Your Partner for Energetic Materials.
Unmatched Expertise. Proven Solution.

Widely acknowledged for its high level of expertise and know-how in chemical synthesis and transformation of energetic molecules, EURENCO develops, manufactures and provides a largely diversified range of cutting-edge energetic materials for both the defense and the commercial markets.

Increasingly involved in new international programs, EURENCO has reinforced its production capabilities in Europe and restructured its activities, to best meet the needs of its partners in the following sectors:

• FUEL ADDITIVES
• DEFENSE, SPACE & SECURITY
• OIL & GAS AND MINING INDUSTRY

A leading European company for military explosives, propellants and combustible items, EURENCO also provides explosives for the civil sector (oil & gas perforation, mining), and additives for diesel fuel, 2-EHN in particular, a chemical that improves diesel fuel quality.

Laboratories, pilot workshops, multi-purpose units and large scale facilities, all contribute to strengthening EURENCO’s R&D and manufacturing capabilities, allowing small scale to mass production.

A favored partner of major companies worldwide, EURENCO aims to constantly enhance its flexibility and reactivity to provide a tailor-made service for common success.
Created in January 2004 to bring together the French, Belgian and Swedish Explosives & Propellants activities, EURENCO inherited its prestigious predecessors’ (SNPE and Bofors) centuries of in-depth knowledge of energetic materials.

In December 2013, Groupe SNPE (owner of EURENCO) was acquired by GIAT Industries (parent company of the NEXTER Group).

Ranges of EURENCO products are marketed through specific brands:

- **Bofors Powders:** propellants for hunting, sporting and law enforcement
- **MANUCO:** energetic nitrocellulose for propellants and propelling charges
- **PB Clermont:** spherical powders for small and medium caliber ammunition
- **VeryOne:** 2-EHN cetane improver for diesel fuels

From its headquarters based South of Paris (Massy •), EURENCO operates 4 modern production plants in France (Bergerac •, Sorgues •), Belgium (Clermont •) and Sweden (Karlskoga •).

EURENCO is also present in the United States, through a commercial office in Washington DC • (for explosives, propellants and combustible items) and a distribution company in Houston • (for fuel additives).

In order to meet the strong market demand, EURENCO also runs a number of storage facilities worldwide, among which one of the largest storage parks for pyrotechnics in continental Europe.
Bofors has developed world class powders for more than 100 years, pioneering the development and manufacture of new and customized propellants for ammunition in hunting, sporting and law enforcement.

Bofors Powders is Alfred Nobel’s legacy. Relying on the same spirit of innovation, Bofors Powders continues to develop and manufacture the highest quality of propellant in the very same location where Nobel once built its laboratory. Like him, Bofors Powders strives to look ahead, to be the best and the one leading the way. This is Bofors’ driving force, and has been since 1898.

EURENCO Bofors offers an extensive range of high quality extruded propellants, as well as customized propellants specially designed to maximize performance. Grain geometry and composition for each propellant type is designed to meet the required characteristics for the chosen application.

Bofors Powders supplies the world’s leading brands of premium and accurate long-range ammunition.

For more information: www.eurenco.com
Located in Bergerac (France), MANUCO is a joint venture between EURENCO and MAXAM Chem. Using either cotton linters or wood pulp as raw materials, MANUCO manufactures different grades of energetic nitrocellulose for the production of propellants (for all caliber ammunition), propelling charges and dynamite.

MANUCO provides 3 kinds of energetic nitrocellulose:

- With high nitrogen content (gun cotton);
- With low nitrogen content (pyrocellulose);
- A blend of both high and low nitrogen content.

Custom-made nitrocellulose can also be manufactured to meet any military standard.

Inheriting Bergerac NC’s extensive know-how and understanding of quality, safety and environmental stakes related to this product, MANUCO is able to offer technical assistance as well as R&D capacities.

For more information:
www.manuco-nc.com
PB Clermont, standing for “Poudrerie Belge de Clermont”, was founded in 1850 and is one of the world’s most experienced propellant manufacturers.

PB Clermont produces exclusively spherical propellants, a nitrocellulose smokeless powder suitable for:

- small and medium caliber (up to 25 mm) ammunition
- civil applications (power tools)
- mortar rounds secondary charges

Spherical powders provide an improved loading of cartridges due to an excellent flowability, excellent physical and chemical stability, as well as lower barrel erosion.

Faced with an extensive and highly diversified worldwide market, PB Clermont has made a point of listening carefully to customer requirement and trends, in order to constantly enhance, optimize or innovate.

For more information: www.pbclermont.be
Capitalizing on its extensive experience in alcohol nitration, coupled with vast expertise in the manufacturing of explosives, EURENCO developed its own specific production process to safely produce Cetane Improver, also known as 2-Ethylhexyl Nitrate (2-EHN).

Over 30 years after it first started, the production of Cetane Improver has become a fully integrated and vital part of the Sorgues manufacturing complex (France).

Anticipating the growing need for fuel additives offering both technical and economical advantages, EURENCO launched a new brand to promote its 2-EHN solution and meet the strong market demands worldwide: VeryOne Cetane Improver.

Relying on more than 7,800 metric tons of North American product storage, as well as an annual capacity of 75,000 metric tons of Cetane Improver, VeryOne is the world leading 2-EHN manufacturer.

EURENCO VeryOne offers the greatest capacity, reliability and expertise.

For more information: www.veryone.com
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Transfer of Technology

• EURENCO has **proven experience** in the management of Transfer of Technology projects, through the SNPE Group during the 1970s-1980s:
  > Technologies: production units for high explosive filling, nitrocellulose, spherical powders and single base propellants
  > Countries involved: USA, Brazil, Canada, India, South Korea

• Today, with regards to explosives and propellants, **technologies considered for transfer** include:
  > New construction or upgrade of complete production units
  > Quality control laboratories for physicochemical tests and ballistic tests
  > Rehabilitation of pyrotechnic industrial sites

• **2 options** for EURENCO:
  > Technology licensor on outright ToT projects
  > Technology licensor and subcontractor for a qualified and competitive engineering company on turnkey projects
Research & Development

4 ACTIVITY SEGMENTS:
> Explosives
> Small, medium and large caliber propellants
> Modular charges and combustible items
> Fuel additives

EUROPEAN-WIDE R&D NETWORK

MEMBER OF IMEMG, GTPS

ONE HUNDRED OR SO ACTIVE PATENT FAMILIES

DESIGN
Engineering of new energetic materials

FEASIBILITY ON LAB SCALE
Nitration, crystallization, characterization and small-scale formulation

EXPERTISE
Full-scale performance and environmental tests

INDUSTRIALIZATION
Pilot workshops, multi-purpose production units and loading facilities

DEVELOPMENT
Assessment of mechanical, ballistic and detonic properties

STRAOCH PARTNERSHIPS WITH OUR CUSTOMERS
EXPLOSIVES
EURENCO develops, manufactures and provides a unique range of products for the military and civil markets:

- **High explosives (Conventional & Insensitive)** for melt-cast, pressed and cast PBX explosive charges, fuse boosters, pyrotechnics, mining and oil & gas applications;

- **Cast PBX charges for Insensitive Munitions**: missile warheads, bombs and penetrators, torpedoes, underwater mines and shell ammunition;

- **Plastic explosives** for demolition, breaching and cutting operations.

To ensure both flexibility and large-scale capabilities, EURENCO is equipped with modern and innovative facilities, such as multipurpose synthesis units and automated filling workshops for Insensitive Munitions.
EXPLOSIVES
SINGLE MOLECULES
EXPLOSIVES

SINGLE MOLECULES

EURENCO provides a complete range of high explosives, including primers, oxidizers, energetic polymers, as well as insensitive and thermostable molecules.

Laboratories and multi-purpose units also contribute to the development and scale-up of new energetic molecules.
EXPLOSIVES
SINGLE MOLECULES

RDX

Best solution for both performance and cost

SPECIFICATIONS

MIL-DTL-398 C
STANAG 4170

APPLICATION

Main charges for warheads, ammunition and boosters
Pyrotechnical devices (cap-relay, detonators, cutting cords)
Oil well perforating charges

TECHNICAL CHARACTERISTICS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.82</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8 750 m/s</td>
</tr>
<tr>
<td>RDX type 1 and type 2 available in all standard particles sizes (Class 1 to Class 5)</td>
<td></td>
</tr>
<tr>
<td>Specific grades available on request</td>
<td></td>
</tr>
<tr>
<td>I-RDX (“insensitive grade”) Threshold for detonation</td>
<td>Increased from 25 to 55 Kbar when used with PBXN109</td>
</tr>
</tbody>
</table>
**HMX**

Best solution for high performance, high thermal stability and low shock sensitivity

**SPECIFICATIONS**

- MIL-DTL-45444 C
- STANAG 4284

**APPLICATION**

- Main charges for warheads, ammunition and boosters
- Oil well perforating charges, shock tubes and detonating cords
- Formulations more insensitive to shocks

**TECHNICAL CHARACTERISTICS**

- **Density**: 1.91
- **Detonation velocity**: 9100 m/s
- **Deflagration point**: 287 °C
- **Threshold for detonation**: increased from 28 to 40 Kbar when used in PBX with 85% HMX
- **Standard particle sizes**: class 1 to class 5
- **Specific grades available on request**
CL-20

Higher performance than standard explosives

SPECIFICATIONS
According to EURENCO spec.

APPLICATION
High impulse energetic material for rocket motor applications
High explosive and high energetic aluminized and minimum smoke propellant

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
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<tbody>
<tr>
<td>Density</td>
<td>2.02 - 2.04</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>10,000 m/s</td>
</tr>
<tr>
<td>Particle sizes</td>
<td>coarse (100/150 µm) and medium (20/50 µm)</td>
</tr>
</tbody>
</table>
**EXPLOSIVES**

**SINGLE MOLECULES**

**HNS**

High thermal stability and good initiation reliability

**SPECIFICATIONS**

MIL-WS-5003

**APPLICATION**

Booster charges

Space and military pyrotechnics

Perforating and cutting charges for oil & gas industry

Initiation explosive in slapper detonators

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.74</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>7,000 to 7,100 m/s</td>
</tr>
<tr>
<td>Deflagration point</td>
<td>316 – 318 °C</td>
</tr>
<tr>
<td>HNS type 1 to type 4</td>
<td></td>
</tr>
</tbody>
</table>
TATB

Low sensitivity and high thermal stability

SPECIFICATIONS

According to EURENCO spec.

APPLICATION

Insensitive compositions for main charges and boosters

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.94</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>7970 m/s</td>
</tr>
<tr>
<td>Self ignition temperature</td>
<td>320 °C</td>
</tr>
</tbody>
</table>
**FOX-7**

Greater resistance to impact and friction than standard explosives

### TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1,885</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8,800 m/s (RDX: 8,930 m/s)</td>
</tr>
<tr>
<td>Heat of formation</td>
<td>-8 kJ/mole</td>
</tr>
<tr>
<td>Particle sizes</td>
<td>class 1 to class 4</td>
</tr>
</tbody>
</table>

### APPLICATION

- Insensitive compositions for main charges and boosters
- High performance propellants for tank ammunition
GUDN (FOX-12)

Low sensitivity, excellent thermal stability, high gas yield

SPECIFICATIONS

According to EURENCO spec.

APPLICATION

LOVA propellants and insensitive fillings for ammunition
Automotive safety

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.75</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8,210 m/s</td>
</tr>
<tr>
<td>Heat of formation</td>
<td>-355 kJ/mole</td>
</tr>
</tbody>
</table>
NTO

High performance, low sensitivity and enhanced thermal stability

SPECIFICATIONS

STANAG 4170

APPLICATION

Insensitive compositions for main charges and boosters

TECHNICAL CHARACTERISTICS

- **Density**: 1.91
- **Detonation velocity**: 8 430 m/s
- **Friction sensitivity**: 0% at 353 N
- **Standard particle sizes**: class 1 to class 4
- **Specific grades available on request**
PETN

More sensitive to shock and friction than standard explosives

APPLICATION

STANAG 4023

Detonating cords and cutting charges for mining
Plastic explosive for demolition, demilitarization and main fill for hand grenades
Initiation and booster charges

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.76</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8400 m/s (1.7 g/cm³)</td>
</tr>
<tr>
<td>Impact sensitivity</td>
<td>3 J</td>
</tr>
</tbody>
</table>
ADN

Strong oxidizer and high impulse

SPECIFICATIONS

According to EURENCO spec.

APPLICATION

Ingredient in composite rocket motor propellants and depth charges for underwater ammunition

Liquid mono propellant for rocket motors used in spacecraft propulsion

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
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<tbody>
<tr>
<td>Density</td>
<td>1.81</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>approx. 7 000 m/s</td>
</tr>
<tr>
<td>Heat of formation</td>
<td>-35.8 kJ/mole</td>
</tr>
<tr>
<td>3 grades</td>
<td>crystalline, prilled and coated,</td>
</tr>
<tr>
<td></td>
<td>ultra pure</td>
</tr>
<tr>
<td>Green product</td>
<td>no HCL release</td>
</tr>
</tbody>
</table>
EXPLOSIVES

SINGLE MOLECULES

GAP DIOL

Energetic polymer used as a binder

SPECIFICATIONS

According to EURENCO spec.

APPLICATION

High energetic composite rocket propellant grains
Insensitive charges and LOVA propellants for ammunition
Gas generators for automotive safety

TECHNICAL CHARACTERISTICS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.24 - 1.29</td>
</tr>
<tr>
<td>Combustion velocity</td>
<td>488 mm/s</td>
</tr>
<tr>
<td>Mean molecular weight</td>
<td>≈ 2000</td>
</tr>
</tbody>
</table>
TNC

Ignition and thermostability

**SPECIFICATIONS**

MIL-T-13723

**APPLICATION**

Ignition composition for ammunition
Catalyst for airbags’ combustion (automotive safety)

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting point</td>
<td>290 / 295 °C</td>
</tr>
<tr>
<td>Self ignition temperature</td>
<td>378 °C</td>
</tr>
</tbody>
</table>
EXPLOSIVES
SINGLE MOLECULES

TNR
Ignition

SPECIFICATIONS
MIL-T-50611

APPLICATION
Precursor for primers compositions for small caliber

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
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<tbody>
<tr>
<td>Density</td>
<td>1.83</td>
</tr>
<tr>
<td>Self ignition temperature</td>
<td>252 °C</td>
</tr>
<tr>
<td>TNR type 1 (P) and type 2 (W)</td>
<td></td>
</tr>
</tbody>
</table>
DNBF

Ignition and thermostability

SPECIFICATIONS

According to EURENCO spec.

APPLICATION

Green replacement of TNR
Precursor for primers compositions for small caliber
Primary explosive for airbag initiators, sealing charges

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.77</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>7 700 – 7 900 m/s</td>
</tr>
<tr>
<td>Self ignition temperature</td>
<td>378 °C</td>
</tr>
<tr>
<td>Purity</td>
<td>class 2 (&gt; 97%) and class 3 (&gt; 95%)</td>
</tr>
</tbody>
</table>
EXPLOSIVES
DEFENSE & SECURITY
For the Defense & Security market, EURENCO develops and produces specific explosive compositions and formulations for melt-cast, pressed and cast-PBX applications in main charges and boosters:

- Conventional compositions for medium caliber, warheads, artillery, tank and mortar ammunition;
- Insensitive compositions for the loading of Insensitive Munitions;
- Demolition explosives for explosive ordnance disposal as well as demolition, cutting and breaching operations.
EXPLOSIVES
DEFENSE & SECURITY
CONVENTIONAL COMPOSITIONS
EURENCO provides a wide range of conventional formulations to be used for shaped charges, medium caliber ammunition (20 mm, 25 mm, 30 mm, 40 mm), as well as main charges and boosters in warheads, mortar, tank and artillery shells.

These compositions are manufactured for loading using melt-cast or pressed technology.
EXPLOSIVES
DEFENSE & SECURITY
CONVENTIONAL COMPOSITIONS

COMP B
RDX / TNT

SPECIFICATIONS
MIL-C-401

APPLICATION
Melt-cast or pressed compositions for main charges

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.71</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>7 900 m/s</td>
</tr>
<tr>
<td>Grades</td>
<td>Granular form</td>
</tr>
<tr>
<td>Low viscosity</td>
<td>&lt; 7 s</td>
</tr>
</tbody>
</table>
EXPLOSIVES
DEFENSE & SECURITY
CONVENTIONAL COMPOSITIONS

HEXOTOL
RDX / TNT

SPECIFICATIONS
According to EURENCO spec.

APPLICATION
Melt-cast compositions for main charges

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.65 - 1.71</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>7800 - 8000 m/s</td>
</tr>
<tr>
<td>Grades</td>
<td>Granular form</td>
</tr>
<tr>
<td>Ingredient ratio</td>
<td>Adapted to required performance</td>
</tr>
</tbody>
</table>
OCTOL

HMX / TNT

SPECIFICATIONS

MIL-O-45445B

APPLICATION

Melt-cast composition for high performance warheads and shaped charges

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.805 - 1.81</td>
</tr>
<tr>
<td>Octol type 1</td>
<td>Class 1</td>
</tr>
<tr>
<td>Octol type 2</td>
<td>Class 1 and 2</td>
</tr>
<tr>
<td>Ingredient ratio</td>
<td>Adapted to required performance</td>
</tr>
</tbody>
</table>
COMP A3 / A4 / A5

RDX / Wax or Binder

SPECIFICATIONS

A3/A4: MIL-C-440
A5: MIL-E-14970

APPLICATION

Pressed composition for boosters and main charges

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.61 for Comp A3</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8470 m/s for Comp A3</td>
</tr>
</tbody>
</table>
PBXN-3

HMX / Nylon

SPECIFICATIONS

MIL-E-82738

APPLICATION

Pressed composition for main charges

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.73</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8370 m/s</td>
</tr>
<tr>
<td>Grades</td>
<td>white granules</td>
</tr>
</tbody>
</table>
EXPLOSIVES
DEFENSE & SECURITY
CONVENTIONAL COMPOSITIONS

SPECIFICATIONS
MIL-C-21723

APPLICATION
Pressed composition for boosters

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.64</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8070 m/s</td>
</tr>
</tbody>
</table>
HEXOWAX

RDX / Wax or Binder

SPECIFICATIONS
According to EURENCO spec.

APPLICATION
Pressed composition for main charges and boosters

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.71 - 1.73</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8350 - 8450 m/s</td>
</tr>
<tr>
<td>Ingredient ratio</td>
<td>Adapted to required performance</td>
</tr>
</tbody>
</table>
PBXW-17

RDX / Polyacrylate

SPECIFICATIONS

MIL-DTL-32057 (OS)

APPLICATION

Pressed composition for shaped charges and boosters

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>&gt; 1.66</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8100 m/s</td>
</tr>
</tbody>
</table>
**PBXN-5**

HMX / Viton

<table>
<thead>
<tr>
<th>TECHNICAL CHARACTERISTICS</th>
<th>SPECIFICATIONS</th>
<th>APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.86</td>
<td>Pressed composition for boosters</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8800 m/s</td>
<td></td>
</tr>
<tr>
<td>Grades</td>
<td>white granules</td>
<td></td>
</tr>
</tbody>
</table>
PBXW-11

HMX / Polyacrylate

SPECIFICATIONS

DTL-WS-33500

APPLICATION

Pressed composition for shaped charges and boosters

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.80 - 1.83</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8820 m/s</td>
</tr>
</tbody>
</table>
OCTOWAX

HMX / Wax or Viton

SPECIFICATIONS
According to EURENCO spec.

APPLICATION
Pressed composition for high performance warheads and shaped charges

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.78 - 1.86</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8800 m/s</td>
</tr>
</tbody>
</table>
EURENCO develops insensitive formulations to be used in boosters and main charges by warheads and ammunition manufacturers.

In addition to melt-cast and pressed compositions, EURENCO also provides standard Cast PBX formulations, ready to use, specifically for the loading of Insensitive Munitions (medium and large caliber ammunition, missile and torpedo warheads, underwater mines, aircraft bombs...).

EURENCO is also equipped with both high-tech and cost-effective loading facilities, and contributes to the development of new Insensitive Munitions, in partnership with customers.
# Ontalites

## NTO / TNT

### Technical Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.77 - 1.81</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>7600 - 7900 m/s</td>
</tr>
<tr>
<td>Ingredient ratio</td>
<td>Addition of RDX to insure high performance</td>
</tr>
<tr>
<td>Adapted to customer application</td>
<td>With or without aluminium</td>
</tr>
</tbody>
</table>

### Application

IM melt-cast composition for main charges

### Specifications

According to Eurenco spec.
### SPECIFICATIONS

According to EURENCO spec.

### APPLICATION

IM melt-cast composition for main charges

### TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.65</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>6800 m/s</td>
</tr>
<tr>
<td>Possibility to add RDX or HMX - with or without aluminium - for higher performance</td>
<td></td>
</tr>
</tbody>
</table>
FOX-7 COMPOSITION

FOX-7 / Viton

SPECIFICATIONS

According to EURENCO spec.

APPLICATION

IM pressed composition for boosters

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.82</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8362 m/s</td>
</tr>
<tr>
<td>Critical diameter</td>
<td>&lt; 5 mm</td>
</tr>
<tr>
<td>Shock sensitivity</td>
<td>31 kbars</td>
</tr>
</tbody>
</table>
PBXN-7
TATB / RDX

TECHNICAL CHARACTERISTICS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.78</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>7770 m/s</td>
</tr>
<tr>
<td>Critical diameter</td>
<td>2.5 - 3.8 mm</td>
</tr>
<tr>
<td>Shock sensitivity</td>
<td>20 kbars</td>
</tr>
</tbody>
</table>

SPECIFICATIONS
MIL-DTL-82744

APPLICATION
IM pressed composition for boosters
EXPLOSIVES
DEFENSE & SECURITY
INSENSITIVE COMPOSITIONS

V350
TATB / HMX

SPECIFICATIONS
STANAG 4170

APPLICATION
IM pressed composition for boosters and main charges

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1,887</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8170 m/s</td>
</tr>
</tbody>
</table>
ISSENSITIVE COMPOSITIONS

SPECIFICATIONS

STANAG 4170

APPLICATION

IM pressed composition for boosters and main charges
IM equivalent to comp A3

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.84</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8350 m/s</td>
</tr>
<tr>
<td>Critical diameter</td>
<td>5 - 7 mm</td>
</tr>
<tr>
<td>Shock sensitivity</td>
<td>&gt; 25 kbars</td>
</tr>
</tbody>
</table>
NTO / HMX

IM pressed composition for high performance boosters
IM equivalent to PBXN-5

STANAG 4170

<table>
<thead>
<tr>
<th>TECHNICAL CHARACTERISTICS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1,871</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8416 m/s</td>
</tr>
<tr>
<td>Critical diameter</td>
<td>&lt; 5 mm</td>
</tr>
</tbody>
</table>
CAST PBX COMPOSITIONS FOR INSENSITIVE MUNITIONS

EURENCO offers one of the world’s widest range of Cast PBX solutions. This extensive know-how is the outcome of continuous research effort and experience acquired over 40 years to render munitions insensitive to accidental or intentional threats (fuel fire, bullet impact, metallic fragment, drop, shock, etc.).

Thanks to these assets, EURENCO has become one of the key players in the field of Cast PBX technology for Insensitive Munitions, and highly contributes to fulfil the new Armed Forces’ needs to:

> Reduce the vulnerability of combat platforms, warehouses and storage plants,
> Ensure total personnel safety,
> Increase performance of weapon systems,
> Lower operating and life cycle costs.

Furthermore, EURENCO is equipped with a complete range of cost-effective high-tech manufacturing processes:

> Unique and revolutionary “bi-component” process for continuous production of shell ammunition,
> Batch process for serial production of warheads, bombs and penetrators, torpedoes and underwater mines.
## Explosives

### Defense & Security

**Inert Sensitivity Compositions**

#### RDX Based Formulations

<table>
<thead>
<tr>
<th>REFERENCES</th>
<th>MAIN INGREDIENTS</th>
<th>DENSITY</th>
<th>DETONATION VELOCITY (M/S)</th>
<th>MAIN APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>B 2211</td>
<td>I-RDX® / AP / Al, IB</td>
<td>1.81</td>
<td>5500</td>
<td>Underwater Mines and Torpedoes - Enhanced Blast Warheads</td>
</tr>
<tr>
<td>B 2238</td>
<td>RDX, IB</td>
<td>1.57</td>
<td>8040</td>
<td>Booster - Missile Warheads - Shells</td>
</tr>
<tr>
<td>B 2245</td>
<td>I-RDX® / NTO / AP / Al, IB</td>
<td>1.81</td>
<td>5150</td>
<td>Underwater Mines and Torpedoes</td>
</tr>
<tr>
<td>B 2258</td>
<td>I-RDX® / AP / Al, IB</td>
<td>1.67</td>
<td>7100</td>
<td>Missile Warheads</td>
</tr>
<tr>
<td>B 2263 (HBU 88)</td>
<td>I-RDX®, IB</td>
<td>1.63</td>
<td>8150</td>
<td>Missile Warheads - Shells</td>
</tr>
<tr>
<td>B 2265</td>
<td>I-RDX®, IB</td>
<td>1.65</td>
<td>8290</td>
<td>Missile Warheads - Shells</td>
</tr>
<tr>
<td>B 2271</td>
<td>I-RDX® / Al, IB</td>
<td>2.42</td>
<td>5800</td>
<td>Enhanced Blast Formulation For Dual Charges</td>
</tr>
<tr>
<td>B 2274</td>
<td>RDX / ADD / Al, IB</td>
<td>1.67</td>
<td>5500</td>
<td>Low Collateral Damage Munitions</td>
</tr>
<tr>
<td>B 2276</td>
<td>RDX, IB</td>
<td>1.66</td>
<td>8300</td>
<td>Booster Explosive</td>
</tr>
<tr>
<td>PBXN-109</td>
<td>I-RDX® / Al, IB</td>
<td>1.65</td>
<td>7600</td>
<td>General Purpose Bombs and Penetrators</td>
</tr>
</tbody>
</table>

#### HMX Based Formulations

<table>
<thead>
<tr>
<th>REFERENCES</th>
<th>MAIN INGREDIENTS</th>
<th>DENSITY</th>
<th>DETONATION VELOCITY (M/S)</th>
<th>MAIN APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>B 2188</td>
<td>HMX / PETN, IB</td>
<td>1.62</td>
<td>7900</td>
<td>Booster Explosive - Safety Device</td>
</tr>
<tr>
<td>B 2237</td>
<td>HMX / AP / Al, IB</td>
<td>1.71</td>
<td>7330</td>
<td>Missile Warheads</td>
</tr>
<tr>
<td>B 2250</td>
<td>HMX / AP / Al, IB</td>
<td>1.80</td>
<td>6400</td>
<td>Enhanced Blast General Purpose Bombs or Penetrators</td>
</tr>
<tr>
<td>B 2273</td>
<td>HMX, IB</td>
<td>1.72</td>
<td>8490</td>
<td>Missile Warheads</td>
</tr>
<tr>
<td>B 3108</td>
<td>HMX / Al, EB</td>
<td>1.82</td>
<td>7830</td>
<td>Missile Warheads</td>
</tr>
<tr>
<td>ORA 86</td>
<td>HMX, IB</td>
<td>1.70</td>
<td>8350</td>
<td>Missile Warheads - Shaped Charges</td>
</tr>
<tr>
<td>PBX 80/20</td>
<td>HMX, IB</td>
<td>1.66</td>
<td>7970</td>
<td>Shells</td>
</tr>
<tr>
<td>PBXN-110</td>
<td>HMX, IB</td>
<td>1.68</td>
<td>8300</td>
<td>Missile Warheads - Shaped Charges</td>
</tr>
</tbody>
</table>

#### NTO Based Formulations

<table>
<thead>
<tr>
<th>REFERENCES</th>
<th>MAIN INGREDIENTS</th>
<th>DENSITY</th>
<th>DETONATION VELOCITY (M/S)</th>
<th>MAIN APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>B 2214</td>
<td>HMX / NTO, IB</td>
<td>1.63</td>
<td>7450</td>
<td>General Purpose Bombs and Penetrators</td>
</tr>
<tr>
<td>B 2248</td>
<td>HMX / NTO, IB</td>
<td>1.69</td>
<td>8050</td>
<td>Missile Warheads</td>
</tr>
<tr>
<td>B 2267</td>
<td>I-RDX® / NTO, IB</td>
<td>1.65</td>
<td>7570</td>
<td>Shells</td>
</tr>
<tr>
<td>B 2268</td>
<td>I-RDX® / NTO / Al, IB</td>
<td>1.76</td>
<td>7200</td>
<td>General Purpose Bombs and Penetrators</td>
</tr>
</tbody>
</table>

#### CL-20 Based Formulations

<table>
<thead>
<tr>
<th>REFERENCES</th>
<th>MAIN INGREDIENTS</th>
<th>DENSITY</th>
<th>DETONATION VELOCITY (M/S)</th>
<th>MAIN APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>B 2266</td>
<td>CL-20, IB</td>
<td>1.85</td>
<td>9050</td>
<td>Shaped Charges</td>
</tr>
</tbody>
</table>

Qualified according to STANAG 4170
EXPLOSIVES
DEFENSE & SECURITY
DEMOLITION EXPLOSIVES
A worldwide reference for demolition explosives, EURENCO provides a complete range of plastic explosives for all types of demolition, cutting and breaching operations.

Compliant with the new international requirements on the marking of plastic explosives (Montreal Convention), they come in different packages: malleable blocks, flexible sheets, adhesive tape, extrudable paste.

With a strong emphasis on innovation and careful listening of users’ expectations, EURENCO has also developed a new generation of plastic explosives, based on plastic bonded explosive (PBX) technology, addressing mainly Armed Forces, and more particularly Special Forces and Army Combat Engineers.
C4

Malleable and safe to handle

SPECIFICATIONS

MIL-C-45010A
Compliant with Montreal Convention

APPLICATION

Demilitarization, demolition and breaching operations

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.65</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8 100 m/s</td>
</tr>
<tr>
<td>Supplied in bulk or packages</td>
<td>from 0.5 kg up to 2 kg</td>
</tr>
<tr>
<td>RDX-based formulation</td>
<td></td>
</tr>
</tbody>
</table>
**PE4**

Malleable and safe to handle

**SPECIFICATIONS**

- STANAG 4439
- Compliant with Montreal Convention

**APPLICATION**

Demilitarization, demolition and breaching operations

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.65</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8 200 m/s</td>
</tr>
<tr>
<td>Supplied in bulk, packages</td>
<td>from 0.5 kg up to 2 kg or 125 g cartridges</td>
</tr>
<tr>
<td>RDX-based formulation</td>
<td></td>
</tr>
</tbody>
</table>
### TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.5</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>7600 - 7900 m/s</td>
</tr>
<tr>
<td>Ignitability</td>
<td>cap #6 or cord 5 gr/m²</td>
</tr>
<tr>
<td>Explosive heat</td>
<td>5 MJ/kg</td>
</tr>
<tr>
<td>PETN-based formulation</td>
<td></td>
</tr>
</tbody>
</table>

### APPLICATION

Demilitarization, demolition and breaching operations

### SPECIFICATIONS

Compliant with Montreal Convention

Easy to ignite and shape even at low temperature ("polar dough")
HEXOMAX

Outstanding malleability at all temperatures
No exsudation, no hardening

SPECIFICATIONS
Compliant with Montreal Convention

APPLICATION
Demilitarization, demolition and breaching operations

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.5</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>7 850 m/s</td>
</tr>
<tr>
<td>Plasticity (GEMO FE-371-A-1 test)</td>
<td>≤ 8</td>
</tr>
<tr>
<td>Temperature of use</td>
<td>- 40 °C to + 63 °C</td>
</tr>
<tr>
<td>RDX-based formulation</td>
<td></td>
</tr>
</tbody>
</table>
HEXOSHEET

Easy to handle and cut manually

SPECIFICATIONS

Compliant with Montreal Convention

APPLICATION

Demolition, breaching and cutting operations

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.58</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8 000 m/s</td>
</tr>
<tr>
<td>Temperature of use</td>
<td>-40 °C to +63 °C</td>
</tr>
<tr>
<td>Thickness</td>
<td>≥ 3 mm</td>
</tr>
<tr>
<td>RDX-based formulation</td>
<td></td>
</tr>
</tbody>
</table>
FORMEX

Flexible sheet

SPECIFICATIONS

According to EURENCO spec.

APPLICATION

Demolition, breaching and cutting operations

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>from 1.2 to 1.4</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>$\geq 6200\ m/s$</td>
</tr>
<tr>
<td>10 different thicknesses</td>
<td>from 1 mm to 10 mm</td>
</tr>
<tr>
<td>PETN-based formulation</td>
<td></td>
</tr>
</tbody>
</table>
HEXOTAPE

Easy to handle, double-sided adhesive and explosive tape

SPECIFICATIONS
Compliant with Montreal Convention

APPLICATION
Suitable for cutting works and openings (barriers, doors, scrap metal...)

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.58</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8 000 m/s</td>
</tr>
<tr>
<td>Temperature of use</td>
<td>- 40 °C to + 63 °C</td>
</tr>
<tr>
<td>Available in</td>
<td>8 mm and 15 mm wide</td>
</tr>
<tr>
<td>RDX-based formulation</td>
<td></td>
</tr>
</tbody>
</table>
**HEXOTUBE**

Extrudable plastic explosive to be used with an extruder-applicator

**SPECIFICATIONS**

Compliant with Montreal Convention

**APPLICATION**

Demolition, breaching and cutting operations
Suitable for surfaces hard to reach: corners, angles, key-holes...
Does not dry up after opening

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.58</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8 000 m/s</td>
</tr>
<tr>
<td>Temperature of use</td>
<td>+ 20 °C to + 63 °C</td>
</tr>
<tr>
<td>Available in 200 g or 500 g cartridges</td>
<td></td>
</tr>
<tr>
<td>RDX-based formulation</td>
<td></td>
</tr>
</tbody>
</table>
Using its thorough experience in high explosives and propellants for the military market, EURENCO produces high quality and high thermal stability explosives suited for the Oil & Gas Industry, which are extensively used in shaped charges for perforating guns in well completion.

Heat resistance is an important characteristic of the explosives used for perforating deep oil wells, since the temperature in a drilled hole increases with the depth. The same requirements exist in the gas industry.

For many years, EURENCO has worked in close partnership with shaped charge manufacturers, and has constantly applied itself to extend applications for its products through its development and production means. Today, EURENCO continues to provide high explosives for such perforating charges.
EXPLOSIVES

OIL & GAS

RDX COMPOSITION

Best solution for both performance and cost

SPECIFICATIONS

UN and DOT approved
Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
CE-marking

APPLICATION

Ignition and main explosive for shaped charges for perforating guns in standard well completion
Customized flowability while minimizing dusting properties

TECHNICAL CHARACTERISTICS

Density 1,82
Detonation velocity 8 750 m/s
Melting point 204°C
Heat of combustion -2 092.0 ± 2.1 kJ/mol
Volume of detonating gases 900 l/kg
EXPLOSIVES

OIL & GAS

HMX COMPOSITION

Highly purified HMX for high thermal stability and low shock sensitivity

SPECIFICATIONS

- UN and DOT approved
- Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
- CE-marking

APPLICATION

- Ignition and main explosive for shaped charges for perforating guns in deep well completion
- Designed to meet the highest requirements of the Oil & Gas Industry

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.90</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>9 100 m/s</td>
</tr>
<tr>
<td>Melting point</td>
<td>287 °C</td>
</tr>
<tr>
<td>Heat of combustion</td>
<td>-2 820 ± 2.8 kJ/mol</td>
</tr>
<tr>
<td>Volume of detonating gases</td>
<td>927 l/kg</td>
</tr>
</tbody>
</table>
HNS COMPOSITION

Very high thermal stability and good initiation reliability

SPECIFICATIONS

UN and DOT approved
Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
CE-marking

APPLICATION

Ignition and main explosive for shaped charges for perforating guns in very deep well completion
Can withstand temperatures around 250 – 300 °C for periods of time

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.74</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>7 000 to 7 100 m/s</td>
</tr>
<tr>
<td>Melting point</td>
<td>316 – 318 °C</td>
</tr>
<tr>
<td>Heat of combustion</td>
<td>-6 434.2 ± 5.0 kJ/mol</td>
</tr>
<tr>
<td>Volume of detonating gases</td>
<td>700 l/kg</td>
</tr>
</tbody>
</table>
RDX coated with polyethylene for increased density and performance

**SPECIFICATIONS**

UN approved
Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
CE-marking

**APPLICATION**

Ignition and main explosive for shaped charges for perforating guns in standard well completion
Improves electrostatic, loading and pressing properties of the crystals
Approximately 100% lower impact sensitivity compared with waxed product
Latest technology patented by EURENCO

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.82</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8 750 m/s</td>
</tr>
<tr>
<td>Melting point</td>
<td>204 °C</td>
</tr>
<tr>
<td>Heat of combustion</td>
<td>-2 092 ± 2.1 kJ/mol</td>
</tr>
<tr>
<td>Volume of detonating gases</td>
<td>900 l/kg</td>
</tr>
</tbody>
</table>
HMX PE-COATED

Highly purified HMX coated with polyethylene for high thermal stability and significantly reduced shock sensitivity

SPECIFICATIONS

UN approved
Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
CE-marking

APPLICATION

High performance leader on the market
Ignition and main explosive for shaped charges for perforating guns in deep well completion
Improves electrostatic, loading and pressing properties of the crystals
Approximately 100% lower impact sensitivity compared with waxed product
Latest technology patented by EURENCO

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.90</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>9,100 m/s</td>
</tr>
<tr>
<td>Melting point</td>
<td>287 °C</td>
</tr>
<tr>
<td>Heat of combustion</td>
<td>-2,820 ± 2.8 kJ/mol</td>
</tr>
<tr>
<td>Volume of detonating gases</td>
<td>700 l/kg</td>
</tr>
</tbody>
</table>
EURENCO’s explosives also find applications in the Mining & Quarrying industry, as it provides both purified HMX for shock tubes and mini-boosters for ignition charges.

They are used to ignite slurries and emulsion to full detonation, by giving the energy impulse necessary to initiate larger charges.

As an explosive manufacturer, EURENCO also provides RDX and PETN as raw material for all types of initiation devices.
X-DOUGH

Malleable, easy to ignite and cost-efficient PETN-based plastic explosive

SPECIFICATIONS

UN and DOT approved
Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
CE-marking
Compliant with Montreal Convention

APPLICATION

Softer than C4, easier to shape even at low temperature (“polar dough”)
Adhesion to vertical surfaces
Civil and law enforcement applications for ignition (booster), mine destruction, demilitarization and demolition work

TECHNICAL CHARACTERISTICS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1,5</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>7 600 – 7 900 m/s</td>
</tr>
<tr>
<td>Ignitability</td>
<td>cap #6 or cord 5 gr/m²</td>
</tr>
<tr>
<td>Explosive heat</td>
<td>5 MJ/kg</td>
</tr>
<tr>
<td>Static spark sensibility</td>
<td>&gt; 726 mJ</td>
</tr>
<tr>
<td>Impact sensitivity</td>
<td>25 J</td>
</tr>
<tr>
<td>Deflagration onset</td>
<td>180 °C</td>
</tr>
</tbody>
</table>
**X-PIPE**

Mini-booster for detonators

**SPECIFICATIONS**

- UN approved
- Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
- CE-marking
- Compliant with Montreal Convention

**APPLICATION**

- Filled with 12 grams of X-DOUGH
- Diameter: 11 mm; Length: 130 mm
- Gives the energy impulse necessary to initiate larger charges
- Ignites slurries and emulsions to full detonation

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.45</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>7 600 – 7 900 m/s</td>
</tr>
<tr>
<td>Ignitability</td>
<td>cap #6</td>
</tr>
<tr>
<td>Explosive heat</td>
<td>5 MJ/kg</td>
</tr>
<tr>
<td>Static spark sensibility</td>
<td>&gt; 726 mJ</td>
</tr>
<tr>
<td>Impact sensitivity</td>
<td>25 J</td>
</tr>
<tr>
<td>Deflagration onset</td>
<td>180 °C</td>
</tr>
</tbody>
</table>
Purified fine crystallized HMX for shock tubes

**SPECIFICATIONS**

UN and DOT approved
Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
CE-marking

**APPLICATION**

High quality shock tubes for mining and quarrying applications
Ensures continuous transmission of shock waves and allows non-interrupted conductibility to ignition of charges

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.90</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>9 100 m/s</td>
</tr>
<tr>
<td>Melting point</td>
<td>277 °C</td>
</tr>
<tr>
<td>Heat of combustion</td>
<td>-2 820 ± 2.8 kJ/mol</td>
</tr>
<tr>
<td>Volume of detonating gases</td>
<td>700 l/kg</td>
</tr>
</tbody>
</table>
**PETN**

Pure PETN crystals for high performance

**SPECIFICATIONS**

- UN and DOT approved
- Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
- CE-marking

**APPLICATION**

- Ignitors and detonating cords

**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.76</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>7 600 – 7 900 m/s</td>
</tr>
<tr>
<td>Explosive heat</td>
<td>5 MJ/kg</td>
</tr>
<tr>
<td>Static spark sensibility</td>
<td>&gt; 726 mJ</td>
</tr>
<tr>
<td>Impact sensitivity</td>
<td>25 J</td>
</tr>
<tr>
<td>Deflagration onset</td>
<td>180 °C</td>
</tr>
<tr>
<td>Wide range of particle sizes distribution</td>
<td></td>
</tr>
</tbody>
</table>
RDX WAX

Highly purified RDX coated with wax

SPECIFICATIONS

UN and DOT approved
Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
CE-marking

APPLICATION

Ignitors and detonating cords
Optimized for large scale automatic dosing and pressing of charges

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
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</tr>
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<tbody>
<tr>
<td>Density</td>
<td>1.82</td>
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<td>Detonation velocity</td>
<td>8,750 m/s</td>
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<tr>
<td>Melting point</td>
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<tr>
<td>Heat of combustion</td>
<td>-2,092 ± 2.1 kJ/mol</td>
</tr>
<tr>
<td>Volume of detonating gases</td>
<td>900 l/kg</td>
</tr>
</tbody>
</table>
PETN PE-COATED

PETN coated with polyethylene for low sensitivity and high flowability

SPECIFICATIONS

UN and DOT approved
Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
CE-marking

APPLICATION

Electrical and non-electrical detonators
Boosters charges
Approximately 100% lower impact sensitivity compared with waxed product
Latest technology patented by EURENCO

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.76</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>8 400 m/s</td>
</tr>
<tr>
<td>Melting point</td>
<td>140 °C</td>
</tr>
<tr>
<td>Heat of combustion</td>
<td>-2 572.4 ± 0.8 kJ/mol</td>
</tr>
<tr>
<td>Volume of detonating gases</td>
<td>823 l/kg</td>
</tr>
<tr>
<td>Cost advantage</td>
<td>can be transported dry</td>
</tr>
</tbody>
</table>
RDX PE-COATED

RDX coated with polyethylene for increased density and performance

SPECIFICATIONS

UN and DOT approved
Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
CE-marking
Compliant with Montreal Convention

APPLICATION

Electrical and non-electrical detonators
Booster charges
Improves electrostatic, loading and pressing properties of the crystals
Approximately 100% lower impact sensitivity compared with waxed product
Latest technology patented by EURENCO

TECHNICAL CHARACTERISTICS

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</tr>
<tr>
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</tr>
<tr>
<td>Heat of combustion</td>
<td>-2 092 ± 2.1 kJ/mol</td>
</tr>
<tr>
<td>Volume of detonating gases</td>
<td>900 l/kg</td>
</tr>
</tbody>
</table>
HNS

Small crystals, good flowability

SPECIFICATIONS

UN and DOT approved
Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
CE-marking

APPLICATION

Detonators

TECHNICAL CHARACTERISTICS

<table>
<thead>
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<tbody>
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<tr>
<td>Melting point</td>
<td>316 - 318 °C</td>
</tr>
<tr>
<td>Heat of combustion</td>
<td>-6 434.2 ± 5.0 kJ/mol</td>
</tr>
<tr>
<td>Volume of detonating gases</td>
<td>700 l/kg</td>
</tr>
</tbody>
</table>
DNBF

Ignition and thermostability

SPECIFICATIONS

According to EURENCO spec.

APPLICATION

Primers compositions for initiation in detonators

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1,77</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>7 700 - 7 900 m/s</td>
</tr>
<tr>
<td>Melting point</td>
<td>168 - 172 °C</td>
</tr>
<tr>
<td>Auto-ignition</td>
<td>268 °C (progressive heating)</td>
</tr>
<tr>
<td>Sensitivity to friction</td>
<td>314 N (HMX: 150 N)</td>
</tr>
</tbody>
</table>
TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting point</td>
<td>290 - 295 °C</td>
</tr>
<tr>
<td>Explosion heat</td>
<td>300 kJ/kg</td>
</tr>
<tr>
<td>Auto-ignition</td>
<td>≥ 200 °C</td>
</tr>
</tbody>
</table>

According to EURENCO spec.

APPLICATION

Primers compositions for initiation in detonators

Thermostability
EURENCO manufactures high purity ADN, used as an oxidizer in liquid mono-propellant for rocket engines in space applications.

LMP-103S fulfills space propulsion requirements, and compared with hydrazine, it is less toxic and brings higher performance. Hence reducing fueling cost and tank volumes, and enabling extended missions.

First tested by ECAPS (Swedish Space Corporate Group) in the PRISMA satellite in 2010.
LMP-103S

Replacement of hydrazine as monopropellant

SPECIFICATIONS

Demonstrated on the Prisma satellite in 2010
Patented by ECAPS together with HPGP thrusters
UN and DOT Class 1.4S

APPLICATION

Environmental friendly liquid monopropellant fuel for space applications in High Performance Green Propulsion (HPGP)

TECHNICAL CHARACTERISTICS

- 65% ADN (ammonium dinitramide)
- 35% water solution made up of methanol and ammonia
- 6% higher specific impulse and 30% higher impulse density than hydrazine monopropellant
New energetic oxidizer in solid and liquid propellants

SPECIFICATIONS

UN approved
Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
CE-marking
Compliant with Montreal Convention

APPLICATION

High detonation velocity and increased performance due to higher bubble energy
Possible replacement for ammonium perchlorate (AP)
Can be supplied as crystals or “prills” (spherical particles)

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>1.81</td>
</tr>
<tr>
<td>Detonation velocity</td>
<td>≈ 7 000 m/s</td>
</tr>
<tr>
<td>Melting point</td>
<td>92 °C</td>
</tr>
<tr>
<td>Heat of combustion</td>
<td>980 kJ/mol</td>
</tr>
<tr>
<td>Auto-ignition</td>
<td>160 °C</td>
</tr>
</tbody>
</table>
EXPLOSIVES
RAIL HARDENING
EURENCO manufactures an explosive specifically designed for rail hardening, according to characteristics defined by rail equipment companies.

EURENCO also developed its own techniques to apply explosive for this application, and provides all necessary services related to the completion of this work: reception and preparation of railway tracks, application of custom-made explosive sheet, and detonation.

EURENCO has the advantage of being able to rely on its Baussenq facility, providing access to both storage and a detonating range.
CORE TREATMENT

Hardening of rail crossings by explosion

SPECIFICATIONS

- 15 years of experience
- (400 blasts / year)

APPLICATION

- Thin and flexible explosive sheets suitable for all types of crossing designs: tailor-made according to blue prints provided by customers
- High and even hardness 10 - 15 mm into the material, inducing excellent wear resistance
- No geometric distortions or strains, and minimum flaws on the surface

TECHNICAL CHARACTERISTICS

- High performance explosive (RDX-based)
- Detonation velocity: 8000 m/s
- Detonation pressure: 25.1 GPa
- Up to 12 possible core treatments everyday
PROPPELLANTS
Drawing on a long skilled experience in propellants, EURENCO manufactures a wide range of single and multi base propellants for both civil and military applications:

- **Single and multi base propellants** for small to large caliber military ammunition, mortar increments, recoilless antitank weapons, reloading powders and hunting & sporting cartridges;
- **Low vulnerability (LOVA) propellants** for insensitive propelling charges;
- **Spherical powders** for military small arms ammunition, hunting & sporting cartridges and industrial tools.

EURENCO also produces military grades of nitrocellulose used in the manufacturing process of single and multi base propellants, as well as combustible cases.
EURENCO manufactures both single base propellants and spherical powders to cover the entire range of small caliber ammunition:

- Single base propellants for .22 inch to 12.7 mm calibers;
- Spherical powders for 4.6 mm to 20 mm small arms.

5.56 and 5.7 calibers are almost exclusively loaded with spherical powders, due to a small filling orifice and limited space allocated to the propellant.
RIFLE POWDER

High performance and high energy extruded and spherical propellants

SPECIFICATIONS

STANAG 4170
UN and DOT approved
CE-marking
Identification and Traceability according to European Directive 2008/43/EC and 2012/4/EU

APPLICATION

Customized to maximize the performance of the customers’ chosen components
All civil and military rifle calibers, from 0.22 up to 20 mm

TECHNICAL CHARACTERISTICS

- 1-perforated propellant grains
- Propellant compositions with up to 15% of nitroglycerine
- Spherical powders of different densities and cylindrical grains, all with various burning moderator, flash reducer and decoppering agents
- Green propellants for green applications
PISTOL POWDER

Wide range of spherical and porous fast burning propellants

SPECIFICATIONS

UN and DOT approved
CE-marking
Identification and Traceability according to European Directive 2008/43/EC and 2012/4/EU

APPLICATION

For all types and calibers of pistol ammunition
Capability to design tailored products

TECHNICAL CHARACTERISTICS

- Stick or 1-perforated grains
- Single base or double base propellant compositions
- Spherical powders of various densities
SHOT SHELL POWDER

Huge selection of different types of porous propellants and spherical powders

SPECIFICATIONS

UN and DOT approved
CE-marking
Identification and Traceability according to European Directive 2008/43/EC and 2012/4/EU

APPLICATION

For shot shell ammunition of all calibers
Performance according to customer request

TECHNICAL CHARACTERISTICS

Stick, flake or T-shaped grains
Single base or double base propellant compositions
Low density spherical graphitized propellant
RELOADING POWDERS

High energy propellants with superior velocity and accuracy

SPECIFICATIONS

- UN and DOT approved
- CE-marking
- Identification and Traceability according to European Directive 2008/43/EC and 2012/4/EU

APPLICATION

- Extruded propellants for all types of reloading powders
- Spherical powders to be found in Ramshot range

TECHNICAL CHARACTERISTICS

- Spherical and 1-perforated grains
- Single base or double base propellant compositions
- Extreme lot to lot consistency
- Minimal barrel wear and excellent flow-ability for easy reloading
PROPPELLANTS
MEDIUM CALIBER
EURENCO provides single and multi base propellants for medium caliber ammunition ranging from 30 mm to 57 mm, as well as their igniters.
PROPELLANTS FOR MEDIUM CALIBER

Single and multi base propellants for medium caliber ammunition ranging from 30 mm to 57 mm, and their igniters

### APPLICATION

<table>
<thead>
<tr>
<th>Size</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 mm</td>
<td>- Single or multi perforated propellant grains&lt;br&gt;- Single base or double base propellant compositions</td>
</tr>
<tr>
<td>40 mm</td>
<td>- 1-perforated propellant grains&lt;br&gt;- Single base or double base propellant compositions</td>
</tr>
<tr>
<td>40 mm LOVA</td>
<td>- 19-perforated LOVA propellant grains&lt;br&gt;- Based on RDX and CAB compositions</td>
</tr>
<tr>
<td>57 mm</td>
<td>- 1-perforated propellant grains&lt;br&gt;- Single base or double base propellant compositions</td>
</tr>
<tr>
<td>57 mm LOVA</td>
<td>- 19-perforated LOVA propellant grains&lt;br&gt;- Based on RDX and CAB compositions</td>
</tr>
</tbody>
</table>

### SPECIFICATIONS

UN No. classified
Identification and Traceability according to European Directive 2008/43/EC and 2012/4/EU
PROPELLANTS
LARGE CALIBER
With regards to large caliber, EURENCO provides:

• Single and multi base propellants for naval, tank and field artillery ammunition (76 mm to 203 mm), mortar increments (60 mm, 81 mm and 120 mm), and recoilless antitank weapons;

• Spherical powders for mortar increments (60 mm and 81 mm).

EURENCO is also able to supply double base or multi base propellant paste according to customer request.
# Anti-Tank Propellant

Various recoilless antitank systems

## Application
For all types of recoilless antitank systems

## Technical Characteristics
- Flake or strip
- Double base propellant compositions
- Dimensions according to customer request

## Specifications
UN and DOT approved
Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
CE-marking
# MORTAR PROPELLANT

60 mm, 81 mm and 120 mm

## Application

<table>
<thead>
<tr>
<th>60 mm and 81 mm mortar ammunition</th>
<th>TECHNICAL CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flake</td>
<td>- Flake</td>
</tr>
<tr>
<td>Double base propellant compositions</td>
<td>- Double base propellant compositions</td>
</tr>
<tr>
<td>Spherical powders used in primary and secondary charges</td>
<td>- Spherical powders used in primary and secondary charges</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>120 mm mortar ammunition</th>
<th>TECHNICAL CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-perforated grains</td>
<td>- 1-perforated grains</td>
</tr>
<tr>
<td>Single and double base propellant compositions</td>
<td>- Single and double base propellant compositions</td>
</tr>
<tr>
<td>Dimensions according to customer request</td>
<td>- Dimensions according to customer request</td>
</tr>
</tbody>
</table>

## Specifications

UN and DOT approved
Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
CE-marking
## Artillery Propellant

**105 mm and 155 mm**

### Application

<table>
<thead>
<tr>
<th>For 105 mm Artillery Guns</th>
<th>Technical Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Single or multiperforated grains</td>
<td></td>
</tr>
<tr>
<td>- Single, double or multi base propellant compositions</td>
<td></td>
</tr>
<tr>
<td>- Dimensions according to customer request</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>For 155 mm Artillery Guns</th>
<th>Technical Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Single or multiperforated grains or sticks</td>
<td></td>
</tr>
<tr>
<td>- Single, double or multi base propellant compositions</td>
<td></td>
</tr>
<tr>
<td>- Dimensions according to customer request</td>
<td></td>
</tr>
</tbody>
</table>

### Specifications

- UN and DOT approved
- Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
- CE-marking
TANK PROPELLANT

90 mm, 105 mm and 120 mm

APPLICATION

For 90 mm, 105 mm and 120 mm tank ammunition

- Single or multi perforated grains or sticks
- Single, double or multi base propellant compositions
- Dimensions according to customer request

TECHNICAL CHARACTERISTICS

SPECIFICATIONS

UN approved
Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
CE-marking
ROCKET PROPELLANT

Rockets and missiles

APPLICATION

For different types of rockets and missiles

TECHNICAL CHARACTERISTICS

- Rods or tubes
- Double base or multi base propellant compositions
- Dimensions according to customer request

SPECIFICATIONS

UN approved
Identification and traceability according to EU Directive 2008/43/EC and 2012/4/EU
CE-marking
AUTOMATIVE SAFETY

PROPELLANTS

AUTOMATIVE SAFETY
EURENCO provides single base and LOVA propellants to industrials specialized in automotive safety.

Propellants are integrated into airbags and belt-restrainer systems, as gas generators, in order to rapidly inflate the bag where airbags are concerned, or retract the belt in the case of seat-belt pretensioners.

The use of one kind of propellant over the other depends on the customer’s choice.
PROPELLANTS FOR AUTOMOTIVE SAFETY

For airbags and safety belt restraint systems

<table>
<thead>
<tr>
<th>APPLICATION</th>
<th>TECHNICAL CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIP (auto-ignition pill) for automotive safety systems</td>
<td>GUDN-based composition with very exact auto ignition temperature</td>
</tr>
</tbody>
</table>
| LOVA propellant for airbags | Insensitive propellant with 7 or 19 hole perforated grains  
Propellant composition based on RDX and CAB |
| Propellant for safety belt restraint system | Single base propellant with 1 or 7 hole perforated grains |

SPECIFICATIONS

UN No. classified
Identification and Traceability according to European Directive 2008/43/EC and 2012/4/EU
PROPELLANTS
INDUSTRIAL TOOLS
EURENCO’s spherical powder is also used in cartridges for professional power tools, such as powder actuated nailers or cattle-slaughtering guns.

The high burning rate of spherical powder makes it ideal for this type of application, which requires the delivery of high energy with a small propellant volume.
PROPELLANTS FOR INDUSTRIAL TOOLS

For power tools and cattle slaughter

SPECIFICATIONS

UN No. classified
Identification and Traceability according to European Directive 2008/43/EC and 2012/4/EU

APPLICATION

Powder loaded in high performance cartridges to be used in power tools for concrete and steel
The most common used propellant for cattle-slaughtering guns

TECHNICAL CHARACTERISTICS

High energy and low residue propellant
Spherical powders with up to 40% nitroglycerin
COMBUSTIBLE ITEMS
EURENCO manufactures and provides a complete range of combustible items for various applications:

- **Modular Artillery Charge System (MACS)** for artillery ammunition;
- **Combustible Cartridge Cases (CCC’s)** for tank and artillery munitions;
- **Nitrofilm** for mortar horseshoe containers and automotive safety;
- **Base Bleed grains** for extended range artillery ammunition;

EURENCO is also equipped with up-to-date production capacities, among which a new automated workshop for the manufacturing of artillery modular charges.
EURENCO develops a large range of combustible items specifically for Defense & Security applications.

Together with NEXTER Munitions, EURENCO developed, industrialized and qualified modular charges for 155 mm L39 to L52 artillery guns, such as the CAESAR self-propelled howitzer (155 mm L52). EURENCO is equipped with a fully automated and continuous workshop dedicated to the manufacturing of artillery modular charges.

EURENCO also provides combustible cases for 120 mm tank ammunition, as well as Nitrofilm for mortar horseshoe containers and base bleed grains for extended range ammunition.
MACS: BOTTOM CHARGES

Linkable Bottom Charge Module (BCM): for zones 1 and 2

SPECIFICATIONS

Munitions 155 mm Artillery NATO 39 to 52 Cal.

APPLICATION

Provide a complete zoning solution for 155 mm artillery applications:
- Extended range
- Improved logistics
- Higher rates of fire

TECHNICAL CHARACTERISTICS

> Single base propellant for BCM

> Low vulnerability: MURAT* label without packaging

> Fully combustible design

> Easy and quick handling

> Different assembling modes:
  linkable or unlinkable in line with needs
MACS: TOP CHARGES

Linkable Top Charge Module (TCM): for zones 3 to 6

SPECIFICATIONS
Munitions 155 mm Artillery
NATO 39 to 52 Cal.

APPLICATION
Provide a complete zoning solution for 155 mm artillery applications:
- Extended range
- Improved logistics
- Higher rates of fire

Uniflex Modular Charge Systems

TECHNICAL CHARACTERISTICS

> Multi base propellant for TCM

> Low vulnerability: MURAT* label without packaging

> Fully combustible design

> Easy and quick handling

> Different assembling modes:
  linkable or unlinkable in line with needs
COMBUSTIBLE CARTRIDGE CASES

Compatible with automatic loading

SPECIFICATIONS

Munitions 105 mm and 120 mm Tank

APPLICATION

Provide a number of advantages for 120 mm tank applications:
- Protection of the propellant charge
- Reduction in barrel wear
- Additional energy to the charge
- Increased firing rate

TECHNICAL CHARACTERISTICS

- Increased muzzle velocity: + 5%
- Vulnerability levels to Bullet Impact with single base propellant: Type III to Type V
- Vulnerability levels to Fire with single base propellant: Type III to Type V
- Self ignition temperature: 180 °C to 240 °C
Innovative film made up of nitrocellulose

**SPECIFICATIONS**

Munitions 51 mm, 60 mm, 81 mm, 120 mm Mortar

**TECHNICAL CHARACTERISTICS**

> Transparent or colored
> Can be reinforced with nylon (Cellunyl®)
> Available in rolls or sheets of different sizes and thickness (0,10 mm to 0,30 mm)
> Specific shapes on request (containers, disks, increments, pyrotechnical igniters)

**APPLICATION**

Can be used as horseshoe containers for mortar ammunition or as pyrotechnical devices for specific applications. Provides many advantages compared with conventional Celluloid:

- Enhanced flexibility, transparency, thermoplasticity, combustibility and inflammability
- Excellent mechanical properties and chemical stability
- Solvent residue < 2%
- Resistant to water and severe weather conditions
BASE BLEED

For extended range artillery ammunition

SPECIFICATIONS

STANAG 4170 for composition

APPLICATION

Enhances projectile range up to 30% without reduction in accuracy
Adaptable to all types of shells and calibers

TECHNICAL CHARACTERISTICS

> Excellent mechanical properties at all temperatures
> Low sensitivity to relative humidity
> Burning rate easily tunable
> Complex shape achievable through thermoplastic technology
COMBUSTIBLE ITEMS
CIVIL APPLICATIONS
EURENCO’s Nitrofilm can be substituted to Celluloid for a variety of applications, including in the civil sector.

Today, it is essentially found in automotive safety, as thermal fuse or container, but it could also be used tomorrow to meet different needs in other industrial activities.
NITROFILM

Celluloid product substitution for any pyrotechnical application

SPECIFICATIONS

According to EURENCO spec.

APPLICATION

Thermal fuse or container for automotive safety
Continuous transformation in serial conditions possible
Safe, stable and easy to use

TECHNICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness</td>
<td>0.1 mm to 0.3 mm</td>
</tr>
<tr>
<td>Width</td>
<td>560 mm max</td>
</tr>
<tr>
<td>Length</td>
<td>400 linear meters max</td>
</tr>
<tr>
<td>Transparent or colored</td>
<td></td>
</tr>
<tr>
<td>Available in sheets or rolls</td>
<td>different sizes</td>
</tr>
</tbody>
</table>
UNMATCHED EXPERTISE, PROVEN SOLUTION.