



INNOVATIVE
SCIENCE, INC.

Novel Saboted Polymer Tipped Ammunition for Sporting Applications

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Introduction

The utility of side arms in military engagements is questionable given the widespread use of body armor. Innovative Science Corporation has devised ideas for ammunition capable of operating in current side arms that possesses superior penetrative qualities for defeating body armor fielded by today's modern armies.¹ As a prelude to this new military small arms ammunition we disclose another; albeit, simplified novel small arms ammunition that our company recently developed for use in sporting applications.²

Not long ago, Hornady[®] introduced a new type of ammunition named LEVERevolution[®]. The novel feature of this ammunition was the incorporation of polymer tipped bullets that could undergo deformation and prevent contact firing of cartridges superimposed upon one another in a tubular magazine upon recoil. This ammunition was also purported to possess improved ballistic characteristics and variants of it for use in revolvers was also introduced. Taking Hornady's approach one step further, Innovative Science Corporation desired to improve upon the ballistic characteristics by incorporating the use of a sabot in combination with a polymer tipped bullet. Specifically, reducing the coefficient of friction experienced by the projectile would possibly allow for enhanced velocity which in turn could lead to flatter trajectories among other improvements. It was decided that two approaches would be explored in context of the sabot concept. One approach relied on traditional plastic sleeve type sabots (e.g. Knight[®] High Pressure Sabots) in which the bullet is seated. The second methodology relied on use of bullets in which the plastic portion of the sabot constitutes an integral part of the bullet itself (e.g. Powerbelt Bullets[®] Copper Series Aerotip[™]).³

Experimental

All sabot rounds used IMR[®] 4198 powder. Each round was fired from a bench rest using a Marlin[®] Model 1895 rifle. The velocity of each round was determined using a Shooting Chrony[®] Beta Model five feet from the muzzle. Average velocities that are reported are the average of a minimum of 3 replicates.

Results and Conclusions

Preliminary results for sabot rounds are provided in Table 1 in comparison to standard reloads and Hornady[®] LEVERevolution[®] ammunition. Dramatic improvements in velocity were witnessed for both sabot approaches.³ In all cases perceived recoil was much less than standard reloads or LEVERevolution[®] cartridges. It should be noted that in all runs the bullet weight of each sabot round was lower in comparison to that used in the reloads or LEVERevolution[®] cartridges. One method to further increase the velocities of the sabot rounds is to use a thermoplastic of lower surface energy such as poly(tetrafluoroethylene) or ultra high molecular weight polyethylene. Use of optimized powders may also further increase the resultant velocities. In conclusion the combination of a sabot with a polymer tipped bullet result in ammunition of superior ballistics than currently exhibited by LEVERevolution[®] cartridges.

Table 1. Comparison of Average Velocities.

ID	IMR [®] 4198 (grains)	Bullet Wt. (grains)	Avg. Vel. (fps)
Std. Rel. ^a	—	450	1,599
HLR ^b	—	325	1,878
KHPS ^c	45	175	2,148
TCSW ^d	50	200	2,294

- a. Lyman[®] 457406 cast lead bullet.
- b. Hornady[®] LEVERevolution[®].
- c. Knight[®] High Pressure Sabot with flat point cast lead bullet.
- d. Thomson/Center[®] Shock Wave[®] (ATK) with polymer tipped bullet.

References

1. This technology is available for development under a joint development agreement or similar R&D agreement.
2. The information provided in this publication constitutes a public disclosure of this and related inventions. Parties interested in obtaining the patent rights to this invention should contact Dr. S.P. Lewis at Innovative Science Corporation.
3. Additional testing on this approach is required. Velocities of approximately 2,200 fps were readily obtained for 225 grain .45 caliber Copper Series Aerotip[™] bullets out of .45-70 cartridges fired from a Marlin[®] Model 1895 rifle. Innovative Science Corporation has ideas for improved versions of bullets in which the sabot is an integral part of the projectile. Parties interested in obtaining the intellectual property rights in this area should contact Innovative Science Corporation.