Ultrasim® 3D Sustainability Analysis (LCA) - BETA

Offering

Ultrasim® 3D Sustainability Analysis (LCA) - BETA

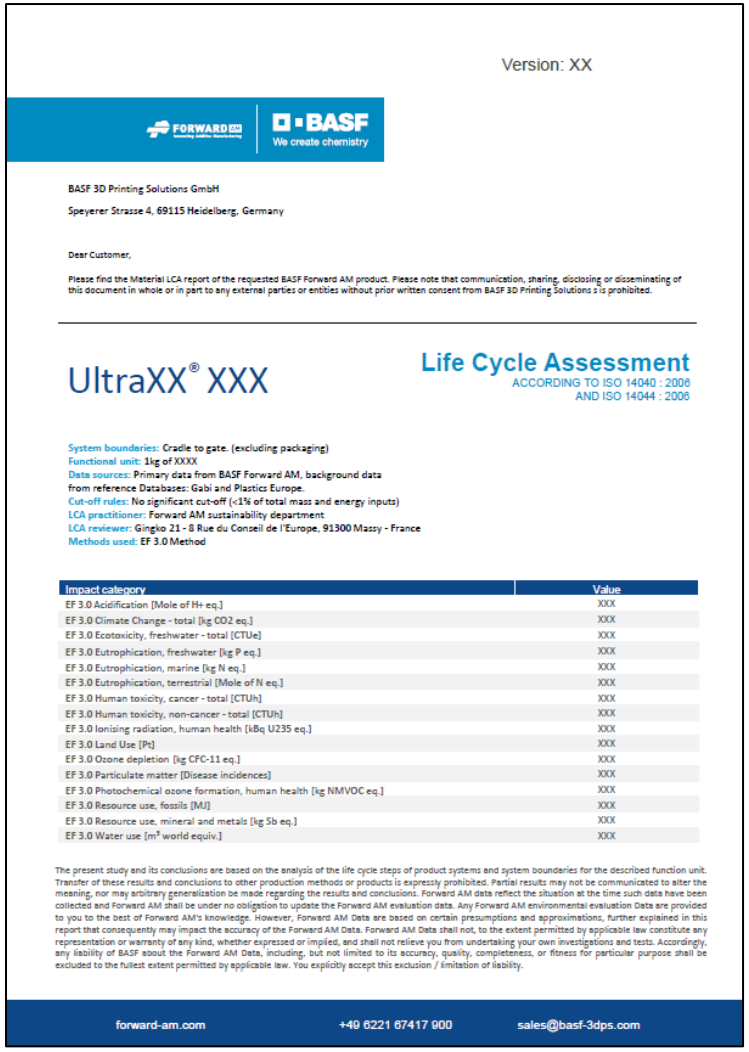
	Starter	Premium	Enterprise
	Material LCA	**Part LCA Service (CO2)**	**Become a Partner**
What you get:			
• LCA material onepager	✓	✓	✓
• CO2 footprint report of 3D printed part		✓	✓
• Add your printer			✓
• Implement LCA data to your software			✓
What 3D printing materials:			
• Ultrasint® Powder	• Ultrasint® TPU 01 and 88A • Ultrasint® PP 1400 • Ultrasint® PA11 and PA11 Black	• Ultrasint® TPU 01 • Ultrasint® TPU 88A (coming soon) • Ultrasint® PP 1400 (coming soon) • Ultrasint® PA11 and PA11 Black (coming soon)	BASF Forward AM Materials
• Ultrafuse® Filaments	• Ultrafuse® PLA – under review (3Q 23) • Ultrafuse® ABS – under review (3Q 23) • Ultrafuse® PET – under review (3Q 23) • Ultrafuse® rPET – under review (3Q 23)	• Ultrafuse® PLA – under review (3Q 23) • Ultrafuse® ABS – under review (3Q 23) • Ultrafuse® PET – under review (3Q 23) • Ultrafuse® rPET – under review (3Q 23)	
What 3D printing machines:			
• Ultrasint® Powder		• HP JF 52XX • SLS printers (coming soon)	Your printer
• Ultrafuse® Filaments		• Ultimaker S5 • FFF printers (extension possible)	
Get your Add-on:		• Extended LCA with all 16 impact categories • Ultrasim® 3D Cost Analysis (TCO) • Comparison to conventional manufacturing • Carbon Footprint compensation	
What we need from you:		• STL-file of your part • Input report (production setup)	• 1 hour of your time to understand your problem and derive a solution concept
Price:	**Free of Charge**	**Starting at 3.500 €**	**On request**
Lead time:	**14 days**	**On request**	**On request**

Workflow and Examples

Starter: Material LCA

Material

Assessment conditions



Version: XX

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BASF 3D Printing Solutions GmbH

Speyerer Strasse 4, 69115 Heidelberg, Germany

Dear Customer,

Please find the Material LCA report of the requested BASF Forward AM product. Please note that communication, sharing, disclosing or disseminating of this document in whole or in part to any external parties or entities without prior written consent from BASF 3D Printing Solutions is prohibited.

UltraXX® XXX

Life Cycle Assessment
ACCORDING TO ISO 14040 : 2006
AND ISO 14044 : 2006

System boundaries: Cradle to gate. (excluding packaging)
Functional unit: 1kg of XXXX
Data sources: Primary data from BASF Forward AM, background data from reference Databases: Gabi and Plastics Europe.
Cut-off rules: No significant cut-off (<1% of total mass and energy inputs)
LCA practitioner: Forward AM sustainability department
LCA reviewer: Gingko 21 - 8 Rue du Conseil de l'Europe, 91300 Massy - France
Methods used: EF 3.0 Method

Impact category	Value
EF 3.0 Acidification [Mole of H+ eq.]	XXX
EF 3.0 Climate Change - total [kg CO2 eq.]	XXX
EF 3.0 Ecotoxicity, freshwater - total [CTUe]	XXX
EF 3.0 Eutrophication, freshwater [kg P eq.]	XXX
EF 3.0 Eutrophication, marine [kg N eq.]	XXX
EF 3.0 Eutrophication, terrestrial [Mole of N eq.]	XXX
EF 3.0 Human toxicity, cancer - total [CTUh]	XXX
EF 3.0 Human toxicity, non-cancer - total [CTUh]	XXX
EF 3.0 Ionising radiation, human health [kBq U235 eq.]	XXX
EF 3.0 Land Use [Pt]	XXX
EF 3.0 Ozone depletion [kg CFC-11 eq.]	XXX
EF 3.0 Particulate matter [Disease incidences]	XXX
EF 3.0 Photochemical ozone formation, human health [kg NMVOC eq.]	XXX
EF 3.0 Resource use, fossils [MJ]	XXX
EF 3.0 Resource use, mineral and metals [kg Sb eq.]	XXX
EF 3.0 Water use [m³ world equiv.]	XXX

The present study and its conclusions are based on the analysis of the life cycle steps of product systems and system boundaries for the described function unit. Transfer of these results and conclusions to other production methods or products is expressly prohibited. Partial results may not be communicated to alter the meaning, nor may arbitrary generalization be made regarding the results and conclusions. Forward AM data reflect the situation at the time such data have been collected and Forward AM shall be under no obligation to update the Forward AM evaluation data. Any Forward AM environmental evaluation Data are provided to you to the best of Forward AM's knowledge. However, Forward AM Data are based on certain presumptions and approximations, further explained in this report that consequently may impact the accuracy of the Forward AM Data. Forward AM Data shall not, to the extent permitted by applicable law constitute any representation or warranty of any kind, whether expressed or implied, and shall not relieve you from undertaking your own investigations and tests. Accordingly, any liability of BASF about the Forward AM Data, including, but not limited to its accuracy, quality, completeness, or fitness for particular purpose shall be excluded to the fullest extent permitted by applicable law. You explicitly accept this exclusion / limitation of liability.

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Environmental data in 16 impact categories [according to EF 3.0]

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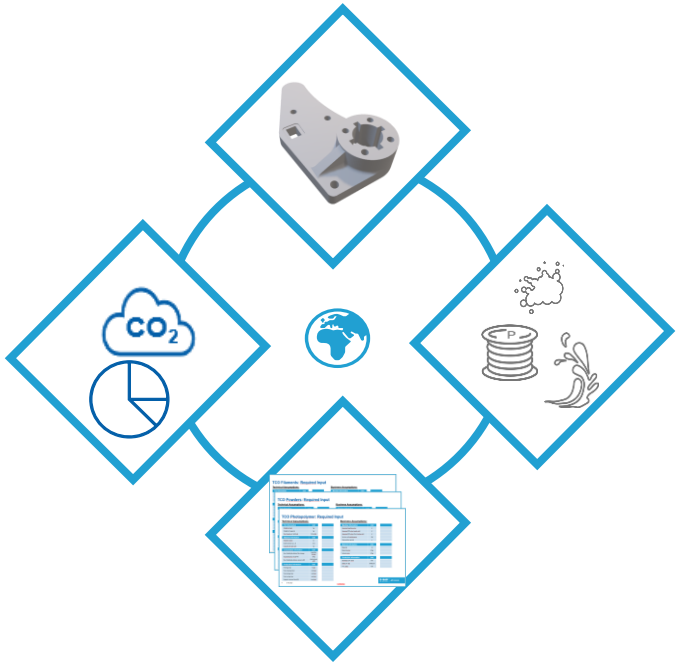
Premium – Workflow: Part LCA Service (CO_2)

1. Schedule a 30min call

Set up the production setting (e.g. location, transportation) of your 3D printed application.

2. We calculate the CO2 footprint of your part

We perform the LCA to assess the carbon footprint of your part



3. LCA report and presentation

We present you the LCA report and explain process hotspots

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Premium – Example: Summary of Conditions

Life Cycle Assessment conditions

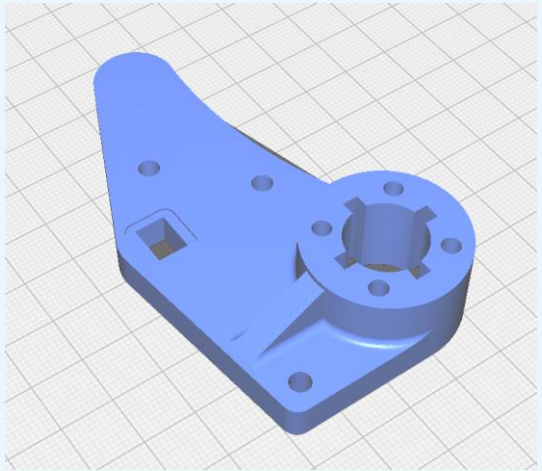
Functional unit :
We assume the functional unit to be **one complete build job** of this **BASF mount** printed on a **HP MJF 52XX** 3D printer. Every part printed with acceptable quality is the desired outcome.

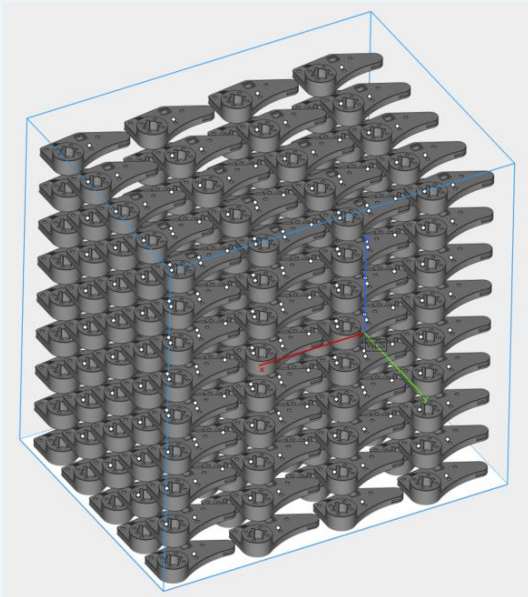
Goal of the study :
Measuring the impact **of part fabrication in MJF** specifically on the **HP MJF 52XX** using a **Ultrasint powders** including all impact categories

Scope of the study :
Cradle to Gate

Methodology used:
EF 3.0

Cutoff criteria:
95% of all impacts





Production setup:

- Total parts per build job: 180 parts
- Gap between parts: 5 mm
- Layer thickness = XX µm
- Total occupation for 1 part = 1/180
- Machine : HP MJF 52XX
- Build volume : 380 x 284 x 380 mm
- Part scrap rate : XX %
- Supports : 0 %
- Quantity : min : 180 parts
- Finish : Raw (Sandbasted part)

Assumptions:

- Study not critically reviewed [But materials currently in progress]
- Part packaging and transport of printed part neglected
- Assembly, use phase and end of life treatment of printed part neglected
- Production in Europe Electricity grid mix for Europe used
- Part scrap rates and build scene not validated in production environment

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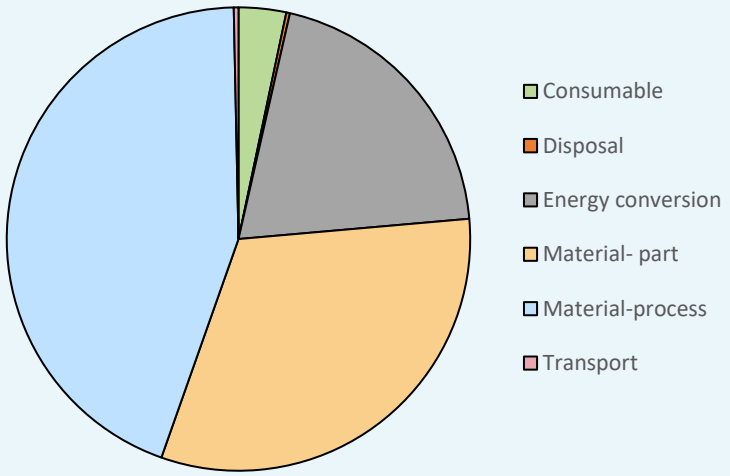
Premium – Example: CO2 Footprint Report of 3D Printed Part

Part carbon footprint

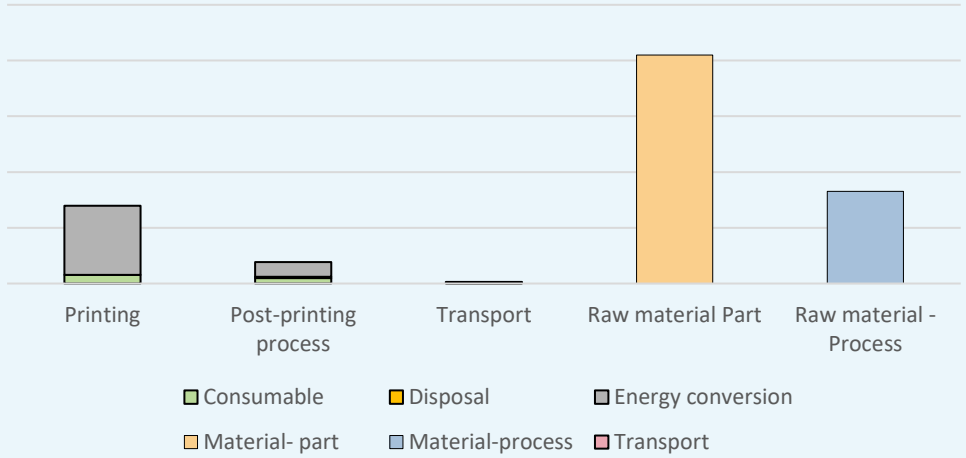
XXX
kg CO2 Eq

*estimated for a complete platform of parts

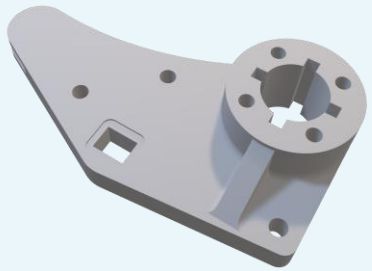
Hotspots in absolute quantities:



Process hotspots:



Future optimization potiential:



- Optimization scenario 1
- Optimization scenario 2
- …..

Scope of analysis:

Climate change:

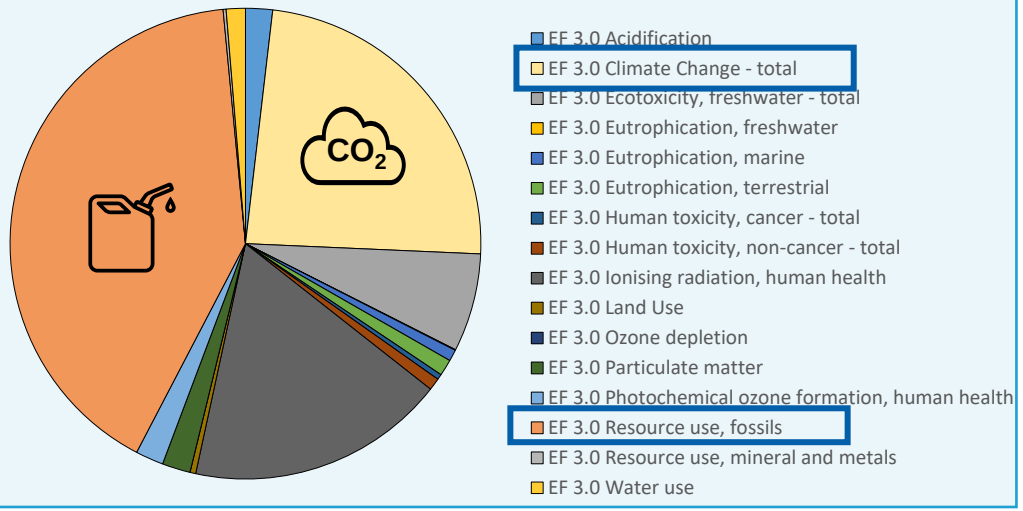
XX %
of overall environmental impact of the part

Learn more about the rest of thecontribution through our enterprise solution

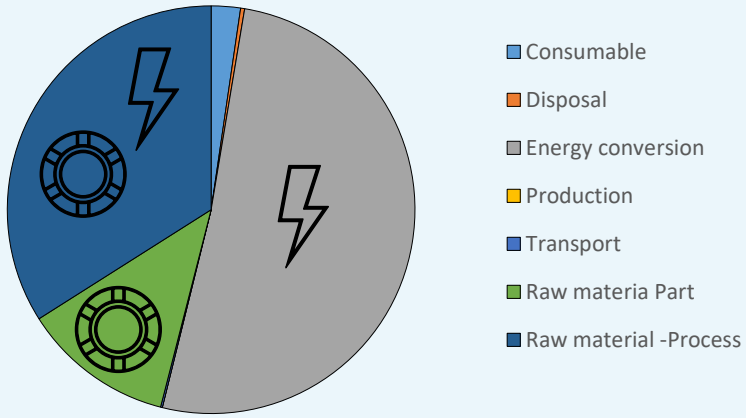
*estimated according to the scheme pressented by EF 3.0

Premium – Example: Environmental Report of 3D Printed Part

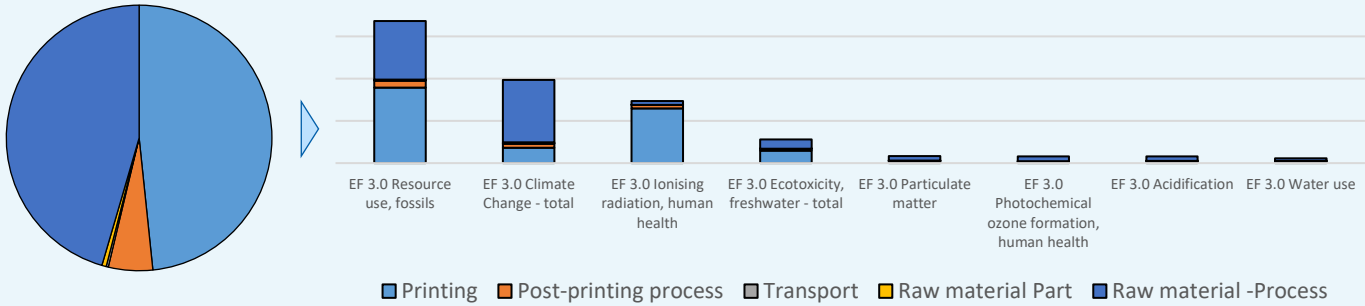
Normalised and weighed results



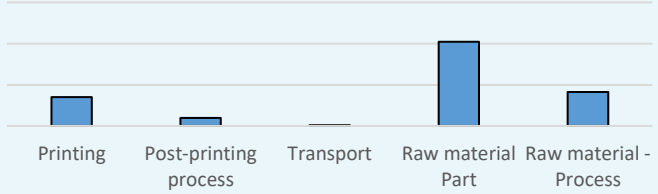
Quantity based split
normalised and weighed results



Process split
Normalised and weighed results

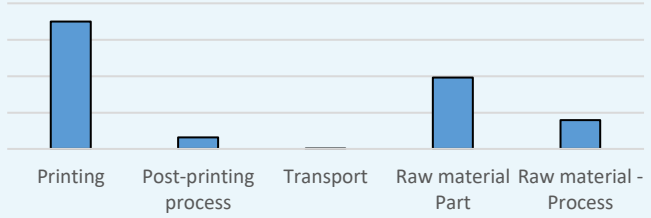


Climate change [CO2 eq]



XX kg CO2eq

Resource use – fossils [MJ]



XX MJ

Takeaways

- Highest contributing impact categories:
  - Resource use
  - Climate change
- Quantity based hotspots:
  - Electricity, Material
- Process hotspots:
  - Printing process
  - Material

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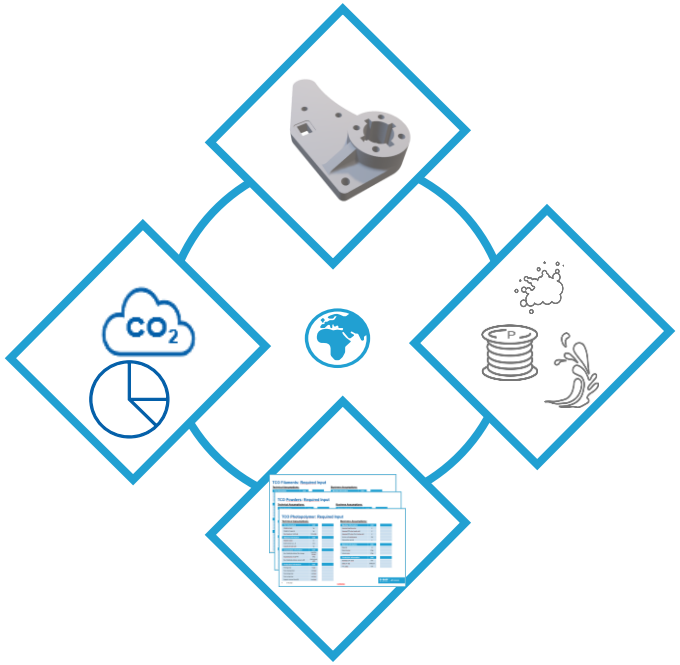
Enterprise – Workflow: Become a Partner

1. Kick-Off Meeting

We start with a 1-hour kick-off meeting understand your problem and derive a solution concept. This may include integration of a printer or LCA data into your software platform.

2. LCA data preparation

We prepare the integration of your printer or software



3. More transparency of your solution

We present you the LCA report of your machine or environmental footprint feature in your software

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Any Questions? Contact Us!

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