

**24.09.2020**

## ***Statement of the Confederation of the German Textile and Fashion Industry (t+m) to public consultation on the proposed restriction on PFHxA***

The Gesamtverband textil+mode represents the interest of 1,400 small and medium-sized companies in the German textile and fashion industry with more than 132,000 employees.

The Gesamtverband Textil und Mode has already submitted comments during the first consultation period. This opinion complements and updates this opinion. We have also actively contributed to the opinion of our European umbrella organisation EURATEX. We fully support the opinion of EURATEX.

With our statement, we would like to address the critical points of the restriction proposal (Chapter I), explain them (Chapter II) and ask the decision-makers to ensure that urgent corrections are made. We also provide detailed recommendations in this regard. We hope that our statement will make an essential contribution to the clarification and preservation of the German and European textile industry.

### **I. Facts and demands about this PFHxA-Restriction**

- **The proposal contradicts the ECHA proposal to replace C8 chemistry with C6-Chemistry in the final PFOA-restriction process (PFOA POP-regulation dated April 2020).**
- **The proposal contradicts all efforts (several million Euro) being made by the EU-textile industry to convert textile products from C8 to C6-Chemistry over the last years.**
- **The PFHxA Dossier identifies a possible risk in the future solely based on longevity, but does not provide any evidence of this.**
- **We demand a socio-economic study under consideration of the massive impact of the whole EU-supply chains since the textile industry is a cross-sectoral industry linked to all other sectors.**
- **Wrong immissions are projected – correction is necessary.**
- **No PFHxA-Restriction without harmonised EN/ISO testing method.**
- **A massive extension of derogations in the proposal for textile products to protect EU population is needed, the environment etc. has to be taken in account because of missing alternatives.**
- **Urgent need for harmonisation of regulations on fluorine chemistry (C9-14, C8, PFOA) according to Annex III to this statement.**

## II. Justification of our claims from section I

### General statement / Introduction

The restriction proposal on PFHxA submitted by ECHA is of high importance for the German textile industry. We have therefore intensively discussed the restriction proposal with our members - despite the tense situation of CORONA for the companies. The results of the survey of affected companies showed that in quite a few cases nearly the whole product portfolio would be affected by the announced restriction. This includes medical textiles, for critical areas of reusable surgical gowns and drapes, as well as multilayer laminates for Personal Protective Equipment (PPE) against wet, cold, bacteria, viruses, dirt, oil, heat, flame and other external influences relating to care, durability and physiological stress reduction (breathability) as it also concerns high-tech products for environmental protection, automotive, construction and many others. Together with our European umbrella organisation EUR-ATEX, we have therefore conducted a "Euratex DATABASE" in response to the feedback from our survey (see Annex I).

From our point of view the draft of requirements and restrictions does not consider the current best available technologies. Manufacturers will face tremendous difficulties in conforming with the targeted requirements (due to regulatory or customer needs). Not only does the intended restriction contradict the technical specifications and requirements due to the lack of alternatives in performance during use and after laundry. Options fulfilling the requirements (standards etc.) are not available or under development. Losing the entire fluorocarbons would also imply that our members would no longer be able to deliver into this market. Personal protective equipment (PPE) applications represent in many cases more than 75% of their product portfolio.

In the underlying risk assessment, the dossier writer explicitly states that PFHxA is neither classified as a CMR substance (carcinogenic, mutagenic/mutagenic, toxic for reproduction/toxic for reproduction) nor as an endocrine disruptor (hormone disrupting), nor as PBT/vPvB. For this reason, perfluorohexanoic acid is not listed as a so-called substance of very high concern (SVHC) under the EU chemicals regulation REACH. The dossier identifies a possible threat in the future solely based on longevity, but does not provide any evidence of this. On this basis, any emission is classified as an unacceptable risk.

Like described before and as it can be seen in the Annex I – a more robust socio-economic assessment, including assessment of alternatives, is required.

Greater focus must therefore be placed on socio-economic impacts. There is no doubt that many high-tech applications (such as specific protective clothing or essential innovations such as fuel cells with appropriate membrane technology) are still needed. Moreover, it is also not foreseeable which future applications will even urgently need the unique properties of fluorochemical-based polymers. If C6 fluorochemistry is banned for many essential uses in the EU, the need for applications on this basis will not disappear. Instead, entire value chains will be relocated outside the EU with lower environmental standards (environmental leakage) and finished products will be imported. Future innovations on this technological basis will not be possible in the EU. None of this helps the environment, the innovative European strength or even the local labour market, but creates further supply dependencies and may even increase global PFC emissions. Masks (CORONA) or other medical protective equipment can no longer be produced in the EU in future. The effect of this restriction process on the textile industry is to threaten the existence of numerous EU textile companies, particularly in the area of technical textiles. This means that tens of thousands of jobs in the EU will be lost and that

value chains will break. Many of REACH's protective goals for people and the environment are led ad absurdum.

Without this performance, companies and complete EU-value added chains would be shifted to "non EU-production sites".

The specialised German technical textile companies and also EU-textile trademarks will technically not be able to compete with technical textiles from mainly Asian, South and Middle-American markets, which are not controlled by such restrictions. European companies will lose their competitiveness as their products will offer lower performance.

We therefore conclude, that intended regulation is a clear competitive disadvantage for companies, which can cause severe consequences for the German and EU textile industry.

## **Fluorchemistry for textiles is an essential driver for progress, technology, health care, innovation and environmental and climate protection.**

First of all, it should be stated, that the textile industry is not at all opposed to a restriction of chemicals on everyday items such as rain jackets (for which reasonable alternatives for water repellency are available). For ordinary consumer outdoor apparel that only requires water repellency, fluorine-free options are available and already in use (e.g. formulations based on kinds of paraffin, polysiloxanes, modified melamin resins; polyurethanes; dendrimers; polyacrylates) Combinations of these substances can provide meanwhile good permanences in laundering.

Textile treatment with fluoro- and fluorinated polymers provides many protective functions for humans and the environment. As it can be seen in Annex I (Euratex Database) there are many essential technical applications for which fluorchemistry is necessary because of no alternative substitutes. This list covers more than 150 products and product groups and emphasises that these are used in almost all sectors of the economy. Technical textiles produced in the EU are delivered as cross-sectional B2B-products to other hightechnology industry sectors in the EU to have a variety of high value products. Many mediumsize EU companies are highly specialized in the field of technical textiles and produce world-marketable products with a specific high performance level.

Please note: these products contained in Annex I (Database) are manufactured under the highest environmental regulations in Europe and comply with the highest requirements for health and environmental protection. They meet the highest standards, are exceptional products and are traceable. There are already numerous business models for environmentally sound management during the use phase and after the end of the life cycle.

According to the proposal in the restriction dossier, THE ONLY EXEMPTION that has so far been defined are for personal protective equipment to protect users from risks according to PPE Regulation (EU) 2016/425 Annex I cat. III (a), (b), (c) and (d) as well as for nonwoven medical textiles. It should be noted that these exceptions have not been placed under a time limit. This indicates that the authors of the restriction are well aware that, in numerous applications, there are currently no alternatives to C6 or C8 telomere fluorochemicals.

BUT NO EXEMPTIONS are foreseen for textile fuel cell membranes, fire-load minimised covers for vehicle engine compartments, hot gas filtration textiles used at waste incineration plants, UV- or sun-protective textiles, architecture and lightweight construction textiles, medical textiles or medical products not made of nonwovens, personal protective equipment not

certified as Category III, textile-based conveyor belts for the food industry, fire-load optimised household textiles and much more. Virtually none of these articles is ever washed or releases PFHxA into the environment during usage. Further, NO exemption it is foreseen for textile coatings. C6/C8 fluorinated polymers are used as auxiliaries in the coating process to prevent the coating paste from penetrating the fabric.

**Products, for which water repellence in connection with oil, stain, biological, blood and chemicals repellence is essential by fluorinated polymers can only provide these combination of effects. If oil, stain and chemicals repellence is vital there are also no fluorine-free alternatives available.**

In the following sections, several examples are given to illustrate the consequences of the proposed restrictions if a comprehensive extension of the derogations is not achieved.

### **Remain and consider: Our products protect and save lives.**

The function of protective clothing used in the context of occupational safety **is to protect the wearer (employee)** from harmful influences during work. This damage can be of thermal, mechanical, chemical or other physical nature. Often, the protective clothing protects against a combination of the hazards mentioned above, this protective function defines the difference between work clothing and protective workwear.

EU framework directive 89/391/EC regulates safety and health protection at work. The employer is obliged to carry out a risk analysis (89/656/EEC is implemented in Germany by the Occupational Health and Safety Act (ArbSchG), the PPE Usage Ordinance (PSA-BV) and the Workplace Ordinance (ArbStättV). The risk analysis is an obligation out of the Occupational Health and Safety Act §5). In particular, when assessing the possible chemical hazards, only the substances handled in the company/at the respective workplace are considered. The selection of the required protective clothing is the result of the risk analysis. Thus, there is a comprehensive set of regulations which obliges the employer to use only adequate protective clothing and to take into account the personal interests of the employee (adapted work shoes, safety glasses with eyesight, non-allergenic protective clothing, etc.). It was not only after the Corona crisis that we concluded that dependence on the production of important protective textiles almost exclusively abroad could not guarantee a timely and sufficient supply. The production of high-quality protective equipment without the risk of qualitative fluctuations must continue to be possible within the EU.

The evaluation of the RAPEX notifications has shown that protective clothing offered in particular from the Far East, e.g. FFP masks, often does not fulfil the claimed protective function. Whether this production also meets the high environmental requirements prevailing in Europe is doubtful, according to the current state of knowledge.

As already reported, German companies in the textile industry have actively participated in the development of the EURATEX database (see Annex 1). At this point, we would like to take a closer look at some of the answers we received as examples and as a supplement to the DATABASE.

### Example 1: Bulletproof vests

It is ludicrous that useful bulletproof vests for authorities such as the police and border security guards are apparently to be abolished in the EU, for these items are equipped with C6/C8 polymers to make them water-repellent. Fluorine-free coating – that is, without C6/C8 polymers - will allow projectiles to glide through the aramid fibre layers as smoothly as butter, as it does not provide a sufficient barrier to moist.

The result will be lethal for the wearer, as is this proposed restriction for numerous textile companies and other EU industries. Bulletproof vests, however, belong to Risk Category III (I) Injuries from projectiles or knife wounds, for which no exemption has yet been provided. The restriction procedure directly concerns equipment used for the manufacture of personal protective equipment, e.g. firefighters, police and operating or nursing staff protective equipment. The auxiliaries ensure wash resistant water-, oil-, chemical-, dirt- and blood-repellent finish, which protects the wearer from a variety of dangers. As the basis of the restriction is – as regards the finish of textiles – contamination of the auxiliary chemicals in the range of traces, i.e. in the microgram (millionth of a gram) per kilogram range, we consider it as not balanced regarding the advantage of protecting the lives of people, especially as due to technical solutions even the emission of these traces is minimised.

Bulletproof textile waistcoats only work if they are dry. This is why the highest demands are placed on this protective workwear in terms of water repellency, which can only be guaranteed by fluorinated polymers.

- The amendment to the EU POP Regulation of July 2020 restricts the placing on the market of PFOA and related compounds and thus the C-8 telomers used in the textile industry. This applies directly to articles produced after the entry into force.
- All articles manufactured before 4 July 2020 may only be marketed until 4 January 2021. Items that were already in use before entry into force may continue to be used.
- An exemption for specific protective clothing is provided for until 4 July 2023: "oil and water-repellent textiles intended to protect workers from dangerous liquids presenting risks to their health and safety". Gesamtverband textil+mode has repeatedly pointed out during the discussions on the Stockholm Convention and the POP regulation that the definition does not include bulletproof vests (category III I of the PPE Regulation) if interpreted strictly. So far, the Commission refers in a guidance document to "consider not only it's wording but also the context in which it occurs and the objectives pursued by the rules of which it is part". This can be seen as an indication that manufacturers and marketers of bulletproof vests containing PFOA and related compounds in the C-8 fluorinated polymer as impurities will not be prosecuted. The marketing of the products would still be possible. However, we believe that clarification on the substance is urgently needed. A reply from the Commission to our requests is still pending. We will remain on the line. The use of the C-8 fluorinated polymers with PFOA and related compounds as impurities for protective workwear including bulletproof vests will be phased out in 2023. Then, only fluorinated polymers of C-6 chemistry will be allowed to be used. But the draft proposal for restrictions on perfluorohexanoic acid (PFHxA) and related compounds (as impurities in fluorinated polymers of C-6 chemistry) provides for exemptions for an unlimited period for certain protective workwear not for risk category III (I)!

### Example 2: Reusable solutions for infection protection

Especially under the impression and experience of the current COVID19 pandemic, the importance of reusable solutions in medical applications and infection protection cannot be overestimated. The sudden lack of adequate protective clothing all over Europe, the discontinuity and high dependence on worldwide mainly Asian supply chains have stressed the necessity of independent solutions made in Europe.

These are already available for public and commercial sourcing as a reliable, ecologically responsible solution in the form of functional textiles for reusable protective clothing - again in line with the EU circular economy strategy and in the interest of ensuring availability.

Both surgical gowns according to EN 13795 as well as protective gowns and suits according to EN 14126 which contain repellency against liquid chemicals as an essential part have been requested for delivery by European and German authorities both on national and federal state level. Also, in these cases, the announced restriction would withdraw the technical basis for right European products, paving the way for Asian imports and give priority for single-use, disposable products.

### Example 3: Technical standards do not distinguish between disposable and reusable products!

- Please note that there are overlaps in the use of MP/PPE in several standards. In the field of medical devices, these are indeed the two standards for surgical drapes/clothing and for protective gowns in hospitals, which are used for protection against infectious agents:
- DIN EN 13795-1:2019-06: Surgical clothing and drapes - Requirements and test methods - Part 1: Surgical drapes and gowns
- DIN EN 14126:2004-01: Protective clothing - Performance requirements and test methods for protective clothing against infective agents
- Conditionally, because some manufacturers, who entered the market in the course of the mask shortage, make their products water-repellent against liquids using hydrophobic auxiliaries.
- DIN EN 14683:2019-10: Medical face masks - Requirements and test methods
- All the standards mentioned so far have been upgraded to "essential" status by the Commission and CEN as part of the COVID-19 campaign. And all standards are used by both the disposable and the reusable sector, so that the unequal treatment of both product segments by giving preference to disposable products by way of derogation is blatantly obvious here. Both production philosophies serve the same protective purpose. The overlap is also with the PPE sector, which protects against chemicals with DIN EN 14605, but is also used in hospitals:
- DIN EN 14605:2009-08: Protective clothing against liquid chemicals - Performance requirements for chemical protective suits with liquid-tight (Type 3) or spray-tight (Type 4) connections between parts of the clothing, including garments protecting parts of the body only (Types PB [3] and PB [4])

#### Example 4: Woven and knitted medical devices

- The exemptions for medical textiles only refer to nonwoven textiles. That woven or knitted textiles in the medical sector should not be covered by an exception is incomprehensible both from a technical point of view and for reasons of sustainability. Urgent clarification is needed: Medical devices (i.e. surgical drapes and clothing) are a 100% business in all European Hospitals. EVERY operation in Europe is required to be "covered" and equipped with surgical drapes and gowns. To protect both patient and wearer. Either with disposable or reusable materials. In Germany alone, we have over 19 million patients per year in German hospitals. According to statistics, approx. 40% of these undergo surgical procedures. Disposable products come from world production and are at most refined in the EU/Germany, but mostly only commissioned. We have just seen the collapse of these supply chains for masks (EN 14683) and protective clothing (EN 13795 / EN 14126). Reusable products, i.e. those that at the moment are NOT subject to an exemption, come from regional economic cycles and were increasingly in demand precisely because of the collapsing / fragile one-way supply chains. Suppose the exemptions for disposable and reusable products are now structured differently. In that case, this not only cuts into the leg of the regional medium-sized service provider landscape, but also places itself immediately into complete dependence of the global supply chain. Although market shares in Europe are around 80/20 for disposable and reusable products, the performance of reusable products is provided by specialised companies in the context of textile supply for hospitals (bed linen, workwear etc.). Every day in Germany alone, around 1,000 tonnes of hospital linen is sustainably reprocessed for disinfection, without which no hospital could operate for more than two days.
- Membrane laminates are used for reusable medical products such as surgical gowns and drapes in the high-performance risk classification. These are designed and certified according to EN 13795 for the protection of patients and medical staff from liquids and microorganisms, some even provide a viral barrier. These reusable textile products are washed and sterilised and can be reprocessed up to 100 times in professional laundry services, reducing the amount of medical waste significantly compared to disposable products. As an accompanying product and for the fulfilment of requirements in standard performance risk classifications, tightly-woven microfilament fabrics are finished with fluorocarbon chemistry to prevent the penetration of specific liquids which appear in the operating theatre. There is no adequate alternative to C6 or C8 textile auxiliaries, containing only traces of PFAxH as an unintended byproduct to achieve the relevant performance on these woven fabrics. Consequently, the entire sector of reusable surgical textile products in Europe is questioned by the mentioned restriction, priority would be given to disposable alternatives. In contrast, quantities and capacities in textile production, washing and sterilisation industry are endangered. Moreover, the disposable industry is privileged by the exception of nonwoven medical products through the restriction.
- Patches that are offered as medical products are also partly equipped with C6 chemicals. This applies in particular to plasters and plaster fabrics, which are offered rolled up. In this case, the fluorine-containing finish serves to make the patch rollable without the adhesive layer sticking to the outside or peeling off the inside. Replacement by other finishing chemicals reduces the durability of the products, especially at warm ambient temperatures. Also, the adhesive layer would have to be formed with significantly less adhesive force, which would make the use of plasters and plaster bandages questionable in various applications.

### Example 5: Police and public security

A lot of highly specialised companies deliver protective textiles to essential authorities like police departments, customs, Bundesgrenzschutz (Federal Border Guard) and fire departments in various European states. Protective textiles for military police and law enforcement respectively the protective clothing made of it are excluded from the PPE regulation. This means that in the case of C6 restriction the current parameters of many individual specifications cannot be achieved. Here the requirements are specified by individual tenders and users are used to a high-performance level. The same can be confirmed for particular user groups like for instance THW in Germany. These garments also do not belong to PPE regulation, even the design requirements and cut of the garment make it impossible or very difficult for EN ISO PPE certification.

Required repellence effects against soiling, solvents and oil cannot be achieved with the currently available fluorine free DWR products. These products are therefore no substitutes to C6 or telomer fluorochemistry. At least C6-fluorochemistry must be applied to fulfil repellent requirements.

Would the restriction be implemented according to the restriction proposal those companies could no longer fulfil the following standard requirements.

Although standards like EN 343 and EN 20471 do not explicitly require spray or repellence properties, the reason for making it a customer requirement above the standards is justified in the practice of use. Protective clothing without or low repellency properties bears the risk of increased water absorption under bad weather conditions leading not only to discomfort but to increased weight and physical stress of the wearer. A product not offering acceptable performance is very likely to be replaced by materials from sources outside Europe.

Repellence effects against soiling, solvents and oil cannot be achieved with the currently available fluorine-free DWR products. These are therefore no substitutes to C6 or C8 telomer fluorochemistry. The mentioned repellence is an essential factor for increasing the lifecycle, for example of high-visibility protective clothing according to EN ISO 20471. We want to point out that a long lifecycle and the high number of repeated uses in connection with rental services is an essential part of the EU and national strategies on the circular economy. A restriction without technical alternatives would contradict these strategic objectives.

This affects for example the following areas of application where at least C6-fluorochemistry must be applied:

- All high-visibility applications where soiling could be reduced and thus the visibility increased, shunting traffic, trains etc. in the interest of a requirement fulfilment and long lifecycle.
- Alpine workers, mountain rescue units
- Ambulance and rescue workers in general
- Water rescue
- Road service
- Construction workers
- Aid Agencies, e.g. German Technisches Hilfswerk THW

Technical requirements for weather protection equipment for armed forces (e.g. Bundeswehr) contain requirements for oil repellency (grade 5 or higher after five washing cycles at 60°C) which cannot be achieved under the intended restrictions. This would make it necessary to adjust public tender specifications under acceptance of lower performance and protection.

### Example 6: Use of C6-fluorochemicals for drugs

- Particularly noteworthy are textile carrier systems for transdermal plasters. These patches are medicines. They are stuck to the skin and release an active ingredient in a controlled manner.
- Textile carrier systems for plasters are equipped with C6-fluorochemicals. This equipment serves to ensure a capable adhesive bond. During the development of these systems, attempts were already made to dispense with fluorine chemicals or to use alternative types of finishing. However, no alternative without C6 finishing came even close to meeting the required durability and adhesive properties of the plasters.
- A short- and medium-term replacement of the C6 chemicals on the tissues, which are a component of drugs, would mean, if a viable replacement can be found at all, a new approval of the system, which would mean not only costs of several million Euros in addition to upcoming development costs, but also a development time of 5 to 10 years. These costs would ultimately have to be reflected in the price of the drugs or, if no replacement is found by the end of the use of the C6 chemicals, which is more likely, it would mean the elimination of these drugs.

### Example 7: Industrial Filter – e.g. Hot-Gas-Filtration

- „Cleanable filter media for dust separation in industrial processes“ includes a variety of processes from the production of aluminium to cement, including incineration/energy recovery, metallurgical processes and food technology. The temperatures here go from below 0°C up to 250°C with PTFE-articles, but the fluorocarbons are not so high loadable, the limit of permanent resistance is below 200°C. These media are described in the VDI guideline 3677 part 1 which is currently being revised.
- Oil and water repellency of the fluorocarbons are essential, as well as the renewability or cleanability and also the excellent chemical and thermal resistance. It is expected (with guarantee) that the filter media will maintain the emission values and a differential pressure level for 3 – 4 years in continuous operation (i.e. 24,000 to 32,000 h, with a trend towards increase) under the conditions mentioned above, which means that the components are sufficiently stable over this travel time. In most cases, these are limit values set by the authorities, which the operator of the filter plant must comply with and verify.
- These conditions can be quite demanding, with the temperature levels mentioned, chemically aggressive gas (NO<sub>2</sub>, SO<sub>2</sub>, SO<sub>3</sub>, H<sub>2</sub>O, HCl, HF) - and dust components (acid, alkaline, sticky, abrasive) - and a recurring compressed air cleaning.
- At least concerning the requirement profile oil-repellent, there is no substitute for fluorocarbon chemistry at present, nor are there any statements from textile chemistry that development can be expected here.

### Example 8: Textile Finishing

Response from a company:

...

- „As a textile finishing company, we would be severely affected by the planned outages of the fluorocarbon-6 chemical industry. We have already invested a six-digit EURO amount in the conversion from FC-8 chemicals to FC-6 chemicals between 2011 and 2013. To achieve the required targets and property profiles again with FC-6 chemistry compared to the starting point of FC-8 chemistry, high development costs were incurred and a lot of time was spent.
- In the meantime, solution attempts and textile finishes on the production side with FC-free chemicals have not been permanently accepted by our customers due to lower durability properties, especially on dark dyes, and the lack of oleophobia.
- If FC chemicals were to be permanently banned now, the following product groups, among others, would no longer be available to us in textile finishing: Fire brigade protective clothing, table linen, mouth-and-nose masks, pillowcases and pads for outdoor use, mattress pads, etc. This would mean a direct loss of sales of about 15 per cent for us.
- Ultimately, the FC ban would mean that the better and ready-made textiles with hydrophobic and oleophobic properties could only be procured directly in Asia.

#### Summary:

**If the restrictions were to enter into force according to the draft, the use of auxiliaries to give textiles their protective properties would no longer be legal in Germany (and EU). Still the need for those products continues to exist. The Corona crisis has shown that dependence of the production e.g. of PPE at foreign production facilities is critical. Furthermore, it has been demonstrated the past that the quality of these articles, which have to meet a large number of stringent standards, are subject to fluctuations, especially in the case of production in non EU countries.**

### **III. Textile production in Europe is carried out under the highest environmental standards! Encourage Textile industry to achieve further progress in developing innovative environmental technologies - bans only encourage manufacturing in Asia and destroy an EU high-tech economy.**

As the Federal Ministry for the Environment, Nature Conservation and Consumer Protection (BMU) states on its website ([www.bmu.de](http://www.bmu.de)) and analyses of the Federal Environmental Specimen Bank for some compounds show: The exposure of the population has decreased significantly in recent decades for PFOS (perfluorooctane sulphonic acid, C8) and PFOA (perfluorooctanoic acid, C8). The exposures were highest in 1986. Today, they are around 10% for PFOS and approximately 30 % for PFOA compared to the levels at that time. The textile industry played a significant role in reducing those levels.

This tendency is mainly the result of the success of considerable investments by companies in the EU (see further explanations). However, the information and trends in the dossier lead in a different direction and show an unacceptable level of burden, which we cannot understand. Fundamental questions of emission sources would also have to be discussed. The primary sources of emissions into the environment (e.g. through aerosols in teflon production, fire-fighting foams and/or fire training areas etc.) have already been under control in the Member states and are largely eliminated (or are under elimination processes) or are largely minimized or eliminated by continuous technological development and dynamic operator obligations to comply with state of the art in the EU. The future release into the environment is therefore primarily limited to "abrasion" in products or extreme fire events where fluorinated fire-fighting foams must still be used for safety reasons. These issues must also be carefully weighed against the environmentally friendly side of the coin (e.g. ultrafiltration through membranes in wastewater treatment technology).

To avoid emissions to air and water a variety of environmental protection requirements, which are carefully monitored by the authorities are obligatory for textile production in Germany. These include reuse of impregnation liquor, separate equipment-rinsing water disposal and others both for PFOA/RS and PFHxA/RS reducing emission from a few grams in 2010 to close to zero. Accordingly, the PFHxA-emission in initial textile finishing to wastewater, before wastewater treatment, are below 0,020 kg/a. Modern low-volume chassis is designed, among other things, to minimise the residual liquors in such a way that only the amount of liquors that are required for the desired effect is provided in the chassis. The filling volume is minimised by displacement bodies and short distances of the chassis walls to the fabric. Residual impregnation liquors and if necessary, the first rinsing water is not drained, but pumped into a container and reused or discarded as waste. This system has reduced emissions by over 95%.

In the 1990s, the wastewater treatment plants connected to textile sites have been subject to intensive surveillance by the authorities regarding fluorinated substances. Despite low thresholds of 300 ng/l, the wastewater treatment plants have no more been an issue regarding relevant emissions of fluorinated substances for several years. A proposal for best-available technology (BVT) in the context of the BREF process is enclosed (Annex II). Further information is given in the EURATEX statement.

Laundries that also carry out re-impregnation work in Germany are based on the highest standards and environmental requirements. Fluorocarbons are disposed of 100% by ultrafiltration or precipitation at the laundries. The reason is that the laundries use drawable fluorocarbons. By emulsification, the fluorocarbons are made "pseudo-cation active" so that they

are drawable. This means that in the wastewater they accumulate on the dirt and suspended particles and can therefore be filtered or precipitated well.

## **Disposal situation - consider differentiated use scenarios - and disposal routes!**

It is like things that PPE must have a long service life, quantities and charges are known to the user (employer). The latter has an obligation for these long service lives (until e.g. the warranty period has expired, sometimes up to 10 years). Special equipment is usually maintained, washed and repaired by service providers to maintain the functionality of the textiles. In Germany, the environmentally friendly handling and disposal of washing water is a duty!

- In the PPE sector, systems for return, cleaning and disposal have already been established in Germany (hospitals, police, military).
- Particularly in the PPE sector, the service life of the products is characterised by ensuring lasting functionality. Physical or chemical/biological contamination of the products is application-related. If they are no longer functional, they must be removed from the material cycle due to contamination. In Germany, this is guaranteed by thermal recycling by the highest requirements. Widespread in Germany are incineration temperatures at above 1000 °C, this disposal method is environmentally friendly, ecological and safe.
- In case of textiles used in the private sector (tents, tarpaulins, clothing, furniture), there are presently no legal requirements in Germany for collection and separation. Still the situation will change due to the revision of the German regulation. The Gesamtverband Textil und Mode e.V. is presently working intensively for better traceability, sampling and disposal including recycling, preparation for reuse and waste prevention.
- For individual products such as sleeping bags, for example, there is a greater focus on reuse (e.g. passing on sleeping bags or other outdoor items for charitable use). Here a patchwork of disposal channels is noticeable. There is no uniform explanation of how end consumers can recycle/dispose of their (textile) articles. Sometimes retailers or manufacturers offer repair or take-back services. Here the textile industry and its members will contribute to ensuring the transparency and disposal safety of the products.

## **Laundries and textile service companies meet the requirements for environmentally friendly handling:**

- Roughly speaking, 30 million people in Germany wear workwear or protective clothing. Three jackets and three trousers each. 12-15% of these are personal protective equipment; 6% of these have FC finish. In other words, approx. 2% of the total volume has FC finish. The textile service serves 50% of these FC-finished goods.
- Laundries also carry out re-impregnation work in Germany based on the highest standards and environmental requirements. In Germany, there are two different options possible:
  - Either the user buys PPE with FC and has the garments washed and re-treated by a commercial laundry company on a contract basis. As a rule, the clothing is disposed of with the household waste or
  - The user rents PPE with FC and has it regularly reprocessed and repaired by a textile service provider. The textile service provider disposes of his PPE by thermal

means (waste incineration), as he does not accept any liability risk so that discarded protective clothing can continue to be used.

- As fluorocarbons are very expensive, they are used extremely sparingly. They are also dosed very accurately, as they cause blockages in ultrafiltration systems. There are hardly any closed systems; some of the wastewater is collected and reused.
- Laundries with UF systems and/or precipitation have no problems with fluorocarbons. Here, as a rule, no fluorocarbons are detectable in the water that is delivered to the municipality. The situation is different if the local authority prohibits the operation of its own treatment/biology etc.
- Currently, textile service companies that rent out PPE provide thermal destruction. This is for liability reasons, as they do not want their products to continue to be used through unclear channels.

## Contact

Dr.-Ing. Antje Eichler  
phone: +49 30 726220-30  
email: [aeichler@textil-mode.de](mailto:aeichler@textil-mode.de)

*The German textile and clothing industry is the second largest consumer goods industry in Germany with around 1 400 companies and more than 132 000 employees in Germany. German textile and fashion companies generate annual sales of around 32 billion euros (60 % of which are textiles, 40% of clothing) and are thus the leaders in Europe. Textile companies are important suppliers for industries such as automotive, aerospace, medicine, geotechnology etc. The overall association textil + mode (t+m) is the umbrella organization of the German textile and fashion industry. t+m represents the interests of the industry in the areas of economic, social, collective bargaining and education policy.*

[www.textil-mode.de](http://www.textil-mode.de)