



SAFETY DATA SHEET

Jossad 200

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name: Jossad 200, 2-ethylhexyl nitrate (2EHN)

CAS#: 27247-96-7

Synonyms: nitric acid, 2-ethylhexyl ester

Chemical Formula: $C_8H_{17}ONO_2$

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SECTION 2: COMPOSITION AND INFORMATION ON INGREDIENTS

IUPAC name:	2-ethylhexyl nitrate (2EHN)
EINECS name:	nitric acid, 2-ethylhexyl ester
Molecular formula:	C ₈ H ₁₇ ONO ₂
CAS No.:	27247-96-7
EINECS No.:	248-363-6

SECTION 3: HAZARDS IDENTIFICATION**Emergency overview:**

- Combustible liquid and vapour
- Self-reactive, energetic substance with a low auto-ignition temperature – when heated above 100°C may undergo a self-accelerating, exothermic decomposition that causes a rapid rise in temperature and pressure.

Potential Health Effects:

- **Ingestion:** irritation of mouth, throat and digestive tract
- **Eye contact:** transient discomfort by watering of the eyes and redness; conjunctiva
- **Skin contact:** skin contact may produce symptoms of vasodilation (reduced blood pressure and other cardiovascular effects to produce such symptoms as
throbbing headache, confusion and possible loss of consciousness)
following skin absorption
- **Inhalation:** inhalation of vapours may cause irritation of the mucous membranes (nose, throat and lungs); absorption of vapours through the respiratory tract can result in vasodilation (reduced blood pressure and other cardiovascular effects to produce such symptoms as throbbing headache, confusion and possible loss of consciousness)

Environment Hazards:

- 2EHN is not acutely toxic to aquatic life at the limits of its solubility
- 2EHN is immiscible, it floats on water and may emulsify; it may form a film on water surfaces causing impaired oxygen transfer

SECTION 4: FIRST AID MEASURES

Inhalation: remove the person to fresh air at once; provide respiratory support as needed; get prompt medical attention

Skin contact: decontaminate the contact area, wash with soap and water; get prompt medical attention

Eye contact: wash eyes with plenty of water, get prompt medical attention

Ingestion: DO NOT induce vomiting as aspiration of liquid product into the lungs can cause chemical pneumonitis; get prompt medical attention

NOTES TO PHYSICIANS: treat as organic nitrate poisoning; symptoms of vasodilation may be present following organic nitrate over exposure

SECTION 5: FIREFIGHTING MEASURES

Suitable Extinguishing Media: water spray, foam, dry chemical powder or CO₂

Unsuitable Extinguishing Media: water jet

Protective Equipment for Fire-fighters: wear self contained breathing apparatus (SCBA) and chemical protective clothing

SECTION 6: ACCIDENTAL RELEASE MEASURES

- Personal Precautions:** wear adequate personal protective equipment and clothing; ensure the area is completely free from any residue of the spill
- Environmental Precautions:** prevent the material from entering sewers; advise suitable authorities, if spillage has entered water courses or sewers or has contaminated vegetation
- Spillage:** absorb spills or leaks of 2EHN using sand, earth or other inert material; shovel up solid absorbent material and place it in adequate and properly labelled containers for disposal; do not flush the product from contaminated area

SECTION 7: HANDLING AND STORAGE

- Handling:** minimize the exposure of personnel to 2EHN; use the product in well ventilated area; avoid contact with eyes, respiratory tract, skin and clothing;
- loading and unloading of 2EHN: use equipment that does not have the potential to heat the product; pumped transfer of 2EHN should always be done under controlled conditions and all transfer valves must be open before pumps are started; do not pump 2EHN against a closed outlet, this may heat the product within the pump depending on the type of pump in use; to prevent the risk of heating the product, closed circuit pumping, including that through pressure relief valves when the pump outlet is closed or blocked must be avoided;
- tank to tank transfer of 2EHN can be easily carried out using nitrogen or air padding by using a pneumatic driven pumping system;

pipings: use non-insulated mild steel or stainless steel piping; any steam or electrical tracing must be physically disconnected; whenever possible, dedicated lines for 2EHN are preferred to avoid safety / environmental problems;

valves: stainless steel full-bore ball valves are preferable; traditional ball, gate and butterfly valves may also be used; stainless steel, cast iron and cast steel are all suitable materials; copper, zinc and its alloys, aluminium and most plastics are inadequate or incompatible materials;

Storage: product should be stored far from heat sources and other flammable products; storage tanks are recommended to be located in an open or well ventilated area away from inhabited buildings; stainless steel tanks are preferred for storage;

no heating systems of any kind should be installed; instrumented fire and heat detection systems should be installed; to minimize the consequences of spill and leakage into the environment, a containment wall (bund) should surround tanks with a minimum capacity to handle tank contents and deluge water.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limit Values: the internal exposure guideline for 2EHN is 1 ppm based on 8hr time weighted average (TWA); in the light of the potential temporary effects of overexposure, it is suggested that 1 ppm is also adopted as reference standard for short term exposure averaged over 15 minutes (STEL)

Respiratory protection: respiratory protection is not required, if the product is handled within a closed system; respiratory protection is required for open systems or where concentration of 2EHN in the working environment is higher than the recommended exposure guideline of 1 ppm TWA / STEL

Hand Protection: when hand contact is likely, appropriate wrist long chemical resistant gloves (neoprene or nitrile rubber) should be worn

Eye Protection: safety goggles should be worn

Skin Protection: when skin contact is likely, appropriate skin protection clothing should be worn

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: colourless to pale yellow liquid

Odour: pungent, ester, characteristic

Molecular weight: 175.23

Flash Point: >70°C (closed-cup)

9. PHYSICAL AND CHEMICAL PROPERTIES (continuation)

Freezing point:	<-45°C
Boiling point:	>100°C (decomposes)
Vapour pressure:	27 Pa at 20°C
Vapour pressure:	40-53 Pa at 40°C
Vapour pressure:	1.33 kPa at 82°C
Density:	0.96 g/ml at 20°C
Kinematic viscosity:	1.8 cSt at 20°C
Solubility in water:	12.6 mg/L at 20°C
Heat of vaporization:	368 kJ/kg
Lower Explosive Limit:	0.25% v/v in air (literature value)
Auto / Self ignition temperature:	130°C (decomposes)
Decomposition temperature:	>100°C

SECTION 10: STABILITY AND REACTIVITY

Stability:	2EHN is stable at ambient temperatures, it has a low auto-ignition temperature and will decompose when heated above 100°C
Conditions to Avoid:	all contact with sources of heat, flames, sparks or any other source of ignition; vapours may be explosive; avoid overheating of containers
Materials to Avoid:	contamination with acids, alkalis, reducing and oxidising agents, amines and phosphorus
Hazardous Decomposition Products:	combustion or thermal decomposition will generate oxides of carbon and nitrogen.

SECTION 11: TOXICOLOGICAL INFORMATION**Acute Health Effects:**

- **Ingestion:** low acute oral toxicity tested in animals LD50 > 5000 mg/kg (rat)
- **Inhalation:** absorption through respiratory tract can result in vasodilation (reduced blood pressure and other cardiovascular effects to produce such symptoms as throbbing headache, confusion and possible loss of consciousness)
- **Skin:** skin contact with 2EHN can result in vasodilation (reduced blood pressure and other cardiovascular effects to produce such symptoms as throbbing headache, confusion and possible loss of consciousness); prolonged skin contact may produce temporary discomfort

Chronic Health Effects:

No significant chronic, mutagenic, carcinogenic reproduction or developmental effects are known for 2EHN.

SECTION 12: ECOLOGICAL INFORMATION**Ecotoxicity:**

Acute toxicity to fish: LC50 (Danio rerio, 96 hour): above solubility limit

Acute toxicity to daphnia: *EC50 (Daphnia magna, 48 hours): above solubility limit*

Algal growth inhibition: *EC50 biomass: above solubility limit*

EC50 growth rate: above solubility limit

Microtox®: EC50 (15 min.): 0.01% (100 mg/l)

Slightly soluble in water: solubility limit 12.6 mg/l at 20°C
(may emulsify with water)

Mobility:

The octanol/water partition coefficient predicts moderate mobility/moderate affinity for soil or sediment.

Persistence and degradability:

The substance shows no evidence of biodegradability in water. Hydrolysis test – readily hydrolysed:

Half-life at pH 7 (25°C) is approximately 7 days

Half-life at pH 7 (50°C) is approximately 24 days

Bioaccumulation potential:

The substance is completely miscible with fat and has potential for bioaccumulation.

Other adverse effects:

May form a film on water affecting oxygen transfer.

SECTION 13: DISPOSAL CONSIDERATIONS
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Product Disposal: Incineration in approved onsite or offsite facilities equipped with flue gas post-combustion, wet scrubbing and de-dusting systems is the preferred disposal practice. 2EHN is not suitable for landfill or treatment by biological processes.

SECTION 14: TRANSPORT INFORMATION
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Regulatory information	UN No.	Proper Shipping Name	Class	Packaging Group
DOT Classification (USA)	NA 1993	Combustible liquid, n.o.s. (2-ethylhexyl nitrate)	Combustible liquid	III
TDG Classification (Canada)	UN 3082	Environmentally hazardous substance, liquid, n.o.s.	9	III

		(2-ethylhexyl nitrate)		
ADR / RID / IMDG / IATA	UN 3082	Environmentally hazardous substance, liquid, n.o.s. (2-ethylhexyl nitrate)	9	III

SECTION 15: REGULATORY INFORMATION

EU Classification: × Harmful Xn

Risk phrases: R20/21 Harmful by inhalation and in contact with skin
R44 Risk of explosion if heated under confinement

Safety phrases: S15 Keep away from heat
S24/25 Avoid contact with skin and eyes
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection

SECTION 16: OTHER INFORMATION

MSDS first issue: 27 January 2000

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