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In case of emergency: 55 11 6297 0209 (24 hours)
55 11 2246 3100 (M-F 08:00 am – 5 pm)
USA – CHEMTREC – 800-424-9300 (CUSTOMER NUMBER: 23951)

TRADE NAME: NITROCELLULOSE

For safety, Occupational Health and Environmental Control purposes, the information contained in this document should be available to all employees, users, and customers of this product.

1. PRODUCT IDENTIFICATION


- Chemical name: Cellulose Nitrate
- Synonymous: Cellulose Nitrate, Pyroxylin, Colodium Cotton
- Chemical Family: Ester
- UN number: 2556

2. COMPOSITION

CHEMICAL NAME	CAS Nº	%
Nitrocellulose (< 12.3% N)	—	65 - 72 (ASTM) 63 - 67 (DIN)
Ethyl Alcohol (wetting Agent)	64-17-5	28 - 35 (ASTM) 33 - 37 (DIN)

3. PHYSICAL AND CHEMICAL PROPERTIES

- Form: Granular / chip
- Color: White
- Odor: Alcohols (wetting agents)
- pH – valve: Not applicable
- Specific gravity of the cast film: 1.58 – 1,65
- Bulk density: 0,6 (600 kg/m³)
- Water solubility: Insoluble
- Solubility in organic solvents: NC is soluble in esters, ketones ether-alcohol solution, glacial acetic acid and amyl acetate

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- Decomposition temperature: Higher than 180°C
- Flash point of wetting agent: Ethanol: 12,8 °C (closed cup)
- Explosion limits of w.a.: Ethanol: 3.3% (lel) – 19% (uel)
(% Volume)
- Vapor pressure of w.a: Ethanol: 40 mmHg at 20°C (4.4 kPa)

4. RISKS TO HEALTH

Local effects:

- Inhalation: inhaled dust or alcohol vapor may cause respiratory track irritation.
- Skin and eye absorption: may cause slight irritation.
- Ingestion: toxic due to alcohol presence (may cause sore throat, abdominal pain, nausea, vomiting, or diarrhea).

Systemic effects:

- Alcohol lengthened inhalation in high concentration, besides the local effects on the eye and upper respiratory system, may cause headache, drowsiness, tremors, and fatigue.

Chronic effects:

- Not observed.


If the skin becomes red or blistered, get medical attention.

Super-exposure aggravated by health conditions

- Not reported.

5. FIRST AID PROCEDURES

- Ingestion: never give anything by mouth to an unconscious person. If conscious, give large quantities of water (dilution effect). Do not induce vomiting.
- Inhalation: remove the victim to a ventilated area. If not breathing, give artificial respiration. Call a physician.

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- Skin contact: immediately remove the contaminated clothing and wash before reuse. Flush the expose area with plenty of water and neutral soap. If the skin becomes red or blistered, get medical attention immediately.
- Eye contact: do not allow the victim to keep the eyes closed, carefully hold the eyelids apart and wash continuously with eye – wash solution for at least 15 minutes. Get medical attention as soon as possible.
- General: after administering first-aid, get medical attention.

6. EXPOSURE CONTROL / PERSONAL PROTECTION

Exposure Limits:


	TLV - TWA (ACGIH) (ppm)	TLV - STEL (ACGIH) (ppm)
Ethyl Alcohol	1000	-----

Work environment

- It is necessary to install an adequate ventilation exhaustion system to avoid exceeding recommended exposure limits.
- The work areas must be provided with safety stations (emergency shower, and eyewash fountains).
- Contaminated clothing must be washed before reuse.
- Keep the Personal Protective Equipment clean and well maintained.
- Keep nitrocellulose away from ignition sources and prevent build-up of static electric charges.
- Avoid contact with eyes, skin, & clothing.
- Avoid breathing dust or vapor.
- Do not swallow.
- Wash thoroughly after handling and before eating, drinking, or smoking.

Respiratory Protection

- Appropriate respiratory protection is required when exposure to airborne contaminants may exceed acceptable limits. Respirators should be selected and used in accordance with manufacturers recommendations.

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Handling and recommended Personal Protective Equipment:

- Appropriate protective clothing
- Chemical goggles
- Safety shoes with antistatic base
- Respiratory protection
- Gloves (solvent resistant)


7. FIRE FIGHTING PROCEDURES

- Burning nitrocellulose can only be extinguished by large quantities of water applied as fog or spray. Caution should be used as the drum lids can be blown off.
- The alcohol reduces the speed of the nitrocellulose burning; so that, it's important to avoid allowing the product to become dry.
- If the alcohol evaporates, the nitrocellulose ignition will occur rapidly if exposed to sun and may explode if confined or exposed to impact, friction sparks or static electricity.
- The nitrocellulose containers (not fiber drum) may explode under the fire heat action. The nitrocellulose contains O₂ sufficient to self-support the burn, even in atmospheres with low level of O₂.
- Be aware of the possibility of toxic products generated by thermal decomposition (nitrous gases). In case of fire use self-contained breathing apparatus (positive pressure). Apply cooling water on the container walls even after the fire is extinguished. If a fire occurs in a large area in storage or shipment areas, use remote activation of installed fire extinguishing equipment. The residual water used to combat the fire, cannot be sent to the drain or disposed of without treatment. Keep it in dikes to be disposed of accordingly.
- After the fire is extinguished, material may be unstable and could re-ignite by itself. Ensure that the residual material is wetted. Keep people away, and isolate the area around the fire.

8. STABILITY AND REACTIVITY

Stability:

- Nitrocellulose is stable if maintained wetted in alcohol or water.
- Dry nitrocellulose is sensitive and will could flammable by impact or friction.

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- There is no risk of polymerization.

Chemical incompatibility:

- Nitrocellulose is incompatible with peroxides, chlorine, strong oxidizing agents, acids or alkaline products.

Conditions to be avoided:

- Do not expose the product to sunlight, heat or ignition sources, as well as to incompatible products listed above. Do not allow, in any hypothesis, the product become dry. Stability decreases and deterioration starts with increasing temperatures.


Resulting decomposition products:

- The decomposition by thermal oxidizing may produce carbon monoxide (CO), oxides of nitrogen (NOx) and other potentially toxic fumes.

9. HANDLING AND STORAGE

Handling and storage precautions:

- Nitrocellulose can be stored in fiber drums, or cardboard boxes. The product must be put in antistatic plastic bag. The storage area must be maintained cool, dry and ensure adequate ventilation, maintaining distance from ignition sources and also from products considered incompatible (see item # 8).
- Do not allow the product to become dry.
- The storage and work areas must be resistant to fire and it have copious amounts of water available. Antistatic footwear, clothing and flooring must be used.
- The container must be opened only in the operational areas, never in the storage area. Use copper tools or other non ferrous material. Tools made of plastic materials must not be used because of their tendency to produce static electricity.
- In case of spillage, immediately gather the entire spilled product from the surface or from the equipment to a drum and keep wetted in alcohol or water.

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- If it is possible, there should be no electrical equipment in the Nitrocellulose storage area. If it is necessary, use explosive proof equipment.
- Keep the quantity of product in the processing area to a minimum. This would not be expected to exceed the amount necessary for one shift.
- Do not drop, slide and roll on bang on the drums.

Engineering control:

- To avoid any health potential risks, use sufficient exhaustion/ventilation to control the presence of contaminated air to keep the concentration below the exposure limits.
- To minimizing the explosive risks due to the solvents vapor presence, all electrical equipment must be grounded.

Hazard Class and Label Name:


- 4.1 Flammable solid.

10. ACCIDENTAL RELEASE MEASURES

- Notify the safety people, segregate and keep the place ventilated, prohibit the access to non involved personnel, and remove any ignition sources. The people involved in cleaning area, must be protected against vapor inhalation or skin/eye contacts.
- Spilled Nitrocellulose must be thoroughly wetted with few of water, swept up carefully and kept in tightly closed watertight container.
- Prevent spilled Nitrocellulose from contaminating water sources, sewers, soil or vegetation.

11. DISPOSAL CONSIDERATIONS

- The residue may be treated (denitrate) with an alkali (NaOH -15%- 2 hour).
- Another disposal way is denitrate the residue with sodium sulfide (5% solution – 1 hour).
- Do not burn in boiler or incinerator or in any other closed equipment.
- Alternatively destroy by burning small quantities outside at a safe place in a open fire under competent control. Ignite remotely.
- Packaging: remove all the residual from the plastic bags and wash. Do not reuse the bags. After emptying, the drums must be examined in order to guarantee that all the nitrocellulose was removed (the residual must be eliminated in cleaning cloths). The drums cover must be

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restored closed with a metallic link and well tight. The residual cloths must be kept in closed boxes, wet in water.

- Waste disposal should be in accordance with national, state and local environmental regulations.

12. ECOLOGICAL DATA

- Nitrocellulose: There is no evidence to suggest that NC has any detrimental effect on the environment.
- Wetting agent:
 - Biological Oxygen Demand (BOD5): Ethanol (N.D.)
- Chemical Oxygen Demand (COD): Ethanol(N.D.)
- Bacteria toxicity (EC 50): Ethanol (1000 mg/l)
- Fish toxicity (LC 50) : Ethanol (12340 mg/l)

13. TOXICITY DATA


There is no evidence that Nitrocellulose can cause adverse effects, but the toxicity data of the wetting agents is known:

Ethanol: LD50 oral (rat): 13700 mg/kg
 LD50 inhal (rat): 20,000 ppm (10h)

14. TRANSPORT INFORMATION

Special transportation caution:

- Road Transport
 - It must also take PPE, emergency kits, emergency profile, with an envelope and risks simbology. The vehicle must be in good general conditions; the driver must use adequate clothing, oriented and also take the certificate of Dangerous Products Transportation Course.
- PPE: Appropriate protective clothing, chemical goggles, safety shoes with antistatic base and gloves (solvent resistant).

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- Transport on Passenger Airplanes:
 - Quantity limitations: 1 kg
 - Packaging with: chinaware, plastic, metal, aluminum, plastic bag, glass blister, fiber.
 - The package must be resistant to a internal pressure, and also be approved by competent authorities. If it cannot be observed, it'll be consider as class 1.
- Transport on Load Airplanes:
 - Quantity limitations: 15 kg
 - Packaging with: chinaware, plastic, metal, aluminum, plastic bag, glass blister, and fiber.
- Maritime and Rail transport
 - Do not ship when package presents spillage or damage.
 - This substance can be transported in recommended packages since the alcohol content is maintained during transit.
- Others
 - Avoid the transport of Nitrocellulose with others materials in the same compartment. Analyze the compatibility of Nitrocellulose with others materials.

15. REGULATORY INFORMATION

Information about hazards and safety as written on the label.


Phrases R: 11

Easily flammable.

Phrases S: 16-33-37/39

Keep away from sources of ignition - No smoking. Take precautionary measures against static discharges. Wear suitable gloves. Wear eye protection.

- Road transportation
 - UN number: 2556
 - Package adequate name: NITROCELLULOSE WITH ALCOHOL

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- Hazard class: 4.1
- Packaging group: II

- Air transportation
 - IATA class: 4.1
 - Packaging group: II

- Sea transportation
 - UN number: 2556
 - Package adequate name: NITROCELLULOSE WITH ALCOHOL
 - Hazard class: 4.1
 - Packaging group: I (IMDG CODE)
II (49 CFR - Parts 100 to 177)

- Rail transportation
 - UN number: 2556
 - Package adequate name: NITROCELLULOSE WITH ALCOHOL
 - Hazard class: 4.1
 - Packaging group: II

16. REFERENCES

- M.S.D.S - Alcohol – Shell Ltda - Brazilian Manufacturer
- Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices - ACGIH .
- International Maritime Dangerous Goods Code .
- Dangerous Goods Regulations - International Air Transport Association .
- Brazilian Dangerous Products Road Transport Regulation .

The data and information contained in this sheet have a complementary character, provided with good faith and also representing what we have the best about the subject. However, it does not mean that the subject has been completely exhausted. The existing governmental regulations predominate in the data of this sheet.
This sheet was elaborated by Cia Nitro Química Brasileira Industrial Safety and Health Dept.