

HACKTEX VIRTUAL TRAINING MATERIALS

MOOC on ADVANCED TEXTILES MANUFACTURING INDUSTRY

Learning unit 4

Lesson 4.1

Standards and regulations for smart textiles

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Standards and regulations for smart textiles

LU 4.1



Contents

- 1. The need for standardization in the field of smart textiles**
- 2. Organizations involved in developing standards and regulations for smart textiles**
- 3. Correlation between the end-use requirements and standards for smart textiles**

1. The need for standardization in the field of smart textiles



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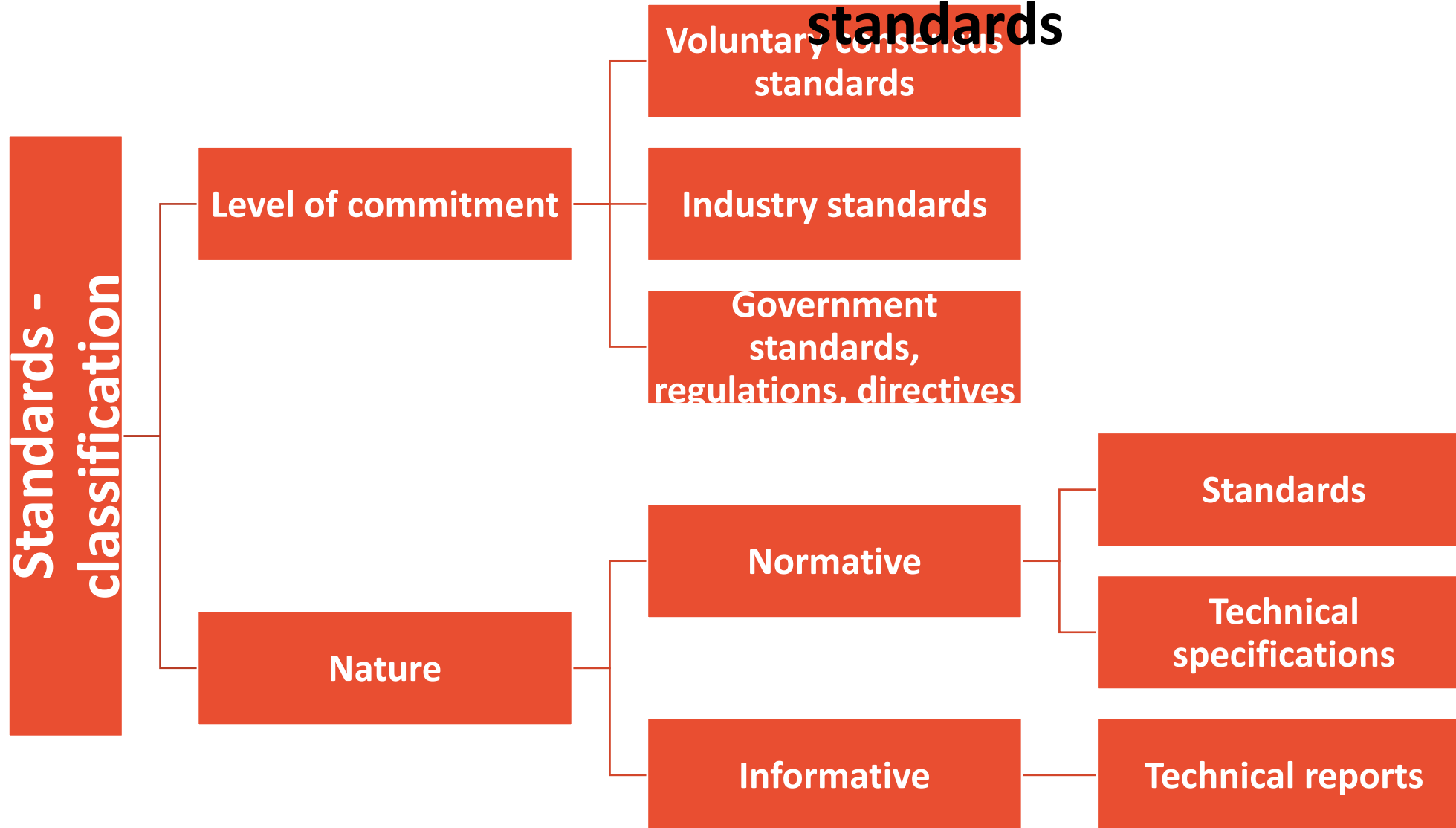
1.1. Standards – definition, types of technical standards, life cycle of a technical standard



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Classification of technical standards



Structure of a technical standard

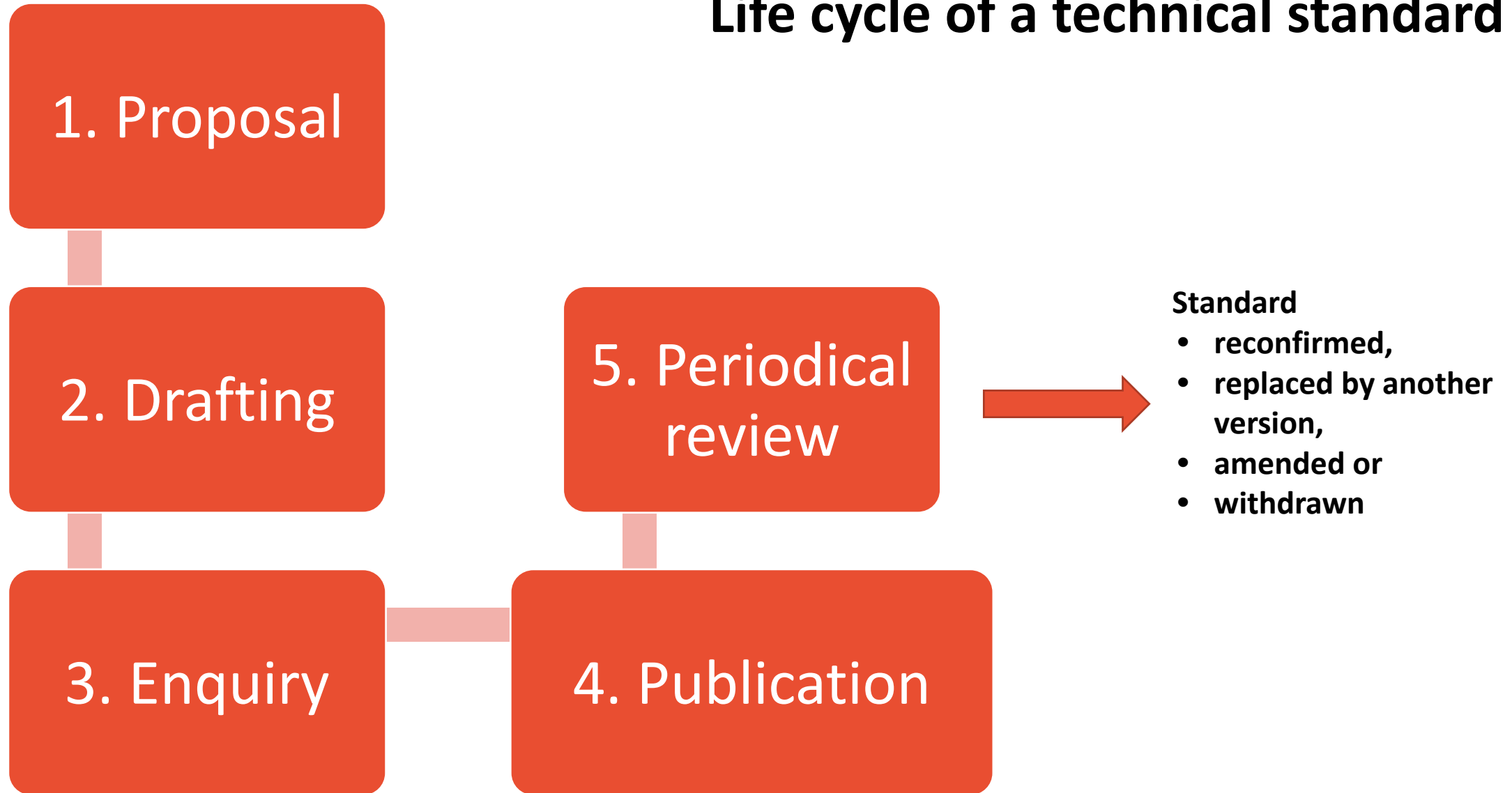
Denomination of a standard:

- Initials of the organizations adopting the standard
 - Number of the standard, followed by the year when the standard was adopted
 - Title of the standard
 - Any modifications, amendments
-
- **EN 16812: 2016 Textiles and textile products - Electrically conductive textiles - Determination of the linear electrical resistance of conductive tracks**  Adopted in 2016, not yet modified or amended.
 - **ISO 6330: 2021 Textiles — Domestic washing and drying procedures for textile testing**  4 editions, last one in 2021, all included modifications.
 - **IEC 62899-201:2016+AMD1:2018 (Consolidated version) Printed electronics - Part 201: Materials – Substrates**  Issued in 2016, amended in 2018. Consolidated version - both the original and amended content is included.

Structure of a technical standard



Life cycle of a technical standard



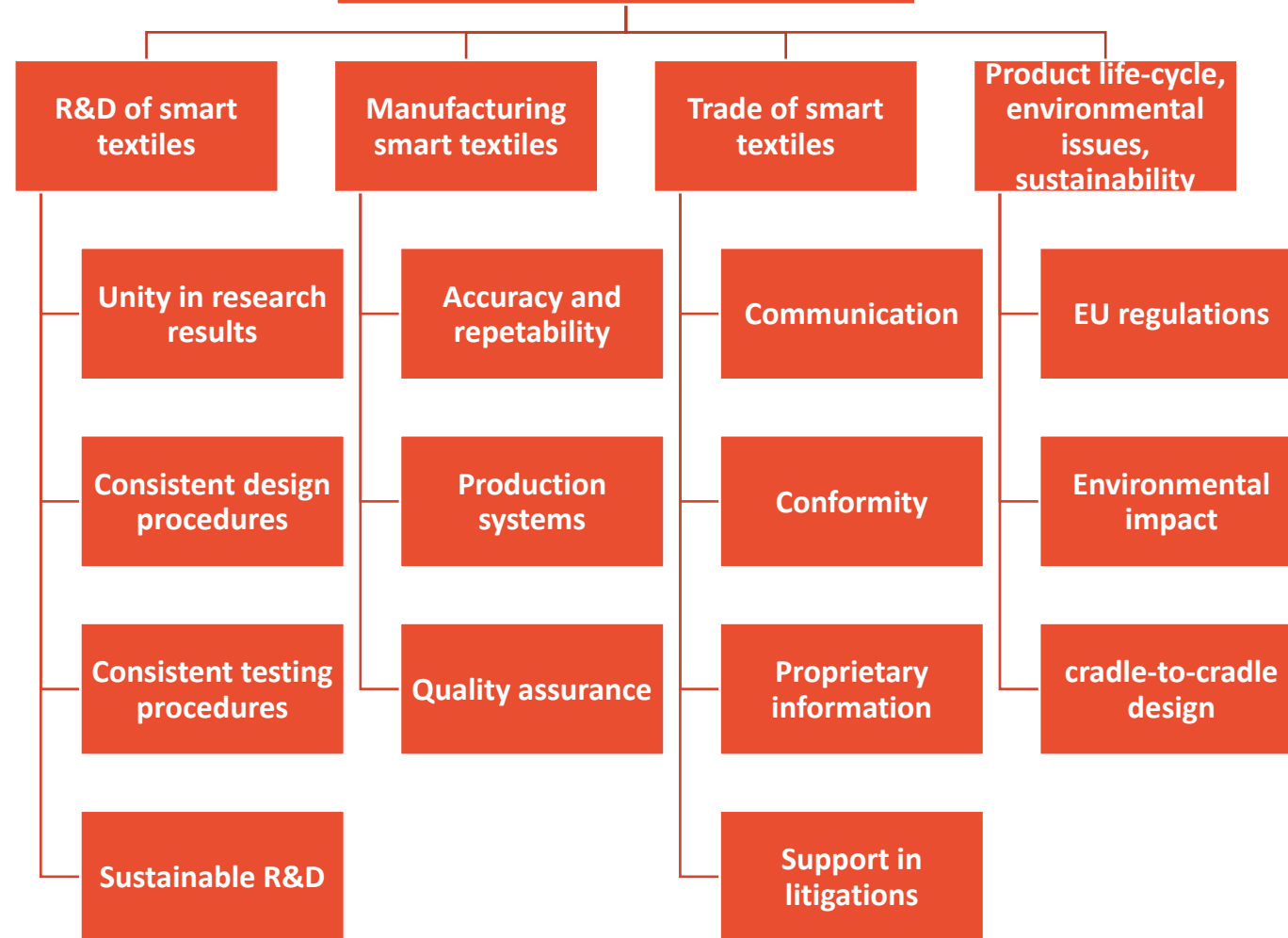
1.2. The need for standardization in the field of smart textiles



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Advantages of standardization



2. Organizations involved in developing standards and regulations for smart textiles

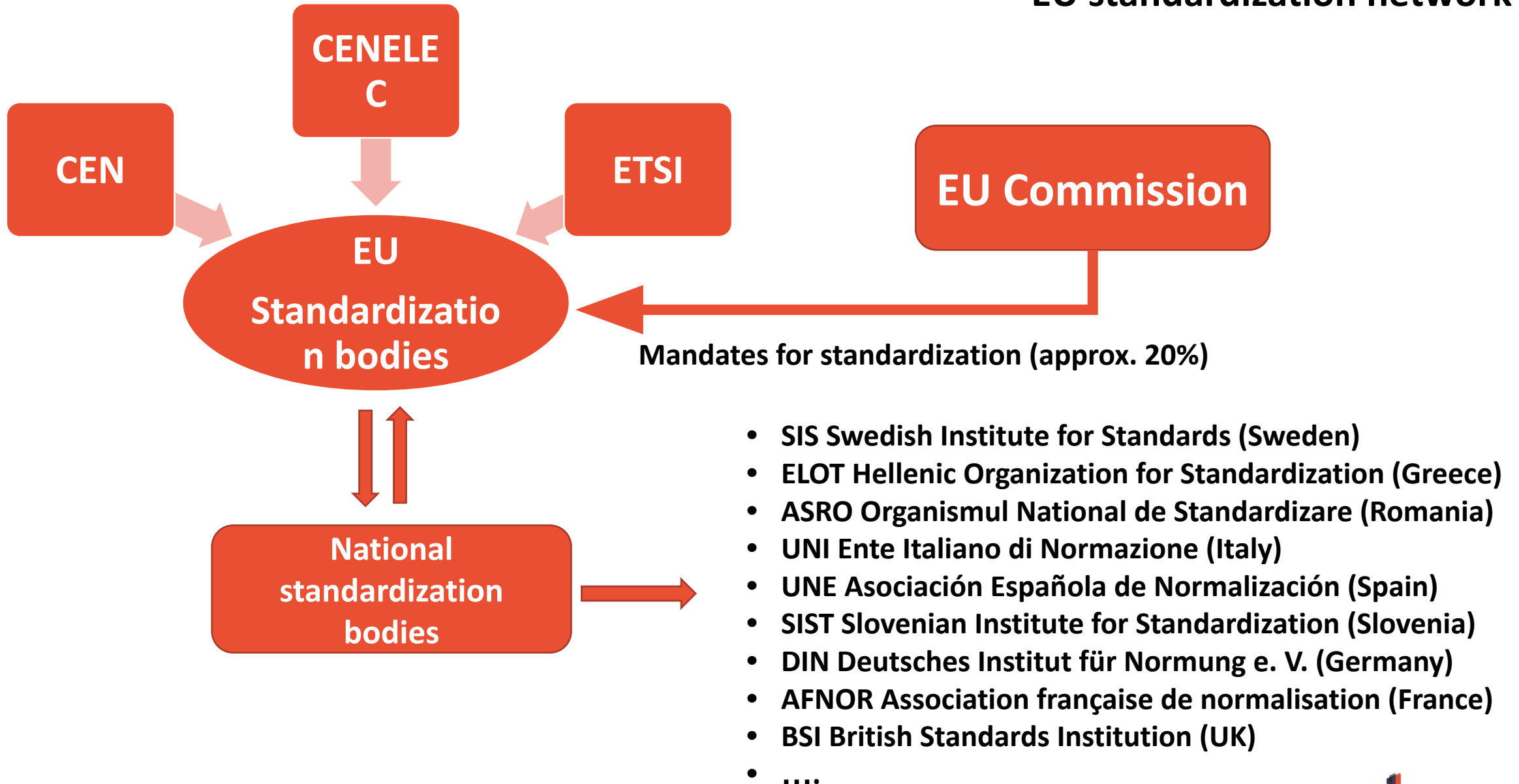


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EU standardization network



International standardization organizations

- ✓ **International Standard Office ISO - independent, non-governmental international organization with a membership of 167 national standards organizations, including those from all EU countries**
- ✓ **International Electrotechnical Commission IEC is a non-profit organization that develops and publishes standards concerning electrical technologies, with a network of over 150 countries**
- ✓ **ASTM International (former American Society for Testing and Materials), an organization that develops technical standards for a variety of industrial applications**
- ✓ **Association of American Textile Chemists and Colorists AATCC is a standardization organization that is dedicated exclusively to the textile sector**
- ✓ **IPC is an American non-profit organization for the electronics sector that is developing standards at a global level.**

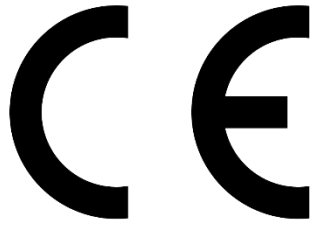
Standardisation organisation	Technical committee	Working group	Other WG of interest
ISO	TC38	WG32 Smart textiles	
IEC	TC 124 Wearable electronic devices and technologies		
CEN	CEN/TC248 Textiles and textile products	WG31 Smart textiles and electronic textiles	CEN/TC 248/WG 4 Coated fabrics; CEN/TC 248/WG 14 UV protective properties; CEN/TC 248/WG 24 Test methods for the flammability of textiles; CEN/TC 248/WG 28 Thermoregulatory properties of textiles and textile products; CEN/TC 248/WG 39 Circular Economy for textile products and the textile chain.
ASTM	Smart textiles subcommittee D13.50		
AATCC	RA111, Electronically-Integrated Textiles		
IPC	D-70	D-71 E-textiles joining and interconnection techniques D-72 Textile materials D-73a e-textiles printed electronics design D-74 E-textiles test methods development and validation D-75a -EU E-textiles wearables (standard task group in Europe)	

Standard harmonization

```
graph TD; A[Standard harmonization] --> B[The process in which standards are aligned by adopting common standards and the redundant ones are eliminated.]; A --> C[The EU directives for a certain domain of use (egg. PPE, health) contain regulations that must be followed and the requirement to harmonize the existing standards for the respective destination.];
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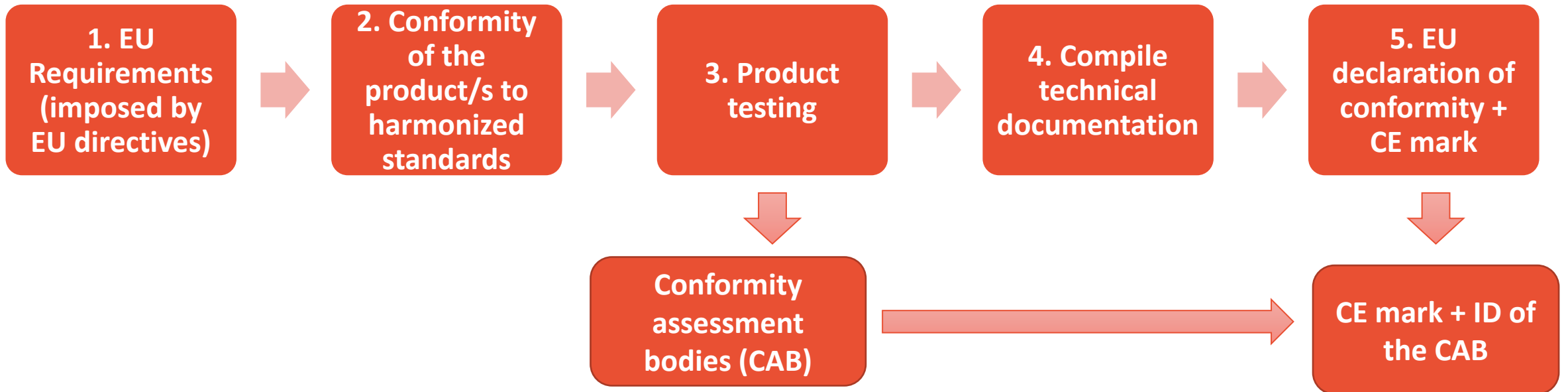
The process in which standards are aligned by adopting common standards and the redundant ones are eliminated.

The EU directives for a certain domain of use (egg. PPE, health) contain regulations that must be followed and the requirement to harmonize the existing standards for the respective destination.



the CE marking indicates that a product has been assessed by the manufacturer and deemed to meet EU safety, health and environmental protection requirements

Some products have to be certified.
For smart textiles, their use for medical devices and PPE requires certification.

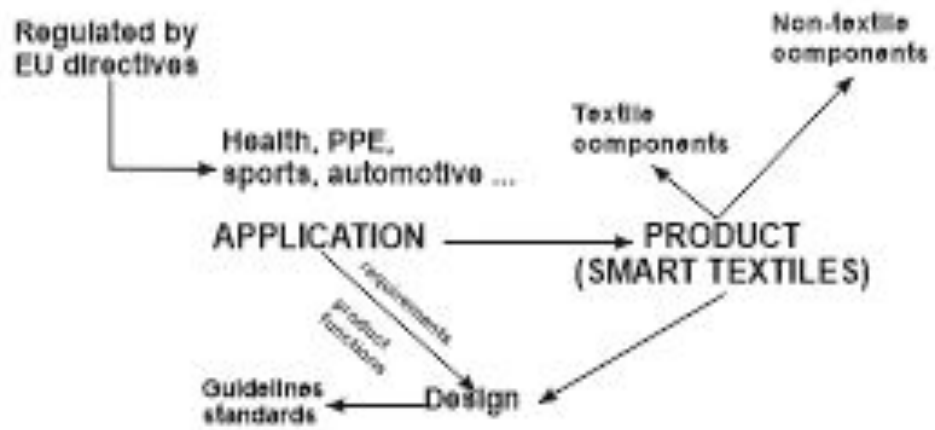


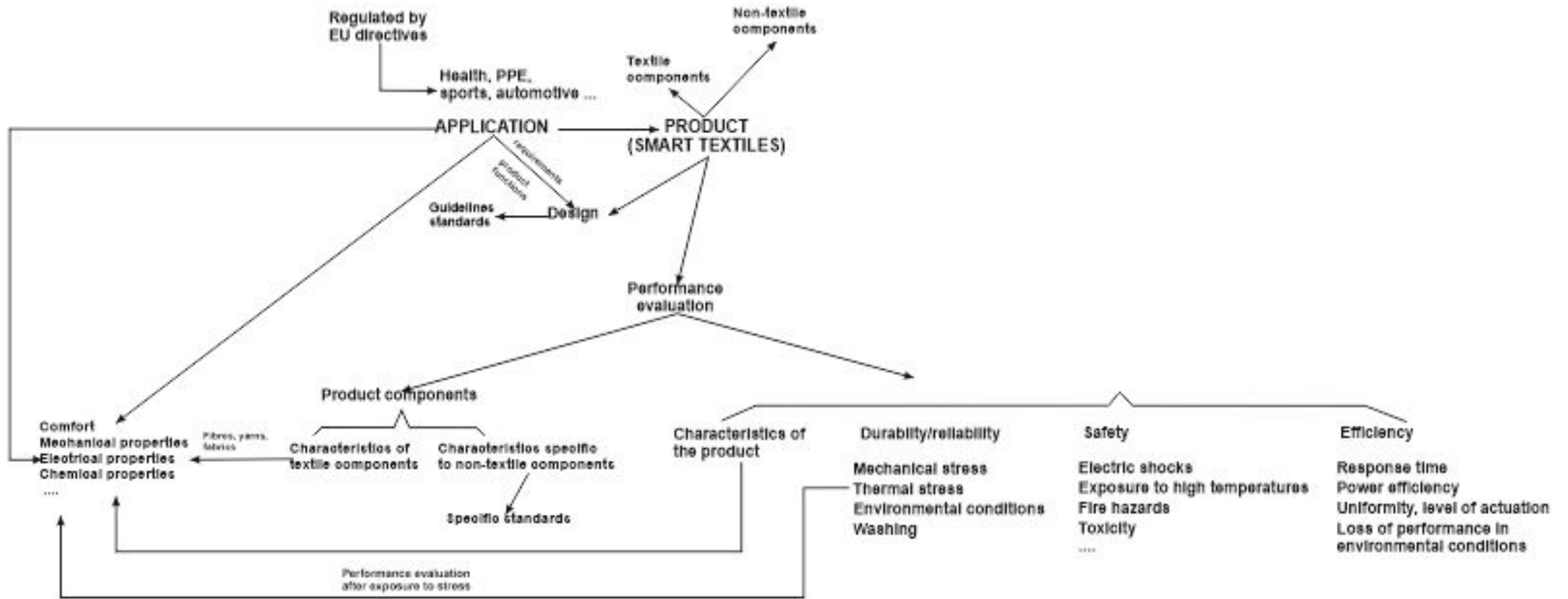
3. Correlation between the end-use requirements and standards for smart textiles

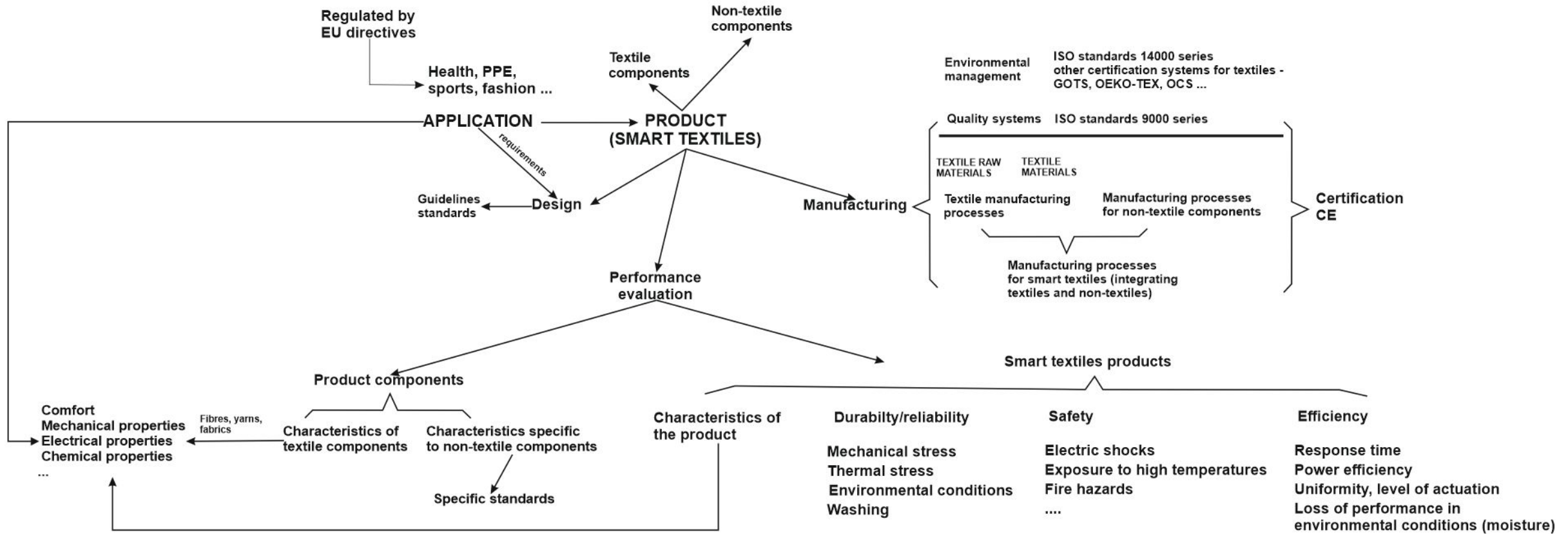


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Summary

- Standards and regulations are essential for developing smart textile products, as they impose the norms for the entire value chain, from design to manufacturing to use and to end-of-life.
- The organizations involved in developing standards for smart textiles are national, regional (at EU level -CEN/CENELEC and ETSI) and international (ISO, ASTM, AATCC, IPC).
- An important aspect of regulations concerning certain applications is the need to certify such products. Certification is attested by the CE marking.
- Standards regulate and support the design of smart textiles, the evaluation of their performance, durability, safety, efficiency and their manufacturing.

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