HAZBREF Interim Stakeholder Meeting in Tallinn

Background paper concerning the textile sector on Day 1, Tuesday 21 May 2019

Preliminary findings from textile industry case studies

Within the textile value chain, textile finishing is an environmentally challenging process. This is mainly due to the comparatively high consumption of energy and chemical products. In particular, textile factory wastewater contains many chemical compounds removed from grey fabric and used for textile finishing, which basically encompasses textile pre-treatment, dyeing and/or printing and final finishing. In addition, emissions to air and in the form of liquid and solid waste have to be properly managed (captured and recycled) or disposed of. This includes the sludge from wastewater treatment processes.

The specific consumption of chemical products can be up to 1 kg chemicals/ kg textiles.[1] A considerable number of the technical compounds used for textile finishing is hardly or non-biodegradable, such as dyestuffs, optical brighteners, complexing agents, dispersing agents, agents for fastness improvement, synthetic sizing agents, crosslinking agents, fluoroorganic compounds etc. Following the precautionary principle, the emission of such compounds should be prevented and minimized based on the application of best available techniques (BAT). BAT is defined by the so-called Sevilla Process. They represent "the most effective and advanced stage in the development of activities and their methods of operation, indicating the practical suitability of particular techniques for providing the basis for emission limit values and other permit conditions designed to prevent and, where this is not practicable, to reduce emissions and the impact on the environment as a whole."[2] BATs can help the textile industry to improve their processes and to minimize adverse environmental impacts associated with the release of recalcitrant/hazardous chemicals. Furthermore, a uniform definition of BAT-based emission standards for relevant chemicals in the textile industry would also create a level playing field for the industry and help to foster more efficient operations.

Although many of the chemical-related BATs presented in the Reference Document on Best Available Techniques (BREF) for the Textiles Industries from 2003[3] are still valid today, there has been significant progress in the area of chemical regulation and management, underlining the importance of the ongoing textile BREF revision. By analyzing current and emerging approaches of chemical management in the textile sector (on the basis of selected case studies in Europe), the HazBREF textile project seeks to support this process and facilitate the exchange of best available techniques in general, as well as to guide the determination of specific chemicals-related BATs for the textile industry.

By means of four case studies from Germany, Poland, and Sweden (two draft case studies from Germany are already available), important approaches for chemicals management can be demonstrated. The first step and fundament is a detailed chemical inventory including the compilation of relevant data of all the chemical products used. There are templates available to

[1] Schönberger H.; Schäfer T. (2003): Best Available Techniques in Textile Industry. Berlin: Federal Environment Agency.
[2] DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010
[3] European Commission (2003): Reference Document on Best Available Techniques for the Textiles Industries, http://eippcb.jrc.ec.europa.eu/reference/BREF/txt_bref_0703.pdf

carry out this compilation in a form which allows easy extraction of relevant information for all concerned in- and outside the company. Till date, the textile finishing industries usually depend on the information contained in material safety data sheets (MSDS). However, the quality of MSDS varies considerably, also for want of a clear quality standard for MSDS. It is challenging for textile industries to access and use additional reliable sources of information. Ideally the data from MSDS should be compiled in a dedicated database which would allow the ready evaluation of different practical chemicals management aspects relevant for unloading, storage and handling, wastewater management, occupational health and safety, and other. This would also facilitate achieving conformance to many existing labels such as GOTS, ZDHC, bluesign, SteP etc., as used along the textile value chain. Based on this information, concrete measures can be developed for handling and storage, identification of alternative products to substitute recalcitrant and hazardous chemical compounds. For instance, such common good practices could be:

- The provision of a dedicated area for unloading bulk chemicals with a catchment tank in case of leaks or spillages;
- Installation/use of double-walled tanks with overfilling safety devices for liquid bulk chemicals such as caustic soda, liquid detergent formulations, and with explosion protection for hydrogen peroxide;
- Applying good storage practices, including e.g. the storage of sodium dithionite in a separate room;
- Storage of intermediate bulk containers (IBCs) on catchment tanks having the volume of the IBC; in case of storage of several IBCs on one catchment tank, the volume should be equal or exceed the volume of the biggest IBC;
- For drums, the aforementioned recommendation also applies (refer respective regulations and recommendations regarding secondary containment).

For substituting recalcitrant/hazardous chemicals, detailed knowledge is required with respect to biological degradation and elimination, as far as IED is concerned. To this regard, practical guidance needs to be developed. The same is true for obtaining relevant information from chemical suppliers in case the MSDS contain limited or insufficient information.

Certain concentrated residues (non-preventable quantities which still remain after application of prevention/minimization measures) such as residual dyeing padding liquors, residual printing pastes, residual finishing liquors may have to be segregated for separate external disposal.

With respect to emissions to air, the database should also contain the emission factors for the chemical products used for final finishing. With the application of the so-called emission factor concept, considerable prevention of emissions to air can be achieved, and thus abatement measures can be minimized or even prevented.