

File No: EX/49(NA/924)

3 April 2020

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

Polymer in Disperbyk-2000

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Director

Chemicals Notification and Assessment

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FULL PUBLIC REPORT

Polymer in Disperbyk-2000

1. APPLICANT

Original Holder of Assessment Certificate (First Applicant)

An Assessment Certificate for the notified chemical known by the name Polymer in Disperbyk-2000 was granted to Nuplex Industries (Aust) Pty Ltd (ACN 000 045 572) of 49-61 Stephen Road BOTANY NSW 2019.

The Assessment Report for Polymer in Disperbyk-2000 is identified by the sequence number NA/924.

Second Applicant

Since granting of the abovementioned Assessment Certificate, BASF Coatings Pty Ltd, 231-233 Newton Road WETHERILL PARK NSW 2164 has submitted a notification statement in support of their application for an extension of the original Assessment Certificate for Polymer in Disperbyk-2000. Nuplex Industries (Aust) Pty Ltd has agreed to this extension.

Information submitted by BASF Coatings Pty Ltd pertains to the introduction of the notified polymer for use as a component in solvent based paint used in the automotive industry. Introduction volumes will be less than 1000 kg per year imported as a component of the coating product.

2. IDENTITY OF THE CHEMICAL

The chemical name, CAS number, molecular and structural formulae, molecular weight, spectral data, details of the polymer composition, residual monomers, adjuvants/additives, purity and details of exact import volume have been exempted from publication in the Full Public Report and the Summary Report.

2.3 *Marketing Name(s)*
Polymer in Disperbyk-2000

3. PHYSICAL AND CHEMICAL PROPERTIES

The polymer is never isolated in pure form. The following data is for polymer solution in a mixture of organic solvents.

Appearance at 20°C & 101.3 kPa: Clear amber liquid with an ester like odour

Boiling Point:	175°C
Specific Gravity:	1.163
Vapour Pressure:	Not determined (see comments below)
Water Solubility:	Not determined (see comments below)
Partition Co-efficient (n-octanol/water):	Not determined
Hydrolysis as a Function of pH:	Not determined (see comments below)
Adsorption/Desorption:	Not determined (see comments below)
Dissociation Constant:	Not determined (see comments below)
Flash Point:	> 100°C
Flammability Limits:	Not flammable
Autoignition Temperature:	Not applicable
Explosive Properties:	Not explosive
Reactivity/Stability:	The polymer is stable and no decomposition occurs up to 100°C

3.1 Comments on Physico-Chemical Properties

The notified polymer contains approximately 20% quaternary ammonium and polyethoxylate functionality, the remainder is hydrophobic. The notifier has confirmed that the notified polymer is water soluble rather than dispersible in water.

The notified polymer contains ester linkages that could be expected to undergo hydrolysis under extreme pH conditions. However, in the environmental pH range of 4 to 9, significant hydrolysis is unlikely to occur.

The partition coefficient was not determined due to the water solubility of the notified polymer. However, its hydrophilic nature is indicative of partitioning into the aqueous phase.

No adsorption/desorption tests were conducted for the notified polymer, however, it is expected to be mobile in soil due to its water solubility.

The vapour pressure for the notified polymer was not determined, due to its high molecular weight it is likely to be relatively low.

No dissociation constant tests were conducted for the notified polymer due to lack of groups that are likely to dissociate in water.

4. PURITY OF THE CHEMICAL

Degree of Purity: high

Additives/Adjuvants:

<i>Chemical name:</i>	1-methoxy-2-propyl acetate
<i>CAS No.:</i>	108-65-6
<i>Weight percentage:</i>	> 20 %
<i>Toxic Properties</i>	eye irritant (harmful \geq 20 %); flammable (NOHSC, 1999a)
<i>Chemical name:</i>	2-butoxyethanol
<i>CAS No.:</i>	111-76-2
<i>Weight percentage:</i>	> 20 %
<i>Toxic Properties</i>	Harmful by inhalation, skin contact or if swallowed; irritating to respiratory system (harmful \geq 20 %) (NOHSC, 1999a)

5. USE, VOLUME AND FORMULATION

Mode of Introduction of Notified Chemical (100%) Over Next 5 Years
Imported.

Maximum Introduction Volume of Notified Chemical (100%) Over Next 5 Years

Year	1	2	3	4	5
Tonnes	<1	<1	<1	<1	<1

Use

•
Solvent based paint used in the automotive industry.

Port of Entry
Sydney

Identity of Manufacturer/Recipients

•
BASF Coatings Pty Ltd located at 231-233 Newton Road, Wetherill Park NSW 2164.

Transportation and Packaging

The notified polymer will be imported in 30 L, 15 L, 3.5 L, 1 L and 500 mL steel

cans as an ingredient in different paint lines. From the dockside, the notified polymer will be offloaded and shipped by road transport to BASF Coatings warehouse in NSW.

6. OCCUPATIONAL EXPOSURE

Occupational Exposure

Number and Category of Workers

Category of Worker	Number	Exposure Duration	Exposure Frequency
<i>Notifiers Site</i>			
Transport & Warehousing	10	1-2 hours	200 days/year
<i>At Car manufactures</i>			
<i>Paint Application</i>			
Unloading and preparation of mixture	1-2	1-2 hours	200 days/year
Spray painting	20	8 hours/day	200 days/year
Cleaning equipment	10	2 hours/day	200 days/year
<i>Aftermarket industry e.g. Crash car shop</i>			
Unloading and preparation of mixture	1-2	1 hour	24 days/year
Spray painting	2	10-45 mins	200 days/year
Cleaning equipment	2	15 mins	200 days/year

Exposure Details

Given the nature of the processes involved in handling new products containing the notified polymer, it is estimated that the total number of workers potentially exposed to the new polymer will be high, but that the total time of exposure will be relatively low and the concentration of the notified polymer in finished paint will be low. The possibility of incidental contact with this chemical will be minimised by good industrial hygiene practices and proper protective equipment, essential for the protection against exposure to the solvent carriers and other ingredients contained in the new products.

The paints containing the notified polymer will be imported by sea as part of a mixed load of chemicals. It is anticipated that 1-2 deliveries will occur per month. It is expected that less than 10 workers would be involved in receiving the import at the dock, the transport of the materials to storage of BASF Coatings Pty Ltd warehouse and dispatch from the warehouse. The customers, (car manufactures and crash repair shops) located in metropolitan areas around Australia will receive the paint in its original packaging.

Car manufacturing Sites

At the car manufacturing workshops the operations are continuous and workers are dedicated to individual tasks. At each individual car manufacturing workshop, one or two workers are required to unload the paint containing the notified polymer, deliveries are estimated to occur once or twice per month. The same workers also assist in preparation of the mixture. A total of 20 workers will be involved in spray painting. The spray painters will open the steel can of the finished paint containing the notified polymer and may mix it with other additives prior to application. The mixture is then loaded into the spray equipment and applied to the car in a spray booth.

Once spraying is completed or the paint has been exhausted, the equipment is drained and cleaned using solvents and rags. Approximately 10 workers are involved in the cleaning of equipment. The rinsates and used rags are collected for disposal. Empty cans are drained onto absorbent material and the cans are disposed of to landfill. Spray booth filters will be removed by workers for disposal every 2-4 months.

Aftermarket industry – Crash car shop

At each individual crash shop, one person is required to unload the paint containing the notified polymer. Deliveries are estimated to occur once or twice per month.

One to two operators at each crash car workshop will be involved in using the new paints for spray panel repair. Preparation of the ready to spray mixture usually takes between 10-15 mins. Spraying time will vary from 10 minutes for a single panel repair to 45 minutes for a full vehicle spray. Given that the majority of a spray-painter's time is spent in the preparation of the surface, it is estimated that during any week, a spray-painter will have the potential to be exposed to the notified polymer for a maximum of five hours per week.

Small Car Repair workshops

In a well ventilated area the spray painter will spread newspaper sheets on the ground around the particular area to be painted. The newspaper sheets will collect any waste paint and overspray from spray painting. Once spraying is completed or the paint has been exhausted, the equipment is drained and cleaned using solvents and rags. Empty cans are drained onto absorbent material and the cans are collected by licensed contractor. The newspaper sheets with the paint material are disposed of in a bin which is also collected by a licensed contractor.

It is estimated that there will be approximately 1000 spray-painters around Australia who will use the new paints containing the notified polymer on a regular basis. Each painter will on average undertake approximately 150 jobs per year at an average application time of 15 minutes.

7. PUBLIC EXPOSURE

Public exposure to the notified polymer is only likely after fully cured paint has been applied to car bodies and parts. Although there may be dermal contact, there is negligible potential for exposure of the public to the notified polymer since it is strongly bound in cured films.

8. ENVIRONMENTAL EXPOSURE

Release of Chemical at Site

Release at the notifier's warehouse may result due to accidental spills. It is estimated that a maximum of 5% of the notified chemical (~7 kg per year of notified polymer) would be lost during spillage. Spills are contained and soaked up with inert absorbent material (sand, soil or vermiculite) and placed in a sealable container for appropriate disposal. Waste material is disposed of in accordance with local, state or national EPA regulations.

Release of Chemical from Use

Release of the notified polymer to the environment as a result of its use in car manufacturing industries and crash repair shops around Australia is expected to be minimal, unless an accidental spillage occurs.

Accidental spills

If accidental spillage occurs during normal operating procedures, it will be contained and soaked up with inert absorbent material (sand) and placed in a sealable container for disposal. Waste material is disposed of in accordance with Local, State or National EPA regulations.

Residues in empty containers

The finished paint products will be packaged in 30L, 15L, 3.5L, 1L and 500ml steel cans. The steel cans will be disposed off to landfill. The residues in the containers are expected to account for up to 5 % of the import volume (~2.2 kg per year of the notified polymer). The table below provides an estimate of the residue of the notified substance in the empty containers and the disposal method in place.

<i>Type and size of container</i>	<i>Residue in empty container (%)</i>	<i>Proportion of import volume of notified chemical per container (g)</i>	<i>Amount disposed per year (kg)</i>	<i>Amount disposed per year (kg)</i>
500 ml steel can	5	1.08	0.5	Landfill
1 L steel can	3	1.29	0.9	Landfill
3.5 L steel can	2	3.01	0.6	Landfill
15 L steel can	1	6.45	0.15	Landfill
30 L steel can	0.5	6.45	0.075	Landfill

Overspray

A loss of 30% of the ready-for use material is achieved by the use of HVLP spray guns and slightly higher loss with the more outdated high pressure guns. The engineering controls for over-spray are typically spray booth filters and water scrubbers. The spray booth filters are usually renewed every 2-4 months. The filters are disposed of according to Local, State, National EPA regulations as are the scrubber waters. This can be done privately or professionally depending on the vehicle repair shop management.

Based on 30% (worst case) over-spray losses during application procedures, a level of notified polymer in paint mixtures and an annual import volume of 100 kg, it is expected that approximately 1.3 kg of notified polymer per annum would be lost via overspray.

Smaller workshops may not have spray booths. Overspray is collected on newspaper sheets which are disposed off to landfill. Based on 2% losses from spray painting, it is expected that approximately 0.086 kg of the notified polymer per annum would be lost in this manner.

Cleaning of equipment

Based on 5% losses from cleaning of equipment after application procedures, a level of notified polymer in paint mixtures and an annual import volume of 100 kg, it is

expected that approximately 0.035 kg of notified polymer per annum would be lost via cleaning of equipment.

Disposal

Paint containers containing residues of the polymer will be disposed of either professionally or privately depending on operations of the Spray shops.

If incidental spillage occurs during normal operating procedures, it will be contained and soaked up with inert absorbent material (sand, soil or vermiculite) and placed in a sealable container for appropriate disposal. Waste material is disposed of in accordance with local, state or national EPA regulations.

Any overspray of the new material that does occur would be trapped in the spray booth and removed to an approved landfill in accordance with local, state or national EPA regulations.

9. EVALUATION OF TOXICOLOGICAL DATA

No toxicological data were provided.

The notified polymer is not classified as a hazardous substance according to the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999b). It contains low level of residual monomers.

10. ASSESSMENT OF ENVIRONMENTAL EFFECTS

No ecotoxicological data were provided.

11. ASSESSMENT OF ENVIRONMENTAL HAZARD

The majority of the notified polymer will be crosslinked with other paint components to form a very high molecular weight and stable paint film. Therefore, once incorporated into the paint formulation, the notified polymer is expected to be immobile and pose little risk to the environment.

The notified polymer in waste from spills, equipment cleaning and drum recycling will be collected by licensed waste disposal contractors and treated by a distillation process whereby, the solvent is reclaimed and the remaining solid containing the notified polymer will be disposed of in landfill. The notified polymer in overspray will also be disposed of in landfill. The notifier indicates that incineration of waste may also occur.

The notified polymer is water soluble and therefore would be expected to be mobile in both the terrestrial and aquatic compartments. However, the notified polymer would be expected to dilute and disperse and eventually associate with the soil matrix and sediments. Cationic

polymers that are water soluble are known to be toxic to aquatic organisms and therefore, the notified polymer is expected to exhibit some aquatic toxicity (Nabholz, 1993). However, environmental exposure in this manner should be low and dispersed and therefore the overall environmental hazard should be low. The notified polymer is not expected to cross biological membranes due to its high molecular weight and is therefore not expected to bioaccumulate.

The notified polymer is not likely to present a hazard to the environment when it is stored, transported and used in the proposed manner.

12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS

Hazard Assessment

No toxicological data was provided and the notified polymer cannot be assessed against the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999b). Polymers of high molecular weight do not readily cross the skin or other biological membranes, and the overall toxicity is expected to be low. The Material Safety Data Sheet (MSDS) for the imported product Disperbyk-2000 indicates that it is a possible skin, eye and a respiratory irritant. The MSDS list a number of potential health effects due to inhalation, or repeated skin contact namely headaches, dizziness to loss of consciousness, injury to liver, kidney and bone marrow and on prolonged exposure may result in permanent damage to brain and nervous system. These relate mainly to the solvents present in the product rather than the notified polymer.

The imported product Disperbyk-2000 is classed as a Class 3 dangerous good (flammable liquid) because of the solvent content.

Occupational Health and Safety

There is little potential for significant occupational exposure to the notified polymer during transport and storage of Disperbyk 2000.

The system by which the notified polymer is dispensed from the drums to the blending vessel is via vacuum hose lines and all operations involving the transfer is carried under exhaust ventilation, and exposure due to skin contact from drips and splashes is likely only when hoses are coupled and uncoupled from the production line. The blending of the product, containing the notified polymer at approximately 40 % concentration, into finished coatings will occur in automated closed systems. Exposure to the product containing the most concentrated form of the notified polymer will be limited to incidental skin contact arising from drips, splashes and spillage that may result during semi-automated blending, batch adjustments, sampling and analytical procedure. Other scenarios of exposure (paint application) to the notified polymer are at concentrations of less than 1 %.

The final paint mix including the pre-prepared paint component containing the notified polymer could contain a wide variety of additional ingredients. The spraying procedure also produces a dense aerosol which could adversely affect human health even in the absence of additional hazardous components.

For these reasons, the notified polymer must be assessed for the contribution it makes to the hazards associated with spray application of the paint. The presence of many potential and

actual hazardous substances in the formulations requires the use of stringent engineering controls, such as a correctly constructed and maintained spray booth, and of a high level of personal protective equipment, such as impermeable overalls and gloves and a full face shield and respirator. The use of the paint containing the notified polymer should be in accordance with the NOHSC *National Guidance Material for Spray Painting* (NOHSC, 1999c). The level of protection from exposure afforded by the standard protective measures will provide adequate protection from the notified polymer.

Once the applied final paint mix has hardened, the polymer will not be separately available for exposure or absorption.

There is a NOHSC exposure standard for 2-butoxyethanol, identified as an ingredient in the polymer solution Disperbyk-2000. The employer is responsible for ensuring that this exposure standard, and exposure standards pertaining to other final paint mix additives, are not exceeded in the workplace.

The solutions containing the notified polymer are flammable due to their solvent content. Precautions must be taken to avoid sources of ignition, e.g. use of earthing leads. Operators should wear antistatic overalls and footwear.

The wastes containing the notified polymer may be hazardous materials on the basis of the solvent and other resin content, and the precautions used for the additional materials should be adequate for protection from the notified polymer. In addition, much of the polymer will be crosslinked and hardened, and therefore immobile, by the time of disposal.

The polymer size, mode of use, use of personal protective gear and *in situ* engineering controls indicate that significant risks to human health through occupational exposure to the notified polymer are unlikely. No specific control measure are required to reduce the risk of skin, eye and respiratory irritation due to the notified polymer.

Public Health

The notified polymer will not be available for sale to the public. Since the notified polymer will be used in paints for car body parts not handled by the public, the risk of exposure of the public to the notified polymer is considered to be low. The notified polymer will not pose a significant risk to public health when used in the proposed manner.

13. RECOMMENDATIONS

To minimise occupational exposure to Polymer in Disperbyk-2000 the following guidelines and precautions should be observed:

- Use of the paint containing the notified polymer should be in accordance with the NOHSC *National Guidance Material for Spray Painting* (NOHSC, 1999c);
- Employers should ensure that NOHSC exposure standards for all of the components of the final paint mix are not exceeded in the workplace;
- Protective eyewear, chemical resistant industrial clothing and footwear and impermeable gloves should be used during occupational use of the products

containing the notified polymer; where engineering controls and work practices do not reduce vapour and particulate exposure to safe levels, an air fed respirator should also be used;

- Spillage of the notified polymer should be avoided. Spillages should be cleaned up promptly with absorbents which should then be put into containers for disposal;
- Good personal hygiene should be practised to minimise the potential for ingestion;
- A copy of the MSDS should be easily accessible to employees.

If products containing the notified polymer are hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999b), workplace practices and control procedures consistent with State and Territory hazardous substances regulations must be in operation.

Guidance in selection of protective eyewear may be obtained from Australian Standard (AS) 1336 (Standards Australia, 1994) and Australian/New Zealand Standard (AS/NZS) 1337 (Standards Australia/Standards New Zealand, 1992); for industrial clothing, guidance may be found in AS 3765.2 (Standards Australia, 1990); for impermeable gloves or mittens, in AS 2161.2 (Standards Australia/Standards New Zealand, 1998); for occupational footwear, in AS/NZS 2210 (Standards Australia/Standards New Zealand, 1994a); for respirators, in AS/NZS 1715 (Standards Australia/Standards New Zealand, 1994b) and AS/NZS 1716 (Standards Australia/Standards New Zealand, 1994c).

14. MATERIAL SAFETY DATA SHEET

The MSDS for the product containing the notified polymer was provided in a format consistent with the *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994).

This MSDS was provided by the applicant as part of the notification statement. It is reproduced here as a matter of public record. The accuracy of this information remains the responsibility of the applicant.

15. REQUIREMENTS FOR SECONDARY NOTIFICATION

Under the Act, the director must be informed if any of the circumstances stipulated under subsection 64(2) of the Act arise, and secondary notification of the notified polymer may be required. No other specific conditions are prescribed.

16. REFERENCES

Nabholz, J.V., Miller, P. and Zeeman, M., (1993) Environmental Risk Assessment of New Chemicals Under the Toxic Substances Control Act (TSCA) Section Five, Environmental Toxicology and Risk Assessment, American Society for Testing and Materials, ASTM STP 1179, Landis, W.G., Hughes, J.S. and Lewis, M.A., Eds. Philadelphia, pp 40-55.

NOHSC (1994): National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

NOHSC (1999a) List of Designated Hazardous Substances [NOHSC:10005(1999)]. Australian Government Publishing Service, Canberra.

NOHSC (1999b): Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1999)]. National Occupational Health and Safety Commission, Canberra, AusInfo.

National Occupational Health and Safety Commission (1999c) National Guidance Material for Spray Painting. Australian Government Publishing Service, Canberra.

Standards Australia (1990) Australian Standard 3765.2-1990, Clothing for Protection against Hazardous Chemicals Part 2 Limited protection against specific chemicals. Standards Association of Australia.

Standards Australia (1994) Australian Standard 1336-1994, Eye protection in the Industrial Environment. Standards Association of Australia.

Standards Australia/Standards New Zealand (1992) Australian/New Zealand Standard 1337-1992, Eye Protectors for Industrial Applications. Standards Association of Australia/Standards Association of New Zealand.

Standards Australia/Standards New Zealand (1994a) Australian/New Zealand Standard 2210-1994, Occupational Protective Footwear. Standards Association of Australia/Standards Association of New Zealand.

Standards Australia/Standards New Zealand (1994b) Australian/New Zealand Standard 1715-1994, Use and Maintenance of Respiratory Protective Devices. Standards Association of Australia/Standards Association of New Zealand.

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Standards Australia/Standards New Zealand (1998) Australian/New Zealand Standard 2161.2-1998, Occupational protective gloves, Part 2: General requirements. Standards Association of Australia/Standards Association of New Zealand.