

Research Institute of Industrial Chemistry 1954 - 2019

Demolition Charges

Semtex® PI SE M
- Special thermoplastic explosive
- Many forms - basically in sheets
- Three types (PETN, PETN/RDX, RDX)
- Base explosive for demolition charges



Semtex® PI SE M LCT
- Cutting tapes
- Adhesive layer for better contact
- 4 types (20, 55, 205, 740 - grams per meter)

Semtex RAZOR®
- Flexible Linear Shaped Charges
- 7 types (5, 10, 15, 20, 25, 30, 40 - mm of steel)
- Adhesive layer for better contact
- Possible vertical or horizontal bending

BREACHCASE - BC25
- Based on RAZOR 25
- Breaching the hole in brick or concrete wall
- Hole dimensions 1 x 0.5 m
- Man portable



Semtex RAZOR® Booster
- Booster charges primary for ignition of RAZOR Charge
- Adhesive layer for better contact
- 6 grams of thermoplastic explosive PI TE M
- Possible use as small demolition charge

Semtex Desintegrator® 13
- For opening or liquidation potentially dangerous objects

Semtex Desintegrator® 50
- For opening or liquidation potentially dangerous objects



DIRECTORS of VÚPCH



Dr. František Krejčí, CSc.
1954 - 1955



Ing. Josef Žalný
1956 - 1961



Ing. Boris Vetičský, CSc.
1961 - 1985



Ing. Jiří Tůma, DrSc.
1985 - 1990



Ing. Bedřich Štefan
1990 - 1992



Ing. Tomáš Král
1992 - 1993



Ing. Miroslav Horáček, CSc.
1993 - 2002



Ing. Ladislav Lehký, CSc.
2002 - 2010



Ing. Ladislav Velehradský, Ph.D.
2010 - 2018



Ing. Kamil Dudek, Ph.D.
2018 -

Aircraft Rescue Systems

Military Aircraft Rescue Systems

Systematic development from 1955
Designed for AERO light (combat) aircrafts
L-29, L-39, L-139, L-59, L-159 ALCA

The system consists of

- URM-1 or URM-1M** - Under seat rocket motor
- ROP** - Rocket motor for canopy ejection
- PP-POP** - Pyrotechnic cartridge for activation of canopy ejection mechanism
- PP-TVM** - Pyrotechnic cartridge for activation of ejection telescope
- PP-GP** - Pyrotechnic cartridge for activation of pyromechanism of rescue system
- PP-VVPR** - Pyrotechnic cartridge for activation of pilot fastening system
- VMP-2M** - Pyrotechnic cartridge for activation of parachute

Set of **Pyrotechnic cartridges** for ejecting seat VS-20 of L-159T2 aircraft. New generation for multiple use.



Canopy Severance System - KRYT

Quick and safe clearance of catapulting path or quick creating the emergency exit from aircraft

Minimum level pressure and noise effect

Civil Aircraft Rescue Systems

Designed for ultralight aircrafts

For emergency parachute ejection

- GRS
- GRS-M
- GRS-V
- GRS-E
- GRS-EM
- GRS-EV

- MAGNUM 250R
- MAGNUM 250
- MAGNUM 450
- MAGNUM 600
- MAGNUM 1000
- MAGNUM 1500

- UPI-PFE-200
- UPI-PFE-400

Large Caliber Ammunition

155mm MODULAR PROPELLING CHARGES
- Full combustible charges for 155mm systems
- Useful for 39, 45 or 52 caliber barrels
- More than 25 years of systematic development

1st GENERATION of MODULAR CHARGE SYSTEM
- Three types of modular charges
- Modules A and B for range from 5 to 15 km
- Module D for range up to 40 km

125mm APFSDS ammunition for MBT

- For variants of T-72 Main Battle Tanks
- International developments
- PpSv97 VETRA in Czech Army service
- P99 TAPNA in Slovak Army service
- Penetration capability more than 500 mm of steel in 2000 m



BIMODULAR CHARGE SYSTEM (BMCS)

- 2nd Generation
- Two types of modular charges
- BC-E for low-zones
- TC-F for high-zones



ER AMMUNITION for 152mm SPGH DANA

- Developed in 2012
- Without the modification necessity of the system of automatic loading
- Separate loading ammunition
- 152 mm OFdV (HE ER BB) shell
- Propelling charge P740
- Range 25,500 m (25 % more than standard HE)



Ballistics Protection

Reactive Armor DYNA

Developed in 1998 in cooperation with Military Repair Facility in Nový Jičín and with Military Technical Institute in Slavčice

Explosive Reactive Armor designed for T-72 M4CZ MBT in Czech Army service

Protection against shaped charges

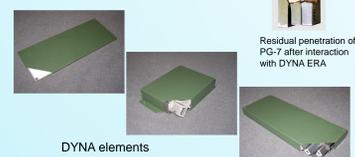
Effective against tandem SC warheads



Penetration capability of PG-7 warhead (~300 mm)



T-72 M4CZ with DYNA ERA



DYNA elements

Residual penetration of PG-7 after interaction with DYNA ERA

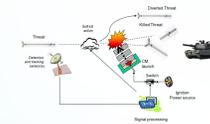
Active Protection System EFA

Developed from 2002 in cooperation with Military Research Institute in Brno.

Designed for light combat vehicles - OT-64, BVP-1, BVP-2, KBVP PANDUR II.

Hard-kill protection against RPGs and ATGMs.

Countermeasure charges based on direction of energy of explosion



KBVP PANDUR II with test parts of APS LEFA

Test Facilities

Ballistic laboratory

- History:**
- first shot in October 17th, 1924
- 50m rifle range
- cannon range with 1 tunnel



Present:

- rebuilding in 1988
- 50m rifle range
- 100m middle-caliber range
- cannon range with 2 tunnels
- test barrels in 100 calibers from .22LR to 125 tank barrel
- universal breach UZ 67 and UZ 2002
- piezotransducers KISTLER 6215 and 6213B
- 67 guns in ballistic laboratory's armory
 - > submachine gun Z-Brno ZK 383 - 1938
 - > snipers gun MOSIN 9130
- 1 221 samples and 25 000 shots per year



Rocket range

- Tests:**
- measurement of generators thrust and pressure (ballistic tests of rocket motors, pyrocartridges etc.)

- Products:**
- aircraft rescuing systems
- pyrocartridges, rocket motors



Explosives test room

- History:**
- start by establish Research Institute
- 1967 - 1968 experimental mine drift for permitted explosives testing (Synthesit®, Seminit®, Uhlometanit, Ostravit®)

- Present:**
- production control
- experimental samples testing
- cooperate with Czech Police or Czech Proof House for Arms and Ammunition



Accredited laboratory of safety engineering

- Tests:**
- BAM fall-hammer test
- Friction test
- Thermal stability test at 75°C
- Fulmination point test
- Determination of sensitivity to external thermal stimulus - Koener test
- Determination of ability of a substance to propagate detonation - UN GAP test
- Test of mass explosion capacity - Single package test
- External fire test
- Unconfined package test
- Twelve meters drop test
- DSC, DTA
- Determination of detonation propagation



Mechanical Engineering and Transfer of technologies

Task - Development, construction and sales of technological devices

- Cutters
- Rollers
- Dryers
- Mixers
- Engines
- Pressing forms
- Pressure machines
- ...

- Development and construction of test devices

- Ballistics simulators
- Closed Vessels
- ...

- Special construction

- Reactive armor elements
- Rapid fire-extinguishing systems
- ...

- Sales of complete production lines

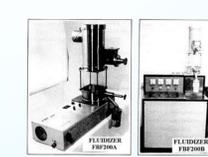
- Nitrocellulose
- Smokeless powders
- Combustible components
- ...

- Technical assistance

- Training of operators
- Commissioning of production
- Trial run

LABORATORY FLUIDIZERS FBF

- Developed and realized in eighties of last century
- FBF200 and FBF400 models
- For drying, cooling, granulation, homogenization...



BALLISTICS SIMULATORS and CLOSED VESSELS

- Developed and realized from seventies of last century
- Closed vessels for smokeless powder production
- Different volumes
- For low and high pressures
- ...

EXPRO® - RAPID FIRE-EXTINGUISHING SYSTEM

- Developed and realized in nineties of last century
- For rapid fire-extinguishing and preventing of explosion in internal parts of technological installations
- Installed in Czech companies (Synthesia, ALPIQ, Vitara)



Mixer - design and realisation

For investor: Republic of China



Hydraulic dehydration pressure - design and realisation

For project: POF Pakistan



NC propellants Cutting machine - solution of design

For project: POF Pakistan

