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

PUBLIC REPORT

Polymer in BYK-3951P

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.

For the purposes of subsection 78(1) of the Act, this Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This Public Report is also 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
NICNAS**

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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/1807	BASF Australia Ltd	Polymer in BYK-3951P	ND*	< 15 tonnes per annum	Component of products for powder coatings and the construction industry

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification

As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System for the Classification and Labelling of Chemicals* (GHS), as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

Human health risk assessment

Provided that the recommended controls are being adhered to, under the conditions of the occupational settings described, the notified polymer is not considered to pose an unreasonable risk to the health of workers.

When used in the proposed manner, the notified polymer is not considered to pose an unreasonable risk to public health.

Environmental risk assessment

On the basis of the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Recommendations

REGULATORY CONTROLS

CONTROL MEASURES

Occupational Health and Safety

- A person conducting a business or undertaking at a workplace should implement the following engineering controls to minimise occupational exposure to the notified polymer:
 - Enclosed, automated processes, where possible
 - Provide adequate ventilation
- 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:
 - Avoid contact with skin and eyes (during reformulation and powder coating processes)
 - Avoid generation of and inhalation of dusts
- A person conducting a business or undertaking at a workplace should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer:
 - Protective clothing/coveralls (during reformulation and powder coating processes)
 - Impervious gloves (during reformulation and powder coating processes)
 - Eye protection (during reformulation and powder coating processes)
 - Respiratory protection, if inhalation exposure may occur

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

- Spray applications should be carried out in accordance with the Safe Work Australia Code of Practice for *Spray Painting and Powder Coating* (SWA, 2012a) or relevant State or Territory Code of Practice.
- A copy of the (M)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 for the Classification and Labelling of Chemicals (GHS)* as adopted for industrial chemicals in Australia, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation should be in operation.

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 chemical should be handled by physical containment, collection and subsequent 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 1000;or
- (2) Under Section 64(2) of the Act; if
 - the function or use of the polymer has changed from a component of products for powder coatings and the construction industry, 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.

(Material) Safety Data Sheet

The (M)SDS of the notified polymer and products containing the notified polymer provided by the notifier were reviewed by NICNAS. The accuracy of the information on the (M)SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

BASF Australia Ltd (ABN: 62 008 437 867)
Level 12, 28 Freshwater Place
Southbank VIC 3006

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, analytical data, degree of purity, polymer constituents, residual monomers, impurities, additives/adjuvants, use details, import volume and identity of manufacturer.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows: all physico-chemical properties.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None.

NOTIFICATION IN OTHER COUNTRIES

USA (2007) and China (2013)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

BYK-3951P ($\leq 65\%$ notified polymer)

MOLECULAR WEIGHT

$> 1,000$ Da

ANALYTICAL DATA

Reference IR and GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY

$> 90\%$

4. PHYSICAL AND CHEMICAL PROPERTIES

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

Property	Value	Data Source/Justification
Melting Point/Freezing Point	< 0 °C	Estimated by notifier.
Density	1120 kg/m ³ at 20 °C	(M)SDS
Vapour Pressure	< 0.1 kPa	(M)SDS (based on the high molecular weight of the polymer, expected to be low)
Water Solubility	Not determined	Expected to be water dispersible based on the presence of hydrophilic moieties in the chemical structure.
Hydrolysis as a Function of pH	Not determined	The notified polymer contains hydrolysable functionality. However, it is not expected to be significantly hydrolysed under normal environmental conditions (pH 4 - 9).

Partition Coefficient (n-octanol/water)	Not determined	The notified polymer is expected to partition from water to n-octanol on the basis of its low water solubility.
Adsorption/Desorption	Not determined	Based on its cationicity and presumed low solubility in water, the notified polymer is expected to adsorb strongly to soil, sediment and sludge.
Dissociation Constant	Not determined	The notified polymer is a salt and will therefore be ionised in the environmental pH range of 4-9.
Flash Point	> 110 °C	(M)SDS
Autoignition Temperature	> 200 °C	(M)SDS
Explosive Properties	Not determined	Contains no functional groups that would imply explosive properties.
Oxidising Properties	Not determined	Contains no functional groups that would imply oxidative properties.

DISCUSSION OF PROPERTIES

Reactivity

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

Physical hazard classification

Based on the limited submitted physico-chemical data depicted in the above table, the notified polymer is not recommended for hazard classification according to the *Globally Harmonised System for the 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 be imported into Australia at $\leq 65\%$ concentration in a powder form (adsorbed on silicon dioxide) or as a component ($\leq 0.05\%$) of finished products for use in construction.

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

Year	1	2	3	4	5
Tonnes	< 15	< 15	< 15	< 15	< 15

PORT OF ENTRY

Sydney, Melbourne, Brisbane, Perth and Adelaide.

TRANSPORTATION AND PACKAGING

The products containing the notified polymer will be imported into Australia via sea. Within Australia, all forms of the notified polymer will be transported by road or rail.

Powder coatings.

The powder product containing the notified polymer ($\leq 65\%$ concentration) will be imported in sealed 25 or 200 kg steel drums.

Construction.

Finished products containing the notified polymer will be imported in 25 kg paper bags and/or 1,000 kg flexible intermediate bulk containers.

USE

The notified polymer will be used as an additive in products for powder coatings and the construction industry.

OPERATION DESCRIPTION

The notified polymer will not be manufactured in Australia. The notified polymer will be imported at $\leq 65\%$ concentration for use in powder coatings or at $\leq 0.05\%$ concentration as a component of grout to be used in the construction industry.

Powder coatings.

Reformulation of the imported product containing the notified polymer (at $\leq 65\%$ concentration) will occur in Australia. At the reformulation sites, the imported product will be transferred to a mixing vessel. The imported product will undergo high speed dispersing and blending in a mixer/extruder, grinding, filtration and sieving.

At application sites, the powder coating products containing the notified polymer will be applied to surfaces (e.g. via spraying, rollers or dipped). For non-spray applications, the product will undergo stirring and pump transfer onto trays, prior to use. Once applied onto the desired article, the product will heat cure on the surface, rendering the notified polymer inert.

Construction.

The imported grout (containing the notified polymer at $\leq 0.05\%$ concentration) will not be repackaged or reformulated prior to use. The cement based grout will be mixed with water at the construction site and applied to support structural elements, on and offshore. The notifier has indicated that spills during grout mixing are expected to be minimal.

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>
Transport and storage workers	2 -3	10 – 15
Blending operator	8	50
Laboratory/quality control	1	20
Application	6	260

EXPOSURE DETAILS

Transport and storage

Transport and storage workers may come into contact with the notified polymer (at $\leq 65\%$ concentration) only in the unlikely event of accidental rupture of containers.

Powder coatings

Exposure (dermal, ocular and inhalation) to the notified polymer at $\leq 65\%$ concentration (powder form) by workers may occur during reformulation processes, e.g. during transfer processes, quality assurance testing and during cleaning and maintenance activities, and during application of the powder coatings. Exposure is expected to be minimised through the use of enclosed, automated systems (where possible), adequate ventilation and personal protective equipment (PPE). Once the coating is cured, the notified polymer will be unavailable for exposure.

Construction

There is potential for dermal, ocular and inhalation exposure to the notified polymer at $\leq 0.05\%$ concentration by construction workers during transfer/mixing/application processes of the cement based grout containing the notified polymer to construction surfaces. Any potential exposure may be minimised by the use of PPE. Once the grout is hardened, the notified polymer will be unavailable for exposure.

6.1.2. Public Exposure

The products containing the notified polymer are expected to be used in industrial settings only. No 'do-it-yourself' (DIY) applications of the products are intended. The public may be exposed to the cured coatings or the hardened grout, however the notified polymer will be unavailable for exposure.

6.2. Human Health Effects Assessment

No toxicity data were submitted.

Based on the high molecular weight of the polymer (> 1,000 Da) and low proportion of low molecular weight species, the potential of the notified polymer to be dermally or orally absorbed following exposure is limited. The extent to which the notified polymer will be absorbed/cleared from the lungs following inhalation exposure to powders is uncertain.

Based on structural considerations, there is potential for the notified polymer to cause skin and eye irritation and skin sensitisation. However, the potential for these effects is likely to be limited by the high molecular weight of the polymer.

Health hazard classification

As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

6.3. Human Health Risk Characterisation

6.3.1. Occupational Health and Safety

Workers may experience dermal, ocular and inhalation exposure to the notified polymer (at $\leq 65\%$ concentration; powder form), particularly during the reformulation processes and end-use of the notified polymer. The potential for eye and skin irritation and/or skin sensitisation effects to be associated with the notified polymer cannot be ruled out, following exposure during reformulation and/or powder coating processes. Such effects are not expected at the proposed usage concentration in construction ($\leq 0.05\%$ notified polymer). The effects following inhalation exposure to powders to which the notified polymer will be adsorbed are uncertain.

Workers who will handle the products containing the notified polymer are expected to wear appropriate personal protective equipment (PPE) including respiratory protection (if there is potential for inhalation exposure), impervious gloves, coveralls, and eye protection to prevent them from exposure to the notified polymer. Reformulation and end-use activities are also expected to utilise enclosed/automated processes, where possible, and occur in ventilated environments (e.g. spray booths when applying powder coatings). Once the surface coatings or grout have cured/hardened, the notified polymer will be bound within an inert matrix and will not be bioavailable.

Therefore, given the expected use of PPE and engineering controls in place to limit exposure during reformulation and end use, the risk to workers from use of the notified polymer is not considered to be unreasonable.

6.3.2. Public Health

The products containing the notified polymer are intended to be used in industrial settings only, and will not be available to the public. The public may come into contact with the cured coatings or hardened grout, however, the notified polymer will not be available for exposure. Therefore, the risk to the public from the use of the notified polymer is not expected to be unreasonable.

7. ENVIRONMENTAL IMPLICATIONS

7.1.1. Environmental Exposure

RELEASE OF CHEMICAL AT SITE

Powder Coatings

The notified polymer will not be manufactured in Australia. In the event of transport accident, any spilled material not reused is expected to be collected to be disposed of to landfill.

The notified polymer is not expected to be significantly released to the environment from the reformulation processes. The reformulation will take place at the powder coating plant with bunding facilities and therefore,

the wastes are expected to be contained. Small empty containers with residual notified polymer are expected to be deposited at collection points provided by local councils for recycling or landfill disposal. Large empty containers containing the notified polymer are expected to be disposed of at approved landfills.

Construction

The notified polymer will not be manufactured or reformulated in Australia. Therefore, no release of the notified polymer is expected from manufacturing and reformulation processes.

RELEASE OF CHEMICAL FROM USE

The notified polymer will not be manufactured into Australia. Release of the notified polymer at the customer site is expected to be minimal because any excess powder coating is normally collected and recycled. In the event of transport accident, any spilled material not reused would be collected for disposal. The notified polymer will not be manufactured into Australia. Release of the notified polymer at the customer site is expected to be minimal because any excess powder coating is normally collected and recycled. In the event of transport accident, any spilled material not reused would be collected for disposal. The notified polymer will not be manufactured into Australia. Release of the notified polymer at the customer site is expected to be minimal because any excess powder coating is normally collected and recycled. In the event of transport accident, any spilled material not reused would be collected for disposal. The notified polymer will not be manufactured into Australia. Release of the notified polymer at the customer site is expected to be minimal because any excess powder coating is normally collected and recycled. In the event of transport accident, any spilled material not reused would be collected for disposal. The notified polymer will not be manufactured into Australia. Release of the notified polymer at the customer site is expected to be minimal because any excess powder coating is normally collected and recycled. In the event of transport accident, any spilled material not reused would be collected for disposal.

Powder Coatings

When coating formulations containing the notified polymer are applied by spray techniques, it is anticipated that the coating products will be collected as waste material. As the application of coating is expected to be conducted at industrial sites in designated spray booths, the overspray is expected to be captured in the spray booth filters or other capture systems. The captured notified polymer is expected to be disposed of to landfill. Application by brush and roller is expected to be efficient, with very little release expected from these application methods. Less than 1% of the notified polymer may remain as residues in the product containers, which are expected to be disposed of to landfill. It is estimated that the notified polymer in washings of the reformulation and application equipment is expected to be treated prior to being released to the sewer.

Construction

The cement based grout containing the notified polymer will be used to support various structural elements, on and offshore. It is expected that very limited spills will result from grout mixing and application. If spills occur, it is expected to be collected and disposed of to a licensed off site waste disposal centre. Empty paper bags and flexible intermediate bulk containers are expected to be sent for recycling. Total waste from all sources is expected to be approximately 1% of the total import volume of the notified polymer.

RELEASE OF CHEMICAL FROM DISPOSAL

Powder Coatings

The majority of the notified polymer is expected to be disposed of to landfill along with the used article at the end of its useful life. The notified polymer is expected to remain associated with the substrate to which it has been applied. Residues and their containers (large and small) will be disposed of by licensed waste contractors to an approved secure landfill.

Construction

Disposal of the hardened cement based grout at the end of the life of the fixed installation (expected to be 20 – 50 years) will most likely be disposed of to an approved, secure landfill.

7.1.2. Environmental Fate

No environmental fate data were submitted. No significant release of the notified polymer into the aquatic environment is expected either during formulation or application. Should the notified polymer enter the aquatic environment through accidental spills, it is not expected to cross biological membranes, due to its high molecular weight and cationicity, therefore is not expected to bioaccumulate.

Powder coatings

The captured overspray and the majority of articles to which the notified polymer will be applied will be disposed of to landfill. The majority of the notified polymer is expected to be cured within an inert polymer matrix adhering to articles following its use in coating applications. In its cured form it is not expected to be mobile, bioavailable or biodegradable. Ultimately, the notified polymer is expected to eventually degrade via biotic and abiotic processes in landfill, or by thermal decomposition during metal reclamation processes, to form water and oxides of carbon, phosphorous and nitrogen.

A small fraction of the notified polymer may be released to the sewerage system due to the cleaning of the reformulation and application equipment. In wastewater treatment processes in sewage treatment plants (STPs), most of the notified polymer is expected to partition to sludge due to its low water solubility, high molecular weight and cationicity. The sludge from the STPs is expected to be removed for disposal to landfill or used on land for soil remediation. The notified polymer is not expected to bioaccumulate based on its high molecular weight and cationicity.

Construction

The majority of the notified polymer will be incorporated into an inert grout matrix and in this form, it is not expected to be bioavailable. The notified polymer will be disposed of to landfill as residues, collected spills, collected excess cured grout or with the disposed associated fixed installation at the end of its useful life. Leaching of the notified polymer is not expected given the polymer will be in the cured form. The notified polymer in cured grout matrix is not expected to be bioavailable nor bioaccumulative. No significant release of the uncured polymer to the aquatic compartment is expected. With time, the notified polymer will undergo slow degradation via biotic and abiotic processes in landfill to form water, and oxides of carbon, phosphorous and nitrogen.

7.1.3. Predicted Environmental Concentration (PEC)

The predicted environmental concentration (PEC) has not been calculated as insignificant release of the notified polymer to the water environment is expected based on its assessed use pattern.

7.2. Environmental Effects Assessment

No ecotoxicity data were submitted. The notified polymer contains cationic groups and therefore may be toxic to algae. However, the notified polymer is expected to have low water solubility and very limited aquatic exposure is expected due to its use pattern.

7.2.1. Predicted No-Effect Concentration

A predicted no-effect concentration (PNEC) has not been calculated for the notified polymer as no ecotoxicity data were submitted. The release of the notified polymer to the aquatic environment will be very limited based on its assessed use pattern.

7.3. Environmental Risk Assessment

A risk quotient (PEC/PNEC) for the notified polymer was not calculated, as neither a PEC nor PNEC was derived. Release of the notified polymer to the aquatic environment in ecotoxicologically significant quantities are not expected based on its reported use pattern. The notified polymer is not expected to be bioaccumulative and is expected to slowly degrade in the environment. Based on the assessed use pattern of the notified polymer, the notified polymer is not considered to pose an unreasonable risk to the aquatic environment.

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