File No: LTD/1902

May 2016

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

PUBLIC REPORT

Polymer 2 in Selemix Tinters

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 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 Department of the Environment.

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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 CHEMICAL	INTRODUCTION VOLUME	USE
LTD/1902	PPG Industries Australia Pty Ltd	Polymer 2 in Selemix Tinters	ND*	< 1 tonne per annum	Component of automotive paints

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification
As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System of Classification and Labelling of Chemicals* (GHS), as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

Human health risk assessment
Provided that the recommended controls are being adhered to, under the conditions of the occupational settings described, the notified polymer is not considered to pose an unreasonable risk to the health of workers.

When used in the proposed manner, the notified polymer is not considered to pose an unreasonable risk to public health.

However, the notified polymer is anticipated to degrade in the environment to release fluorinated degradants similar to perfluorohexanoic acid (PFHxA) that is known to be persistent. Due to environmental distribution of the persistent chemicals, the use of the notified polymer may lead to secondary human exposure to the fluorinated degradants via the environment. The notified polymer is proposed to replace perfluoroalkyl polymers that may release longer chain perfluorocarboxylic acids (PFCAs) in the environment. Longer chain PFCAs are known to be more hazardous to human health with higher bioaccumulation potential compared to shorter chain PFCAs. The overall human health risk posed by the notified polymer is anticipated to be less than that of the perfluoroalkyl polymers it replaces.

Environmental risk assessment
On the basis of the reported use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

However, the anticipated degradants of the notified polymer are chemically similar to the very persistent chemical, PFHxA. The assessed use pattern of the notified polymer does not control the release of breakdown products into the environment during use and after disposal and the long-term environmental risk profile of PFHxA is currently unknown. Consequently, the long-term risk profile for the notified polymer and its degradation products is unknown.

No environmental fate data or degradation studies were provided by the notifier. The persistence of chemicals similar to PFHxA in the environment is of concern because they have potential to be globally distributed. However, the ecotoxicological profile and bioaccumulation potential of PFHxA is considered to be less problematic when compared with long chain (C8 and above) perfluorocarboxylic acids, noting that current evidence suggests PFHxA is not bioaccumulative in aquatic ecosystems. Nonetheless, the introduction and use of chemicals that release very persistent fluorinated degradants upon degradation should be considered a short-term measure until suitable alternatives, with less persistent chemistry, are identified.

Recommendations

CONTROL MEASURES

Occupational Health and Safety

- A person conducting a business or undertaking at a workplace should implement the following engineering controls to minimise occupational exposure to the notified polymer as introduced in Selemix Tinters:
  - Local exhaust ventilation
  - Spray booth if spray application occurs

- A person conducting a business or undertaking at a workplace should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer as introduced in Selemix Tinters:
  - Avoid breathing in mists, vapours or aerosols

- A person conducting a business or undertaking at a workplace should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer as introduced in Selemix Tinters:
  - Respiratory protection

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

- Spray applications should be carried out in accordance with the Safe Work Australia Code of Practice for *Spray Painting and Powder Coating* (SWA, 2015) or relevant State or Territory Code of Practice.

- 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

- If the notified polymer or products containing the notified polymer cannot feasibly be disposed of using a technique that will destroy the notified polymer, disposal should be to landfill where leaching to the water compartment will be managed.

Emergency procedures

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

Regulatory Obligations

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 chemical 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 chemical, 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 polymer has a number-average molecular weight of less than 1,000;
- the polymer is intended to be used in products available to the public;
- additional information has become available to the person as to an adverse effect of the fluorinated degradation products of the polymer on human health or the environment;

or

(2) Under Section 64(2) of the Act; if
- the function or use of the polymer has changed from a component of automotive paints, or is likely to change significantly;
- the amount of polymer being introduced has increased, or is likely to increase, significantly;
- the polymer has begun to be manufactured in Australia;
- additional information has become available to the person as to an adverse effect of the polymer on occupational health and safety, public health, or the environment.

AICS Entry

- When the notified polymer is listed on the Australian Inventory of Chemical Substances (AICS) the entry is proposed to include the following statement(s):
  - This polymer has been assessed by NICNAS and there are specific secondary notification obligations that must be met. Potential introducers should contact NICNAS before introduction.

(Material) Safety Data Sheet
The (M)SDS of products containing the notified polymer provided by the notifier were reviewed by NICNAS. The accuracy of the information on the (M)SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

PPG Industries Australia Pty Limited (ABN: 82 055 500 939)
14-20 McNaughton Road
CLAYTON VIC 3168

NOTIFICATION CATEGORY
Limited: Synthetic polymer with Mn ≥ 1,000 Da.

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication: chemical name, other names, CAS number, molecular and structural formulae, molecular weight, analytical data, degree of purity, polymer constituents, residual monomers, impurities, additives/adjuvants, use details and import volume.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)
Variation to the schedule of data requirements is claimed for all physico-chemical properties

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
Selemix Tinters (products containing the notified polymer at < 0.1% concentration)

MOLECULAR WEIGHT
Number Average Molecular Weight (Mn) > 1,000 Da

ANALYTICAL DATA
Reference GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY
> 95%

DEGRADATION PRODUCTS
The notified polymer may potentially degrade to form 1-heptanol, 2,2,3,3,4,4,5,5,6,6,7,7-dodecafluoro- (dodecafluoroheptanol, CAS No. 335-99-9) or heptanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7-dodecafluoro- (dodecafluroheptylic acid, CAS No. 1546-95-8) that are similar to hexanoic acid, 2,2,3,3,4,4,5,5,6,6,6-undecafluoro- (PFHxA, CAS No. 307-24-4) and may be persistent in the environment.

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: imported as solutions in organic solvents

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Not determined	Imported in organic solutions
Boiling Point	Not determined	The imported solution has a boiling point of > 37.78 °C based on (M)SDS. The notified polymer would be expected to decompose prior to boiling.
Density	Not determined	The imported solution has a density of 1,070 kg/m^3 based on (M)SDS.
Vapour Pressure	< 1.3×10^{-9} kPa	Estimated based on the NAMW > 1,000 Da (US EPA, 2013)

Property	Value	Data Source/Justification
Water Solubility	Not determined	Expected to have limited solubility based on its predominantly hydrophobic structure and high molecular weight.
Hydrolysis as a Function of pH	Not determined	The notified polymer contains hydrolysable functionalities. However, no significant hydrolysis is expected to occur in the environmental pH range of 4 – 9.
Partition Coefficient (n-octanol/water)	Not determined	Expected to partition from water to n-octanol on the basis of its low predicted water solubility and predominantly hydrophobic structure.
Adsorption/Desorption	Not determined	The notified polymer is expected to be immobile in soil based on its high molecular weight and presence of ionic functionality which will adsorb to soil and sediment.
Dissociation Constant	Not determined	Contains ionisable functionalities. Therefore, the notified polymer is expected to be ionised at the environmental pH range of 4 – 9.
Flash Point	Not determined	The imported solution has a flash point of 32 °C (closed cup) based on (M)SDS. The notified polymer is expected to have a high flash point based on the estimated low vapour pressure and the partial fluorination.
Flammability	Not determined	The imported solution has following flammability limits based on (M)SDS: Upper: 10% Lower: 1%
Autoignition Temperature	Not determined	Expected to be relatively high based on the partial fluorination.
Explosive Properties	Not determined	Contains no functional groups that would imply explosive properties
Oxidising Properties	Not determined	Contains no functional groups that would imply oxidative properties

DISCUSSION OF PROPERTIES
No test data on physical and chemical properties of the notified polymer were provided. The notified polymer will not be isolated during manufacture and will be imported in organic solutions at concentrations < 0.1%.

Reactivity
The notified polymer is expected to be stable under normal conditions of use.

Physical hazard classification
Based on the submitted physico-chemical data depicted in the above table, the notified polymer cannot be recommended for hazard classification according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia.

5. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
The notified polymer will not be manufactured in Australia. It will be imported as a component in Selemix Tinters at concentrations < 0.1%.

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	< 1	< 1	< 1	< 1	< 1

PORT OF ENTRY
Melbourne

TRANSPORTATION AND PACKAGING
The notified polymer will be imported as a component in Selemix Tinters in either 1 or 3 L cans. The cans will be transported by road and/or railway.

USE
The notified polymer will be imported as a component of tinters at < 0.1% concentration for automotive paints. Selemix Tinters containing the notified polymer will be used at up to 50% concentration in the final paints; therefore the maximum final use concentration of the notified polymer in the paints will be < 0.05%.

OPERATION DESCRIPTION
Selemix Tinters containing the notified polymer at concentrations < 0.1% will either be directly distributed to industrial customers, or will be reformulated into finished paints with the notified polymer at concentrations < 0.05% for distribution.

At the reformulation sites the imported tinters will be transferred from the 1 L or 3 L cans into vats where they will be mixed with other raw materials to form the paints. Once blending is complete, quality assurance (QA) workers will take small samples for laboratory analysis. An automated and metered process will then be used to dispense the blended finished paints into individual packaging typically 10 and 20 kg steel cans.

The finished automotive paints containing < 0.05% notified polymer will be used by industry only. Spray is expected to be the main method of final application, and will be conducted in spray booths. Prior to spray applications, the final paints may be manually decanted and mixed.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

The notified polymer may undergo slow degradation in the environment. As such, most potential exposure to workers and the public is expected to be to the notified polymer itself, rather than to its degradation products. Exposure to the residual polyfluoroalkyl starting constituents and/or impurities of the notified polymer is also possible. Such exposure is limited by the low concentration of polyfluoroalkyl impurities in the notified polymer in the imported products and end-use products.

The notified polymer is a potential precursor for dodecafluoroheptanol and dodecafluroheptylic acid that are similar to PFHxA and may be persistent in the environment. This may lead to secondary human exposure to PFHxA-like chemicals. This exposure is unquantifiable.

6.1.1. Occupational Exposure

CATEGORY OF WORKERS

Category of Worker	*Exposure Duration (hours/day)*	*Exposure Frequency (days/year)*
Stevedores	2 – 3	5
Warehousing workers	4 – 8	5
Reformulation process workers	4	260
QA workers	4	260
Paint applicators	8	260
Maintenance workers and cleaners	8	260

EXPOSURE DETAILS

Transport and storage
Stevedores and warehousing workers will only handle sealed cans containing Selemix Tinters for distribution and storage. Exposure to the notified polymer for these workers is not expected unless the sealed packages are accidentally breached.

Reformulation
At the reformulation site, process workers may have the potential for exposure to Selemix Tinters containing the notified polymer at < 0.1% concentration during connection/disconnection of metered pumps to the imported cans. Quality assurance (QA) workers may come into contact with finished paints containing the notified polymer at < 0.05% concentration while sampling the blended mixture for laboratory analysis. The main routes for exposure for both reformulation process and QA workers are expected to be dermal and ocular. Based on the high molecular weight of the notified polymer with expected low vapour pressure, inhalation exposure to the

polymer is unlikely to occur unless aerosols are formed. As stated by the notifier, personal protective equipment (PPE), i.e. appropriate certified respirators, safety glasses with side shields, chemical resistant impervious gloves, and chemical-resistant protective clothing will be used by workers to minimise the potential for exposure.

End use
Prior to spray applications, the finished paints containing the notified polymer at < 0.05% concentration may be decanted and mixed manually.

During spray applications, paint applicators may have the potential for exposure to the notified polymer via inhalation, dermal and ocular routes. As stated by the notifier, spray applications will be conducted in spray booths equipped with exhaust ventilation and filtering systems. Workers are expected to wear spray suits with appropriate respirators in place. These control measures are anticipated to mitigate the potential for exposure during spray application.

Maintenance workers and cleaners may have the potential for exposure to residues of the final paints with the notified polymer at < 0.05% concentration when cleaning up equipment, spray booths, spills or leaks from the work processes. Exposure to the notified polymer for these workers is also expected to be mitigated through the use of PPE i.e. appropriate certified respirators, safety glasses with side shields, chemical resistant impervious gloves, chemical-resistant protective clothing and work boots.

6.1.2. Public Exposure
The Selemix Tinters and final paints containing the notified polymer will be used in industrial settings only and will not be made available to the public. Members of the public may come into contact with the notified polymer that has been applied and cured onto automotive bodies. However, once the final paint is cured, the notified polymer is expected to be bound within inert matrix and will not be available for exposure.

6.2. Human Health Effects Assessment
No toxicity data were submitted for the notified polymer.

The notified polymer is a polyacrylate with a Mn > 1,000 Da and low percentage (< 2%) of low molecular weight species (Mn < 500 Da). This type of polymers may generally be considered to be of low hazard. However, the notified polymer contains polyfluorinated carbon chains and fluorinated polymers have been known to cause lung injury, which is characterised by respiratory problems ranging from mild to severe effects associated with acute or repeated exposures. Uncertainties remain surrounding possible acute or chronic respiratory tract effects following acute or repeated exposures to the notified polymer.

Health hazard classification
As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS),* as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

Hazard implication of breakdown products
The notified polymer contains polyfluoroalkyl side-chains that may potentially degrade to form degradants with a polyfluorinated carbon chain length of 6. The notified polymer is proposed to replace polymers that are expected to breakdown to form degradants with perfluorinated carbon chain lengths ranging from 6 to 12. It has been known that the toxicokinetic and toxicological properties of fluorinated substances are generally becoming less favourable with increase of perfluoroalkyl carbon chain length. It has also been reported that the bioaccumulation potential of perfluorocarboxylic acids increases with perfluoroalkyl carbon chain length (Conder, 2008; Giesy 2010).

The notified polymer may potentially breakdown to form polyfluorinated degradants chemically similar to PFHxA. PFHxA is known to have a less hazardous human health profile compared to PFOA (NICNAS, 2015a). It is therefore inferred that the human health hazards associated with the expected breakdown products of the notified polymer are likely to be similar or less than those associated with PFOA or longer chain perfluorocarboxylic acids, which are known degradants of many perfluoroalkyl polymers currently on the market.

6.3. Human Health Risk Characterisation

6.3.1. Occupational Health and Safety

There are uncertainties surrounding possible acute or chronic respiratory tract effects from the notified polymer when inhaled. However, during the reformulation and end use, inhalation exposure of workers to the notified polymer is expected to be minimal due to the industrial nature of the processes, the presence of engineering controls (spray booths and local exhaust ventilations) and use of PPE including safety glasses, impervious gloves, chemical-resistant protective clothing and appropriate certified respirators.

Once the final paints are cured after end use, the notified polymer will be trapped in an inert polymer matrix and will not be available for further exposure.

Under the conditions of the occupational settings described, in the presence of engineering controls and PPE specified, the notified polymer is not considered to pose an unreasonable risk to occupational health.

Workers may also be exposed to per- and polyfluoroalkyl impurities of the notified polymer at low concentrations (< 0.1%), during reformulation. It is expected that the engineering controls and PPE utilised during these operations (as outlined above) will act to mitigate any risk associated with such exposure.

6.3.2. Public Health

The notified polymer is intended for industrial use only and therefore direct exposure of members of the public to the notified polymer is not expected. Once the final paints containing the notified polymer are cured, the polymer is expected to be bound within inert matrix and will not be available for exposure. When used in the proposed manner, the notified polymer is not considered to directly pose an unreasonable risk to public health.

Risk from exposure to degradants

The public may potentially be exposed indirectly to the environmentally persistent, fluorinated degradants of the notified polymer, such as dodecafluoroheptanol and dodecafluroheptylic acid, chemically similar to PFHxA. The long term significance and magnitude of such exposure remain unknown. However, available data indicates that PFHxA has reduced toxicological properties and bioaccumulation potential compared to the long chain perfluoroalkyl substances such as PFOA that are known breakdown products of perfluoroalkyl polymers currently in Australian commerce. The notified polymer is proposed to replace polymers containing perfluoroalkyl carbon chain lengths ranging from 6 to 12. Based on the proposed replacement, it is anticipated that the risk to human health from indirect exposure to breakdown products of overall perfluoroalkyl substances would decrease following the introduction of the notified polymer.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1. Environmental Exposure

RELEASE OF CHEMICAL AT SITE

The notified polymer will not be manufactured in Australia; therefore, there will be no release from this activity. Environmental release during importation, transport and distribution may occur as a result of accidental spills. In the event of a spill, the notified polymer is expected to be contained and collected with an inert absorbent material and disposed of in accordance with local regulations.

Reformulation of the notified polymer occurs in a closed system and release to atmosphere is expected to be negligible. Solvent used for equipment washing containing residues of the notified polymer are expected to be recycled for reuse on site or disposed of via accredited waste disposal contractors. Wastes and spills (estimated < 1% of annual import volume) during reformulation activities are expected to be contained on-site and disposed of in accordance with local regulations. Residues in import containers are expected to be disposed of via the trade waste stream of the formulator in accordance with local regulations.

RELEASE OF CHEMICAL FROM USE

Paint products containing the notified polymer are expected to only be used in industrial facilities. Therefore, any losses from overspray (estimated at 30% of annual import volume) during industrial use are expected to be collected using standard engineering controls such as spray booths. These losses, together with other wastes

generated during use, including residues in application equipment washings and empty paint containers are expected to be disposed of in accordance with local regulations.

RELEASE OF CHEMICAL FROM DISPOSAL
The notified polymer in paints is expected to share the fate of the automotive parts to which it has been applied. The notified polymer is likely to be either thermally decomposed during metal reclamation processes or disposed of to landfill at the end of the useful life of the article to which it has been applied.

7.1.2. Environmental Fate
No environmental fate data were submitted. The majority of the notified polymer is expected to be bound within an inert matrix of cured paints as part of its use pattern as a component in automotive paints. The majority of notified polymer in wastes disposed of to landfill is expected to be in solid cured paint and it is not expected to be bioavailable, biodegradable nor mobile in this form. Based on the high molecular weight of the notified polymer, it is not likely to cross biological membranes, hence bioaccumulation is not expected. Furthermore, bioaccumulation of the notified polymer is unlikely due to limited bioavailability in its solid form in landfill and its limited release to surface waters during use. The notified polymer will eventually degrade in landfill or by thermal decomposition during metal reclamation processes, to form water and oxides of carbon and degradation products containing polyfluoroalkyl functionality. The expected initial polyfluoroalkyl degradation products are assumed to undergo further degradation to form substances similar to 6:2 fluorotelomer alcohols (FTOH) and PFHxA among other compounds. It is noted that some volatile degradation intermediates have the potential to undergo long range atmospheric transport and thus may result in translocation of persistent substances in the environment.

Chemicals similar to PFHxA are expected to be recalcitrant in the environment, and potentially undergo long range transport while mainly staying in the water column. In water, they are expected to be very persistent and will not undergo hydrolysis photolysis or biodegradation.

High-temperature incineration is the preferred method of disposal of poly- and perfluoroalkyl chemicals (and polymers) due to the environmental persistence characteristics, when it results in mineralisation of the perfluoroalkyl functionality to oxides of carbon and hydrofluoric acid. Incomplete combustion of perfluoroalkyl functionality may produce an array of partially oxidised fluorocompounds. Therefore, disposal of the notified polymer and its degradation products by incineration should only take place at facilities that demonstrate complete combustion of the perfluoroalkyl functionality and have adequate measures in place to control release of hydrofluoric acid.

The long-chain perfluorinated acid, perfluorooctanoic acid (PFOA), and its ammonium salt, have been categorised as persistent, bioaccumulative and toxic (PBT) substances according to domestic environmental hazard criteria. Chemicals with these hazard characteristics are of high concern to the environment and PFOA (and substances which may degrade to PFOA) are subject to increasingly stringent regulatory controls in other developed countries. However, the short-chain perfluorocarbons have been assessed as being of lower overall concern to the environment based on the available information (NICNAS, 2015b).

Monitoring data have identified 6:2 FTOH and PFHxA in the environment. A study conducted in Canada showed that the volatile 6:2 FTOH is found in outdoor air, in concentrations ranging from 29 picograms per cubic metre (pg/m^3) in a rural environment to 87 pg/m^3 in a highly urbanised location. Another study conducted in Germany reported environmental concentrations of 6:2 FTOH in the air ranging from 17 to 149 pg/m^3. PFHxA has been detected in Australia in the water of Sydney Harbour at a concentration of 2.9 nanograms per litre (ng/L). However, it is noted that there are multiple potential sources for 6:2 FTOH and PFHxA in the environment including past industrial use of other fluorinated chemicals contaminated with these substances, use in articles or from the use of other fluorinated chemicals which degrade to these substances in the environment (NICNAS, 2015b).

7.1.3. Predicted Environmental Concentration (PEC)
The PEC has not been calculated for the notified polymer because, based on its reported use pattern (including during reformulation), significant quantities are not expected to be released to the aquatic environment.

7.2. Environmental Effects Assessment
No ecotoxicity data were submitted. The notified polymer contains anionic groups and therefore may be toxic to algae. However, the notified polymer is expected to have low water solubility and very limited aquatic exposure is expected due to its use pattern.

With reference to degradants, the currently available data for the short-chain perfluorocarbons are summarised in the IMAP Environment Tier II assessment for Short-Chain Perfluorocarboxylic acids and their direct precursors. Based on data for PFHxA and perfluorobutanoic acid (PFBA), all short-chain perfluorocarboxylic acids, including perfluoropentanoic acid (PFPeA), were categorised as not Toxic (Not T) according to domestic environmental hazard criteria (NICNAS, 2015b).

7.2.1. Predicted No-Effect Concentration

A predicted no-effect concentration (PNEC) has not been calculated for the notified polymer as, based on its reported use pattern, significant quantities are not expected to be released to the aquatic environment.

7.3. Environmental Risk Assessment

The risk quotient (Q = PEC/PNEC) for the notified polymer has not been calculated because release to the aquatic environment in significant quantities is not expected based on its reported use pattern as a component in automotive paints. The majority of the environmental release of the notified polymer will be disposal of the cured paints to landfill and by thermal decomposition during metal reclamation processes. In cured paints the notified polymer is bound within the inert paint matrix and is unlikely to leach or be bioavailable. Therefore, on the basis of its limited aquatic exposure and assessed use pattern, the notified polymer is not expected to pose an unreasonable risk to the environment.

Conclusions

On the basis of the assumed low hazard and assessed use pattern, the notified polymer is not considered to pose an unreasonable short-term risk to the environment. However, when the notified polymer is disposed of to landfill, it is expected to very slowly degrade and, potentially, form the persistent chemicals similar to perfluorohexanoic acid (PFHxA). The assessed use pattern of the notified polymer does not control the release of breakdown products into the environment after disposal and the long-term environmental risk profile of PFHxA is currently unknown. Consequently, the long-term risk profile for the notified polymer and its degradation products is unknown.

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