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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME
(NICNAS)**

FULL PUBLIC REPORT

**2-Propenoic acid, 2-methyl-, butyl ester, telomer with 2,2-bis[[(mercaptoacetyl)oxy]
methyl]-1,3-propanediyl bis(mercaptoacetate), methyl 2-methyl-2-propenoate and
1,2-propanediol mono(2-methyl-2-propenoate)**

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth) (the Act) and Regulations. This legislation is an Act of the Commonwealth of Australia. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Department of Health and Ageing, and conducts the risk assessment for public health and occupational health and safety. The assessment of environmental risk is conducted by the Department of the Environment and Heritage.

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**Director
Chemicals Notification and Assessment**

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APPLICANT(S)

Degussa Australia Pty Ltd of 30 Commercial Drive, DANDENONG, VIC 3175.

NOTIFICATION CATEGORY

Synthetic Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

No details are claimed exempt from publication.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

No variation to the schedule of data requirements is claimed.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None.

NOTIFICATION IN OTHER COUNTRIES

US-EPA PMN 99-1070, 1999.

2. IDENTITY OF CHEMICAL

CHEMICAL NAME

2-Propenoic acid, 2-methyl-,butyl ester, telomer with 2,2-bis[[(mercaptoacetyl)oxy]methyl]-1,3-propanediyl bis(mercaptoacetate), methyl 2-methyl-2-propenoate and 1,2-propanediol mono(2-methyl-2-propenoate)

OTHER NAME(S)

Acrylic polymer on the basis of n-butyl methacrylate and methyl methacrylate

MARKETING NAME(S)

PLEX 6840F,
PLEX 6841F,
PLEX 6846F,
PLEX 6849F,
SISURA TYPO 41WL,
SICURA PLAST 45-L,
45-2-1050 Weiss,
41-WL-1000 TRANSPARENTWEISS "WL",
41-WL-5635 EUROBLAU "CD".

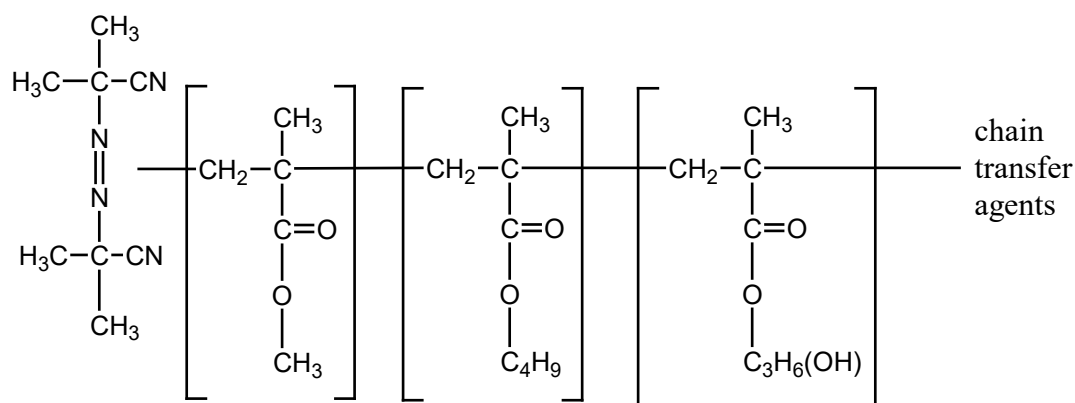
CAS NUMBER

225937-89-3

MOLECULAR FORMULA

$C_{13}H_{20}O_8S_4 (C_8H_{14}O_2 \cdot C_7H_{12}O_3 \cdot C_5H_8O_2)_x$

STRUCTURAL FORMULA



chain transfer agents = $(\text{HS}-\text{CH}_2-(\text{CO})-\text{O}-\text{CH}_2-)_4\text{C}$

or $\text{HS}-\text{CH}_2-(\text{CO})-\text{OH}$

MOLECULAR WEIGHT

Number Average Molecular Weight (Mn)	9090
Weight Average Molecular Weight (Mw)	14000
Polydispersity Index (Mw/Mn)	1.54
% of Low MW Species < 1000	0.3
% of Low MW Species < 500	0.3

3. COMPOSITION

POLYMER CONSTITUENTS

<i>Chemical Name</i>	<i>CAS No.</i>	<i>Weight % starting</i>	<i>Weight % residual</i>
2-Propenoic acid, 2-methyl-, methyl ester	80-62-6	56.8	0.24
2-Propenoic acid, 2-methyl-, butyl ester	97-88-1	23.0	0.06
2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol	27813-02-1	15.0	0.04
Acetic acid, mercapto-, 2,2-bis[[[(mercaptoacetyl)oxy]methyl]-1,3-propanediyl ester	10193-99-4	5.0	0.79
Propanenitrile, 2,2'-azobis[2-methyl-	78-67-1	0.1	0.003
Acetic acid, mercapto-	68-11-1	0.1	trace

PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</i>
Meets Molecular Weight Requirements	Yes
Meets Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
No Substantial Degradability	Yes
Water Absorbing	Yes
Low Concentrations of Residual Monomers	Yes
Not a Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

4. INTRODUCTION AND USE INFORMATION

MAXIMUM INTRODUCTION VOLUME OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Tonnes</i>	5	10	10	10	10

USE

An ingredient in UV curable coating for printing inks, varnishes and self adhesive labels.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

UV-curable inks containing 6-40% notified polymer will be imported into Australia in 1, 2.5, 5 or 10 kg containers.

At the printing sites, UV-curable inks will be manually filled into in fountain on the printing machine. For colour printing, the ink will be mixed with other colour ingredients before the filling. After printing, the notified polymer will be fixed with other ingredients to form a cross-linked matrix.

An organic-solvent mixture containing <0.5% notified polymer will be used for machinery cleaning. Disposal will be in the responsibility of certified special waste collectors for off-site solvent regeneration and incineration.

6. EXPOSURE INFORMATION

6.1. Summary of Environmental Exposure

The notified polymer will be imported in formulated inks. A small amount (<0.2%) of the notified polymer may be washed off from printing machinery during the normal cleaning process using an organic solvent mix. Licensed disposal contractor for off-site solvent regeneration normally should deal with this and residues containing the notified polymer will be disposed of to landfill.

Residues remaining in the import containers (0.5%) may either be disposed of through metal recycling companies (for 1-20 kg metal cans) or enter the controlled waste system (plastic cans) and be disposed of by incineration or washed and sent to landfill.

The majority of the notified polymer will be bound within the cured coating matrix adhering to printing inks, varnishes and self adhesive labels. Once the chemical is within a cured coating it is likely to share the fate of the substrate which may involve recycling or landfill.

6.2. Summary of Occupational Exposure

Dermal, ocular and inhalation exposure may occur during certain printing processes. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls and personal protective equipment worn by workers.

After application and once dried, the ink containing the notified polymer is cured into an inert matrix and is hence unavailable to exposure.

During transport and storage, workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached.

6.3. Summary of Public Exposure

The notified polymer is intended only for use in industry. The notified polymer will not be sold to the

public except in the form of printed articles. There is potential for extensive public exposure to articles comprised partly of the notified polymer. However, after printing, the ink containing the notified polymer is cured into an inert matrix and is hence unavailable to exposure.

7. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	White powder with faint characteristic odour.
Melting Point/Glass Transition Temp	50-110°C
Density	1150 kg/m ³ at 20°C
Water Solubility	0.12 mg/L. Determined by suspending polymer in water and then evaporating and aliquot of the supernatant after filtering and centrifuging.
Dissociation Constant	Not determined. The polymer does not contain groups which would be expected to dissociate in the environmental pH range (4-9).
Particle Size	2% of the particles was <7 µm.
Reactivity	Stable under normal environmental conditions
Degradation Products	The polymer contains ester groups but these should not hydrolyse under ambient environmental conditions in the pH range of 4 to 9. Due to its low solubility, the polymer is expected to associate with soils and sediments.

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

No toxicological data were submitted.

8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

In powder form, the notified polymer may cause mechanical irritation to the eyes, and to the respiratory tract if inhaled. Repeated or prolonged skin contact may result in mild irritation. However, the polymer is imported in a liquid form, namely, printing inks and varnishes.

9. ENVIRONMENTAL HAZARDS

9.1. Ecotoxicology

No toxicological data were submitted.

9.2. Environmental Hazard Assessment

The notified polymer will be used as a component of UV curable inks. Once these inks have been cured the notified polymer is expected to remain within the product matrices. Hence, the majority of the notified polymer will share the fate of the articles into which it is incorporated. It is anticipated that these will be disposed of to landfill or incinerated at the end of their useful lifetime. In landfill, it is expected that the notified polymer will remain immobile within the matrices. Incineration of the notified polymer will result in the formation of water vapour and oxides of carbon and nitrogen.

During the paper recycling process, the paper will be repulped in water, cleansed of contaminants, deinked with alkali, washed, cooked, bleached, screened and then used in the normal process as other pulp materials. The alkali mixture resulting from the deinking stage is most likely recycled or

neutralised and disposed of to wastewater treatment plants (WWTP) by a licensed waste contractor. It is expected that during deinking all of the coating containing the notified polymer will be removed from the paper/pulp and will mostly move to sludge due to its low solubility.

Very little if any will be released to water and it is not possible to calculate a reasonable predicted environmental concentration (PEC).

The above considerations indicate minimal exposure to the environment when the notified polymer is used in the manner and levels indicated by the notifier.

10. RISK ASSESSMENT

10.1. Environment

The polymer is not considered to pose a risk to the environment based on its reported use pattern.

10.2. Occupational health and safety

The OHS risk presented by the notified polymer is expected to be low due to its low hazard and limited opportunity for exposure.

10.3. Public health

The notified polymer will not be available to the public. Members of the public may make dermal contact with products containing the notified polymer. However, the risk to public health will be negligible because the notified polymer is bound within a matrix and unlikely to be bioavailable.

Therefore, the risk to public from exposure to the notified polymer is considered low.

11. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

11.1. Environmental risk assessment

The polymer is not considered to pose a risk to the environment based on its reported use pattern.

11.2. Human health risk assessment

11.2.1. Occupational health and safety

There is Low Concern to occupational health and safety under the conditions of the occupational settings described.

11.2.2. Public health

There is Negligible Concern to public health based on its reported use pattern.

12. MATERIAL SAFETY DATA SHEET

Material Safety Data Sheet

The notifier has provided MSDS as part of the notification statement. The accuracy of the information on the MSDS remains the responsibility of the applicant.

13. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- No specific engineering controls, work practices or personal protective equipment are required for the safe use of the notified polymer itself, however, these should be

selected on the basis of all ingredients in the formulation.

- Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.
- A copy of the MSDS should be easily accessible to employees.
- If products and mixtures containing the notified polymer are classified as hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances*, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Environment

- The following control measures should be implemented by end users to minimise environmental exposure during use of the notified chemical:
 - Do not allow material or contaminated packaging to enter drains, sewers or water courses.

Disposal

- The notified polymer should be disposed of by landfill or by incineration.

Emergency procedures

- Spills/release of the notified chemical should be handled by containing, scooping up and placing in marked containers for disposal.

13.1. Secondary notification

The Director of Chemicals Notification and Assessment must be notified in writing within 28 days by the notifier, other importer or manufacturer:

- (1) Under subsection 64(1) of the Act; if
 - the notified polymer is introduced in a chemical form that does not meet the PLC criteria.

or

- (2) Under subsection 64(2) of the Act:
 - if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.