



ANIITTI

Product information 26.4.2007

1. Product description and use

ANIITTI is a powdery blasting explosive, whose ingredients include ammonium nitrate, trotyl and aluminium powder. It is used as a column charge for benching in both wet and dry conditions, and can be used for tunneling, blasting in populated areas as well as for stoping.

2. Packages

| Item | Ø (mm) | Length (mm) | Explosive (g/cartridge) | Packing (kg/box) |
|----------------------------|-----------|----------------|----------------------------|---------------------|
| Aniitti, paper cartridge | 24 | 400 | appr. 200 | 25 |
| Aniitti, paper cartridge | 28 | 400 | appr. 275 | 25 |
| Aniitti, paper cartridge | 32 | 400 | appr. 360 | 25 |
| Aniitti, paper cartridge | 36 | 400 | appr. 450 | 25 |
| Aniitti, paper cartridge | 40 | 400 | appr. 540 | 25 |
| Aniitti, plastic cartridge | 50 | 440 | appr. 850 | 25 |
| Aniitti, plastic cartridge | 60 | 440 | appr. 1200 | 25 |
| Aniitti, plastic cartridge | 70 | 440 | appr. 1500 | 25 |

| Transport classification | |
|--------------------------|---------------------------------------|
| RID/ADR | 1.1D, 4 Blasting Explosive, type B |
| IMDG | 1.1 D |
| UN number | 0082 |
| Class | 1.1 |

3. Explosion technical features

| Specifications | Unit | |
|-----------------------------|---------------------|---|
| Form | | Powdery |
| Density | kg/dm ³ | 0.95–1.15 |
| Oxygen balance | % | + 0.8 |
| Gas volume* | dm ³ /kg | 880 |
| Energy* | MJ/kg | 4.5 |
| Force / weight unit (S)* | | 1.0 (Extra-Dyn. 1.0) |
| Typical values | | |
| Velocity (Ø 40 mm)** | m/s | 3 500 |
| Transmission (Ø 40 mm)** | cm | 10–12 |
| Sand test value | % | 68–70 (PETN 100) |
| Sensitivity Detonator | | Detonator sensitive, detonator no. 6 → |
| Detonating cord | | Usable |
| Reliability | | Tested at - 25°C |

* Cheetah 2.0 (NTP), theoretical

** open space (20 °C)

4. Main raw materials and their hazard clauses

| Raw material | Hazard clause |
|-----------------------|----------------------|
| ammonium nitrate | O, Xi; R8, R38 |
| trinitrotoluene (TNT) | E, T; R2-23/24/25-33 |
| aluminium powder | x |

5. Storage and shelf life

If stored in a dry environment, the minimum shelf life of Aniitti is 1 year. The product should be stored in a dry and cool place, according to the appropriate regulations.

The frost resistance of Aniitti is good. Transmission and sensitivity are slightly lower at sub-zero temperatures. The product detonates reliably up to the temperature mentioned under item 3.

The water resistance of Aniitti is limited. The plastic covered cartridge lasts for at least 8 hours charged in a wet hole, assuming that the cover of the cartridge is intact.

6. Handling safety

Aniitti is a CE approved product complying with the essential safety requirements according to the EU directive. Conformity tests have been carried by the civil explosives notified body in Finland, the Finnish Defence Forces Research Institute of Technology (PvTeknTL, 0812). The products must meet, for example, the following minimum requirements with regard to handling safety:

| Test | Requirement |
|--------------------------------------|-------------------------------|
| Impact sensitivity (BAM) | ≥ 2 J |
| Abrasion sensitivity (Julius Peters) | ≥ 80 N |
| Heat stability | 75 ° C, 48 h (no reaction) |

The TNT included in Aniitti can cause toxic symptoms. Furthermore, Guar powder (a natural substance), an additive substance in Aniitti, can cause irritation. Skin contact with Aniitti should be avoided by using protective gloves. Any explosive substance that has come into contact with the skin must be removed and the area should be washed with soap and water. If the substance gets into the eyes, the eyes must be bathed thoroughly with water. If the possible irritation continues, a doctor must be contacted. Overalls and other work clothes that have any dried explosive substance

on them can ignite and burn. If any explosive substance adheres to work clothes, it should be removed mechanically and then the clothes should be washed using normal water washing.

7. Environmental impact

Explosive that has not exploded or otherwise remains attached to the rock debris will dissolve gradually in water, releasing ammonium nitrate, aluminium powder and trotyl into nature. In a water system, nitrate has an eutrophic effect and it contaminates groundwater. Trotyl does not degrade; it remains in the soil and dissolves extremely slowly. Dissolved TNT can affect micro-organisms in the vicinity of the dissolving site.

Careful and clean charging helps to minimise harmful environmental effects. In addition, the amount of harmful fire gases (CO, NO_x) produced by the explosion can be reduced by the correct use of the product. (See operating instructions, item 8.)

In general, the amount of gases produced in an explosion depends on the oxygen balance and how complete the explosion is. At ideal conditions where the oxygen balance is zero and the explosion is complete, the main explosion products produced are carbon dioxide, water vapour and nitrogen gas. In practice, this ideal condition is never achieved and the oxygen balance is usually either slightly negative or slightly positive.

The calculated oxygen balance of Aniitti in the open air is + 0.8%, meaning that small amounts of NO_x gases and carbon monoxide are produced by the explosion. The more positive the oxygen balance is, the more NO_x gases are produced in relation to carbon monoxide. In the open air, these gases are rapidly dispersed. When blasting in a confined space, e.g. underground or at an excavation or other location where toxic or harmful explosion gases can accumulate, one should not enter the blast site before the gases are dispersed (for example by ventilation) so that they do not cause a health hazard. NOTE! Since carbon monoxide is heavier than air, it accumulates in locations that are lower than the surroundings, such as the bottom of a well.

8. Operating instructions

If an Aniitti cartridge is detonated by a detonator, the end of the detonator must be positioned carefully at the centreline of the cartridge. If the end of the detonator is too far from the centreline during initiation, a misfired cartridge may result due to insufficient impulse.

Aniitti is excellent for all types of blasting duties, in both dry and wet conditions. The plastic covered cartridge endures for at least 8 hours charged in a wet hole, assuming that the cover of the cartridge is intact. The most common applications for Aniitti are as a column charge for open-cut mining and gallery work.

When charging wet holes with Aniitti, we recommend that the detonator is placed, e.g., into a dynamite cartridge in order to ensure initiation of the charge. For optimal combustion to be achieved, holes must be blown dry before charging.

Aniitti that is presumed not to be fit for blasting must be disposed of by burning it together with additional combustible materials. Not more than 5 kg of Aniitti, with a maximum thickness of 5 cm, is allowed to be disposed of at one time. More detailed disposal instructions can be found in the appropriate Finnish legislation for blasting (“Räjätys- ja louhintatyön järjestysohje”, paragraphs 71 and 73).

FORCIT receives outdated explosives for disposal. Any explosives which are returned are not liable for a refund and the costs for disposal are agreed separately in each case.

Instructions for reclamation:

If defects are found in the product when it is delivered or the product does not operate as expected, the following information regarding the product must be supplied to the FORCIT explosives plant in writing:

- the size of the product and the manufacturing date from the package;
- the appearance of the product and description about the handling characteristics / feel of the product;

the operating situation on the site.

A sample of the rejected product must be delivered immediately to the manufacturing plant for detailed investigation. In order to facilitate easy identification, detailed identification information must be attached to the sample before dispatching.