



# FORPRIME

Product information December 30, 2015

## 1. Product description and use

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Forprime is a charge manufactured by Forcit, Hanko plant. It is suitable for underground blasting as ignition of Anfo and emulsion explosives when charging with a blast hole charger. The product contains hexogen-based and orange coloured mass with the marking agent. The paste-powder like mass is filled in polypropylene covered cartridge and it does not contain nitroglycol or ammonium nitrate. Forprime pipe colour is light green.

## 2. Packages

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Name	Ø /mm	Length / mm	Explosive g/cartridge	Explosives in case/kg
Forprime	15	150	Approx. 25	500 pieces / 13 kg

Transportation classification	Forprime
RID/ADR	1.1D Boosters, without detonator
IMDG	1.1 D
UN number	0042
Hazard class	1.1 D Explosives

### 3. Explosion technical features

Product	Forprime	
<b>Specifications</b>		
Form	Paste-powder	
Density	kg/dm <sup>3</sup>	1.40 - 1.45
Velocity of detonation	m/s	> 6000
<b>Typical and calculated values</b>		
Velocity of detonation	m/s	7200
Oxygen balance	%	- 22 (RDX)
Gas volume*	dm <sup>3</sup> /kg	876
Explosion heat*	MJ/kg	5.0
Strength/weight unit*	S	1.20
Operational depth in water	m	25
Operational temperature in cold	°C	- 30
Initiation method	Strength according to EN 13763-15 #3 detonator at least	

\* Cheetah 2.0 (NTP), calculated

### 4. Main raw materials and their hazard clauses

Raw material	Forprime
Hexogen	Xn; R48/22 T; R39/25 T; R25 E; R2 Expl. 1.1; H201 Acute tox. 3; H301 STOT SE1; H370 STOT RE2; H373

## 5. Storage and weather resistance

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In dry and cool space, the shelf life of Forprime is guaranteed for 2 years if it is handled and stored according to instructions. In humid and warm (> 25 °C) storage conditions its shelf life shortens. With aging and exposure to frost, the mass hardens somewhat and the velocity of detonation may slowly decrease, however it is always over 6000 m/s. The products are stored in accordance with valid legislation.

Forprime has good frost resistance and its water resistance is excellent.

## 6. Handling safety

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Forprime is the CE approved product which has been found to fulfil the essential safety requirements of the EU decree. The testing has been performed by the notified inspection body for civil explosives, the Finnish Defence Forces Research Institute of Technology (0812). The product must fulfil for example the following minimum requirements describing handling safety:

Test	Requirement
Shock sensitivity (BAM)	≥ 2 J
Abrasion sensitivity (Julius Peters)	≥ 80 N
Thermal stability	75°C, 48 h (no reaction)

Skin contact should be avoided by using protective gloves. Any explosive substance on the skin must be removed and the area washed with water and soap. In case the substance gets into the eyes, rinse with lots of water. Contact a doctor if irritation persists. Overalls and other work clothes with dried explosive material on them may ignite and burn. Explosive substance that gets on work clothes is removed mechanically, after which the work clothes are washed normally in water.

## 7. Environmental impact

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The water resistance of Forprime pipes is good. Unexploded substance does not dissolve into water. Hexogen decomposes extremely slowly in nature.

Careful and clean charging helps to minimize harmful environmental effects. Also, the quantity of harmful combustion gases (CO, NO<sub>x</sub>) generated by the explosion can be reduced by correct use of the products.

As a general rule, the generation of gases in the explosion depends on the oxygen balance and on how complete the explosion is. In ideal conditions, in which the oxygen balance is zero and the explosion is complete, the main explosion products are carbon dioxide, water vapour and nitrogen gas. The more positive the oxygen balance is the more NO<sub>x</sub> gases are generated in proportion to carbon monoxide. In an open space, these gases dissipate quickly. When blasting in a confined space, underground, in an excavation or other location in which toxic or harmful explosion gases may accumulate, one should not enter the blast site until the explosion gases have dissipated (for example by ventilation) enough to no longer pose a health hazard.

The oxygen balance of Forprime is negative. As a whole, 25 gram pipe produces so little harmful explosion gases, that it is better to ensure quality of main explosive (for example Anfo) to minimize harmful gases.

## 8. Operating instructions

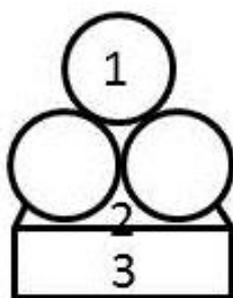
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Forprime is typically used in underground blasting as ignition of Anfo and emulsion explosives when charging with a blast hole charger. The hexogen-based mass is very safe to handle since the mass is insensitive. For the same reason the product explodes completely in open air only in front of the detonator and there should not be an air pocket between mass and detonator cap. Air pockets can be avoided by placing the detonator just before charging a blast hole. The location of the bottom of the detonator cap has been marked on the pipe to facilitate charging. The most optimal temperature for the mass viscosity is + 5 °C - + 15 °C. In colder circumstances the mass can be hard and then a plastic skewer should be used to create a hole for the detonator.

## 9. Disposal

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Forprime-products that is doubted to not function must be disposed. The charger or senior charger is allowed to dispose small quantities of explosive material. Disposal is done by burning with accessory fuels. The maximum quantity to be burnt is 5 kg in one batch and as a layer of maximum 5 cm. The burning shall be done at a minimum of 100 metres from a public road or inhabited building.



1. Maximum 5 kg and as a maximum 5 cm thick layer.
2. Wood cotton or other equivalent burnable product
3. Wooden base (for example 50 x 100 plank)

Fuel oil is applied to the explosives and burnable accessory fuels and they are lit on the side from which the wind is blowing. Igniting the fire can be done using a one-meter-long stick with a wood cotton tip doused in fuel oil.

Forcit accepts aged explosives for disposal. No compensation is paid for returned explosives and the cost of disposal is agreed separately case by case.

Explosives shipped to Forcit for disposal must have the appropriate denotations. Contact customer care or technical services before shipping the product.

## 10. Reclamation instructions

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If the product has detectable defects or it does not function in the expected manner, the following data shall immediately be given to Forcitr customer care or technical services:

- Product name, size and manufacturing date marked on the package
- Product or package appearance
- Description of the product's abnormality
- Operating circumstances in the blast site

Defective products are delivered to the nearest Forcitr service station from which they are delivered to the manufacturing plant for further examination. Returned products must be accompanied with a filled out Forcitr product return form, which you can print out on our website (<http://www.forcitr.fi/forcitr-explosives>, menu products). Contact customer care or technical services before returning the product.