four unfired "PMC 357 MAG" cartridges and one "PMC 357 MAG" fired cartridge case. One portion of the examination was to determine whether or not the fired cartridge case was fired in the firearm.

The firearm's breech face had a pebbled appearance as well as a visible casting line above the firearm's firing pin aperture (**Figure 2**). These two observations raised the question of whether or not the breech face exhibited unique individual characteristics or just subclass characteristics.

Traditionally, the majority of firearms have a breech face that has been machined, imparting unique, individual characteristics to the head and primer of a fired cartridge case (**Figure 3**). However, this author had not previously seen a breech face surface like the submitted Taurus.

A letterhead fax was set to Taurus Manufacturing, Inc., in Florida, requesting information about how the frame was produced and whether the breech face area receives any further finishing before being coated. Taurus responded in a timely manner, stating that *"*[...] *The metallic frame is from metal injection molding with blue finish (oxide black).* [...] *Yes, it receives machining*[,] *and it's glass microspheres blast*[*ed*] (**Figure 4)** [1]*."*

These statements established those characteristics transferred from the breech face to the fired cartridge case were indeed individual in nature [2]. Mikrosil™ casts of both the breech face and firing pin impression markings helped document the identification (**Figures 5**).

Conclusion

In addition to individual characteristics which are imparted to traditionally finished breech faces, breech faces that are finished by glass microspheres, or similar types of blasting material, impart a surface of microscopic individual characteristics. Depending on the cartridge case material and/or pressures developed, these individual characteristics may be transferred to the head of a fired cartridge case.

References

[1] Taurus Representative, Personal communication.
[2] Coody, A.C., "Consecutively Manufactured Ruger P-89 Slides," AFTE Journal, Vol. 35, No. 2, Spring 2003 , pp. 157-160.

Figure 1: Taurus Protector Poly revolver

Date Received: May 9, 2014
Peer Review Completed: June 24, 2014

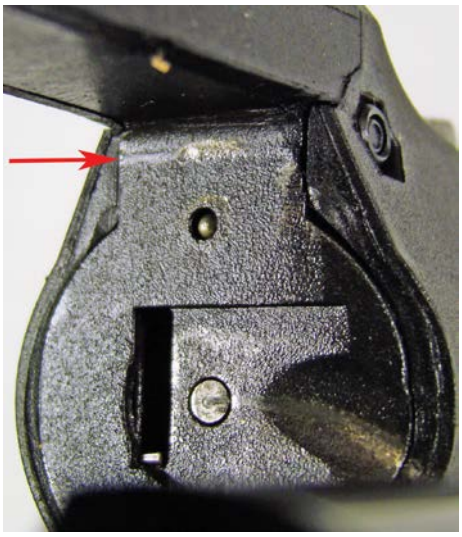

Figure 2: Breech face of Taurus Protector Poly revolver (red arrow at casting line)

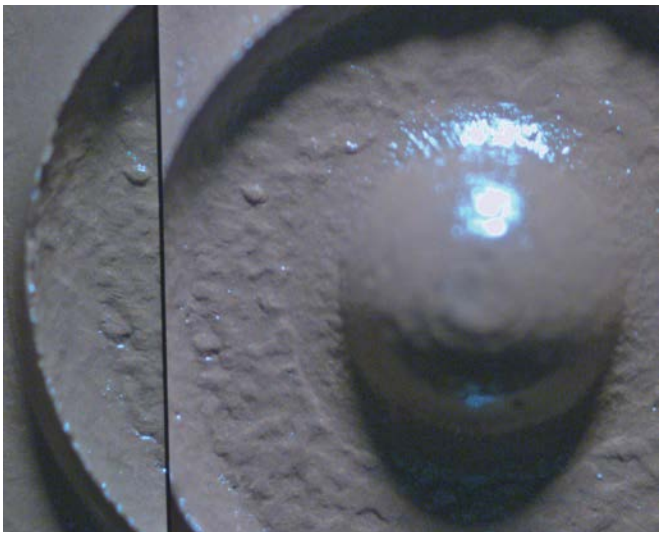

Figure 4: Comparison of casts of breech face marks on fired cartridge cases

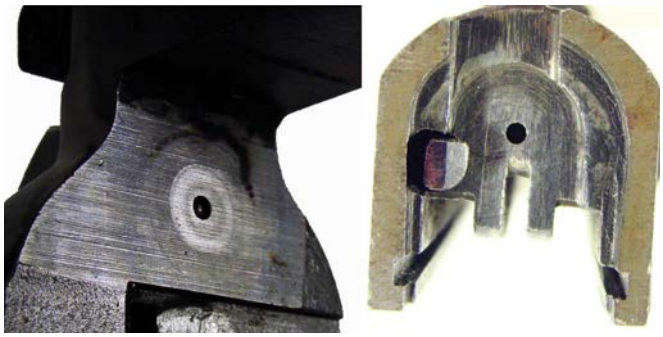

Figure 3: Examples of machined breech faces in other firearms

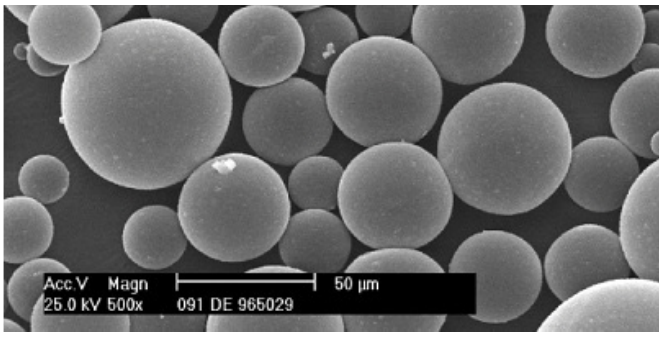

Figure 5: Microspheres[†]

[†]Image from: http://free-stock-illustration.com/microspheres+glass+bubbles?image=1296480944