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November 1999

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION  
AND ASSESSMENT SCHEME**

**FULL PUBLIC REPORT**

**Modified ABS Resin Natural**

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 National Occupational Health and Safety Commission which also conducts the occupational health & safety assessment. The assessment of environmental hazard is conducted by the Department of the Environment and the assessment of public health is conducted by the Department of Health and Family Services.

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Director  
Chemicals Notification and Assessment

**FULL PUBLIC REPORT****Modified ABS Resin Natural****1. APPLICANT**

Dow Chemical Australia Ltd of Kororoit Creek Road ALTONA VICTORIA 3018 has submitted a notification statement in support of their application for an assessment certificate for Modified ABS Resin Natural under the provision of Synthetic Polymer of Low Concern.

**2. IDENTITY OF THE CHEMICAL**

Modified ABS Resin Natural is considered not to be a hazardous substance based on the nature of the chemical and the data provided. Therefore the chemical name, CAS number, molecular and structural formulae, molecular weight, spectral data, details of the polymer composition, exact import volume and specific use have been exempted from publication in the Full Public Report.

**Marketing Name:** Modified ABS Resin Natural

**3. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Appearance at 20°C and 101.3 kPa:</b>	cream-coloured opaque granules
<b>Melting Point:</b>	100 – 150°C
<b>Density:</b>	1 050 – 1 120 kg/m <sup>3</sup>
<b>Vapour Pressure:</b>	not applicable
<b>Water Solubility:</b>	< 1 mg/L
<b>Hydrolysis as a Function of pH:</b>	see notes below
<b>Flammability Limits:</b>	not flammable
<b>Autoignition Temperature:</b>	> 400°C

<b>Explosive Properties:</b>	not explosive
<b>Reactivity/Stability:</b>	stable – see notes below
<b>Particle Size Distribution:</b>	99.99% > 1 mm (2 – 3 mm in diameter and 3 – 4 mm long)

### Comments on Physico-Chemical Properties

The data provided for the notified polymer satisfies the criteria of Regulation 4A of the Industrial Chemicals (Notification and Assessment) Regulations for the notification category of Synthetic Polymer of Low Concern.

The polymer is presented as cream coloured, opaque granules (2-3 mm diameter by 3-4 mm length). The structure of the polymer does not indicate any reactive properties. Under the conditions of use the polymer will not undergo photo or thermal degradation.

Water solubility was not determined. However a study of the solution/extraction behaviour of the polymer conducted under OECD Guideline ENV/EPOC (96)8, 1996, indicated that the water solubility of the polymer was substantially less than 1 mg/L. In the study, the polymer was agitated in water for 48 hours then the dissolved organic carbon in solution was determined.

The new polymer contains pendant nitrile groups, which are susceptible to hydrolysis. However, the potential for hydrolysis in the environmental pH region (4<pH<9) is quite low and also would be precluded by the very low water solubility of the polymer.

## 4. PURITY OF THE CHEMICAL

**Degree of Purity:** > 99.6%

### Hazardous Impurities:

One of the monomers is on the NOHSC *List of Designated Hazardous Substances* (NOHSC, 1999) but at below the cut-off concentration. It is an experimental teratogen, skin and eye irritant and explosive in vapour form. It has a NOHSC exposure standard, that is included on the Material Safety Data Sheet (MSDS). Another ingredient present at 0.03% emits toxic fumes of oxides of sulphur when heated to decomposition (Sax and Richard, 1996). At the request of the notifier the identity of these two chemicals is accepted as exempt information.

**Additives/Adjuvants:** exempt information; none are hazardous substances

## 5. USE, VOLUME AND FORMULATION

The notified polymer will not be manufactured in Australia. It will be imported in sealed 25 kg polyethylene bags at more than one tonne per annum for the next five years. The polymer

will be imported as a solid granulated material to be used as medium impact injection moulding in industrial and automotive components.

## **6. OCCUPATIONAL EXPOSURE**

The notified polymer will be imported into Australia in sealed 25 kg polyethylene bags. The total import volume will be transported by road to a warehouse for storage prior to transportation to the manufacturing site. Waterside, transport and warehouse workers should not be exposed to the notified polymer except in the event of a spill.

Initially die moulding will be carried out on a pilot scale using approximately 1 000 kg of the notified polymer. During pilot scale operations the notified polymer is manually loaded into the machine hopper, then transferred by a screw valve to a heated chamber maintained between 240 to 260°C and introduced into the closed mould. The mould is then cooled to less than 80°C and the component containing the notified chemical is removed from the mould for inspection. During this process one operator and a supervisor will be exposed to the notified polymer and the operating time is considered intermittent and estimated to be approximately 40 hours, spread over several days. The manual transfer to the hopper potentially exposes the workers to the notified polymer. The moulding machine is a closed system. There is potential for workers to come into contact with hot surfaces. Workers are normally protected from the hot polymer during purging by means of a splashguard fitted to the machine. Fumes generated during moulding are trapped by an exhaust system attached to the moulding machine.

Much larger volumes of the chemical will be used during commercial production. During commercial production the notified polymer is transferred directly from the bags via a vacuum feed system to the hopper thus avoiding direct worker contact. The injection moulding process is automated. The commercial manufacturing process is essentially a closed system. However, some fumes may be generated if the notified polymer is allowed to remain in the heated barrel at the end of a shift and the temperature exceeds 260°C. During commercial manufacture, a single moulding machine or 2 or more automated machines will be handled by one worker.

Dermal, ocular and inhalation exposure is expected due to manual handling of the notified polymer during pilot scale operations. Exposure would be reduced during commercial production where the processes of transfer and manufacture are closed and automated.

The notifier states workers handling the notified polymer are provided with safety glasses, gloves and overalls. Workers involved in manual loading are required to wear an air-purifying (dust removal) respirator.

## **7. PUBLIC EXPOSURE**

The notified polymer is not available for sale to the general public. The potential for public exposure to the notified polymer during transport and moulding operations or from disposal is negligible. Articles made from the notified polymer are normally specialised components for use in automotive or industrial equipment. Although the public will make dermal contact

with moulded automobile parts containing the notified polymer, exposure will be negligible because of high molecular weight (> 1 000) and the cured state of the notified polymer in the finished products.

## **8. ENVIRONMENTAL EXPOSURE**

### **Release**

The polymer has the potential for environmental release during the loading process of the die or by accidental spillage during transport. During die testing and at maximum usage levels, the notifier anticipates less than 2% loss of the imported polymer at the manufacturing site.

### **Fate**

After completion of their intended end use, the moulded parts will generally be disposed of as waste solid in landfill. If granules of the raw resin are spilled, they may either be collected for use or disposed of in landfill. When deposited into landfill, the organic components of the resin (raw or end-use product) including the new polymer would be inert and immobile, but could nevertheless be expected to be very slowly degraded through the biological and abiotic processes operative in these facilities.

## **9. EVALUATION OF TOXICOLOGICAL DATA**

No toxicology data were submitted.

## **10. ASSESSMENT OF ENVIRONMENTAL EFFECTS**

No ecotoxicological data were provided.

## **11. ASSESSMENT OF ENVIRONMENTAL HAZARD**

The notified polymer in the product is expected to be environmentally inert due to its high molecular weight and low solubility. The majority of the polymer will be contained within the end-use product. The physical characteristics of low water solubility and low volatility suggest that the mobility of the polymer in the environment will be very limited. Should release occur during transport, the polymer should become immobile and remain associated with the soil/sediment layer where because of its stability, it will degrade slowly.

The low environmental exposure of the polymer as a result of the proposed use indicates the overall environmental hazard should be low.

## **12. ASSESSMENT OF PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY EFFECTS**

Polymer Modified ABS Resin Natural is accepted as a synthetic polymer of low concern and is considered to be of low hazard to human health. The polymer is of high molecular weight and should not cross biological membranes. The polymer is presented as granules. The amount of associated dust was not provided, however given the high percentage as large granules (> 1 mm) it should be small.

The MSDS for the polymer indicates that the only health hazard would result from physical injury from the solid form and dust. The MSDS further states that fumes from the treated polymer may cause adverse effects.

The occupational health risk posed to transport and storage workers is negligible, given the expected negligible exposure to the notified polymer under normal circumstances.

The greatest exposure to the notified polymer may occur during manual handling during pilot scale operations. As the notified polymer is manually loaded to the hopper there is potential for ocular contact and inhalation exposure to any generated dust. No health effects apart from minor irritation are expected. Commercial production involves essentially closed and automated processes. The moulding will typically be conducted using splash guard fitted machines under local exhaust ventilation, therefore inhalation exposure from this source is considered negligible. As exposure is controlled, no health effects are anticipated.

The MSDS lists the NOHSC exposure standards for the relevant constituent monomers and/or impurities.

The notified polymer is not available for sale to the general public. It will be used for industrial purposes and will enter the public domain as moulded automobile parts containing the notified polymer. Although members of the public will make dermal contact with moulded parts containing the notified polymer, exposure will be negligible due to low systemic exposure.

### **13. RECOMMENDATIONS**

To minimise occupational exposure to the notified polymer the following guidelines and precautions should be observed:

- Safety goggles should be selected and fitted in accordance with Australian Standard (AS) 1336 (Standards Australia, 1994) to comply with Australian/New Zealand Standard (AS/NZS) 1337 (Standards Australia/Standards New Zealand, 1992);
- Respiratory protection should be selected and fitted in accordance with AS/NZS 1715 (Standards Australia/Standards New Zealand, 1994) to comply with AS/NZS 1716 (Standards Australia/Standards New Zealand, 1994) ;
- Industrial clothing should conform to the specifications detailed in AS 2919 (Standards Australia, 1987) and AS 3765.2 (Standards Australia, 1990);

- Impermeable gloves or mittens should conform to AS 2161 (Standards Australia/Standards New Zealand, 1998);
- All occupational footwear should conform to AS/NZS 2210 (Standards Australia/Standards New Zealand, 1994);
- Spillage of the notified chemical should be avoided. Spillages should be swept up promptly and collected or use or disposal;
- Good personal hygiene should be practised to minimise the potential for ingestion;
- A copy of the MSDS should be easily accessible to employees.

#### **14. MATERIAL SAFETY DATA SHEET**

The MSDS for the notified chemical was provided in accordance with the *National Code of Practice for the Preparation of Material Safety Data Sheets* (National Occupational Health and Safety Commission, 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, secondary notification of the notified chemical shall be required if any of the circumstances stipulated under subsection 64(2) of the Act arise. No other specific conditions are prescribed.

#### **16. REFERENCES**

National Occupational Health and Safety Commission (1999) List of Designated Hazardous Substances [NOHSC:10005(1999)]. Australian Government Publishing Service, Canberra.

National Occupational Health and Safety Commission (1995) Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1033(1995)]. Australian Government Publishing Service, Canberra.

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

Sax N.I. and Richard L. Dangerous Properties of Industrial Materials, 7th Edition Van Nostrand Reinhold 1996.

Standards Australia (1987) Australian Standard 2919-1987, Industrial Clothing. Standards Association of Australia, Sydney.

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, Sydney.

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

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, Sydney/Wellington.

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

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, Sydney/Wellington.

Standards Australia/Standards New Zealand (1994), *Australian/New Zealand Standard 1715-1994, Selection, Use and Maintenance of Respiratory Protective Devices*, Standards Association of Australia Publ., Sydney, Standards Association of New Zealand Publ, Wellington.

Standards Australia/Standards New Zealand (1994), *Australian/New Zealand Standard 1716-1994, Respiratory Protective Devices*, Standards Association of Australia Publ., Sydney, Standards Association of New Zealand Publ, Wellington.



