



AMMO^{MM} INDIA 2018

12-13 March 2018 | Federation House, New Delhi



Knowledge Associate



Ammunition Manufacturing in India

Road to Self-reliance





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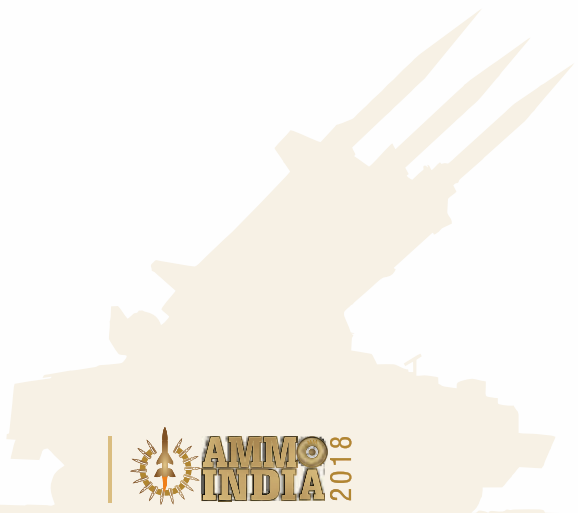


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Foreword



Indian Defence sector has seen a renewed focus on policy reforms and ease of doing business under the leadership of our Defence Minister, Smt. Nirmala Sitharaman.

With a modernisation budget allocation of over USD 11.47 Billion for the armed forces, Defence & Aerospace Sector undoubtedly remain at the forefront of 'Make in India' campaign of the Government of India.

One area identified by the Ministry of Defence, which holds a tremendous opportunity for the private sector, is manufacturing high tech ammunitions indigenously. FICCI whole-heartedly welcomes this move, even though it has taken close to two decades after our bitter experience during the Kargil Conflict of 1999. The Kargil war exposed our vulnerabilities and brought the nation's attention to the fact that our forces lacked the ability to sustain even a short-term conflict, due to the inadequate stockpile of ammunition.

The development of this sector will not only cater to the current demand-supply gap but also reduce reliance on imports for critical equipment. It is worth mentioning the hitherto yearly import bill for ammunition alone is in tune of INR 50 billion!

I am confident that Indian Industry - both public and private, together with Ordnance Factories can surge national capacities and meet the ammunition requirements of armed forces indigenously with best-in-class technology.

With this backdrop and to facilitate the 'Make Ammunition in India' mission, FICCI and CENJOWS have endeavoured to create AMMO INDIA 2018 - the largest platform for all relevant stakeholders in this sector. AMMO INDIA being proposed as an annual feature and intends to be a forum to recommend solutions to the major impediments in Ammunition manufacturing. At the same time, it shall also serve as a platform to showcase industry capabilities and enable Business - to - Business (B2B) / Government - to - Business (G2B) engagements.

My best wishes and sincere thanks to all the participants of AMMO INDIA 2018.



Dr. Sanjaya Baru
Secretary General
FICCI



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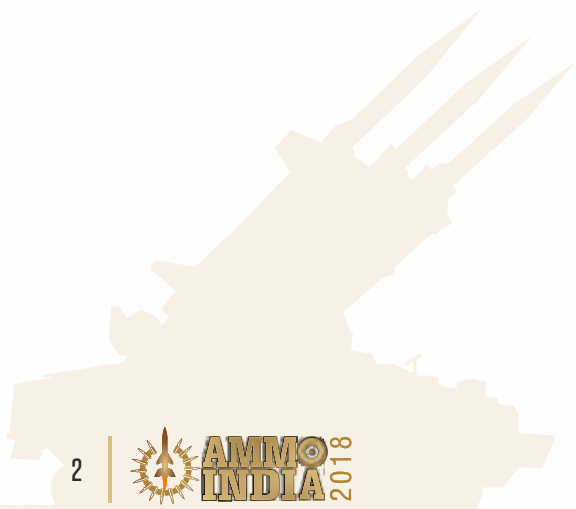
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Ammunition Manufacturing in India

Road to Self-reliance



Introduction

The manufacturing of arms and ammunition is governed by the Arms Act (1959) and Arms Rules (1962). It was protected by the Government of India (GoI) and only Ordnance Factory Board (OFB) had the licence to manufacture arms and ammunition for the Armed Forces. Indian private industry was only allowed to produce single barrel and double barrel guns and associated cartridges. The Department of Industrial Policy and Promotion (DIPP) finally opened the manufacture of small arms and ammunition in the private sector with nil or up to 26 percent FDI in 2002.¹ In 2005, DIPP further liberalised the sector by issuing industrial licences to a few companies to manufacture arms and ammunition.

Has this regime undergone any change since then? Yes, and it has made significant strides in ensuring a level playing field for the Indian private industry. In a landmark move, the MHA revised Arms Rules 1962 (now called as Arms Rules 2016, published on 15 July 2016) to allow Indian companies to manufacture and proof test of firearms.² Subsequently in 2017 the Arms Rules were amended again to boost the 'Make in India' manufacturing initiative. These changes have been discussed under the section Policy and Procedures.

We have also seen a significant number of RFIs and RFPs issued by the MoD in the last few years for manufacturing of arms and ammunition to the Indian private companies. The largest procurement of such initiatives was launched by the MoD in 2017, when they released 8 RFPs for procurement of medium and large calibre ammunition from the Indian private industry. The requirement for ammunition ranges from 23mm HEI/APIT for the ZU/ Stella air defence gun systems to 125mm FSAPDS for the T90/T72 tanks.

So what has been the motivation for the Government and Ministry of Defence to pursue manufacturing of arms and ammunition with the private industry? At present almost 80 percent of the ammunition requirement of the Armed Forces is supported by OFB. Ammunition Factory Khadki, Ordnance Factory Ambajhari, Gun and Shell Factory Cossipore, etc. specialize in small, medium and large calibre ammunition and explosives. While they continue to be the primary supplier for ammunition, OFs lack capacity to fulfil the entire requirement of the Armed Forces.

The 2015 CAG report³ reflected the poor status of the ammunition stockpile-74 percent of the 170 types of ammunition failed to meet the Minimum Acceptable Risk Level (MARL)

¹ Press Note 2 (2002 series) DIPP

² Rule Number 51 to 66 of Chapter V - Part 1

³ Report No. 19 of 2015 - Union Government (Defence Services) Army and Ordnance Factories (Performance Audit of Ammunition Management in Army)

requirements, and only 10 percent met the War Wastage Reserve (WWR) requirements. The CAG's 2017 report⁴ noted that "no significant improvement took place in the critical deficiency in availability and quality of ammunition."

The CAG says that of a total of 152 types of ammunition considered critical by the Indian Army to fight a war:

- As many as 61 types of ammunition is available for just 10 days only
- Only 31 were available for 40 days
- As many as 12 types of ammunition was available for 30 to 40 days
- As many of 26 types of ammunition was available for a little over 20 days.

In terms of private industry, there are only **two** significant suppliers:

1. **Solar Industries:** founded in 1995, manufactures a complete range of industrial explosives (bulk and cartridge), detonators and detonating fuse and cast boosters. They have the world's largest cartridge manufacturing facility at a single location at Chakdoh, Nagpur.
2. **Premier Explosives Limited:** founded in 1980, has been manufacturing solid propellants from 2003. The company has been catering to the needs of tactical missiles like Astra, Akash and rockets like Pinaka.

⁴ Report No.15 of 2017 - Compliance audit Union Government Army and Ordnance Factories Reports of Defence Services

Procurement Process

Modernisation of the infantry soldier is aimed at enhancing lethality and providing individual protection. Towards this end, procurement cases for modern weapons such as Anti-Tank Guided Missile (ATGMs), Sub Machine Gun with Ammunition, Light Machine Gun, Assault Rifles & Under Barrel Grenade Launcher (UBGL) and Close Quarter Battle (CQB) Carbines are in progress.

Classification of Ammunition

Type	Diameter Range	Main Weapons
Small Calibre	5.56 to 12.7 millimeter (mm)	Carbine, Rifle, Light Machine Gun
Medium Calibre	14.5 to 40 mm	Anti-Material Rifle, Grenade Launcher.
High Calibre	73 to 155 mm	Rocket Launcher, Gun, Tank
Mortar Bombs	~~	Mortar
Missiles	~~	Tanks & Missile Launcher

(Source: DGOS (OS-15) letter dated 12.12.2013)

The management of ammunition is done by placing five year Roll on Indent on Ordnance Factory Board (OFB) to enable it to plan its production. The indent is placed on mutually agreed targets keeping the OFB capacity in view. (a) The first five year Roll on Indent for 2010 to 2014 was placed on OFB in February 2010 for ₹ 24,311 crore for 113 ammunition items. OFB produced ammunition worth ₹ 18,314 crore. (b) The second Roll on Indent was placed on OFB in October 2013 for projected requirement of five year perspective plan for year 2014 to 2019. Production reports of OFB are being monitored on a monthly basis.⁵

The remaining ammunition which is not being manufactured by OFB, the Army imports through capital and revenue route. On the other hand, imports too have failed to fill the supply gap as procurement has proven to be unreasonably slow. No procurement of ammunition took place against the nine items initiated for procurement through capital route during the period 2008-2013 due to single vendor situation, complexities in TOT, delay in finalization of GSQR, etc. In case of revenue procurements also, the success rate of fructification of contracts was as low as 20 percent.⁶ Thus, due to delay in finalization of import contracts, the built-up of ammunition has been badly hampered.

⁵ Annual Report 2016-17, Ministry of Defence

⁶ http://www.cag.gov.in/sites/default/files/press_release/press_release_8_may_2015_19of2015.pdf

Current Status

One of the largest procurement initiatives in Arms and Ammunition was launched by the MoD last year when they released eight RFPs (**Appendix 1**) for procurement of medium and large calibre ammunition from the Indian private industry on 25th March 2017. The requirement for ammunition ranges from 23mm HEI/APIT for the ZU/ Strella air defence gun systems to 125mm FSAPDS for the T90/T72 tanks.

After the initial release of the RFPs the MoD decided to release a corrigendum as early as 1st June 2017. Since then there have been **nine amendments** to the submission date for extension of time.



Policy and Procedures

The Defence procurement process for arms and ammunition has been an uphill task for the Indian Armed Forces. While we have seen success in many other areas like Armoured Fighting Vehicle (AVF), Missiles etc. in terms of indigenous design, development, and manufacturing, we are still failing to fulfil basic requirements of arms and ammunition inventory. Today almost the entire burden lies with the Ordnance Factory Board in terms of indigenous supply for arms, ammunition and artillery. While Mod has taken several steps to open this sector to private industry in the recent past, there are still many hurdles left to cross.

DPP and DPM

The procurement of ammunitions and armaments, like everything else in Defence sector, follows the procedures laid out in the DPP 2016 and DPM 2009. Through the DPP 2016, the GoI has made amendments to accelerate decision-making, simplify contractual and financial provisions, and establish a level playing field for the public and private players. With the introduction of Indigenous Design Development and Manufacture (IDDM) and enhancements to the MAKE categories, MoD has provided the right thrust to the private sector.

Industrial Licence

The licencing is governed by two major documents which are The Arms Act 1959 and the Arms Rules 2016. The Arms Rules is a comprehensive document on pre-requisites and requirements for the manufacturing of arms and ammunitions in India.

Since opening the arms and ammunition to the Indian private industry, very few companies have risen to the challenge to acquire licenses and are in active production today. Solar Industries, Bharat Forge, L&T, Tata Power SED are a few shining examples.

The licencing policies are managed by the MHA and DIPP. Earlier, the onus was on DIPP to grant Industrial License for all defence items requiring license, it was MHA which gave the security clearance. During 2017, MHA took entire ownership of licencing, which again reverted certain responsibilities to DIPP. This has created a lot of confusion within the industry as to which is the rightful agency to approach for any clarifications and guidance. We need a streamlined policy and a single agency to interface with the industry and external vendors to make headway in this regard.

In a substantial step forward, MHA has amended the Arms Rules, 2016 (hereinafter referred to as the "Parent Rules") vide notification G.S.R. 1342(E) dated October 27, 2017, and has subsequently brought into force the Arms (Amendment) Rules, 2017 (hereinafter referred to as

the "Amendment Rules). The Amendment Rules have been liberalised to boost "Make in India" manufacturing policy of the Government as well as to promote employment generation in the field of manufacturing of arms and ammunition.

The significant amendments are

1. **Validity of Licence:** Licence will now be valid for life-time
2. **Approval:** No prior approval from MHA for supplying small arms and light weapons to Central Government or State Governments
3. **Capacity:** enhancement of capacity up to 15 percent of the quantity approved under licence will not require any further approval by the Government.
4. **Licence fee:** This has been reduced significantly. Earlier the licence fee was Rs. 500/- per firearm which added up to very large sums and was a deterrent to seeking manufacturing licenses. The licence fee will now range from Rs. 5,000/- to the maximum of Rs. 50,000/-.
 - a. The fee for manufacturing licence shall be payable at the time of grant of license rather than at the time of application.
5. **Applicability:** Single manufacturing licence will be allowed for a multi-unit facility within the same State or in different States within the country.

Wassenaar Arrangement

In a remarkable development, elite export control regime *Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies*, commonly referred to as the Wassenaar Arrangement (WA) in Dec 2017 admitted India as its 42nd member. This development is expected to raise New Delhi's stature in the field of non-proliferation besides helping it acquire critical technologies.

In a statement released by the group said, "Wassenaar Arrangement participating states reviewed the progress of a number of current membership applications and agreed at the plenary meeting to admit India which will become the Arrangement's 42nd participating state as soon as the necessary procedural arrangements for joining the WA are completed." The decision was taken at a two-day plenary meeting in Vienna.

The Wassenaar Arrangement plays a significant role in promoting transparency and greater responsibility in the transfer of conventional arms, dual-use goods, and technologies.

More importantly, it allows for easier access to export or import of the products listed in the agreement. A list of relevant items under the purview of the regime have been summarised in **Appendix 2.**

FDI Policy

FDI policy applies to any organization that is looking for establishment of branch office, liaison office, project office or any other place of business in India. If the principal business of the applicant is Defence, approval of Reserve Bank of India is not required in cases where Government approval or license/permission by the concerned Ministry/Regulator has already been granted.

In May, 2001, the Defence Industry sector, which was hitherto reserved for the public sector, was opened for Indian private sector participation, with Foreign Direct Investment (FDI) up to 26 percent, both subject to licensing. Recently, Department of Industrial Policy & Promotion - Ministry of Commerce & Industry vide Press Note No. 5 (2016 Series), has allowed 100 percent FDI. As per the extant FDI policy, foreign investment of up to 49 percent is permitted under automatic route, and above 49 percent through government approval wherever it is likely to result in access to modern technology or for other reasons to be recorded.

The latest release in August 2017 of the FDI policy allows the following investment in Defence sector

- 49 percent is automatic approval
- 50 -100 percent allowed with Government approval

Other Conditions⁷ as per the most recent press note are as follows:

- Infusion of fresh foreign investment within the permitted automatic route level, in a company not seeking industrial license, resulting in change in the ownership pattern or transfer of stake by existing investor to new foreign investor, will require Government approval.
- Licence applications will be considered and licences given by the Department of Industrial Policy & Promotion, Ministry of Commerce & Industry, in consultation with Ministry of Defence and Ministry of External Affairs.
- Foreign investment in the sector is subject to security clearance and guidelines of the MoD.

⁷ http://dipp.nic.in/sites/default/files/CFPC_2017_FINAL_RELEASED_28.8.17.pdf

- Investee company should be structured to be self-sufficient in areas of product design and development. The investee/joint venture company along with manufacturing facility, should also have maintenance and life cycle support facility of the product being manufactured in India.

Key enablers of the FDI policy

- 100 percent FDI in defence sector : FDI upto 49 percent under Automatic route
- Requirement of single largest Indian ownership of 51 percent of equity is removed
- 03 years of lock in period for equity transfer has been abolished

FDI in defence sector is also subject to industrial license under the Industries (Development & Regulation) Act, 1951 and the Arms Act 1959 for manufacturing of arms and ammunition.

Ordnance Factory Board

Ordnance Factory Board is a conglomerate of 41 Ordnance Factories(OF), 9 Training Institutes, 3 Regional Marketing Centres and 4 Regional Controller of Safety which functions under the Department of Defence Production. Its primary objective is to achieve self-reliance in equipping the armed forces with state-of-the-art battlefield equipment.

OFB has indigenized a wide range of small, medium and high calibre ammunitions over the last few decades. Their product list includes but is not restricted to the following ammunition:-

Small Calibre	Cartridge SA for 9mm, 5.56mm, 7.62mm
Medium Calibre	Cartridge for 14.5mm, 23mm, 30mm and 40mm
Large Calibre	84mm TPT, SHELL 105 mm IFG HE, MAIN BATTLE TANK AMMUNITION 120 mm FSPADS, SHELL 155 mm ILLUMINATING MIRA

Research & Development (R&D) is being cultivated at OFB in a structured manner since 2006 with the establishment of 13 Ordnance Development Centres (ODCs). With the assistance of premier academic institutions like IITs at Mumbai, Kanpur and Kharagpur, to name a few, the Ordnance Factories are not only upgrading existing products but also developing new weapon platforms.

OFB has taken up R&D projects in the domains of Product Development/ Upgrade, Indigenisation, Import substitution and Process Development. OFB has developed major weapon platforms, arms and ammunition and approximately 22 percent of the turnover of OFB is from products developed indigenously by Ordnance Factories.

OFB is presently developing Upgraded BMP-II, Futuristic Infantry Combat Vehicle (FICV), Air Defence Gun and 155mm x 52 Cal Mounted Gun System and related ammunitions and Electronic Fuzes.



Indian Private Industry

To achieve the goal of self-reliance in the Defence sector, continuous efforts are being made to increase in digenization, wherever technologically feasible and economically viable. With the said changes and amendments in various policies, the Indian private industry is keen on supporting the requirement of the Armed forces and the Make in India vision.

Post liberalisation of the defence sector in 2001 and further amendments in 2006, there is yet to be any significant manufacturing development that has taken place in the private industry on arms and ammunition. A list of companies with industrial licence to manufacture arms and ammunition is provided in **Appendix 3**.

Few notable companies have begun investing into this sector. For example, Punj Lloyd has setup a facility in Malanpur in 2017. The plant, a joint venture with Israel Weapon Systems, will produce four products - X95 carbine and assault rifle, Galil sniper rifle, Tavor assault rifle and Negev Light Machine Gun (LMG). Bharat Forge Limited, a subsidiary of Kalyani Group, have a joint venture company - BF Elbit Advanced Systems Private Limited, formed in 2012 to manufacture artillery, mortars, and mine protected vehicles in India. Yet, even with all these companies having Industrial Licence for manufacturing arms and ammunition, not a single order has been placed with any of the firms.

With all the policy changes and amendments in favour of the Indian private industry, the new entrants will still have to tackle the following challenges:

- Technology
- Licencing
- Infrastructure
- Security
- Skilled manpower
- Proof Testing

Expectations from FOEMs

The fact that India ranks amongst the top ten countries in the world in terms of its military expenditure, makes it one of the most attractive markets for defence. This makes it a no-brainer for any foreign original equipment manufacturer (FOEM) that India should be on their customer list. Having said that, Govt has an agenda to reduce import dependence in defence by 35-40 percent⁸ and it is actively promoting indigenous defence manufacturing with initiatives like 'Make in India' and policy reforms including allowing 100 percent FDI. As a result, the role of FOEMs is shifting from direct exporters to that of partners in co-development and production.

The role of FOEM would be that of a technology partner to the Indian company. As of date, no Indian private company has produced ammunition for the armed forces. By partnering with Indian companies, FOEMs have the benefit of winning orders through the Buy (IDDM) and Make routes. Further, setting up a Joint Venture will enable FOEMs to enjoy economies of scale, and lower labour cost. The FOEM can look at export potential once the Indian company is fully-operational and is able to provide a cost advantage vis a viz their current manufacturing operations outside India.

Several overseas defence companies, such as Expal of Spain, Nexter of France, Rosoboronexport of Russia, Chemring Group of the United Kingdom, Saab of Sweden, Elbit of Israel, Rheinmetall Defence of Germany, Diehl Defence of Germany, Denel of South Africa, Yugoimport of Serbia, Bumar of Poland, Orbital ATK Armament Systems of the United States and Arsenal of Bulgaria, are/were in talks with private Indian companies to provide cutting-edge technology for multiple Indian ammunition programs.

⁸ <https://www.thehindubusinessline.com/economy/we-are-looking-to-cut-defence-imports-by-3540/article8626685.ece>

Roadmap for Indigenisation

We have seen a lot of enthusiasm from the industry in the arms and ammunition space for the last couple of years. MoD has been stating the need for private industry participation to fulfil the requirements of the Armed forces. We need to capitalise on this fervour before interest wanes from the Indian industry.

Role of Government

The GoI should clearly state the percentage of Indigenous Content (IC) in ammunition manufacturing from past experience. In the case of INSAS rifle, which was designed by DRDO and manufactured by Rifle Factory Ishapur, it is said to have 100 percent IC. There were multiple design iterations and significant funding required before developing a product like INSAS. Hence the GoI cannot expect the same level of IC from the private industry from the word go.

Explosives and ammunition filling are the most critical processes in ammunition manufacturing. A few ordnance factories have established themselves in explosive filling. If we look at small calibre ammunition the shell needs to attain the desired spin and kinetic energy upon release. The filling needs to be precise enough to ensure a) the bullet does not explode within the barrel and b) that the bullet gets the requisite kinetic energy when it leaves the barrel.

Since the private industry is going to take up these manufacturing processes, making the explosives and the filling process are going to be some of the crucial technologies. Today the private industry might not have complete access to DRDO. GoI should also provide access to research done by DRDO on arms and ammunition so that the private industry can understand, learn, and implement these processes in their own facilities.

The Government should also assist the private industry in terms of infrastructure (Plant and machinery, security of facility, proof testing of arms and ammunition) setup. A lot of the machines required for ammunition manufacturing would have to be imported from countries like Russia or Germany. There could be relaxed taxation on imports of such machinery.

Keeping all these in mind, GoI needs to decide on the IC percentage expected from the Indian private industry. If we go by the IDDM category of DPP 2016, then a 60 percent IC content should be the recommendation from the Government.

Role of Private Industry

Barring a small handful of companies, the private industry has no experience in manufacturing military grade arms and ammunition. Design development and manufacturing was restricted to the DRDO labs and OFB based on the earlier government policies. Of late the MoD has realised the capacity crunch with the OFB and is looking towards the private industry to fulfil the requirements of the Armed Forces. Taking everything into consideration the industry must strive for 90-95 percent IC as their final goal, (Even as GoI or RFP might state 60 percent IC).

The industry should also try and create the manufacturing eco-system so that all the machining and finishing operations can be indigenised to begin with. Explosive related processes could be taken up gradually as they absorb the technology and understand the product and manufacturing processes.

An analysis of the complete supply chain and processes involved in manufacturing of ammunition is required to identify areas of strength within the country. This will also provide a means to assess the kind of investment required. Another crucial factor would be inclusion of tier II and tier III manufactures of the Indian company into the ammunition manufacturing supply chain, assuming they will not be a fully integrated manufacturing setup.

Recommendations

MoD

- **Reduce procurement lead times:** Multiple RFIs and RFPs have been issued in the past with no result in the arms and ammunition category.
- **RFP must outline complete roadmap:** It would not suffice to simply issue RFPs exclusive to private industry. Complete roadmap for an ammunition RFP should be outlined, one with hand-holding and guidance to the private industry from the Gol, (including agencies like the DGQA, the end user and DRDO).
- **Long-term covenant:** should be part of any proposal for ammunition manufacturing, once you place an order on a company then for next 10 years they would be the source for that product (in order to get ROI on infrastructure investment).

Industrial Licence

- **Licencing process should be streamlined:**
 - ❖ DIPP has an online process now but MHA (which issues licence for small arms and ammunition) is an offline process.
 - ❖ Documents required need to be clearly stated, since the documents stated on the site and forms do not seem to suffice.
- **Establish an Ombudsman for Industrial Licence:** Regular feedback mechanism and intimation to the industry on details lacking in their application and well as status.

Private Industry

Lack of design and R&D within the private sector, still leaves us dependent on foreign OEMs for ToT. Notwithstanding the fact that this sector was not open to the private industry, there needs to be more than just intent from the companies to fructify arms and ammunition manufacturing and address the needs of the Armed Forces.

Appendix 1 : List of RFPs issued by the Indian Army to procure ammunition from Indian industry

Reference Number	Description	Equipment	QTY (yearly for 10 years)
A/18129/MAPI/23MM /OS AMN PROC	23mm HEI/APIT (high -explosive incendiary /armour-piercing incendiary tracer) ammo	ZU-23 air defence guns	5,00,000
A/18107/30MM HEI HET/MAPI/OS AMN PROC	30mm HEI/T (high -explosive incendiary - tracer) ammo	BMP-2 infantry combat vehicles	1,88,600
A/18153/30MM VOG17/MAPI/OS AMN PROC	30mm VOG 17	30mm Automatic Grenade Launcher	5,00,000
A/18106/BMCS/HZLZ/MAPI/ OS AMN PROC	BMCS (low zone and high zone)	Howitzer	1,00,000
A/18114/MAPI/ 125 MM/FSAPDS /T/OS AMN PROC	125 mm FSAPDS	Tank T90 / T72	20,000
A/18120/40MM/MGLUBGL/M API /OS-AMN PROC	40mm MGL/UBGL (multiple grenade launcher/under barrel grenade launcher) ammo.	multiple grenade launcher/under barrel grenade launcher	3,00,000
A/18138/122 ERROCKET/MA PI /OS AMN PROC	122 mm HE ER Rocket		5000
A/18231/ELECT FZ ARTY/MAPI/ OS AMN PROC	Electronic Fuzes	Artillery gun systems	4,99,400

(Source: eprocure.gov.in)

Appendix 2 : Munitions List of the Wassenaar Arrangement December 2017

ML1. Smooth-bore weapons with a calibre of less than 20 mm, other arms and automatic weapons with a calibre of 12.7 mm (calibre 0.50 inches) or less and accessories, as follows, and specially designed components therefor:

- a. Rifles and combination guns, handguns, machine, sub-machine and volley guns*
- b. Smooth-bore weapons as follows:*
 - 1. Smooth-bore weapons specially designed for military use;*
 - 2. Other smooth-bore weapons as follows:*
 - a. Fully automatic type weapons;*
 - b. Semi-automatic or pump-action type weapons*
 - c. Weapons using caseless ammunition*

ML2. Smooth-bore weapons with a calibre of 20 mm or more, other weapons or armament with a calibre greater than 12.7 mm (calibre 0.50 inches), projectors and accessories, as follows, and specially designed components therefor:

- a. Guns, howitzers, cannon, mortars, anti-tank weapons, projectile launchers, military flame throwers, rifles, recoilless rifles, smooth-bore weapons and signature reduction devices therefor*
- b. Smoke, gas and pyrotechnic projectors or generators, specially designed or modified for military use*
- c. Weapons sights and weapon sight mounts, having all of the following:*
 - 1. Specially designed for military use; and*
 - 2. Specially designed for weapons specified in ML2.a*
- d. Mountings and detachable cartridge magazines, specially designed for the weapons specified in ML2.a*

ML3. Ammunition and fuze setting devices, as follows, and specially designed components therefor:

- a. Ammunition for weapons specified by ML1., ML2. or ML12.;*

Fuze setting devices specially designed for ammunition specified by ML3.a

Appendix 3 : List of companies with Industrial Licence to manufacture arms/ammunition (not exhaustive)

Company	Licence Description
INDTECH CONSTRUCTION PVT. LTD	SMALL ARMS & AMMUNITION VIZ: 5.56 MM, 7.62 MM, 9 MM, 12.7 MM& 14.5 MM CALIBRES ONLY
LARSEN & TOUBRO LTD, MUMBAI	ARMAMENT INCLUDING AMMUNITION/ORDINANCE LIKE MISSILES, ROCKETS, TORPEDO LAND/NAVAL MINES, DEPTH CHARGES INCLUDING
VEM TECHNOLOGIES PVT. LTD	ASSEMBLY, INTEGRATION & CHECKOUT OF ARMS AND AMMUNITIONS (ROCKET AND MISSILES)
SEC INDUSTRIES PRIVATE LIMITED	STATIC AND MOBILE LAUNCHERS FOR AIR LAUNCH MISSILES (SHORT, MEDIUM AND LONG RANGE), ROCKETS, BOMBS & AMMUNITIONS AND PTAS BOTH LAND AND SHIP BASED INCLUDING THEIR SUB-SYSTEMS AND UPGRADES
HYT ENGINEERING COMPANY PVT. LTD	MANUFACTURE OF SHELLS FOR AMMUNITION (VARIOUS CALIBER SIZES)
GODREJ & BOYCE MANUFACTURING COMPANY LTD.	EMPTY SHELLS AND REQUIRED FUSES FOR AMMUNITION AND EXPLOSIVES SUCH AS BOMBS, MINES, MISSILES & TORPEDOES, EXCLUDING THE FILLING OF EXPLOSIVE
M/S LORDS VANIJYA PVT. LTD.	MANUFACTURE AND ASSEMBLY OF AMMUNITION, EMPTY FUZES, PRIMERS AND SWITCHES
M/S MICRON INSTRUMENTS PVT. LTD.	(i). WEAPON SYSTEMS SUCH AS MORTARS, ROCKET LAUNCHERS, GRENADE LAUNCHERS AND MISSILE LAUNCHERS (ii). AMMUNITION FOR ANTI-AIRCRAFT GUNS, ARTILLERY GUNS, TANK GUNS MORTARS ETC. (iii). ROCKETS, GRENADES, MISSILES, AIRCRAFT BOMBS OF VARIOUS TYPES, (iv). SUB-ASSEMBLIES FOR WEAPON SYSTEMS

Company	Licence Description
	(iv). SUB-ASSEMBLIES FOR GRENADES, ROCKETS, AIRCRAFT BOMBS, MORTAR BOMBS, ARTILLERY SHELLS AND MISSILES
M/S PREMIER EXPLOSIVES LTD.	<p>DESIGN, DEVELOPMENT, UPGRADE, REFURBISHED AND PRODUCTION OF READY TO USE AMMUNITION OF 40 MM AND ABOVE CALIBRE,</p> <p>a. PRODUCTION OF AMMUNITION FIRED FROM ARTILLERY, TANKS, HELICOPTERS, AIRCRAFTS AND NAVAL CRAFTS (EXCLUDING SMALL ARMS AMMUNITION) [10,00,000 Nos. Annually]</p> <p>2. DESIGN, DEVELOPMENT, REFURBISHMENT AND UPGRADE OF READY TO USE ROCKETS AND MISSILES.</p> <p>a. ROCKETS [1,00,000 Nos. Annually]</p> <p>b. MISSILES(TACTICAL) [1,00,000 Nos. Annually]</p>
ZM/S. BF ELBIT ADVANCED SYSTEMS PVT. LTD.	<p>MANUFACTURE OF</p> <p>(a) GUNS, HOWITZERS, MORTARS, PROTECTED TACTICAL VEHICLES</p> <p>(b) AMMUNITION INCLUDING SMART BOMBS AND READY-TO-FILL SHELLS EXCLUDING FILING</p>
M/S. SOLAR INDUSTRIES INDIA LIMITED	<p>DESIGN, DEVELOPMENT, UPGRADE, REFURBISHED AND PRODUCTION OF READY TO USE AMMUNITION OF 40 MM AND ABOVE CALIBER</p> <p>PRODUCTION OF</p> <p>(A) AMMUNITION FIRED FROM ARTILLERY, TANKS, HELICOPTERS, AIRCRAFTS AND NAVAL CRAFTS (EXCLUDING SMALL ARMS AMMUNITION).</p> <p>(B) DESIGN, DEVELOPMENT, UPGRADE, REFURBISHMENT AND UPGRADE OF READY TO USE ROCKETS AND MISSILES</p> <p>a. ROCKETS</p> <p>b. MISSILES (TACTICAL)</p> <p>2. FILLED FUZES FOR ARTILLERY SHELLS, MORTAR BOMBS, MISSILES, GRENADES AND SIMILAR MUNITION OF WAR</p>

Company	Licence Description
M/S. KALYANI STRATEGIC SYSTEMS LIMITED (KSSL)	MANUFACTURE, MAINTENANCE AND OVERHAUL OF THE FOLLOWING ITEMS:- (i) AMMUNITION AND FUZE SETTING DEVICES. (ii) BOMBS, TORPEDOES, ROCKETS, MINES, MISSILES, DEPTH CHARGES, DEMOLITION CHARGES, DEMOLITION DEVICES, DEMOLITION KITS, AIRCRAFT MISSILE PROTECTION SYSTEMS. (iii) ENERGETIC MATERIALS AND RELATED SUBSTANCES. (iv) HIGH VELOCITY KINETIC ENERGY WEAPON SYSTEMS AND RELATED EQUIPMENT. (v) DIRECTED ENERGY WEAPON (DEW) SYSTEMS, RELATED OR COUNTERMEASURES EQUIPMENT AND TEST MODELS.
HIMACHAL FUTURISTIC COMMUNICATIONS LIMITED	MANUFACTURE OF AMMUNITION AND FUZE SETTING DEVICES INCLUDING THE FOLLOWING:- (i) SAFING AND ARMING DEVICES, FUZES, SENSORS AND INITIATION DEVICES; (ii) POWER SUPPLIES WITH HIGH ONE TIME OPERATIONAL OUTPUT; (iii) COMBUSTIBLE CASES FOR CHARGES; (iv) SUBMUNITIONS INCLUDING BOMBLETS, MINELETS AND TERMINALLY GUIDED PROJECTILES.
CONTINENTAL DEFENCE SOLUTIONS PVT. LTD	MOUNTED GUN SYSTEMS AND THEIR AMMUNITIONS ONLY, AMMUNITION & FUZES, AIR DEFENCE GUNS, LOITERING MISSILE SYSTEM, WEAPONS & AMMUNITION
SHAN ARMS INDUSTRIES PRIVATE LIMITED	MEDIUM CALIBERS AMMUNITION (i) 14.5 MM (ii) 16 MM (iii) 23 MM (iv) 30 MM (v) 40 MM

Company	Licence Description
	HIGH CALIBERS AMMUNITION (i) 73 MM (ii) 76.2 MM (iii) 84 MM (iv) 105 MM (v) 125 MM AND ABOVE
PIPAVAV DEFENCE AND OFFSHORE ENGINEERING COMPANY LTD.	MANUFACTURE OF ASSEMBLY AND TESTING OF ALL CALIBERS OF AMMUNITION RANGING FROM 20 MM TO 203 MM FOR THE INDIAN ARMED FORCES

(Source: DIPP list of Industrial Licences issued between Jan 2001 and Jun 2016)





About FICCI

Established 90 years ago, FICCI is the largest and oldest apex business organization in India. Its history is closely interwoven with India's struggle for independence, its industrialization, and its emergence as one of the most rapidly growing global economies.

A non-government, not-for-profit organization, FICCI is the voice of India's business and industry. From influencing policy to encouraging debate, engaging with policy makers and civil society, FICCI articulates the views and concerns of industry, reaching out to over 2,50,000 companies. FICCI serves its members from large (domestic and global companies) and MSME sectors as well as the public sector, drawing its strength from diverse regional chambers of commerce and industry.

The Chamber with its presence in 14 states and 10 countries provides a platform for networking and consensus-building within and across sectors and is the first port of call for Indian industry, policy makers and the international business community.



About CENJOWS

CENJOWS was raised at the initiative of Ministry of Defence on 24 Aug 2007 and is registered under 'The Societies Registration Act 1860'. The centre has been set up to:

- Rise above sectoral and departmental legacies, and examine joint warfare and synergy issues in their entirety.
- Provide the much-needed interface between various stakeholders, viz the government, public and private sector, academia, NGOs and civil society.
- Initiate debates and discussions in an independent and unbiased milieu for emergence of best possible alternative.

Mission

To promote Integration as a synergistic enabler for the growth of Integrated National Power and provide alternatives in all dimensions of its applications through focused research and debate.

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