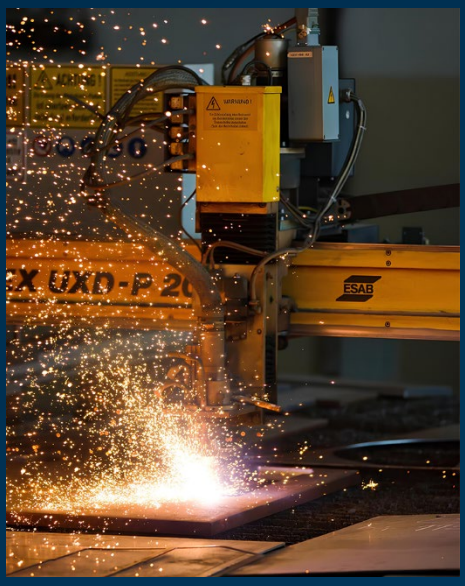
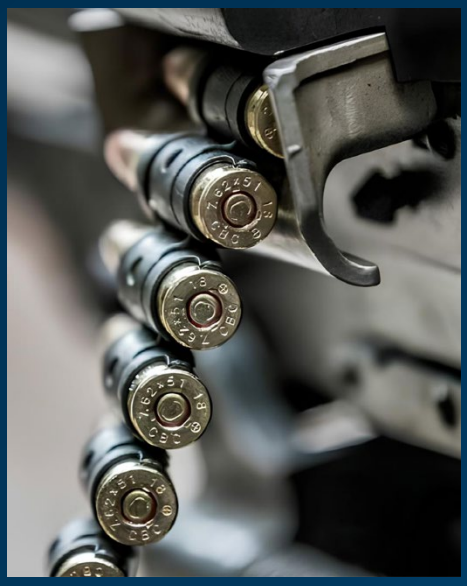
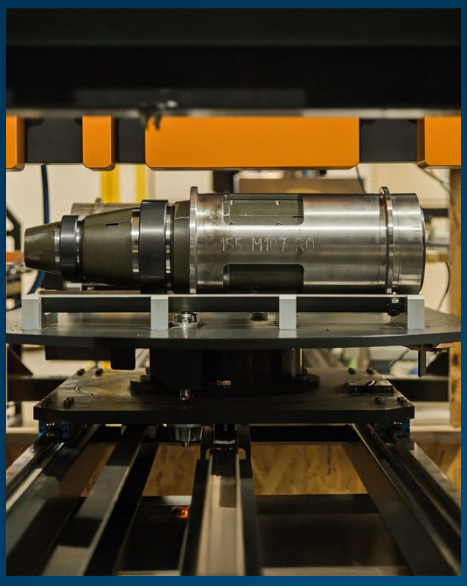
DELTA DEFENCE

QUALITY AND TRADITION

CATALOGUE







QUALITY AND TRADITION

CONTENTS

HISTORY

1993 — Incorporation of Delta-B "NORICUM GHN-45 project"

2004 — Cooperation with BAE Systems "IFF - identification friend-foe" for the Slovak Airforce

2005 — Cooperation with DIEHL BGT DEFENCE "RM-70/85 MODULAR"

2006 — Cooperation with BAE SYSTEMS "MOKYS-mobile C3 system project" Privatization of Military Repair Plant - VOP Prešov

2011 — Acquisition of MANURHIN, Mulhouse French ammunition technology producer

2013 — Strategic cooperation with Explosia, Pardubice Czech Republic "Small and Medium calibre propellants"

2016 — Acquisition Istrochem Explosives, Bratislava Development and production of explosives in Slovakia

2019 — Establishment of Neotechnology Design Bureau

2022 — Launch of Filling and Casting Lines Series Production

2024 — Turnkey Projects for Factory Producing

MAP


ICELAND
NORWAY
SWEDEN
FINLAND
NORTH SEA
BALTIC SEA
ESTONIA
LATVIA
LITHUANIA
RUSSIA
DENMARK
BELARUS
IRELAND
UNITED KINGDOM
NETHERLANDS
BELGIUM
GERMANY
POLAND
PREŠOV
CZECH REPUBLIC
SLOVAKIA
UKRAINE
AUSTRIA
HUNGARY
MOLDOVA
FRANCE
SWITZERLAND
SLOVENIA
ROMANIA
CROATIA
ITALY
BOSNIA AND HERZEGOVINA
SERBIA
BULGARIA
MACEDONIA
PORTUGAL
SPAIN
GREECE
BLACK SEA
MEDITERRANEAN SEA

INTRODUCTION

DELTA DEFENCE, a.s. Bratislava is an authorized research and development (R&D), trading and manufacturing company specializing in the executing of projects related to the production processes of armored vehicles and technological processes for the production of small-caliber, medium-caliber and large-caliber ammunition, including chemical inputs to production.

This involvement includes projects carried out in collaboration with BAE Systems, such as the IFF project for friend or foe identification based on communication between ground radar and transponder which was installed in aircraft or helicopter, or the project for a mobile communication system for the Slovak Army. For the Slovak Army, DELTA DEFENCE has modernized the RM 70/85 Modular rocket launcher, capable of firing both 122mm GRAD and 227mm MLRS rockets. This project was realized in cooperation with Diehl Defence.

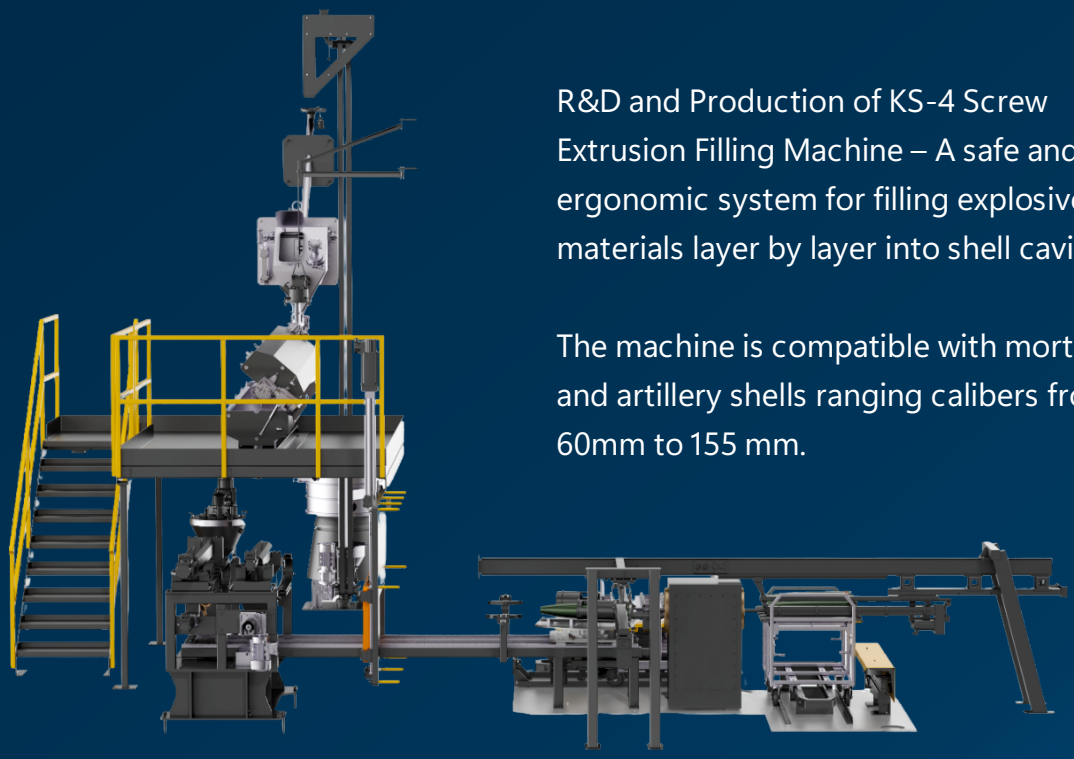
Over the course of its 30-year history, DELTA DEFENCE, in its role as an integrator, participated in all transformation projects of Slovakia's entry into NATO.

Through acquisitions, whether with the French ammunition production line manufacturer Manurhin or the Slovak explosive manufacturer, the company has acquired technological processes, production lines, and skilled workers that constitute a key portfolio of its current production.

<u>Production:</u>

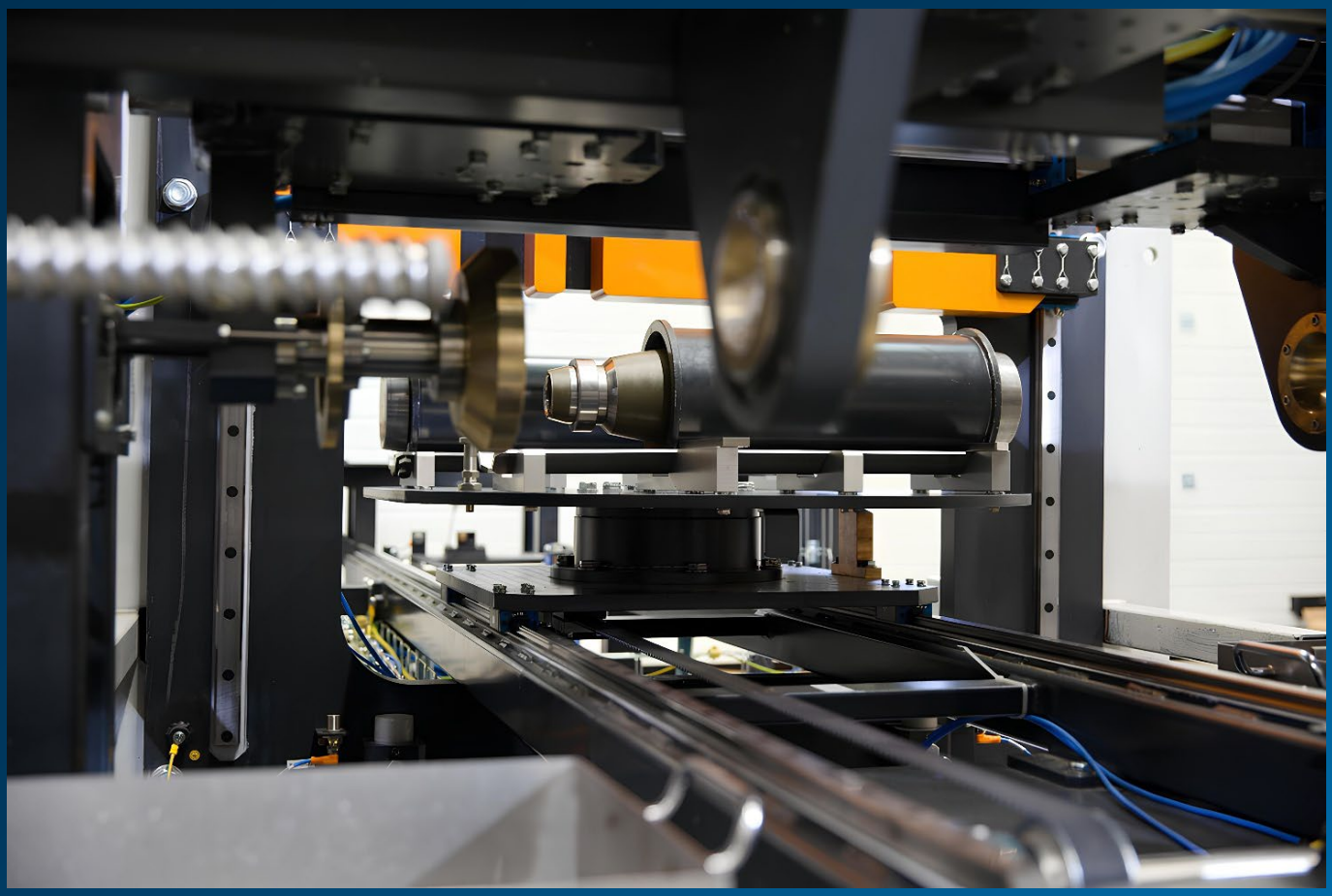
- Lines for ammunitions manufacturing
- Armor vehicles
- Artillery system NORICUM GHN-45,
- Howitzer with a caliber of 155mm
- Manufacturing lines for industrial explosives
- 122mm GRAD rockets
- Filling of high-explosive material using the screw extrusion method into large-caliber ammunition (60mm – 155mm). This method involves the continuous pressing of explosive material layer by layer inside the shell cavity

FILLING LINE FOR LARGE CALIBER AMMUNITION USING SCREW EXTRUSION METHOD



R&D and Production of KS-4 Screw Extrusion Filling Machine – A safe and ergonomic system for filling explosive materials layer by layer into shell cavity.

The machine is compatible with mortar and artillery shells ranging calibers from 60mm to 155 mm.

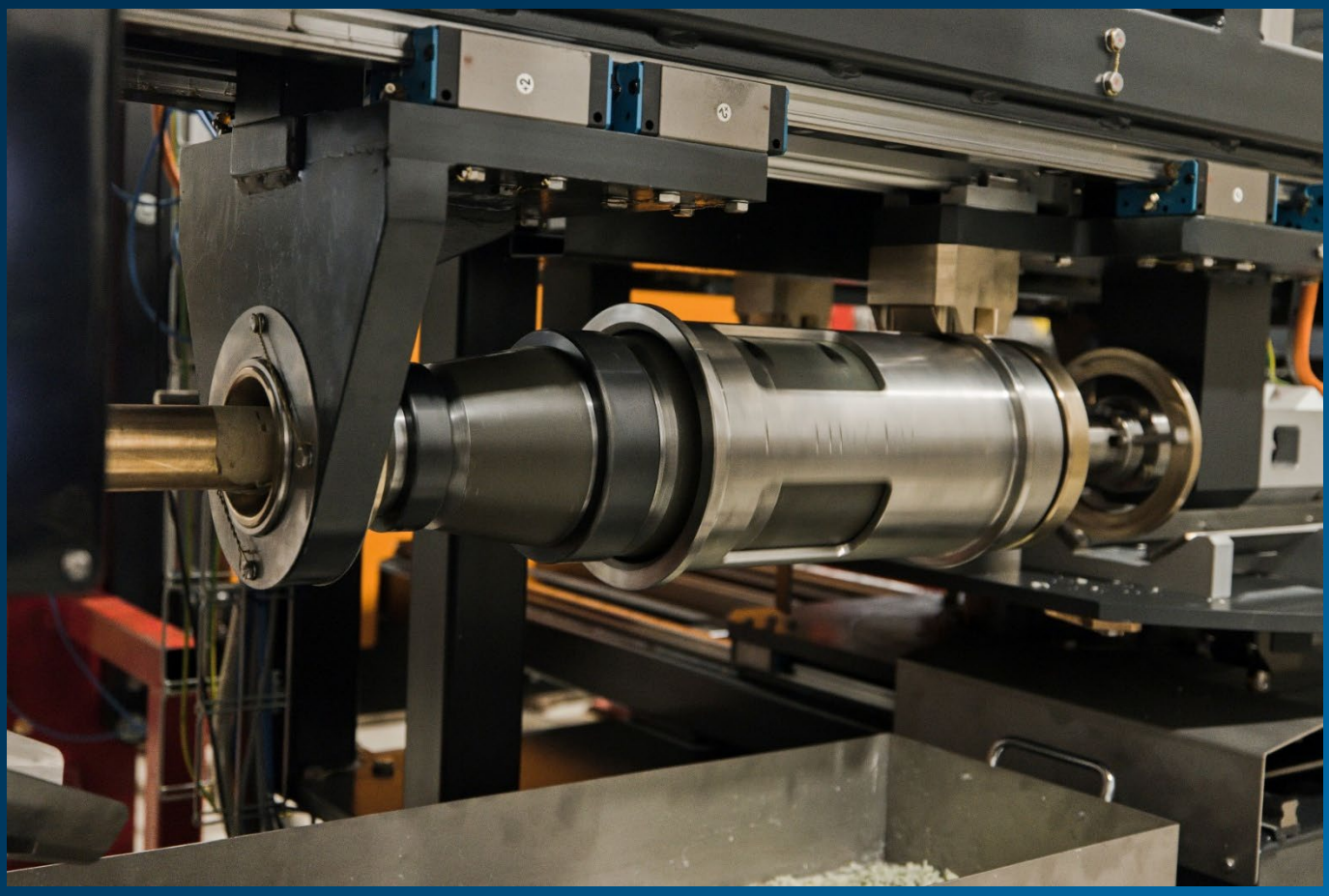


INPUTS:

- Empty projectile bodies
  paint and internal asphalt paint
- Plugs for projectile bodies
- Explosive in packaging
- Zinc stearate
- Lacquer for explosive
- Transport pallets, handling equipment
- Lubricating oils, greases
- Packaging material

OUTPUTS:

- Filled projectile bodies
- Projectile bodies for paint repair
- Explosive for disposal
- Explosive for reprocessing
- Parts from the KS-4 machine
- Wastewater
- Packaging material



TECHNOLOGICAL LINE FOR CASTING HAND GRENADES AND CASTING 60MM, 80MM CAL. MORTAR AMMUNITION

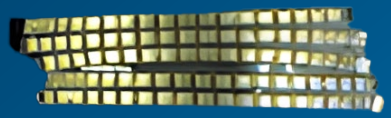
Technology for casting mortar hand grenades and ammunition of 60 mm and 80 mm calibre with TNT and TNT/RDX explosives, production of TNT mixed with RDX with a final shape in the form of flakes.

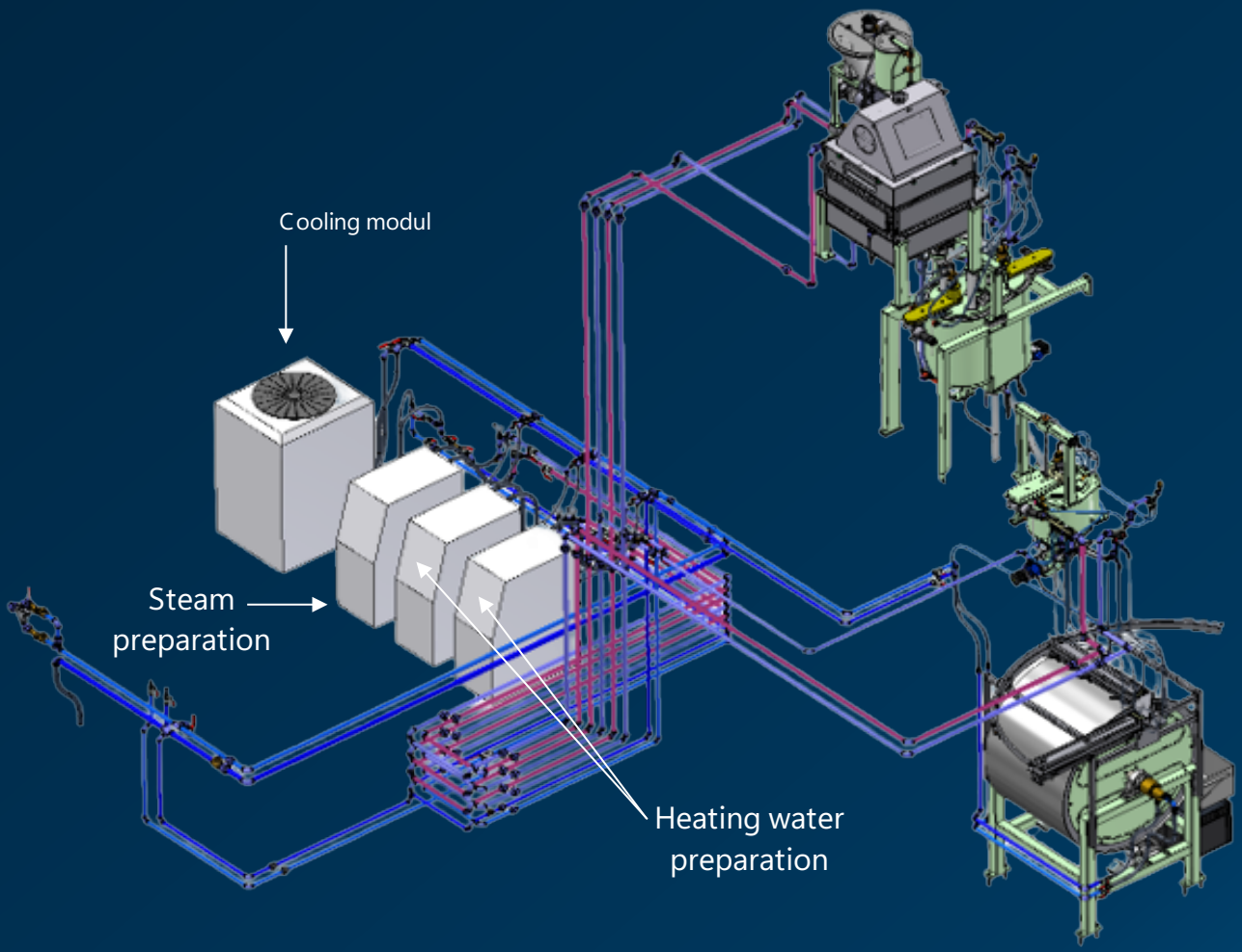
INPUTS:

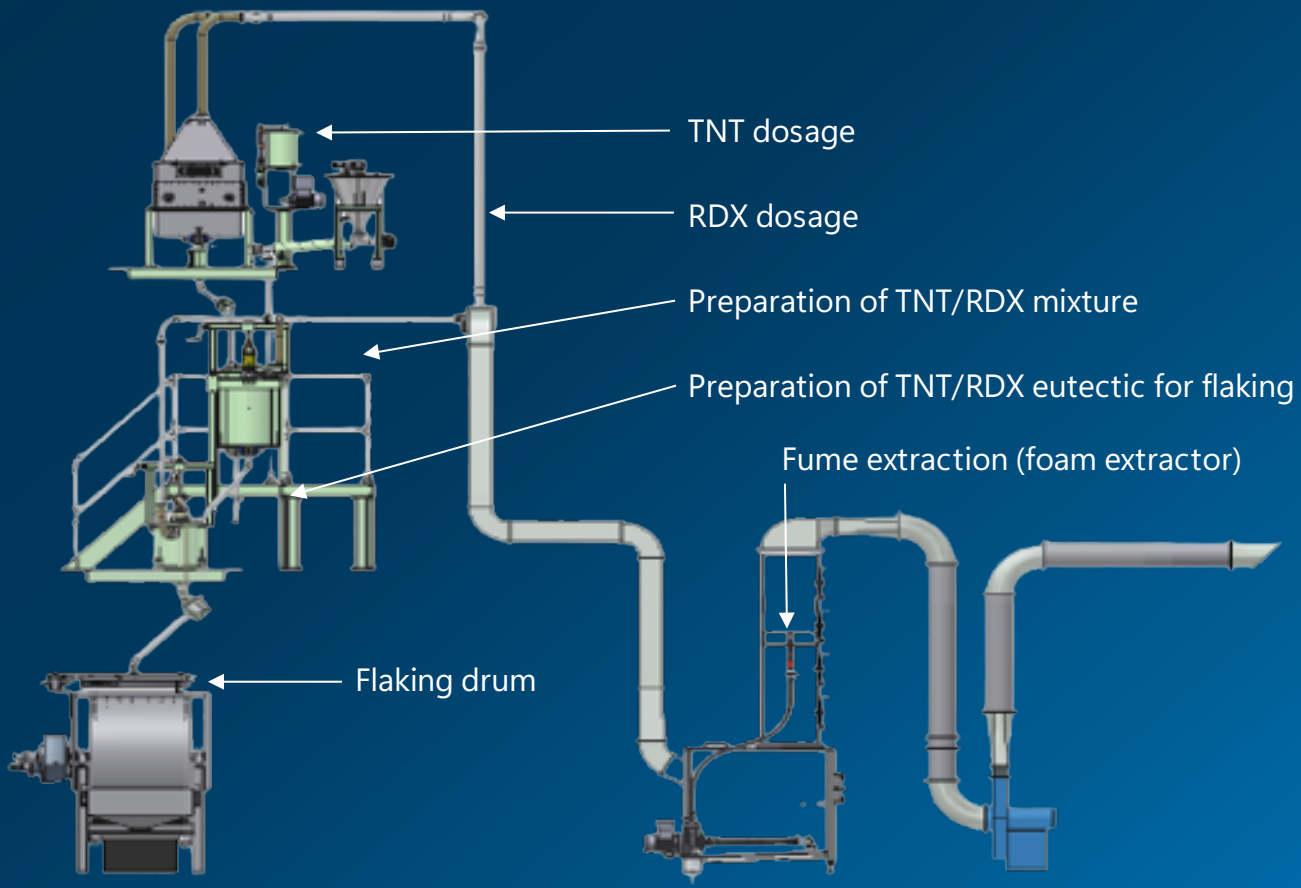
- Empty projectile bodies
- Explosive materials TNT / RDX according MIL and GOST standard
- Explosive materials TNT after delaboration
- Explosive in packaging
- Transport pallets, handling equipment
- Lubricating oils, electric energy
- Packaging material

OUTPUTS:

- Filled grenades bodies and mortar shells
- Flakes for composition of TNT and RDX
- Utilised explosive material TNT in form of flakes
- Packaging material




Cooling modul
Steam preparation
Heating water preparation


TNT dosage
RDX dosage
Preparation of TNT/RDX mixture
Preparation of TNT/RDX eutectic for flaking
Fume extraction (foam extractor)
Flaking drum

ARTILLERY SYSTEM NORICUM GHN-45, A HOWITZER WITH A CALIBER OF 155MM

Description

The GC-45's general design followed several decades of work by Bull with fin-stabilized artillery shells, starting at the Canadian Armament Research and Development Establishment (CARDE) and later at Project HARP.

Years of research and testing aimed at producing a howitzer capable of firing supersonic-speed ammunition with the longest possible range culminated in a collaboration with South African DENEL, which developed the chassis. Later, in the 1990s, manufacturing itself moved to Europe. At that time, DELTA DEFENCE, together with T&T, acquired this project and began production in Switzerland.

Following successful exports of NORICUM GHN-45 to the United Emirates, Oman, and the Thai Army, the production license was sold to India, to the company Kalyani. Bharat Forge, a subsidiary of Kalyani, carried out the modernization of this system in its workshops. The highlight of the modernized Bharat 52 system was the extension of the barrel by more than one meter. The advantage of the 155/52 caliber lies primarily in its longer range.

Description of family GC-45:

Vehicle:

- 155mm GC-45, towed
- 155mm GH N-45 JOKA, towed
- 155mm GH N-45 A1, towed
- 155mm GH N-45 APU, towed, self-propelled by auxiliary power unit
- 155mm GH N-45 APU-P, towed, self-propelled by auxiliary power unit and power laying

Accessories:

- Support Equipment, Echelon 1, Organisational Level, Direct Support
- Support Equipment, Echelon 2, Organisational Level, Field Support
- Support Equipment, Echelon 3, General Support Level
- Support Equipment, Echelon 4, Arsenal/Industrial Support Level

Category	Specification	Details
General	Origin	Austria
	Type	Towed howitzer
	Crew	6
Dimensions-Travelling	Weight	12,4 t with APU
		10,1t without APU
	Length	13,97m with barrel facing rearward
		9,72m with barrel stowed over trails
	Width	2,5m
	Height	2,26m with barrel facing rearward
		2,05m with barrel stowed over trails
Dimensions-Firing Position	Length	11.4m
	Width	9.93m
Ordnance	Type	155mm 45-caliber howitzer
	Ammunition	155mm NATO, 23-liter chamber
	Barrel length	7.05m
		7.72m including breech and loading tray
	Muzzle brake	Yes, multi-slotted

GRAD ROCKET 122MM WITH EXTENDED RANGE

Description

122 mm rocket projectiles are intended for use against enemy manpower in the open and in field shelters, for making passages in minefields and defence wiring, against hostile artillery and for destruction of armoured materiel. The rocket projectiles are equipped with the MRV- U contact delay fuze or with aproximity fuze. When a proximity fuze is used, fragmentation effect is increased up to 6 times.
In addition, a Grad 122 mm variant employing a new type of propellant provides an extended range of up to 40 km.

Caliber [mm]	Length [mm]	Total weight [kg]
122	2875	67

Weight of warhead with fuze [kg]	Propellant weight [kg]
19,1	20,45

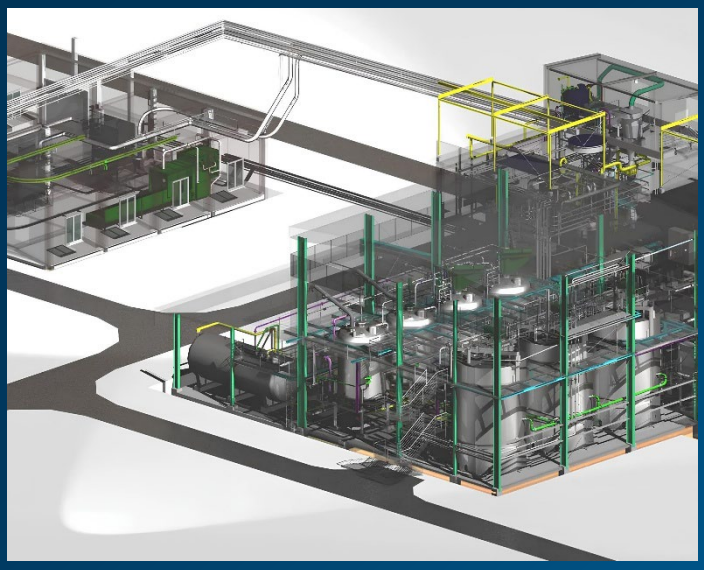
Optimal angle of elevation [°]	Maximum range [km]	Maximum speed [m/s]
48	20,1	690,6

TURNKEY PROJECTS FOR THE CONSTRUCTION OF MANUFACTURING PLANTS FOR THE PRODUCTION OF TNT AND PROPELLANTS

Turnkey projects include solutions for the production of TNT, single, double, and triple-base powders, acid adjustment, and the modification and processing of cellulose.

The manufacturing plants primarily include technology installed in the following facilities:

- Storage areas
- Preparation and milling of raw materials
- Production of semi product
- Production of final propellant grain
- Laboratory for quality control
- Final product assembling
- Administrative facility



The facilities have to be constructed in accordance with the standards for this type of work. In addition, highest level of control of the movement of the people within the area has to be ensured, with special control of the area immediately to the factory.

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