EPD

Environmetnal declaration according to SIRII

Company	Ozon Ltd
Product	OIL SORBENT NES

IVL Version: 20051104

COMPANY

Ozon Ltd
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The company was founded in 1992 and employed 30 persons in 2003. It produces and provides:

1) Design, production, assembly, startup and adjustment, commissioning and maintenance of:

- newly constructed and reconstructed surface waste water purification facilities;
- industrial estates exposed to pollution by oil products;
- filling stations;
- car-washing facilities on the turnkey basis.

The range of services includes quality insurance of supplied equipment, warranty and after-warranty servicing of the purification facilities.

2) Production of the hydrophobic sorbent NES for

- purifying oil-polluted waste waters
- removing oil and oil-product spills and pollution on various surfaces (water, soil, concrete etc.).

3) Environmental consulting and environmental designing and developing, reaching agreements with the relevant authorities on environmental projects, and documentation (rates of emission of air pollutants, limit of admissible rates of waste disposal, limit of admissible discharges, water facility permits).

The company is a member of the St. Petersburg Chamber of Commerce and Industry and the Association of Environmental Entrepreneurship.

THE PRODUCT

The oil sorbent NES (more specifically NESv) is manufactured from a natural aluminium silicate, vermiculite. The mineral is impregnated with a hydrophobic chemical. The resulting sorbent may be used to collect oil spills from the ground or from water surfaces. It may also be used in sorption columns in wastewater treatment equipment. Some data about the product are given in table 1.

Table 1. Product specification given by the company

SORBENT TYPE	NESv
Oil sorption capacity, kg of oil / kg of sorbent	6
Moisture capacity, % w/w	70
Absoprtion time	0,5 min
Density in package, tonnes / m^3	0,1 – 0,15
Heat resistance at 300°C	Resistant
Thermal regeneration potential	Thermal regeneration possible
Toxicity	Safe
Package	Paper or polypropylene bags

The sorption capacities in table 2 were determined in laboratory tests at the IVL Swedish Environmental Research Institute.

Table 2. Results of sorption tests at IVL. Average values of two tests with each oil

SORBENT TYPE	NESv
Oil sorption capacity, kg of oil / kg of sorbent, diesel oil on water	2,4
Oil sorption capacity, kg of oil / kg of sorbent, immersion in motor oil	2,95

List of materials and chemical substances

The sorbent NES consists of the following materials

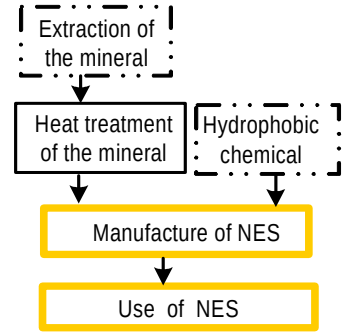
MATERIAL CONTENT	
Vermiculite, particle size 0,3 – 5 mm	94,1 % w/w
Hydrophobic chemical	5,9 % w/w

No chemicals listed in Annex 1 (August 21, 2001) to the EU Council Directive 67/548/EEC (June 27, 1967, classification, packaging and labelling of dangerous substances) or on the observation list of the Swedish National Chemicals Inspectorate (2nd edition 1998) are used in the manufacturing process.

Fine dust of silicate mineral may be released to air from the manufacturing process.

Presentation of the environmental performance

The environmental performance is based on the results of a life cycle assessment, which comprises the manufacturing of the sorbent and its application to collect oil spillage from the ground.



Company-specific data
Data from another supplier than the company´s
Available literature data

The life cycle of the sorbent is divided into two phases:
The manufacturing phase

- Extraction of the necessary natural resources
- Production of the starting materials, vermiculite and the hydrophobic chemical.
- Transport of the starting mterials to the factory of Ozon.
- Manufacture of the sorbent and packing for delivery

The use phase

- Transport of the sorbent from the factory to the application site.
- Adsorption of oil spillage.
- Transport of the used sorbent to a facility for final disposal of the oil.

The LCA is based on production and operational data for Ozon for the year 2003.

Data on electricity generation are basically based on data from Western Europe from the middle of the 1990´s, however data on the composition of the electricity from the average grid in the S:t Petersburg area, as well as data on some emissions from electricity generation there, were available for 2003 and have been used.

Data on the energy consumption for extraction and refining of fossil energy wares have been collected for the years 2000 – 2001, whereas data on emissions from heat generation from fossil fuels are West European data from the middle of the 1990´s.

The life cycle inventories of chemicals and polymers are generally from the middle of the 1990´s

The sorbent is assumed to be produced and used in S:t Petersburg. Fossil fuels and feedstocks are assumed to come from Russian oil fields and refineries.

The functional unit for the manufacturing phase is the amount of sorbent required to adsorb 1 m^3 of oil, packaged for delivery at the factory.

(This amount is 140 kg for an oil density of 840 kg/m^3).

The functional unit of the application phase is 1 m^3 of adsorbed oil, delivered at a facility for final disposal.

Extraction and manufacture of the adsorbed oil is not included in the LCA, nor is final disposal of the adsorbed oil at for instance a landfill or in an incinerator.

Energy allocation as described by Frischknecht et al (1996) is used in the inventories of oil extraction and refineries.

The following main data sources have been used:

PROCESSES

Manufacture of the sorbent, including transport distances for the starting materials and the product

Extraction and manufacture of vesicular vermiculite

Manufacture of the hydrophobic chemical

Electricity generation

Extraction and use of fossil fuels

Polymers

Paper packaging

Transports

DATA SOURCES

Specific data from Ozon

Data from a Swedish manufacturer, supplemented with literature data.

Literature data(2003)

Data from the power supplier in the S:t Petersburg province, supplemented with data from ETH (R. Frischknecht et al., “Ökoinventare für Energiesysteme”, 3rd ed., 1996)

Energy Statistics of the Non-OECD Countries, 2000 - 2001, IEA (2003), supplemented with data from ETH (R. Frischknecht et al., “Ökoinventare für Energiesysteme”, 3rd ed., 1996)

I. Boustead, “Eco-Profiles of Plastics and Related Intermediates”, APME, Brussels

Finnish average data for unbleached recycled paper (KCL, Espoo, 1992)

Nätverket för Transport och Miljö (2003), Stockholm (Network for Transport and Environment)

ENVIRONMENTAL PERFORMANCE DECLARATION

Environmental impacts to adsorb 1 m^3 of oil and transport it to a disposal facility.

	Manufacturing phase	Application phase	Total
Resource use			
Use of non-renewable energy resources (kWh)	1700	100	1800
Use of non-renewable material resources (kg)	526	0	526
Use of renewable energy resources (kWh)	1,3	0	1,3
Use of renewable material resources (kg)	20	0	20
Emissions			
Global warming (kg CO_2-equivalents)	290	20	310
Acidification (mol H^+-equivalents)	43	4	47
Ozone depletion (kg CFC-11 equivalents)	$2,7 * 10^{-5}$	0	$2,7 * 10^{-5}$
Photochemical oxidant formation (kg ethylene eq.)	0,15	0,04	0,19
Eutrophication (kg oxygen equivalents)	4,2	1,0	5,2
Recyclable resources			
Materials (kg)	0,004 [2)]	10 [3)]	10 [3)]
Wastes			
Hazardous waste (kg) [1)]	3,5	0	3,5
Regular wastes (kg) [1)]	320	10	330

1) Data on waste classification are uncertain. We have classified regulated chemical waste and radioactive waste as hazardous. Unspecified industrial waste is classified as regular waste. Spent sorbent and adsorbed oil are not included in the amount of waste.

2) Plastic waste from polypropylene manufacturing.

3) Paper and polypropylene packing material.

Resources

NON-RENEWABLE RESOURCES, KG	
Oil	26
Natural gas	57
Coal	18
Natural uranium	3,8 ‘10^{-3}
Silicate mineral	520
Quartz	6,4
RENEWABLE RESOURCES, KG	
Pine wood	20

Information

The used sorbent may be regenerated by heat treatment and renewed impregnation with the hydrophobic chemical.

Information from the verification body

This stepwise EPD was prepared at the SIRII institute IVL Swedish Environmental Research Institute Ltd and verified by Mr. Lars-Gunnar Lindfors, scientific director.

The drafting of and working methods for environmental declarations according to Sirii has been carried out within Sirri (Swedish Industrial Institute´s Initiative). Participating institutets have been FRAMKOM verskamhetsutveckling AB, IFP Swedish Institute for Fibre and Polymer Research, IVF Industriforskning och Utveckling AB, IVL Svenska Miljöinstitutet AB and TRÄTEK, Institutet för Träteknisk Forskning.

This environmental declaration was compiled on 4 November 2005 by Mats Almemark

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