

Cleaner Production Training for EPD Punjab

Promotion of Sustainability in the Textile and Garment Industry in Asia-FABRIC

6. Introduction to Best Available Techniques Checklist Tool

10:00 – 11:00

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on behalf of GIZ FABRICS and Espire Consult

- **Introduction to Best Available Techniques Checklist Tool**
 - ✓ Introduction of different available Checklist tools for later use by the EPA Staff
 - <https://www.umweltbundesamt.de/en/publikationen/checklist-based-on-best-available-techniques-in>)

Definition

„best available techniques“ (BAT), regularly defined jointly by EU member states as well as industrial and environmental associations. In the EU, BREF documents – Best Available Techniques Reference Documents – form the basis for permits for environmentally relevant industrial installations. Since 2012, the UBA offers a detailed BAT checklist, providing additional assistance to producers for achieving reduction targets.

Recap of the definitions

BAT – Best Available Techniques **Best:** In terms of techniques, the most efficient ways of achieving an elevated level of environmental protection overall

Available: Techniques permitting their implementation in technically and economically viable conditions, bearing in mind the costs and the benefits

Techniques: Encompass both the technology used and the way in which the plant is designed, built, managed, maintained, operated and decommissioned

BEP – Best Environmental Practice • Most appropriate application of the combination

Checklists on best available techniques in the textiles and leather industry

The UBA (Federal Environment Agency of Germany) has published a checklist tool on best available techniques (BAT) in the textiles and leather industry.

Brands manufacturers and retailers can use the checklists to disseminate European environmental standards among their suppliers and initiate improvements.

The software is based on Excel, it is easy to use and the download available free of charge in English and German language versions.

Advantages of the checklists at a glance:

- Comprises all best available techniques (BAT) mandatory to apply in Europe.
- Enables comparison with own processes.
- Individual selection of core topics.
- Ideas for improvement measures.
- Action plan for further use.

www.umweltbundesamt.de/en/publikationen/umweltstandardsin-textil-schuhbranche

[https://www.umweltbundesamt.de/en/publikationen/checklist-based-on-best-available-techniques-in-textiles and leather](https://www.umweltbundesamt.de/en/publikationen/checklist-based-on-best-available-techniques-in-textiles-and-leather)

How to use the checklist

Users can select either the entire production process or single stages when comparing their production with the best available techniques of the European Union. Questions guide the user through different topics providing proposals for improvement for energy savings, resource efficiency, substitution of hazardous substances and perfection of the production flow. The checklists comprise many references to additional information such as chapters of the EU BAT Reference documents and additional literature.

When checking their processes, users can fill in the checklist their ideas for improvement as well as priorities, persons in charge and time frames. At the end of the revision process, these ideas and determinations are available as a comprehensive action plan that can be saved electronically, exported in PDF format or printed on paper.

Tasks of your environmental management

- Identification and prioritization of acute environmental risks in the company, so that these can be addressed quickly. This also includes obtaining support from specialists and environmental Partners on Site.
- Precise description of process stages with increased potential for environmental risk at your company. Precisely-defined procedures are an important basis for environmental management system measures about environmental protection issues.
- Integration of the measures described in this brochure into your corporate processes in a manner that ensures that no inefficient isolated solutions arise.

Target and background

This checklist supports the identification of measures that reduce environmental impacts of the textile industry. Effective measures help reducing operational costs, improving product quality and company image.

The checklist is based on a comprehensive technical analysis of the European textile industry. This refers to techniques that are currently available, lead to best protection to the environment as a whole and are considered as economically viable - the so called “best available techniques” (BAT). They derive from a stakeholder dialogue organised by the European Commission, involving representatives of Member States, of the European textile industry and of environmental NGOs. The conclusions on Best Available Techniques (BAT) were published in a BAT Reference Document in 2003.

Goals

In the BREFs, examples for benchmarks and concrete savings in different process steps are given. Stakeholders in the chain of custody are invited to make use of the knowledge compiled in the BREF documents for their own purpose. These BREF documents are detailed and industry specific sources for ideas on how to improve the production processes in regard of its environmental impact. The measures e.g. aim at:

- reducing losses and increasing efficiency in the use of raw materials, chemicals etc.
- increasing product quality and reliability
- reducing the amount of energy need
- reducing the amount of water need
- avoiding or reducing pollution of air and water
- avoiding or reducing the amount of hazardous substances in the products

It has to be mentioned that the described BATs depend on the type of aggregates, products, and processing.

Know Why

The motivations for improving the environmental performance of the production process are site specific and may be:

- reducing production costs (e.g. via energy/water savings or reduction of operating resources (auxiliaries, chemicals, dyes etc.))
- improving health and working place conditions
- fulfilling national and international legal requirements
- fulfilling requirements within the chain of custody (e.g. brands, trade companies)
- avoiding conflicts with the factory's neighbourhood and/or environmental organisations
- enhancing reputation as „green“ company

HOW TO USE THE CHECKLIST

Table 1 gives an overview over the BATs addressed in the checklist and refers to the detailed tables (in the electronic version with a hyperlink). These tables guide the user via questions (see explanation and illustration below).

1. Headers are directly related to the structure of the BREF.
2. A clear reference helps to follow directly to the BREF.
3. Symbols indicate the impact category addressed by the measure.
4. A literal copy of the measure is given.
5. A justification for the BAT explains the purpose and the benefits of applying the BAT.
6. In the core table for each BAT the user is guided by questions on 2-3 levels. The higher level question enters into the topic.
7. and (8) They are amended with lower level questions giving more details. Consequently, lower level questions only need to be answered in case the answer to the higher level question indicates the necessity. In the example below, the question on raw materials/substrates only is relevant if the user positively answered the higher level question on having listings of input streams.
8. In footnotes additional and important information is given.

Topics covered in the checklist

Table 1: Topics covered in the checklist in chronological order with indication of process covered and impact categories addressed.

number	measure	process covered					impact categories				
		generic	pretreatment	dyeing	printing	finishing	waste water	energy consumption	use of resources	waste	air pollution
1	<u>Generic BAT (whole textile industry)</u>										
1.1	<u>Management/Good housekeeping</u>										
1.1.1	<u>Input/output streams evaluation / inventory</u>	x	x	x	x	x					
1.1.2	<u>Implementation of environmental awareness and training programmes</u>	x	x	x	x	x					
1.1.3	<u>Good practices for maintenance and cleaning</u>	x	x	x	x	x					
1.1.4	<u>Storage and handling of chemicals</u>	x	x	x	x	x					
1.2	<u>Dosing and dispensing of chemicals (excluding dyes)</u>	x	x		x	x					
1.3	<u>Selection & use of chemicals</u>										
1.3.1	<u>General principles</u>	x	x	x	x	x					
1.3.2	<u>Surfactants</u>	x	x	x	x						
1.3.3	<u>Complexing agents</u>	x	x	x							
1.3.4	<u>Antifoaming agents</u>	x		x							

number	measure	process covered					impact categories				
		generic	pretreatment	dyeing	printing	finishing	waste water	energy consumption	use of resources	waste	air pollution
1.4	<u>Selection of incoming fibre raw material</u>	x	x								
1.5	<u>Washing</u>	x	x	x	x						
1.6	<u>Water and energy management</u>	x	x	x	x						
1.7	<u>Management of waste streams</u>	x									
2	<u>Process-integrated measures for unit processes and operations</u>										
	Textile finishing and carpet industry										
2.1	<u>Pretreatment</u>										
2.1.1	<u>Removing knitting lubricants from fabric</u>		x								
2.1.2	<u>Desizing for cotton and cotton blends</u>		x								
2.1.3	<u>Bleaching</u>		x								
2.1.4	<u>Mercerising</u>		x								
2.2	<u>Dyeing</u>										
2.2.1	<u>Dosage and dispensing of dye formulations</u>			x							
2.2.2	<u>General BAT for batch dyeing processes</u>			x							

Topics covered in the checklist

number	measure	process covered					impact categories				
		generic	pretreatment	dyeing	printing	finishing	waste water	energy consumption	use of resources	waste	air pollution
2.2.3	BAT for continuous dyeing processes			x							
2.2.4	PES & PES blends dyeing with disperse dyes			x							
2.2.5	Dyeing with sulphur dyes			x							
2.2.6	Batch dyeing with reactive dyes			x							
2.2.7	Pad-batch dyeing with reactive dyes			x							
2.3	Printing										
2.3.1	Process in general				x						
2.3.2	Reactive printing				x						
2.3.3	Pigment printing				x						
2.4	Finishing										
2.4.1	Process in general					x					
2.4.2	Easy-care treatment					x					
2.4.3	Softening treatments					x					

number	measure	process covered					impact categories				
		generic	pretreatment	dyeing	printing	finishing	waste water	energy consumption	use of resources	waste	air pollution
3	Effluent treatment										
3.1	Effluent/Waste water treatment	x									
3.1.1	Effluent treatment in the textile finishing and carpet industry	x									
4	Wool										
4.1	Selection of incoming fibre raw material	x	x								
4.2	Process integrated measures for unit processes and operations										
4.2.1	Wool scouring			x							
4.2.1.1	Wool scouring with water			x							
4.2.1.2	Scouring with organic solvent			x							
4.2.2	Wool dyeing				x						
4.2.3	Wool finishing					x					
4.2.3.1	Mothproofing treatments in carpet industry					x					
4.3	Effluent treatment and waste disposal										
4.3.1	Effluent treatment in the wool scouring sector (water-based process)	x									
4.3.2	Sludge from waste water treatment of wool scouring effluent	x									

Generic BAT, Input / output analysis

FKZ 3710 44 3162 Checklist for the textile industry based on BREF

(1)	1 Generic BAT (whole textile industry)			
	1.1 Management / Good housekeeping			
(2)	1.1.1 Input / output streams evaluation / inventory			Follow (13)
	See BREF chapters 4.1.2 and 5.1			
(4)	BAT is to implement a monitoring system for process inputs and outputs (both on-site and on-process level), including inputs of textile raw material, chemicals, heat, power and water, and outputs of product, waste water, air emissions, sludges, solid wastes, and by-products.			
(5)	BENEFITS: A good knowledge of the process inputs and outputs is a prerequisite for identifying priority areas and options for improving environmental performance.			
	Details	Status (10)	Remarks (11)	Follow (12)
		YES NO partly not appl.		YES NO
(6)	Do you have listings of input streams?			
(7)	Are the raw materials / substrates listed?			
(8)	Kind and quantity [t/a]? Make-ups [%]?			
	Details	Status (10)	Remarks (11)	Follow (12)
		YES NO partly not appl.		YES NO
(7)	Are the chemicals / textile auxiliaries listed? Kind and quantity [kg/a]? If yes, what kind of listings exist?			
(8)	Auxiliaries and finishing agents for fibres and yarns? Pretreatment agents? Textile auxiliaries for dyeing and printing? Finishing assistants? Technical auxiliaries for multipurpose use in the textile industry? Basic chemicals? ¹ Dyestuffs and pigments?			
(9)	¹ all inorganic compounds, all aliphatic organic acids, all organic reducing and oxidising agents, urea			

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- Environmental Health & Safety Guidelines (EHSG)⁷

Based on the described first analysis priorities for action may already become obvious and focus areas for additional analysis can be identified.

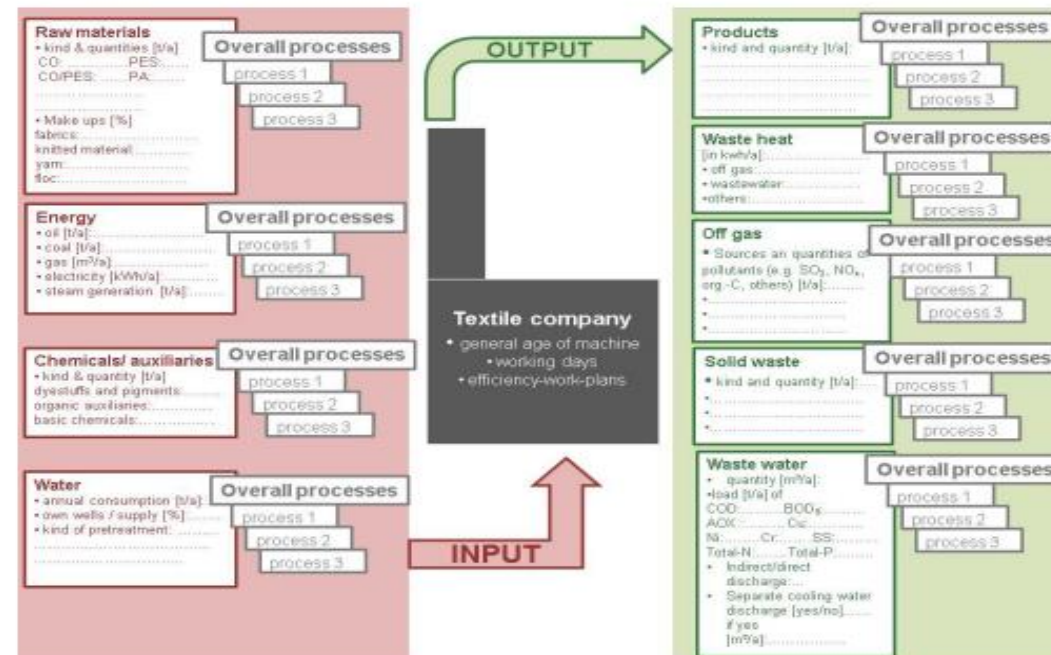


Figure 1: Input/Output analysis

Detailed Checklist example

Details	Status				Remarks	Follow	
	yes	no	partly	not appl.		yes	no
Textile auxiliaries for dyeing and printing?							
Finishing assistants?							
Technical auxiliaries for multipurpose use in the textile industry?							
Basic chemicals? ⁸							
Dyestuffs and pigments?							
Do you have all up-to-date Material Safety Data Sheets? <i>If not, ask your supplier.</i>							
Do you have forms for the listing of characteristics of auxiliaries etc.?							
Do you list the energy sources? Oil [t/a]? Coal [t/a]? Gas [m ³ /a]? Electricity [kWh/a]? Steam generation [t/a]?							
Do you measure the water consumption? <i>At site level?</i> <i>At specific process level/ aggregates?</i> <i>Do you have own wells?</i> <i>Do you have any kind of water pretreatment?</i>							

⁸ all inorganic compounds, all aliphatic organic acids, all organic reducing and oxidising agents, urea

Do you have listings of output streams?							
Are the ready-made products listed? <i>Kind and quantity [t/a]?</i>							
Do you measure the waste Water? <i>Quantity?</i> <i>Load?</i> ⁹ <i>Indirect/direct discharge?</i> <i>Separate cooling water discharge?</i>							
Do you measure the solid waste? <i>Kind and quantities [t/a]?</i> <i>Do you segregate waste streams?</i> <i>Do you recycle certain waste streams?</i>							
Do you measure the off gas? <i>Sources and quantities?</i> ¹⁰							
Do you measure the waste heat? <i>Off gas?</i> <i>Waste water?</i> <i>Others?</i>							

⁹ COD, BOD₅, AOX, Cu, Ni, Cr, Total-N, Total-P⁹, SO₂, NO_x, org. C, others

¹⁰ SO₂, NO_x, org. C, others

The digital tool, BAT_Checklist_Textiles_v102

BAT_Checklist_Textiles_v102 - Gespeichert

Datei Checklist Textiles About..

Save Save as.. Beenden Complete content Table of measures Background Company Overview Index Checklist Textiles Glossary Additional literature Documents Zoom 70% 85% 100% Help Help

Checklist based on Best Available Techniques for the Textile Industry

► Next

The checklist presented here has the objective to support the identification of improvement potential regarding the environmental impact in the textile industry.

Please save this file for a certain year using a respective name before starting the input!
Click the button 'Next' above to start the input.

You must enable macros before using this application.
Please note the security warning that might appear below the menu bar.

Click on the link below to open online help and learn more about security settings and how to avoid repetitive warnings.

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Umwelt Bundesamt

Developed on behalf of the German Environment Agency

<https://www.umweltbundesamt.de/en>

Version 1.02 – October 11, 2016

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