PROJECT DELIVERABLE REPORT

Grant Agreement Number: 101058732

Joint Industrial Data Exchange Pipeline

Type: DEM- Demonstrator, Pilot, Prototype

D5.3 Use Case 2 Incremental Demonstration Report

Issuing partner	ADL
Participating partners	ADL, CRF, ADS
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Dissemination Level		
PU	Public	✓
PP	Restricted to other programme participants (including the Commission services)	
CO	Confidential, only for members of the consortium (including the Commission services)	
SEN	Sensitive, limited under the conditions of the Grant Agreement	

Contents

Executive Summary

This report confirms the demonstration-type deliverable results, by providing end-user validation activities (screenshots) of a live and working JIDEP system.

The report has extra associated materials (video summary), as well as partner presentations from the year-2 plenary session.

It should be noted that the report captures the state of the demonstrations for the M28, however the deadline for the completion of demonstrations is M32. Accordingly, certain demonstration activities are still ongoing.

1 Use-Case-2 Demonstration Plan

The overall UC2 demonstration plan anticipates industrial cooperation between LEs, SMEs, and Academia by placing JIDEP at the core of this collaboration.

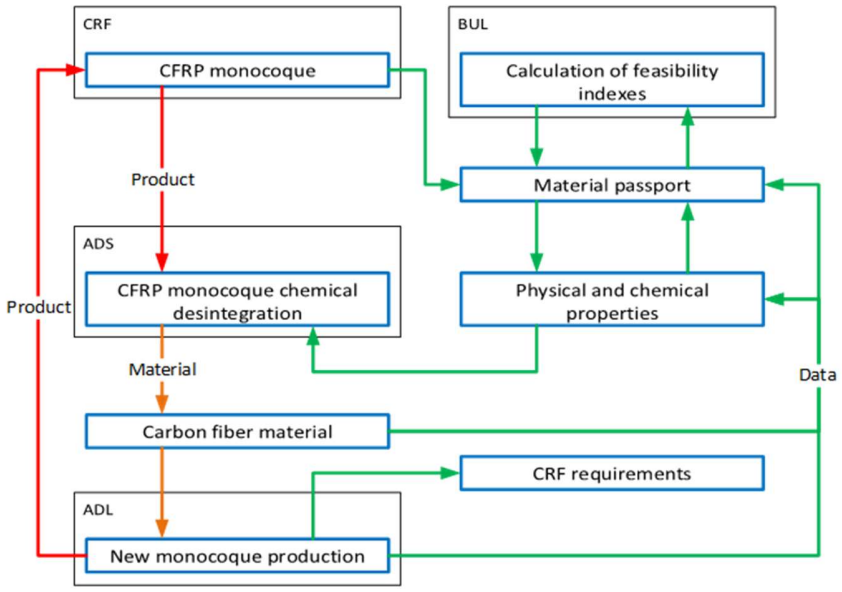


Figure 1: UC2 demonstration plan

As depicted in the following table, the plan distinguishes 6 activities, 3 of which have already been completed, and the remaining 3 are ongoing.

Step	Demonstration activity	Activity start date	Actual start date	Status
1	Providing automobile's floor reinforcement CFRP beam (the part) (CRF)	2024 05	2023 08	Completed
2	Matching the chemical solvent and disintegrating the part (ADS)	2024 06	2023 08	Completed
3	Re-fabrication of a new CFRP part using recycled fibers (ADL)	2024 07	2024 06	Ongoing
4	Confirming the technical performance of a new part (ADL)	2024 08	2024 10	Ongoing
5	Analyzing the possible level of recycled material inclusion (CRF)	2024 09	2024 09	Ongoing
6	Calculation of feasibility indexes (BUL)	2024 10	2024 10	Ongoing

2 Use-Case-2 Demonstration Results – ADL

2.1 JIDEP Testing

ADL has been closely engaged in the thorough testing of the JIDEP platform. While most of the user-acceptance-testing results were addressed within WP4, the key features and usability aspects were addressed within WP5 as well, because they emerged during the micro R&D project activity phase.

JIDEP

User Acceptance Test Template
Project Name: JIDEP
Project Module: JIDEP Platform
Document Date: 19/10/2023

User Acceptance Testing (UAT):
The purpose of the acceptance test is to confirm that the JIDEP Platform is ready for operational use. During the Acceptance Test, you will evaluate the JIDEP Platform to its initial requirements or features.

N.B.

1. Please fill up **UAT Team & Hardware** table below.
2. Follow UAT test cases (**UAT1-UATX**) in **UAT Requirements-Based Test Cases** table (page 2 – page X) to run the tests.
3. Please report your test results in **UAT Test Results** table (page X).

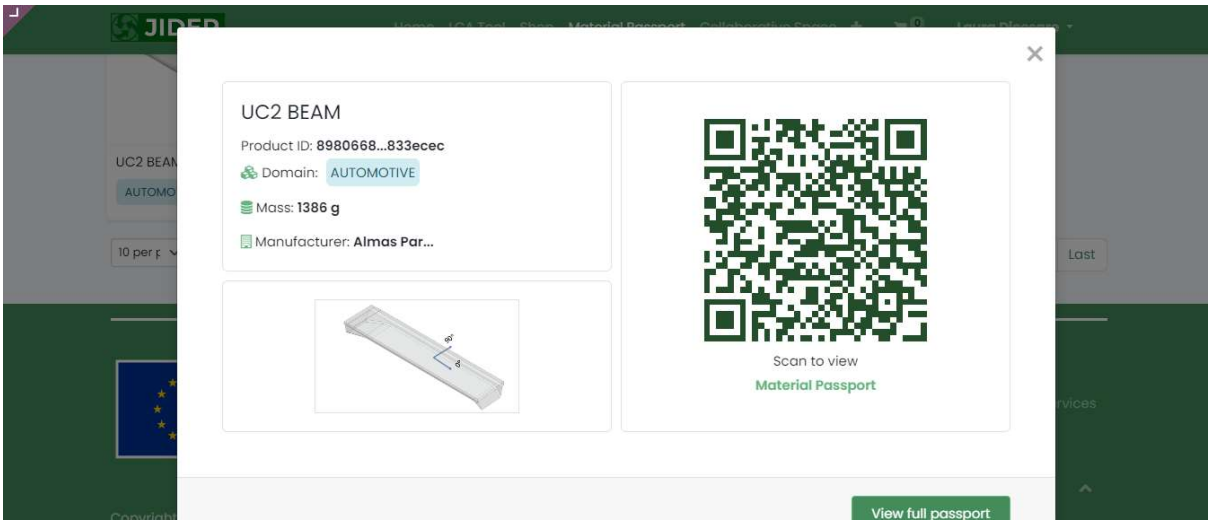
UAT Team & Hardware			
Company Name	**Tester Name**	**Operating System**	**Browser**
Almas Partecipazioni Industriali SPA	Laura Di Cesare	Windows 10 Pro version 22H2	Chrome

UAT Scope (In Scope – Out of Scope)	
UAT - In Scope	**UAT - Out of Scope**
In Scope *List of features that will be tested* - **UAT1**: User registration - **UAT2**: User authentication - **UAT3**: Material passport creating for CFRP car beam in standard configuration - **UAT4**: Material passport creating for CFRP car beam in "green" configuration starting from data of UAT3 - **-UAT5**: Search and view of "external" (from other users) Material passports in the platform - **UAT6**: Publication of Material passports in Market place - **UAT7**: Remove of Material passports from Market place - **UAT8**: Modification of existing Material passport (CFRP car beam in "green" configuration) - **UAT9**: QR code view of material passport - **UAT10**: View of existing material passport data	Out of Scope *List of features that will not be tested.*

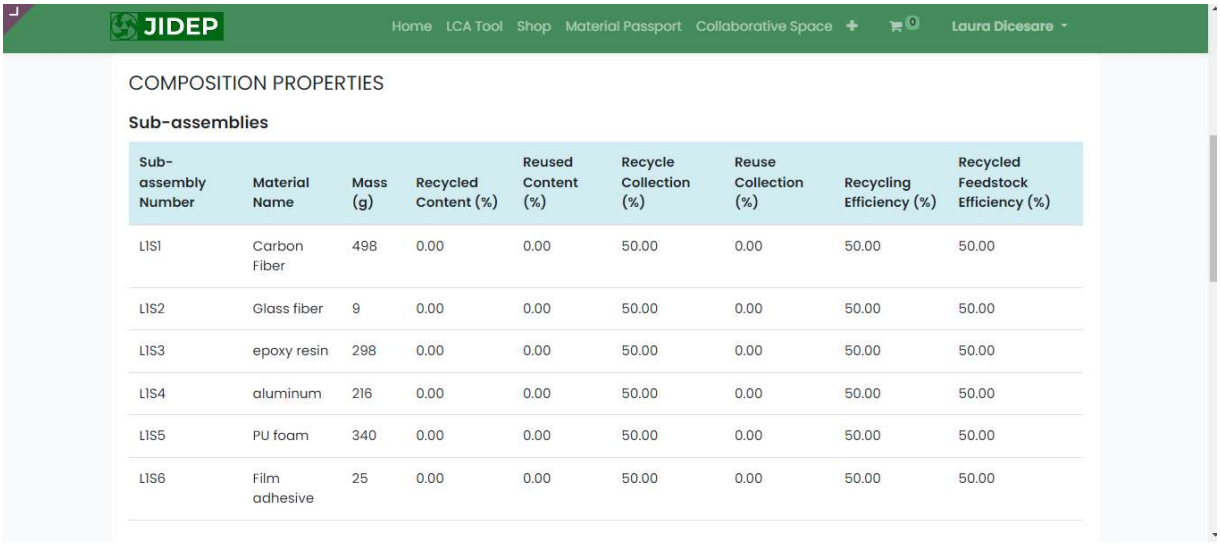
UAT Assumptions
- **Test environment:** The test cases will be conducted in the manual-test.jidep.co platform. - **Test documentation:** All UAT test cases are documented in **UAT Requirements-Based Test Cases** table (page 2 – page 3) - **Test result report:** Success, Errors, failures and other will be reported in **UAT Test Results** table (page 3)

2.2 JIDEP Validation

ADL can confirm that, upon extraction of the automobile composite beam part, it was able to successfully create the product passport within the JIDEP platform.



ADL can also confirm that it was able to provide the part's composition properties without any issues.



Sub-assembly Number	Material Name	Mass (g)	Recycled Content (%)	Reused Content (%)	Recycle Collection (%)	Reuse Collection (%)	Recycling Efficiency (%)	Recycled Feedstock Efficiency (%)
L1S1	Carbon Fiber	498	0.00	0.00	50.00	0.00	50.00	50.00
L1S2	Glass fiber	9	0.00	0.00	50.00	0.00	50.00	50.00
L1S3	epoxy resin	298	0.00	0.00	50.00	0.00	50.00	50.00
L1S4	aluminum	216	0.00	0.00	50.00	0.00	50.00	50.00
L1S5	PU foam	340	0.00	0.00	50.00	0.00	50.00	50.00
L1S6	Film adhesive	25	0.00	0.00	50.00	0.00	50.00	50.00

Certain materials were missing within the material database, and the issue was addressed to TVS.

The list of materials that were proposed for being included in the JIDEP material database were mainly the natural raw materials, i.e.:

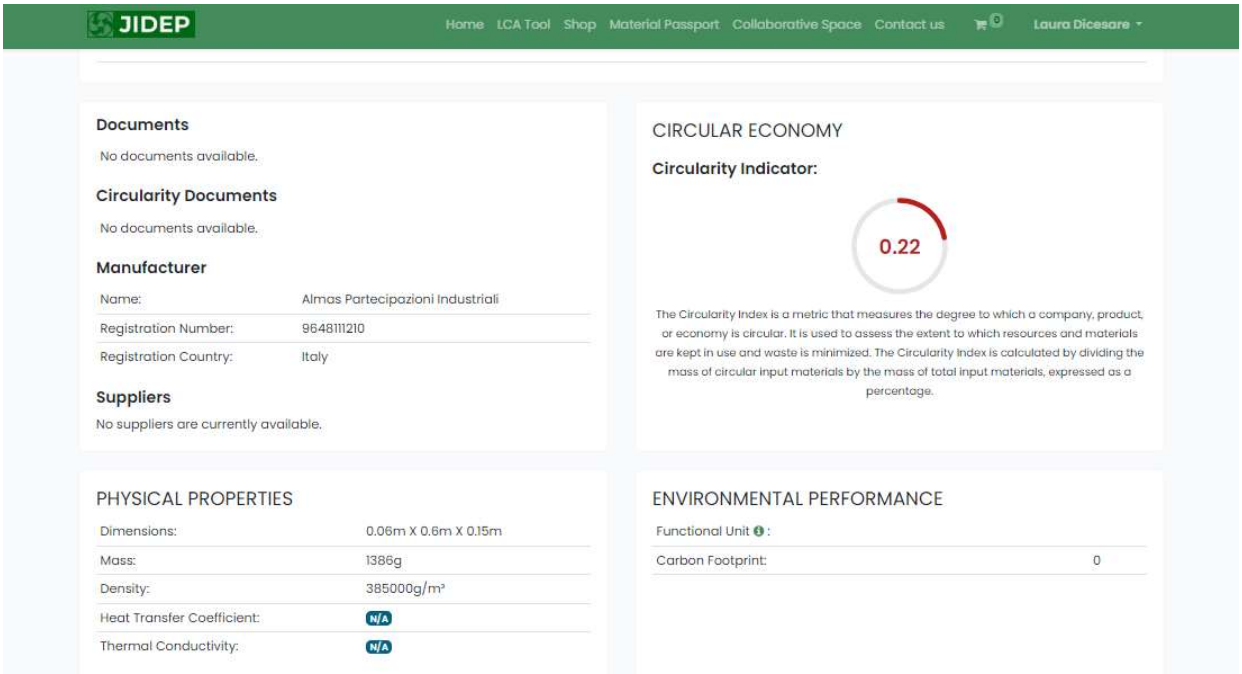
Plastic thermoset category:

- CFRP: Carbon fibre reinforced plastic, epoxy resin
- RCFRP: Recycled Carbon fibre reinforced plastic, epoxy resin
- CFRP: Glass fibre reinforced plastic, epoxy resin
- CF: Carbon fibre
- RCF: Recycled Carbon fibre
- GF: Glass fibre
- Epoxy resin

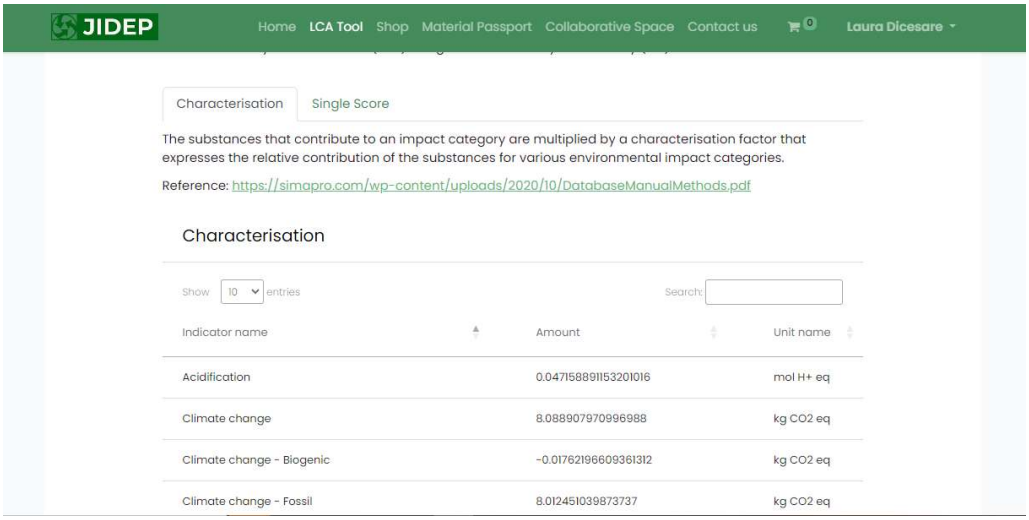
Also, optional entries were suggested:

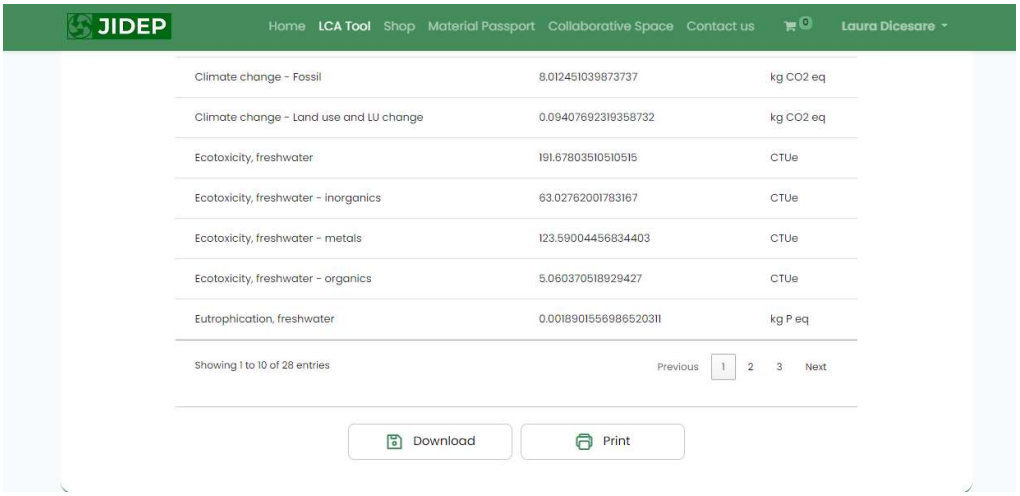
- Natural fibre
- Aramid fibre
- Bio epoxy resin (30% bio)

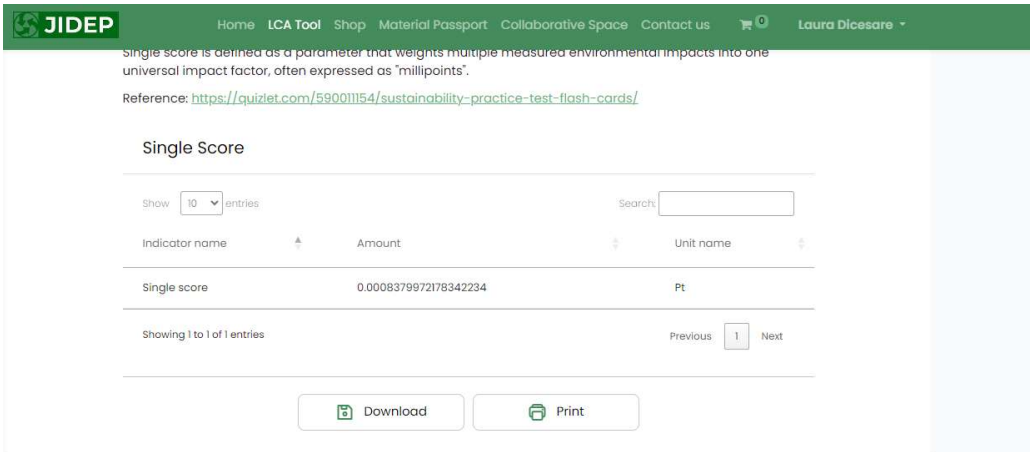
The resulting circularity index for the part, as estimated by JIDEP, will be validated in the final task (feasibility index assessment); however, ADL can confirm that the functionality is working as expected.



ADL has also validated the functionality and capabilities of the LCA tool and can confirm that its features and methods are working without issues.







2.3 Conclusions and Next Actions

ADL confirms that all major modules of the JIDEP platform are working without major issues. ADL has asked for a clarifying workshop to better understand the different LCA methods and the underlying working principles of each.

ADL recommends finding a slightly more practical way of addressing/proposing the missing materials in the JIDEP's material database.

3 Use-Case-2 Demonstration Results – CRF

3.1 JIDEP Testing

CFR has started JIDEP testing since early versions when the system still had minor bugs.

The company conducted User Acceptance Testing (UAT) for the JIDEP platform to ensure its readiness for operational use. This testing process involved evaluating the platform's functionality against specified requirements, focusing on user interactions and system performance.

The testing began when the user registration functionality was assessed, confirming that users could successfully register on the platform. This was followed by UAT2, which evaluated user authentication to ensure that registered users could securely log into the platform.

Next, UAT3 involved testing the creation of a material passport for a carbon fiber-reinforced polymer (CFRP) car beam in a standard configuration. Expanding on this, CRF (UAT4) checked the ability to create a material passport for the same component in a "green" configuration, starting from a specific data point (UAT3).

UAT5 testing activities focused on the platform's capability to search for and view "external" material passports created by other users, fostering a collaborative information-sharing environment. CRF tested the publication feature (UAT6) for these material passports in the marketplace, enabling users to make their information available to others.

The next steps involved management features within the marketplace: CRF assessed the removal of material passports (UAT7), ensuring users could delete entries as needed. Then CRF evaluated the modification process (CRF8) for existing material passports, specifically for CFRP car beams in the "green" configuration.

The final stages (UAT9) included testing the generation of a QR code linked to a material passport, which ensured that users could effectively view existing material passport data (UAT10).

These comprehensive testing steps validated the JIDEP platform's critical functionalities, from user registration to data sharing, ensuring a seamless user experience before it was set to go live.

User Acceptance Testing (UAT):
The purpose of the acceptance test is to confirm that the JIDEP Platform is ready for operational use. During the Acceptance Test, you will evaluate the JIDEP Platform to its initial requirements or features.

N.B.

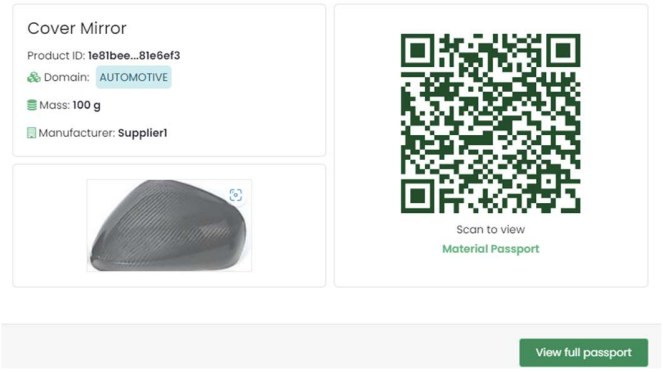
1. Please fill up **UAT Team & Hardware** table below.
2. Follow UAT test cases (**UAT1-UATX**) in **UAT Requirements-Based Test Cases** table (page 3 – page 4) to run the tests.
3. Please report your test results in **UAT Test Results** table (page 4 - page 5).

UAT Team & Hardware			
Company Name	**Tester Name**	**Operating System**	**Browser**
CRF	Andrea Pipino	Windows Edizione Windows 10 Enterprise Versione 22H2 Data installazione: 21/09/2022 Build sistema operativo 19045.4780 Esperienza Windows Feature Experience Pack 1000.19060.1000.0	Microsoft Edge for Windows Version 128.0.2739.67

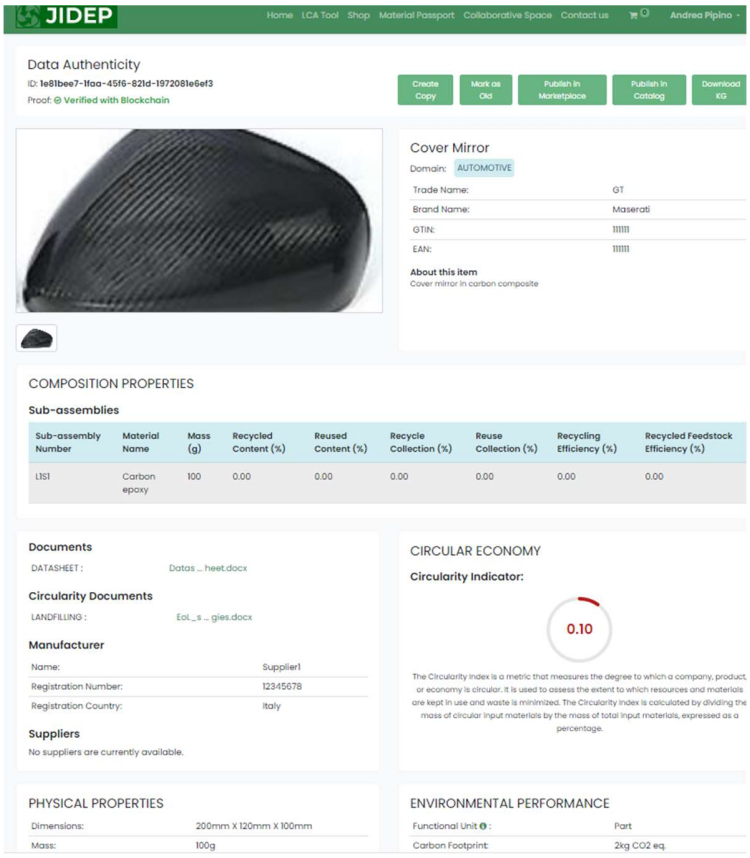
UAT Scope (In Scope – Out of Scope)	
UAT - In Scope	**UAT - Out of Scope**
In Scope *List of features that will be tested* - **UAT1:** User registration - **UAT2:** User authentication - **UAT3:** Material passport creating for CFRP car beam in standard configuration - **UAT4:** Material passport creating for CFRP car beam in "green" configuration starting from data of UAT3 - **-UAT5:** Search and view of "external" (from other users) Material passports in the platform - **UAT6:** Publication of Material passports in Market place - **UAT7:** Remove of Material passports from Market place - **UAT8:** Modification of existing Material passport (CFRP car beam in "green" configuration) - **UAT9:** QR code view of material passport - **UAT10:** View of existing material passport data	Out of Scope *List of features that will not be tested.*

3.2 JIDEP Validation

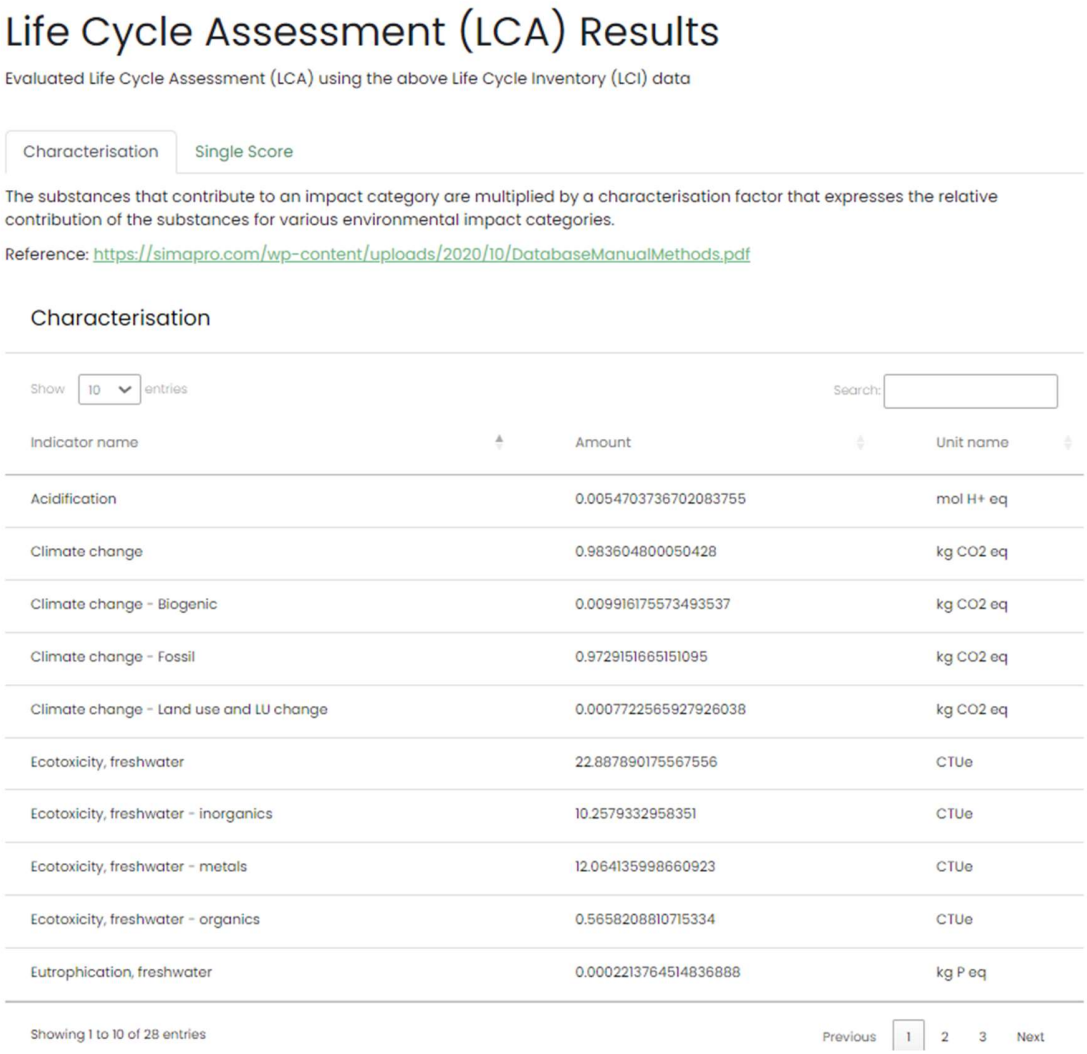
CRF can confirm that the material passport was submitted successfully, resulting in a functional QR code.



The material composition properties, units, and the relevant fields are all working as expected, including the circularity index calculation feature.



The LCA testing was also smooth, however it is hard to critically assess the results for their feasibility. CRF is looking forward to feasibility index assessment activity, which has started recently.



Life Cycle Assessment (LCA) Results

Evaluated Life Cycle Assessment (LCA) using the above Life Cycle Inventory (LCI) data

Characterisation | Single Score

The substances that contribute to an impact category are multiplied by a characterisation factor that expresses the relative contribution of the substances for various environmental impact categories.

Reference: https://simapro.com/wp-content/uploads/2020/10/DatabaseManualMethods.pdf

Characterisation

Show 10 entries Search:

Indicator name	Amount	Unit name
Acidification	0.0054703736702083755	mol H+ eq
Climate change	0.983604800050428	kg CO2 eq
Climate change - Biogenic	0.009916175573493537	kg CO2 eq
Climate change - Fossil	0.9729151665151095	kg CO2 eq
Climate change - Land use and LU change	0.0007722565927926038	kg CO2 eq
Ecotoxicity, freshwater	22.887890175567556	CTUe
Ecotoxicity, freshwater - inorganics	10.2579332958351	CTUe
Ecotoxicity, freshwater - metals	12.064135998660923	CTUe
Ecotoxicity, freshwater - organics	0.5658208810715334	CTUe
Eutrophication, freshwater	0.0002213764514836888	kg P eq

Showing 1 to 10 of 28 entries Previous 1 2 3 Next

3.1 Conclusions and Next Actions

CRF declares that all major modules of the JIDEP platform are working without major issues.

CRF has asked for a clarifying workshop to better understand the different LCA methods and the underlying working principles of each.

CRF highly recommends drafting the introduction document explaining the functionality of the LCA tool, especially from the regulatory and methodological perspective.

4 Use-Case-2 Demonstration Results – ADS

4.1 JIDEP Testing

ADS was one of the early user acceptance testers. While no significant system bugs or malfunctions were identified, ADS raised certain issues related to the way product passports are being structured. E.g. certain new templates are needed to provide passports for raw materials, hence the template customisation feature is very much welcome.

JIDEP

User Acceptance Test Template
Project Name: JIDEP
Project Module: JIDEP Platform
Document Date: 19/10/2023

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UAT Team & Hardware			
Company Name	**Tester Name**	**Operating System**	**Browser**
ADS	Kasparas Kižys (R&D Manager)	Win 11 Pro	Microsoft Edge for Business Version 127.0.2651.105

UAT Scope (In Scope – Out of Scope)	
UAT - In Scope	**UAT - Out of Scope**
In Scope *List of features that will be tested* - **UAT1:** User registration - **UAT3:** User authentication - **UAT4:** Functionality testing	Out of Scope *List of features that will not be tested.* - **UAT2:** Company registration

UAT Assumptions	
- **Test environment:** The test cases will be conducted in the manual-test.jidep.co platform. - **Test documentation:** All UAT test cases are documented in **UAT Requirements-Based Test Cases** table (page 2 – page 8) - **Test result report:** Success, Errors, failures and other will be reported in **UAT Test Results** table (page 9 – page 10)	

4.2 JIDEP Validation

ADS, having validated the JIDEP's product passport functionality can confirm it is functionally capable and is fit for production use.

Data Authenticity

ID: b4ef4136-f5a8-45a2-a9ba-47198b92cb42

Proof: Verified with Blockchain

Create Copy | Mark as Old | Publish in Marketplace | Publish in Catalog | Download KG

Recycled Carbon Fiber Strands

Domain: AUTOMOTIVE

Trade Name:	ADS-CF-REC-S
Brand Name:	ADS
GTIN:	N/A
EAN:	N/A

About this item

The recycled carbon fiber retains a strand structure of 5-10 cm length with minor impurities.

COMPOSITION PROPERTIES

Sub-assemblies

Sub-assembly Number	Material Name	Mass (g)	Recycled Content (%)	Reused Content (%)	Recycle Collection (%)	Reuse Collection (%)	Recycling Efficiency (%)	Recycled Feedstock Efficiency (%)
L1S1	ADS	100	0.00	0.00	50.00	0.00	50.00	50.00

Documents

DATASHEET : td_en ... 13712.pdf

Circularity Documents

No documents available.

Manufacturer

Name:	ADS
Registration Number:	2024101788970001
Registration Country:	Lithuania

Suppliers

No suppliers are currently available.

CIRCULAR ECONOMY

Circularity Indicator:

The Circularity Index is a metric that measures the degree to which a company, product, or economy is circular. It is used to assess the extent to which resources and materials are kept in use and waste is minimized. The Circularity Index is calculated by dividing the mass of circular input materials by the mass of total input materials, expressed as a percentage.

PHYSICAL PROPERTIES

Dimensions:	5cm X 1mm X 0.1mm
Mass:	100g
Density:	1.7g/cm³
Heat Transfer Coefficient:	N/A
Thermal Conductivity:	N/A

ENVIRONMENTAL PERFORMANCE

Functional Unit :	
Carbon Footprint:	0

ADS, however, could not verify the capabilities of the LCA tool, because the tool itself only uses standardised and certified recycling methods, whereas ADS has not yet certified its wind-turbine blade recycling process.

4.1 Conclusions and Next Actions

ADS declares that JIDEP tools are fully capable and meet the initial expectations.

However, certain areas for future development are recommended:

1) Introduction of product passport template system
    a. In particular, ADS asks for the capability to provide metrics for non-homogeneous materials (varying length, thickness, mass density)
2) Introduction of custom LCA methods for organizations to define their own, not yet certified, environmental accountability metrics.
3) Capability to provide other types/classes of materials, as recommended by ADL (§2.2)