

File No PLC/607

17 March 2006

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

FULL PUBLIC REPORT

Polymer in TAGAT V20

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth) (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 Ageing, 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 Heritage.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at:

Library
Australian Safety and Compensation Council
25 Constitution Avenue
CANBERRA ACT 2600
AUSTRALIA

To arrange an appointment contact the Librarian on TEL + 61 2 6279 1162 or email ascc.library@dewr.gov.au

This Full 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:

Street Address:	334 - 336 Illawarra Road MARRICKVILLE NSW 2204, AUSTRALIA.
Postal Address:	GPO Box 58, SYDNEY NSW 2001, AUSTRALIA.
TEL:	+ 61 2 8577 8800
FAX	+ 61 2 8577 8888.
Website:	www.nicnas.gov.au

**Director
NICNAS**

TABLE OF CONTENTS

FULL PUBLIC REPORT.....	3
1. APPLICANT AND NOTIFICATION DETAILS	3
2. IDENTITY OF CHEMICAL	3
3. COMPOSITION	3
4. INTRODUCTION AND USE INFORMATION.....	4
5. PROCESS AND RELEASE INFORMATION	4
5.1. Operation Description.....	4
6. EXPOSURE INFORMATION	4
6.1. Summary of Occupational Exposure	5
6.2. Summary of Public Exposure	5
6.3. Summary of Environmental Exposure.....	5
6.3.1. Environmental Release	5
6.3.2. Environmental Fate.....	5
7. PHYSICAL AND CHEMICAL PROPERTIES	6
8. HUMAN HEALTH IMPLICATIONS.....	6
8.1. Toxicology.....	6
8.2. Human Health Hazard Assessment.....	6
9. ENVIRONMENTAL HAZARDS	6
9.1. Ecotoxicology.....	6
9.1.1. Discussion of observed effects.....	6
9.2. Environmental Hazard Assessment	7
10. RISK ASSESSMENT	7
10.1. Environment	7
10.2. Occupational Health and Safety	7
10.3. Public Health	7
11. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS.....	7
11.1. Environment	7
11.2. Human Health.....	7
11.2.1. Occupational health and safety	7
11.2.2. Public health.....	7
12. MATERIAL SAFETY DATA SHEET	8
12.1. Material Safety Data Sheet	8
13. RECOMMENDATIONS	8
13.1. Secondary Notification	8

FULL PUBLIC REPORT**Polymer in TAGAT V20****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

International Sales & Marketing Pty Ltd (ABN 36 467 259 314)
260 - 262 Highett Road
HIGHETT VICTORIA 3190

NOTIFICATION CATEGORY

Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical Name
CAS Number
Molecular and Structural Formula
Molecular Weight
Polymer Constituents
Residual Monomers/Impurities

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

No variation to the schedule of data requirements is claimed.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None.

NOTIFICATION IN OTHER COUNTRIES

TSCA Exempt Polymer (2003 USA) and Canada (DSL)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Polymer in TAGAT V20; Break-Thru EM V20; Tego Impuls 20, Sitren MR 870

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn)	Between 1000 and 10000
% of Low MW Species < 1000	< 10%
% of Low MW Species < 500	< 10%

3. COMPOSITION

PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</i>
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. INTRODUCTION AND USE INFORMATION

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

The notified polymer is imported in 25 kg and 200 kg drums in mixed FCLs.

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

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Tonnes</i>	20	35	50	75	100

USE

An emulsifier for oil/water systems in metal working fluids and a release agent for moulded products including precast concrete.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

The polymer in TAGAT V20 is manufactured in Germany and is shipped to Australia in 20' FCLs in 25 kg and 200 kg drums at a typical concentration of 97%. FCLs are offloaded at the dock and transported to contractor warehouses where drums are removed and stacked on pallets awaiting delivery to customers.

Metal Working Fluid Manufacture

When Polymer in TAGAT V20 arrives in Australia it is sold to various Metal Working Fluid companies that blend metal working fluids.

Polymer in TAGAT V20 is used as an ingredient in the formulation of a vegetable oil based metal working fluids to reduce the use of petroleum based fluids. Metal working fluids are used in controlled environments and are applied to work pieces, cutting tools, or grinding wheels to facilitate operations which involve highly automated cutting equipment or manually operated equipment to:

- lubricate the tool-workpiece interface
- reduce the amount of heat generated
- reduce tool wear
- improve surface finish
- keep the tool temperature down to prevent premature wear and damage
- keep the workpiece temperature down to prevent warpage or inaccurate machining dimensions
- provide a good finish on the workpiece
- wash away chips
- inhibit corrosion or surface oxidation

Precast Concrete Release Agent – Sitren MR 870

Sitren MR 870, a formulated product with the notified polymer present at 1.25%, has been sourced as an alternative release agent to achieve a superior quality product and eliminate any allergy related conditions to employees. It arrives in 20 L pails. The employee decants the product via a drum lift into sealed 200 L metal spray units and applies the product to the metal casting beds and formwork via light spraying through a metal wand. The decanting is done with a spillage kit which has spillage socks to absorb any spillage. The spillage collection drums are sent off to JJ Richards Waste Contractor as required.

6. EXPOSURE INFORMATION

6.1. Summary of Occupational Exposure

Dermal and ocular exposure can occur during certain formulation processes. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls (elimination/substitution, design/restructuring, isolation/enclosure, machine guarding, local exhaust ventilation system, general/dilution exhaust ventilation system) and personal protective equipment worn by workers.

6.2. Summary of Public Exposure

The notified polymer is intended only for use in industry and the public is only likely to be exposed in the event of a transport accident

6.3. Summary of Environmental Exposure

6.3.1. Environmental Release

The notifier indicates that if accidental spillage of the notified polymer occurs during the blending process it will be contained and soaked up with absorbent material before being transported off-site to an approved industrial facility for appropriate disposal. It is estimated that <3% (<3000 kg based on the maximum import volume of 100 tonnes) residues left in the import drum will be collected with other oil products and disposed of to approved oil disposal facilities. Drums are sent to approved drum reconditioning facilities where they are cleaned and waste residues collected for disposal.

The end-use of the notified polymer is as an emulsifier for oil/water systems in metal working fluids and a release agent for moulded products including precast concrete. The notifier indicates that whilst the fluids are used in closed loop baths and then disposed of to approved oil recycling facilities there is potential for exposure to the environment through spillage, inappropriate disposal and inefficient aerosol collection. These losses are either collected through exhaust systems and deposited onto cloth filters or may collect on surfaces and materials in the area. Wastes from the metal cut-offs and filings (<0.01%) can be collected and disposed to metal recycling facilities. The majority of the fluids are collected into a bath which is reused until contamination levels require regeneration. Cleaning of the equipment generally reuses the washings in the bath. Spent baths are either processed on site or collected for recycling. The emulsions in water based baths are split into the oil and water phase. The oil phase is collected and disposed through incineration predominantly. The water phase is either evaporated to remove water and create a sludge or pushed through filters to purify the water and then released to waste water. The notifier indicates that based on 100 tonnes volume usage per annum and 15% remains in the water phase, there will be 750 kg per site discharge per annum to water ways (based on 20 sites). This is said to be a worst case scenario because when oil/water metal working fluid emulsion is deliberately broken through the addition of salts, the notified polymer migrates to the oil phase and is disposed of along with other oil residues. The majority of the waste fluid is collected as an emulsion in the bath. The oil phase is disposed of through incineration producing carbon dioxide and water. The water phase will be discharged to the waterways.

Limited information is available on Australian metal working industry practices, particularly those for small and medium enterprises, relating to disposal of waste fluids. The problem for environmental exposure is the potential for inappropriate disposal of the notified chemical by small metal working companies. According to the EU Technical Guidance Document a worst case release to water could amount to 31.6% of the chemical used as water based fluids in the industries. As there are believed to be no significant differences in industry practices between Europe and Australia, this will be assumed in the initial worst case PEC calculation for Australia in the Risk Assessment Section.

In respect of the use as a precast concrete release agent, there would be a lower environmental release than for metal working fluids. No residual release agent will be left on the precast elements after they are lifted and delivered to sites as the cement adsorbs any residue. Therefore, the product will be confined to the manufacturing plant only. The spray tanks are never washed out as they are continually filled without wash out going down drains. Thus the PEC calculation is not considered for the proposed use.

6.3.2. Environmental Fate

The notified polymer is dispersible in water. It is considered to be not readily biodegradable. Due to its relatively high molecular weight, the notified polymer is unlikely to bioaccumulate in aquatic organisms. The notified polymer entering receiving waters is likely to become associated with the

sludge and sediment compartment. The hydrocarbon portions of the polymer are likely to be slowly degraded by biotic and abiotic processes.

7. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	TAGAT is an amber coloured liquid
Melting Point/Glass Transition Temp	Not applicable, decomposes at 330°C.
Density	≈ 1000 kg/m ³ at 20°C
Water Solubility	100 g/L at 20°C, dispersible. The solubility cannot be determined due to the formation of a stable emulsion. A separation of the water phase from the rest of the product could not be reached by any of the physical methods applied. However, based on the largely hydrophobic structure of the polymer the true water solubility is likely to be very low.
Reactivity	Stable under normal environmental conditions.
Degradation Products	None under normal conditions of use.

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

The following toxicological end-points were submitted:

<i>Endpoint</i>	<i>Result</i>	<i>Classified?</i>	<i>Effects Observed?</i>
Rat, acute oral LD50 > 2000 mg/kg bw	Not hazardous	no	no

The result was indicative of low hazard.

8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

9. ENVIRONMENTAL HAZARDS

9.1. Ecotoxicology

The following toxicological studies were submitted:

<i>Endpoint</i>	<i>Result and Conclusion</i>
Ready Biodegradability (OECD 301D, Biodegradation was determined with a non-adapted activated sludge for the notified polymer)	The notified polymer reached the 10% biodegradation level after an adaptation phase of 4 days. The pass level of biodegradation >60% was not reached in the 10-d window or after 28 days. The notified polymer is considered to be not readily biodegradable.
Daphnia Toxicity [<i>Daphnia magna</i>] (OECD 202 and EC guideline 92/69/C2 EEC L383 A/172).	48 h EC50 >100 mg/L. The notified polymer is considered to be not toxic to Daphnia.
Algal Toxicity [<i>Scenedesmus subspicatus</i>] (OECD 201)	72 h EbC50 = 341 mg/L 72 h ErC50 = 885 mg/L The notified polymer is considered to be not toxic to alga.

All results were indicative of low hazard.

9.1.1. Discussion of observed effects

The notified polymer in water was homogeneously dispersed and turbid throughout exposure for Daphnia and algae. No biologically significant effect was seen at the nominal concentration of 100 mg/L for Daphnia. The notified polymer was found to inhibit the growth of the fresh water green alga at concentrations >62.5 mg/L (biomass and growth rate).

9.2. Environmental Hazard Assessment

The results indicate that the notified polymer is not toxic to Daphnia and algae, indicative of low environmental hazard to the aquatic compartment.

10. RISK ASSESSMENT

10.1. Environment

The main environmental release will result from the discharge to sewer from use as metal cutting fluids. A calculated worst-case scenario daily PEC in the sewer effluent is 22 µg/L as a continental release in Australia. In calculating the PEC, the following were assumed: (1) usage of the maximum import volume of 100 tonnes is evenly distributed over a 365 day period; (2) usage is nationwide, with a population of 20 million contributing 200 L of water per person per day to the sewer, (3) there is no adsorption or degradation in the sewer prior to release and (4) will be released from small operators with a worst case release to sewer of 31.6% or 31.6 tonnes per year.

Based on the low toxicity of the notified polymer to Daphnia and algae, the PNEC is calculated to be >100 µg/L (>100 mg/L/1000) as only two trophic levels are available with the Daphnia 48 h EC50 of >100 mg/L as the toxicological end point. The Q value is calculated to be $22 / >100 = <0.22$, indicating an acceptable environmental risk.

For the proposed use as a precast concrete release agent, a lower environmental release than from metal working fluids would be expected. Thus there is unlikely to be an environmental risk from both use patterns.

10.2. Occupational Health and Safety

Occupational exposure is minimised by the use of appropriate personal protective equipment. The laboratory, manufacture and filling area are all well ventilated. Spills are to be contained immediately, absorbed onto absorbent material and cleaned up using appropriate personal protective equipment.

The OHS risk presented by the notified polymer is expected to be low. The notified polymer may be present in formulations containing hazardous ingredients. If these formulations are classified as hazardous to health in accordance with the NOHSC Approved Criteria for Classifying Hazardous Substances, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

10.3. Public Health

Public exposure is negligible. The product is primarily used in machining parts used in industrial automotive applications therefore no direct exposure is anticipated. There will be no exposure of the mould release agent. There is a minimum risk that the public may be exposed through transport incident and spillages external to a factory usage.

11. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

11.1. Environment

The polymer is not considered to pose a risk to the environment based on its reported use pattern.

11.2. Human Health

11.2.1. Occupational health and safety

There is Low Concern to occupational health and safety under the conditions of the occupational settings described.

11.2.2. Public health

There is Negligible Concern to public health when used in the proposed manner.

12. MATERIAL SAFETY DATA SHEET

12.1. Material Safety Data Sheet

The notifier has provided MSDS as part of the notification statement. The accuracy of the information on the MSDS remains the responsibility of the applicant.

13. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- 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.
- A copy of the MSDS should be easily accessible to employees.
- If products and mixtures containing the notified polymer are classified as hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances*, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Environment

Disposal

- The notified polymer should be disposed of by incineration.

Emergency procedures

- In case of spillage, the notified polymer should be taken up with absorbent material (eg sand, kieselguhr, universal binder). Dispose of absorbed material in accordance with the government regulations.

13.1. Secondary Notification

The Director of Chemicals Notification and Assessment must be notified in writing within 28 days by the notifier, other importer or manufacturer:

- (1) Under subsection 64(1) of the Act; if
 - the notified polymer is introduced in a chemical form that does not meet the PLC criteria.

or

- (2) Under subsection 64(2) of the Act:
 - if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required.