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Tool 7.6 Circular Design Evaluation Worksheet



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Circular Solutions for Furniture
A Horizon Europe Initiative

Tool 7.6 Circular Design Evaluation Worksheet

Phase 7 – Implementation and Operation

Objective of the Tool

The Circular Design Evaluation Worksheet helps furniture companies assess how well a product supports circular economy principles through its physical design and technical architecture.

The tool enables organisations to evaluate product modularity, disassembly, repairability, refurbishment potential, and material recovery capabilities. It supports companies in identifying design weaknesses that limit circular operations and helps prioritise improvements that extend product lifecycles and improve resource recovery.

The worksheet also supports integration with Digital Product Passports (DPPs) and other lifecycle documentation systems by structuring key product and material information in a systematic way.

What the Tool Is

The Circular Design Evaluation Worksheet is a practical product assessment and improvement tool used to evaluate the circular readiness of furniture products.

It combines:

- product architecture mapping
- disassembly scoring
- repairability assessment
- refurbishment evaluation
- material recovery analysis

into a structured evaluation process that helps organisations identify technical barriers and opportunities for circular product design.

The tool supports both:

- existing product evaluation

- early-stage circular product redesign

and helps translate circular strategy into concrete design improvements.

When to Use the Tool

This tool is particularly useful when companies are:

- Evaluating whether products support repair, refurbishment, reuse, or recycling
- Redesigning products for circularity or regulatory compliance
- Identifying technical barriers to circular business models
- Developing products compatible with refurbishment or Furniture-as-a-Service models
- Preparing Digital Product Passport documentation
- Assessing disassembly and material recovery potential
- Prioritising product-level circular design improvements

The tool can be applied both:

- during product development
- and during evaluation of existing products already in the market.

It is especially relevant for companies exploring:

- modular design
- repair services
- refurbishment systems
- reverse logistics
- lifecycle extension strategies.

How to Use the Tool

Step 1 – Record Product Information

Document the basic product details, including product category, model, manufacturer, evaluation team, and assessment date.

Step 2 – Map Product Architecture

Identify the main product modules, materials used, likely wear components, reusable components, and disassembly challenges.

Step 3 – Conduct Disassembly Assessment

Evaluate the product using the disassembly scoring dimensions:

- fastener accessibility
- connection type
- disassembly time
- tool requirements
- component independence
- material separation

Calculate the overall disassembly score and circular design level.

Step 4 – Assess Repairability

Evaluate whether key components can be repaired or replaced efficiently, including spare parts availability and repair accessibility.

Step 5 – Assess Refurbishment Potential

Examine whether products can be economically refurbished and reintroduced into secondary markets.

Step 6 – Assess Material Recovery

Evaluate how easily materials can be identified, separated, and recovered through existing recycling pathways.

Step 7 – Identify Improvement Opportunities

Document technical weaknesses and define potential design improvements together with their expected circular impact.

Step 8 – Prioritise Recommended Actions

Identify high-, medium-, and low-priority design interventions and assign responsibilities where relevant.

Step 9 – Review Product Data Integration

Assess whether the product supports lifecycle documentation requirements such as:

- material composition tracking
- repair instructions
- spare parts catalogues
- DPP compatibility

Expected Output

The exercise produces a Circular Design Evaluation Report describing:

- product modularity and architecture
- disassembly performance
- repairability potential
- refurbishment feasibility
- material recovery capability
- technical barriers to circularity
- recommended product design improvements
- DPP and lifecycle documentation readiness

This output helps organisations identify how product design influences the feasibility of circular business models and lifecycle management strategies.

Key Dimensions of the Circular Design Evaluation Worksheet

1. Product Architecture Overview

Examines how the product is physically structured, including modules, materials, wear components, and disassembly complexity.

Guiding question:

How does the current product architecture support or limit circularity?

2. Disassembly Assessment

Evaluates how easily products and components can be separated, repaired, reused, or recovered.

Guiding question:

How easily can the product be disassembled without damaging components or materials?

3. Repairability Assessment

Assesses whether products can be repaired efficiently using accessible components, tools, and instructions.

Guiding question:

How easily can the product be repaired and maintained during use?

4. Refurbishment Potential

Examines whether products can be economically restored and reintroduced into secondary use cycles.

Guiding question:

Can the product realistically support refurbishment and second-life applications?

5. Material Recovery Assessment

Evaluates how well materials support identification, separation, and recycling.

Guiding question:

How effectively can materials be recovered at end-of-life?

6. Improvement Opportunities & Recommended Actions

Identifies design weaknesses and prioritises interventions improving circular performance.

Guiding question:

Which design improvements would most effectively strengthen circularity performance?

7. Integration with Circular Product Data

Examines compatibility with lifecycle documentation and Digital Product Passport requirements.

Guiding question:

Does the product support transparent lifecycle and circularity data management?



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