

File No: PLC/219

April 2001

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION
AND ASSESSMENT SCHEME**

FULL PUBLIC REPORT

IBR Copolymer

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 Aged Care.

For the purposes of subsection 78(1) of the Act, copies of this full public report may be inspected by the public at the Library, National Occupational Health and Safety Commission, 92-94 Parramatta Road, Camperdown NSW 2050, between the following hours:

Monday - Wednesday	8.30 am - 5.00 pm
Thursday	8.30 am - 8.00 pm
Friday	8.30 am - 5.00 pm

Copies of this full public report may also be requested, free of charge, by contacting the Administration Coordinator on the fax number below.

For enquiries please contact the Administration Coordinator at:

Street Address: 92 -94 Parramatta Rd CAMPERDOWN NSW 2050, AUSTRALIA

Postal Address: GPO Box 58, SYDNEY NSW 2001, AUSTRALIA

Telephone: (61) (02) 9577 9514 FAX (61) (02) 9577 9465

Director
Chemicals Notification and Assessment

TABLE OF CONTENTS

FULL PUBLIC REPORT	3
1. APPLICANT	3
2. IDENTITY OF THE CHEMICAL.....	3
3. POLYMER COMPOSITION AND PURITY	3
4. PLC JUSTIFICATION.....	3
5. PHYSICAL AND CHEMICAL PROPERTIES.....	3
6. USE, VOLUME AND FORMULATION.....	4
7. OCCUPATIONAL EXPOSURE	5
8. PUBLIC EXPOSURE	6
9. ENVIRONMENTAL EXPOSURE.....	6
9.1. Release	6
9.2. Fate.....	6
10. EVALUATION OF HEALTH EFFECTS DATA	6
11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA.....	7
12. ENVIRONMENTAL RISK ASSESSMENT.....	7
13. HEALTH AND SAFETY RISK ASSESSMENT.....	7
13.1. Hazard assessment.....	7
13.2. Occupational health and safety.....	7
13.3. Public health.....	8
14. MSDS AND LABEL ASSESSMENT.....	8
14.1. MSDS	8
14.2. Label.....	8
15. RECOMMENDATIONS	9
16. REQUIREMENTS FOR SECONDARY NOTIFICATION.....	9
17. REFERENCES.....	10

FULL PUBLIC REPORT**IBR Copolymer****1. APPLICANT**

South Pacific Tyres of Hume Highway SOMERTON VIC 3062 (ABN 63 715 623 147) has submitted a notification statement in support of their application for an assessment certificate for the synthetic polymer of low concern (PLC) IBR Copolymer.

2. IDENTITY OF THE CHEMICAL

The chemical name, CAS number, molecular and structural formulae, molecular weight, spectral data and details of the polymer composition have been exempted from publication in the Full Public Report.

Marketing names: Budene Nissic, IBR Copolymer

3. POLYMER COMPOSITION AND PURITY

Details of the polymer composition have been exempted from publication in the Full Public Report.

4. PLC JUSTIFICATION

The notified polymer meets the PLC criteria.

5. PHYSICAL AND CHEMICAL PROPERTIES

Property	Result	Comments
Appearance	tan to red-brown coloured solid rubber stock	
Melting point:	not provided	
Glass transition temperature:	-47.5 to -39.5 °C	
Density	0.9 kg/m ³	(Murray, 2000)

Water solubility	<1 g/L	The water solubility of the notified polymer was attempted to be determined using the column elution method of OECD TG 105. An approximate solubility of <1 g/L was reported as no observable amount of the test substance was dissolved in the water (Murray, 2000). The true value is expected to be much lower.
Particle size	not determined	in slabs or bale form
Flammability	not highly flammable	(Murray, 2000)
Autoignition temperature	> 400°C	(Murray, 2000)
Explosive properties	not explosive	(Murray, 2000)
Stability/reactivity	not reactive	the notified polymer is designed to be chemically and environmentally inert
Hydrolysis as function of pH	not determined due to the low water solubility	the notified polymer does not contain any groups likely to hydrolyse under environmental conditions (pH 4-9)
Partition coefficient:	not determined due to the low water solubility	
Dissociation constant	not determined	dissociation is not expected as the notified polymer has no acidic or basic functionality

6. USE, VOLUME AND FORMULATION

Use:

The notified polymer will be used in the manufacture of rubber tyres.

Manufacture/Import volume:

The anticipated import volume is 15 tonnes per annum in the first year, 25 tonnes per annum in year 2 and 45 tonnes per annum thereafter.

Formulation details:

IBR copolymer will be imported into Australia as a synthetic rubber in the form of bales or slabs containing >90% notified polymer. Each bale is individually sealed and wrapped in polyethylene film, and collectively packed in sealed heavy-duty wooden cardboard or

aluminium containers. The rubber containers will be transported to 2 facilities/locations in Australia by truck or rail.

IBR copolymer will be mixed and blended with other components prior to moulding into tyres, and curing. The tyre manufacturing process is conducted using automated and self-contained machinery. The processing equipment operates at high temperatures (<200°C) and is equipped with exhaust ventilation systems designed to remove heat and rubber fumes. The finished tyres contain approximately 0.7 – 0.9 kg notified polymer.

7. OCCUPATIONAL EXPOSURE

Few details of the number of workers and no anticipated exposure times were provided by the notifier. The notified polymer will be used in 2 facilities/locations in Australia.

Exposure route	Exposure details	Controls indicated by notifier
<i>Formulation</i>		
<i>Plant operators (50-60 workers)</i>		
dermal	intermittent skin contact when charging the mixer (>90% notified polymer in baled synthetic rubber)	gloves and overalls
dermal	exposure to compounded rubber while monitoring the progress of the manufacturing process and cleaning the equipment (0.7-0.9 kg notified polymer in polymer batch)	gloves, overalls and eye protection; heat resistant gloves, body protection and face shield where contact with hot material is possible
<i>Transport and storage</i>		
<i>Truck Drivers</i>		
none	No exposure expected for deliveries of baled rubber and finished rubber tyres	none
<i>Storage Workers</i>		
none	The notified polymer will be handled in sealed containers and no exposure is expected except in the case of an accident	none

8. PUBLIC EXPOSURE

The notified polymer will be used as an ingredient in automobile tyres and is not available for sale to the public. The potential for public exposure to the notified polymer during transport, reformulation or disposal is assessed as negligible. However, some members of the public may make occasional dermal contact with tyres manufactured using the notified polymer.

9. ENVIRONMENTAL EXPOSURE

9.1. Release

Release to the environment may occur during transportation of the notified polymer, although it is unlikely that a container would be sufficiently damaged to allow environmental exposure.

During the manufacturing process release of solid waste material is expected to be minimal as it will be recycled or reused wherever possible. If final disposal of material containing the notified polymer is required, it can be safely disposed to sanitary landfill as inert solid waste.

The mixer is fitted with side dust collectors and fume extractors. Fumes are passed through a scrubber system before being emitted to the atmosphere. The dust from the dust collectors is recirculated at a low rate back to the mixer, and the water from the scrubber system exits the plant as a prescribed trade waste. No quantities for waste notified polymer have been supplied, but given the physical form of the polymer and the nature of the manufacturing process, waste is expected to be minimal.

A proportion of the notified polymer is expected to be lost onto the road surfaces by treadwear. Industry sources indicate the tread component of the average tyre weighs 1.65 kg and the treadwear of the tyre is approximately 0.016 g/km of travel or 0.064 g/km for the 4 tyres on an automobile. Therefore the polymer will be released in the environment in particulate form in a very dispersed manner.

9.2. Fate

The majority of the notified polymer will share the fate of the tyres at the end of their useful lives. Many used tyres are burnt as fuel in kilns or shredded and used to make various other articles such as rubber bricks. Others are disposed of directly to landfill. During incineration of waste or used rubber articles, the polymer will be destroyed by conversion to oxides of carbon and nitrogen and water vapour. Polymer disposed of to landfill is expected to remain intact as part of the vulcanised rubber matrix, and there are no known degradation products. A biodegradation test was not provided, but it is assumed that the polymer will undergo very slow degradation by biotic and abiotic processes.

10. EVALUATION OF HEALTH EFFECTS DATA

No toxicological data were submitted.

11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA

No ecotoxicological data were submitted.

12. ENVIRONMENTAL RISK ASSESSMENT

The release to the environment of the notified polymer from the manufacturing process is expected to be negligible, as recycling will occur wherever possible. Some release to water may occur from the scrubber system, but due to the insolubility of the polymer, the risk to the aquatic environment is considered to be low.

If the used rubber articles such as tyres are combusted as fuel, the polymer will be destroyed. In landfill the polymer is considered to be immobile and inert and will therefore not pose a risk to the environment.

Polymer entering the soil environment through tyre tread wear, tear or shredding and use in the manufacture of other items, will be highly dispersed. It is expected to be very slowly degraded through biotic and abiotic processes.

The environmental hazard from the notified chemical can be rated as low.

13. HEALTH AND SAFETY RISK ASSESSMENT

13.1. Hazard assessment

No toxicological information has been provided for the notified polymer. However, the notified polymer meets the PLC criteria and is unlikely to be a hazardous substance according to the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999).

The polymer is not reactive, and because of the high molecular weight, it is not expected to cross biological membranes.

The MSDS indicates that health effects such as minor skin irritation may occur on frequent or prolonged contact with skin.

13.2. Occupational health and safety

Under normal conditions of use, little occupational exposure is expected from the notified polymer. The notified polymer is in a form of synthetic rubber in bales or slabs which precludes inhalation exposure and skin absorption. Furthermore, tyre manufacture employs an automated and enclosed system. Intermittent skin contact with the baled rubber containing >90% of the notified polymer is possible when charging the mixer. Exposure to compounded rubber while monitoring the progress of the manufacturing process and cleaning the equipment can also occur. Skin protection is recommended to prevent frequent and prolonged contact with baled rubber and compounded rubber.

The major occupational hazard associated with the use of the polymer is the application of elevated temperatures during tyre manufacture. Precautions to minimise exposure such as worker protection against the hot molten rubber mixture containing the notified polymer is required. These include use of heat resistant gloves, body protection and face shield where risk of contact with hot material is possible. The manufacturing equipment is also equipped with exhaust ventilation systems designed to remove heat and rubber fumes.

The cured tyre contains a maximum of 0.9 kg notified polymer. Once the notified polymer is moulded into tyres and cured, it becomes unavailable for exposure.

Conclusion

IBR copolymer is not hazardous to human health and measures are in place to control occupational exposure. Therefore, the notified polymer is of low concern to occupational health and safety and no specific risk reduction measures are necessary.

13.3. Public health

The notified polymer is not available for sale to the public. Although members of the public may occasionally make dermal contact with tyres manufactured using the notified polymer, the risk to public health from the notified polymer is likely to be low because the notified polymer is unlikely to be bioavailable.

The notified polymer will not pose a significant hazard to public health when used in the proposed manner.

14. MSDS AND LABEL ASSESSMENT

14.1. MSDS

The MSDS of the notified polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994a). It is published here as part of the assessment report. The accuracy of the information on the MSDS remains the responsibility of the applicant.

14.2. Label

The label for the notified polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC, 1994b). The accuracy of the information on the label remains the responsibility of the applicant.

15. RECOMMENDATIONS

No specific precautions are required to control exposure to the notified polymer. However, in the interests of good occupational health and safety, the following guidelines and precautions should be observed:

- Protective eyewear, chemical resistant industrial clothing and footwear and impermeable gloves should be used during occupational handling of the notified polymer;
- 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;
- A copy of the MSDS should be easily accessible to employees.

If products containing the notified chemical are hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999), 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); and for occupational footwear, in AS/NZS 2210 (Standards Australia/Standards New Zealand, 1994a); and other internationally acceptable standards.

16. REQUIREMENTS FOR SECONDARY NOTIFICATION

Secondary notification may be required if:

- (i) any of the circumstances stipulated under subsection 64(2) of the Act arise. If any importer or manufacturer of the notified polymer becomes aware of any of these circumstances, they must notify the Director within 28 days; or
- (ii) the notified polymer is introduced in a chemical form that does not meet the PLC criteria.

17. REFERENCES

Connell D. W. (1990) General characteristics of organic compounds which exhibit bioaccumulation. In Connell D. W., (Ed) Bioaccumulation of Xenobiotic Compounds. CRC Press, Boca Raton, USA.

Murray, T. (2000) Determination of Physico-Chemical Properties of IBR Polymer. Study No. 31279. Test Facilities: Chemir/Polytech Laboratories, Maryland Heights and Safety Consulting Engineering, Inc., Schaumburg.

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

National Occupational Health and Safety Commission (1994b) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. Australian Government Publishing Service, Canberra.

National Occupational Health and Safety Commission (1995) Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment, [NOHSC:1003(1995)]. In: Exposure Standards for Atmospheric Contaminants in the Occupational Environment: Guidance Note and National Exposure Standards. Australian Government Publishing Service, Canberra.

National Occupational Health and Safety Commission (1999) List of Designated Hazardous Substances [NOHSC:10005(1999)]. 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 (1998) Australian/New Zealand Standard 2161.2-1998, Occupational protective gloves, Part 2: General requirements. Standards Association of Australia/Standards Association of New Zealand.