Innovative Award Winning Technology

WASP™

Less Lethal Impact Munitions

Kinetic Impact System Information

INTRODUCTION

The use of lethal force by military and police agencies is both politically and socially unacceptable in many of the every day circumstances faced by agency personnel. Moreover, lethal force is inappropriate for crowd control and for detention facility applications. To that end, agencies around the world deploy less-lethal ammunitions to manage these types of situations. Less-lethal munitions are designed to provide positive alternatives to the use of lethal force or deter unwanted behavior. They are also useful in crowd control and targeting specific, aggressive, or uncooperative individuals.

However, in many cases, existing less-lethal ammunitions have proven to be impractical, inaccurate, or ineffective and require a great deal of improvements and specialized training in order to provide a positive operational outcome at the crisis site.

From the comprehensive understanding developed from examination of existing non-lethal projectiles weaknesses and deficiencies, a new less-lethal projectile was developed by way of scientific principles and rubber technology. This innovative, lead free projectile has precise shot placement capabilities, unmatched consistency, and will not freeze in cold climactic conditions (i.e. become very rigid and potentially lethal) therefore, can also be used by military personnel in a wide range of operational temperatures and environments worldwide.

For more information, visit:
www.wasplesslethal.com

APPLICATION

The single most important evaluation attribute of a non-lethal kinetic energy projectile is accuracy. Other characteristics of the projectile are subordinate to its ability to impact selected targets. WASP™ impact projectiles are the most accurate tool of its kind, but also allow a greater deployment distance while maintaining the kinetic energy sufficient to provide incapacitation or the distraction of a non-compliant, aggressive subject making it ideal for pain compliance, area denial, and crowd control operations.

PROGRAM GOAL

The WASP™ program goal was to design and manufacture less-lethal ammunitions, in multiple calibers, with precise shot placement capabilities, for use in a wide range of operational temperatures and environments, by way of scientific principles and rubber chemistry / technology.

PROGRAM OBJECTIVES

WASP™ less-lethal program objectives are to:

1) Provide a projectile safe for use in extreme hot and cold temperatures.
2) Provide a direct fired, impact projectile with supreme accuracy and shot placement capabilities at ranges commensurate with current US DOD rules of engagement and beyond.
3) Provide military, police, and corrections agencies the novel capability to temporarily incapacitate subjects by maintaining the kinetic energy sufficient to create pain compliance at extended ranges.
4) Provide projectiles in various calibers for use with existing weapon systems so as to encourage military and public safety personnel use at nominal cost.

"A study of existing less-lethal ammunitions was carried out to identify both material and design deficiencies. Looking at these products, it was evident that the existing ammunition's chemical makeup was one of the factors that lends to their poor performance and frequent ineffectiveness."

TECHNICAL APPROACH

Keeping in mind the wide variety of mission profiles that military and public safety personnel are called upon to carry out, WASP™ impact projectiles are currently available in three calibers for three different weapon systems.

Caliber	Weapon System	Operational Range
20 Gauge	Pistol	Up to 50 feet
12 Gauge	Shotgun	Up to 150 feet
.50 Caliber	Rifle	Up to 300 feet

"The main limitations to all projectiles studied are their lack of effectiveness at extended ranges".

RESEARCH METHODOLOGY

A study of existing less-lethal ammunitions was carried out to identify material and design deficiencies. In an effort to analyze the causes of their deficiencies and failures, it was necessary to investigate the core problem associated with the type of materials being used for this application. The material composition, Shore "A" hardness, and dynamic mechanical analysis are all important parameters in understanding their failures. Looking at these products, it was evident that the existing ammunition's chemical makeup was one of the factors that lends to their poor performance and frequent ineffectiveness.

The main limitations to almost all projectiles studied are their lack of effectiveness at extended ranges and their increase in rigidity (i.e. lethality) in cold climatic conditions. Additional drawbacks include poor accuracy and low energy transfer, particularly with single or multiple ball round-shaped projectiles, which makes them ineffective.

SOCKS

The 12 gauge bean bag system is currently the most commonly used impact munitions platform used in policing. Sock type bean bags are made of lead pellets encased in a flexible woven material with a stabilizing tail made of fabric. These single projectiles are generally fired from a 12 gauge shotgun. While the tail improves accuracy, one limitation is that they are not accurate at medium and/or extended distances. To be successful, officers must be in close proximity to the target. The requirement of being close to the target significantly intensifies the risk to officers and increases the prospect that the confrontation might deteriorate to the point where lethal force is required. *(National Institute of Justice Impact Munitions Report, 2004).*

Testing of sock rounds show that they frequently do not open fully when fired, leading to impacting the target while still partially folded or rolled. This has caused serious injuries in the past and both sock type and bean bag rounds have been associated with fatal accidents. *(Charles, 2002 and Dahlstrom, 1998).*

"Testing of sock rounds show that they frequently do not open fully when fired. This has caused several injuries in the past."

Problems typically associated with sock or bean bag rounds are:

- Inaccuracy
- Tearing or breaking of fabric
- Presence of environmentally toxic lead

WASP™ productivity improvements over socks are exceptional. WASP™ projectiles posses flight characteristics physically impossible for sock or bean bag rounds to duplicate. As a result, WASP™ 12 gauge projectiles have the capacity to deliver unique impact characteristics with precision accuracy and remarkable impact energy levels at distances that would leave a sock or bean bag skipping in the dirt. No bags to unfold, no tearing or breaking of fabric, and because WASP™ impact projectiles are 100% lead free, there is no risk of spilling toxic lead pellets into the environment.

RUBBER FIN STABILIZED

These projectiles are made of thermo-set elastomers. These single rubber projectiles are generally fired from a 12 gauge shotgun or compressed gas weapon. While the fin stabilization improves the accuracy at extended ranges, their typical mass is less than ten grams. Representative problems associated with fin stabilized rounds are:

- Low energy transfer
- High fabrication costs
- Very small tolerances in design dimensions
- In cold climactic conditions these projectiles "freeze" i.e. become very rigid and could be lethal.

MULTIPLE RUBBER BALL

These projectiles are made of thermo-set elastomers. These multiple rubber projectiles are generally fired from 12 gauge or 37/40 mm weapons. Range is dependent upon the number of projectiles, caliber of the projectiles, and amount of propellant. Representative problems associated with multiple rubber ball rounds are:

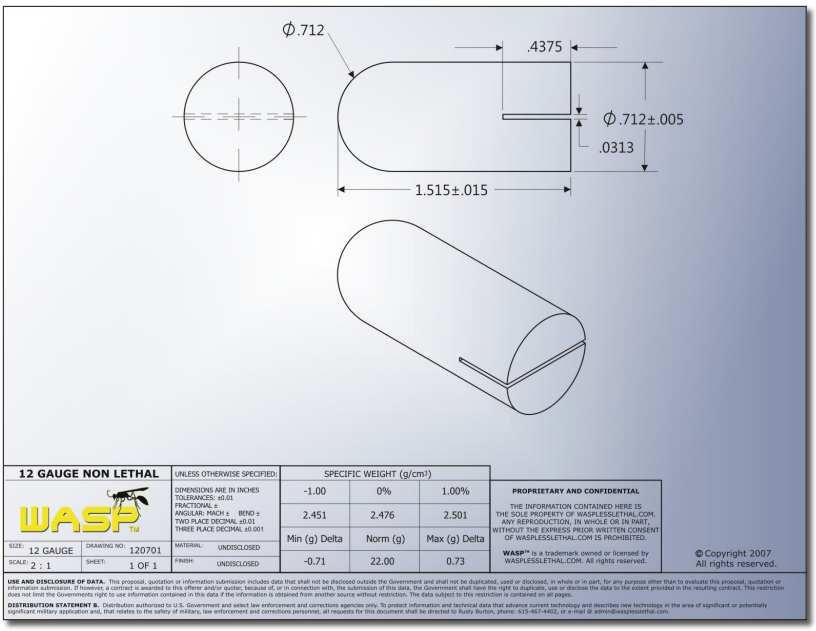
- Projectiles are indiscriminate, hence have little or no accuracy
- Very low energy transfer, as low mass projectiles loose their kinetic energy very quickly.
- Very small tolerances in design dimensions
- In cold climactic conditions these projectiles "freeze" i.e. become very rigid and could be lethal.

DESIGN OF NEW PROJECTILE

"For projectiles, a lower density invariably translates into poor performance in terms of accuracy."

When designing the WASP™ projectile, several design criteria were considered. Such criteria included the maximum tolerable energy force per unit area that the body can withstand before a serious injury or death takes place. *(Ijames, March 1998).*

"There are optimum material density requirements for any bullet, lethal or less-lethal. Use of a light weight projectile causes many problems including low energy transfer to the target."



"WASP™ impact projectiles are 100% lead free, there is no risk of spilling toxic lead pellets into the environment."

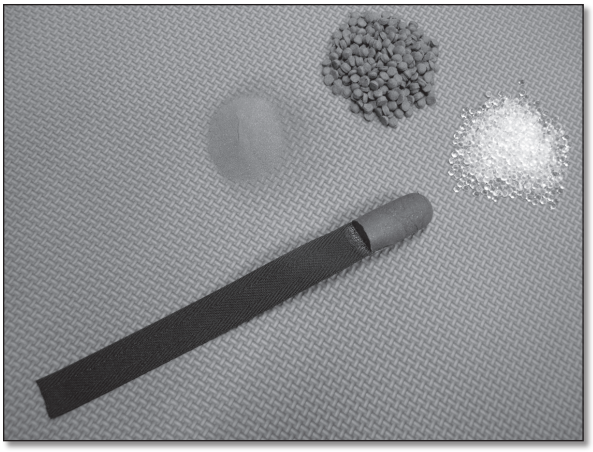
Other criteria included the weight and density of the projectile, as there are optimum material density requirements for any bullet, lethal or less-lethal. Use of a light weight projectile causes many problems including low energy transfer to the target. Additionally, lighter weight projectiles have to be fired at much faster velocities to provide sufficient energy transfer, which requires a propellant powder that would burn faster. The combination of fast powders and lightweight projectiles can dangerously exceed recognized gun chamber pressure standards.

For projectiles, a lower density invariably translates into poor performance in terms of accuracy. Furthermore, a lower density bullet composite cannot be brought up to their desired weight by increasing their size due to dimensional limitations imposed by the standard gun chambers into which the bullet must fit.

DEPLOYMENT & TACTICS

As first responders, patrol officers very often have the opportunity to quickly counteract, defuse, or totally neutralize combative or aggressive subjects before a situation escalates to a much more serious situation. When used properly, the aggressive use of less-lethal weapons early in standoff confrontations almost always results in less severe injuries to both suspects and officers as well as a significant decrease in reduced liability lawsuits and an improved public image for the law enforcement and corrections agencies.

"WASP™ projectiles will not freeze in cold temperatures or get soft and pliable in extreme hot temperatures".



This unique, lead free projectile is comprised of a specialized composite that allows WASP™ projectiles physical properties to remain unchanged within a temperature range of -58° to 212° F. This means WASP™ projectiles will not freeze in cold temperatures or get soft and pliable in extreme hot temperatures. This provides agency personnel the ability to deliver extremely unique impact characteristics with supreme accuracy and unmatched consistency in a multitude of environmental conditions and temperatures.

By combining the rugged reliability of the AR15/M16 style weapons with a WASP-50™ less-lethal projectile, the WASPCAR™ kinetic impact system generates devastating, less-lethal impacts at ranges up to ninety (90) meters.

MANUFACTURING CAPABILITIES

WASP™ is a commercial off-the-shelf (COTS) less-lethal munition currently available to military, law enforcement & corrections agencies worldwide. The newly constructed, state of the art loading facility contains the newest, most technologically advanced shot shell loading equipment available today and, like the WASP™ projectile itself, brings a whole new level of safety, performance, and reliability to the international less-lethal community.

WASP™ 12 gauge impact projectiles are loaded under the standards and procedures outlined by US DOD 4145 and US DOD 6055.9 as well as in compliance with MIL-SPEC, DCMA control and inspection procedures.

CONCLUSION

WASP™ cartridges are less-lethal, low-hazard, non-shrapnel producing munitions designed to inflict less than lethal trauma and are intended to confuse, disorient and distract a person(s) who may be a potential threat to friendly force personnel. These devices are usable by military forces in protection of key facilities, security or crowd control. Field commanders and soldiers will have effective non-lethal capability thereby increasing flexibility in the application of force during military, law enforcement patrol or SWAT operations.

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