

# Extrusion Technologies and Recycling (ETR)

## Research area at the Institute of Lightweight Structures

### About this organisation

#### Machine translation

This organisation has been machine-translated based on data provided in German.

The ETR research area combines the fields of plastics processing, fibre composite technologies and machine design with the aim of implementing new innovative products, processes and machines as part of the continuous production of fibre-plastic composites. In addition to new extrusion and recycling concepts, the team also addresses high-efficiency plant systems and the development of new materials for lightweight construction solutions.

Extrusion and recycling - Process engineering development for single and twin-screw extruders - Extrusion impregnation of reinforcing fibres - Technologies for the compounding of plastics with reinforcing fibres - Compounding of bio-based materials - Property modification of plastics with elastomer recyclates - Substitution of multi-stage processes through direct processing - Recycling concepts for fibre-reinforced plastics - Reactivation and compounding of elastomer waste Machine and plant systems - Innovative twin-screw extruder systems - Reactivation systems for elastomers - Single-stage direct processing system for the production of thermoplastic pre-pregs Material development - Compounds for special applications - Bio-based polypropylene - Basalt fibre-reinforced thermoplastic compounds - Fibre reinforcement of PVC - Compounds made from plastics and elastomer recyclates - Blends with nanoparticles

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#### Organisation type

University or higher education institution

#### Sectors

No specific sector

#### Employees

10 up to 49

#### Turnover

Up to €2m

#### Funding

n/a

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## About this organisation



### Main areas covered

Plastics processing, Compounding, Recycling, Extrusion, Impregnation

### Infrastructure

one-step direct impregnation, Single and twin screw extruder, Reactruder for elastomer processing, Various pelletising systems, Film calenders & impregnating calenders

### Certifications

### Keywords

Tape and organo sheet production, Thermoplastic impregnation, Extrusion, Recycling, Compounding

### Memberships

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## Overview of lightweighting expertise

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|                                                                                                                                                                                                                     | Research | Development | Manufacturing & Supply |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|------------------------|
| <b>Offer</b>                                                                                                                                                                                                        |          |             |                        |
| <b>Products</b><br>Parts and components, Semi-finished parts, Machines and plants, Software & databases, Systems and end products, Materials, Tools and moulds, Others (Processing technologies)                    | ✓        | ✓           |                        |
| <b>Services &amp; consulting</b><br>Training, Consulting, Testing and trials, Engineering, Prototyping, Validation, Simulation, Technology transfer, Approval, Others (Technology development, compound production) | ✓        | ✓           |                        |
| <b>Field of technology</b>                                                                                                                                                                                          |          |             |                        |
| <b>Design &amp; layout</b><br>Lightweight manufacturing, Lightweight design, Hybrid structures, Lightweight construction concepts, Lightweight material construction                                                | ✓        | ✓           |                        |
| <b>Functional integration</b><br>Sensor technology, Material functionalisation                                                                                                                                      | ✓        | ✓           |                        |
| <b>Measuring and testing technology</b><br>Visual analysis (e.g. microscopy, metallography), Materials analysis, Destructive analysis, Non-destructive analysis                                                     | ✓        | ✓           |                        |
| <b>Modelling and simulation</b><br>Materials                                                                                                                                                                        | ✓        | ✓           |                        |
| <b>Plant construction &amp; automation</b><br>Plant construction, Automation technology                                                                                                                             | ✓        | ✓           |                        |
| <b>Recycling technologies</b><br>Downcycling, Material separation, Recycling, Upcycling                                                                                                                             | ✓        | ✓           |                        |

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|                                                                                                                                 | Research | Development | Manufacturing<br>& Supply |
|---------------------------------------------------------------------------------------------------------------------------------|----------|-------------|---------------------------|
| <b>Manufacturing process</b>                                                                                                    |          |             |                           |
| <i>Additive manufacturing</i>                                                                                                   |          |             |                           |
| <i>Coating (surface engineering)</i>                                                                                            |          |             |                           |
| <b>Fibre composite technology</b><br>Pre-preg processing, Others (thermoplastic impregnation, calender impregnation, extrusion) | ✓        | ✓           |                           |
| <b>Forming</b><br>Impact extrusion, Compression moulding, Thermal converting, Deep-drawing, Rolling                             | ✓        | ✓           |                           |
| <i>Joining</i>                                                                                                                  |          |             |                           |
| <b>Material property alteration</b><br>Heat treatment                                                                           | ✓        | ✓           |                           |
| <b>Primary forming</b><br>Extrusion, Pultrusion                                                                                 | ✓        | ✓           |                           |
| <i>Processing and separating</i>                                                                                                |          |             |                           |
| <i>Textile technology</i>                                                                                                       |          |             |                           |

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|                                                                                                                                                                                                                                                                                                                    | Research | Development | Manufacturing<br>& Supply |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|---------------------------|
| <b>Material</b>                                                                                                                                                                                                                                                                                                    |          |             |                           |
| <b>Biogenic materials</b><br>Bioplastics, Biocomposites, Wood, Others<br>(Natural fibres)                                                                                                                                                                                                                          | ✓        | ✓           |                           |
| <b>Cellular materials (foam materials)</b><br>Closed-pore, Open-pore, Syntactic foams                                                                                                                                                                                                                              | ✓        | ✓           |                           |
| <b>Composites</b><br>Aramid fibre composites, Basalt fibre-reinforced plastic, Glass-fiber reinforced plastics (GFRP), Carbon-fiber reinforced plastics (CFRP), Metal-fibre-polymer composite, Metal matrix composite, Nanocomposites, Natural fibre reinforced plastics (NFRP), Laminates, Particulate composites | ✓        | ✓           |                           |
| <b>Fibres</b><br>Aramid fibres, Basalt fibres, Glass fibres, Ceramic fibres, Carbon fibres, Natural fibres                                                                                                                                                                                                         | ✓        | ✓           |                           |
| <i>Functional materials</i>                                                                                                                                                                                                                                                                                        |          |             |                           |
| <i>Metals</i>                                                                                                                                                                                                                                                                                                      |          |             |                           |
| <b>Plastics</b><br>Thermoset plastics, Elastomers, Thermoplastics                                                                                                                                                                                                                                                  | ✓        | ✓           |                           |
| <i>Structural ceramics</i>                                                                                                                                                                                                                                                                                         |          |             |                           |
| <b>(Technical) textiles</b><br>Yarns, rovings, Meshes, Laid webs, Crocheted fabrics, Woven fabrics, Knitted fabrics, Nonwovens, mats                                                                                                                                                                               | ✓        | ✓           |                           |

## Extrusion Technologies and Recycling (ETR)

*Research area at the Institute of Lightweight Structures*

### Contacts

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