"Capacity Building and Strengthening Institutional Arrangement"

Workshop: "Best Available Techniques (BAT)

BREFs on Textile and Weaving Industries

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APAT

Agency for Environmental Protection and Technical Services

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1. Introduction

Textile & Weaving in brief

The Textile industry is one of the longest and most complicated industrial chains in manufacturing industry. It is a fragmented and heterogeneous sector dominated by SMEs, with a demand mainly driven by three main end-uses: clothing, home furnishing and industrial use.
It is composed of a wide number of sub-sectors, covering the entire production cycle from the production of raw materials (man-made fibres) to semi-processed (yarn, woven and knitted fabrics with their finishing processes) and final products (carpets, home textiles, clothing and industrial use textiles).
Weaving is an ancient textile art and craft that involves placing two threads or yarn made of fibre onto a warp and weft of a loom and turning them into cloth. This cloth can be plain (in one color or a simple pattern), or it can be woven in decorative or artistic designs, including tapestries.

2. Index of the BREF for Textile Industry

(applicable to plants whose treatment capacity exceeds 10 tonnes per day)

Executive Summary, Preface, Scope

- General Information
- Applied Processes And Techniques
- Emission And Consumption Levels
- Techniques To Consider In The Determination Of Bat
- Best Available Techniques
- Emerging Techniques
- Concluding Remarks

References, Glossary, Annexes

3. Methodology of analysis of a production cycle

Natural Fibres

FAMILY	TYPE	TYPICAL USE
Animal	Wool	Clothing, overcoat, lingerie, technical: car components
	Silk	Clothing, lingerie, drapery, braiding, furnishing
Vegetable	Cotton	Clothing, lingerie, furnishing, technical applications
	Flax	Linen, clothing, furnishing, lingerie
	Hemp	Clothing, furnishing, sails, sacks, ropes
	Jute	Protective clothing, furnishing, sacks, bags, belts, hats, carpets, technical: road & railway substratum
	Ramie	Curtain, rope
	Kapok	Filling
	Manila, Sisal, Raffia	Sacks, rope, carpets
	Coconut	Carpets

3. Methodology of analysis of a production cycle

Man made Fibres: organic by natural polymers

FAMILY	NAME	TYPICAL USE
Cellulose	Rayon viscose,	Clothing, overcoat, lingerie, furnishing
	Rayon ammoniacal	Clothing, lining material, lingerie, furnishing, label & tape
	Rayon Acetate (artificial silk)	Female clothing (suit, blouse, velvets), overcoat, summer knitwear, tie, satin, braiding, furnishing, medical use:adhesive bandage
	Lyocell	Clothing, hygienics, medical & technical applications (100% bio-degradable)
Proteinic	Lanital-merinova (animal origin)	Production of felts, mixed with other natural artificial or synthetic fibres

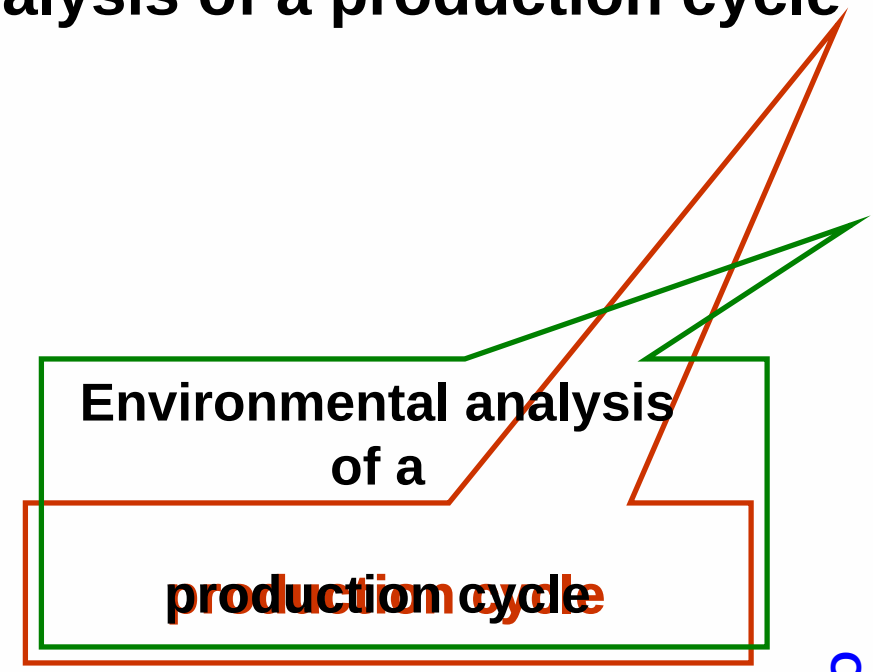
3. Methodology of analysis of a production cycle

Man made Fibres: synthetic

Polyamide	Nylon	Female clothing, collants and hosiery. bathroom lingerie. sporting cloth, raincoat, umbrella, furniture covering, car inner fabric, moquette, bags, felts.
Polypropylene		lingerie, sporting cloth, hosiery, napkin, sanitary pad, blanket. floor & wall fabrics
Polyester	Terital, Dacron ecc.	Clothing, sporting clothing, raincoat, working cloth, lingerie, filling and technical applications
Aramide		Sails, protective cloths (gloves, trousers, jacket).
Modacrilic		Furnishing, ecological fur, toys and peluches, blanket, protective cloths, floor and wall fabrics, saddlery for aerial, train, ship & car transport, filling&filtering
Polyethylene		High performances ropes (sea and industrial), sporting articles, bullet-proof clothes, collision-proof clothes, gloves and uniforms for fencing
Polyurethane	Elastane fibres	Clothing, beachwears,, sporting clothing, underwear, hosiery
Poliacrylic	Orlon, leacril, Dralon ecc.	Knitwear, under-garment, hosiery, carpets, furnishing, ecological fur. technical applications

3. Methodology of analysis of a production cycle

Analysis of a production cycle



the specific segment of an economic or industrial activity with an homogeneous production

the analysis of every phase of the working process

AIMED TO EVALUATE

- Optimize the use of resources in the process
- Compare the environmental performance of the installation versus the pertinent industry

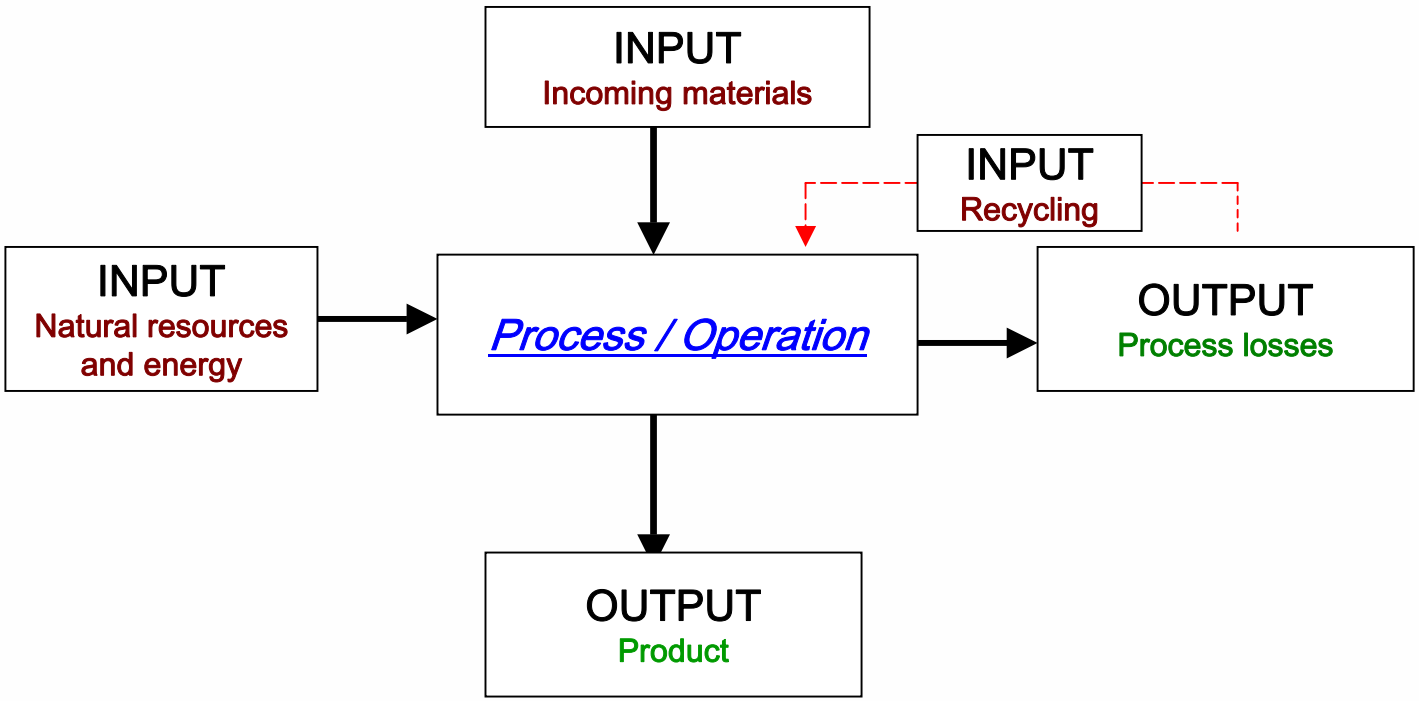
IN ORDER TO

1. materials & energy comsumption
2. primary resources consumption
3. dangerous effluents emission
4. impact and risk factors
5. applied techniques in the process
6. best available techniques

3. Methodology of analysis of a production cycle

Splitting up the process cycle into phases

Analysis of a phase



3. Methodology of analysis of a production cycle

Methodology of analysis

- Input: incoming materials, natural resources, energy
- Output: final product, waste, dangerous effluents and effects in the different environment matrices
- Reuse of materials inside the production process
- Balance of materials, energy and water
- Indirect environment effects
- Integrated approach: IPPC, BAT, BREF

4. Some final considerations

- The textile industry is a very complex and variegated sector. The impact of the implementation of the BAT identified will depend on the characteristics of each mill.
- A Quality Assurance system is necessary, particularly for incoming textile material (many companies have difficulty in controlling/ selecting the source of the fiber raw material).
- A collaboration system with upstream partners in the textile chain is envisaged, in order to create a chain of environmental responsibility for textiles.

5. Recommendations for future work

- A more systematic collection of data is needed on the current consumption and emission levels and on the performance of techniques to be considered in the determination of BAT, especially for water effluents.
- A more detailed assessment of the costs and savings associated with techniques is needed to further assist the determination of BAT.
- Collection of further information on areas not properly covered by the BREF due to a lack of information.

Future EC projects

- Clean technologies.
- Emerging effluent treatment.
- Recycling technologies and management strategies.

6.Reference documents

- BREF: Reference Document on Best Available Techniques for the Textiles Industry – July 2003:

Applied Processes and techniques(chapter 2), Best Available Techniques (chapter 5), Emerging Techniques (chapter 6)
http://eippcb.jrc.es/pages/Fmembers.htm

- Methodology for the environmental analysis of a production cycle – APAT 36/2006 *(Italian language)*

http://www.apat.gov.it/Media/cicli_produttivi/Avvio.htm

- Analysis of the textile industry (wool) in the “Piemonte” region - ARPA Piemonte, 2007 *(Italian language)*