Recyclability and Recoverability Calculation Method for Rolling Stock

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Content

• Introduction – UNIFE Topical Groups
• Current Recycling Activities
• Goal and Scope of Rolling Stock Recycling Calculation Method
• Principles of Calculation Method
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UNIFE represents the European Rail (Supply) Industry

- Based in Brussels since 1992
- 22 permanent employees
- A trusted partner of the European institutions in all matters related to rail and transport
- Full members: 81 of the largest and medium-sized companies in the rail supply sector
- Associated members: 18 National Associations, representing almost 1,000 suppliers of railway equipment + EFRTC and UNISIG
- UNIFE members have an 80% market share in Europe and supply more than 50% of the worldwide production of rail equipment and services.
Who is the Sustainable Transport Committee?

• The UNIFE Sustainable Transport Committee acts as a coordinator for all the environmental matters and provides a platform for consensus-building to formulate common positions.
• Fields of action related to Ecodesign of Railway Systems.
• There are 3 technical groups under the leadership of the Sustainable Transport Committee:
  – Chemical Risk topical group
  – Energy Efficiency topical group
  – **Life Cycle Assessment topical group**
    • Product Category Rules for Environmental Product Declarations (EPD Type III)
    • Recycling
    • Life Cycle Assessment according ISO 14040
Why Recycling?

Recycling is a comprehensive issue and analyzed since 1985 especially for cars. Following several mandatory obligations, standards and customers requirements needs to be fulfilled:

• Automotive:
  – EU Legislation for End of Life Vehicles (ELV Directive)
  – 95 % legal bound recoverability rate by the end of 2015
  – Well organized take back system
  – Calculation standardized related to ISO 22628
  – Recycling orientated product design (e.g VDI 2243)

• Electrical and Electronic Equipment (EEE):
  – IEC/TS 62635 Ed.1.0: End of life recyclability calculation for EEE
  – IEC/TS 62650 Ed.1.0: End of Life information exchange for electro technical equipment between manufacturers and recyclers
  – WEEE and RoHS

• Shipping Industry: Hongkong Convention

• Railway Industry:
  – Voluntary calculation of recyclability and recoverability rates on behalf of industry
What does a recycling calculation method for rolling stock look like?

**Goal**
- Development of a railway specific recycling calculation method in order to fulfill the needs of complex products like trains
- Based on terminology of automotive sector, improved for railway components
- Encourage suppliers to design railway products in a recycling friendly way (Design for Recycling)

**Scope**
- Time scope: Rolling stock products starting from 2005 up to current technologies
- Geographical scope: Worldwide (for legislation scope Europe)
- Technology scope: European Recycling Technologies
Recyclability or Recoverability Rate?

<table>
<thead>
<tr>
<th>Rolling Stock Mass</th>
<th>Recoverability Rate</th>
<th>Recyclability Rate</th>
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<tbody>
<tr>
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<td>Reuse</td>
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<td>Recycle</td>
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<td>Energy Recovery</td>
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<td>Disposal</td>
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Generated formula for Rolling Stock

**Recyclability** = Reuse + Recycle

**Recoverability** = Reuse + Recycle + Energy recovery

**Reuse** – Using a product without post processing

**Recycle** – Reprocessing materials e.g. Metal scrap, plastic granulate for hot molding

**Energy recovery** – Generating heat or electricity from incineration of materials

**Disposal** – Waste dedicated to landfill
How does a Recycling Process for Rolling Stock look like?

**Pre-treatment**
- Take vehicle to a safe place
- Extraction of fluids → sent for recycling, energy recovery or disposal
- De-pollution: removal of hazardous components

**Dismantling**
- Dismantling parts for reuse or to facilitate the separation of materials for recycling or disposal
- As much manual material separation as possible
- Metals: sent for recycling
- Polymers: sent for recycling or energy recovery

**Shredding**
- The remaining part of the vehicle: sent for shredding
- Recycling of ferrous metals

**After Shredder residue**
- The non-metallic shredder residue: preferably recycled before sent to incineration process

**Mass flows**
- Reuse
- Material Recycling
- Energy Recovery
- Disposal
Benefits!

• Transparent method considering the recyclability factors of different materials
• Option for modular approach
• Predictable forecast for recycling benefits and costs
• Common industry agreement which ensures comparability
• Continuous improvement of resource efficiency
Thank you for your attention!
Questions?

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