File No: LTD/2024
LTD/2025
LTD/2026

April 2018

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

PUBLIC REPORT

Polymer in Sika ViscoCrete PC-7.5 (LTD/2024)
Polymer in Sika ViscoCrete PC-5.5 (LTD/2025)
Polymer in Sika ViscoCrete WR-6 (LTD/2026)

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
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/2024	Sika Australia Pty Ltd	Polymer in Sika ViscoCrete PC-7.5	ND*	< 3,000 tonnes per annum	Concrete additives
LTD/2025		Polymer in Sika ViscoCrete PC-5.5		≤ 2,000 tonnes per annum	
LTD/2026		Polymer in Sika ViscoCrete WR-6		< 3,000 tonnes per annum	

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification
As no toxicity data were provided, the notified polymers cannot be classified 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 polymers are not considered to pose an unreasonable risk to the health of workers.

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

Environmental risk assessment
On the basis of assumed low toxicity and the reported use pattern, the notified polymers are 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 polymers as introduced:
  - Avoid skin and eye contact

- 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 during handling of the notified polymers as introduced:
  - Coveralls
  - Eye protection
  - Impervious gloves

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

- A copy of the SDS should be easily accessible to employees.

- If products and mixtures containing the notified polymers 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 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 polymers 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 polymers should be handled by physical containment, 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 polymers are 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 polymers have a number-average molecular weight of less than 1,000 g/mol;

or

(2) Under Section 64(2) of the Act; if
  - the function or use of the polymers has changed from concrete additives, or is likely to change significantly;
  - the amount of polymers being introduced has increased, or is likely to increase, significantly;
  - the polymers have begun to be manufactured in Australia;
  - additional information has become available to the person as to an adverse effect of the polymers 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 the products containing the notified polymers 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)
Sika Australia Pty Ltd (ABN: 12 001 342 329)
55 Elizabeth Street
WETHERILL PARK NSW 2164

NOTIFICATION CATEGORY
Limited: Synthetic polymer with Mn ≥ 1,000 g/mol

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication: chemical names, other names, CAS numbers, molecular and structural formulae, molecular weight, analytical data, polymer constituents, residual monomers, impurities, use details, and import volumes.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)
Variation to the schedule of data requirements is claimed for all physical and chemical properties.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
LTD/2024: Polymer in Sika ViscoCrete PC-7.5
LTD/2025: Polymer in Sika ViscoCrete PC-5.5
LTD/2026: Polymer in Sika ViscoCrete WR-6

MOLECULAR WEIGHT
LTD/2024: Number Average Molecular Weight (Mn) is > 10,000 g/mol.
LTD/2025: Mn is > 1,000 g/mol.
LTD/2026: Mn is > 10,000 g/mol.

ANALYTICAL DATA
Reference NMR, IR and GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY
> 98% (for all notified polymers)

4. PHYSICAL AND CHEMICAL PROPERTIES

LTD/2024, LTD/2025 AND LTD/2026

APPEARANCE AT 20 °C AND 101.3 kPa: Light yellow liquids

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Expected to be < 0 °C*	Introduced in aqueous solutions
Boiling Point	Expected to be ~100 °C at 101.3 kPa*	Introduced in aqueous solutions
Density	1,100 kg/m^3 at 20 °C*	SDS
Vapour Pressure	Not determined	Expected to be low based on the high molecular weight

Property	Value	Data Source/Justification
Water Solubility	Not determined	Expected to be water dispersible based on the presence of hydrophilic moieties in the chemical structures
Hydrolysis as a Function of pH	Not determined	Expected to be hydrolytically stable in the environmental pH range (4-9)
Partition Coefficient (n-octanol/water)	Not determined	Expected to have a low partition coefficient based on high water dispersibility
Adsorption/Desorption	Not determined	May partition to the solid phase
Dissociation Constant	Not determined	Expected to be ionised in the environmental pH range (4-9)
Flash Point	Not determined	Introduced in aqueous solutions
Flammability	Not determined	Introduced in aqueous solutions
Autoignition Temperature	Not determined	Introduced in aqueous solutions
Explosive Properties	Not determined	Contain no functional groups that would imply explosive properties
Oxidising Properties	Not determined	Contain no functional groups that would imply oxidising properties

* Properties of the aqueous dispersions containing the notified polymers at < 70% concentration

DISCUSSION OF PROPERTIES
Each of the notified polymers will be individually imported in aqueous dispersions.

Reactivity
The notified polymers are expected to be stable under normal conditions of use.

Physical hazard classification
Based on the limited physico-chemical data depicted in the above table, the notified polymers cannot be 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 polymers will not be manufactured in Australia. They will be individually introduced in aqueous solutions at < 70% concentration.

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

LTD/2024 and LTD/2026:

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	3,000	3,000	3,000	3,000	3,000

LTD/2025:

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	1,000	1,000	1,000	2,000	2,000

PORT OF ENTRY
Sydney

IDENTITY OF MANUFACTURER/RECIPIENTS
Sika Australia Pty Ltd

TRANSPORTATION AND PACKAGING
Aqueous solutions of the notified polymers will be imported in 1,000 L intermediate bulk containers (IBC) and isotainers. The products containing the notified polymers will be reformulated individually in Australia into a variety of end-use liquid concrete additives with the notified polymers at concentrations 5 – 50%. The end-use concrete additive products will be repackaged in 1,000 L IBC and isotainers, and transported across Australia by road and rail.

USE

The notified polymers will be used as additives in concrete. The final use concentrations for each of the notified polymers in concrete will be < 1%.

OPERATION DESCRIPTION

Reformulation

The notified polymers will be blended with other ingredients to produce various liquid concrete additive products. At reformulation sites, the aqueous solutions of the notified polymers will be pumped from the import containers into a 20,000 L blending tank. The notified polymers will be mixed with other components in a standard liquid blending process. The system will be automated, enclosed with local exhaust ventilation and will be designed to minimise waste material generation. When the blending is completed, a quality assurance (QA) sample will be taken, and the finished products will be packaged into new IBC or isotainers for distribution.

End Use

The end-use liquid concrete additive products will be used in concrete batching plants. The concrete additives will be added into the initial batching water at a rate of approximately 200 – 1,000 mL per 100 kg of cementitious material. The mixed concrete will be filled into concrete transport trucks, distributed to and used in construction sites, where the concrete will be gravity fed or pumped from the trucks into the required framework, smoothened and allowed to cure. Alternatively, the mixed concrete can be directly filled into mouldings in precast concrete plants for immediate use. The final concentration for each of the notified polymers in cured concrete will be < 1%.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

6.1.1. Occupational Exposure

CATEGORY OF WORKERS

Category of Worker	*Exposure Duration (hours/day)*	*Exposure Frequency (days/year)*
Transport and storage	1 – 2	12
Reformulation plant workers	8	48
Concrete manufacturers	8	300
Concrete user	8	300

EXPOSURE DETAILS

Transport and storage

Exposure of transport and storage workers to the notified polymers is not expected, except in the event of accidental spill or breach of packaging.

Reformulation

Dermal and ocular exposure to each of the notified polymers at < 70% concentration may occur during transfer and blending stages, and during the cleaning of empty containers, reformulation equipment and distribution trucks. Inhalation exposure to the notified polymers is not expected unless aerosols are generated. Exposure to the notified polymers will be minimised through the use of automated and enclosed systems, engineering controls (including local exhaust ventilation) and workers using personal protective equipment (PPE) including gloves, goggles and coveralls.

Concrete production

Dermal and ocular exposure to each of the notified polymers at < 50% concentration may occur during pumping, mixing, transfer and cleaning stages of concrete production. Exposure to the notified polymers will be mitigated by the use of automated systems and equipment, as well as workers wearing PPE including gloves, goggles and coveralls.

Concrete use
During construction, workers may be dermally exposed to the concrete containing each of the notified polymers at < 1% concentration. Accidental ocular exposure is also possible. Exposure to the notified polymers would be limited, due to low final use concentrations and the use of automated equipment. Construction workers may also come into contact with cured concrete containing the notified polymers, but at this stage, the notified polymers will be bound within a hardened matrix of the concrete and are not expected to be available for further exposure.

6.1.2. Public Exposure
The notified polymers will be for industrial use only, and will not be available to the public. Public may come into contact with cured concrete containing each of the notified polymers at < 1% concentration, but the notified polymers will be bound within the hardened concrete matrix and are not expected to be available for exposure.

6.2. Human Health Effects Assessment
No toxicity data were submitted for the notified polymers. Based on the relatively high molecular weight (Mn > 1,000 g/mol) with low level of low molecular weight species (< 5% molecules with molecular weight < 1,000 g/mol), absorption of the notified polymers across the skin or biological membranes is expected to be limited. Therefore systemic effects from dermal exposure are not expected.

The notified polymers contain structural alerts for irritation and therefore, the potential for irritation effects from the notified polymers cannot be ruled out.

Health hazard classification
As no toxicity data were provided, the notified polymers cannot be classified 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 polymers may have irritation properties. Therefore workers may be at risk of irritation effects when handling the notified polymers at < 70% concentration during product reformulation and concrete production. However, the expected use of automated equipment and PPE (coveralls, goggles and gloves), should minimise the risk of irritation.

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

6.3.2. Public Health
The notified polymers will be for industrial use only and will not be available to the general public. The public may come into contact with cured concrete containing the notified polymers; however, once the concrete is cured the notified polymers will not be in a bioavailable form for exposure.

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

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1. Environmental Exposure

RELEASE OF CHEMICAL AT SITE
The notified polymers will be imported into Australia as components of aqueous solutions for reformulation into concrete additive products. The reformulation process will involve pumping the aqueous solutions containing the notified polymers from containers into an on-site holding tank where the solutions will be blended with other components within the enclosed environment. The finished products will then be filled into end-use containers. Release of the notified polymers is expected to be limited to accidental spills (1% of the annual import volume), cleaning of the reformulation equipment (2% of the annual import volume) and transfer of the additives (1% of the annual import volume). The washings from cleaning of the reformulation equipment will be collected for reuse or sent to the licensed waste contractor. Accidental spills of the notified polymers during reformulation,

transport or storage are expected to be adsorbed onto a suitable material and disposed of in accordance with State/Territory regulations.

RELEASE OF CHEMICAL FROM USE

At the concrete batching plant, the concrete additives containing the notified polymers will be pumped from the transport containers into on-site storage tank and then added to the initial batching water using an electronic dispenser unit. The mixed concrete is then gravity-fed into concrete transport trucks via a hopper. The mixed concrete may be also filled into mouldings in precast concrete plants. The washings from cleaning of the delivery trucks and the mixer are expected to be recycled into subsequent concrete batches. Wastes from equipment washings and spills are estimated to be less than 1% of the annual import volume of the notified polymers. In the event of spills, the products containing the notified polymers are expected to be collected with adsorbents, and disposed of to landfill in accordance with local government regulations. Only a small proportion of the notified polymers (estimated to be 0.1 to 0.3% of the annual import volume) may enter the aquatic environment via disposal to stormwater drains, as sand bags will be used to block the runoff water from entering the stormwater drains at the construction sites. Any excess concrete containing the notified polymers is expected to be cured before disposal to landfill in accordance with local government regulations.

RELEASE OF CHEMICAL FROM DISPOSAL

The notified polymers are expected to share the fate of the concrete and are expected to be disposed of to landfill at the end of its life cycle. Residues of notified polymers in empty containers are also expected to be disposed of to landfill in accordance with local government regulations.

7.1.2. Environmental Fate

No environmental fate data were submitted for the notified polymers. The majority of the notified polymers is expected to share the fate of the concrete and be disposed of to landfill at the end of its life cycle. The notified polymers are also expected to enter landfill as collected wastes and residues. In landfill, the notified polymers will be cured within an inert concrete matrix and will be neither bioavailable nor mobile. A very small proportion of the notified polymers may be released to stormwater drains from cleaning of the application equipment and spills. Once released to the aquatic environment, the notified polymers are not expected to bioaccumulate based on their high molecular weight. In landfill and water, the notified polymers are expected to eventually degrade via biotic and abiotic processes to form water and oxides of carbon.

7.1.3. Predicted Environmental Concentration (PEC)

For the worst case scenario, the percentage of the annual imported quantity of each notified polymer inadvertently disposed of to stormwater drains is estimated to be 0.3% by the notifier and this will result in low and dispersed aquatic exposure given the notified polymers will be used at multiple construction sites across Australia.

7.2. Environmental Effects Assessment

No ecotoxicological data for the notified polymers were submitted. Anionic polymers are generally of low toxicity to fish and daphnia, however they are known to be moderately toxic to algae. The mode of toxic action is over-chelation of the nutrient needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone leading to chelation of essential nutrients. The notified polymers contain functionalities that dilute the chelating effect, which result in significantly reduced toxicity to algae (Boethling & Nahbolz, 1997).

7.2.1. Predicted No-Effect Concentration

The Predicted No-Effect Concentration (PNEC) has not been calculated since no ecotoxicological data were submitted.

7.3. Environmental Risk Assessment

The risk quotients (Q = PEC/PNEC) of the notified polymers have not been calculated, since the PNECs are not known. On the basis of assumed low toxicity, a low potential for bioaccumulation and reported use pattern as additives in concrete products, the notified polymers are not expected to pose an unreasonable risk to the environment.

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