CEN/CLC/JTC 10 Material Efficiency

Helen Versluys – Dirk De Moor

Embracing technology
Embracing ambition
Quick background on CEN/CLC/JTC 10 Energy-related products - Material Efficiency Aspects for Ecodesign
EU Circular Economy Package

- Current focus in Eco-Design implementing measures for ErP is on energy efficiency aspects.
- Systematic examination of “issues such as reparability, durability, upgradability, recyclability, or the identification of certain mater
Mandate (M543)

- One of the reasons for the relative lack of ecodesign requirements related to material efficiency in the implementing measures adopted so far is the absence of adequate metrics. The Commission estimates that the availability of standardisation deliverables, particularly generic standards, will facilitate discussions on potential requirements related to material efficiency aspects in future product-specific implementing measures adopted under the Ecodesign Directive.

- CEN, CENELEC and ETSI are requested to draft new European standards on material efficiency aspects for energy-related products in support of implementation of Directive 2009/125/EC.

- Standard request is linked to the following material efficiency aspects:
  - Extending product lifetime.
  - Ability to re-use components or recycle materials from products at end-of-life.
  - Use of re-used components and/or recycled materials in products.
Mandate (M543)

- Any deliverable resulting from this request should fulfil the following criteria:
  - Provide reliable, accurate and reproducible measurement procedures, which are not prohibitively expensive or imply lengthy tests;
  - Enable (when referenced by harmonised standards adopted in accordance with separate, product specific standardisation requests) both economic operators and market surveillance authorities to determine conformity with relevant requirements set out in one or several ecodesign implementing measures.

- General methods
  - Not directly applicable;
  - To be used in preparation of product-specific standardization deliverables or methods.
CEN/CLC/JTC 10 working groups

- **WG 1**: Terminology (technical report)
- **WG 2**: Durability
- **WG 3**: Upgradability, Ability to repair, Facilitate Re-Use, Use or re-used components
- **WG 4**: Ability to re-manufacture
  - Ability to re-manufacture
  - Proportion of re-used components
- **WG 5**: Recyclability, recoverability, RRR index, Recycling, Use of recycled materials
  - Recyclability/Recoverability
  - Proportion of recycled material content
- **WG 6**: Documentation and/or marking regarding information relating to material efficiency of the product
  - Declare the use of critical raw materials
  - Documentation and/or marking regarding information relating to material efficiency
<table>
<thead>
<tr>
<th>TC 10 WG</th>
<th>New Item Nr</th>
<th>Title of deliverable</th>
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<tr>
<td>1</td>
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<td>pr TR 45550 : Definitions related to material efficiency</td>
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<td>1</td>
<td>2</td>
<td>pr TR 45551: Guide on how to use generic material efficiency standards when writing energy related product specific standardization deliverables</td>
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<td>2</td>
<td>3</td>
<td>pr EN 45552 : General method for the assessment of the durability of energy related products</td>
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<td>pr EN 45554 : General method for the assessment of the ability to repair, reuse and upgrade energy related products</td>
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<td>pr EN 45553 : General method for the assessment of the ability to remanufacture energy related products</td>
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<td>pr EN 45555 : General methods for assessing the recyclability and recoverability of energy related products.</td>
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<td>pr EN 45556 : General method for assessing the proportion of re-used components in an energy related product</td>
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<td>pr EN 45557 : General method for assessing the proportion of recycled material content in energy related products.</td>
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<td>pr EN 45558 : General method to declare the use of critical raw materials in energy related products</td>
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<td>10</td>
<td>pr EN 45559 : Methods for providing information relating to material efficiency aspects of energy related products</td>
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Latest state of affairs
Progress until now

- **1st official draft standards available for all six working groups (since Oct 2017)**
  - Different levels of maturity & detail
  - Discussions still ongoing with regard to scope, measurement methods, scoring systems, etc.
  - Overlap / interlinkage between draft standards not solved yet

- **Comments by national committees were provided end 2017**
  - Extensive comments on all drafts

- **Multiple (web) meetings at WG level**
  - To process comments from national committees
  - To adapt drafts accordingly
Most important moments for national committees to provide comments

Original timing

- NWIP to TC10 (NC)
- NWIP to BT
- NWIP approved
- 1st Draft Ready (Sec. Enq.)
- Comm back
- 2nd Draft Ready (Enquiry)
- Comm back
- Final Draft ready
- Result Final Vote

2017
- Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec
- 3rd Meet 23/24 May
- Write Standard

2018
- Jan | --- | Aug | Sep | Oct | Nov | Dec
- 4th Meet 21 Sept.
- Review Prep. 2nd Draft

2019 Q1
- 5th Meet
- 6th Meet 6-9 Sept.
- END

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New timing

- In some cases up to 100 pages of comments by national committees on 1st drafts & extensive rewriting needed
- 9 months delay requested by working groups 1, 2, 3, 4 and 5 due to complexity of the work
  - WG 6: Final vote expected March 2019
  - WG 1, 2, 3, 4, 5: Final vote expected towards end of 2019
Draft standard on repair, re-use & upgrade in detail
General method RRU assessment

- Definition of parts that are relevant for the RRU assessment
  - Identify and list parts prone to be replaced, repaired, reused or upgraded
  - Assess the relevance of the parts
  - Rank parts in a priority list
General method RRU assessment

- Parameters for the RRU assessment
  - Ability of a product to be disassembled
    - Disassembly depth
    - Fastener type, number and visibility
    - Tools needed
    - Working environment
    - Skills level
  - Manufacturer support to facilitate repair, reuse or upgrade
    - Diagnostic support and interface
    - Availability of spare parts
    - Information availability (repair manuals, technical drawing)
    - Return models (logistical chain)
General method for RRU assessment

- Annex A: common general purpose tools
- Annex B: assessment methodologies
  - Semi-quantitative
  - Quantitative

Disassemblability index:

\[ dd = dd_n + \beta \cdot dd_f = \frac{1 + n_D}{n} + \beta \cdot \frac{\sum_{k=1}^{h} \alpha_k \cdot f_{Dk}}{f} \]
Repairability index (draft!)

The Product reparaability index can be expressed as the combination of the portion of the product parts that could be repaired and the time needed to do the repairs:

\[ R_{\text{repair}} = \sum_{i=1}^{p} \frac{t_{\text{repair},i}}{m_i \cdot W_{\text{need},i}} \cdot \frac{m_{\text{tot}}}{t_{\text{ref}}} \]

\[ R_{\text{repair}} \geq 0; \ [\text{dimensionless}] \]

where:

- \( R_{\text{repair}} \) = Product reparaability index \ [\text{dimensionless}];
- \( p \) = number of parts considered \ [\text{dimensionless}];
- \( m_i \) = mass of part \( i \) \ [kg];
- \( W_{\text{need},i} \) = overall weighting factor of part \( i \), \ [dimensionless];
- \( t_{\text{repair},i} \) = Time for repair of part \( i \) \ [s];
- \( t_{\text{ref}} \) = reference time \ [s];
- \( m_{\text{tot}} \) = total mass of the product \ [kg].

The more parts that can be repaired and the shorter the repair time for those parts, the lower the index, the better the reparaability. A normalisation is done by dividing by a reference time \( t_{\text{ref}} \). A place holder for weighting need for reparaability of parts (e.g. \( W_{\text{need},i} = w_{\text{fail},i} \cdot w_{\text{crit},i} \cdot w_{\text{env},i} \cdot w_{\text{value},i} \)) is included in the formula.
Recyclability rate – Recoverability rate (draft!)

\[
R_{cyc} = \frac{\sum_{k=1}^{n} (m_k \times R_{cyc,k})}{m_{tot}} \times 100\%
\]

\[
R_{cov} = \frac{\sum_{k=1}^{n} (m_k \times R_{cov,k})}{m_{tot}} \times 100\%
\]
Recycled content (draft!)

The post-consumer recycled material content, $rc_{post}$, of a material, as a percentage by mass (mass fraction in percent), shall be calculated using the formula:

$$rc_{post} = \left(\frac{\text{post - consumer recycled material mass in the material}}{\text{total mass of a material}}\right) \times 100\%$$

$$= \left(\frac{m_{post}}{m_{tot}}\right) \times 100\%$$
Conclusion
Material efficiency & ErP: it’s happening now

- JTC 10 general standards: end 2019
- Material efficiency already included in proposals for product-specific requirements
  - For instance Draft Regulation Eco-design requirements for electronic displays
    - Energy-efficiency requirements
    - Material efficiency requirements (linked to durability, repairability, reuse & dismantling at end of life)
    - Information requirements such as information to repair displays
- JRC studies ‘Ecodesign for circularity’
  - Analysis of material efficiency aspects of smartphones
  - Assessment of the reparability and upgradability of TVs
Lifts & ecodesign requirements

- Lifts are included in the indicative list of new product groups of the Working Plan 2016-2019.
- Lifts will be subject to a preparatory study that investigates in more detail the potential for environmental improvement, including aspects relevant to the circular economy.
  - The Commission will explore the possibility of establishing requirements in areas such as durability (e.g. minimum life-time of products or critical components), reparability (e.g. availability of spare parts and repair manuals, design for repair), upgradeability, design for disassembly (e.g. easy removal of certain components), information (e.g. marking of plastic parts) and ease of reuse and recycling (e.g. avoiding incompatible plastics), greenhouse gas and other emissions.
  - No Ecodesign measure will be proposed if the major part of the energy savings potential in lifts is already captured through other Ecodesign regulations on their components, such as the regulation on electric motors.
Lifts & ecodesign requirements

- Recycling
  - Recyclability is a product characteristic. Burden on the manufacturer.
  - Recycling depends on the end-of-life (demolition) process.
Thank you
For your attention