



Large  
equipment  
directory

# Progressing your Research and Development

NCC is a world-leading innovation organisation that turns cutting-edge research and technology into industrial impact.

We bridge the gap between academia and industry, helping companies of all sizes to capitalise on cutting-edge innovations to deliver more. We do this at every stage of their journey and across the entire product lifecycle, from the earliest concept to end-of-life.

NCC can support your businesses by giving access to an extensive list of capabilities.

These capabilities come in the form of knowledge and advanced equipment – to fast-track your development needs and specialist knowledge acquisition.

Get in touch and we will formulate a proposal tailored to your needs in the form of a development project or equipment usage hire.

Capability categories:

- Fibre Deposition
- Resin Injection
- Moulding
- Curing

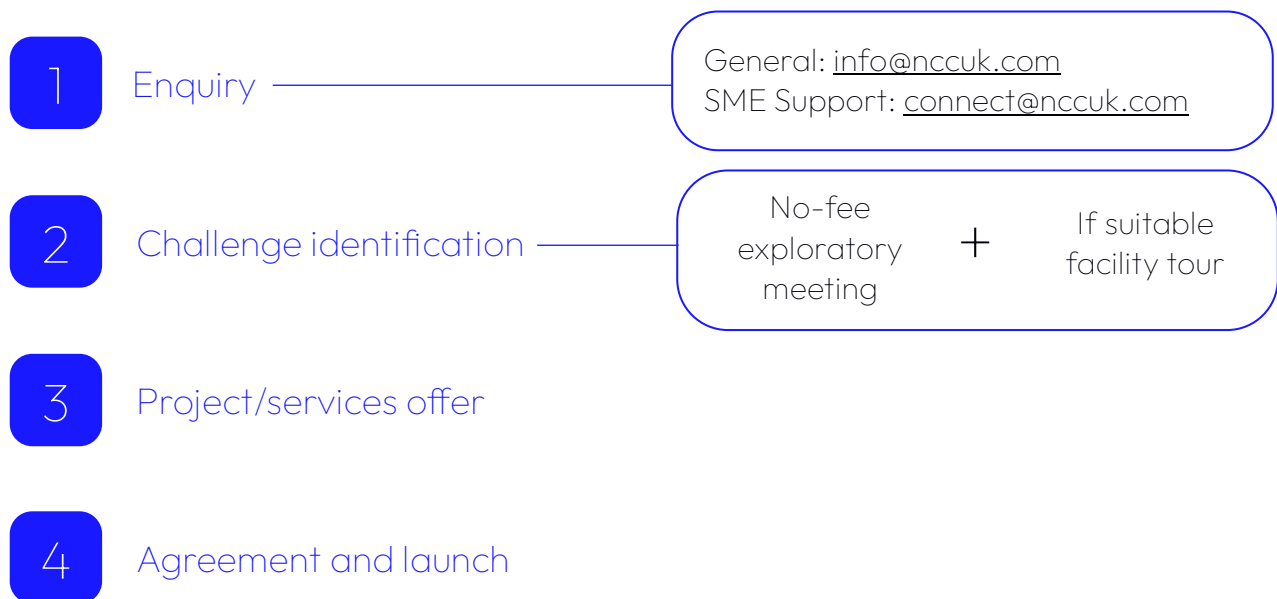
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# How to work with us

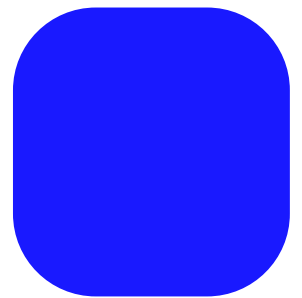
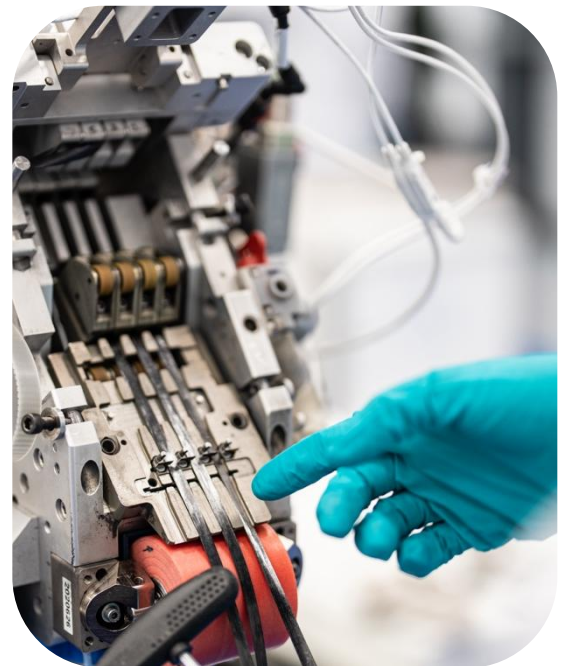
Get in touch with us - we will  
connect you with our specialists.



Challenge identification meeting  
can be performed on site at NCC  
or digitally. This is offered at no  
fee to clients.

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## Fibre depositions



## Tailored Fibre Placement – Tajima Machine

|                                             |                                                                                                |
|---------------------------------------------|------------------------------------------------------------------------------------------------|
| Machine                                     | Tailóred.Fibré.Plácen eñf.{TFP}                                                                |
| Bed size                                    | 550 x 650 mm                                                                                   |
| Max Part Size                               | 500 x 600 mm                                                                                   |
| Max Speed                                   | 800 stitches per minute                                                                        |
| Minimum Steering Radius                     | 2 mm (with carbon fibres)                                                                      |
| Fibre Angles                                | Full 360°                                                                                      |
| Reinforcement Material                      | Most windable materials (e.g. Thermoplastic commingled materials, Carbon, Glass, Flax rovings) |
| Base Material                               | Carbon, Glass, Polymer films, Flax, Soluble PVA<br>Format: Veil, NCF, Woven fabric             |
| Stitch Material                             | Polyester, Cotton, Linen, Nylon                                                                |
| Max Yarn Density for Reinforcement Material | 50 Tex (= 50 g/km)                                                                             |
| Auxiliaries                                 | Bobbin winder                                                                                  |
| Software                                    | EDOpath (stitch programming software)                                                          |
| Product                                     | 2D preform ready for RTM/infusion/consolidation                                                |

## Fibre depositions


[YouTube Demo – NCC's Filament Winder](#)

## Cygnet-Textimp – Filament Winder

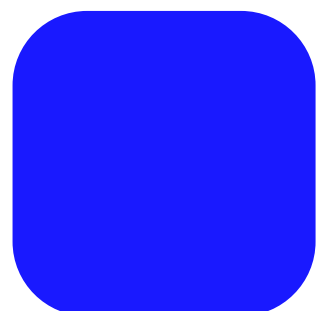
|                                              |                                                                                                                                            |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Machine                                      | Fílán eñf.Wínder                                                                                                                           |
| Axis                                         | 4 axis (x, y, a, b)                                                                                                                        |
| Max Part Size                                | 1 m length, 475 mm outer diameter                                                                                                          |
| Max Internal Pressure Applied to the Mandrel | Up to 6bar                                                                                                                                 |
| Fibre Angles                                 | 8°- 89°                                                                                                                                    |
| Material                                     | Towpreg, Wet winding with dry tows and a resin bath, Thermoset tape                                                                        |
| Max Number of Tows                           | 4                                                                                                                                          |
| Fibre Material                               | Glass or Carbon (other types on request)                                                                                                   |
| Creel                                        | Two creels available: <ul style="list-style-type: none"> <li>- Tow-preg – up to 150N per tow</li> <li>- Dry – up to 10N per tow</li> </ul> |
| Wet-out system                               | Spreader System and Coating Drum                                                                                                           |
| Auxiliaries                                  | Rotisserie oven<br>IR lamp<br>Extraction<br>Shrink tape dispenser                                                                          |
| Software                                     | Cadfil                                                                                                                                     |

## Fibre depositions

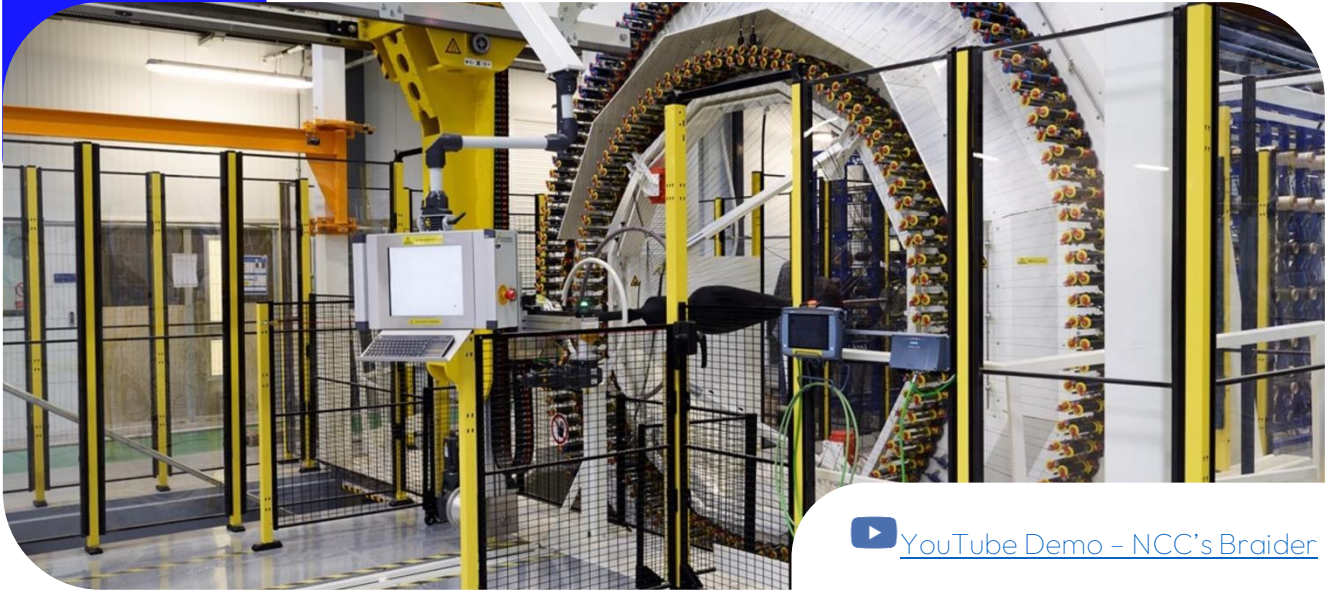

[YouTube Demo – NCC's Automated Preforming Cell](#)

## Loop Technology – Automated Preform Cell

|                |                                                                                                                       |
|----------------|-----------------------------------------------------------------------------------------------------------------------|
| Machine        | Aúfón afed. Préfórn .Céll.{APC}                                                                                       |
| Robots         | Kuka 300kg payload 2.5m reach<br>Kuka 500kg payload 3m reach with force torque sensor                                 |
| Platform       | Both robots mounted on a 16 m Gudel track                                                                             |
| Environment    | Clean Room                                                                                                            |
| End Effectors  | Material handling<br>Ultrasonic trimming knife<br>Contactless Metrology<br>Fibre angle measurement & defect detection |
| Material Types | Dry Fibre<br>Thermoset Prepreg<br>Thermoplastic Prepreg                                                               |
| Application    | Dry Fibre preform manufacture & inspection.<br>End effector test and development                                      |



## Fibre depositions



[YouTube Demo – NCC's Braider](#)

## Eurocarbon - Twin-Ring Axial Braider

|                    |                                                                       |
|--------------------|-----------------------------------------------------------------------|
| Machine            | Oweíbraideí                                                           |
| Max Part Size      | 9.8 m long, 0.8 m diameter                                            |
| Max Traverse Speed | 2 m/min                                                               |
| Number of Bobbins  | Outer ring: 288 radial, 144 axial<br>Inner ring: 192 radial, 96 axial |
| Material           | Glass, Carbon, Aramid, Basalt, Jute                                   |
| Traverse System    | Gantry                                                                |
| Auxiliaries        | Extraction<br>Bobbin winder<br>Tow twister                            |
| Monitoring         | In-process angle and coverage                                         |

## Fibre depositions



[YouTube Demo – NCC's Coriolis AFP](#)

## Automated Fibre Placement – Coriolis C1

|                  |                                                                                              |
|------------------|----------------------------------------------------------------------------------------------|
| Machine          | Aúfón afed.Fibré.Plácen eñf.{AFP}.-<br>Teñsíóñed.Fibré.Plácen eñf.{Fílan eñf.Wíndiñg}        |
| Number of Tows   | 8                                                                                            |
| Tow Width        | 6.35 mm                                                                                      |
| Material         | Thermoset tape, Dry fibre tape, Thermoplastic tape, CMC                                      |
| Max Working Area | 3.1 m arm reach, 10 m long                                                                   |
| Tool Positions   | Vertical and Horizontal                                                                      |
| Max Tool Weight  | Vertical: 3 tonnes<br>Horizontal: 6 tonnes                                                   |
| Auxiliaries      | Infrared heater<br>Laser heater<br>Humm3 flashlamp<br>USK ultrasonic knife<br>Renishaw probe |
| Applications     | Complex 3D geometry                                                                          |

## Fibre depositions



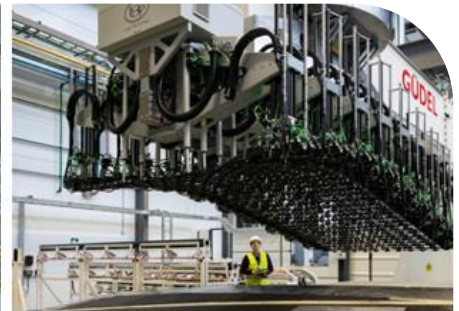
[YouTube Demo – NCC's Hybrid AFP/ATL](#)

## AFP/ATL

### Electroimpact (EI)

|                  |                                                                                                  |
|------------------|--------------------------------------------------------------------------------------------------|
| Machine          | Aúfón afed.Fibré.Plácan ení.{AFP}.–<br>Aúfón afed.Tape.Laýíng.{ATL}                              |
| Number of Tows   | AFP: 8<br>ATL: 1                                                                                 |
| Tow Width        | AFP: 12.7 mm<br>ATL: 75 / 200 / 300 mm                                                           |
| Material         | AFP: Thermoset tape, Dry fibre tape, Thermoplastic tape<br>ATL: Thermoset tape                   |
| Max Working Area | 4.5 x 11.8 m                                                                                     |
| Tool Positions   | Vertical and Horizontal                                                                          |
| Max Tool Weight  | Vertical: 25 tonnes<br>Horizontal: 9.07 tonnes                                                   |
| Auxiliaries      | Infrared heater<br>Humm3 flashlamp<br>USK ultrasonic knife<br>Renishaw probe<br>Laser projection |
| Applications     | Wing covers, Fuselage sections, Rocket stages                                                    |

## Fibre depositions


[YouTube Demo – NCC's UHRD Cell](#)

## Ultra-High-Rate Deposition (UHRD) Pilot Line

|                       |                                                                                                                                             |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Machine               | Wide.fabric.ş .fape.placen eñf                                                                                                              |
| Material              | Dry fibre (carbon, glass)                                                                                                                   |
| Technology            | FibreFORM (pick & place)<br>FibreROLL (roll-up and roll-out)<br>Dry Fibre Placement                                                         |
| Cell Working Volume   | 20 x 5 x 1.8 m                                                                                                                              |
| Maximum Material Size | FibreFORM: 4 x 1.24 m<br>FibreROLL 1.3: 20 x 1.24 m<br>FibreROLL 5: 20 x 5 m<br>DFP: 6 tows x 38.1 mm width (228.6 mm overall course width) |
| Auxiliaries           | Humm3 flashlamp (DFP only)<br>USK ultrasonic knife<br>Renishaw probe<br>Laser projection                                                    |
| Applications          | Large low complexity structures                                                                                                             |

Resin injection



[YouTube Demo – NCC's HT-RTM](#)

## ISOJET HT-RTM

|                        |                                                                 |
|------------------------|-----------------------------------------------------------------|
| Machine                | High.Ten þeafúfe.–Reiñ.Trañsfeř.Móúldiñg                        |
| Capacity               | 15 litre (Premixed)                                             |
| Flow rate              | Up to 3.5litres/min                                             |
| Max Pressure           | 30 bar                                                          |
| Max piston & line temp | 300C                                                            |
| Heating rate           | Up to 5C/min                                                    |
| Interfacing Equipment  | PEI 1100T press<br>Data acquisition: TC, pressure and flow rate |
| Application            | High-Temperature RTM                                            |



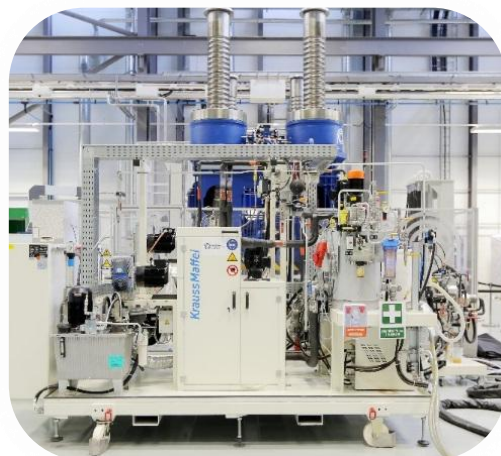
Resin injection



## CI-JET HT-RTM

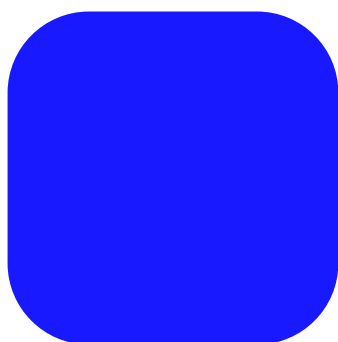
|                        |                                                                                    |
|------------------------|------------------------------------------------------------------------------------|
| Machine                | High.Ten þeafúfe.—Reiñ.Trañsef.Móúldiñg                                            |
| Capacity               | 25 litre (3 part possible)                                                         |
| Flow rate              | Up to 10litres/min                                                                 |
| Max Pressure           | 9 bar                                                                              |
| Max piston & line temp | 100C                                                                               |
| Interfacing Equipment  | PEI 1100T press<br>Hare 100T Press<br>Data acquisition: TC, pressure and flow rate |
| Application            | High-Temperature RTM                                                               |

Resin injection



## Krauss Maffei HP-RTM

|                        |                                                                 |
|------------------------|-----------------------------------------------------------------|
| Machine                | High.Přesšíře. -Rešíř.Třašíře.Móúdířg                           |
| Flow rate              | Up to 5.5kg/min                                                 |
| Max Pressure           | 220 bar                                                         |
| Max piston & line temp | 120C                                                            |
| Interfacing Equipment  | PEI 1100T press<br>Data acquisition: TC, pressure and flow rate |
| Application            | High-Pressure thermoset (Epoxy) or thermoplastic (PU)           |



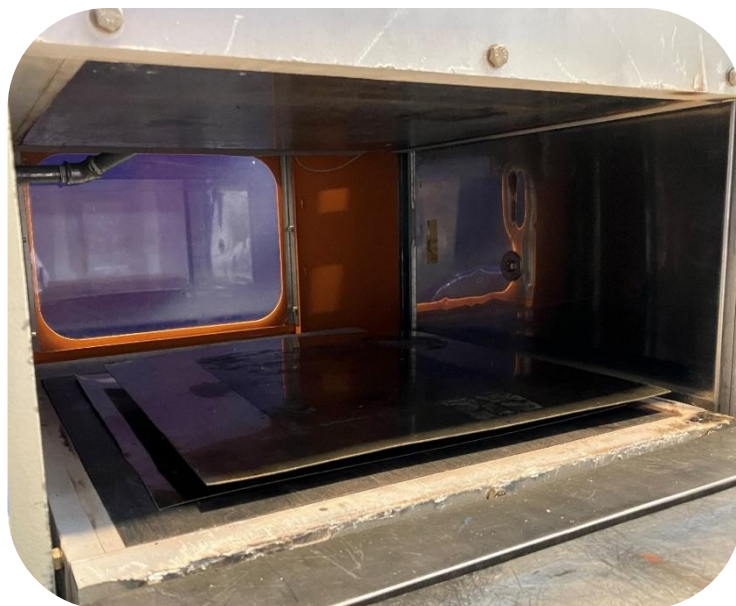
## Resin injection



## Composite Integration - LSRI

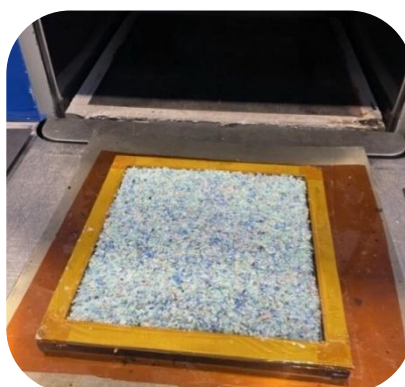
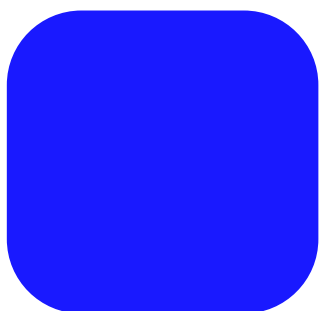
|                       |                                                                                                                                           |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Machine               | La rge.Sca le.Re si n. l n f u si o n                                                                                                     |
| Capacity              | 2 x 200 litre tanks                                                                                                                       |
| Flow rate             | Single component – 4 L/min<br>Two Component – 20 L/min                                                                                    |
| Max Pressure          | Single component – 10 bar<br>Two Component – 20 bar                                                                                       |
| Max tank & line temp  | 150°C                                                                                                                                     |
| Interfacing Equipment | Any compatible infusion or RTM mould. In-mould pressure sensors can drive the process.<br>Data acquisition: Flow rate, TC, resin pressure |
| Application           | Supporting resin infusion (epoxy) and RTM processes of large-scale components                                                             |

## Mouldings



## BIPEL Press 50T

|                    |                                                |
|--------------------|------------------------------------------------|
| Machine            | Sn óóth.Pláteň.-Heated.Přeśś                   |
| Max Tool area      | 400x400mm                                      |
| Stroke             | 220mm                                          |
| Max Pressing Force | 50 Tonnes                                      |
| Max Platen Temp    | 400C                                           |
| Auxiliaries        | Active platen cooling 10C/min                  |
| Application        | Fast flat panel material characterisation work |



## Mouldings



## Aeroform Press 150T

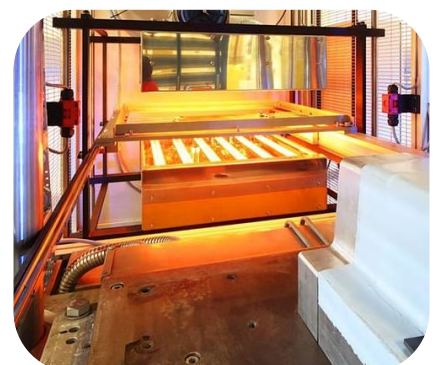
|                    |                                               |
|--------------------|-----------------------------------------------|
| Machine            | Heated.Přešs                                  |
| Max Tool area      | 1500x1200mm                                   |
| Stroke             | 750mm (6 pistons)                             |
| Max Pressing Force | 150 Tonnes                                    |
| Max Platen Temp    | 400C                                          |
| Additional info    | Active platen cooling<br>Compression moulding |

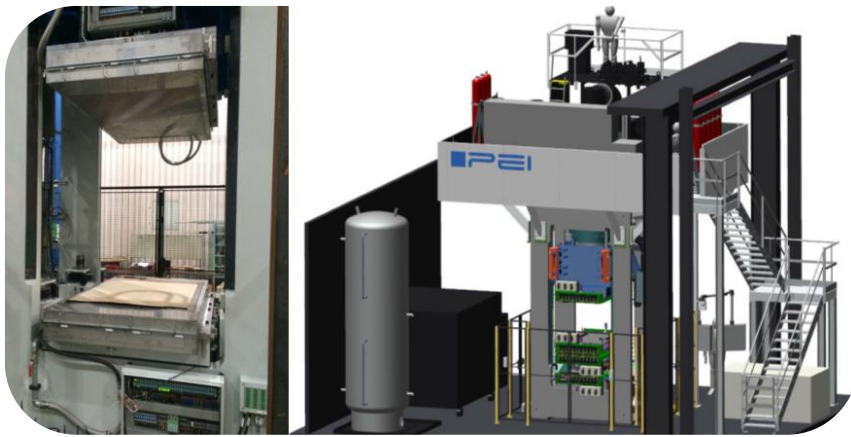
## Mouldings



## Hare Press 100T

|                    |                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------|
| Machine            | Heated.Prés.ş.Theırn óplástic.Stan bıııı                                                   |
| Max Tool area      | 600x600mm                                                                                  |
| Stroke             | 500mm (Single piston)                                                                      |
| Max Pressing Force | 100 Tonnes                                                                                 |
| Max Closing speed  | 300mm/s                                                                                    |
| Max Platen Temp    | 400C                                                                                       |
| Additional info    | Thermostamping<br>Compression moulding<br>Medium Wave IR heater<br>Shuttle transfer system |





 [YouTube Demo – NCC’s RTM using PEI Press](#)

# PEI Press 1100T

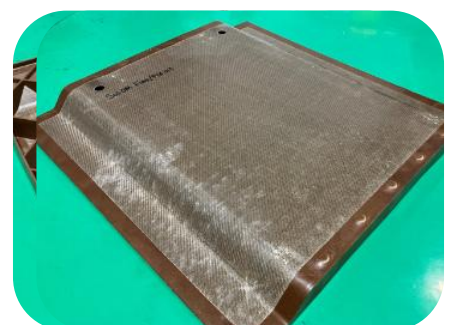
|                    |                                                                                           |
|--------------------|-------------------------------------------------------------------------------------------|
| Machine            | Heated.Prés.ş.Theñ óplástic.Stan piñg                                                     |
| Max Tool area      | 1800x1300mm                                                                               |
| Stroke             | 2200mm (Single piston)                                                                    |
| Max Pressing Force | 1100 Tonnes                                                                               |
| Max Closing speed  | 800mm/s                                                                                   |
| Max Tool Weight    | 20T                                                                                       |
| Max Platen Temp    | Primary platen oil: 200C<br>Secondary platen electric: 400C                               |
| Additional info    | Active cooling platen (10C/min)<br>Fume Extraction<br>RTM Capable<br>Compression Moulding |

## Mouldings

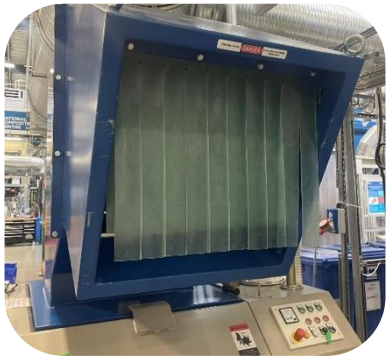


## Engel Injection Overmoulding 1700T

|                        |                                                                                                                   |
|------------------------|-------------------------------------------------------------------------------------------------------------------|
| Machine                | Ínjectiún óúlder.ş .Órganósheet.Oweín óúlder                                                                      |
| Max Tool area          | 1800x1400mm                                                                                                       |
| Stroke                 | 2400 mm                                                                                                           |
| Max Pressing Force     | 1700 Tonnes                                                                                                       |
| Max Tool Temperature   | 180C                                                                                                              |
| Max Barrel Temperature | 450C                                                                                                              |
| Auxiliaries            | Infrared heating oven<br>Organosheet transfer robot<br>Re-grinder<br>Moulding compound dryer<br>Moisture analyser |



Mouldings



Zerma  
Granulator

|                     |                                                    |
|---------------------|----------------------------------------------------|
| Machine             | Grańúlátor.{Aúyíliarý.óf.ówern óúídeń}             |
| Material Feed Hatch | 550 x 450 mm                                       |
| Conveyor belt       | 500 x 2700 mm                                      |
| Material Size       | 300 x 200 mm (depends on material type)            |
| Material Feed Rate  | Depends on material type                           |
| Granule Size        | 6-8 mm                                             |
| Material Type       | Thermoset and Thermoplastic<br>Various fibre types |
| Process Type        | Batch                                              |
| Output              | Waste purge compound for overmoulding              |

Curing



# Autoclave 1

## - Large

|                 |                                             |
|-----------------|---------------------------------------------|
| Machine         | Aúfóclawe                                   |
| Max Panel Size  | 10 x 2.9 m                                  |
| Max Height      | 2.3 m                                       |
| Max Temp        | 405°C                                       |
| Max Pressure    | 13 bar                                      |
| Max Tool Weight | 15 Tonnes (using the existing trolleys)     |
| Atmosphere      | Nitrogen                                    |
| Auxiliaries     | 30x N-type thermocouples<br>4x vacuum ports |

Curing



# Autoclave 2

## – Medium

|                 |                                             |
|-----------------|---------------------------------------------|
| Machine         | Aúfóclawe                                   |
| Max Panel Size  | 3 x 2 m                                     |
| Max Height      | 1.1 m                                       |
| Max Temp        | 205°C                                       |
| Max Pressure    | 6.9 bar                                     |
| Max Tool Weight | 2 Tonnes (spread evenly)                    |
| A†mosphere      | Compressed air                              |
| Auxiliaries     | 12x K-type thermocouples<br>3x vacuum ports |

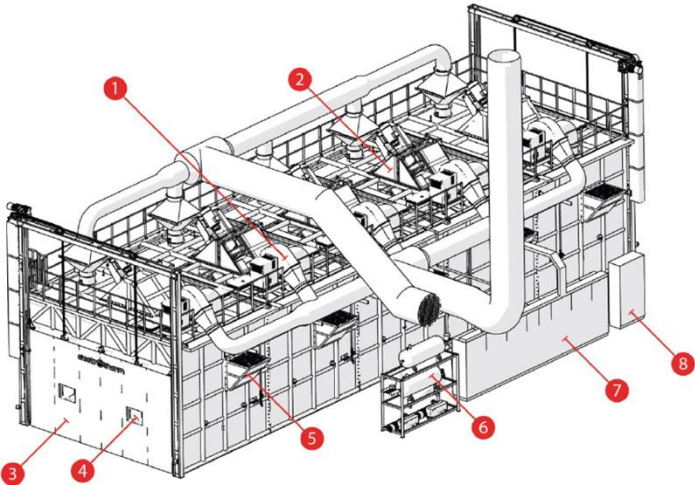
Curing



# Autoclave 3

## - Small

|                 |                                              |
|-----------------|----------------------------------------------|
| Machine         | Aúfóclawe                                    |
| Max Panel Size  | 1.9 x 1.3 m                                  |
| Max Height      | 1.2 m                                        |
| Max Temp        | 230°C                                        |
| Max Pressure    | 6.9 bar                                      |
| Max Tool Weight | 1.3 Tonnes (spread evenly)                   |
| Atmosphere      | Compressed air                               |
| Auxiliaries     | 24x K-type thermocouples<br>16x vacuum ports |



# Electrotherm Oven

|                |                                             |
|----------------|---------------------------------------------|
| Machine        | Oweń                                        |
| Max Panel Size | 20 x 5 m                                    |
| Max Height     | 3 m                                         |
| Max Temp       | 250°C (±5°C)                                |
| A†mosphere     | Air                                         |
| Auxiliaries    | 100 K-type thermocouples<br>32 vacuum ports |

