

1 Pultrex Px 500/10 and  
Herzog braiding wheel.

## PULTRUSION @Fraunhofer

### Fraunhofer Institute for Casting and Processing Technology IGCV

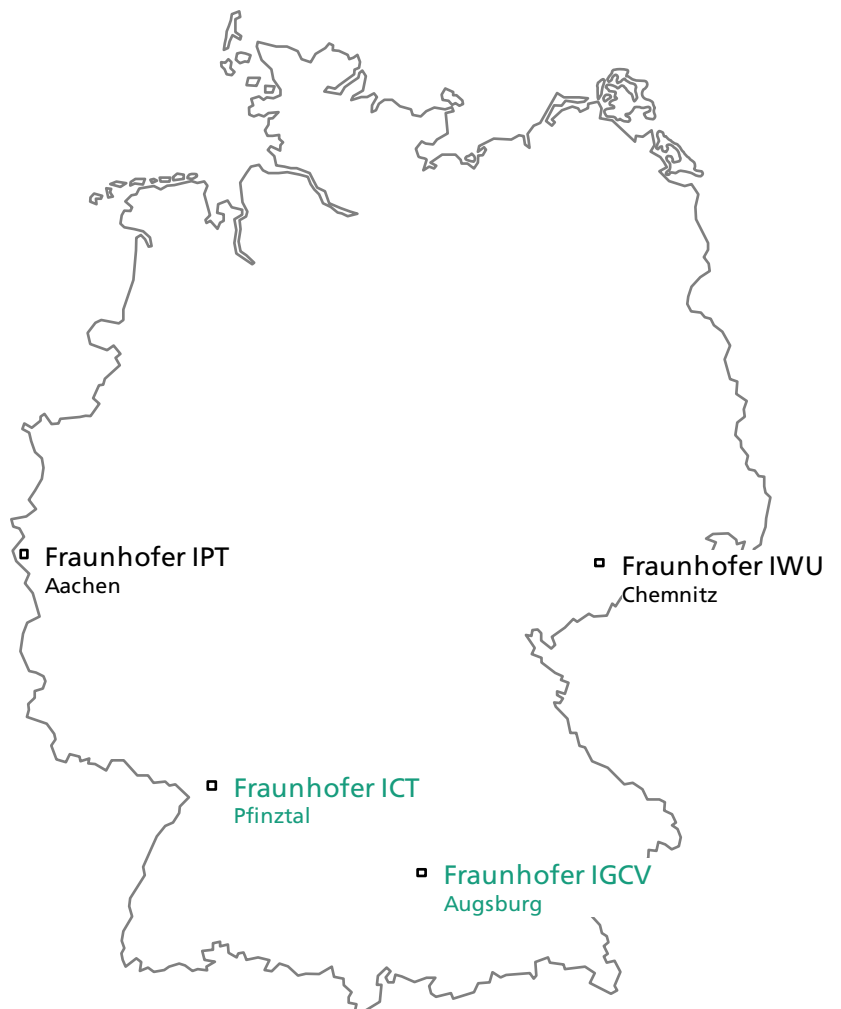
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## Machinery and equipment

### Fraunhofer IGCV

#### "straight"-Pultrusion line #1

- Two alternating grippers
- Max. width of profiles 500 mm
- Max. pull-force 10 mt
- Optional addition: in-line braiding carousel (2 x 72 spools)
- Optional addition: caterpillar-puller

#### "straight"-Pultrusion line #2

- Two alternating grippers
- Max. width of profiles 750 mm
- Max. pull-force 8 mt

#### "straight"-Pultrusion line #3

- Double belt puller
- Max. width of profiles 100 mm
- Max. pull-force 2 mt

### Fraunhofer ICT

#### "straight"-Pultrusion line #1

- Caterpillar-puller
- Max. profile envelope 200 x 80 mm
- Max. pull-force 8 mt

### Fraunhofer IPT

#### "micro"-Pultrusion

- Rods and tubes from approx.  $\varnothing$  0.5 mm to  $\varnothing$  2.0 mm for medical applications

### Fraunhofer IWU

#### "radius"-Pultrusion

- $R_{\min} = 1.5 \text{ m}$ ,  $R_{\max} = \infty$  (straight)
- Max. profile-envelope 300 x 150 mm
- Max. pull-force 8 mt

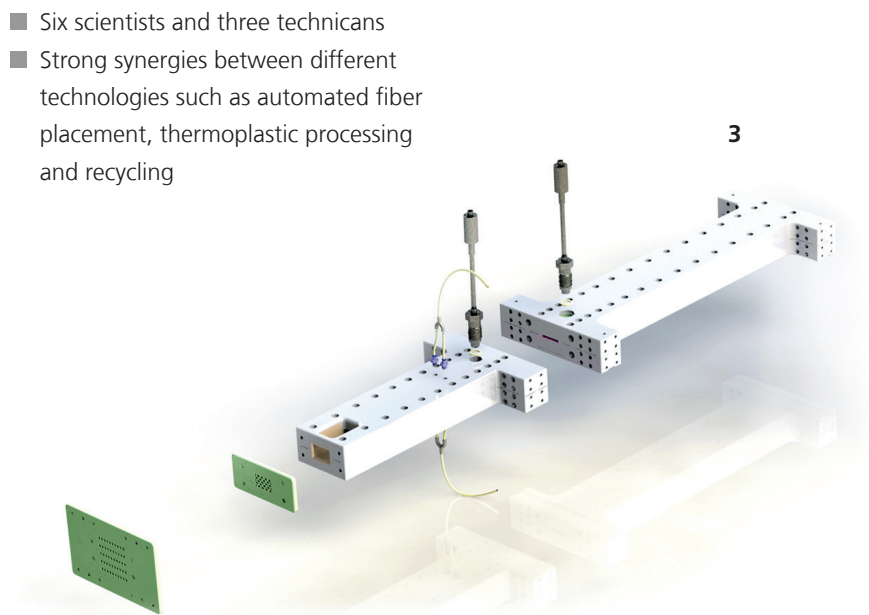
- Two-component metering and static-dynamic mixing for epoxy resin systems
- Two-component metering and static-dynamic mixing for polyurethane systems available at IGCV, ICT, IWU
- Slitter for continuous strand mats and woven or "complex" textiles available at IGCV
- Extruder and melt-pump for thermo-plastic co-extrusion available at ICT
- Two-component metering and mixing for  $\epsilon$ -caprolactam available at ICT

## Combined and complementary expertise

- Six scientists and three technicians
- Strong synergies between different technologies such as automated fiber placement, thermoplastic processing and recycling

## Supporting

- Process planning and management
- Tooling design and engineering
- Tooling implementation, testing and optimization of process parameters
- Prototyping and small-series production runs
- Resin system development
- Training and on-site support



2 Example of fiber guidance to produce a "structural" profile.

3 Example of bolt-on injection- and impregnation chamber for production of PUR-CF65 (spar-caps).