

# Material Safety Data Sheet

## FORTIS SERIES

### 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product name: FORTIS BULK SERIES  
 Chemical name: Not applicable  
 Synonyms: FORTIS ADVANTAGE SERIES, FORTIS EXTRA SERIES, FORTIS MEX SERIES, FORTIS CONTROL SERIES  
 Chemical family: Explosives  
 Formula: Not applicable  
 Description: Explosive agent, sensitive to high explosive load.  
 Uses: Utilisation in the construction, mining and cement industry and blasting work in general, it can be loaded or deposited under a borehole as bulk explosive.  
 Supplier: Orica Colombia S. A.  
 Address: Avenida 19, N° 100 – 12, piso 4, Bogotá, Colombia  
 Telephone number: +57 1 6358139  
 Fax: +57 1 6166002  
 Emergency telephone: In Colombia: +228 4620332  
 Out of Colombia: +57 2284 620332  
 (**Night and day.** In case of chemical emergency such as spill, leakage, fire or accident).

### 2. COMPOSITION / INFORMATION OF INGREDIENTS

Product description: "Use: Mining, quarries and works in general. Generally supplied as a bulk product in the blasting borehole.

Components/	CAS number	Proportion	Risk phrase
Ammonium nitrate	6484-52-2	>60%	-
Water	7732-18-5	<15%	Non dangerous
Diesel combustible	68334-30-5	<10%	R40 Carc. Cat. 3, R65, R66, R51/53
Non dangerous components		<10%	-
Mineral oil	8012-95-1	<10%	-

### 3. HAZARDS IDENTIFICATION

This material is dangerous according to criterion of ASCC, DANGEROUS SUBSTANCES.

Risks! Risk of explosion for shock, friction. Limited evidence of carcinogenic effect. Harmful when swallowed.

## 4. FIRSTS AIDS MEASURES

**Inhalation:** Move the victim from the exposure area, remove the contaminated clothing, allow the patient take a comfortable position and keep warm. Keep the patient under rest until the complete recovery, if the patient has difficulty in breathing and develops a bluish colour in the skin (which suggests lack of oxygen in the blood – cyanosis). Make sure the air path is free from obstruction and have a qualified person that provides oxygen through a mask, applying artificial breathing if the patient does not breath. Seek medical advice.

**Skin:** If there is contact with the skin, remove the contaminated clothing and wash with potable water. If there is irritation seek medical advice. Nitrates can be absorbed through the wound. Burns or cracks in the skin. Wash the clothes before using again. For burns in the skin cover with dry and clean gauze until the medical help is available.

**Eyes:** In eye contact wash immediately with water, in all the cases of eyes contamination, it is a sensitive precaution look for medical.

**Ingestion:** Seek medical advice.

Rinse mouth with water, if swallowed not to induce vomit, give a glass with water.

**Notes for the doctor:** Symptomatic treatment, it may cause methaemoglobin. Clinical findings: or relaxing of soft muscles for nitrate.

Headache, dizziness and marked hypo-pressure. Cyanosis is clinically detectable when approximately 15% of the haemoglobin has been converted to methemoglobin. Symptoms as headache, dizziness, weakness and dyspnoea that occur when the concentration of methemoglobin is 30 to 40%. At levels close to 60% there are convulsion, comma and respiratory paralysis and blood turns chocolate colour. At higher levels it can occur death.

A photogrammetric spectre analysis can determine the presence and concentration of methemoglobin in the blood.

**Treatment:** 1.- Provide oxygen 100%.

2.- In cases of ingestion use gastric washing out. In skin contamination burns continue being washed to remove salts.

3.- Observe blood pressure and treat hypo pressure if necessary.

4.- When methemoglobin concentrations exceed 40% or when symptoms are present, provide 102mg/kg Methylene blue body weight in a 1% solution for intravenous injection slow, if cyanosis has not been resolved within an hour, a second dose of 2mg/kg body weight can be given, the total dose should not exceed 7mg/kg bodyweight. Undesirable effects such as shortness of breath, chest pain, vomiting, diarrhoea, mental confusion and cyanosis can occur. Without treatment methaemoglobin levels of 20-30% may revert to normal in 3.

5.- Rest in bed is required to methemoglobin levels in excess of 40%.

6.- Continue to monitor and administer oxygen for at least 2 hours after treatment with Methylene blue.

7.- Consider transferring to a centre where hemoperfusion can be developed to remove nitrates from the patient blood if conditions are instable.

8.- After the inhalation of oxides of nitrogen, the patient should be observed in a hospital for 24 hours for the occurrence of pulmonary oedema.

Additional observation for 2 or 3 weeks may be required for the occurrence of inflammatory changes or bronchiolitis fibrous or bilaterally.

## 5. FIRE FIGHTING MEASURES

Specific danger: Explosive material, avoid any ignition source.

Fire fighting means: In case of small fire if the current explosive is not burnt, carefully remove as much explosive as necessary at a safe distance.  
Fire fighters will use devices or auto-contained air, if there is a risk of fumes or combustion products, however if the explosive is burnt evacuate areas immediately.  
**DO NOT FIGHT FIRE.** In burnings under confinement or semi confinement conditions, some nitrogen oxides and/or carbon monoxide will be present, brown fumes indicate the presence of toxic nitrogen oxides.

## 6. ACCIDENTAL RELEASE MEASURES

Area free of all non-protected personnel. Eliminate all source of ignition. In case of transport accident notify the police and Orica Colombia Tel. +57 2284 620332.

## 7. HANDLING AND STORAGE

Recommendations for handling: Avoid the contact with other chemicals, avoid contact with skin and eyes: Not to expose material to impacts, friction between hard surfaces or any way of heat.

Recommendations to store: The Ammonium Nitrate is compatible with, and must be stored away of the tetra-nitro-methane, acid cichlorine isocyanide, some bromate, chloride, hypochlorite or chloroisocyanurate or some organic nitrate. Store material in a well-ventilated magazine adequate for class 1.1D explosive.

Deteriorated Product: The process of deterioration is a gradual break of the phase of emulsion joined with ammonium nitrate crystallization, if there are signs of deterioration the product must be tested at fire before its use.

## 8. EXPOSURE CONTROL / PERSONAL PROTECTION

Recommendable Limits of Personal Exposure: It does not have assigned value for this specific material, for the safety national commission and occupational health, however the exposure standard for the ingredients:

Mist of refined mineral oil: TWA 8h= 5mg/m<sup>3</sup>

Paraffin waxes (Fumes): TWA 8h = 2mg/m<sup>3</sup>, as the published by the safety national commission and occupational health of Australia.

**TWA:** Is the average of concentration pondered in time, over the 8-hours working day, for a 5-working-days week, over an entire labouring day.

These standards of exposure are guides to be used in the occupational health risks control. All the atmospheric contamination must be kept at a so small level as possible.

This standard of exposure must not be used as watershed between chemical dangerous concentrations. There is no relative toxicity measure.

The supplier recommends the following exposure standard.

Diesel oil: 500mg/m<sup>3</sup>, total steam (approx.100 ppm) or 5mg/m<sup>3</sup> of stable aerosol (TWA) for 8h. Weighted average in time.

Engineering conditions measures: Safe ventilation is acceptable if the components air concentrations are controlled under the exposure standard figure.

Personal equipment protection: ORICA Guide of EPP No 1, 1998:A - Overalls, safety shoes, chemical eyeglasses, gloves.

Wash out the contaminated clothing and other protective equipment before its store or reuse. Always wash out before smoking, eating, drinking or using the toilet. Wear overalls, chemical eyeglasses and protective gloves.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	The emulsion can be hot (60 – 70°C)
Colour:	Grey to beige colour
Odour:	Negligible
Solubility:	Insoluble in water
Specific gravity:	1.10-1.35 @ 20°C
Flash point:	Not applicable

## 10. STABILITY AND REACTIVITY

**Stability:** Detonation might occur for strong impact or excessive heat, particularly under confinement. The ammonium nitrate is a strong oxidant agent. It is incompatible with tetranitromethane, dichloroisocyanuric acid, trichloroisocyanuric acid, bromate, chlorate, chlorite, hypochlorite or chlorine-cyanurate and inorganic nitrate and metallic dusts. When it is heat at decomposition (non-confined) it produces nitrous oxides, ammonium nitrate and water fumes, when it is mixed with strong acids and occasionally during a blasting it produces a maroon toxic gas irritant mainly nitrogen dioxide. When it melts it may decompose violently due to shock or pressure, it may occur detonation for a strong impact, excessive heating particularly under confinement.

## 11. TOXICOLOGICAL INFORMATION

Not expected adverse health effects, if the product is handled according with this safety data sheet and the product label. The symptoms or effects that may arise if the product is poorly managed and it is happening over-exposure are:

- Ingestion: May cause nausea, vomits, diarrhoea and abdominal pain. Other symptoms include headache and dizziness.
- Contact with eyes: May be an ocular irritant.
- Contact with skin: Contact with the skin may result in irritation; it has a degreasing action in the skin. Repetitive or prolonged with the skin may lead to irritant contact dermatitis. It might be absorbed through wounds, lacerations or burnt skin with resulting adverse effects. The contact with hot material may cause burns in the skin.
- Inhalation: The material can be irritant to the respiratory tract mucosa membranes. Steams breathing might result in headaches, dizziness and possible nausea.
- Long-term effects: No information available for the product. Available evidence from animal studies indicates that the repeated and prolonged exposure to a component can result in effects on the skin. The material contained within the diesel oil as component of this formula (poly cyclic aromatic hydrocarbon P. HS) some of these P. HS have been implicated as potential carcinogens to the skin in humans under conditions of poor personal hygiene, and repeated contact. Prolonged skin and exposure to sunlight. Toxic effects are not likely to occur if practiced good personal hygiene.
- Toxicologic data: For the Ammonium nitrate ingredient
- LD50(rat)oral. 2217 mg/kg. In humans and animals methemoglobinemia under non-treated circumstances followed to over exposure to nitrates. The absorption of nitrates has occurred for some path might cause dilatation of blood vessels for a direct muscle relaxation.

## 12. ECOLOGICAL INFORMATION

Avoid contamination of navigable ways.

## 13. FINAL DISPOSAL CONSIDERATIONS

Small quantities or deteriorated/damaged explosives can be destroyed for inclusion in a blasting borehole containing explosive products.  
For great quantities of damaged or deteriorated explosives, notify to ORICA Argentina in its production plant.

## 14. TRANSPORT INFORMATION

Transport for train and road.

Classified as dangerous material by the Australian Code criteria for the transport of explosive by roads and train

UN Identification:	No. 0332
Class:	1.5D Explosive.
Chemical risk code:	E
Communication of risks:	Irritant oxidant explosive.

Sea transport:

Classified as dangerous material under the sea international code for dangerous materials for sea transport.

UN No: 0332

Class: 1.5D explosive.

Name for explosive transport: Type E.

## 15. REGULATORY INFORMATION

This product is an “explosive” and will have to fulfill with the “General Regulation of Transport of Dangerous Goods by Road” – decree 779/95 Annex S from the national transit law N° 24449 and with the “National Law of Weapons and Explosives” N° 20429 and its decree N° 302/83.

## 16. OTHER INFORMATION

Data consigned upon this Informative Sheet were obtained from dependable sources. However, they are provided without express or implied guarantee in relation to their accuracy or adjustment. Opinions expressed in this paper belong to qualified professionals. The information provided is the one currently known on the subject.

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