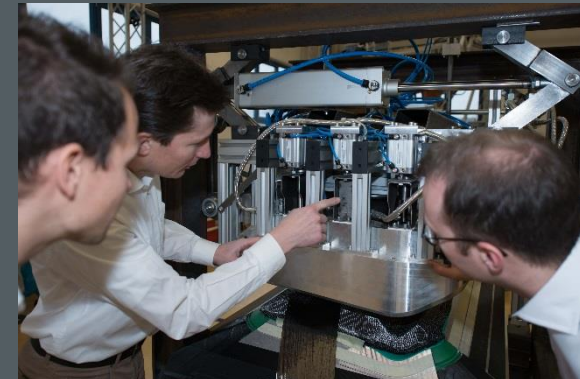
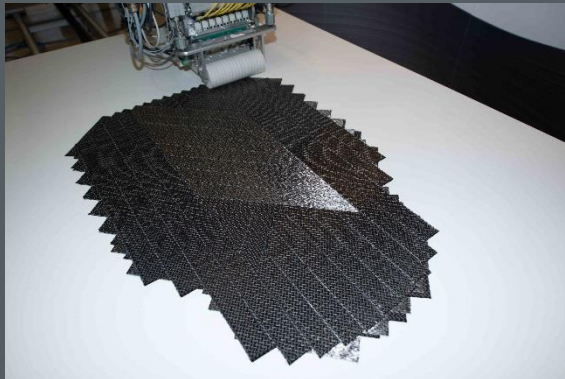


# ADDITIVE MANUFACTURING OF TAILORED STACKS / BLANKS BASED ON UD – TAPES

Workshop on modern composite technologies  
Composite-Expo Krakow October 16<sup>th</sup>-17<sup>th</sup> 2018.



Ingo Karb  
October 16<sup>th</sup>, 2018

  
**compositence**

# „we think composite“

Means for us to be your central entry point regarding all questions around composites and preforming!

## Some facts about Compositence

- Located in Leonberg / Germany (near Stuttgart)
- Currently 15 employees (mainly engineers)

## Our valued customers (examples)

### Plant Customers



# Compositence Products and Services

## Stack & Blank Production

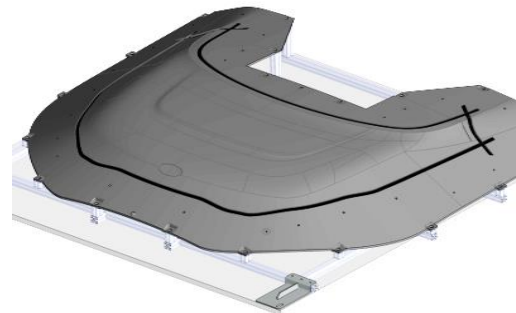
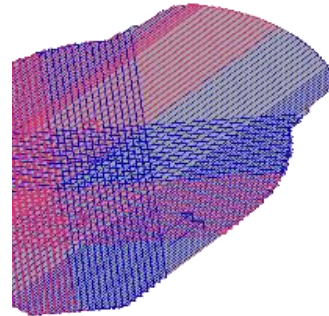
Customized layup

- Dry Fibre
- Thermoplastic
- Thermoset



## Engineering - Service

- Components
- Process
- Tooling
- Software



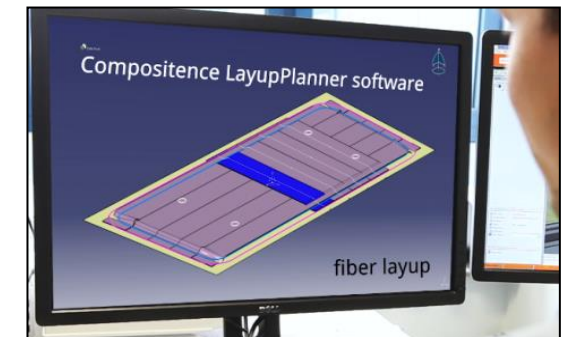
## Production Facilities

- 2D High Productivity
- 3D Robot based
- Customer Specific



## Services

- Plants maintenance
- Operator Training
- Software updates
- Software Training



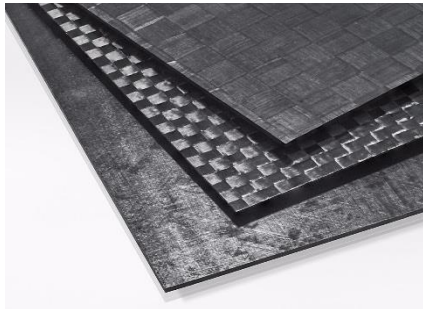


# Challenges of todays Composite Production

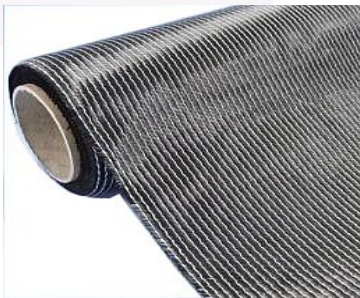
## Expensive Raw Material

Semi-finished products:

- non-crimp fabrics
- organo-sheet
- prepreg fabrics

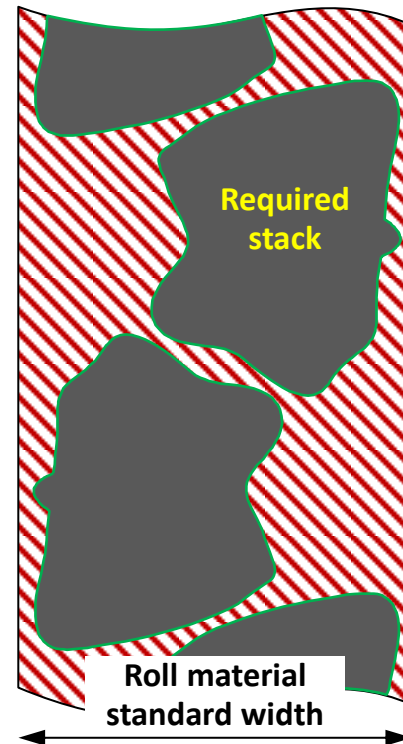


source: SGL



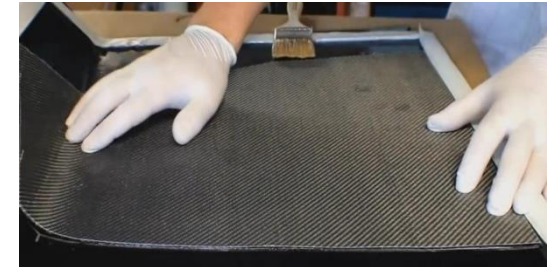
## Subtractive Process

- cutting waste: 43 %



## Manual Layup

- high cost
- unstable quality



source: easycomposites

# Our Solution: Additive Stack Manufacturing

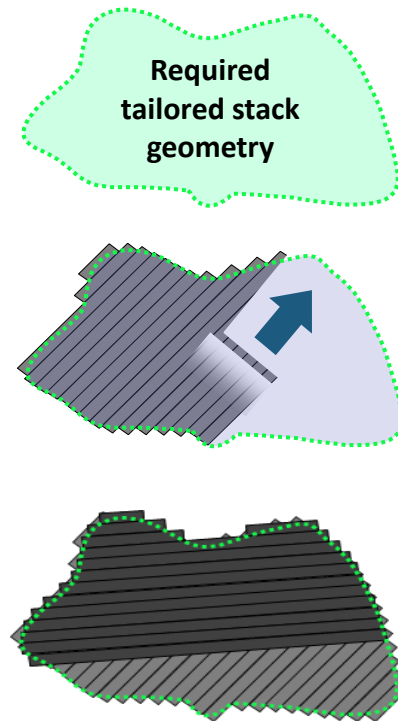
## Cost-effective Raw Material

- Dry fiber tape
- Thermoplastic tapes
- TowPregs



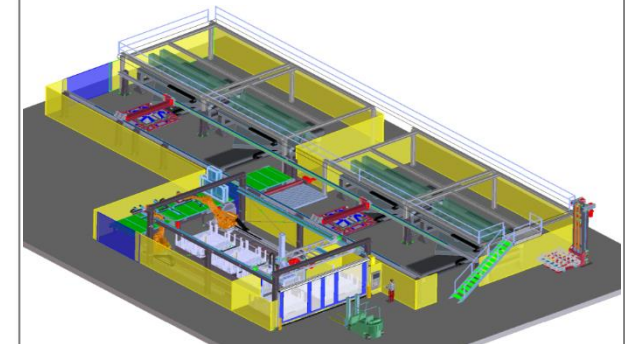
## Additive Process

- cutting waste: 3-6 %
- flexibility



## Automation

- automated processes
- consistent quality
- scalable



Automated stack production line

# 3D Robot based Thermoplastic Tape Placement Plant



Video available @  
[www.compositence.com](http://www.compositence.com)



# Fully automated 2D placement system

Video available @  
[www.compositence.com](http://www.compositence.com)



# In House Stack / Blank Production

2D Stack / Blank

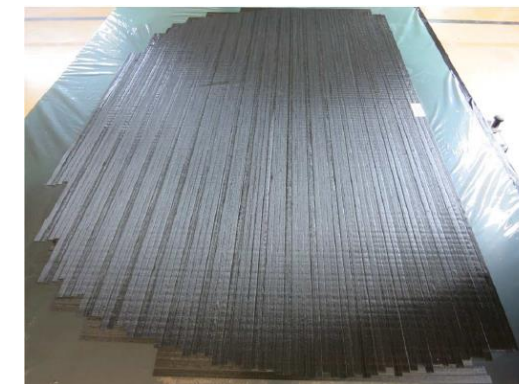
**Dry Fiber Tape Stack**



**Thermoplastic Tailored Blank**



**TowPreg Tailored Blank**



3D Component

**Automotive Body Panel**



**Automotive Door Panel**



**Trunk Lid inner shell**





# Machinery: modular, combinable and flexible, step by step expandable

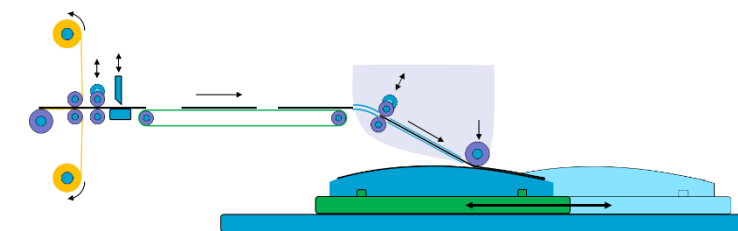
**Manipulation system**  
according to your  
need



2D

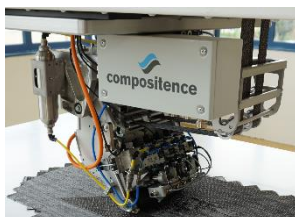


3D

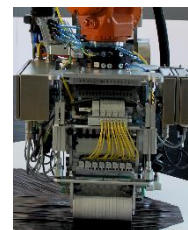


Customized solutions

**Placement head**  
according to your  
application



Dry fiber tape



Thermoplastic tape



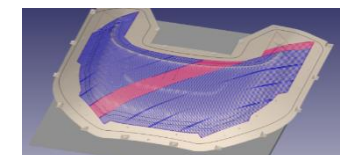
Thermoset tape

Adaptable:

- number of slots
- slot width

**Software**  
component design  
offline programming

Offline programming via our software “LayupPlanner”



**„we think composites“**

**Xièxie!**

**Thanks!**

**Danke!**



**compositence.com**