



# CTC & Additive Manufacturing Technologies

Additive lightweight design for an innovative and resource-efficient aviation

an **AIRBUS** company

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CEO

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**CTC**

**we are  
composites**

# Where do we come from?



# Where are we today?

## 2001

- CTC GmbH founding
- 100% Airbus subsidiary
- Intention R&D projects also outside AIRBUS

## 2004

- Technology Center building
- 2500 m<sup>2</sup> shop floor for carbon activities
- Industrial composite processing for future Airbus aircraft

## 2006

- A350 development period
- Valuation composite maturity status
- Decision phase for the key technologies composites A350
- Industrial composite production

## 2012

- Expansion of the fields of activity
- Assembly; cabin processes, ... composite recycling
- CTC develop to a service- supplier for carbon production; internal AIRBUS and external

## 2026

- International business not only aircraft
- New to the list education & training in the composite environments
- Absolute priority: industrial processes



Source: Composites World



Source: Airbus



**CTC** we are composites



# Facts & figures.

CTC is a 100% subsidiary of Airbus Operations GmbH

**> 80**  
Employees including PhD students

**> 50**  
Composites & lightweight experts

**3500 m<sup>2</sup>**  
Shopfloor  
Air-conditioned

Cooperation with suppliers and development partners in the Composites United network

Integrated in Airbus Technology Programs

**> 30**  
International students

EN 9100 and ISO 14001 certified

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# CTC Sites & Offices.

**CTC Stade**  
we are composites  
an AIRBUS company

**ZAL Hamburg**  
ZAL Zentrum für Angewandte Luftfahrtforschung

**ECOMAT Bremen**  
ECOMAT Bremen Center for Efficient Processes and Technology

**Technologiezentrum Augsburg Augsburg**  
AUGSBURG INNOVATIONS PARK

**Busan Techno Park Busan, South Korea**  
부산테크노파크 BUSAN TECHNOPARK

# Our partners and customers.

### Collaboration partners

### Networks

### University collaborations

The image shows the entrance to the CTC 3D-Hub. Above the glass entrance is a glowing blue logo that reads "CTC 3D-Hub". Inside the center, there is a workstation with a wooden top and white drawers, featuring three large 3D printers. The background shows more industrial equipment and glass partitions.

**CTC 3D-Hub**

**CTC Production Center focussing on the Material Extrusion (MEX) process**

**Reference Shop for FCM**

**Prototypes, Jigs & Tools**

**In-House End-to-End-process for agile production environment**

**New Materials screening and testing**

**Additive  
Manufacturing with  
polymer &  
composite materials**



# Available printers MEX

**Ultimaker S5 – S3**  
standard polymers



**INTAMSYS  
FUNMAT PRO 610 HT**  
HP polymers



**Lynxter S300X**  
Elastomer / Polyurethane



**Bambu Lab X1**  
Multicolor



**Fortus 450mc**  
HP polymers



**INTAMSYS**  
Engineering polymers



**Chromatic RX-AM**  
Elastomer / Polyurethane



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# Available print heads FCM

## Orbital Composites print head

Commingled yarn with 'kiss-impregnation'. Rods and thick filament

## Dyze design print head

Neat thermoplastic and support structure

## Anisoprint print head

In-nozzle impregnation of the reinforcement

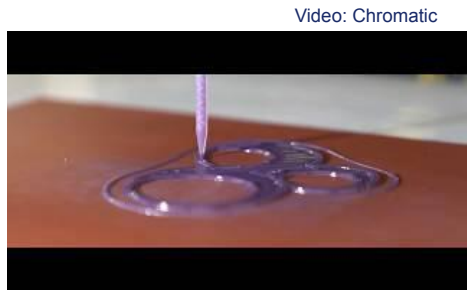
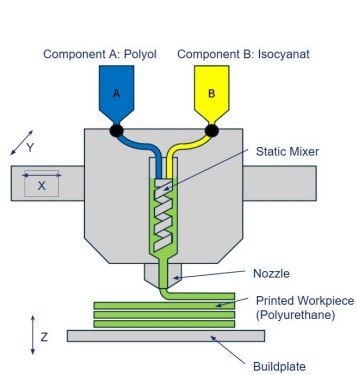
## FLATISA print head

Prepreg filament

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# Process Development & Material Evaluation: REAM (Reactive Extrusion Additive Manufacturing)



Low viscous print process

## Research Question:

- How do specific process parameters and environmental conditions influence component quality?
- What are the design limitations and constraints?
- What are the potential use cases?



Production



Bellow



Gasket

## Print of elastomer materials

- Component A and B are mixed in the mixer and dispensed through a nozzle
- The crosslinking reaction starts immediately
- No heat is required

→ Resulting material: thermoset elastic polyurethane with isotropic material properties

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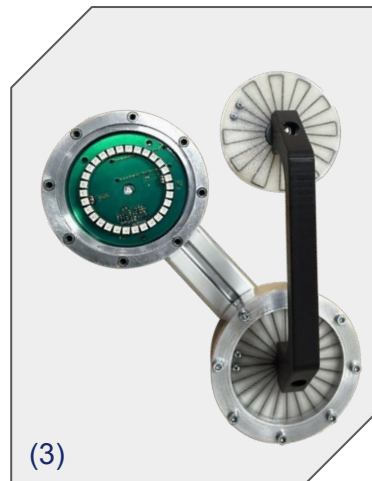
we are composites

# Function-integrated additive manufacturing

## Load-optimized and functional

**Aircraft Partition Wall:** A lightweight structure that combines additively manufactured frames with functional elements.

- **CFRP Frame:** A thermoplastic, carbon fiber-reinforced frame with optimized fiber path planning for maximum stability. (1)
- **Functional Lighting:** Integration of light guide elements and electrical interfaces directly into cabin components, enabling a more compact design. (2)
- **Sensing Handle:** A 3D-printed handle with antibacterial surfaces and integrated force measurement and signal processing. (3)
- **Seat Heating:** Heating wires and sensors are embedded directly into the elastomeric components of the seat during the printing process. (4)



# Multi Functional Robot System

## Overview – Fiber Deposition Feasibility – Details

Facility: @ CTC



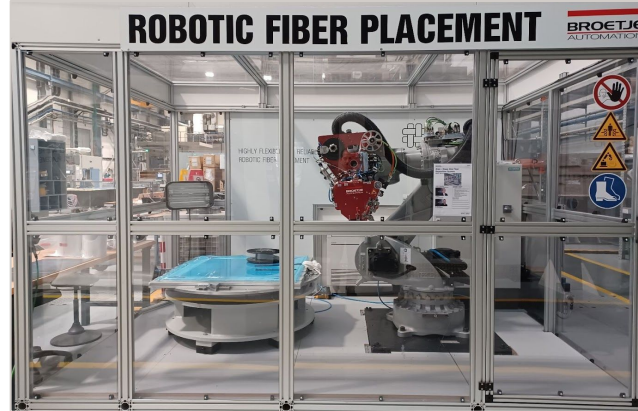
[source: CarbonAxis]

### Lab "Fibre Deposition System"

#### Plattform CarbonAxis

- 1/8" - 1/2" Tapes (UPDATE: 1")
- double-tow-system
- part size: max 1 m x 0.6 m x 0.2 m
- heating:
  - IR heating lamp
  - Hot air gun + heated plate

Facility: @ CTC



[source: CTC]

### Test-Part "Fibre Deposition System"

#### Plattform STAXX ONE

- 1/4", 1/2", 1", 2"
- single-tow-system
- part size / table size: 0.9 m x 0.9m
- heating:
  - IR heating lamp
  - Flash Lamp

Facility: @ CTC



[source: BRÖTJE]

### Industrial "Fibre Deposition System"

#### Plattform NGM²DF-System

##### Start Configuration: STAXX ONE

- 1/4", 1/2", 1", 2"
- single-tow-system
- part size: 12.5m x-axis and rotating table size with 1.600mm diameter
- heating:
  - IR heating lamp
  - Flash Lamp

# Thank you.

[www.ctc-composites.com](http://www.ctc-composites.com)



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# Contact.

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