



Case Study: Eliminating PFCs from textile production

REWE Group Detox Program

Agenda

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1. Introduction

- **Abstract:** REWE Group aims to eliminate restricted hazardous chemicals from the production process of private label textiles. In order to learn more about the substitution of hazardous chemicals, REWE Group develops case studies with different suppliers from its textile supply chain. The following case study shows how we support a supplier (a garment manufacturer in Bangladesh) in his continuous efforts towards a Detox conform supply chain in general, and the substitution of PFCs at a specific washing plant in his supply chain in particular.
- **Involved supplier:** Garment manufacturer and washing plant in Bangladesh
- **Aim of the project:** Increased understanding and improved skills for chemical compliance management, update of the chemical inventory, substitution of non-compliant chemicals if possible
- **Project period:** March – June 2016

2. Background information

▪ **Wet processes**

- With our Detox Program, we focus on the crucial stages of textile production in which toxic chemicals could be used, such as the main wet processes (e.g. dyeing, washing and printing). The individual wet processes are analyzed and a risk assessment is carried out, thereby enabling the evaluation of risks regarding contamination with restricted substances.

▪ **Information about PFCs**

- PFCs or *perfluorinated compounds* are man-made chemicals which are not produced by natural processes. They are highly resistant to chemical, biological and thermal degradation.
- Some PFCs act as hormone disruptors, some show reproductive and carcinogenic effects.
- PFCs are very persistent and bioaccumulate in the food chain as well as in the human body.
- PFCs are mostly used as stain or water repellents and as finishing for all-weather functions.
- Potential alternatives for PFCs finishes and coatings are waxes, paraffins, polyurethane, dendrimers and silicones. Other alternatives are in the trial phase.
- The OECD listed siloxanes and silicone polymers as well as stearamidomethyl pyridine chloride as possible substitutes. The substances are suitable for impregnation of textiles, leather and carpets, as well as surface coating, paint and varnish.

Sources: UNEP / OECD 2013. SYNTHESIS PAPER ON PER- AND POLYFLUORINATED CHEMICALS (PFCS).
Online available: http://www.oecd.org/env/ehs/risk-management/PFC_FINAL-Web.pdf
ZDHC: Durable Water and Soil Repellent Chemistry in the Textile Industry – A Research Report, 2012
http://roadmaptozero.com/df.php?file=pdf/DWR_Report.pdf

3. Project overview

Project steps

The support of the garment manufacturer in Bangladesh in his continuous efforts towards a Detox conform supply chain in general, and the substitution of PFCs at a specific washing plant in his supply chain in particular included the following steps:

- a. **Kick-off meeting** with supplier and washing plant to explain the project and discuss project steps
- b. **Base-line assessment** to evaluate the practices and procedures in the chemical management
- c. **Initial training and chemical inventory** to verify the compliance with ZDHC* and Detox requirements
- d. **Substitution plan** to replace restricted substances
- e. **Training and capacity development** to form an understanding for compliance issues and train workers to ensure implementation of necessary procedures

In the following slides each of these steps is explained in more detail.

*ZDHC = Zero Discharge of Hazardous Chemicals (<http://www.roadmaptozero.com/>)

3a. Project step: Kick-off meeting

Kick-off meeting

- The kick-off meeting has been conducted in March 2016 in Bangladesh.
- Representatives of the supplier, the washing plant, the REWE Group (Corporate Responsibility and Merchandising) as well as representatives from the service provider which supported the project joined this meeting.
- During the meeting the Detox program and the planned project have been explained to the supplier and the washing plant. The project shall help the supplier to implement measures in order to become compliant with the Detox requirements.
- A cooperation agreement has been signed, contact persons have been assigned and the steps of the project were discussed.

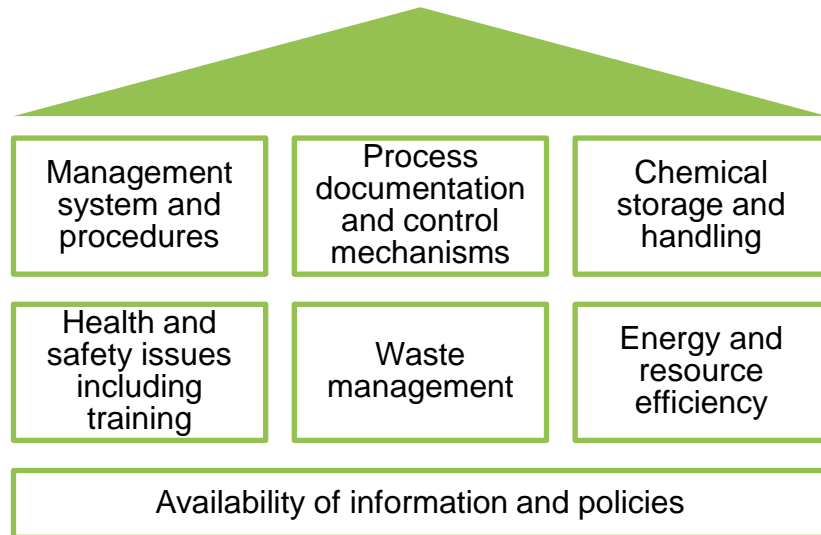


3b. Project step: Base-line assessment on chemical management

Base-line assessment of the chemical management

- A base-line assessment of the practices and procedures in the chemical management of the washing plant has been conducted in April 2016 by the service provider in order to evaluate the status quo and develop a corrective action plan.
- 5 follow-up visits to answer questions and accompany the implementation of corrective actions were conducted from April to June so that an intensive support was ensured.

Focus areas of the base-line assessment:



Outcome:

- Assessment of the status quo
- Identification of areas for improvement
- Development of a corrective action plan (CAP)
- Support with the CAP implementation
- Initiation of a continuous development process

3c. Project step: Initial training and chemical inventory

Initial training

A full-day training on basic requirements of chemical management was conducted for 5 participants of relevant departments to impart knowledge on the following topics:

- CAP implementation steps
- Chemical inventory
- Steps for process optimization
- Roles and responsibilities

Chemical inventory

After the training a complete chemical inventory containing 137 chemicals from 35 chemical manufacturers or agents has been set up.

Detox compliance check

- Compliance with ZDHC*/Detox requirements has been controlled.
- It was expected to find some chemicals containing PFCs due to results of a previous water test.

Name	CAS No.	Supplier	Quantity	Location	Notes
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*ZDHC = Zero Discharge of Hazardous Chemicals (<http://www.roadmaptozero.com/>). For some chemicals ZDHC compliance confirmation was the only confirmation available.

3d. Project step: Substitution plan

- **Findings for PFCs:**

The effluent water of the washing plant had been tested in June 2015 with findings for PFCs:

Chemical group	Restricted substance	Reporting limit	Detection
PFCs (Perfluorocarbon)	PFHXA	0,01 µg/L	0,35
	PFBA	0,01 µg/L	6,85

- **Chemical inventory check**

- The check of the chemical inventory revealed a chemical containing PFC.
- Water repellent agent from a large chemical manufacturer containing PFCs under the detection limit of ≤ 20 ppm has been found.

- **Substitution of the PFC containing chemical:**

- The need to find a fluorine free substitute with the same characteristics as the non compliant substance has been discussed with the washing plant and immediate substitution was agreed.
- An alternative compliant substance has been identified by the washing plant and will be used in future.
- The next water test will show whether the limit values for PFCs can now be met.
- All new chemicals in the washing plant will be checked for Detox compliance before usage in future.

3e. Project step: Training and capacity development

■ **Training for sustained chemical management**

- In June a meeting with representatives from the top management of the washing plant took place to discuss required procedures for sustained chemical management and compliance with Detox requirements.
- On the same day further training was conducted for 9 participants from relevant departments to convey additional knowledge and to ensure that the washing plant will be able to continue with the verification of conformity, the update of the chemical inventory and manage compliance issues on its own in future.



■ **Training topics**

- Chemical management system and related roles and responsibilities
- Verification of conformity of chemicals, potential sources of restricted substances and substitution
- Chemical inventory maintenance
- Chemical storage and handling procedures, safety measures and personal protective equipment
- Internal training planning
- Internal auditing procedures and focus areas

4. Summary

This case study has shown that the identification of sources for certain substances is not easy. Therefore, a complete and up-to-date chemical inventory is the basis for a successful substitution. The set-up required the collaboration of different departments in the washing plant which has been challenging in the first phase of the project. The check of the chemical inventory has been time-consuming because chemical manufacturers were sometimes reluctant to reply enquiries. Procedures to verify Detox compliance before usage of chemicals are essential. Therefore, the washing mill is working on the establishment of such a process and will check all new chemicals for compliance before usage in future. Trainings and workshops helped the washing plant to reflect and restructure their chemical management procedures. Surprisingly, the substitution has been less challenging which can be explained by the high willingness of the washing plant to cooperate and to become Detox compliant.

Main Challenges:

There has been no system to keep the chemical inventory up-to-date at the beginning of the project. In addition, there have not been procedures in place to verify the compliance of chemicals. Insufficient internal communication was another challenge. Workshops and training helped to provide an understanding of Detox requirements and necessary procedures.

Outlook:

The wet process facility has been very committed throughout the project. It has stopped the usage of the PFC containing chemical and has already identified suited substitutes. Procedures that ensure sustained chemical management will be implemented. A water test shall confirm that the substitution has been successfully conducted.

5. Closing words

“All members of the Detox team in our factory are very happy about the training program. After training the confidence level of our team members has increased significantly. Every person now is careful about the Detox program and dedicated to achieve the Detox goal.”

Environmental Management System Officer at the washing plant





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