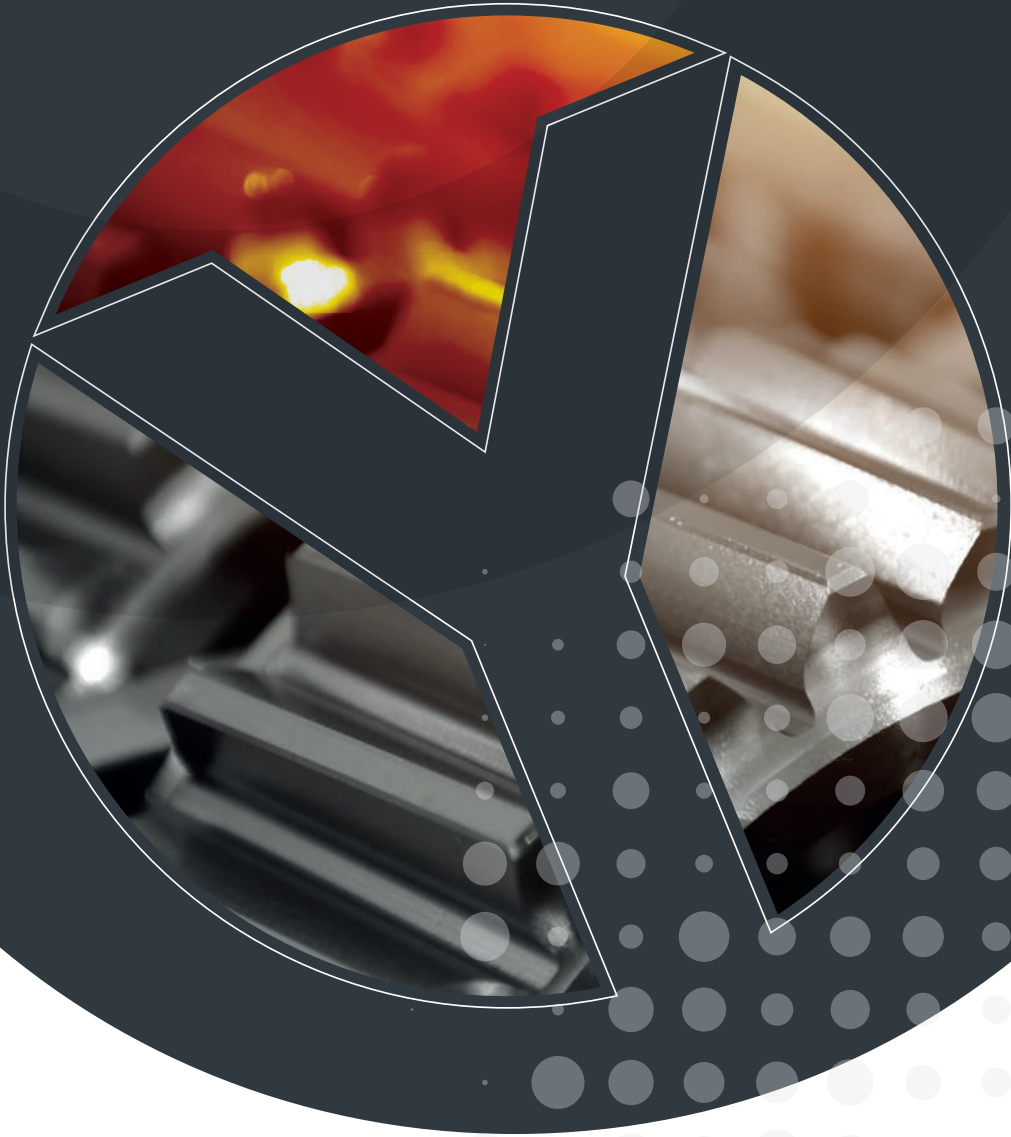




YETER MAKİNA

MACHINES MADE SPECIAL



Ammunition Assembly Machines

www.yetermunitions.com

About Us

Our family business was established in 1990 to build special-purpose machines. We have built many custom-designed mechanical systems as a long-term, committed solution partner for several industries.

In the defense industry, we maintain our position as an approved supplier for Turkey's largest munitions manufacturer. We have several ex-proof systems running in these facilities for over a decade.

Our high-capacity small-arms ammunition assembly machines have proven themselves by operating three shifts a day for years producing military ammunition in Turkey.

Today we continue manufacturing these rotary-type ammo assembly machines in a 2,500 square meter indoor plant in Turkey. We produce all our ammo machines and systems according to ATEX Directive and we certify them ex-proof.

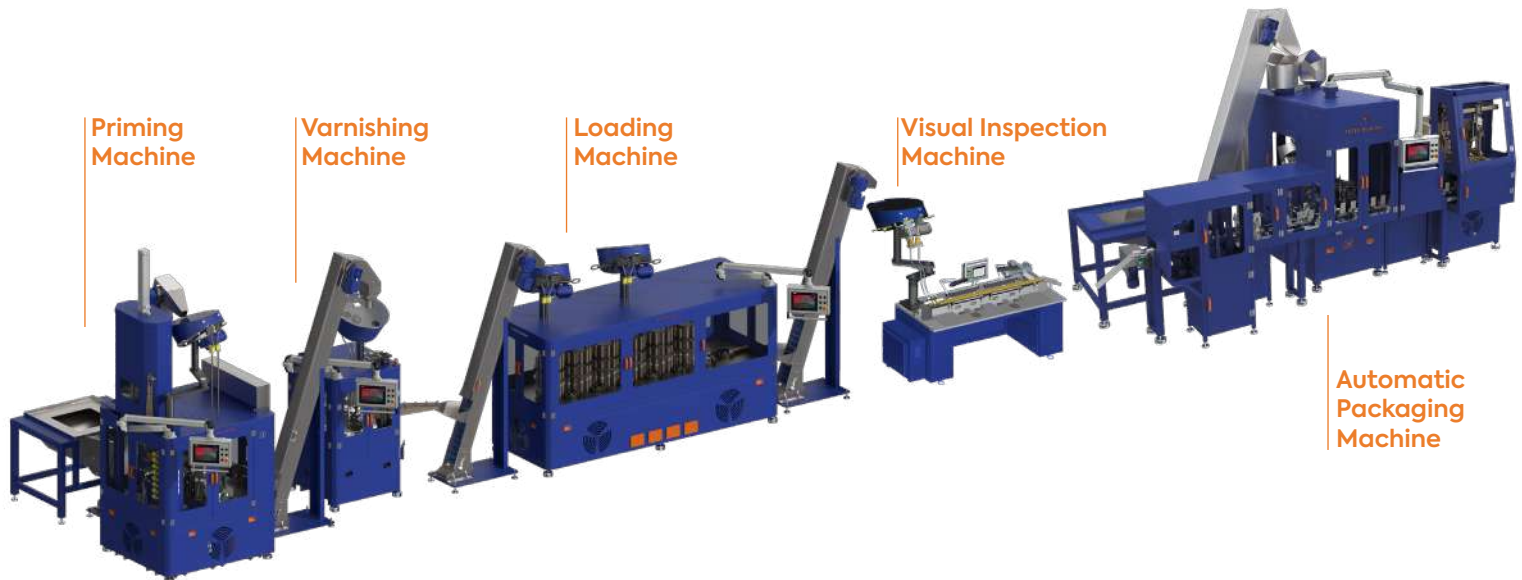
We have several CNC machines, including 5-axis CNCs and CMMs (Coordinate Measurement Machines) for precise parts manufacturing for our systems.

We are now a system integrator and can deliver turn-key small arms ammunition assembly lines including the software and control panels with ex-proof properties.

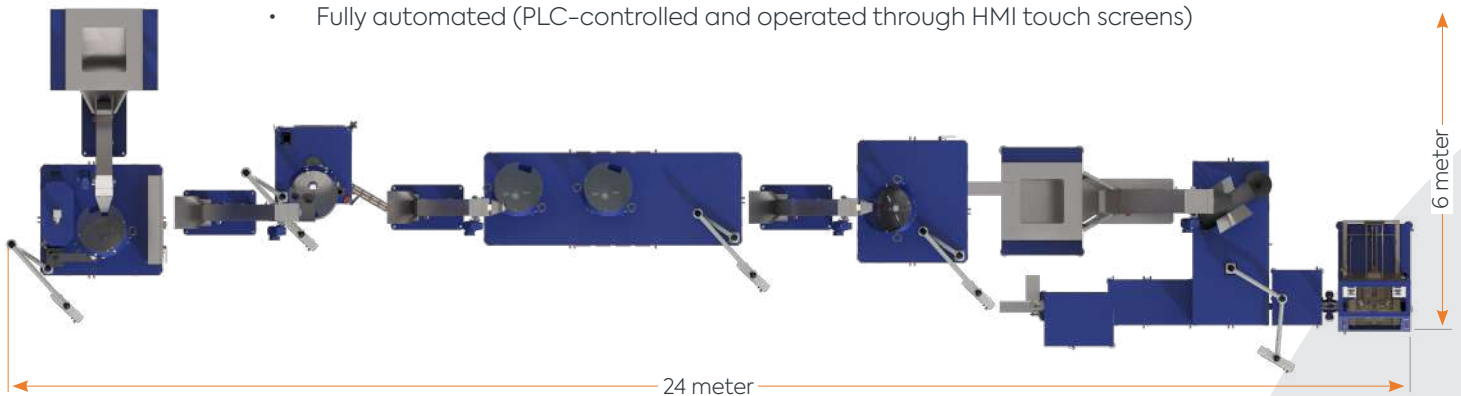


The machines presented in the catalog are in operation at MKEK facilities.

SMALL ARMS AMMUNITION ASSEMBLY LINE



- High capacity. 240 ppm.
- Multiple calibers with conversion tools (Any group of pistol or rifle calibers including NATO Calibers, Soviet Calibers, and blanks)
- Quality check functions at every station.
- Ex-proof. It is built following the ATEX Directive.
- Easy to operate and maintain. Built on CAM mechanisms.
- Fully automated (PLC-controlled and operated through HMI touch screens)





Primer Inserting Machine

Functions and Advantages

- Primer inspection. Checks for right-side-up primer and the existence of primer anvil.
- Cartridge case inspection. Checks for the flash hole, extractor groove, and cartridge mouth circularity. (Checking for the flash hole also assures that only empty primer pockets are inserted with primer)
- Ring crimping (Ring-crimp or 3-stab crimping based on customer's preference)
- Ring-crimp inspection. Camera check for the existence of ring crimping.
- Primer depth inspection. Checks for accurate depth of primer.
- Sound and safety enclosure
- Dynamic, continuous primer insertion
- Door-closed sensors



The ammo assembly line begins with the primer inserting machine. It is a high-capacity rotary-type machine based on a cam mechanism. Therefore, it is reliable and easy to maintain. It has several quality check functions to ensure a precise primer insertion. Furthermore, the quality functions inserted in this machine ensure that the shell cases are good enough to continue with assembly.

The system is designed ex-proof and further safety precautions are taken. The primer feeder is placed in a safety enclosure and the machine does not operate until the feeder is safely enclosed. Primers are slid down from the feeder to the machine through a tube, creating a safety gap in the tube. Furthermore, a sound detection system is embedded in case a primer ignited to shut the system down.

Technical Speciments



Machine Name	Primer Inserting Machine		
Production Speed	240 PPM	Labor Requirement	1 Operator / Shift
Electricity Consumption	3 kW	Lubrication System	Automatic
Total Electrical Power	5 kW	Feeding unit	Hopper and Conveyor
Compressed Air Consumption	6 - 7 Bar 7 dm ³ (NI) / min.		
Noise Level	Max 85 desibel		
Available Calibers	9x18 – 9x19 – 7,62x39 – 7,62x51 – 5,56x45 – 7,62x54		

Sealing/Varnishing Machine



Functions and Advantages

- Cartridge mouth circularity assurance
- Avoiding varnishing the faulty shell cases saves on sealant and protects the needle inside the cartridge mouth when applying the sealant.
- No cartridge case, no dispense. A 'Case existing check' is performed to prevent sealant from spilling inside the machine. If the case does not exist on a certain station the needles do not apply sealant.
- No primer, no dispense. If the case is missing the primer, it will be discharged.
- Sealing around the primer and inside the case neck at the same time
- Sound and safety enclosure
- Easy operation through HMI touch screen.
- Dynamic, continuous sealant application
- Door-closed sensors
- Buffer area for curing
- Durable framework.



The primed cases are transferred to the sealing machine from the primer inserting machine via elevator conveyors automatically. In this setup, the sealing comes before loading. Considering the risk of gunpowder or primer contamination by moisture, gun oils, etc. especially in military ammunition the machine ensures cartridge mouth circularity first, then sprays an asphaltic sealant/lacquer around the primer and inside the cartridge case neck at the same time for a strong-enough attachment of the bullet. Finished products are buffered on a linear slide to allow the sealant to cure.

The asphaltic sealant machine is a rotary-type machine based on a cam mechanism. Therefore, it is reliable and easy to maintain. Its continuous motion provides high-capacity throughput.

Based on the end user's preferences the asphaltic sealing machine can be replaced with a UV-curable sealing machine where the sealant is applied on the primer and the case mouth after the loading of the cartridges

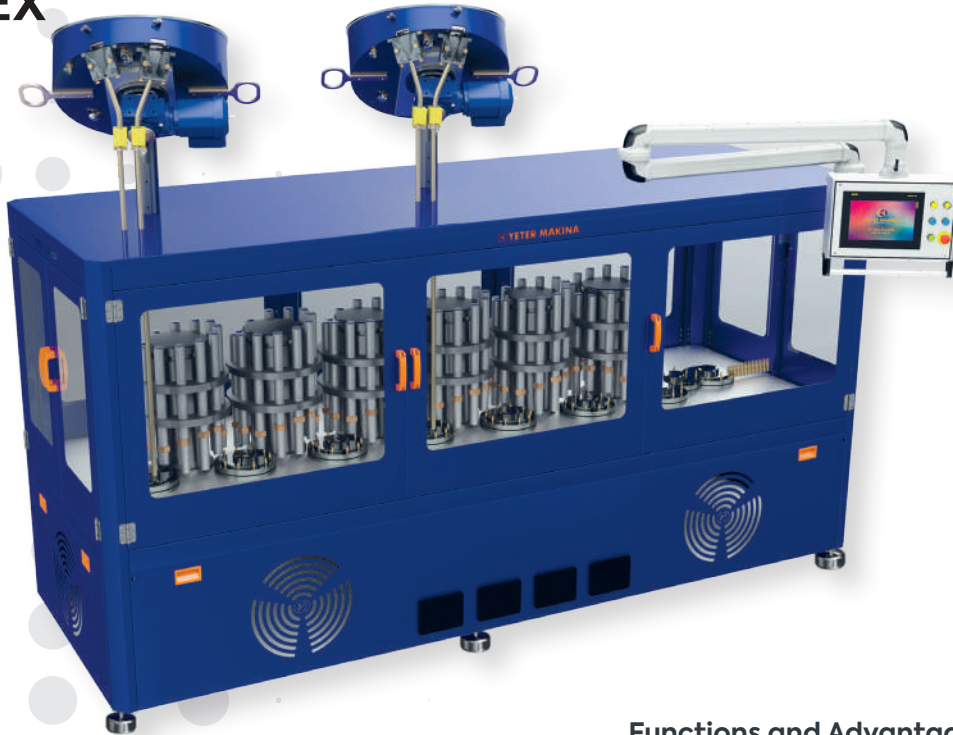


Technical Speciments

Machine Name	Varnishing/Sealing Machine		
Production Speed	240 PPM	Labor Requirement	1 Operator / Shift
Electricity Consumption	0.75 kW	Lubrication System	Automatic
Total Electrical Power	1.2 kW	Feeding unit	Hopper and Conveyor
Compressed Air Consumption	6 - 7 Bar 7 dm ³ (NI) / min.		
Noise Level	Max 85 desibel		
Available Calibers	9x18 – 9x19 – 7,62x39 – 7,62x51 – 5,56x45 – 7,62x54		



Loading Machine



The primed shell cases (also varnished if an asphaltic sealant is used) are transferred into the loading machine automatically. This high-capacity rotary-type loading machine can produce multiple calibers including pistol and rifle calibers. It also has a cam mechanism. Therefore, it is reliable and easy to maintain. Its continuous motion provides high-capacity throughput. The loading machine is embedded with several quality control functions to ensure that the gunpowder level, cartridge length, cartridge weight, and loadability/full form of the cartridge are accurate.

The loading station is where the bullets and the gunpowder are fed into the system. The loading machine is built ex-proof and all the safety precautions are taken to safely handle the gunpowder. Bullets are fed to the system through the bunker and the elevator conveyor feeds the machine's feeder with bullets automatically.

Functions and Advantages

- Case existing check
- Cartridge mouth circularity check (Discards if faulty)
- Gunpowder existing (Discards if faulty)
- Gunpowder level check (Discards if faulty)
- Bullet feeding and seating
- Bullet existing check (Discards if faulty)
- Bullet leveling and mouth crimping
- Cartridge length check (Discards if faulty)
- Cartridge exterior form/loadability check. (Discards if faulty)
- High-accuracy dynamic check-weight station. (Discards the faulty)
- The real-time production count is displayed on the HMI screen.
- Sound and safety enclosure
- Dynamic, continuous loading
- Door-closed sensors
- Durable framework

Technical Speciments

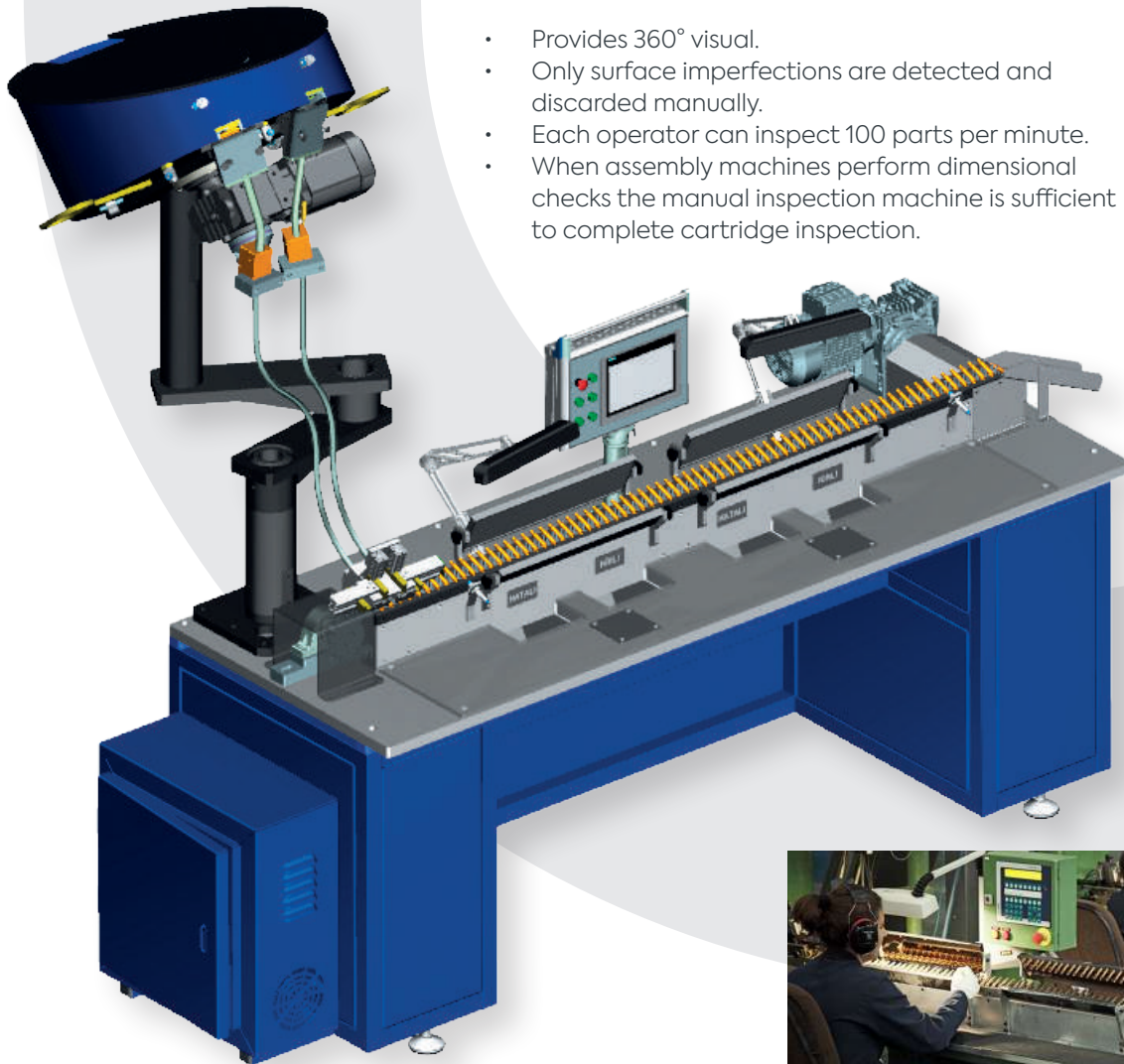


Machine Name	Loading Machine		
Production speed	240 PPM	Labor Requirement	1 Operator / Shift
Electricity Consumption	3 kW	Lubrication System	Automatic
Total Electrical Power	5 kW	Feeding unit	Hopper and Conveyor
Compressed Air Consumption	6 - 7 Bar 7 dm ³ (NI) / min.		
Noise Level	Max 85 desibel		
Available Calibers	9x18 – 9x19 – 7,62x39 – 7,62x51 – 5,56x45 – 7,62x54		

Inspection Machine

Functions and Advantages

- Provides 360° visual.
- Only surface imperfections are detected and discarded manually.
- Each operator can inspect 100 parts per minute.
- When assembly machines perform dimensional checks the manual inspection machine is sufficient to complete cartridge inspection.



This assembly line with all the quality checks performed during the assembly produces accurate cartridges. The components that have dimensional and geometrical imperfections are already discarded from the system. Manual inspection is necessary only to detect surface imperfections. Manual inspection stations will be efficient to handle 200 cartridges per minute with two lines having one operator at each line.

Manual inspection stations are automatically fed by an elevator conveyor from the loading machine. Cartridges are lined up on a horizontal belt and conveyed in front of the operator. The cartridges rotate as they move on the belt for a 360° visual inspection enhanced by a mirror reflection over the horizontal belt.

Technical Speciments



Machine Name	Inspection Machine		
Production speed	200 PPM with twin stations	Labor Requirement	1 Operator / Shift
Electricity Consumption	1 kW	Lubrication System	Automatic
Total Electrical Power	1.5 kW	Feeding unit	Hopper and Conveyor
Compressed Air Consumption	6 - 7 Bar 7 dm ³ (NI) / min.		
Noise Level	Max 85 desibel		
Available Calibers	9x18 – 9x19 – 7,62x39 – 7,62x51 – 5,56x45 – 7,62x54		

Packaging Machine

Functions and Advantages

- Boxes folded and glued automatically.
- Camera check for box folding (discards if faulty)
- Rifle cartridges are stacked into boxes in alternating order. Pistol cartridges are filled in plastic trays first, and then placed in boxes.
- Box closing and hot gluing.
- Camera check for box closing (discards if faulty)
- Weight check for quantity (discards if faulty)



The high-capacity assembly line culminates with an automatic packaging machine. This packaging machine is used in cases where ammo is stacked in cardboard boxes. Boxes are unfolded automatically and conveyed to the filling station. It not only provides continuous operation but also performs checks in that boxes are folded, glued, and filled accurately.

If there are pistol calibers also assembled in this line there will be a separate dedicated packaging machine that fills the pistol cartridges first in plastic trays, then into boxes.

Rifle calibers are stacked in cardboard boxes in an alternating order. Boxes are unfolded automatically and hot glued. Filled and sealed boxes are checked with a camera and weighed at the end of the line to make sure that the quantity in each box is correct.

Ammo packaging machines can be entirely re-designed according to the client's preferences and the requirements of end users. Laser marking, inkjet printing, label applicators, palletizers, etc. can be embedded into the system based on the end-user's logistics and storage requirements. Semi-automatic packaging systems also can be created where preferred.

Technical Speciments



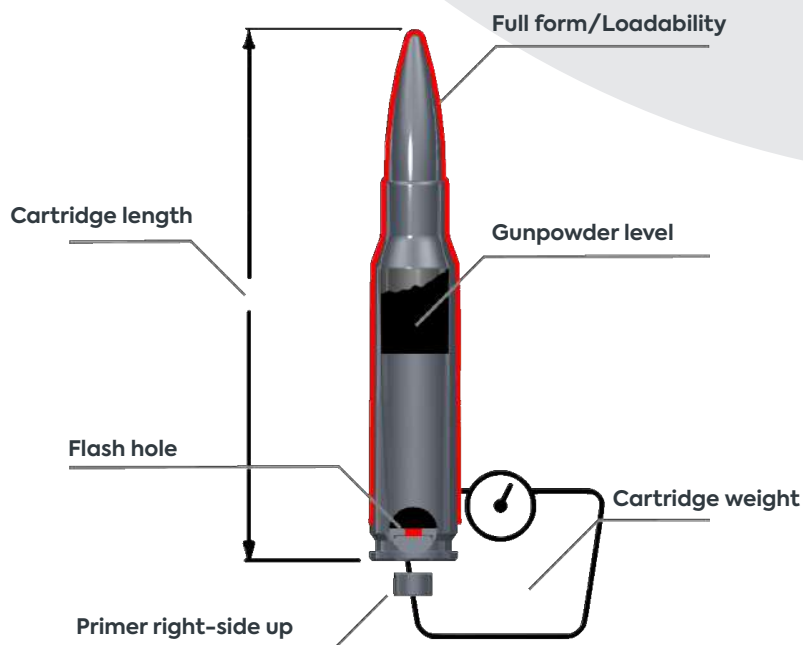
Machine Name	Automatic Packaging Machine		
Production speed	200 PPM	Labor Requirement	1 Operator / Shift
Electricity Consumption	5 kW	Lubrication System	Automatic
Adhesive Type	Hot Glue	Feeding unit	Hopper and Conveyor
Compressed Air Consumption	6 - 7 Bar 7 dm ³ (NI) / min.		
Noise Level	Max 85 desibel		
Available Calibers	9x18 – 9x19 – 7,62x39 – 7,62x51 – 5,56x45 – 7,62x54		

Quality Assurance

During the assembly, all the imperfections on cartridge components that would lead to a misfiring are eliminated. By the time cartridges exit the loading machine their quality control is completed. It is automatically ensured by the system that;

- Primer anvil exists.
- The flash hole exists.
- Primer inserted right side up.
- Primer depth is accurate.
- Ring crimping is accomplished.
- Extractor groove exists.
- The cartridge mouth is circular.
- The gunpowder exists and the level is accurate.
- Bullet crimping is accomplished.
- The cartridge length is accurate.
- The cartridge's full form/loadability is accurate.
- The cartridge weight is accurate.

At this point only surface imperfections such as corrosion, missing annealing, scratches, dents, etc. are left to be inspected. Therefore, this assembly line is equipped with manual inspection machines.



Primer anvil



Ring crimping



Primer depth

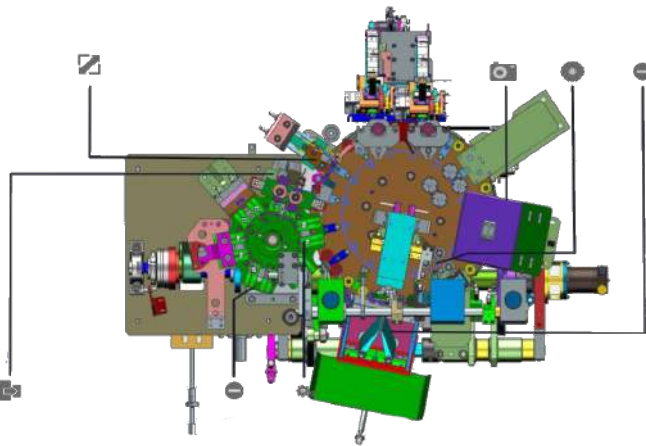


Extractor groove

Human Interface



- The machines are built ex-proof following the ATEX Directive.
- All the safety precautions are taken to safely handle primers and the gunpowder. Materials in the primer and the gunpowder feeding system are chosen accordingly.
- The machines are designed for a minimum level of physical human interaction with the machine.
- The doors of the machines are safely locked and the machines do not operate unless the doors are properly closed.
- The system refuses to run when the air supply pressure is insufficient.
- The system shuts down in case of a jam.
- The real-time production count is displayed on the HMI screens.
- The faults and their location and all the alarms are listed on the HMI screens.
- All stations and their components are displayed on the HMI screens.

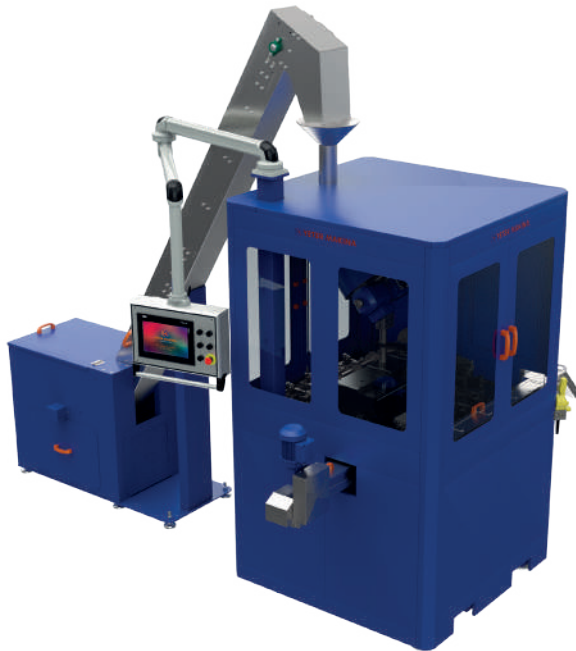


Conversion Tool Kits

It takes only one shift to replace the conversion tool kits of the entire assembly line. After the conversion is completed, another shift may be spent for test runs. Basically in 2 shifts, the system will be ready to assemble the next caliber at full capacity.

We design and produce all the conversion kits at our factories. Therefore, we can guarantee the supply of parts for years. Furthermore, we can provide a complete set of conversion kits for new calibers that the client wants to add to the system.

OTHER AMMUNITION MACHINES

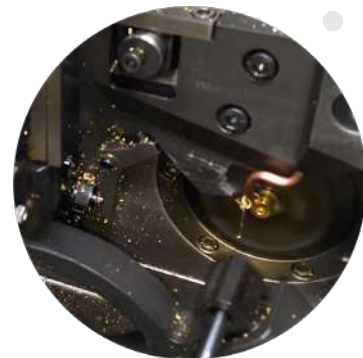
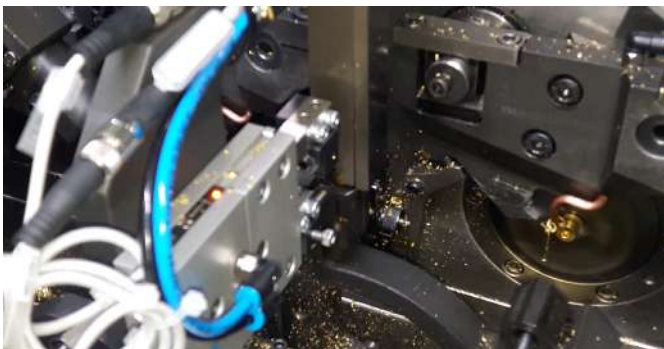


Extractor Grooving and Length Cutting Machine

The extractor grooving machine (also known as 'Head turn and length cutting machine') has a machine capacity of 120ppm with two stations based on a cam mechanism. It performs extractor grooving, length cutting, chamfering, and mouth cleaning after length cutting. The machine requires one operator to run the system through an HMI screen. It requires a compressed air supply.

Functions and Advantages

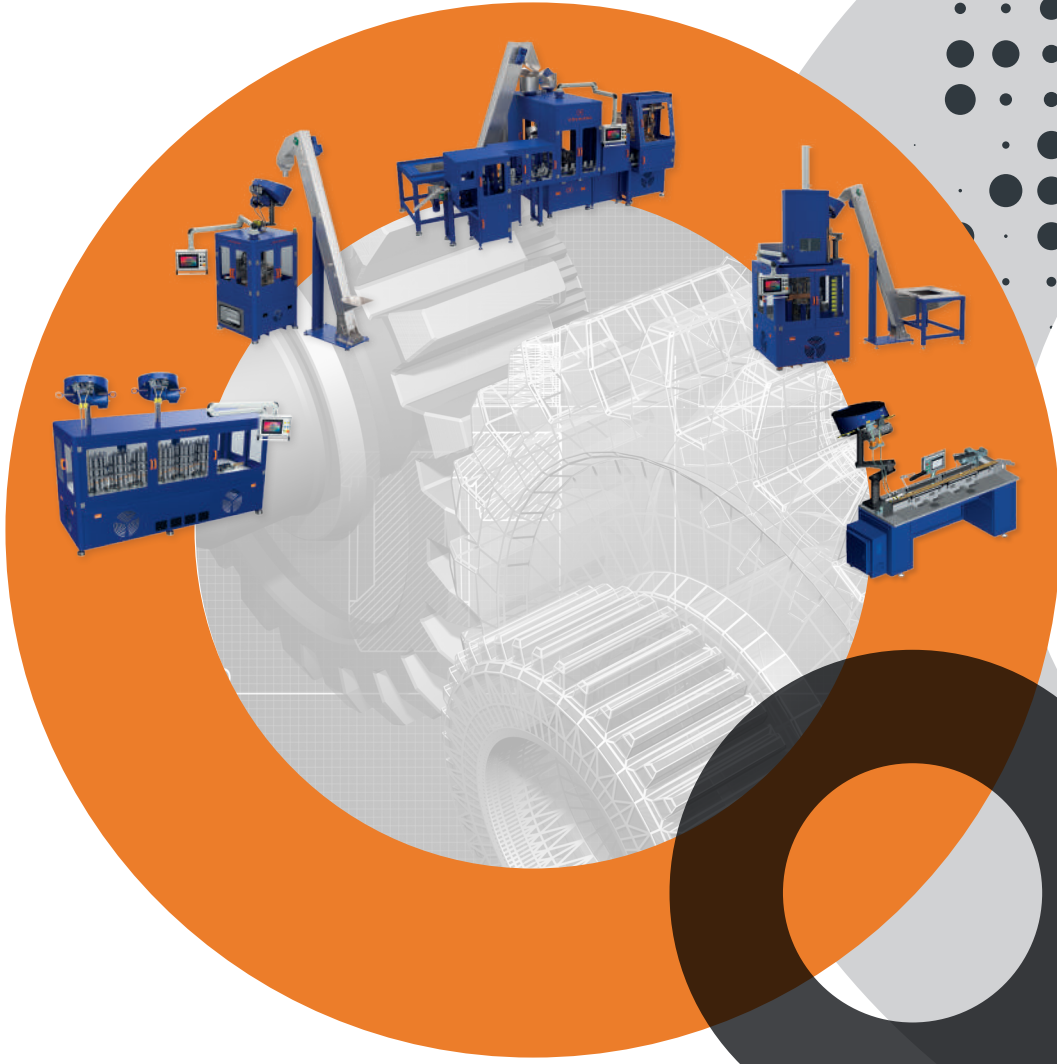
- Extractor grooving
- Chamfering (Grooving and chamfering are performed at the same time by turning)
- Length cutting
- Mouth cleaning (After length cutting)



Technical Speciments



Machine Name	Extractor Grooving and Length Cutting Machine		
Production speed	120 PPM	Labor Requirement	1 Operator / Shift
Electricity Consumption	3 kW	Lubrication System	Automatic
Total Electrical Power	5 kW	Feeding unit	Hopper and Conveyor
Compressed Air Consumption	6 – 7 Bar 7 dm ³ (NI) / min.		
Noise Level	Max 85 desibel		
Available Calibers	9x18 – 9x19 – 7,62x39 – 7,62x51 – 5,56x45 – 7,62x54		



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