EXPLOSIA®

EXPLOSIVES


Kč 200.— ČÍSLO 0003328

AKCIE

ČESKOSLOVENSKÉ AKC. TOVÁRNY NA LÁTKY VÝBUŠNÉ

NA OBNOS

DVĚ STĚ KORUN č.,

které se pro České průmyslové bance v Praze jakožto vlastníku této akcie zajišťují všechna práva k veškerému jmění společnosti, která dle stanov společnosti každému akcionáři přísluší.

Akcie mohou býti převedeny též na jiné osoby, převedení to musí se však státi se svolením správní rady, při čemž musí býti ta která akcie předložena, aby její převedení v knize akcií zaznamenáno býti mohlo.

V PRAZE, DNE 3. PROSINCE 1920.

Československá akciová továrna na látky výbušné.

SINCE 1920

EXPLOSIA®

Explosia a.s.

Explosia a.s. is a traditional and the most important Czech manufacturer of explosives with a history dating to 1920, when "Československá akciová továrna na látky výbušné" (Czechoslovak joint-stock company for the production of explosive substances) was founded in Semtín near Pardubice. The tradition of the company's name dates back to 1934 and more recently to 1998.

Explosia a.s. is 100% owned by the Czech state and is an independent commercial company with a significant position in the industrial explosives market in the Czech Republic.

Explosia a.s. is an internationally known and important manufacturer of industrial explosives, propellants and special products, which are exported to numerous countries of the European Union and elsewhere.

Explosia a.s. has production and storage capacity operated by qualified personnel, which makes it possible to offer a complete line of industrial explosives and igniters for all fields of surface and underground applications carried out by mining companies or companies providing explosive blasting services. As a matter of course, we offer delivery of explosives directly to the firing site and operation of mixing and pump trucks.

In the last few years, **Explosia a.s.** has significantly and successfully focused on providing comprehensive drilling and blasting services, especially in opencast mining of aggregates. These services have been gradually taken over by the Fospol Division.

Research and development in the field of explosives – special products

Explosia has had its own research and development facilities since its inception. In 1954, these led to the creation of the Research Institute of Industrial Chemistry (VÚPCH) with the competence over the whole Czechoslovakia. This institute not only provides research and development in the field of explosives and munitions for Explosia a.s., but for other partners in the Czech Republic and abroad as well. Apart from research and development, the results of which are intended both for industrial applications and the military sphere, the VÚPCH offers its services in the field of analytical chemistry, testing and safety engineering for explosives and propellants, production of new energetic materials and special explosives, and production of pyrotechnic components for aerospace rescue systems.


In accordance with the recommendations given in the ČSN ISO 26000 (010390)

CERTIFICATE

for participating in

REVIEW AND EVALUATION OF ACTIVITIES IN THE AREA OF CORPORATE SOCIAL RESPONSIBILITY

to company

Explosia a.s.

valid from 25.10.2023 till 30.9.2026

Part 1. Introduction	100 %	GOLD
Part 2. Global	100 %	GOLD
Part 3. Economic Area	94 %	GOLD
Part 4. Social Area + OSH	97 %	GOLD
Part 5. Environmental Area	94 %	GOLD
Final Assessment	97 %	GOLD

Quality assurance and quality control

Explosia a.s. has had a certified quality control system according to ISO 9001 since 2003 and an environmental management system according to ISO 14001 since 2009. The proper focus of the integrated quality management system according to ISO 9001 and the environmental management according to ISO 14001 is evidenced by the latest certificate issued by Lloyd's Register Quality Assurance based on a recertification audit. Explosia a.s. holds certification for quality management system compliance with the requirements of the Czech Defence System ČOS 051672 (AQAP 2110). Compliance is regularly recertified by audits. The Analytics and Testing Department is the holder of accreditation certificate for testing laboratories No. 1167.2. Explosia a.s. is also the holder BAM certification proving the conformity of the quality assurance of the production process according to Module D, Annex II of Council Directive 93/15/EEC on the harmonisation of provisions relating to market placement and supervision of explosives for civil uses. We have had the right to use the 'Responsible Care' logo since 2005.


OSVĚDČENÍ

Explosives – products and services

Powder explosives – DAP/ANFO

are mixtures of granulated ammonium nitrate and oil. Powder explosives are designed for opencast, quarry rock and special blasting operations.

Emulsion explosives

are industrial explosives with excellent water resistance. They are produced in both cartridge and so-called bulk form for mixing and pump trucks. Explosia a.s. produces numerous types of emulsion explosives – large and small diameter, cap or booster sensitive, for surface and underground blasting.

Dynamite-type explosives (gelatinous explosives)

are plastic explosives containing liquid nitroesters based on nitroglyceroglycol and are typical representatives of their class. They feature a high content of nitroglycerin in the mixture of nitroesters used for their preparation, which ensures reduced formation of fumes that deteriorate the working environment in warehouses or when charging explosives into boreholes at mining sites. They belong to the category of mining rock blasting explosives, they are used at mining sites where there is no risk of explosion of mine gases or mixtures of combustible dusts with air, but also at surface sites where the nature of the material to be broken requires the use of high-performance blasting explosives, or for underwater blasting.

Explosives for special use

are intended for use, for example, during blasting works under pressure, under water, geoseismic surveys, destruction and other special works. Some of them are used as boosters.

Black powders

are mixtures of potassium nitrate, sulphur and charcoal. They are used as powders for blasting, timing, pyrotechnic purposes, in hunting ammunition and for firing from historical firearms.

Detonating cords

are initiators filled with the PETN high explosive. They are mainly used to ensure transmission of detonation.

Explosives – raw materials

are high explosives for the production of boosters, detonating cords and detonators.

Mixing and pump trucks

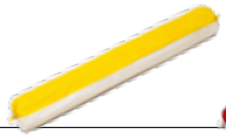
are modern means of explosives technology that transport non-explosive components or mixtures thereof to the consumption site, where they prepare the explosive by mixing or sensitising it and pump it into the boreholes at the same time.

Comprehensive services for miners

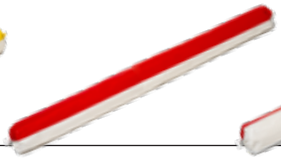
are all the services necessary for the preparation and performance of blasting and are provided with various degrees of comprehensiveness. They primarily consist of drilling and blasting works, delivering explosives and initiators to the blasting sites, blasting technical manager and blaster work, including the charging service, loading and transport.

Product overview

PERMON®
DAP M/ANDEX M



Emsit® V



Emsit® M

Emsit® 1

Emsit® 20

Perunit® E

Semtex® 1A

Semtex® 10

Semtex® 10-SE

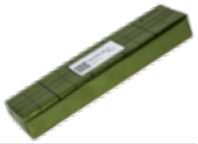
Semtex® S 30

Semtex OLP

Semtex® 1H

Semtex® C-4

Semtex
PE4/PW4



Semtex® 90

VESUVIT® TN

VESUVIT® THH

VESUVIT® T1/2

VESUVIT® A

VESUVIT PM-75

VESUVIT® LC

STARTLINE®

PENTRIT ND

PENTRIT NK

PENTRIT Np-3

PENTRITOL
Np 10 T

TNR

BULK EXPLOSIVES (DAP/ANFO)

PERMON® DAP M/ ANDEX M, manufacturer SSE Slovakia s. r. o.

CE: 1395-004/2004

Classification: UN 0082, EXPLOSIVE, BLASTING, TYPE B, 1.1D, ADR

The PERMON® DAP M rock-blasting mining explosive is a DAP (ANFO) type bulk explosive.

It is used for blasting works both on the surface and underground in non-explosive dry environments. It is usually supplied in bulk and is designed for both gravity and mechanised charging. When charging boreholes with a diameter of 43 to 60 mm by pouring, the depth of the charged boreholes must not exceed 3 m; for boreholes with a diameter greater than 60 mm, the depth of the charged borehole is not limited.

An explosive produced from high quality raw materials – a representative of the world's most widely used group of explosives.

Parameter	Unit of measure	PERMON® DAP M		
		Prescribed values		Determined value
ANPP content	%	94.50	+ 0.5 / - 1.0	94.3
Fuel content	%	5.50	+ 1.0 / - 0.5	5.7
Bulk density	g.cm^{-3}	0.70-0.78		0.74
Water content	%	max. 0.8		
Impact sensitivity	J	min. 30		
Detonation velocity	m/s	min. 2,800		3,700

EMULSION EXPLOSIVES

Emsit® V

CE: 0589.EXP.1985/06

Classification: UN 0241, EXPLOSIVE, BLASTING, TYPE E, 1.1D, ADR

The EMSIT® surface explosive is a modern emulsion type explosive with a high detonation velocity and outstanding resistance to water. The explosive is packaged by a modern cartridge machine into a thermally and mechanically resistant foil with a high strength weld.

It is used in large diameters as a powerful explosive during blasting works in places with wet or water saturated blast holes.

Unlike EMSIT® M explosive, EMSIT® V has a stiffer consistency. It is necessary to use an explosive booster with the detonation velocity of at least 6,000 m/s.

Parameter	Unit of measure	EMSIT® V
Heat of explosion*	kJ/kg	2,800
Gas volume*	dm^3/kg	800
Heat of explosion*	°C	1,800
Oxygen balance*	% O_2	+ 0.5
Detonation velocity in a blast hole (65 mm, non-confined)	m/s	min. 5,000
Detonation transmission (50 mm, non-confined)	cm	on contact
Density	kg/m^3	min. 1,150
Firing	–	Booster 500 g
Water resistance	–	24 h/0.3 MPa
Smallest permitted diameter	mm	50
Shelf life	months	12

* Values determined by calculation

Packaging	Unit of measure	EMSIT® V			
Diameter	mm	50	65	75	90
Weight	g	1,250	2,500	2,500	3,000
Length	mm	approx. 560	approx. 600	approx. 515	approx. 400
Net weight	kg/box	25	25	20	24

Note: The lengths of the charges vary depending on the density of the emulsion matrix.

Emsit® M

CE: 1019-083/V/2004

Classification: UN 0241, EXPLOSIVE, BLASTING, TYPE E, 1.1D, ADR

Emsit® 1

CE: 0589.EXP.0139/01

Classification: UN 0241, EXPLOSIVE, BLASTING, TYPE E, 1.1D, ADR

The EMSIT® M and EMSIT® 1 rock blasting explosive are explosives of a modern emulsion type with a high detonation velocity and outstanding resistance to water. The explosive is packaged by a cartridge machine into a thermally and mechanically resistant foil with a high strength weld.

It is used in both small and large diameters as a powerful explosive during blasting works in places with wet or water saturated blast holes.

It can also be used for underground blasting works.

Parameter	Unit of measure	EMSIT® M, 1
Heat of explosion*	kJ/kg	2,800
Gas volume*	dm^3/kg	800
Heat of explosion*	°C	1,800
Oxygen balance*	% O_2	+ 0.5
Detonation velocity (30 mm, non-confined)	m/s	4,700
Detonation velocity (65 mm, non-confined)	m/s	5,000
Brisance according to Hess	mm	14
Relative explosive strength	%	60
Detonation transmission (50 mm, non-confined)	cm	on contact
Density	kg/m^3	min. 1,050
Firing	–	Detonator No. 8
Water resistance	–	24 h/0.3 MPa
Smallest permitted diameter	mm	30
Shelf life	months	12

* Values determined by calculation

Packaging	Unit of measure	EMSIT® M, 1					
Diameter	mm	30	38	50	65	75	90
Weight	g	500	463	1,250	2,500	2,500	3,000
Length	mm	680	393	540/590	660/690	500/520	435/450
Net weight	kg/box	22	25	25	25	20	24

Note: The lengths of the charges vary depending on the density of the emulsion matrix.

Emsit® 20
from a pump truck

CE: 1019-085/V/2024

Classification: EXPLOSIVE, BLASTING, TYP E, 1.1D, ADR

EMSIT® 20 is a modern emulsion type explosive containing a physical sensitiser with a high detonation velocity and excellent water resistance. It is produced for use on site. It is used as a powerful explosive, especially during blasting works in areas with wet or water saturated blast holes. It features high reliability even in extreme climatic conditions for use in temperatures from -20 to +40°C.

Pumped emulsion explosive
- the most reliable and economical solution,
- greater blast hole charging effectiveness.

Parameter	Unit of measure	EMSIT® 20 from a mixing and pump truck
Oxygen balance*	% O_2	+0.5
Gas volume*	$dm^3.kg^{-1}$	800
Heat of explosion*	$kJ.kg^{-1}$	2,800
Heat of explosion*	°C	1,800
Detonation velocity, min.	$m.s^{-1}$	3,500
Detonation capability	–	passes the test
Explosive density, min.	$g.cm^{-3}$	1.05
Sensitivity to impact by a hammer (10 kg), min.	J	50

* Values determined by calculation

EMULSION MATRIX

Emulsion matrix is a mixture of ammonium nitrate, sodium nitrate and oil phase, it is used for production of emulsion explosives – including material for pump trucks.

Parameter	Unit of measure	Emulsion matrix
Density	kg/m^3	min. 1,350

DYNAMITE-TYPE EXPLOSIVES

Perunit® E

CE: 0589.EXP.0556/07

Classification: UN 0081, EXPLOSIVE, BLASTING, TYPE A, 1.1D, ADR

The PERUNIT® E rock blasting mining explosive is a dynamite-type explosive with high energy content, high density and high detonation velocities. It is used at underground sites in a non-explosive environment and on surfaces where the character of the material to be broken requires the use of a powerful explosive. Especially large-diameter cartridges are suitable for explosive boosting.

It is used for blasting works in wet environments and under water under the conditions specified in its instructions for use.

This traditional explosive does not contain DNT and TNT nitroaromatics hazardous to health.

Parameter	Unit of measure	PERUNIT® E
Heat of explosion*	kJ/kg	min. 4,100
Gas volume*	dm^3/kg	858
Heat of explosion*	°C	min. 3,000
Oxygen balance*	% O_2	+ 2.2
Detonation velocity (65 mm, non-confined)	m/s	6,200
Detonation velocity (28 mm, non-confined)	m/s	2,400
Brisance according to Hess	mm	min. 14
Relative explosive strength	%	min. 78
Detonation transmission (non-confined large diameter cartridges)	cm	min. 4
Density	kg/m^3	min. 1,300
Firing	–	Detonator No. 8
Water resistance (large diameter cartridges)	–	12 h/0.3 MPa
Water resistance (small diameter cartridges)	–	2 h/0.01 MPa
Smallest permitted diameter	mm	28
Shelf life	months	12

* Values determined by calculation

Packaging	Unit of measure	PERUNIT® E						
Diameter	mm	28	38	50	60	65	80	90
Weight	g	200	568	1,250	2,083	2,500	3,125	4,167
Length	mm	220	360	440	610	550	450	480
Net weight	kg/box	25	25	25	25	25	25	25

Small diameter cartridges (28 to 38 mm) are packaged in waxed paper.
Large diameter cartridges (50 to 120 mm) are packaged in a PE hose.

EXPLOSIVES FOR SPECIAL USE

Overview of the minimum parameters of Semtex® type explosive

Parameter	Unit of measure	Semtex® 1A	Semtex® 10	Semtex® 10-SE	Semtex® S30	Semtex® OLP	Semtex® 1H
Oxygen balance	% O_2	- 63	- 44	–	- 3	- 56	- 64
Content of high explosive	%	PETN ≥ 80	PETN ≥ 83	PETN ≥ 86	PETN ≥ 28	PETN ≥ 83	RDX, PETN ≥ 82
Detonation velocity	m/s	≥ 7,000	≥ 7200	≥ 6700	≥ 2000	≥ 7500	≥ 7,000
Smallest permitted diameter	mm	3	5	1.5	20	2	5
Brisance according to Hess	mm	≥ 21	≥ 20	≥ 14		≥ 18	≥ 21
Density	g/cm³	≥ 1.40	≥ 1.40	≥ 1.45	≥ 1.00	≥ 1.45	≥ 1.40
Detonator No. 8 sensitivity	–	100% detonates	100% detonates	100% detonates	100% detonates	100% detonates	100% detonates
Water resistance	–	0.2 MPa	10 h/1 MPa	0.3 MPa	–	10 h/1 MPa	10 h/1 MPa
Temperature of use, min/max	°C	-20/+60	-30/+50	-10/+40	-30/+30	-15/+50	-20/+60
Shelf life	years	2	5	2	1	10	5
Storage temperatures	°C	-10/+40	-10/+40	-10/+40	-30/+30	-20/+50	-10/+40
Relative explosive strength	%	72	65	70	–	80	69

Parameter	Unit of measure	Semtex® C-4	Semtex® PE4/PW4	Semtex® 90P	Semtex® 90PH	Semtex® 90H
Oxygen balance	% O_2	- 48	- 55	- 33	- 36	- 41
Content of high explosive	%	RDX ≥ 88	RDX ≥ 86	PETN ≥ 85.5	RDX, PETN ≥ 85	RDX ≥ 87
Detonation velocity	m/s	≥ 7600	≥ 7500	≥ 7250	≥ 7400	≥ 7500
Smallest permitted diameter	mm	6	–	2	4	8
Brisance according to Hess	mm	≥ 21	≥ 20	≥ 18	≥ 18	≥ 18
Density	g/cm³	≥ 1.50	≥ 1.50	≥ 1.50	≥ 1.52	≥ 1.54
Detonator No. 8 sensitivity	–	100% detonates	100% detonates	100% detonates	100% detonates	100% detonates
Water resistance	–	10 h/1 MPa	10 h/1 MPa	10 h/1 MPa	10 h/1 MPa	10 h/1 MPa
Temperature of use, min/max	°C	-30/+60	-30/+60	-30/+63	-40/+63	-40/+71
Shelf life	years	10	10	10	10	10
Storage temperatures	°C	-20/+40	-20/+40	-40/+50	-40/+50	-40/+71
Relative explosive strength	%	77	75	85	85	85

SEMTEX® 1A

CE:0589.EXP.0138/01

Classification: UN 0084, EXPLOSIVE, BLASTING, TYPE D, 1.1D, ADR

The SEMTEX® 1A red plastic explosive is a special use explosive containing 83% PETN, a non-explosive plasticiser and a marking agent for pre-explosion detection.

It is the basic variant of the Semtex explosive with low toxicity. It is mainly used for destruction and special blasting works or as an explosive booster. The explosive can be cut and shaped under the conditions indicated in the respective instructions for use.

Parameter	Unit of measure	SEMTEX® 1A
Heat of explosion*	kJ/kg	2,648
Gas volume*	dm^3/kg	1,140
Heat of explosion*	°C	1,991
Oxygen balance*	% O_2	- 63.4
Average detonation velocity	m/s	7,340
Brisance according to Hess	mm	min. 21
Relative explosive strength	%	72
Detonation transmission (30 mm diameter)	cm	3
Density	kg/m^3	1,400
Firing	–	Detonator No. 8
Water resistance	–	10 h/1 MPa
Smallest permitted diameter	mm	3
Shelf life	years	2

* Values determined by calculation

Packaging	Unit of measure	SEMTEX® 1A			
Diameter	mm	16	21	–	–
Weight	g	150	250	1,000	2,500
Cartridge type		Prolate	Prolate	Brick	Brick
Net weight	kg/box	15.6	20	25	25

The SEMTEX 1A explosive is packaged in waxed paper and a PE bag.
Individual bricks can be supplied in weights from 250 g to 3,000 g. The product can also be packaged as linear charges weighing 150 g to 300 g. Two options of shipping packaging are offered, namely a cardboard box or wooden crate.

SEMTEX® 10

CE: 0589.EXP.0932/04

Classification:

UN 0084, EXPLOSIVE, BLASTING, TYPE D, 1.1D, ADR

The SEMTEX® 10 black plastic explosive is a special use explosive containing 86% PETN, a non-explosive plasticiser and a marking agent for pre-explosion detection.

It features the optimal combination of adhesiveness, rheological properties and performance with low toxicity. It is mainly used for destruction and special blasting works or as an explosive booster. The explosive can be cut and shaped under the conditions indicated in the respective instructions for use.

Parameter	Unit of measure	SEMTEX® 10
Heat of explosion*	kJ/kg	3,679
Gas volume*	dm^3/kg	1,005
Heat of explosion*	°C	2,759
Oxygen balance*	% O_2	- 44
Average detonation velocity	m/s	7,395
Brisance according to Hess	mm	21
Density	kg/m^3	1,400
Firing	–	Detonator No. 8
Water resistance	–	10 h/1 MPa
Smallest permitted diameter	mm	4
Shelf life	years	5

* Values determined by calculation

Packaging

The SEMTEX® 10 explosive is packaged in waxed paper and PE bags.
Individual bricks can be supplied in weights from 250 g to 3,000 g. Two options of shipping packaging are offered, namely a cardboard box or wooden crate.

SEMTEX® 10-SE

CE: 0589.EXP.5745/03

Classification: UN 0084, EXPLOSIVE, BLASTING, TYPE D, 1.1D, ADR

The SEMTEX® 10-SE plastic explosive is a white special use explosive containing 78% PETN, non-explosive plasticiser, special additives and a marking agent for pre-explosion detection.

It is supplied as a sheet charge wound on a reel. The explosive properties, low toxicity, adhesiveness and general mechanical properties are set to optimally suit explosive hardening of metals, which is its main application. The explosive can be cut and shaped under the conditions indicated in the respective instructions for use.

Parameter	Unit of measure	SEMTEX® 10-SE
Heat of explosion*	kJ/kg	2,709
Gas volume*	dm^3/kg	1,100
Heat of explosion*	°C	1,975
Oxygen balance*	% O_2	- 59
Average detonation velocity	m/s	7,122
Brisance according to Hess	mm	min. 14
Relative explosive strength	%	min. 70
Density	kg/m^3	1,470
Firing	–	Detonator No. 8
Water resistance	–	0.3 MPa
Smallest permitted diameter	mm	1.5
Shelf life	years	2

* Values determined by calculation

Packaging

The SEMTEX® 10-SE explosive is supplied in the form of a sheet charge with the dimensions 300 × 4 mm or 300 × 4 mm and a length corresponding to 10 kg, i.e., approx. 10 m or 5 m. The charge is wound on a reel.

SEMTEX® S30

CE: 1019-118/V/2004

Classification: UN 0084, EXPLOSIVE, BLASTING, TYPE D, 1.1D, ADR

The SEMTEX® S 30 special use explosive is a white bulk material of low toxicity containing 30% PETN mixed with an inert material.

Its properties make it the optimal explosive for explosion welding, so-called explosive cladding.

Parameter	Unit of measure	SEMTEX® S 30
Heat of explosion*	kJ/kg	1,277
Gas volume*	dm^3/kg	420
Heat of explosion*	°C	1,023
Oxygen balance*	% O_2	- 3
Average detonation velocity	m/s	2,200
Relative explosive strength	%	–
Density	kg/m^3	1,050
Firing	–	Detonator No. 8
Water resistance	–	–
Smallest permitted diameter	mm	10
Shelf life	years	1

* Values determined by calculation

Packaging

The SEMTEX® S 30 bulk explosive is packaged in 25 kg PE bags and in a cardboard shipping package.

SEMTEX® OLP

CE: 1019-181/V/2018

Classification: UN 0084, EXPLOSIVE, BLASTING, TYPE D, 1.1D, ADR

The SEMTEX® OLP yellow plastic explosive is a special use explosive containing 85% PETN, non-explosive plasticiser, and a marking agent for pre-explosion detection.

It features greater detonation velocity with somewhat poorer mechanical properties but good adhesiveness and low toxicity. Its properties are mainly intended for filling into packages or ammunition items, but it can also be used during special blasting works or for boosting other explosives. The explosive can be cut and shaped under the conditions indicated in the respective instructions for use.

Parameter	Unit of measure	SEMTEX® OLP
Heat of explosion*	kJ/kg	3,155
Gas volume*	dm^3/kg	1,111
Heat of explosion*	°C	2,316
Oxygen balance	% O_2	- 56
Average detonation velocity	m/s	7,677
Brisance according to Hess	mm	min. 18
Density	kg/m^3	1.45
Firing	–	No. 8 detonator
Water resistance	–	10 h/1 MPa
Smallest permitted diameter	mm	2
Shelf life	years	10

* Values determined by calculation

Packaging

SEMTEX OLP is packaged in 25 kg PE bags and in a cardboard shipping package.

SEMTEX® 1H

CE: 0589.EXP.2478/04

Classification: UN 0084, EXPLOSIVE, BLASTING, TYPE D, 1.1D, ADR

The SEMTEX® 1H plastic explosive is a special use explosive of yellow to orange colour containing 85% high brisance crystalline explosive (pentrit and hexogen), non-explosive plasticiser and a marking agent for pre-explosion detection.

It features high adhesiveness with low stiffness. It is mainly used for destruction and special blasting works or as an explosive booster. The explosive can be cut and shaped under the conditions indicated in the respective instructions for use.

Parameter	Unit of measure	SEMTEX® 1H
Heat of explosion*	kJ/kg	2,765
Gas volume*	dm^3/kg	1,171
Heat of explosion*	°C	2,073
Oxygen balance*	% O_2	- 64
Average detonation velocity	m/s	7,267
Brisance according to Hess	mm	min. 21
Density	kg/m^3	1,400
Firing	–	Detonator No. 8
Water resistance	–	10 h/1 MPa
Smallest permitted diameter	mm	5
Shelf life	years	5

* Values determined by calculation

Packaging

The SEMTEX® 1H explosive is packaged in waxed paper and PE bags.
Individual bricks can be supplied in weights from 250 g to 3,000 g. Two options of shipping packaging are offered, namely a cardboard box or wooden crate.

SEMTEX® C-4

CE: 0589.EXP.5223/04

Classification: UN 0084, EXPLOSIVE, BLASTING, TYPE D, 1.1D, ADR

The SEMTEX® C-4 plastic explosive is a white special use explosive containing 90% hexogen, non-explosive plasticiser and a marking agent for pre-explosion detection.

The explosive is manufactured in accordance with MIL-DTL-45010B. It features high explosive parameters with greater stiffness and low adhesiveness. It is mainly used for destruction and special blasting works or as an explosive booster. The explosive can be cut and shaped under the conditions indicated in the respective instructions for use.

Parameter	Unit of measure	SEMTEX® C-4
Heat of explosion*	kJ/kg	3,780
Gas volume*	dm^3/kg	1,090
Heat of explosion*	°C	2,800
Oxygen balance*	% O_2	- 48
Average detonation velocity	m/s	min. 7,804
Brisance according to Hess (2 plates)	mm	min. 21
Relative explosive strength	%	77
Density	kg/m^3	1,500
Firing	–	Detonator No. 8
Water resistance	–	10 h/1 MPa
Shelf life	years	10

* Values determined by calculation

Packaging

The SEMTEX C-4 explosive can be packaged in special paper and a PE bag, or solely in a PE bag.
Individual bricks can be supplied in weights from 250 g to 2,500 g. Two options of shipping packaging are offered, namely a cardboard box or wooden crate.

SEMTEX® PE4/PW4

CE: 1019-188/V/2020

Classification: UN 0084, EXPLOSIVE, BLASTING, TYPE D, 1.1D, ADR

The SEMTEX® PE4 / PW4 plastic explosive is a white special use explosive containing 88% hexogen, non-explosive plasticiser and a marking agent for pre-explosion detection.

It features greater adhesiveness with lower stiffness. It is mainly used for destruction and special blasting works or as an explosive booster. The explosive can be cut and shaped under the conditions indicated in the respective instructions for use.

Parameter	Unit of measure	SEMTEX® PE4/PW4
Heat of explosion*	kJ/kg	3,470
Gas volume*	dm^3/kg	1,140
Heat of explosion*	°C	2,550
Oxygen balance*	% O_2	- 55
Average detonation velocity	m/s	7,638
Brisance according to Hess	mm	min. 20
Density	kg/m^3	1.50
Firing	–	No. 8 detonator
Water resistance	–	10 h/1 MPa
Smallest permitted diameter	mm	–
Shelf life	years	10

* Values determined by calculation

Packaging

The explosive is supplied in cartridges of various weights from 250 g to 2,500 g and other variants based on agreement between the supplier and customer. The cartridge packaging is typically impregnated paper or plastic foil (bag), which may feature a self-adhesive layer. Packaged cartridges are placed in wooden transport crates or cardboard boxes.

SEMTEX® 90

CE: 90 P 1019-095/V/2017
CE: 90 PH 1019-096/V/2017
CE: 90 H 1019-254/V/2017

Classification: UN 0084, EXPLOSIVE, BLASTING, TYPE D, 1.1D, ADR

The SEMTEX® 90 plastic explosive is a special use explosive containing a crystalline high explosive, non-explosive plasticiser, special additives and a marking agent for pre-explosion detection.

It features very good plasticity even at temperatures in the range around - 40°C. It is mainly used for destruction and special blasting works or as an explosive booster. The explosive can be cut and shaped under the conditions indicated in the respective instructions for use.

The explosive is produced in three variants. The light red SEMTEX® 90 P contains 85.5% PETN with low toxicity, the white SEMTEX® 90 H contains 87% hexogen with lower sensitivity, and the dark green SEMTEX 90 PH containing 50% PETN and 37% hexogen is an optimal compromise of properties.

Parameter	Unit of measure	SEMTEX® 90 P	SEMTEX® 90 PH	SEMTEX® 90 H
Heat of explosion*	kJ/kg	4,438	4,319	4,063
Gas volume*	dm^3/kg	928	965	1,029
Heat of explosion*	°C	3,139	3,092	2,927
Oxygen balance*	% O_2	- 33	- 36	- 41
Average detonation velocity	m/s	typ. 7,394	typ. 7,487	typ. 7,656
Brisance according to Hess	mm	min. 18	min. 18	min. 18
Relative explosive strength	%	min. 85	min. 85	min. 85
Detonation transmission	cm	–	–	–
Density	kg/m^3	typ. 1,520	typ. 1,550	typ. 1,560
Firing	–	Detonator No. 8	Detonator No. 8	Detonator No. 8
Water resistance	10 h/1 MPa	10 h/1 MPa	10 h/1 MPa	10 h/1 MPa
Smallest permitted diameter	mm	2	4	8
Shelf life	years	10	10	10

* Values determined by calculation

Packaging

The SEMTEX 90 explosive can be packaged in green multilayer film or special paper and a PE bag. Individual bricks can be supplied in weights from 500 g to 3,000 g. Two options of shipping packaging are offered, namely a cardboard box or wooden crate.

BLACK POWDERS

Comparison of black powders

Parameter	Unit of measure	Blasting	Pyrotechnic				Hunting
		VESUVIT TN	Vesuvit THH	Vesuvit T 1/2	Vesuvit A	Vesuvit PM-75	Vesuvit LC
Heat of explosion	kJ/kg	3,057	3,085	3,100	3,160	–	–
Gas volume	dm^3/kg	280	280	280	280	280	280
Air temperature min.	°C	185	290	290	290	290	290
Sensitivity to impact, hammer min.	J	10	5	5	5	5	5
Bulk density min.	g/cm^3	0.90	1.05	0.98	0.96	–	0.90
Humidity max.	%	1	1	1	1	2	1
Grain size	mm	2.00-0.63	7.10-2.24	2.00-1.00	1.25-0.71	0.28 and less	0.71-0.28
Shelf life	months	36	12	36	36	36	36
Storage temperature	°C	up to +30	+5 to +30	-20 to +25	-20 to +25	-20 to +25	up to +25
RH during storage	%	20-80	20-80	up to 80	up to 80	20-80	up to 80
UN number		0027					
ADR		1.1.D					
Temperature of use	°C	up to +35	0-40	up to +35	up to +35	up to +35	up to +35
Shelf life	years	3	1	3	3	3	3

* Explosion characteristics determined by calculation

Black powder – mixture of potassium nitrate (KNO3, also known as saltpetre), charcoal and sulphur. It was used in firearms until the end of the 19th century, but it is still used to make fireworks, cannonballs and fuses.

It is also used for blasting works.

VESUVIT® THH and VESUVIT® TN are not water resitant and may only be used in dry environments under the conditions specified in their instructions for use. They are charged into blast holes or fissures by means of cartridges in paper packaging. They can be initiated using an electric igniter, a fuse or an igniter with the initiating capability of the standard number 8 detonator. REF. DET 3 as defined in ČSN EN 13763-15.

VESUVIT® TN

CE: 1019-092/V/2004

Classification: UN 0027, BLACK POWDER, granular or as a meal, 1.1D, ADR

The VESUVIT® TN blasting black powder is a mixture of potassium nitrate, sulphur and charcoal. This black powder is bulk granulated material of a grey-black colour with a semi-glossy surface (graphite).

VESUVIT® TN is used for careful breaking of valuable rocks (block mining) or during blasting works in easily breakable rocks.

VESUVIT® TN is not water resistant and may only be used in dry environments under the conditions specified in its instructions for use. It is charged into blast holes or fissures by means of cartridges in paper packaging. It can be initiated using an electric igniter, a fuse or an igniter with the initiating capability of the standard number 8 detonator.

VESUVIT® THH

CE: 0589.EXP.1692/07

Classification: UN 0027, BLACK POWDER, granular or as a meal, 1.1D, ADR

The VESUVIT® THH blasting black powder is a mixture of potassium nitrate, sulphur and charcoal. It is bulk granulated material of a grey-black colour with semi-glossy or matte surface.

VESUVIT® THH is used for blasting works, as a propellant or rocket fuel.

VESUVIT® THH is not water resistant and may only be used in dry environments under the conditions specified in its instructions for use. It is charged into blast holes or fissures by means of cartridges in paper packaging. It can be initiated using an electric igniter, a fuse or an igniter with the initiating capability of the standard number 8 detonator.

VESUVIT® T1/2

CE: 0589.EXP.0072/98

Classification: UN 0027, BLACK POWDER, granular or as a meal, 1.1D, ADR

Medium-coarse grained non-coated black powder, which, due to its properties, is particularly useful for fireworks production. Vesuvit T1/2 is not water resistant and may only be used in dry environments under the conditions specified in its instructions for use.

VESUVIT® PM-75

CE: 0589.EXP.2951/00

Classification: UN 0027, BLACK POWDER, granular or as a meal, 1.1D, ADR

A powdery black powder suitable, for example, for the production of moulded pyrotechnic bodies.

Vesuvit PM-75 is not water resistant and may only be used in dry environments under the conditions specified in its instructions for use.

VESUVIT® A

CE: 1019-102/V/2004

Classification: UN 0027, BLACK POWDER, granular or as a meal, 1.1D, ADR

Fine-grained graphite-coated black powder, which can also be produced in a non-coated version (Vesuvit A-1) on request.

Vesuvit A is not water resistant and may only be used in dry environments under the conditions specified in its instructions for use.

VESUVIT® LC

CE: 0589.EXP.3924/04

Classification: UN 0027, BLACK POWDER, granular or as a meal, 1.1D, ADR

Graphite-coated black powder designed for hunting and sporting purposes and for shooting historical weapons.

Vesuvit LC is not water resistant and may only be used in dry environments under the conditions specified in its instructions for use.

The **Vesuvit LC1** variant has anincreased fine fraction content and is intended for pistols, and the **Vesuvit LC2 variant** with a reduced fine fraction content is intended for rifles.

DETONATING CORDS

STARTLINE® 6, 10, 12, 15, 20, 40, 80 and 100

Classification: UN 0065, CORD, DETONATING, FLEXIBLE, 1.1D, ADR

STARTLINE® 6, 10, 12, 15, 20, 40, 80 and 100 is a series of classical detonating cords.

The mass of pentrit in grams contained in a running metre of detonating cord of a given type is specified by the number attached behind the STARTLINE® name. STARTLINE®detonating cords are made on electronically controlled machines. This guarantees a perfect continuous column of pentrit along the entire detonating cord length. Synthetic fibres are used for the 'wraps', which give the detonating cords high tensile strength. The surface of the detonating cords is coated with a layer of plastic to ensure their water resistance. These facts ensure exceptional functional reliability even for low-grammage types of detonating cords.

Parameter	Unit of measure	STARTLINE							
		6	10	12	15	20	40	80	100
Colour		Red	Yellow	Green	Blue	Yellow	Orange	Purple	Red
Explosive content	g/m	6.0 ± 1.0	10.0 ± 1.5	12.0 ± 2.0	15.0 ± 2.0	20.0 ± 2.5	40.0 ± 4.0	80.0 ± 8.0	100.0 ± 10.0
Detonation velocity	m/s	6,500	6,500	6,500	6,500	6,500	6,500	6,500	6,500
Outer diameter	mm	min. 3.0	4.7 ± 1.0	5.0 ± 1.0	5.2 ± 1.0	6.6 ± 1.0	8.7 ± 1.5	11.5 ± 2.0	13.0 ± 2.0
Tensile strength	kg	min. 50	min. 60	min. 60	min. 60	min. 70	min. 75	min. 75	min. 75

Packaging

Plastic reels in cardboard packaging.

PARAMETER	CE	Metres on the reel	Number of reels in the package	Total metres in the package
STARTLINE® 6	0589.EXP.4103/02	400	2	800
STARTLINE® 10	0589.EXP.1145/17	300	2	600
STARTLINE® 12	0589.EXP.4104/02	150	4	600
STARTLINE® 12	0589.EXP.4104/02	250	2	500
STARTLINE® 15	0589.EXP.4105/02	130	4	520
STARTLINE® 15	0589.EXP.4105/02	230	2	460
STARTLINE® 20	0589.EXP.4106/02	160	2	320
STARTLINE® 40	0589.EXP.4107/02	100	2	200
STARTLINE® 80	0589.EXP.4108/02	40	2	80
STARTLINE® 100	0589.EXP.3276/08	35	2	70

EXPLOSIVES FOR FURTHER PROCESSING

PENTRIT ND

CE: 0589.EXP.1461/04

Classification: UN 0150, PENTAERYTHRITE TETRANITRATE (PENTAERYTHRITOL TETRANITRATE; PETN), WETTED, with not less than 15% water, by mass, 1.1D, ADR

White crystalline material. The water content shall be at least 15% for transport outside the plant. It is most commonly used as a secondary charge for detonators and detonating cords.

Parameter		Unit of measure	PENTRIT ND
Melting point min.		°C	140
Chemical stability according to Bergmann-Junk, max.		ml NO/g	max. 2.5
Determination of particle size max.	remained on sieve 1.0 mm	%	0
	fell through sieve 0.2 mm	%	12
Bulk density min.		kg/m³	750

PENTRIT NK

CE: 0589.EXP.1453/04

Classification: UN 0150, PENTAERYTHRITE TETRANITRATE (PENTAERYTHRITOL TETRANITRATE; PETN), WETTED, with not less than 15% water, by mass, 1.1D, ADR

White crystalline material. The water content shall be at least 15% for transport outside the plant. It is a major component of military and civilian plastic explosives. It is often used in castable mixtures with trinitrotoluene, for the preparation of booster charges for low-sensitivity industrial explosives as well as for cast charges for engineering munitions and shaped charges.

Parameter		Unit of measure	PENTRIT NK
Melting point min.		°C	139
Chemical stability according to Bergmann-Junk, max.		ml NO/g	2.5
Determination of particle size max.	remained on sieve 1.6 mm	%	0
	fell through sieve 0.2 mm	%	75

Packaging
Pentrit ND, NK is packaged in 20 kg polyethylene bags, tightly sealed and placed in a cardboard box.

PENTRIT Np-3

CE: 1019-099/V/2017

Classification: UN 0475, EXPLOSIVE SUBSTANCES, 1.1D, ADR

It is a mixture of PETN, approx. 3% wax and red dye. It is a loose substance of pink to red colour. It is most commonly used as a secondary charge in detonators and for the production of explosive boosters.

Parameter	Unit of measure	PENTRIT Np-3
Remained on sieve 1.25 mm, max.	%	0
Bulk weight	kg/m^3	min. 700
Moisture and volatile content, max.	%	0.5
Wax content	%	2-4

Packaging

Pentrit Np-3 is packaged in 20 kg polyethylene bags, tightly sealed and placed in a cardboard box.

PENTRITOL Np 10 T (PENTOLITE)

CE: 0589.EXP.1457/04

Classification: UN 0151, PENTOLITE, dry or wetted with less than 15 % water, by mass, 1.1D, ADR

It is a mixture of PETN, approx. 10% trinitrotoluene (TNT) and red dye. It is a loose substance of pink to red colour. It is most commonly used as a secondary charge for detonators, booster production and for detonating cords.

Parameter		Unit of measure	PENTRITOL
Determination of particle size	remained on the sieve 1.0 mm, max.	%	0
	content of 0.2-0.8 mm fraction, min.	%	80
Bulk weight		kg/m^3	700-780
Moisture and volatile content, max.		%	0.1

Packaging

Pentritol is packaged in 2x 10 kg polyethylene bags, tightly sealed and placed in a cardboard box.

TNR
(2,4,6-TRINITRORESORCINOL)

CE: 1019-091/V/2004

Classification: UN 0394, TRINITRORESORCINOL, WETTED with not less than 20% water, by mass, 1.1 D, ADR

It is an odourless, yellow to reddish-brown crystalline substance, staining intensely yellow. Poorly soluble in water. TNR is the most common intermediate for the production of lead styphnate.

Parameter	Unit of measure	TNR
Melting point of dried sample, min.	°C	174.0
Humidity, min.	%	20.0
Residue insoluble in acetone, max.	%	0.2

Packaging

TNR is packaged in polyethylene bags of approximately 12.5 kg, tightly sealed and placed in a cardboard box.

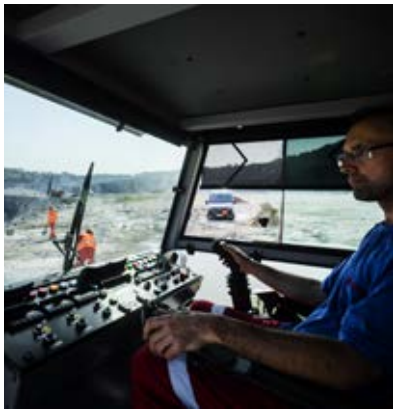
MIXING AND PUMP TRUCKS

Mixing and Pump Trucks

The explosive is produced directly on site and charging is carried out by the vehicle operator as instructed by the blasting technical manager or the blaster. The Emsit® 20 emulsion-type surface explosive is charged by a metering pump via a hydraulic manipulater with a charging hose placed at the bottom of the blast hole.

Mechanised charging of explosives using mixing and pump trucks saves up to approximately 30% of the initial costs on the drilling works after the adaptation of the drilling scheme, which significantly decreases the overall costs of rock breaking. Other important advantages of this work method include:

- Speeding up the preparation of the blasting work,
- Manpower savings during charging,
- Manpower savings during transportation and storage of explosives,
- Substantial decrease of physically demanding work,
- Lower risk of blast hole plugging due to the hydraulic manipulator,
- Tatra chassis ensuring greater off-road capability,
- Trouble-free and safer charging of blast holes filled with water,
- Packaging-free application – no packaging disposal.



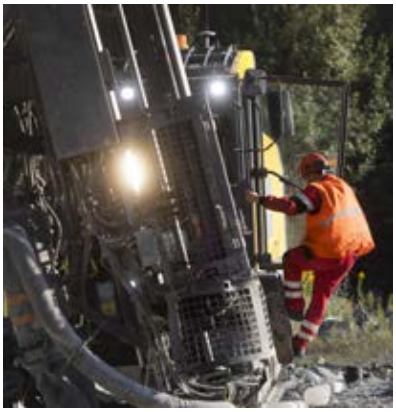
SERVICES FOR MINERS

Services for miners

Explosia a.s. provides its customers from the field of mining with a comprehensive range of services.

These activities can be summarised in the following points:

- Mining activity and activity carried out via mining,
- Machine drilling with a borehole diameter of 90-105 mm,
- Blasting works of small and large extent for the surface mining of rocks, construction works and demolitions,
- Rock breaking by means of hydraulic breaking hammers on tracked vehicles without the use of explosives,
- Storage and sale of industrial explosives and initiators,
- Transport of industrial explosives and detonators by vehicles modified according to ADR,
- Charging services in the form of complementary service for the purchasers of explosives,
- Ensuring the measurement of blasting work effects by an authorised person,
- Geodetic surveying using a total station with GPS,
- Borehole inclination surveying,
- Processing of operational documentation according to the customer's requirements,
- Silo cleaning by means of blasting.



Notes

EXPLOSIA®

Explosia a.s.

Semtín 107
530 02 Pardubice
Czech Republic

Phone: +420 466 825 500
E-mail: explosia@explosia.cz

Sales warehouse Lužná u Rakovníka

Na Prachárně 691
270 51 Lužná v Čechách

GSM: +420 725 559 940
Phone: +420 313 537 757
Fax: +420 313 537 555

Sales warehouse Krmelín

U Paleska 536
739 24 Krmelín

GSM: +420 736 505 967
Phone/fax: +420 313 537 757

Comprehensive services Fospol Division

Češkova 1758
530 02 Pardubice

Phone: +420 466 825 500
E-mail: fospol@explosia.cz

Pump trucks

GSM: +420 736 505 985
E-mail: trhaviny@explosia.cz

www.explosia.cz