

MBAD 822- Marketing

Group Assignment



SOLEMN DECLARATION - GROUP ASSIGNMENT

Solemn declaration by students

We hereby declare that the assignment which we herewith submit to the North-West University as partial completion of the requirements set for the MBA degree, is our own work.

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ASSIGNMENT: MBAD822 - Case Study 4

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1. Introduction

Humans have used weapons for centuries to hunt animals for their meat and to defend themselves from enemies. The earliest evidence of weapons dates back to 400 000 BC in the Germanic regions, where the Schöningen people used spears mainly for hunting purposes. (Marshall, 2009). These spears weren't throwable and had to be used in close quarters to the animal or enemy. From there weapons developed to allow it to be used over a distance and not in close quarters. The main reason for this was to assist with hunting. Examples include the boomerang, darts and the bow and arrow. Up until 5300 BC, weapons were mostly used for hunting, but as the world population expanded so did confrontations between different groups of people increase.

The first weapons developed specifically for warfare was metal daggers and swords in the Bronze age. These along with other weapons were used until the invention of gunpowder in China between 800 and 1300 AD. This invention led to the invention of the cannon, musket and explosive devices. These allowed projectiles to be projected over further distances than before. (Anon, 2019). Development of their firearms continued and will keep on continuing. Today we have a variety of guns namely: shotgun, rifle, handgun, semi-automatic and automatic. All of them allow a projectile to be propelled out of a barrel at a high enough speed to fulfil the desired task (Carlucci & Jacobson, 2018).

In South Africa the main use of firearms aligned with the world-wide use over time. In the early stages it was mostly used for hunting, then mainly for warfare and defence in the apartheid's era up until the demilitarisation between 1994 and 1997 (Cock, 1998) and today it has a variety of uses namely: hunting, sport shooting and defence/protection (self, private security and government police/army) (Carlucci & Jacobson, 2018).

As mentioned, a gun propels a projectile. This is done by the combustion of a propellant in an enclosed space behind the projectile. When the propellant combusts, gas is created as the propellant ignites. The gas is trapped behind the projectile and as more gas is formed the pressure increases. The projectile is the only component that can move and is propelled forward through the barrel by the pressure (Carlucci & Jacobson, 2018). This simple gun system is illustrated in Figure 1.

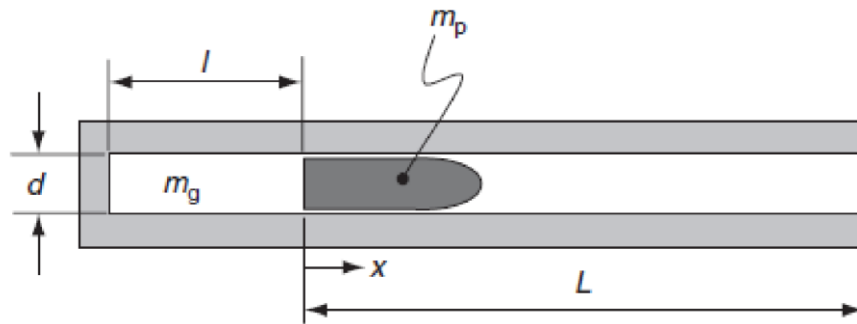


Figure 1: Simple gun system

With a musket the propellant used to be inserted in the front of the barrel followed by the projectile, but with modern guns a bullet is used to house the propellant in an enclosed space behind the projectile. The gun holds the bullet in a chamber at the back of the barrel and has the mechanism to load, fire and dispense a bullet. A bullet consists out three components (James, 2010):

- **Cartridge case:** Brass combustion chamber which holds the primer, propellant and bullet. It is durable and can withstand the force created when propellant combusts.
- **Primer:** A small metal cap in the centre of the head of the cartridge that produces a spark when struck by the firing pin which ignites the propellant.
- **Propellant/powder:** Composition of chemicals which stores chemical energy. This is released during combustion when ignited.
- **Bullet:** The projectile which is propelled out of the barrel by the combustion of the propellant to fulfil the desired task.

There are three stages in the firing sequence namely (James, 2010):

Stage 1: Trigger is pulled and the firing pin strikes the bullet and the primer sparks as seen in Figure 2.

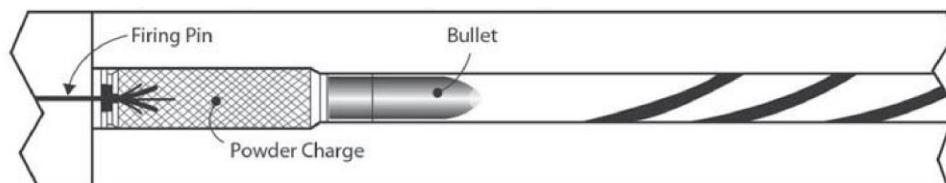


Figure 2: Stage 1 of firing sequence

Stage 2: The propellant is ignited and combustion causes increase in pressure as seen in Figure 3.

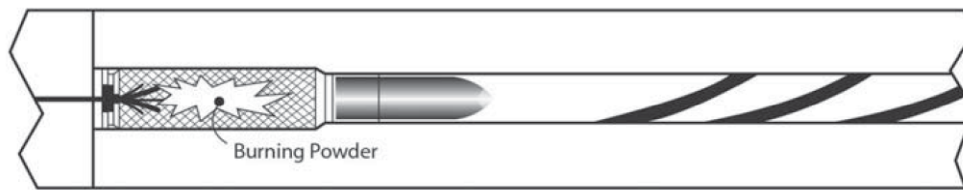


Figure 3: Stage 2 of firing sequence

Stage 3: The pressure propels the projectile out of the barrel as it is the only way to escape as seen in Figure 4.

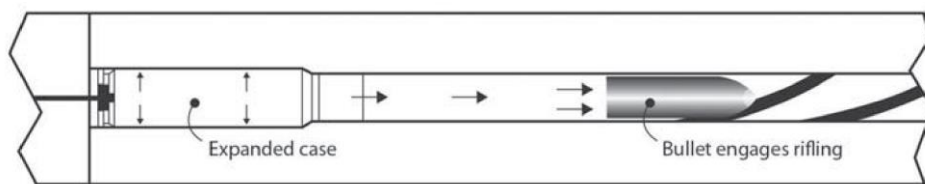


Figure 4: Stage 3 of firing sequence

Ammunition can either be bought over the counter already loaded and ready to shoot based on the type and calibre of the gun, purpose and price class. The price varies in accordance to the quality of the ammunition. The most important factor being the consistency of the ammunition (propellant, bullet, etc) to allow the user to achieve consistent accuracy and performance. Or, the different components can be procured and the ammunition loaded by the user (McHale, 2014).

When reloading ammunition, the following selection criteria is used for the different components (McHale, 2014):

- **Cartridge:** selected based on the type and calibre of the gun.
- **Primer:** selected based on gun type, size and metal cap thickness
- **Bullet:** selected based on type and calibre of gun and desired purpose
- **Propellant:** selected on type and calibre of gun and velocity requirements

There are many propellants on the market. It is critical that the correct one and amount is used. They are designed with different burning rates. The burning rate is the speed at which it burns and rate pressure is created. The quicker it burns; the quicker pressure is created and vice versa. This is illustrated by the pressure curve in Figure 5. This is the most important factor when selecting propellant is largely based on the type of gun. For short barrel guns like a handgun, quick burning propellant is used to get maximum

benefit/velocity before the bullet leaves the barrel (McHale, 2014). As for rifles, slower burning propellant is generally used to continuously combust and create pressure as the bullet moves down the barrel. In this case the pressure curve does not spike as quick and high, but is flatter.

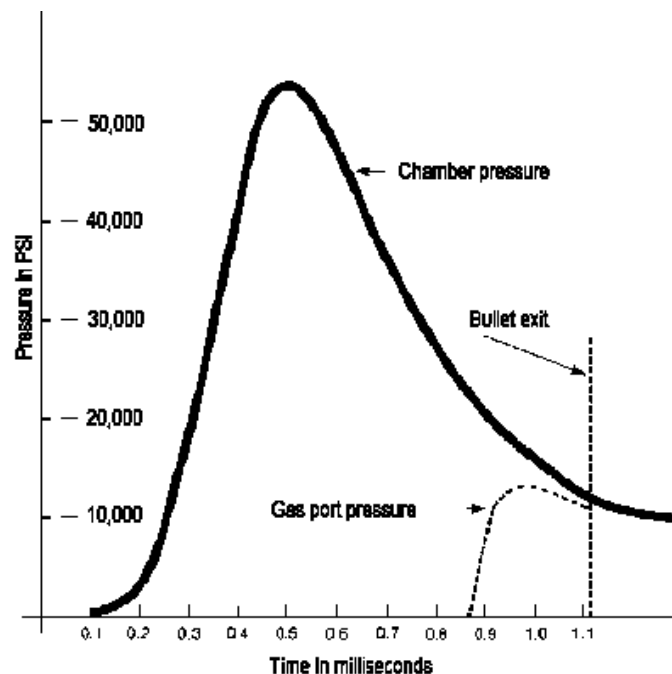


Figure 5: Gun propellant combustion pressure curve

In South Africa, re-loaders only had the option of using Somchem propellants until 2018 (<https://peregrinebullets.co.za/gun-powder-info/>). Somchem started off as a private company, was later bought out by state-owned arm manufacturer Denel and in 2008 a German company Rheinmetall bought a 51% majority share (Marais, 2020). Although they now operate as Rheinmetall Denel Munition, they still produce Somchem propellants along with ammunition and other explosive devices.

2. South African propellant - Market Analysis

2.1. Introduction to Somchem

What is known today as Rheinmetall Denel Munition (Pty) Ltd, is the current beneficiary to what was known in the old South Africa, prior to 1994 as Somchem (Martin, 2019). The well-known munition brand Somchem, went through a series of acquisitions during a course of almost 50years (Lottering, 2005). In the early 1960's Somchem, a division of AEI (African Explosives and Chemical Industries) penetrated the business environment

with a private concern, and within a short period of time created interest from the Armaments Corporation of South Africa (Armcor), up to the point where Armcor bought Somchem from AECI in 1971 (Rheinmetall, 2020). It was until 1992, when Armcor went through a restructuring of the corporation, it split the organisational structure into two primary divisions namely; Armcor Procurement Agency of the Department of Defence and Denel (Pty) Ltd. Denel (Pty) Ltd at the time was the holding company of four defence manufacturing companies within South Africa namely; Somchem, Swartklip, Atlas and Naschem (Rheinmetall, 2020). Rheinmetall Denel Munition (Pty) Ltd (RDM) came into existence September, 2008 when Rheinmetall Defence, a German arms company bought 51% majority shares in the organisation (Rheinmetall, 2020). Somchem primarily operates from their Somerset West facility, with a strong drive to uphold their vision of being, “a world leader in solid propulsion and energetic material applications” (Rheinmetall, 2020). Rheinmetall Denel Munition (Pty) Ltd is South Africa's largest and leading arms and ammunition manufacturer (Martin, 2019).

2.2. Market segments

As stated in this document; Denel (Pty) Ltd, incorporated the military arms and defence manufacturing companies of South Africa. The Rheinmetall Group, an international leading enterprise that specialises in mobility (automotive) and security (defence) technologies, saw the innovation, world renown quality and exponential room for organisation growth should they incorporate this into their portfolio. In the following section, a discussion follows on the primary focused segment of Rheinmetall Denel Munition (Pty) Ltd, for their world renown - Somchem brand.

2.2.1 Ammunition manufacturers

It is to be made known that there is a monumental difference between Ammunition and Arms manufacturers locally and globally. These two segments have their own market size, capacity and operate completely independently of each other.

The key characteristic of the attractiveness and complexity of any business segment of operation is generally the market size. The market size of a segment is a good indication of the activity, opportunities and growth across specified regions or countries (Sambit, 2020).

In a nutshell; ammunition is the primary source of firepower for rifles, mortars, handguns, shotguns, artillery weapons, missiles, landmines, rockets and many more munition weapons (FORTUNE, 2020). According to FORTUNE (2020), a global news-house; state that despite the COVID-19 pandemic there is still an increase in ammunition and arms dealings in the world. The main contributions or assumed endowments to this occurrence lies in rising local and global political unrest, fear of change in more stringent gun and ammunition control and augmented up-taking of shooting sports (recreational and hunting activities) (GVR, 2020).

In South Africa today there are quite a few ammunition manufacturers that meet the needs for the commercial and independent market, but due to the historical rise, environment and running's of ammunition and arms manufacturing in South Africa, RDM still holds more than 95% of the ammunition market in South Africa (Sambit, 2020). With a South African ammunition production market size in excess of \$200 million, below are a list of some of the top competitors and indirectly an illustration of their influence in the segment (dun&bradstreet, 2020):

Table 1: List of some of the ammunition manufacturers in South Africa and their turnover for 2019

Company	Location	Sales Revenue (2019)
RHEINMETALL DENEL MUNITION (RF) (PTY) LTD	Somerset West, Western Cape, South Africa	\$153.23M
TUGELA HARDEWARE CC	Vanderbijlpark, Gauteng, South Africa	\$5.57M
HOT POWER WAPENS CC	Krugersdorp, Gauteng, South Africa	\$3.48M
KALAHARI ARMS CC	Johannesburg, Gauteng, South Africa	\$3.48M
HI-TECH ARMS AND AMMO CC	Benoni, Gauteng, South Africa	\$3.48M
RIPPEL EFFECT SYSTEMS (PTY) LTD	Pretoria, Gauteng, South Africa	\$2.04M
DELTA FIREARMS (PTY) LTD	Johannesburg, Gauteng, South Africa	\$0.70M
FIREARM SUPPORT SERVICES (PTY) LTD	Kempton Park, Gauteng, South Africa	\$0.36M

From the table above, it is evident that RDM still has the monopoly in the design, development, manufacture of large to small calibre ammunition families in South Africa.

Due to the nature of the organisational structure (international shareholders) and world renown ammunition quality, expansion and supply into the global markets will increase the threshold on local and global market share (Rheinmetall, 2020).

As a global leader in propellants (Somchem), one will always have to closely evaluate the global environment of trade. This will also act as a benchmark for future dealings and bagging orders from agencies with multi levels avenues (governments) to help strengthen your global footprint (FORTUNE, 2020).

The global ammunition market size for 2019 was in excess of \$20.4 billion, and there is an expected growth of 3.9% from 2020 to 2027 (GVR, 2020). One of the fastest moving sectors within the ammunition segment is the small calibre ammunition 5.56mm - 9mm.

2.2.2 Reloaders (Sport and Hunting)

There is an embedded culture of precision and quality amongst South Africans ammunition reloaders, one can almost go to the expend and call it patriotism, that should propellants have a larger than 2% Average Burn Rate (Velocity) between ammunition packs or loads the manufacture should withdraw that batch from the market (Marais, 2020). This culture developed under the legislation of Somchem`s term and conditions incorporated into the PMP (Pretoria Metal Pressing) ammunition range (Marais, 2020). To put this standard into perspective, one (hunters, recreational sportsmen) often comes across US and global propellant manufacturers, stating that it is advisable to start loads with a new batch of propellants, there might be differences in burn rates between different batches of a specific brand (From 2% - 10%).

South African law states; that propellant manufacturers (for many years only Somchem had this information available) should openly publish the following information for every batch of propellant manufactured (Marais, 2020):

- The burn rate (velocity) per packing/load discrepancy in relevance to the reference load.
- Flame Temperature
- Specific Energy
- Heat of explosion

- Ratio of specific heats
- Co-volume per mass
- Propellant density (weight per volume)

A practical example will be the latest batch of S365 propellant from Somchem (Marais, 2020):

- This propellant is dedicated to the 30-06 calibre rifle
- The information on the packaging states that the burn rate has a maximum of 0.7% velocity deviation from the last five batches in relevance with the Vihtavouri reference propellant.
- Somchem also states the actual pressures vs velocity attained with Barnes Bullets, this assists local reloaders to calculate start and maximum velocities presented by the specified propellants.

For reloaders there is nothing as frustrating as when you struggle with inaccuracy and reliability of your propellant loading, and you have expert service support that can assist you on demand - an advanced service Somchem offers with their reloading charts.

2.2.3 Arms manufacturers

Arms and ammunition are interlinked segments of the weapons industry. Every weapon makes use of a specific propellant, and depending on the occupation determines the demand for propellant (dun&bradstreet, 2020). The arms trade is a global trade that consists of manufacturing and selling of weapons, R&D and military technologies (NSSF, 2020). The following question will always be an open-ended question; “How many weapons, small - large calibre are being manufactured a year in the world?” We will never know.....!!! (NSSF, 2020). If you thought the ammunition industry globally is big, just in the USA the arms industry contributes over \$60 billion to their economic activities (NSSF, 2020). Elaborating on this statement is that the global arms trade (value) is in excess of grasp (NSSF, 2020).

The characteristics of the arms manufacturing segment is so complex and cannot be captured within the limits of this assignment, and include but not limited to the following sectors; Land-based weapons, Aerospace Systems, Naval Systems and Cybersecurity Systems.

Turning the scope away from the global market to the local market, again South Africa has a few arms manufacturers, with primary revenue stream as supply to the government (military), but again due to historical running's Denel (Pty) Ltd - now Rheinmetall Denel Munition (Pty) Ltd has the market share in development, design and manufacturing of all local arms in South Africa (Rheinmetall, 2020). South Africa is a net importer of arms and to a certain extent a series of ammunitions, the limiting factors being the types of weapons and equipment in use. There is no formal data or information available on exports of South African propellants to the USA arms and ammunition industry, this could be due to lobbying against it to protect and develop their own industry (MinutemanReview, 2020).

3. Somchem – Current condition and prospects

3.1. Current situation

It's the 3 September 2018, Monday morning in Somerset West - and out of the blue Boooooom.....!!!!

An explosion at Somchem!!! An explosion at Somchem!!! Everyone in close proximity yelled. Emergency personnel from the City of Cape Town`s fire department, struggled for hours to secure and get control of the fires that were caused by an explosion at what we know today as Rheinmetall Denel Solutions (News24, 2018).

This event dramatically changed the business plan, marketing approach, market share and business life cycle for Rheinmetall Denel Munition (Pty) Ltd - Somchem.

In co-occurrence to the phenomenon above, the best illustration of RDM current operational situation is to look at some of the internal determining factors and the external determining factors:

Internally;

- It is no secret that 90% of South African state-owned entities are on the down-fall with regards to corruption and sustainability. RDM is not spared by this occurrence and in fact is looming in retrenchment and turnaround strategies (Tilburg, 2020).
- Probably the biggest gap competitors had been waiting for; the explosion phenomenon that occurred in 2018, which had a crippling effect on production and obviously supply.

- Global leaders in the innovation and technological advances of their propellant range, still hold upper ground on intellectual property (IP) and optimisation of manufacturing and operational unit processes.
- RDM has a diverse product portfolio, with majority the shareholder being external to the South African borders, trade and legislation - international influence could be of critical help.

Externally;

- Lobbying of exports and manufacturing policies - like human rights considerations on specified products and restrictions to countries that are in conflict.
- There is room for exponential growth in global markets, if it could be penetrated.

3.2. Future prospects

3.2.1 Market trends and dynamics

As with organisation, future prospects mainly rely on the dynamics of Market Drivers, Limitations within the market and Opportunities that will present themselves.

From the above analysis there is an expected global growth for ammunition (propellant small to larger calibre) development and supply of more than 3% (USD revenue). Fuelling this increase are sectors like; Increasing safety - uncertainties in territorial areas and rights, fight against terrorism and increase in military spending globally (Sambit, 2020). Globally the military sector dominates the utilisation of ammunition and is expected to do so for many years to come. The unique selling proposition as vision for upcoming and leading manufacturers would be to engage in R&D developments and activities to launch and streamline multifunction and lightweight munitions (FORTUNE, 2020).

For Somchem as a propellant brand it is evident that the global market drivers and opportunities are endless - and opportunities will basically present itself, the limitations lie mainly in the “support-vehicle” as guide and structure to acquire certain scenes and settings for headway. Somchem has over 50years of innovation, excellence, customer “patriotism” and quality tucked behind their brand, in an ever adopting and evolving business world, change of a brand name is highly inadvisable.

4. Competitor analysis

As mentioned above, until 2018 Somchem was the only propellant users could obtain legally. It was also the preferred propellant due to its price and consistency between

batches. Today users can use propellants from a variety of manufacturers. Two of the competitors for Somchem in the rifle propellant market are IMR and VihtaVuori.

IMR is a subsidiary of the privately owned Hodgdon Powder group who operate from the USA. They manufacture propellant for handguns, rifles and muzzle loaders. It is a large, productive and efficient company and their products are widely and consistently available in South Africa. Reloaders can either go through the hassle of importing propellant directly from them on their website or from local dealers.

VihtaVuori is a privately-owned company operating from Finland. They produce propellant for handguns and rifles. It is also a large, productive and efficient company and their products are widely and consistently available in South Africa. Reloaders can only buy from local dealers and not directly from them.

A summary of the analysis between Rheinmetall Denel Munition (Pty) Ltd, IMR and VihtaVuori is summarised in Table 2.

Table 2: Competitor analysis

	1	2	3
Company name	Rheinmetall Denel Munition (Pty) Ltd	IMR	VihtaVuori
Parent Company	* Rheinmetall Waffe Munition * Denel (Pty) Ltd	Hodgdon Powder	NA
Core business	Ammunition and propellants	Propellant	Propellant
Location	South Africa	USA	Finland
Products	* Handgun and rifle propellants * Ammunition * Bombs	* Handgun and rifle propellants * Muzzleloader powder	Handgun and rifle propellants
Market (Propellant)	* Ammunition (sport and hunting) * Reloading * Bisley market	* Ammunition (sport and hunting) * Reloading	* Ammunition (sport and hunting) * Reloading
Online presence	Outdated website	* Website * eCommerce	Website
Competitive advantage	Price Batch consistency	Availability	Availability

The advantage that Somchem propellant has over the other two companies is its price and batch consistency, but due to their recent manufacturing troubles their propellants are difficult to find as a result of inconsistent supply. The other two brands are widely and freely available in South Africa.

Somchem's slow, medium and fast-burning rifle propellant offerings are cheaper than similar offerings from both of IMR and VihtaVuori. The comparison is based on price information from Safari and Outdoor. Table 3 is a summary of the comparison between Somchem's slow burning S365, IMR's 4350 and VihtaVuori's N550. The S365 is more than half of the price per gram than the other two products.

Table 3: Slow-burning product price comparison

Slow-burning				
Brand	Product	Price	Weight (g)	R/g
Somchem	S365	R390.00	500	R0.78
IMR	4350	R839.00	454	R1.85
VihtaVuori	N550	R759.00	454	R1.67

In the medium-burning category the S355 is also more than half of the price of the other propellants as summarised in Table 4.

Table 4: Medium-burning product price comparison

Medium-burning				
Brand	Product	Price	Weight (g)	R/g
Somchem	S355	R419.00	500	R0.84
IMR	4064	R999.00	454	R2.20
VihtaVuori	N140	R999.00	454	R2.20

The same goes for the S321 in the fast-burning category as summarised in Table 5.

Table 5: Fast-burning product price comparison

Fast-burning				
Brand	Product	Price	Weight (g)	R/g
Somchem	S321	R289.00	500	R0.58
IMR	4198	R669.00	454	R1.47
VihtaVuori	N120	R999.00	454	R2.20

In all three burning speed categories the Somchem products are the cheapest by more than 50%. However, it must be noted that none of the three Somchem propellants were available on any of the online gun and ammunition stores in South Africa.

Somchem propellants are cheaper and their burn-rate between batches have always been consistent which made them the preferred propellant in South Africa (Marais, 2020), but due to inconsistent supply users are now willing to pay more for a product that is consistently available.

5. Reloading propellant

Weapon ballistics is divided into three groups based on stage of the firing sequence namely (Carlucci & Jacobson, 2018):

- **Interior ballistics:** Interaction between the ammunition and the gun up to the projectile leaving the barrel.
- **Intermediate ballistics:** Motion of the projectile as it leaves the barrel
- **Exterior ballistics:** Movement of the projectile from the end of the muzzle until it hit the target.

The propellant used is of great importance since it has an effect on both the interior and exterior ballistics. Propellant is selected to fit the pressure rating of the barrel, the barrel length and rifling. Reloaders cannot just use any propellant. They have to use propellant designed for the type of rifle in the amounts prescribed by the manufacturing to ensure the safe usage of the rifle (James, 2010).

The three elements that affect the external ballistics are (Carlucci & Jacobson, 2018):

- Gravity causes the bullet to drop. The heavier the bullet the faster it drops
- Air resistance slows the bullet down, the bigger the bullet the faster it slows down.
- The velocity determines the distance bullet travels until it hits the ground. The propellant determines the velocity of the bullet.

Figure 6 is an illustration of the trajectory of a bullet as a result of the three elements mentioned above. The line of sight of the scope is straight towards the target. When the bullet leaves the barrel, it is below the line of sight, then it crosses the line of sight and is above the line of sight and then it crosses it again on its way down as a result of gravity. Rifles are sighted in or zeroed at specific distances. For example, if a rifle is zeroed at 100m it means the distance at which the bullet crosses the line of sight on its way down is at 100m as shown in Figure 6.

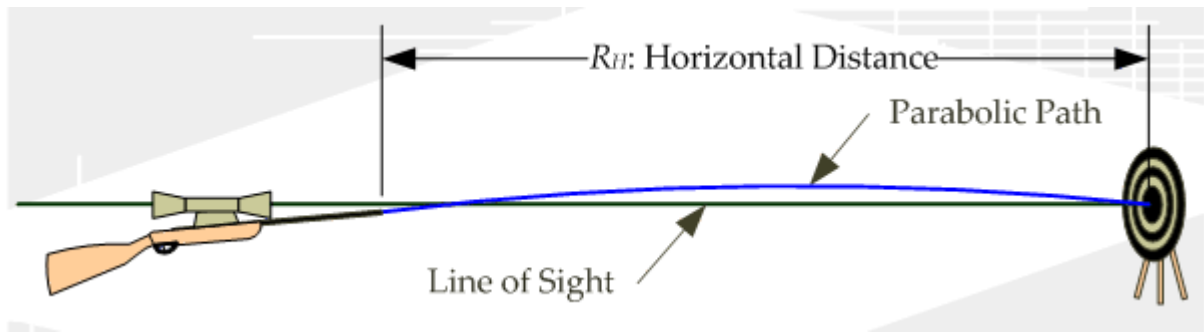


Figure 6: Rifle projectile trajectory illustration

As mentioned earlier, the trajectory of the bullet is determined by its shape, weight and velocity as well as external forces. The reloader cannot control external forces, but can control shape, weight and velocity of the bullet. A reloader wants this to be constant so that the trajectory of the bullet is more or less the same for each shot so that the zero point is the same and the rifle accurate (James, 2010).

The amount of propellant and burning rate determines the speed of the bullet. The reloader ensures he uses the exact same amount of propellant based on the propellant used for each bullet for consistency. Burning rates for different types and brands of propellant are different and so will the velocity and trajectory of the bullet also be different for each type of propellant. This means the reloader will have to redo calculations and zero it's rifle every time different propellant is used. Differences in burning rates over batches for the same type of propellant also influences the accuracy (McHale, 2014). Generally, reloaders redo calculations and zero the rifle every time a different type or brand of propellant is used and some even do this for each batch of propellant. Reloaders don't want to do this as it is costly and takes a lot of effort.

They don't want to switch between propellants and want burning-rate consistency over batches for maximum accuracy.

6. Recommendations and Conclusions

The following are recommendations that Somchem can consider to regain lost and expand market share:

- **Sort out production problem:** As mentioned above ammunition manufacturers and reloaders require propellant to be widely and constantly available. They will not switch back from other propellants unless they are sure they will have access

to Somchem propellant. Somchem has so sort out their production problems to guarantee supply.

- **Rebrand and repackage:** Somchem packaging are outdated in comparison to competitors in the market. They should move to less expensive plastic packaging that is more attractive to the consumer. The current metal packaging is dull and does not grab the consumers attention.
- **Emphasise batch consistency:** One of the advantages Somchem has over competitors are their consistency in burning rates between batches. They guarantee less than 2% variation, something their competitors cannot do. Somchem should emphasise this in their marketing campaign to attract those customers looking for consistency in their propellants.
- **Increase price:** Consumers switched to and got accustomed to the more expensive foreign propellants. Somchem should increase their price to be a little bit less than the competitors. Customers are used to paying these prices and will easily switch back to the better Sochem products even though the savings is not as much as it used to be.
- **Joint ventures with international companies to bypass import legislation:** The major stumbling blocks for international market expansion are foreign legislation and lobbying against ammunition imports. To bypass this Somchem can go into a joint venture with a foreign company in exchange for insights and data of Somchems production and manufacturing. This will allow them to create a similar quality product in another country and share in the market share.
- **Sort out problems at Denel:** In the past Denel was one of the leading arms manufacturers in the world. Somchem supplied all their propellant. If the problems at Denel are sorted out and they regain market share in the arms industry and increase demand for Somchem propellants.

Somchem produce quality propellants, but the inconsistency in the availability of their products must first be sorted out before they can think of regaining market share.

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