MATERIAL SAFETY DATA SHEET

In accordance with 93/112/EEC
Date of Revision: 04/12/2003

SECTION 1 – IDENTIFICATION

Classified as Hazardous according to criteria of NOHSC1 and Dangerous Goods according to the ADG Code2

Product Trade Name : NanoShield Glass **UN No** : 1993

HAZCHEM : 3[Y]E **D. G. Class** : 3

Manufacturer/supplier : NanoShield Treatments Limited
123 New North Road
Eden Terrace, Auckland
New Zealand

Ph: +64 9 307 3860

SECTION 2 – COMPOSITION/COMPONENTS

Chemical Characterisation : Composition from modified hybrid materials in ethanol solution

Hazardous Ingredients : CAS-NO. 64-17-5 **Weight** : 60-100%
Designation: Ethanol
EINECS No.: 200-578-6
Index No.: 603-002-00-5F; R11

SECTION 3 – POSSIBLE DANGERS

Danger Designation : F easy-inflammatory

Special Danger References For Humans and Environment : R11 easy-inflammatory

SECTION 4 – EMERGENCY AND FIRST AID PROCEDURES

After Inhalation : Admission of fresh air, with complaints seek medical advice if necessary.

After Skin Contact : Flush with water immediately.

After Eye Contact : Flush with water for at least 15 minutes. If irritation persists, seek medical advice.

After Ingestion : Rinse mouth with plenty of water. Cause no vomiting. Seek medical advice if necessary.

SECTION 5 – FIRE AND EXPLOSION HAZARD

Unusual Fire and Explosion Hazard : Flammable.

Extinguishing Media : Water fog, alcohol-steady foam, dry chemical, carbon monoxide, CO2

Fire and Explosion Hazards : Highly flammable. Vapours can form explosive mixtures with air and may travel to source of ignition and flash back. Containers may explode if

exposed to excessive heat. Combustion may liberate hazardous fumes. Avoid high temperatures. Closed containers may be cooled with water.

Protective Equipment for Fire Fighting:

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

SECTION 6 – SPILL OR LEAK PROCEDURES

Personal Precautionary Measures : Provide sufficient ventilation.

Environmental Protection Measures : Do not allow to enter drains or water sources.

Procedures for Cleaning/admission : Take up mechanically. Contain and collect spillage with non-combustible adsorbent materials, e.g. sand, earth, vermiculite. Supply into suitable container of the recuperation or disposal.

SECTION 7 – HANDLING AND STORAGE

Precautions to be taken in handling and storage : FLAMMABLE LIQUID. Store in accordance with Dangerous Goods requirements. Avoid contact with skin and eyes. Wash hands after contact with the product. Keep container tightly closed in a dry, well ventilated location away from sources of heat, ignition and direct sunlight. Keep out of frost.

SECTION 8 – SPECIAL PROTECTION INFORMATION

Exposition Delimitation : Keep container tightly closed. Keep away from sources of ignition.

Personal Protection : Avoid contact with skin and eyes. Wear suitable protective clothing and gloves. Wear eye/face protection (Australian Standard AS-1337) or approved equivalent. In case of accident or if you feel unwell, seek medical advice.

Limit Values : 64-17-5 ethanol
MAK: 1900 mg/m^3
Source: MAK (TRGS 900)
Peak limiting: 4
Respiratory protection with suitable filter during high concentrations or during excess of limit values (e.g. MAK).

Respiratory Protection : In case of vapours or mists, a respiratory protection program meeting Australian and New Zealand Standards AS-1716 and AS-1715 requirements must be followed whenever necessary. Use organic vapour and mist cartridge. This will not be required if airborne concentrations are maintained below the exposure limit listed below.

Exposure Limit Information :

	NOHSC[1]			
	TWA		STEL	
Component	(ppm)	(mg/m^3)	(ppm)	(mg/m^3)
Denaturated ethanol	1000	-	a	-

a = not listed
TWA = Time Weighted Average
STEL= Short term Exposure Limit
1 National Occupational Health and Safety Commission (Australia)

Engineering Controls (Ventilation): Use explosion proof local exhaust ventilation sufficient to maintain exposure levels below exposure limit concentrations. Refer to Australian Standard AS-1668.

SECTION 9 – PHYSICAL AND CHEMICAL DATA

Appearance	**:** Colourless Liquid
Odour	**:** Alcohol-like
Boiling Point	**:** 78 ºC (ethanol)
Flash Point	**:** 9 - 13 ºC (ethanol)
Auto Ignition Temperature	**:** 425 ºC (ethanol)
Danger Of Explosion	**:** Steams can form combustible mixtures with air
Explosion Limits	**:** Lower: 3.5 volume of % (ethanol) Upper: 28 volume of % (ethanol)
Steam Pressure (bei20 ºC)	**:** 59 kPa
Density (with 20 ºC)	**:** ~0.8 g/cm^3
Solubility in water	**:** Mixable
pH (500 g/l with 20 ºC)	**:** ~2
Viscosity (dynamic, with 20 ºC)	**:** ~2 mPas
Vapour Density (Air = 1)	: Not specified.
Vapour Pressure	: 5.7 kPa @ 20 ºC ethanol

SECTION 10 – STABILITY AND REACTIVITY

Dangerous Reactions **:** Reactions with strong oxidizing agents.
Steam/air mixtures are combustible.
Product can react with reactive metals and can cause corrosion.

SECTION 11 – TOXICOLOGICAL DATA

Skin Contact **:** May cause irritation.

Eye Contact **:** May cause irritation.

Inhalation **:** May cause irritation. In higher concentrations cause narcotic effect.

SECTION 12 – ECOLOGICAL INFORMATION

No data available.

SECTION 13 – TRANSPORT INFORMATION

Classified as Dangerous Goods according to the Australian Code For The Transport Of Dangerous Goods By Road And Rail (Sixth Edition).

IMDG-Code **:** Class: 3.2 UN-No.: 1170 PG: II
Proper shipping name: FLAMMABLE LIQUID, N.O.S. (Ethanol)

ICAO/IATA-DGR	**:** Class: 3 UN-No.: 1170 PG: II Proper shipping name: FLAMMABLE LIQUID, N.O.S. (Ethanol)
ADNR	**:** Class: 3 Item: 1a
RID/ADR	**:** Class: 3 Item: 3b Hazard No.: 33 UN-No.: 1170

SECTION 14 – TRANSPORTATION REGULATION

Dangerous good in the sense of the transportation regulations. Hazardous for air, sea and road freight. See section 12.

SECTION 15 – REFERENCES TO DISPOSAL

Wastes, including emptied containers, are controlled wastes and should be disposed in accordance with regulations made for waste which cause damage to the environment.

SECTION 16 – REGULATIONS

Marking After EEC – Guidelines	**:** Identification letter and danger designation of the product: F light inflammatory R-sentences: 11 light inflammatory S-sentences: 7 containers keep tightly closed 16 keep away from ignition sources – do not smoke
Incident Regulation	**:** In the appendix IV mentioned (category 6: easy-inflammatory liquids)
Classification after vbf	**:** B
Technical Guidance Air	**:** Ethanol: Class III, number 3.1.7 M%: >90 (appendix E)
Water Endangerment Class	**:** WGK=1 weakly water-endangering: (self classification in accordance with VCI – concept)

Labelling Requirements According to Criteria of NOHSC[1]:

R11 Highly flammable.
R36/3738 Irritating to eyes, respiratory system and skin.
S2 Keep out of reach of children.
S16 Keep away from sources of ignition – no smoking.
S23 Do not breathe vapour/spray.
S24/25 Avoid contact with skin and eyes.
S38 In case of insufficient ventilation, wear suitable respiratory equipment.
S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S28 After contact with skin, wash immediately with plenty of soap and water.
S46 If swallowed, seek medical advice immediately and show this container or label.

SECTION 17 – OTHER DATA

[1] National Occupational Health and Safety Commission (Australia)
[2] Australian Dangerous Goods Code – Sixth Edition

The information in this Material Safety Data Sheet (MSDS) is based on the present state of knowledge and current legislation, and is accordance to standard defined in directive 93/112/EEC. The information in this MSDS provides guideline on health, safety and environmental aspects. For further information about technical performance and application referred to technical data sheet for this product. Although we have tried to make it as accurate and useful as possible, we can take no responsibility for its use or misuse.