Inventory on the use of PFOS in the Netherlands

Ministerie I&M

9 juli 2013
Final Report
9Y3461

Royal HaskoningDHV
Enhancing Society Together

HASKONINGDHV NEDERLAND B.V.
INDUSTRY, ENERGY & MINING

Barbarossastraat 35
Postbus 151
Nijmegen 6500 AD
The Netherlands
+31 24 328 42 84 Telephone
info@rhdhv.com E-mail
www.royalhaskoningdhv.com Internet
Amersfoort 56515154 CoC

Document title	Inventory on the use of PFOS in the Netherlands
Document short title	Inventory of PFOS
Status	Final Report
Date	9 juli 2013
Project name	Inventarisatie omvang PFOS toepassingen in Nederland
Project number	9Y3461
Client	Ministerie I&M
Reference	9Y3461/R0001/902055/Nijm

Drafted by	Judith Dijkers	
Checked by	Maartje Kleintjes	
Date/initials check	9 juli 2013	pp
Approved by	Marko Appel	
Date/initials approval	9 juli 2013	

SUMMARY

Introduction

The Stockholm Convention on Persistent Organic Pollutants (POP) describes the allowed type of uses of Perfluoro Octane Sulfonate (PFOS) within the EU. The Ministry of Infrastructure and Environment is responsible for reporting the use of PFOS in the Netherlands. This inventory is aimed at answering the following questions:

- What is the amount of PFOS used in the Netherlands per allowed type of use?
- What are developments regarding replacement of PFOS?
- What is the situation regarding the prohibited use of PFOS containing fire-fighting foam?

Methods

This inventory started with a desk study, aimed at gathering relevant information on PFOS and obtaining contact data from relevant branch organisations, suppliers, producers and users. Several branch organisations, suppliers or producers have been contacted by telephone to gather information about characteristics of the branch (related to the use of PFOS) and relevant developments. Users of PFOS have been contacted by email with a questionnaire which was aimed at obtaining information about the use of PFOS in 2012. In addition, the Human Environment and Transport Inspectorate has been contacted to assess whether the database for the import of goods ('SAGITTA') contains useful information about PFOS.

Results

The overall response to the questionnaire was 55% (21 out of 38 questionnaires). Additionally, qualitative information has been obtained through personal contact with branch organisations and suppliers. The table on the next page shows the results of the inventory.

Regarding the question about the prohibited use of PFOS containing fire-fighting foam, it seems that the awareness within the industry is high on this subject. There is a lot of attention for the replacement of PFOS foam with non-PFOS foam. Phase-out seems just about finished.

The reliability of the results on the use of PFOS should be interpreted on a qualitative level. Information from personal contacts with branch organisations and large companies support the results. However, the inventory is subject to uncertainty due to lack of data from non-respondents.

	Industry	Type of use	Total reported amount of used PFOS in 2012	Response	Coverage of market share within the industry	Estimated use of PFOS within the industry	Alternatives
1+4	Metal plating industry	Mist suppressants	43.5-44.8 kg*	11 out of 20** (6 no PFOS)	about 30%***	145-150 kg****, *****	Alternatives are on the market, but switching is not possible for all processes. This is due to both health & safety and quality requirements.
2	Semi-conductor industry	Photo-resist or anti-reflecting coatings	0,7 kg	4 out of 12 (3 no PFOS)	Large	In the order of several kilograms	Alternatives are on the market, but there are many different products. Therefore, more time is needed to develop a full range of qualitatively comparable alternatives.
3	Photographic industry	Photolithographic procedures	0 kg	4 out of 4 (4 no PFOS)	Low	0 kg	Within the industry, new techniques have been developed which do not require PFOS.
5	Aviation industry	Hydraulic fluids	0 kg	2 out of 2 (2 no PFOS)	High	0 kg******	Not applicable.

* One respondent reported a substantially higher use (38 kg) than the other respondents. This respondent uses an unusually high amount of a product containing a high concentration of PFOS compared to the other respondents. One respondent reported its use of PFOS containing product in liters. From its concentration the actual PFOS use was estimated at 1.6 kg for this respondent.

** Although 37 companies have been invited to respond to the questionnaire, only 20 of those companies are working with Chrome plating. Therefore, the response has been calculated based on a potential group of 20 relevant companies.

*** Estimation is based on personal communication about the market coverage of all companies within the branch organization, which is about 60%. Combined with a response of 50%, this leads to an estimation of 30% coverage of market share within the industry.

**** This is a worst-case estimation, calculated as follows: Total used PFOS/market coverage. In this calculation, it is assumed that the density of liquid PFOS is 1 kg/L.

***** Atotech and Enthone are two large suppliers within this industry. Both companies offer PFOS-free alternatives.

****** Eastman/Solutia seems to be the largest supplier within this industry and offers a PFOS-free hydraulic fluid.

CONTENTS

1 INTRODUCTION

1.1 Context

The Stockholm Convention on Persistent Organic Pollutants (POP) is aimed at reducing and eventually eliminating environmental pollution by POPs. This Convention defines which substances are indicated as POP and provides regulation for production, import and export. Perfluoro Octane Sulfonate (PFOS) is a POP and its use is restricted to a limited number of types of uses. The allowed types of uses in the European Union are described in the Stockholm Convention and in the European regulation on POP.

Presently, the following types of uses are allowed in the EU:

1. Wetting agents for use in controlled electroplating systems
2. Photo-resist or anti-reflecting coatings for photolithographic procedures
3. Photographic coatings for films, paper or press plates
4. Mist suppressants for non-decorative hard chromium (VI) plating in closed loop systems
5. Hydraulic fluids for aviation

The use of PFOS containing fire-fighting foam has been prohibited as from the 27th of June 2011.

The Ministry of Infrastructure and Environment is responsible for reporting the use of PFOS in the Netherlands. Royal HaskoningDHV has been asked to gather information on the use of PFOS.

1.2 Goals of this study

This study is aimed at answering the following questions:

- What is the amount of PFOS used in the Netherlands per allowed type of use?
- What are developments regarding replacement of PFOS?
- What is the situation regarding the prohibited use of PFOS containing fire-fighting foam?

2 METHODS

This chapter describes the way the study has been executed.

2.1 General approach

The general approach consists of three elements:

- Desk study, aimed at gathering relevant information on the subject and obtaining contact data from relevant branch organisations, suppliers, producers and users;
- Contacting branch organisations, suppliers or producers, aimed at gathering information about characteristics of the branch (related to the use of PFOS) and relevant developments;
- Contacting companies through email with a questionnaire. Appendix 1 contains the questionnaire and accompanying mail (in Dutch only).

In addition to this general approach, the Human Environment and Transport Inspectorate has been contacted to assess whether the database for the import of goods ('SAGITTA') contains useful information about PFOS.

2.2 Specific approach per type of use

In addition to the general approach, the method has been specified per type of use in order to define the target groups for the study.

	Type of use	Target groups for the study
1	Wetting agents for use in controlled electroplating systems	Metal plating industry; hard chroming and decorative chroming; open system or closed loop
2	Photo-resist or anti-reflecting coatings for photolithographic procedures	Semi-conductor industry
3	Photographic coatings for films, paper or press plates	Photographic industry
4	Mist suppressants for non-decorative hard chromium (VI) plating in closed loop systems	Metal plating industry; hard chroming; closed loop
5	Hydraulic fluids for aviation	Aviation industry
6	PFOS containing fire-fighting foam (prohibited use as from the 27th of June 2011)	Branch organisation for fire-fighting foam

Approach Metal Plating industry (use 1 and 4):

1. Contact by telephone with the branch organisation for electroplating industry: "Vereniging voor ondernemingen in de galvano-technische industrie, NGO-SBG";
2. Contact by telephone with two suppliers within the electroplating industry;
3. Attendance of a face-to-face meeting with the technical committee of NGO-SBG. The inventory of PFOS was put on the agenda;
4. 37 Companies, of which 20 potential users of PFOS, have been invited by email to respond to the questionnaire. Contact data has been provided by the NGO-SBG;
5. Subsequently, non-responding companies were reminded by e-mail to fill in the questionnaire.

Approach Semi-conductor industry (use 2):
1. Search on internet for branch organisation and relevant companies;
2. The branch organisation “SEMI” has been contacted for input;
3. One large company has been contacted by telephone for information about the branch;
4. 12 Companies have been invited by email to respond to the questionnaire;
5. Subsequently, non-responding companies were reminded by e-mail to fill in the questionnaire.

Approach Photographic industry (use 3):
1. Contact by telephone with two large companies and two smaller ones. One large company was not based in the Netherlands anymore and was therefore excluded from this study;
2. 3 Companies have been invited by email to respond to the questionnaire;
3. In addition to the questionnaires, there has been contact by telephone with one company specialised in X-ray photography;
4. Subsequently, non-responding companies were reminded by email and by telephone to fill in the questionnaire.

Approach aviation industry (use 5):
1. Contact with two branch organisations for information on the use of PFOS within the aviation industry: “Air Cargo Netherlands” and “Netherlands Aerospace Group”;
2. Two companies have been invited by email to respond to the questionnaire;
3. Subsequently, non-responding companies were reminded by email and by telephone to fill in the questionnaire;
4. Contact by telephone with the producer of the product which is in use in this industry.

Approach fire-fighting foam (use 6):
1. Desk study on information about fire-fighting foam that is provided by suppliers;
2. Contact by e-mail with the branch organisation “VEBON”;
3. Contact by telephone and e-mail with the Ministry of Defence.

3 RESULTS

This chapter describes the results obtained during this study. The estimated use of PFOS containing products is grouped per type of use and is accompanied by information about the number of contacted companies and the response rate. The following table contains an overview of the results.

	Industry	Type of use	Total reported amount of used PFOS in 2012	Response	Coverage of market share within the industry	Estimated use of PFOS within the industry
1+4	Metal plating industry	Mist suppressants	43.5-44.8 kg *	11 out of 20** (6 no PFOS)	about 30%***	145-150 kg****, *****
2	Semi-conductor industry	Photo-resist or anti-reflecting coatings	0,7 kg	4 out of 12 (3 no PFOS)	Large	In the order of several kilograms
3	Photographic industry	Photolithographic procedures	0 kg	4 out of 4 (4 no PFOS)	Low	0 kg
5	Aviation industry	Hydraulic fluids	0 kg	2 out of 2 (2 no PFOS)	High	0 kg******

* One respondent reported a substantially higher use (38 kg) than the other respondents. This respondent uses an unusually high amount of a product containing a high concentration of PFOS compared to the other respondents. One respondent reported its use of PFOS containing product in liters. From its concentration the actual PFOS use was estimated at 1.6 kg for this respondent.

** Although 37 companies have been invited to respond to the questionnaire, only 20 of those companies are working with Chrome plating. Therefore, the response has been calculated based on a potential group of 20 relevant companies.

*** Estimation is based on personal communication about the market coverage of all companies within the branch organization, which is about 60%. Combined with a response of 50%, this leads to an estimation of 30% coverage of market share within the industry.

**** This is a worst-case estimation, calculated as follows: Total used PFOS/market coverage. In this calculation, it is assumed that the density of liquid PFOS is 1 kg/L.

***** Atotech and Enthone are two large suppliers within this industry. Both companies offer PFOS-free alternatives.

****** Eastman/Solutia seems to be the largest supplier within this industry and offers a PFOS-free hydraulic fluid.

Relevant developments within the different industries are described in the following section.

Metal plating industry

Process description

Within this industry, Chrome plating takes place with Chromium III (decorative chroming) or Chromium VI (decorative and non-decorative chroming). The latter is very toxic to humans and thus to workers. During the process of chroming, chromic acid mists can arise above the Chrome plating bath. PFOS is very effective in lowering the surface tension and can therefore prevent the generation of mists. PFOS offers a solution for an occupational problem: reduction of exposure of workers to toxic mists. That is the reason why PFOS is added to mist suppressants.

Use of PFOS

The estimated worst-case use of PFOS within the metal plating industry is 145-150 kilogram.

In a previous study by the National Institute for Public Health and the Environment, researchers estimated the use of PFOS for non-decorative hard chromium (VI) plating to be 390 kg/year (worst-case maximum)[1]. This previous study is not completely comparable with this inventory, due to differences in approach and research questions. For this reason, comparison of the results should be done with caution. The current results indicate a decrease of the worst-case estimate of the use of PFOS in this branch. However, this decrease cannot be quantified with sufficient certainty.

Alternatives

Suppliers do offer PFOS-free products. However, not all processes are suitable for the use of PFOS-free mist suppressants/wetting agents. Main reason is the reduced quality of Chrome plating with PFOS-free products. Another important reason is that the reduction of surface tension by alternatives is lower and could therefore lead to higher exposure to chromium (VI) for the worker.

In some processes[2], it is possible to switch from Chromium VI to Chromium III. Exposure to Chromium III is less toxic to workers compared with Chromium VI. Therefore, from an occupational point of view, there is less need for PFOS. When a company switches from Chromium VI to Chromium III, this is often accompanied by abandoning the use of PFOS.

Relevant observations

- Respondents do not always know exactly whether their process is open or closed. Emissions to the environment are being minimalized with the Best Available Techniques. Respondents describe the concept of a “closed system” as a system which has a minimalized exposure of the worker as a result of measurements like non recirculating ventilation. This is a different interpretation compared to the concept of a closed system in which there is absolutely no contact between PFOS and the environment;
- According to the branch organisation, PFOS is used in decorative Chrome plating. However, it is not clear whether this type of use is covered by the allowed use of wetting agents for use in controlled galvanisation. This description was not broadly recognised within the Branch organisation. It seems to include both decorative and non-decorative metal plating, but it leaves room for differences in interpretation;
- Due to the long shelf life of PFOS containing products, it was not possible to trace the producer of PFOS. Moreover, it seems that part of the current use of PFOS containing products is based on purchase of the product several years ago. For example, a large supplier stated that they stopped the supply of PFOS containing Fumetrol in 2008, but this product is still reported by several users.

[1] Estimation of emissions and exposures to PFOS used in industry. An inventory of PFOS used in metal plating and fire fighting. Y. Bruinen de Bruin et al., RIVM/Expertise Centre for Substances/Integration & Exposure. RIVM Report 601780002/2009.
[2] It is not known which processes are suitable for switching, this has not been asked.

Semi-conductor industry

Process description

A chip is manufactured in layers, containing millions and sometimes over a billion transistors in a single microchip. Getting the signals to the next transistors in line is done by creating metal tracks across the chip that must be insulated from each other and from other circuits.

During the manufacturing of a chip, photolithographic techniques are used for construction of metal tracks. The principle is the same as printing a photograph from a negative. The image of the chip is patterned in several layers. For each layer, the image is exposed on a photo resist, and developed. The areas not covered by the photo resist can then be etched away using a plasma or chemical etchant, and/or electrically modified by adding dopants. Very small amounts of PFOS are required during several critical photolithography applications in manufacturing semiconductor chips, mainly based on the unique surfactant properties of PFOS.

Use of PFOS

Based on the response, the use of PFOS in this industry is estimated to be in the range of several kilograms. The reported used products contain PFOS in amounts of 0,02-0,10%. The highest reported use is 905 kg product with 0,02% PFOS. This leads to 0,181 kg of used PFOS.

Alternatives

According to statements from respondents within this industry, every product has its own specific application. Therefore, for every product, a PFOS-free alternative has to be developed. The industry, together with suppliers, is working on PFOS-free solutions but they claim that more time is needed to develop qualitatively comparable PFOS-free alternatives. It is not known how much more time it will take to develop alternatives. Some photolithographic processes already contain PFOS-free solutions, but details about those processes were not asked and therefore not reported.

Photographic industry

Use of PFOS

The two respondents of the questionnaire both stated that they do not use PFOS. One company responded by telephone and stated that they do not use PFOS.
A company specialised in X-ray photography also responded by telephone and stated that they do not use PFOS.

Alternatives

The two smaller companies both responded that they do not use techniques that require the use of PFOS. Their view on developments within the branch is that there are many small companies and there are new techniques without the need to use PFOS. This view is shared by the company which responded by telephone. Details about those techniques were not asked and therefore not reported.

Relevant observations

The market coverage of this industry is quite low within this study.

Aviation industry

Process description
At present, according to the producer of Skydrol LD-4, a PFOS-related molecule (perfluoroalkyl sulphonate) is added in low levels to this hydraulic fluid. This ingredient provides erosion resistance of hydraulic components of the airplane. It is a critical ingredient for avoiding damage to mechanical parts, thereby extending their operational life. Perfluoroalkyl sulphonates are used in a closed system under controlled conditions. Although Skydrol LD-4 contains a PFOS-related molecule, it is not considered to be a PFOS as mentioned in the EU regulation.

Use of PFOS
Both companies approached in this industry responded that they do not use PFOS-containing hydraulic fluid.

Alternatives
According to the producer of Skydrol LD-4, this product does not contain PFOS and is therefore an alternative for PFOS-containing hydraulic fluids. The PFOS related molecule, perfluoroalkyl sulphonate, is a critical ingredient. Despite extensive research, no substitutes for perfluoroalkyl sulphonate have been identified.

Relevant observations
A large company within this industry responded that PFOS is not indicated on the Safety Data Sheet of the Hydraulic fluid that is being used (Skydrol LD-4). However, the respondent stated that this product does contain PFOS. This statement has been checked with the producer of Skydrol LD-4. According to the technical assistance service of the producer, PFOS is not an ingredient of the hydraulic fluid. This product contains a PFOS related molecule (a perfluoroalkyl sulphonate), in an amount lower than 0,1%.
This ingredient is not indicated on the Material Safety Data Sheet and the producer stated that the substitute molecule was not listed in part I of Annex B to the Stockholm Convention and PFOS related chemicals.

Fire-fighting foam

Use of PFOS
The use of PFOS in fire-fighting foam was not part of the questionnaire. All information regarding this subject has been collected through indirect methods.

In 2010, a study showed that the stocks were estimated to be 18.540 m^3 in 2010 and expected to decrease to 16.222 m^3 in 2011[3].

The Human Environment and Transport Inspectorate has been actively enforcing the prohibition of PFOS-containing fire-fighting foam. In 2012, the Inspectorate performed an inspection regarding the presence of PFOS-containing fire fighting foam in sprinkler installations at 60 companies. During this inspection round, the Inspectorate encountered one case of a PFOS spill with fire-fighting foam. The Inspectorate received in 2012 information from network partners about two companies which were still using PFOS-containing fire-fighting foam. The Inspectorate started a legal process against those companies. These results demonstrate the switch within the industry towards the use of PFOS-free fire-fighting foams.

[3] Implementation of the restriction on PFOS under the Directive 2006/122/EC – electroplating applications and fire-fighting foams containing PFOS stocks. Brussels, 29 January 2010. European Commission.

Alternatives

The Ministry of Defence checked their central database on PFOS-containing fire-fighting foams. Two out of 6 products are definitely PFOS-free, the other four products are almost certainly PFOS-free. The Material Safety Data Sheets of those four products date from 2004 and will be replaced by new ones in the near future. It is expected that those products are PFOS-free due to the new regulations. The amount of remaining PFOS-containing fire fighting foam in military installations is not known.

Many regulators and authorities require tests or practice with fire-fighting foam installations. On an industrial scale, this requires huge amounts of foam to be spent and spilled into the environment. Not only PFOS-containing foams but also non-PFOS containing foams based on other fluoro compounds damage the environment. This may be acceptable when preventing a large scale fire, yet for practice and test situations this effect is unwanted.
Various suppliers of fire-fighting foams advertise “Practice” or “test” foams with environmentally less hazardous ingredients. These foams are NOT up to fire-fighting standards, yet have a similar surface tension and physical form as the real foams containing fluoro-compounds. The ingredients are, according to the suppliers advertisements, biodegradable. Surfactants are mentioned. It is unclear what the ingredients are. If the foams indeed consist of non-hazardous substances, a safety data sheet is not required. This would explain the lack of ingredient information.

Relevant observations

- During this study, the researchers tried to contact the branch organisation VEBON. They did not succeed and the results are therefore based on an online search, contact with the Human Environment and Transport Inspectorate and contact with the Ministry of Defence.
- There are no suppliers of fire-fighting foam which advertise PFOS-containing products on their internet pages. They are well aware of the issue as they offer explicit alternatives.
- The awareness within the branch seems to be high on this subject, with attention for the replacement of PFOS foam with non-PFOS foam. Phase-out seems just about finished and has been stimulated by proactive enforcement of the Inspectorate.

Database on import of goods (‘SAGITTA’)

The Human Environment and Transport Inspectorate performed a search within the database of SAGITTA to indicate whether PFOS has been imported in 2011. The result of that search is that SAGITTA contains no information regarding the import of amounts of PFOS. The result of the search on PFOS within SAGITTA may not reflect the actual situation: SAGITTA administrates goods in groups per type of good. The most detailed level of information regarding PFOS is the UN number from the transport of dangerous goods regulations. These regulations do not have a specific UN number for PFOS or PFOS containing products. A broader group such as “metal working fluids” would incorporate metalworking fluids containing PFOS, but also the larger share of PFOS free metal working fluids.

In addition to the search on PFOS, the Human Environment and Transport Inpectorate performed a search based on the reported trade names. Those products have not been imported in 2011 or 2012.

The researchers discussed shortly the possibility of a search in EDEXIM. This is a database for registration of import from and export to countries outside the European Union. It contains information about dangerous substances as describes in the Rotterdam Convention or European equivalents. However, this database provides no information about import and export between countries of the European Union and has comparable limitations in the way administration takes places.

4 DISCUSSION

Response rate

When discussing response rates, the market share of the respondents is relevant. This information provides an indication of the market coverage of the inventory. Information about market share is highly qualitative in nature and based on personal communications.
The overall response rate is 55%. This response rate is to be expected when using a questionnaire for the gathering of information.

The market coverage is high for the semi-conductor industry and the aviation industry, because the largest companies have responded. The market coverage for the photographic industry is low, because the assumed largest company turned out to be a relative small company in the field of galvanisation within the photographic industry. The market coverage for the metal plating industry is estimated to be 30%. However, personal communication with the technical committee of the branch organisation provided information in line with the results of the questionnaire. This leads to the assumption that the reported use of PFOS in the metal plating industry is realistically estimated.

Reliability

The reliability of the results on the use of PFOS should be interpreted on a qualitative level. Information from personal contacts with branch organisations and large companies support and confirm the results. However, the inventory is subject to uncertainty due to lack of data from non-respondents.

For the photographic industry, due to the low market coverage, the results are believed to be an underestimation.

5 CONCLUSION

The conclusions are grouped per type of use

Metal plating industry

- The roughly estimated use of PFOS containing products is 145-150 kg. This is probably an overestimation, because the high volume reported by one respondent is included in the extrapolation. Furthermore, it is considered to be a worst-case estimation.
- Compared to the other allowed type of uses, the volume of PFOS containing products is the highest in this industry.
- Compared with a previous study on PFOS containing products, the use of PFOS seems to be reduced when comparing the worst-case estimations. However, this cannot be stated with certainty.
- Exposure to Chromium III is less toxic to workers compared with Chromium VI. Therefore, from an occupational point of view, there is less need for PFOS. When a company switches from Chromium VI to Chromium III, this is often accompanied by abandoning the use of PFOS.
- Respondents describe the concept of a “closed system” as a system which has a minimalized exposure of the worker as a result of measurements like non recirculating ventilation. This is a different interpretation compared to the concept of a closed system in which there is absolutely no contact between PFOS and the environment.
- Alternatives are on the market, but switching is not possible for all processes. This is due to both health & safety and quality requirements.

Semi-conductor industry

- The use of PFOS is very low, in the range of a few kilograms.
- Alternatives are on the market, but there are many different products. Therefore, the industry claims that more time is needed to develop a full range of qualitatively comparable alternatives.

Photographic industry (as part of the graphic industry)

- The reported use of PFOS is 0 kilogram. This is probably an underestimation, due to the low market coverage within this industry.
- The photographic industry consists of many small companies. The rest of the graphic industry represents a number of larger companies that are not covered by this survey.
- Within the industry, new techniques have been developed which do not require PFOS.

Aviation industry

- The reported use of PFOS is 0 kilogram.
- The mostly used product (Skydrol LD-4) does contain a PFOS related molecule (in an amount less than 0.1%ww), but this is not a listed chemical in part I, Annex B of the Stockholm Convention.

Fire fighting foam

- The industry is well aware of the status of PFOS containing fire fighting foam. The use of PFOS containing fire fighting foam seems to be phased out.

Recommendations

1. Consider investigating which alternative processes are available using Cr(III) instead of Cr(VI) in metal plating;
2. The concept of open versus closed loop system should be clarified on EU-level. The description used in this report could serve as a definition;
3. Consider clarifying the concept of metal plating regarding hard and decorative plating in relation to the allowed types of use of PFOS;
4. Consider investigating which alternative photolithographic processes already contain PFOS-free solutions;
5. Consider putting additional effort in getting a response from companies in the photographic industry. The branch organisation “Koninklijke KVGO” could serve as a starting point;
6. Consider contacting VEBON about current situation fire-fighting foams

6 REFERENCES

Estimation of emissions and exposures to PFOS used in industry. An inventory of PFOS used in metal plating and fire fighting. Y. Bruinen de Bruin et al., RIVM/Expertise Centre for Substances/Integration & Exposure. RIVM Report 601780002/2009.

Implementation of the restriction on PFOS under the Directive 2006/122/EC – electroplating applications and fire-fighting foams containing PFOS stocks. Brussels, 29 January 2010. European Commission.

Industrielinqs Catalogus 2013 > information about existing branch organisations

Relevant websites of branch organisations:

www.ngo-sbg.nl	> Galvanising industry, including metal plating industry
www.vom.nl	> Surface techniques in metal plating industry
www.semi.org	> Semi-conductor industry
www.kvgo.nl	> Graphic industry
www.acn.nl	> Aviation industry
www.nag.aero	> Aviation industry
https://vebon.org	> Fire fighting industry

Suppliers of ‘practice foam’ for fire fighting:

www.bio-ex.com	> Bio T3 Training Foam 3%
www.ajaxchubbvarel.nl	> Oefenschuim-N en Oefenschuim-U
www.vandoclean.nl	> Practifoam
www.zerofiresystems.nl	> Zero T-Foam V
www.innovfoam.nl	> oefenschuim
www.ansulsolutions.nl	> Advice on how to phase out PFOS containing fire-fighting foam

Appendix 1
Questionnaire and accompanying email

Begeleidende mail inventarisatie.

Subject: Inventarisatie toepassing PFOS(perfluor octaan sulfonaat)-houdende middelen in Nederland. Wij rekenen op uw bijdrage!

Geachte heer, mevrouw,

Namens het Ministerie van Infrastructuur en Milieu (I&M) verzoeken wij u deel te nemen aan de inventarisatie van het nog in gebruik zijnde PFOS in Nederland.

Doel van de inventarisatie
Het Ministerie van I&M is verplicht om de hoeveelheid nog in gebruik zijnde PFOS-houdende middelen te rapporteren aan de Europese Commissie en het secretariaat voor het Verdrag van Stockholm.

Achtergrond
PFOS (een persistent verontreinigende stof) is zeer schadelijk voor de volksgezondheid en het milieu. De stof wordt moeilijk afgebroken, is kankerverwekkend en giftig. Daarom is binnen Europa afgesproken om het gebruik van PFOS waar mogelijk gefaseerd te beëindigen. Dat houdt in dat op dit moment nog slechts een aantal toepassingen is toegestaan. De wetgeving hierover is vastgelegd in het Verdrag van Stockholm en de Europese Verordening voor persistent verontreinigende stoffen.

Waarom is het belangrijk gegevens over het gebruik van PFOS te melden?
PFOS is nog voor enkele toepassingen toegestaan, zodat bedrijven in die gevallen over noodzakelijke hulpstoffen kunnen beschikken. De resultaten van deze inventarisatie kunnen bijdragen aan de onderbouwing van de noodzaak om het gebruik van PFOS in specifieke gevallen te blijven toestaan. Om de inventarisatie zo nauwkeurig mogelijk te maken, is het van belang om uw gebruik te melden.

Wat gebeurt er met uw inbreng?
De resultaten worden gerapporteerd aan het Ministerie van I&M. De Inspectie voor Leefomgeving en Transport (ILT) en het Rijksinstituut voor Volksgezondheid en Milieu (RIVM) ontvangen ter informatie ook een kopie van het onderzoeksrapport. Het Ministerie is verplicht deze informatie op brancheniveau aan te leveren aan de Europese Commissie en het secretariaat voor het Verdrag van Stockholm. Die informatie bevat geen bedrijfsgegevens op individueel niveau.
De informatie die u verstrekt wordt niet gebruikt voor handhavingsdoeleinden.

Waarom krijgt u deze mail?
Wij hebben u deze mail gestuurd, omdat wij het op basis van de informatie op uw website mogelijk achten dat uw bedrijf gebruik maakt van PFOS houdende stoffen. Wij gaan er vanuit dat u vanuit uw functie op de hoogte bent van het gebruik van PFOS in uw bedrijf. Als dit niet het geval is, dan verzoeken wij u om dat te melden via een reply op deze mail en ons door te verwijzen naar de collega die verantwoordelijk is voor het gebruik van PFOS in uw bedrijf.

Wat verwachten wij van u?
Wij verzoeken u bijgaand Excel bestand in te vullen. Het bestand bevat een tabblad met toelichting en een tabblad met vier vragen.

Wanneer willen wij uw reactie uiterlijk binnen hebben?
Wij verzoeken u bijgaande vragenlijst uiterlijk **<deadline>** terug te mailen naar caroline.coucke@rhdhv.com.

Wij danken u hartelijk voor uw medewerking!

Vriendelijke groet,

Royal HaskoningDHV
Enhancing Society Together

Questionnaire (Dutch only)

Gegevens Respondent

Branche: _____

Naam bedrijf: _____

Adres Bedrijf: _____

Functie invuller _____

Vraag 1: Overzicht gebruik PFOS-houdende middelen in 2012

Naam PFOS houdend middel	% PFOS in het middel	Hoeveelheid gebruikt PFOS-houdend middel in 2012	Eenheid	Optie: hoeveelheid gebruikt PFOS in 2012 (de stof)	Eenheid	Voor welke toepassing wordt het PFOS-houdend middel gebruikt? Maak een keuze uit het menu via het pijltje rechts in de cel.	Andere toepassing, nl:	Open of gesloten systeem?	Decoratief of hardmetaal?	Opmerking:

Vraag 2: Zijn er binnen uw branche alternatieven voor PFOS-houdende middelen beschikbaar? Zo ja, welke?

Antwoord vraag 2:

Vraag 3: Maakt uw organisatie gebruik van alternatieven voor PFOS-houdende middelen? Zo ja, welke?

Antwoord vraag 3:

Vraag 3a: Indien u geen alternatieven gebruikt, kunt u aangeven waarom niet?

Antwoord vraag 3a (u kunt kiezen uit verschillende antwoorden):

Anders, nl:

Einde vragenlijst, hartelijk dank voor het invullen!