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Innovating Additive Manufacturing

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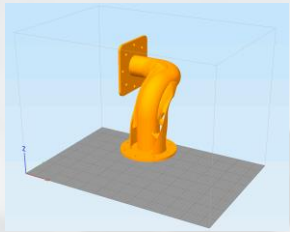
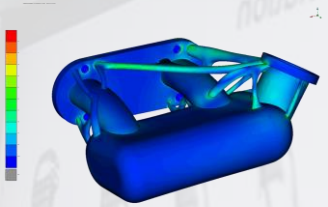
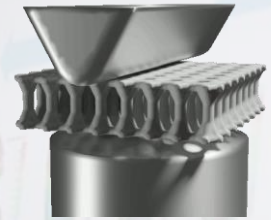
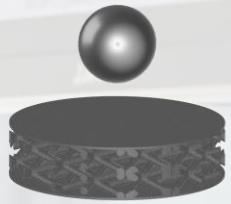
Ultrasim® 3D Simulation (FEA)









Heidelberg, 20.10.22

Why Simulation?

Evolution of Safety Improvements

?

1950 1970 2010 NEXT

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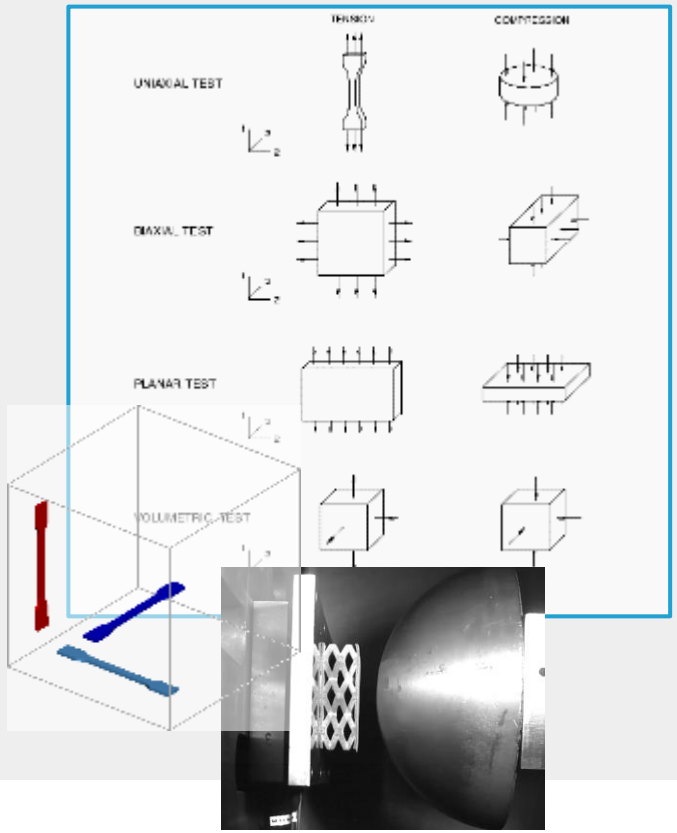
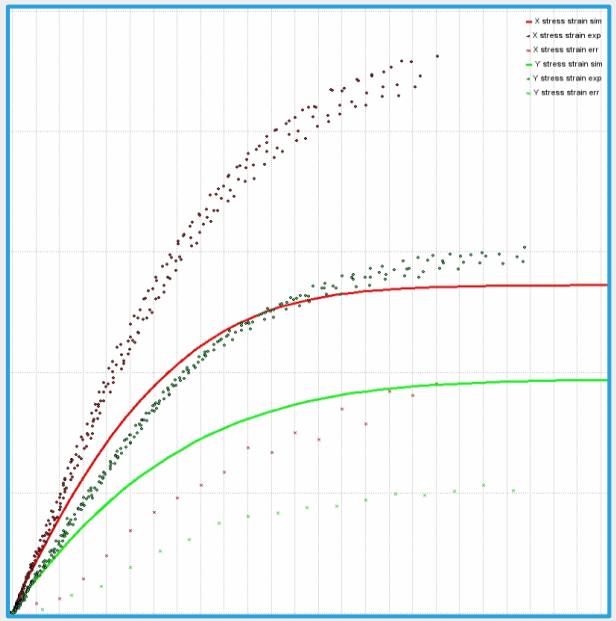
How to be Sure that the Design Works?

Simulation of part behavior

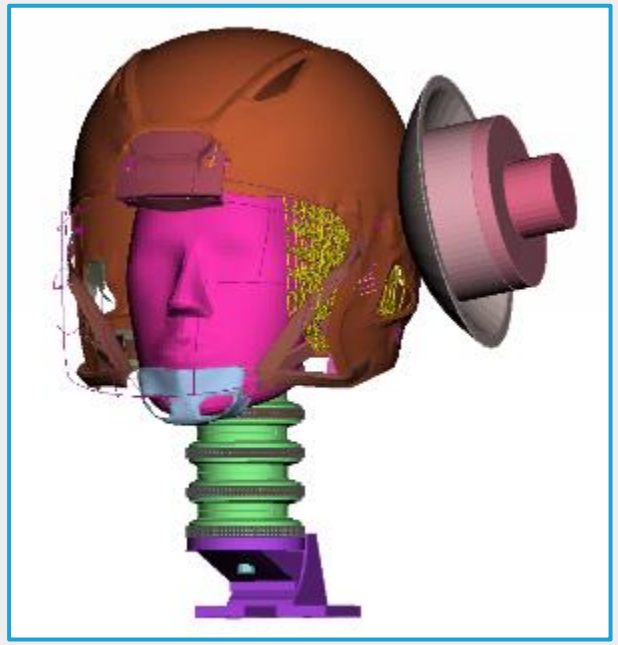
1. Data Measurements



2. Multidimensional Data Fitting



3. Material Model Generation



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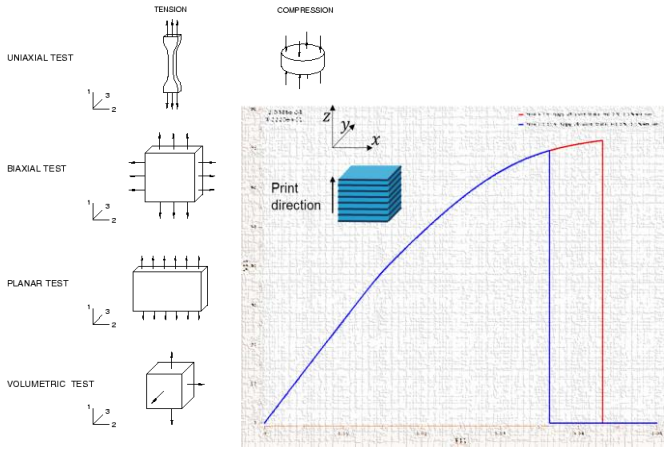
We support you in every stage – from starter to expert

3D Simulation helps you to speed up the engineering process using a digital twin. We offer 3 easy methods to get started:

Raw Material Data

Starter:

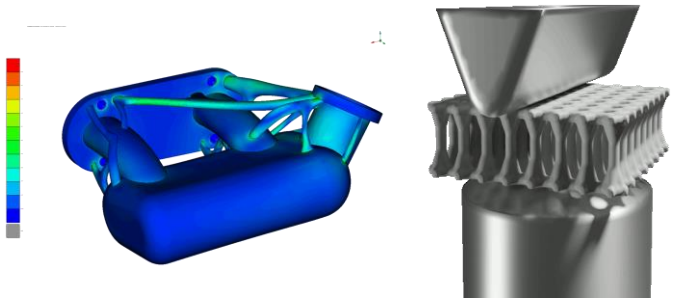
Get the curves behind our TDS data to start basic simulation work.



3D Simulation

Premium:

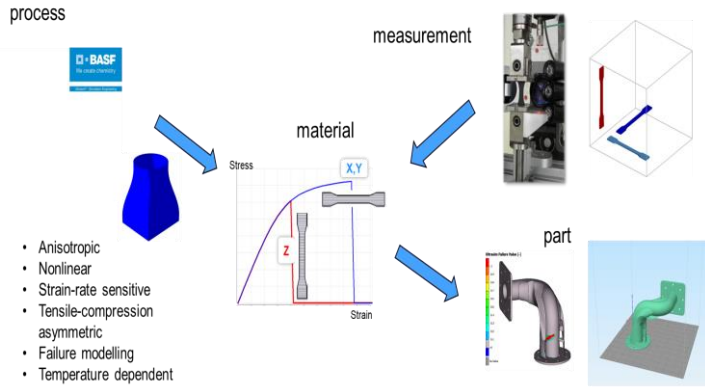
We run the simulation for you. We help you to speed up your engineering process and increases confidence in part performance using a digital twin of your part.



Material Model as a Service

Enterprise:

Use our in-house developed material models for 3D-Printing incl. anisotropy of the process and FEA support of our experienced virtual engineers.



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Ultrasim® 3D Simulation (FEA) - Offering

	Raw Material Data **Starter** Get the curves behind our TDS data to start basic simulation work. Add additional temperatures or strain-rates to the starter solution.	**3D Simulation** **Premium** We run the simulation for you. We help you to speed up your engineering process and increases confidence in part performance using a digital twin of your part.	**Material Model as a Service** **Enterprise** Use our in-house developed material models for 3D-Printing including anisotropy of the process and our experience in virtual Engineering.
What you get:			
• Material data at room temperature	✓	✓	✓
• 3D Simulation (FEA) support		✓	✓
• Ultrasim 3D material model as a service (incl. installation)			✓
Requirements to get started:			
• IT System	• Internal ability to use material data.		• Linux System (e.g. CentOS7) • LS-DYNA with Sharelib OR ABAQUS • Furter Details see Appendix
• FEA Solver	• Any solver		• ABAQUS, LS-DYNA
• Additional requirements			• Advanced FEA knowledge • Dedicated Super-User for FEA
Get your Add-on:	• Material data at additional temperatures and strain rates	• Material data at additional temperatures and strain rates	• Material data at additional temperatures and strain rates
What we need from you:	• Material of interest (see table)	• 1 hour of your time to understand your goal and derive the data set you need.	• 1 hour of your time to understand your problem and derive a solution concept.
Price:	**On request**	**On request**	**On request**
Lead time:	**14 days**	**On request**	**On request**

Simulation-Material-Availability

	Available temperatures			Strain rate / loads		Print Orientation / Anisotropy
	Low	23°C	High	Quasi static (structural loads)	High speed (impact & crash)	
Ultrasint® PA6-MF		●	●	●		●
Ultrasint® TPU01	●	●	●	●	●	●
Ultrasint® PA 11	○	○	○	○	○	○
Ultrasint® PA-11CF	○	○	○	○		○
Ultrasint® PP nat.	○	○	○	○	○	○
Ultracur3D® RG35		●		●		
Ultracur3D® ST45		●		●		
Ultracur3D® ST1400		●		●		
Ultracur3D® RG1100		●		●		
Ultracur3D® EPD 2006		●		●	○	

● Validated, available as Material Data Set*

● Validated, available via Ultrasim Material Model

○ ○ Preliminary

* Can be on short notice be converted into a Ultrasim Material Model

➢ **Any materials of our portfolio can be added on request.**

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How it Works

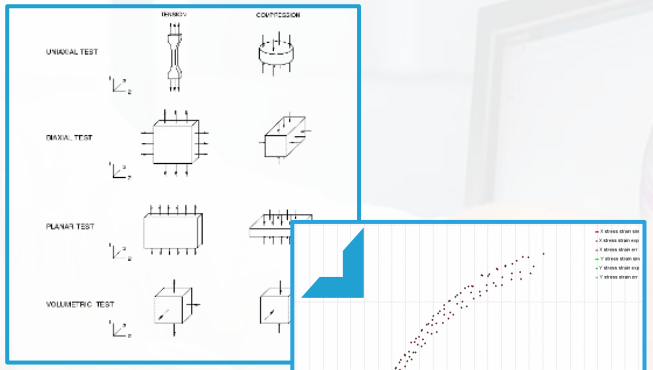
Starter Workflow: Raw Material Data

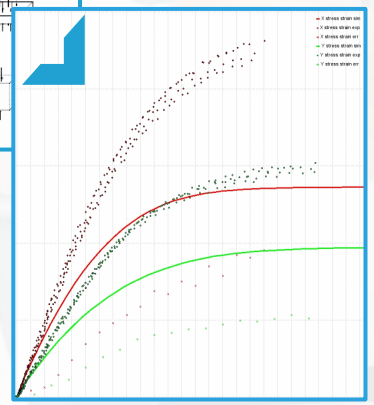
1. Meeting to understand your need of material data and format

We set up a 1-hour call to discuss jointly the material data and format you need.

2. We generate customized material data deck

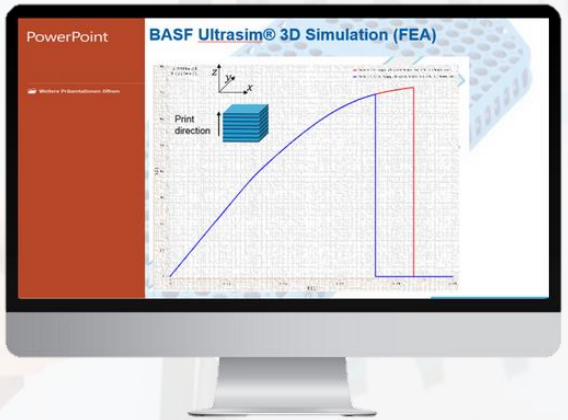
We generate a customized material data overview based on your FEA goal and material choice.





3. You gain access to your material deck

You receive the material deck including a PPT and the raw data of the materials requested.



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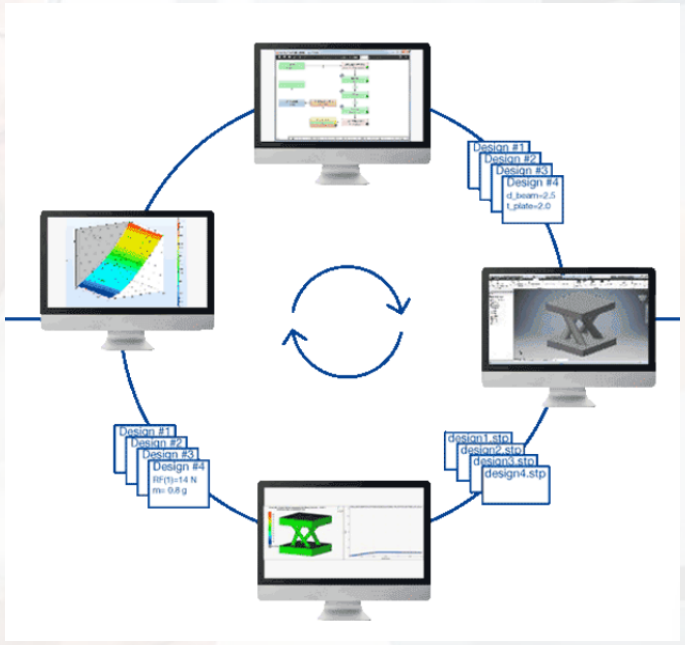
Premium Workflow: 3D Simulation

1. Meeting to understand your simulation request

We set up a 1-hour call to jointly define how CAE can support your development, the inputs we need and the output you are expecting.

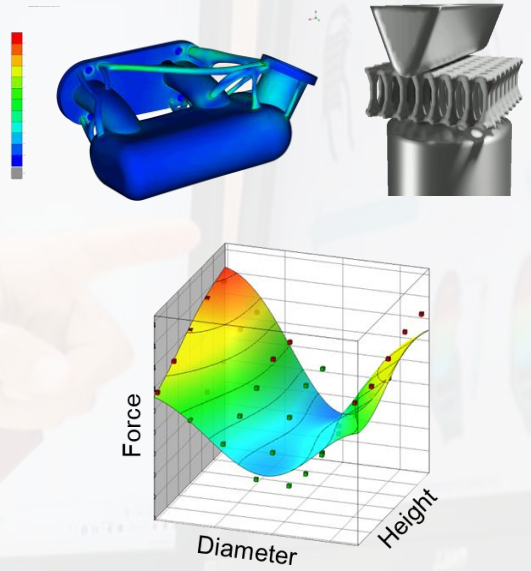
2. We run the requested simulation

We set up the FEA models needed and run the simulation and optimization having a close feedback loop with your team.



3. We present the results and hand over optimized geometries

We present the results to you and hand over a report plus the optimized part geometries.



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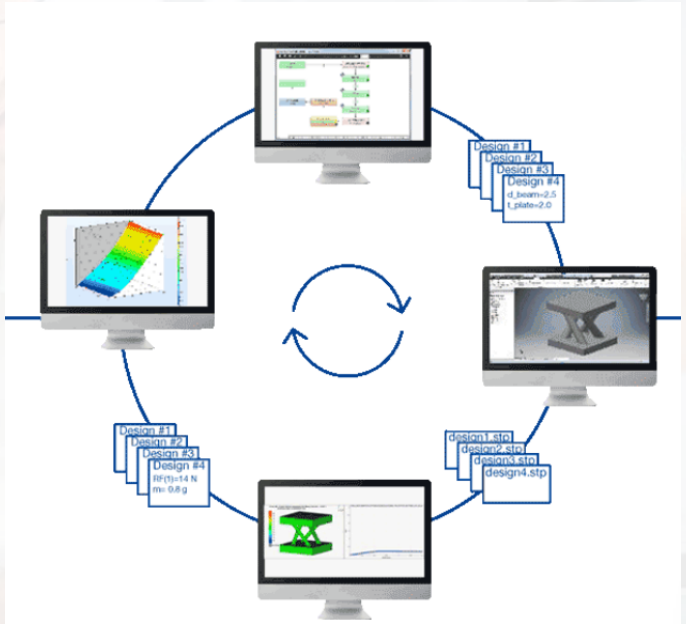
Enterprise Workflow: Material Model as a Service

1. Meeting to understand your need of a specific material model

We jointly define the material model requirements depending on your application (quasi-static, crash, …) and ensure that your IT environment is supported by our tools.

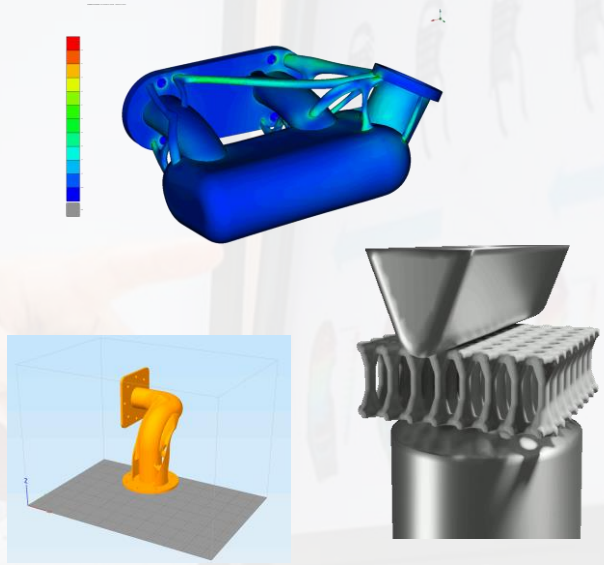
2. Installation and test of Ultrasim

You provide a typical input deck you use in FEA simulation (e.g. ABAQUS) without material model. We integrate our specialized material model and get you set up to start working.



3. You are ready to apply our material models during your FEA

You can choose our material models during your typical workflow and are supported by our FEA specialists.



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Any Questions? Contact Us!

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