File No PLC/1281

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

POLYMER OF LOW CONCERN PUBLIC REPORT

Polymer in Avanse ST-410

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (the Act) and Regulations. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Australian Government 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 Australian Government 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

August 2015

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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 SUBSTANCE	INTRODUCTION VOLUME	USE
PLC/1281	Rohm and Haas Australia Pty Ltd & Dow Chemical (Australia) Pty Ltd	Polymer in Avanse™ ST-410	No	≤ 60 tonnes per annum	Component of coatings.

CONCLUSIONS AND REGULATORY OBLIGATIONS

Human Health Risk Assessment
Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the health of workers and the public.

Environmental Risk Assessment
Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Health and Safety Recommendations

- No specific engineering controls, work practices or personal protective equipment are required for the safe use of the notified polymer itself. However, these should be selected on the basis of all ingredients in the formulation.

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

- If aerosols are formed during the reformulation of the notified polymer, engineering controls and respiratory protection should be used to prevent inhalation exposure.

- 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 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 polymer in an environmentally sound manner in accordance with relevant Commonwealth, state, territory and local government legislation.

Emergency Procedures

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

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 polymer 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 polymer, 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 notified polymer is introduced in a chemical form that does not meet the PLC criteria.
- the notified polymer is intended to be used in products with spray applications;

or

(2) Under Section 64(2) of the Act; if
- the function or use of the notified polymer has changed from a component of coatings, or is likely to change significantly;
- the amount of notified polymer being introduced has increased, or is likely to increase, significantly;
- the notified polymer has begun to be manufactured in Australia;
- additional information has become available to the person as to an adverse effect of the notified 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 product containing the notified polymer was provided by the applicant. The accuracy of the information on the (M)SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

Applicants
1) Rohm and Haas Australia Pty. Ltd. (ABN: 29 004 513 188)
Level 17, 8 Exhibition Street
Melbourne VIC 3000

2) Dow Chemical (Australia) Pty. Ltd. (ABN: 72 000 264 979)
Level 17, 8 Exhibition Street
Melbourne VIC 3000

Exempt Information (Section 75 of the Act)
Data items and details claimed exempt from publication: chemical name, CAS number, molecular and structural formulae, molecular weight, polymer constituents, residual monomers/impurities, use details and import volume.

2. IDENTITY OF POLYMER

Marketing Name(s)
Avanse™ ST-410 (product containing < 60% notified polymer)

Other Name(s)
None specified

Molecular Weight
Number Average Molecular Weight (Mn) is > 10,000 Da

3. PLC CRITERIA JUSTIFICATION

Criterion	*Criterion met*
Molecular Weight Requirements	Yes
Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
Stable Under Normal Conditions of Use	Yes
Not Water Absorbing	Yes
Not a Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

4. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20 °C and 101.3 kPa	Milky, white liquid*
Melting Point	Not determined. The polymer will be imported in solution and will not be isolated.
Density	1,000–1,200 kg/m^3*
Water Solubility	Not determined. Expected to have limited water solubility based on high molecular weight. However, the notified polymer may be water dispersible based on the presence of hydrophilic functionalities and its use in aqueous products.
Dissociation Constant	Contains ionisable functionalities. Therefore, the notified polymer has potential to be ionised under normal environmental conditions of pH (4–9).

Reactivity	Stable under normal environmental conditions.
Degradation Products	None under normal conditions of use.

*Avanse™ ST-410 containing the notified polymer at < 60% concentration

5. INTRODUCTION AND USE INFORMATION

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	10–30	10–30	10–30	30–60	30–60

Use

The notified polymer will be imported as a component of Avanse™ ST-410 at < 60% concentration and will undergo reformulation to produce finished coating products. The coating products containing the notified polymer will be used for clear or tinted application to wood/timber surfaces, for both industrial/professional and public 'Do-It-Yourself' (DIY) use. Application of products will be via brush or roller. Coating products containing the notified polymer are not intended to be applied by spray.

6. HUMAN HEALTH RISK ASSESSMENT

No toxicological data were submitted. The notified polymer meets the PLC criteria and is, therefore, assumed to be of low hazard. Once the coatings are dried, the notified polymer will be bound within the polymer matrix and will not be available for further exposure. However, the notified polymer has low water solubility and a relatively high molecular weight. Inhalation exposure to water insoluble polymers with high molecular weight has been linked with irreversible lung damage due to lung overloading and impaired clearance of the polymers from the lung, particularly following repeated exposure (US EPA, 2013). As the notified polymer will not be isolated from solution and spray application of coatings is not intended, inhalation exposure is not expected. Therefore, the risk of the notified polymer to occupational and public health is not considered to be unreasonable given the assumed low hazard and/or the assessed use pattern.

7. ENVIRONMENTAL RISK ASSESSMENT

No ecotoxicological data were submitted. Anionic polymers are known to be moderately toxic to algae. The mode of toxic action is over-chelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone. This is unlikely to apply to the notified polymer and, therefore, it is not considered to be an over-chelation hazard to algae. The notified polymer also contains potentially cationic functionality; however, the cationic charge density is low and the notified polymer is, therefore, not expected to be of concern to the aquatic environment.

During reformulation and repacking of paints and coatings, the notified polymer may be released to the environment as spills and container residues. These releases are expected to be collected, cured and sent to landfill.

The notified polymer will be used by both professional painters and DIY users. During use, paints and coatings containing the notified polymer are expected to be applied by brush and roller. It is expected that some of the coating product will be spilled during application and will typically entail landfill disposal. Residues containing the notified polymer on brushes and rollers are expected to be rinsed into containers and then allowed to cure along with the container residues before disposal, as solid wastes, to landfill. It is expected that ≤ 5% of the notified polymer used by DIY users may be incorrectly disposed of to the sewer, drains or ground from waste and washing of application equipment. Assuming the releases occurs nationwide and over the entire year, this is unlikely to lead to ecotoxicologically relevant concentrations of the notified polymer in the aquatic environment.

The fate of the coating cured on the substrate will be shared with the fate of the coated article, which ultimately is expected to be sent to landfill. In landfill, the notified polymer will be present as cured solids which will be neither bioavailable nor mobile. Furthermore, the notified polymer is not expected to bioaccumulate due to its high molecular weight. It is expected to eventually degrade in the environment to form oxides of carbon, nitrogen, and water vapour. Therefore, based on its assumed low hazard and assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

BIBLIOGRAPHY

US EPA (2013) High Molecular Weight Polymers in the New Chemicals Program, <www.epa.gov/oppt/newchems/pubs/hmwtpoly.htm>.