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April 2017

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

PUBLIC REPORT

Kg polymer

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (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 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 Energy.

This Public Report is available for viewing and downloading from the NICNAS website or available on request, free of charge, by contacting NICNAS. For requests and enquiries please contact the NICNAS Administration Coordinator at:

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**Director
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SUMMARY

The following details will be published in the NICNAS *Chemical Gazette*:

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS CHEMICAL	INTRODUCTION VOLUME	USE
LTD/1966	Epson Australia Pty Ltd	Kg polymer	No	≤ 150 tonne/s per annum	Component of inkjet printing ink

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification

Based on the available information, the notified polymer is not recommended for classification according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia.

Human health risk assessment

Under the conditions of the occupational settings described, the notified polymer is not considered to pose an unreasonable risk to the health of workers.

Environmental risk assessment

On the basis of the PEC/PNEC ratio and the reported use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Recommendations

CONTROL MEASURES

Occupational Health and Safety

- A person conducting a business or undertaking at a workplace should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer as introduced:
 - Avoid skin and eye contact

Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

- Service personnel should wear disposable gloves and ensure adequate ventilation is present when removing spent printer cartridges containing the notified polymer and during routine maintenance and repairs.
- A copy of the SDS should be easily accessible to employees.
- If products and mixtures containing the notified polymer are classified as hazardous to health in accordance with the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)* as adopted for industrial chemicals in Australia, workplace practices and control procedures consistent

Disposal

- Where reuse or recycling are not appropriate, dispose of the notified polymer in an environmentally sound manner in accordance with relevant Commonwealth, state, territory and local government legislation.

Emergency procedures

- Spills or accidental release of the notified polymer should be handled by containment with adsorbent material, collection and subsequent safe disposal.

Regulatory Obligations

Secondary Notification

This risk assessment is based on the information available at the time of notification. The Director may call for the reassessment of the chemical under secondary notification provisions based on changes in certain circumstances. Under Section 64 of the *Industrial Chemicals (Notification and Assessment) Act (1989)* the notifier, as well as any other importer or manufacturer of the notified chemical, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified polymer is listed on the Australian Inventory of Chemical Substances (AICS).

Therefore, the Director of NICNAS must be notified in writing within 28 days by the notifier, other importer or manufacturer:

- (1) Under Section 64(1) of the Act; if
 - the polymer has a number-average molecular weight of less than 1,000;

or

- (2) Under Section 64(2) of the Act; if
 - the function or use of the polymer has changed from component of printing ink, or is likely to change significantly;
 - the amount of polymer being introduced has increased, or is likely to increase, significantly;
 - the polymer has begun to be manufactured in Australia;
 - additional information has become available to the person as to an adverse effect of the polymer on occupational health and safety, public health, or the environment.

The Director will then decide whether a reassessment (i.e. a secondary notification and assessment) is required.

Safety Data Sheet

The SDS of products containing the notified polymer provided by the notifier was reviewed by NICNAS. The accuracy of the information on the SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

Epson Australia Pty Ltd (ABN: 91 002 625 783)
3 Talavera Rd
NORTH RYDE NSW 2113

NOTIFICATION CATEGORY

Limited: Synthetic polymer with $M_n \geq 1,000$ Da.

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication: chemical name, other names, CAS number, molecular and structural formulae, molecular weight, degree of purity, polymer constituents, residual monomers, impurities, additives/adjuvants, use details, and manufacture/import volume.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows: hydrolysis as a function of pH, adsorption/desorption, dissociation constant, particle size, flash point.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Kg polymer

3. COMPOSITION

DEGREE OF PURITY

> 99%

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (M_n) > 1,000 Da

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: light yellow powder

Property	Value	Data Source/Justification
Melting Point/Freezing Point	67 °C	Measured
Boiling Point	Not observed	Measured
Density	1,259 kg/m ³ at 20 °C	Measured
Vapour Pressure	9.49×10^{-4} kPa at 20 °C	Measured
Water Solubility	< 0.957 mg/L at 20 °C	Measured
Hydrolysis as a Function of pH	Not determined	Hydrolysis is expected to be very slow under environmental conditions due to the limited water solubility of the notified polymer
Partition Coefficient (n-octanol/water)	Not determined	Concentrations were below detection limits in octanol and water phases.
Adsorption/Desorption	Not determined	Expected to partition to soil and sediment based on its high molecular weight
Dissociation Constant	Not determined	Expected to dissociate under

Particle Size	Large fraction (< 2,000 µm): 69.9% Medium fraction (100–2,000 µm): 28.7% Small fraction (< 100 µm): 1.4% MMAD/MAD* = Not determined	environmental conditions Measured
Flash Point	Not determined	Not expected to form flammable vapours due to high molecular weight and low flammability.
Flammability	Non-flammable	Measured
Autoignition Temperature	Not shown to auto-ignite	Measured
Explosive Properties	Non-explosive	Calculated.
Oxidising Properties	Not determined	Contains no functional groups that would imply oxidising properties.

* MMAD = Mass Median Aerodynamic Diameter / MAD = Mean Aerodynamic diameter

DISCUSSION OF PROPERTIES

For full details of tests on physical and chemical properties, refer to Appendix A.

Reactivity

The notified polymer is expected to be stable under normal conditions of use.

Physical hazard classification

Based on the submitted physico-chemical data depicted in the above table, the notified polymer is not recommended for hazard classification according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia.

5. INTRODUCTION AND USE INFORMATION

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

The notified polymer will not be manufactured or reformulated in Australia. The notified polymer will be imported as a component of finished printer ink at a concentration of < 5 %.

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

Year	1	2	3	4	5
Tonnes	≤ 50	≤ 50	≤ 100	≤ 150	≤ 150

PORT OF ENTRY

The main ports in each state.

IDENTITY OF MANUFACTURER/RECIPIENTS

Epson Australia Pte. Ltd

TRANSPORTATION AND PACKAGING

The notified polymer will be imported by sea as a component of inkjet printing ink in sealed cartridges and bottles, and will not be reformulated or repackaged within Australia. The printer cartridges and bottles will be transported by road to the notifier's warehouse and then distributed to retail outlets/end-users.

USE

The notified polymer will be used as a component of inkjet printing ink.

OPERATION DESCRIPTION

No manufacturing or reformulation/repackaging of the ink cartridges or bottles containing the notified polymer (< 5% concentration) will occur in Australia.

Sealed ink cartridges and ink bottles containing the notified polymer will be handled by service technicians and office workers. The end-users will remove the cartridge or bottle from the packaging and place the new cartridge or bottle into the printer. The cartridge or bottle will be disposed of when empty.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

6.1.1. Occupational Exposure

CATEGORY OF WORKERS

<i>Category of Worker</i>	<i>Exposure Duration (hours/day)</i>	<i>Exposure Frequency (days/year)</i>
Transporting and warehousing	2–4	150
Service technicians	1	200
Office workers	8	200

EXPOSURE DETAILS

Transport and Storage

Transport and storage workers will handle the notified chemical at up to 5% concentration in sealed cartridges and bottles of ink. These workers may come into contact with the notified polymer, only in the unlikely event of an accident.

End use

Service technicians and office workers may be exposed to the ink containing the notified chemical ($\leq 5\%$ concentration) when replacing spent cartridges or bottles and during printer maintenance. Dermal exposure is expected to be the main route of exposure and it is expected to be minimised by users following instructions for replacing spent cartridges and bottles.

The potential for incidental dermal and ocular exposure where ink leaks are discovered during maintenance will be minimised through the use of appropriate PPE (gloves).

Occasional dermal exposure during printing may also occur if the printed substrates are handled when wet. Once the ink dries, the notified chemical will be bound to the matrix of the substrates and is not expected to be bioavailable.

Inhalation exposure to the notified chemical is not expected, given the low vapour pressure of the chemical and the low likelihood of aerosols being released from the cartridges and printers.

6.1.2. Public Exposure

The inkjet inks containing the notified polymer will not be made available to the general public for home use.

6.2. Human Health Effects Assessment

The results from toxicological investigations conducted on the notified polymer are summarised in the following table. For full details of the studies, refer to Appendix B.

<i>Endpoint</i>	<i>Result and Assessment Conclusion</i>
Mutagenicity – bacterial reverse mutation	non mutagenic

Toxicokinetics, metabolism and distribution

No information on the toxicokinetics of the notified polymer was provided. Based on the relatively high molecular weight ($> 1,000$ Da) and low water solubility (< 1 mg/L at 20°C), absorption of the notified polymer across the skin or biological membranes is expected to be limited. The notified polymer has a low vapour pressure due to its high molecular weight and a low proportion (1.4%) of particles in the inhalable size range ($< 100\ \mu\text{m}$), hence inhalation exposure is unlikely to occur.

Acute toxicity

No acute toxicity data were provided for the notified polymer. The notified polymer is expected to have limited potential for absorption, hence the toxicity by the dermal and inhalation routes is not expected.

Irritation and sensitisation

No irritation and sensitisation data for the notified polymer was submitted. The notified polymer contain structural alerts for skin and eye irritation, but the potential for irritation is limited by the relatively high molecular weight (> 1,000 Da).

The notified polymer contains no structural alerts for sensitisation. Furthermore, the notified polymer is expected to have limited potential for dermal absorption. Although it cannot be totally ruled out, the notified chemicals are expected to have limited potential for sensitisation.

Repeated dose toxicity

No repeated dose toxicity studies were provided for the notified polymer.

Mutagenicity/Genotoxicity

The notified chemical was not mutagenic in a standard bacterial reverse mutation study.

Health hazard classification

Based on the available information, the notified polymer is not recommended for classification according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia.

6.3. Human Health Risk Characterisation

6.3.1. Occupational Health and Safety

The notified polymer is of low water solubility and non-mutagenic, and is expected to have minimal absorption across the skin.

Dermal or possibly incidental ocular exposure to the notified chemical at < 5% concentration may occur during operations including replacing spent ink cartridges, during transfer of the ink from ink bottles to printers, and during printer maintenance and cleaning. Dermal exposure is also possible when handling printed substrates before the ink dries. However, the exposure is expected to be infrequent or only incidental in nature, given the containment of the notified chemical within purposely designed ink cartridges and ink bottles at a relatively low concentration (up to 5%), and the provision of instructions for safe use of the ink cartridges and ink bottles. Once the ink dries, the notified chemical will be bound to the matrix of the substrates and is not expected to be bioavailable.

Overall, based on the limited exposure, expected low hazard and dermal absorption potential, the risk to workers is not considered to be unreasonable.

6.3.2. Public Health

The public may also come into contact with printed substrates containing the notified chemical. However, once dried the notified chemical is bound into the substrates and will not be bioavailable. Therefore, based on low exposure potential, the risk of the notified chemical to the public is not considered to be unreasonable.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1. Environmental Exposure

RELEASE OF CHEMICAL AT SITE

The notified polymer will be imported into Australia as a component of aqueous ink formulation for inkjet printing in sealed cartridges and bottles and will not be repackaged or reformulated. Environmental release of the notified polymer during transportation is expected to be limited to accidental spills and leaks. In the event of accidental spills or leaks, the notified polymer will be contained and collected with absorbents, and is expected to be disposed of to landfill in accordance with local government regulations.

RELEASE OF CHEMICAL FROM USE

Printing inks containing the notified polymer will only be used by professionals within industrial settings, and are expected to be printed onto various substrates. Once printing is complete, the notified polymer is expected to be irreversibly bound within an inert ink matrix, and is not expected to be released from the printed articles. The printing process will be largely automated; therefore, release of the ink containing the notified polymer to the environment is expected to be limited to accidental spills and leaks. It is estimated by the notifier that 50% of the notified polymer is expected to be released to sewer from paper recycling processes. During the recycling process, waste paper will be repulped and the ink will get detached from the fibres using a variety of alkaline dispersing and wetting agents, water emulsifiable organic solvents and bleaches.

RELEASE OF CHEMICAL FROM DISPOSAL

Collected used ink cartridges will be recycled by subcontractors. Residue inks containing the notified polymer (5% of the importing volume) in empty containers are expected to be disposed in accordance with local government regulations. The majority of the notified polymer will reach landfill as a result of disposal of used articles, sludge waste from recycling and residual in empty containers containing the notified polymer.

7.1.2. Environmental Fate

The notified polymer has low water solubility and high molecular weight, and therefore, will partition to sludge within sewage treatment plants (STPs). In addition, the notified polymer contains biodegradable units under environmental conditions; therefore, both biodegradation and sorption to sludge may be significant removal mechanisms in the STPs.

Since the notified polymer has a molecular weight much greater than 1,000 Da with no significant percentage of low molecular weight constituents, it is not expected to cross biological membranes, and is therefore unlikely to bioaccumulate. In landfill, the notified polymer is expected to degrade by biotic and abiotic processes to form water and oxides of carbon.

7.1.3. Predicted Environmental Concentration (PEC)

The calculation for the Predicted Environmental Concentration (PEC) is summarised in the table below. It is assumed that 50% of the total import volume of the notified polymer is released to the sewer on a nationwide basis over 260 working days, and there is no removal within sewage treatment plants (STPs) under a worst case scenario.

<i>Predicted Environmental Concentration (PEC) for the Aquatic Compartment</i>		
Total Annual Import/Manufactured Volume	1,000	kg/year
Proportion expected to be released to sewer	50%	
Annual quantity of chemical released to sewer	500	kg/year
Days per year where release occurs	260	days/year
Daily chemical release:	1.92	kg/day
Water use	200.0	L/person/day
Population of Australia (Millions)	22.613	million
Removal within STP	0%	
Daily effluent production:	4,523	ML
Dilution Factor - River	1.0	
Dilution Factor - Ocean	10.0	
PEC - River:	0.43	µg/L
PEC - Ocean:	0.04	µg/L

STP effluent re-use for irrigation occurs throughout Australia. The agricultural irrigation application rate is assumed to be 1,000 L/m²/year (10 ML/ha/year). The notified polymer in this volume is assumed to infiltrate and accumulate in the top 10 cm of soil (density 1,500 kg/m³). Using these assumptions, irrigation with a concentration of 0.43 µg/L may potentially result in a soil concentration of approximately 2.84 µg/kg. Assuming accumulation of the notified polymer in soil for 5 and 10 years under repeated irrigation, the concentration of notified polymer in the applied soil in 5 and 10 years may be approximately 0.14 µg/kg and 0.28 µg/kg, respectively.

7.2. Environmental Effects Assessment

The results from ecotoxicological investigations conducted on the notified polymer is summarised in the table below. Details of the study can be found in Appendix C.

<i>Endpoint</i>	<i>Result</i>	<i>Assessment Conclusion</i>
Daphnia Toxicity	48 h EL50 > 100 mg/L (WAF)*	Not harmful to invertebrates up to its limit solubility in water

*Water accommodated fraction

Based on the above ecotoxicological endpoints, the notified polymer is not harmful to invertebrates up to its limit of water solubility. Therefore, the notified polymer is not classified for acute and chronic aquatic hazard according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)* (United Nations, 2009).

7.2.1. Predicted No-Effect Concentration

A predicted no-effect concentration (PNEC) for the aquatic compartment has not been calculated since the notified polymer is not considered to be harmful to aquatic invertebrates up to the limit of its solubility in water.

7.3. Environmental Risk Assessment

The Risk Quotient ($Q = PEC/PNEC$) of the notified polymer has not been calculated as a PNEC is not available for the aquatic compartment due to its low aquatic hazard. Therefore, the release of the notified polymer during the recycling and deinking processes will not lead to ecotoxicologically significant concentrations in the aquatic environment. Based on its high molecular weight, the notified polymer is not expected to bioaccumulate. On the basis of the maximum annual importation volume, assessed use pattern and its low aquatic hazard, the notified polymer is not expected to pose an unreasonable risk to the environment.

APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES**Melting Point/Freezing Point** 67 °C

Method OECD TG 102 Melting Point/Melting Range.
EC Council Regulation No 440/2008 A.1 Melting/Freezing Temperature.
Remarks Differential scanning calorimetry (DSC)
Test Facility NOTOX B.V. (2009)

Boiling Point Not observed

Method OECD TG 103 Boiling Point.
EC Council Regulation No 440/2008 A.2 Boiling Temperature.
Remarks Differential scanning calorimetry (DSC)
Test Facility NOTOX B.V. (2009)

Density 1259 kg/m³ at 20 °C

Method OECD TG 109 Density of Liquids and Solids.
EC Council Regulation No 440/2008 A.3 Relative Density.
Remarks Gas comparison stereopycnometer
Test Facility NOTOX B.V. (2009)

Vapour Pressure 9.49×10^{-4} kPa at 20 °C

Method OECD TG 104 Vapour Pressure.
EC Council Regulation No 761/2009 A.4 Vapour Pressure.
Remarks Isothermal thermogravimetric effusion method
Test Facility NOTOX B.V. (2009)

Water Solubility < 0.957 mg/L at 20 °C

Method OECD TG 105 Water Solubility.
EC Council Regulation No 440/2008 A.6 Water Solubility.
Remarks Flask Method. The water solubility of the test substance was determined by the saturation mass concentration in water. The analytical method was not sensitive enough to measure actual concentrations of the test substance.
Test Facility NOTOX B.V. (2009)

Hydrolysis as a Function of pH Could not be determined

Method OECD TG 111 Hydrolysis as a Function of pH.
EC Council Regulation No 440/2008 C.7 Degradation: Abiotic Degradation: Hydrolysis as a Function of pH.
Remarks The concentration of the test substance should not exceed half the water solubility or 0.01M, whichever is lower. As the concentration of the test substance was below the limit quantification at these levels, the hydrolysis test was not performed.
Test Facility NOTOX B.V. (2009)

Partition Coefficient (n-octanol/water) Could not be determined

Method OECD TG 107 Partition Coefficient (n-octanol/water).
EC Council Regulation No 440/2008 A.8 Partition Coefficient.
Remarks The partition coefficient (n-octanol/water) could not be determined as the quotient of the n-octanol solubility and the water solubility were both <0.957 mg/L.
Test Facility NOTOX B.V. (2009)

Surface Tension Could not be determined

Method OECD TG 115 Surface Tension of Aqueous Solutions.
 EC Council Regulation No 440/2008 A.5 Surface Tension.
 Remarks Water solubility too low
 Test Facility

Particle Size

Method OECD TG 110 Particle Size Distribution/Fibre Length and Diameter Distributions.

<i>Range (μm)</i>	<i>Mass (%)</i>
< 100	1.4
100–180	1.2
180–250	0.8
250–500	2.7
500–2000	24.0
> 2000	69.9

Remarks Sieving method
 Test Facility NOTOX B.V. (2009)

Flammability Non-flammable

Method EC Council Regulation No 440/2008 A.10 Flammability (Solids).
 EC Council Regulation No 440/2008 A.12 Flammability (Contact with Water).
 Remarks
 Test Facility NOTOX B.V. (2009)

Autoignition Temperature Not shown to auto-ignite

Method EC Council Regulation No 440/2008 A.16 Relative Self-Ignition Temperature for Solids.
 Remarks Temperature programmed oven
 Test Facility NOTOX B.V. (2009)

Explosive Properties Non-explosive

Method EC Council Regulation No 440/2008 A.14 Explosive Properties.
 Remarks Calculated based on chemical groups
 Test Facility NOTOX B.V. (2009)

Oxidising Properties Non-oxidising

Method EC Council Regulation No 440/2008 A.17 Oxidizing Properties (Solids).
 Remarks Calculated based on chemical groups
 Test Facility NOTOX B.V. (2009)

APPENDIX B: TOXICOLOGICAL INVESTIGATIONS**B.1. Genotoxicity – bacteria**

TEST SUBSTANCE	Notified chemical
METHOD	OECD TG 471 Bacterial Reverse Mutation Test. EC Commission Regulation 440/2008 B.13/14 Mutagenicity – Reverse Mutation Test using Bacteria.
Species/Strain	<i>S. typhimurium</i> : TA1535, TA1537, TA98, TA100, <i>E. coli</i> : WP2uvrA
Metabolic Activation System	S9 from Phenobarbitone (PB)/ β -naphthoflavone (NF) induced rat liver
Concentration Range in Main Test	a) With metabolic activation: 3–5000 $\mu\text{g}/\text{plate}$ b) Without metabolic activation: 3–5000 $\mu\text{g}/\text{plate}$
Vehicle	DMSO
Remarks – Method	There were no significant protocol deviations.

RESULTS

<i>Metabolic Activation</i>	<i>Test Substance Concentration ($\mu\text{g}/\text{plate}$) Resulting in:</i>			
	<i>Cytotoxicity in Preliminary Test</i>	<i>Cytotoxicity in Main Test</i>	<i>Precipitation</i>	<i>Genotoxic Effect</i>
<i>Absent</i>				
Test 1	> 5,000	> 5,000	$\geq 1,000$	Negative
Test 2		> 5,000	$\geq 1,000$	Negative
<i>Present</i>				
Test 1	> 5,000	> 5,000	$\geq 1,000$	Negative
Test 2		> 5,000	$\geq 1,000$	Negative

Remarks - Results Precipitation of the notified polymer was observed at the start and at the end of the incubation period at 1,000 $\mu\text{g}/\text{plate}$.

No significant increases in the frequency of revertant colonies were recorded for any of the bacterial strains, with any dose material, either with or without metabolic activation.

The positive controls produced satisfactory responses, thus confirming the activity of the S9-mix and the sensitivity of the bacterial strains.

CONCLUSION The notified chemical showed no evidence of mutagenic activity on bacteria under the conditions of the test.

TEST FACILITY NOTOX B.V. (2009)

APPENDIX C: ENVIRONMENTAL FATE AND ECOTOXICOLOGICAL INVESTIGATIONS

C.1. Ecotoxicological Investigations

C.1.1. Acute toxicity to aquatic invertebrates

TEST SUBSTANCE	Notified polymer
METHOD	OECD TG 202 <i>Daphnia</i> sp. Acute Immobilisation Test and Reproduction Test – static. EC Commission Regulation 440/2008 C.2 Acute Toxicity for <i>Daphnia</i> – static.
Species	<i>Daphnia magna</i>
Exposure Period	48 hours
Auxiliary Solvent	None
Water Hardness	180 mg CaCO ₃ /L
Analytical Monitoring	A UV-Vis spectrophotometry
Remarks – Method	The test solution was stirred for 3 days followed by filtration through 0.45 µm membrane filter to give a 100 mg/L stock solution (water accommodated fraction).

RESULTS

Concentration (% filtrate)		Number of <i>D. magna</i>	Cumulative Immobilised (%)	
Nominal [‡]	Actual		24 h	48 h
Control	Control	20	5	5
0.10		10	0	0
1.0		10	0	0
10		10	0	0
100		20	5	5

[‡]Percent of a 0.45 µm filtered solution prepared at a loading rate of 100 mg/L.

EL50	>100 mg/L at 48 hours
NOEC	100 mg/L
Remarks - Results	The actual exposure concentrations were not analysed due to the instrumental limit of quantification (the measured concentrations were below 2.44 mg/L). The notified polymer did not induce significant acute immobilisation of <i>Daphnia magna</i> when exposed to a loading rate of 100 mg/L.
CONCLUSION	The notified polymer is not harmful to aquatic invertebrates up to its limit of water solubility.
TEST FACILITY	NOTOX B.V. (2009)

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