



Weststrasse 51 • 8570 Weinfelden • Switzerland
Fon +41 71 626 0 626 • Fax +41 71 626 0 623
www.imo.ch • info@imo.ch

Requirements for chemicals used in eco-textile processing

Dr. Anett Matthäi, Interlaken, September 23, 2009

Institute for Marketecology IMO
Quality control and certification



Restricted substances in ecolabels and RSLs

Affecting human health



- Toxic
- Carcinogenic
- Mutagenic
- Toxic to Reproduction
- Allergenic
- Endocrine disrupting



Environmentally harmful



- toxic to aquatic organisms
- Persistent
- Bioaccumulative
- Bioavailability for organisms
- causing long-term effects

How are those substances regulated in EU?

History before REACH

„No data – no Problems“

- Until 1981: Approx. 100 000 substances registered and in use (EINECS)
 - No obligation to determine harmful characteristics
- After 1981: Approx 4000 substances registered and in use (ELINCS)
 - Obligation to test new chemicals and label with R/S-phrases
- Most chemicals have not been tested for health or environmental effects
- More than 40 different legislations in EU on chemical
- Authorities had to prove harmful characteristics of a chemical



**Harmonisation to protect human health and the environment:
REACH in 2006**

REACH (EC No 1907/2006)

No Data- No Market!

- Regulation for the production, import and use of chemicals
- All chemicals > 1 tonne
- No distinction between new and old chemicals any more: Obligation to test chemicals released before 1981
- The producer is responsible to test the harmful characteristics of the chemical
- Most hazardous substances have to be reported to the consumer or retailer if more than 0,1% are present in the article

Advantages of REACH (EC No 1907/2006)

- Innovation of new chemicals will be promoted (less costs for registrations compared to the use of hardly tested existing substances before REACH)
- European chemical companies are usually better prepared to provide the safety information to prove compliance with requirements of Eco-labels and standards due to REACH
- Known harmful substances are excluded from most eco-labels and RSLs anyway
 - CMR (carcinogenic, mutagenic, reprotoxic)
 - PBT (persistent, bioaccumulative, toxic)
 - vPvB (very persistent, very bioaccumulative)
 - SVHC (substances of very high concern)

Are there further restrictions on substances in Eco-labels?

Restricted substances in ecolabels and RSLs today

- Heavy metals
- Aromatic /halogenated solvents
- Plasticers (Phtalates, Bisphenol A)
- Brominated flame-retardants (PBB, pentaBDE, oktaBDE, dekaBDE)
- Persistant complexing agents (EDTA, DTPA)
- APEOs (NPEO, OPEO, end-group-terminated PEOs..)
- Optical brighteners (stilbene-derivates)
- **Perfluorinated compounds (PFCs, degrading to PFOAs or PFOSs)**
- **Allergenic substances (disperse dyes, isocyanates)**
- Formadehyde, other short chained aldehydes

Fluorocarbons in water/oil-repellent finishing

High molecular weight polymers containing PFCs get degraded:

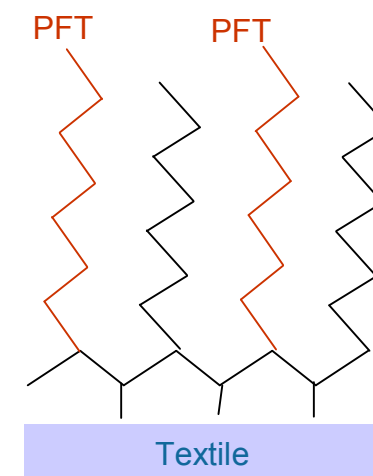
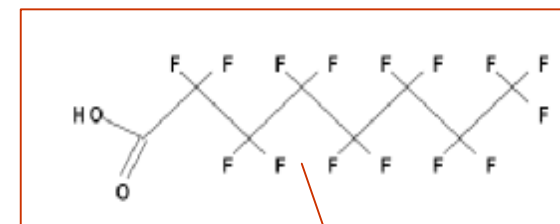
- C8 (Perfluorooctanoic acid PFOA and Perfluorooctanesulfonic acid PFOS)
 - Different modes of toxic action
 - Persistent in the environment
 - Bioaccumulative in blood and tissue

Human blood serum: **5,5-104 ng/mL**

Polar bear (liver, wwt): **4000 ng/g**

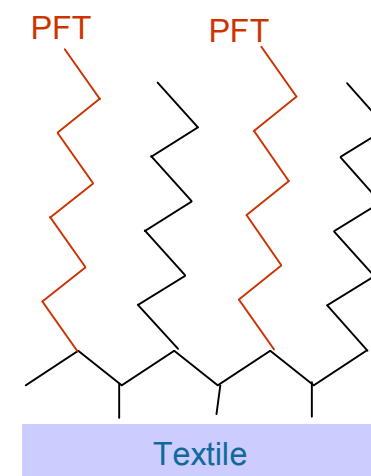
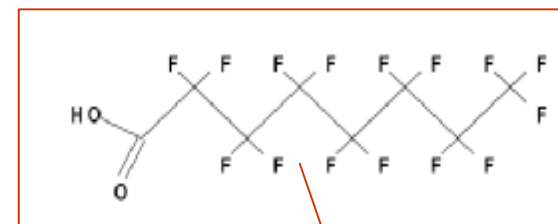
Wild mice near production side (liver, wwt):
178 550 ng/g

- Other PFCs like C6 or C10 could also be detected in the environment



Fluorocarbons in water/oil-repellent finishing

Using alternatives to perfluorinated compounds should be considered



Allergenic substances

- Jeans manufacturer recalls collection of denim articles in EU because they might release harmful vapor under certain conditions
- Reason: Isocyanates from a resin finishing
- Allergenic isocyanates banned via RSL:
 - Diphenylmethane diisocyanate (MDI)
 - Hexamethylene diisocyanate (HDI)
 - Isophorone diisocyanate (IPDI)
 - Tetramethylxylene diisocyanate (TMXDI)
 - Toluene diisocyanate (TDI)



Allergenic substances

**Limit use of substances classified
as allergenic**

or

**restriction of all substances
classified as allergenic?**

- **stays on the fabric?**
- **covalently bound to the textile or just adsorbed?**
- **dermal, oral or inhalative uptake?**





Always ask the right question!