

File No: LTD/1215

11 November 2005

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

FULL PUBLIC REPORT

Quaternary ammonium salt in CP0200

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

1.	APPLICANT AND NOTIFICATION DETAILS	4
2.	IDENTITY OF CHEMICAL	4
3.	COMPOSITION.....	5
4.	INTRODUCTION AND USE INFORMATION.....	5
5.	PROCESS AND RELEASE INFORMATION.....	5
5.1.	Distribution, transport and storage.....	5
5.2.	Operation description.....	5
5.3.	Occupational exposure.....	6
5.4.	Release.....	6
5.5.	Disposal	7
5.6.	Public exposure.....	7
6.	PHYSICAL AND CHEMICAL PROPERTIES.....	7
7.	TOXICOLOGICAL INVESTIGATIONS	10
8.	ENVIRONMENT.....	10
8.1.	Environmental fate.....	10
8.2.	Ecotoxicological investigations	10
9.	RISK ASSESSMENT	11
9.1.	Environment	11
9.1.1.	Environment – exposure assessment.....	11
9.1.2.	Environment – effects assessment	11
9.1.3.	Environment – risk characterisation.....	11
9.2.	Human health.....	11
9.2.1.	Occupational health and safety – exposure assessment	11
9.2.2.	Public health – exposure assessment.....	12
9.2.3.	Human health – effects assessment.....	12
9.2.4.	Occupational health and safety – risk characterisation	12
9.2.5.	Public health – risk characterisation.....	12
10.	CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS	12
10.1.	Hazard classification.....	12
10.2.	Environmental risk assessment	12
10.3.	Human health risk assessment	13
10.3.1.	Occupational health and safety.....	13
10.3.2.	Public health.....	13
11.	MATERIAL SAFETY DATA SHEET	13
11.1.	Material Safety Data Sheet	13
11.2.	Label	13
12.	RECOMMENDATIONS.....	13
12.1.	Secondary notification	14
13.	BIBLIOGRAPHY	14

Quaternary ammonium salt in CP0200

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

BASF Coatings Australia Pty Ltd
51 McIntyre Rd Sunshine Vic 3020
ABN: 91 092 127 501

and

Akzo Nobel Pty Ltd
51 McIntyre Rd Sunshine Vic 3020
ABN: 91 000 017 354

NOTIFICATION CATEGORY

Limited-small volume: Chemical other than polymer, (1 tonne or less per year).

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical identity
Identity of impurities
Spectral data
Introduction Volume
Formulation details
Identity of end-use sites

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

The chemical has been notified in Japan and under the Toxic Substances Control Act in the United States.

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

The chemical is introduced in a solvent solution named CP0200

SPECTRAL DATA

METHOD	Infrared Spectroscopy
Remarks	Peaks consistent with expected functional groups

METHOD	Nuclear Magnetic Resonance (¹ H-NMR)
Remarks	Peaks consistent with proposed structure

METHODS OF DETECTION AND DETERMINATION

Remarks	The identity was confirmed using infrared spectroscopy and ¹ H-Nuclear Magnetic Resonance (see spectral data).
---------	---

3. COMPOSITION

DEGREE OF PURITY
> 99%

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS
All hazardous impurities are present below a total concentration of 1%.

4. INTRODUCTION AND USE INFORMATION

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

The notified chemical will not initially be manufactured in Australia, but will be imported as a solvent solution at a concentration of 25-30%. At a later date the notified chemical may be manufactured in Australia.

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>	< 1	< 1	< 1	< 1	< 1

USE
Additive in OEM automotive coating.

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, transport and storage

PORT OF ENTRY
Melbourne

IDENTITY OF MANUFACTURER/RECIPIENTS
Formulation of the automotive coating and potential future manufacture of the notified chemical will be carried out at Akzo Nobel Pty Ltd, Sunshine, VIC. Application of the coating will occur at car manufacturing sites in Victoria.

TRANSPORTATION AND PACKAGING
The notified chemical at a concentration of 25-30% will be imported in steel drums to the Akzo Nobel Pty Plant. The formulated coating product containing 1-5% notified chemical will be stored and transported in 200 L steel drums. Transport by road will be carried out by licensed transport carriers.

5.2. Operation description

Although initially the notified chemical will only be imported into Australia, there is the potential for manufacture to occur in the future. As such an operation description for both chemical manufacture and coating formulation has been included below.

Import

The chemical solution will be imported in 200 L steel drums and transported to the manufacturing plant in Victoria.

Notified chemical manufacture

Alternatively, the solvent solution containing 25-30% notified chemical will be manufactured in closed reactors. Following manufacture a sample will be removed for quality control purposes. When approved the chemical will be filtered and filled through fixed transfer lines into drums. The drums are stored until the chemical solution is required for reprocessing.

Coating Formulation

The solvent solution (containing 25-30% notified chemical) will be pumped from 200 L drums into the closed mixer. Following mixing with other ingredients, a sample of the coating formulation containing

1-5% notified chemical will be removed for quality control purposes. When approved, the formulated coating is filtered and filled into 200 L drums and stored in a warehouse prior to distribution to car manufacturing facilities

Coating Application

The coating formulation containing 1-5% notified chemical will be pumped via a fixed line into the application tank and mixed with other ingredients. A sample may be removed for quality control purposes. The coating containing 1-5% notified chemical will be sprayed onto car bodies by robots and operators in a dedicated ventilated, down draft spray area. Operators spray the coating onto specific areas of the car that are not coated by the robots. The coated cars travel through an oven where the coating is cured.

5.3. Occupational exposure

<i>Category of Worker</i>	<i>Number</i>	<i>Exposure Duration</i>	<i>Exposure Frequency</i>
Transport and warehousing (imported product)	12	2-4 hours/day	20-130 days/year
Manufacture and Formulation	32	1-8 hours/day	80-100 days/year
Transport and warehousing (formulated product)	10	1-2 hours/day	40-50 days/year
End use	17	1-2 hours/day	20 days/year

Exposure Details

Transport and warehousing workers may come into dermal and ocular contact with the notified chemical through accidental leaks and spillages of the drums and containers.

During manufacture and formulation, raw materials (including the chemical solution) are automatically added to the mixing vats. Mixing is an enclosed process and fixed lines are used to transport substances. Workers will wear impermeable gloves, eye protection and coats. Exposure from the notified chemical to these workers can occur by either dermal or ocular routes, however significant exposure will be limited due to the workplace practices and personal protective equipment used.

Throughout end use, spray painters may come into contact with the notified chemical through dermal, inhalation and ocular routes. The risk of exposure, however, will be minimal as application is done in a well ventilated, down draft spray booth with workers using protective equipment including vapour masks.

After application and once dried, the coating containing the notified chemical is cured into an inert matrix and the chemical is hence unavailable to exposure.

5.4. Release

RELEASE OF CHEMICAL AT SITE

Since initially the notified chemical will be manufactured overseas there will be no release in Australia due to its manufacture. Until it reaches the coating manufacturing site, release to the environment during shipping, transport and warehousing will only occur through accidental spills or leaks of the drums or steel packaged containers.

Potential chemical manufacture

When the notified chemical is manufactured in Australia, it would be expected that a maximum of 2% of the total volume produced per year would be released to the environment from the disposal of spilt material and equipment cleaning to landfill. The manufactured chemical solution would be stored in 200 L steel drums.

Coating Formulation

The notified chemical will undergo reformulation, where it is blended with other ingredients to form an automobile surface coating, and will be stored in 200 L steel drums. At the coating manufacturing site, the annual release of the notified chemical will be via the following points:

Spills	- less than 1%, up to 10 kg, to landfill
Import container residue	- less than 3%, up to 30 kg, likely to waste contractor
Equipment cleaning	- up to 1%, up to 10 kg to interceptor pit onsite.

During the coating formulation operations, it is anticipated that there will be minimal release of the notified chemical during manual transfer from the storage containers to the mixers and during filling of coating into containers or during blending since it is undertaken in enclosed systems. Spills will be within bunded areas and collected with inert absorbent material (eg sand) and placed in a sealable container ready for disposal. All generated washing effluent from the process equipment, including blending tanks and mixers, will go to an interceptor pit where the polymer would be collected in the solids/sludge, possibly by flocculation/precipitation, and then sent to landfill. The treated effluent, containing no or only small amounts notified chemical, will then enter the sewer under a Trade Waste Agreement.

RELEASE OF CHEMICAL FROM USE

Annual release of the notified chemical to the environment as a result of its use in the automotive industry will include:

Spills	- less than 1%, up to 10 kg, to landfill
Container residue	- less than 1%, up to 10 kg, to waste contractor
Overspray and Equipment cleaning	- up to 20%, up to 200 kg

All spills will be contained, collected with inert absorbent material (eg sand) and placed in a sealable container ready for disposal. The coating will be applied within specialised spray booths, generally by robots, therefore transfer efficiency will be quite high (approximately 80%). All overspray will be contained, collected and allowed to harden ready for disposal. Coating equipment will generally be cleaned with solvent. This effluent will be collected and allowed to harden before disposal.

Any coating residue in empty coating containers will be allowed to dry and then disposed of with the container to a licensed drum recycler.

5.5. Disposal

Any spilt material will be disposed of to landfill in sealed labelled containers.

Any solids wastes (containing up to 40 kg of notified chemical) produced during the coating and potential chemical manufacture, will be disposed of to landfill or possibly by incineration. Incineration of the notified chemical will produce water, oxides of carbon and nitrogen and inorganic salts.

Import and coating containers will be disposed of via a licensed drum recycler offsite, who will either incinerate any residues present or send them to landfill.

Any resultant overspray and cleaning effluent (up to 200 kg of notified chemical annually) from coating application will be allowed to harden and will then be disposed of to landfill along with any spilt material (up to 10 kg annually).

It is estimated that annually the proposed use pattern will produce up to 290 kg of solid wastes containing the notified chemical, which will be collected and sent to landfill or, possibly, incineration.

5.6. Public exposure

The notified chemical will not be available to the public. Members of the public will come into contact with the notified chemical once it is dried and cured, and not available for exposure.

6. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa Clear liquid (Product CP0200)

Melting Point/Freezing Point Not determined

Remarks Chemical is not isolated from solution.

Boiling Point Not determined.

Remarks	Chemical solution boils at around 115-120°C (From the MSDS, test report not seen by NICNAS)
Density	Not determined
Remarks	Chemical is not isolated from solution.
Vapour Pressure	Not determined
Remarks	Chemical is not isolated from solution.
Water Solubility	Not determined (5017 mg/L estimation)
Remarks	<p>Chemical is not isolated from solution. The notified chemical is expected to be highly water soluble due to the presence of a cationic functional group.</p> <p>Estimations using the EPIWIN estimation suite (v 3.12) (cationic surfactant class) gives a water solubility of 5017 mg/L based on the estimated log Pow.</p>
Hydrolysis as a Function of pH	Not determined.
Remarks	The notified chemical does not contain any functional groups that have the potential to hydrolyse.
Partition Coefficient (n-octanol/water)	log Pow = 1.26 (estimated)
METHOD	EPIWIN Estimation model (v 3.12) – cationic surfactant class
Remarks	This indicates that the notified chemical is hydrophilic.
Adsorption/Desorption	log K _{oc} = 3.083 (estimation)
METHOD	EPIWIN Estimation model (v 3.12) – cationic surfactant class
Remarks	Due to its charged nature the notified chemical will adsorb to soil and sediments.
Dissociation Constant	Not determined.
Remarks	The notified chemical is expected to remain fully dissociated due to the quaternary ammonium group.
Particle Size	Not determined.
Remarks	Chemical not isolated from solution.
Flash Point	Not determined.
Remarks	Chemical not isolated from solution.
Flammability Limits	Not determined.
Remarks	Chemical not isolated from solution.
Autoignition Temperature	Not determined.
Remarks	Chemical not isolated from solution.
Explosive Properties	Not predicted to be explosive. From examination of the structure, there are no chemical groups that would infer explosive properties, therefore the result has been predicted negative.

Remarks	Chemical not isolated from solution.
Reactivity	Notified chemical is expected to be stable under normal conditions of use.

7. TOXICOLOGICAL INVESTIGATIONS

No toxicity data were submitted

8. ENVIRONMENT

8.1. Environmental fate

No environmental fate data were submitted.

8.2. Ecotoxicological investigations

No ecotoxicity data were submitted.

9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

Initially, exposure will only occur due to use of the notified chemical as it will not be manufactured in Australia. It will be reformulated into coatings that will be used by specialist technicians in the automotive industry, i.e. will not be available for general consumer use. The proposed use pattern and waste management indicate that solid wastes (containing up to 290 kg annually of the notified chemical) resulting from the coating and potential chemical manufacture and coating use will be collected and sent to landfill or incineration. A small amount of the notified chemical may be present in the final effluent from the effluent treatment plant, which will be either returned to the sludge tank or released to sewer.

The notified chemical will interact with other coating components to form a stable chemical matrix and, once dry, is expected to be immobile and pose little risk to the environment. After the useful life of the coated article, the notified chemical will suffer the same fate as the article. If the article is recycled then the notified chemical will be destroyed during the heating process to release water vapour and oxides of carbon.

9.1.2. Environment – effects assessment

No ecotoxicity data were provided.

The notified chemical is cationic, a group known to display toxicity to aquatic organisms (Nabholz et al 1993). However, minimal exposure to the aquatic compartment resulting from the proposed use pattern indicates that the overall environmental hazard should be low.

Further, following application and curing, the notified chemical will be within an inert matrix and be unavailable to organisms. There is a potential for bioaccumulation due to its molecular weight. However, this is unlikely since it will adsorb to suspended organic material, sediments and soil due charged nature and will not be available for bioaccumulation.

9.1.3. Environment – risk characterisation

The notified chemical does not contain any functional groups which have the potential to hydrolyse in extreme pH conditions. It is expected to be readily biodegradable. Due to its charged nature, it is expected that the notified chemical will adsorb to soil and sediments.

Within a landfill environment, the notified chemical in the uncured state contained in waste from coating manufacture and coating application, has the potential to be mobile however would adsorb to the soil due to its cationic nature. It is expected to be readily biodegradable and will also breakdown rate due to biotic and abiotic processes.

During automobile recycling the chemical will be destroyed.

Adverse ecotoxicological effects to aquatic organisms are not expected due to the low aquatic exposure. The notified chemical is not likely to present a risk to the environment when it is stored, transported, used, recycled and disposed of in the proposed manner.

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

Chemical manufacture/coating formulation

The majority of the chemical manufacture/coating formulation process, including filling, is automated and hence exposure is expected to be negligible. In situations where contact to the notified chemical (concentration < 30%) could occur, exposure is expected to be low due to the use of engineering controls and PPE.

Coating Application

Dermal exposure to the notified chemical at a concentration of 1-5% could occur from contact with coating residues during transfer and cleaning operations. However, exposure is expected to be low due to the use of PPE. The majority of the spray application is automatic (by robots) and hence exposure to the notified chemical is not expected. Although there is potential for inhalation exposure where manual spray coating occurs, this is considered to be negligible due to the use of engineering controls (ventilated downdraft spray area) and respiratory PPE (vapour masks).

9.2.2. Public health – exposure assessment

Public exposure to the notified chemical is expected to be negligible as the notified chemical will not be directly available to the public. Although the public will come into contact with the exterior of car bodies coated with notified chemical, the notified chemical will be bound within an inert matrix and hence unavailable for exposure.

9.2.3. Human health – effects assessment

No toxicological data have been provided for the notified chemical and therefore the substance cannot be classified in accordance with the NOHSC Approved Criteria for Classifying Hazardous Substances (NOHSC, 2004).

The notified chemical is cationic. Most undiluted cationic surfactants structurally related to the notified chemical satisfy the criteria for classification as R22 Harmful if swallowed, R38 Irritating to skin and R41 Risk of serious damage to eyes (CETOX, 2001).

9.2.4. Occupational health and safety – risk characterisation

Due to the largely automated nature of the chemical manufacture and coating formulation processes and the relatively small quantities involved, minimal exposure to the notified chemical is expected and hence the risk to workers is expected to be low. Where contact with the notified chemical could occur (transfer of the notified chemical and formulated coating product, cleaning of the tanks and general maintenance), the use of PPE (impermeable gloves, eye protection and coats) and the concentration of the notified chemical (<30%) would limit exposure and thus the risk of adverse irritant effects.

Significant inhalation exposure to the notified chemical during spray application of the coating is not expected due to the use of engineering controls (ventilated downdraft spray area) and respiratory PPE (vapour masks). As such the risk to workers involved in spray application is expected to be low.

9.2.5. Public health – risk characterisation

Public exposure to the notified chemical is expected to be negligible and therefore the risk to public health is also expected to be negligible.

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

10.1. Hazard classification

No toxicological data have been provided for the notified chemical and therefore the substance cannot be classified in accordance with the NOHSC Approved Criteria for Classifying Hazardous Substances. However, based on the classification of similar chemicals, the following classification and labelling details should apply:

R22 Harmful if swallowed
R38 Irritating to skin
R41 Risk of serious damage to eyes

10.2. Environmental risk assessment

The chemical is not considered to pose a risk to the environment based on its reported use

pattern.

10.3. Human health risk assessment

10.3.1. Occupational health and safety

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

10.3.2. Public health

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

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS for CP0200 provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC 2003). It is published here as a matter of public record. The accuracy of the information on the MSDS remains the responsibility of the applicant.

11.2. Label

The label for CP0200 provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC 1994). The accuracy of the information on the label remains the responsibility of the applicant.

12. RECOMMENDATIONS

REGULATORY CONTROLS

Hazard Classification and Labelling

- Use the following risk phrases for products/mixtures containing the notified chemical:
 - Conc \geq 25%: R22; R38; R41
 - 20% \leq conc < 25%: R38; R41
 - 10% \leq conc < 20%: R41
 - 5% \leq conc < 10%: R36

CONTROL MEASURES

Occupational Health and Safety

- Employers should implement the following engineering controls to minimise occupational exposure to the notified chemical in formulated coating products:
 - Spray application should be conducted in a down draft spray booth.
- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified chemical as introduced and in formulated coating products:
 - Avoid skin and eye contact
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified chemical as introduced and in formulated coating products:
 - Impermeable gloves;
 - Overalls;
 - Chemical goggles/face shields for industrial spray painters;
 - Vapour respirators if required.

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 chemical 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

- The following control measures should be implemented by coating formulator to minimise environmental exposure during use of the notified chemical:
 - All process equipment and storage areas should be banded with process drains going to an on-site effluent treatment plant or collection tank.

Disposal

- The notified chemical should be disposed of to landfill or by incineration, where available.

Emergency procedures

- Spills/release of the notified chemical should be handled by containment and collection by absorbent material, then storage of absorbent material in sealable labelled container ready for disposal to landfill.

12.1. 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 Section 64(1) of the Act; if
 - the importation volume exceeds one tonne per annum notified chemical;

or

- (2) Under Section 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.

13. BIBLIOGRAPHY

- CETOX (2001) Environmental and health assessment of substances in household detergents and cosmetic detergent products, Environmental Project No. 615, Danish EPA 2001 Electronic Publication http://www.mst.dk/udgiv/Publications/2001/87-7944-596-9/html/default_eng.htm
- Nabholz JV, Miller P & Zeeman M (1993) Environmental Risk Assessment of New Chemicals Under the Toxic Substances Control Act (TSCA) Section Five. In: Landis WG, Hughes JS & Lewis MA eds, Environmental Toxicology and Risk Assessment. ASTM STP 1179. American Society for Testing and Materials, Philadelphia, p 49.
- NOHSC (1994) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.
- NOHSC (2003) National Code of Practice for the Preparation of Material Safety Data Sheets, 2nd edn [NOHSC:2011(2003)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.
- NOHSC (2004) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(2004)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

