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Surface Treatment of Metals and Plastics guidelines

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STM Sectoral guidances

- Sector Overview
- Hazardous Substances Relevant to STM Sector
- Management of hazardous substances
- Key Aspects of chemicals management
- Permitting Process
- Circular Economy issues
- BAT implementation – overview of good practices
- Recommendations

STM Sector Overview

- ❑ STM is a diverse sector in terms of production processes, business relations, history, clients demands and scales of operation which leads both to opportunities and drawbacks in chemicals management and environmental protection.
- ❑ There have been structural changes with preference to bigger companies related to major industrial sectors automotive, aviation and engineering.
- ❑ Efficient chemicals management, addressing environmental issues as well as occupational health and safety aspects, remain a challenge for the industry.
- ❑ For small STM companies socio-economic aspects are important when considering fulfillment of environmental protection obligations.
- ❑ HAZBREF case studies represents facilities producing components for aviation, automotive and engineering sectors in Poland, Finland, Estonia and Germany.

Hazardous Substances in STM Sector

- Key chemicals used in the processes are:
 - in core processes metals -(Cr VI, Cr III, Ni, Co, Cu, Pb) boric compounds, cyanides
 - auxiliary organic and inorganic chemicals such like fluorides and fluoric compounds, oxylated alcohols.
- Potential releases of hazardous chemicals are through:
 - wastewater, usually discharged to external WWTP after on-site pretreatment
 - hazardous wastes
 - air emissions



SVHC & WFD PS relevant for STM

- The information on substance uses in EU was compiled from the ECHA webpages and SPIN register
- The use volumes in EU were derived from ECHA infocards (total use in EU) and SPIN register (only Nordic countries)
- Key words 'manufacture of fabricated metal products' or 'metal surface treatment products' or 'surface treatment' or 'coating products' or 'coating of metals'
- **Result: 81 substances or substance groups** were identified
 - For example: cadmium, cobalt, chromium and lead substances as well as PFAS substances (PFBS & PFNA)

Management of hazardous substances

- HAZBREF case operators are aware of the environmental requirements and obligations and are effective in meeting the objectives.
- They are proactive in improving their operations (technical and organisational) and open for exchange of experiences.
- In some cases further improvements are limited in terms of economics and technical issues.
- Improvements in process technologies and end-of-pipe measures helped to minimise environmental impacts.

Metal releases to waste water have been diminished especially due to more efficient waste water treatment. Water consumption has also been diminished with the circulation of purified waste water back to process.



Key aspects of chemicals management

Findings from the case studies:

- Safety data sheets are the key information source on hazardous substances. The operators keep the information on chemical inventories in orderly manner usually as excel table or database and document the supportive information.
- Quality management systems, clients requirements, environmental liabilities and BATs are the key drivers in determining processes and the chemicals used.
- Management of Hazardous substances is carried out in principle with regard to legal requirements and liabilities concerning environment and Occupational health and Safety.



REACH related management

- REACH has had a clear effect on facilities using substances requiring authorization in EU (Cr VI).
- The authorisation to use chromium trioxide has been applied by the supplier of the chemical and the granted authorisation includes specific conditions of using the substance.
- REACH requirements have leads to more risk management trainings, better and harmonized labelling of chemicals and improvements related to ordering, transporting, labeling and storage conditions for chemicals



Integrated permit

- ❑ The permit usually lists the key materials used (chemicals) and addresses handling and storage of chemicals and hazardous wastes on site .
- ❑ In some cases a record on chemicals which are hazardous to the environment or human health has to be provided in the permit application.
- ❑ Detailed list of hazardous chemicals with their characterisation is provided in Baseline report prepared according to IED (Polish case).
- ❑ Sometimes additional permit for waste treatment is required. In many cases operation related to use of volatile compounds are reported in the integrated permit.



Monitoring

Findings from case studies:

- The companies report emissions to air, releases to sewer etc. to the relevant administrative bodies. In Finland the report should also include a survey on actions made for reducing the amount of waste generated and improving the recycling of waste.
- In some cases documentation of the installation performance is required. For example in Finland the facility has to keep a daily basis record on the activities in the facility.
- There is, in some cases, observed lack of cooperation between relevant authorities for inspections. Based on our findings joint inspections of environmental, chemical, safety and occupational health authorities are recommended.



Circular economy issues

- ❖ There is an essential potential to improve hazardous waste management with regard to Circular Economy but it requires careful consideration taking into account economic and organizational aspects
- ❖ Prevention of hazardous waste generation is important - regeneration and maintenance of technological baths are widely used techniques
- ❖ The companies recycle some of the hazardous waste internally - eg. neutralization, stripping of metals, recovery of chemicals
- ❖ One of the obstacles for management of hazardous waste is diversification of the processes at the plants, irregularity and scale of wastewater/waste streams.



BAT implementation

- The case studies represent to some extent a benchmark of existing BATs (STM BREF) implementation in practice. It is representative for the processes:
 - zinc coating, chromium, nickel, copper, tin, silver plating, anodizing of aluminum.
 - pre-treatment of the substrates: degreasing, pickling, passivation, deburring, blasting and polishing
- The good examples of BAT implementation include generic BATs and sector specific BATs.



Integrated Pollution Prevention and Control

Reference Document on Best Available
Techniques for the

Surface Treatment of Metals
and Plastics

August 2006



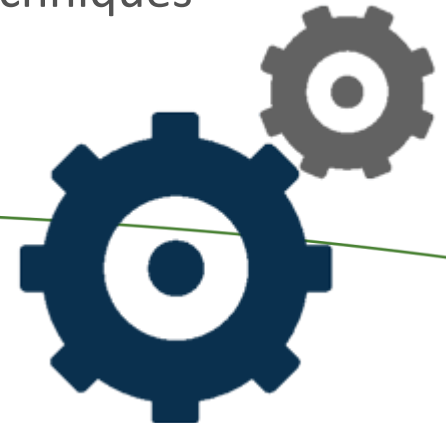
Generic BATs applied in STM

- ✓ Management of chemicals
- ✓ Systematic selection & use of chemicals
- ✓ Management of wastewater streams and recovery of chemicals.
- ✓ Efficiency of raw materials usage
- ✓ Organisation and management of production
- ✓ Systemic inventory and management of hazardous wastes



Process-specific BATs applied in STM

- ✓ Substitution for and/or control of hazardous substances
- ✓ Substitution of technical processes
- ✓ Minimisation of waste of water and materials
- ✓ Improved degreasing and cleaning in case installations
- ✓ Regeneration of baths in place
- ✓ End of pipe techniques for wastewater management including water close cycles
- ✓ Air emission reduction techniques
- ✓ Waste management separation and on site utilisation techniques
- ✓ Monitoring practices



Recommendations

- A** – Development and implementation of Chemical Management System
- B** – Development of well-managed chemical inventories and databases
- C** – Raising awareness and good chemical housekeeping
- D** – Management of new chemicals, approval process
- E** – Process mapping of hazardous substances
- F** – Use of Relevant Tools and References
- G** – STM specific technological improvement



Questions, Comments?



**Thank You for
your attention!**

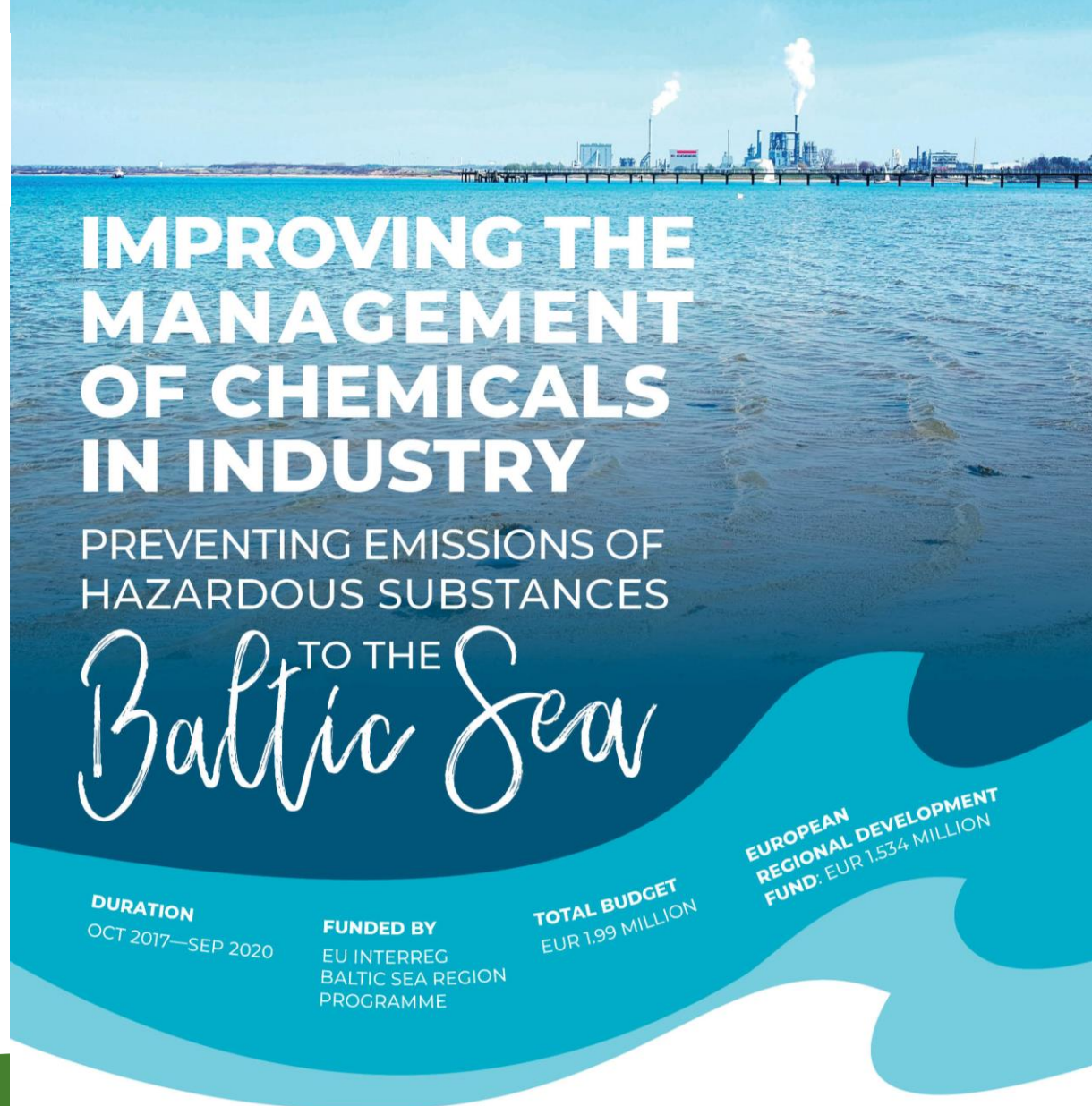
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