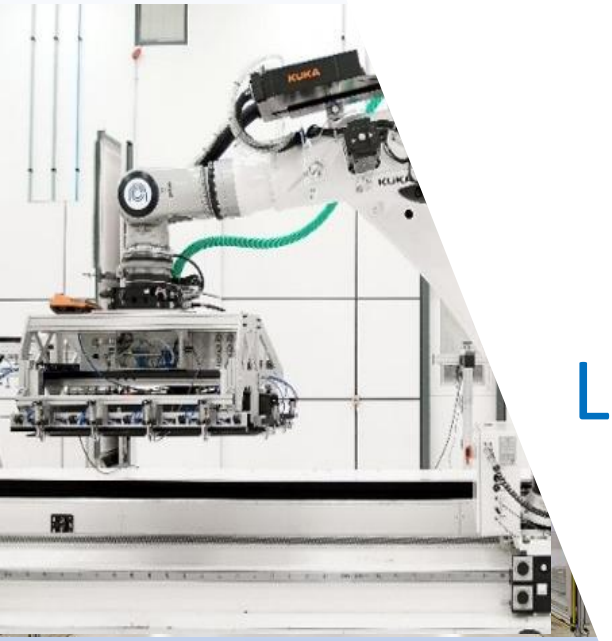
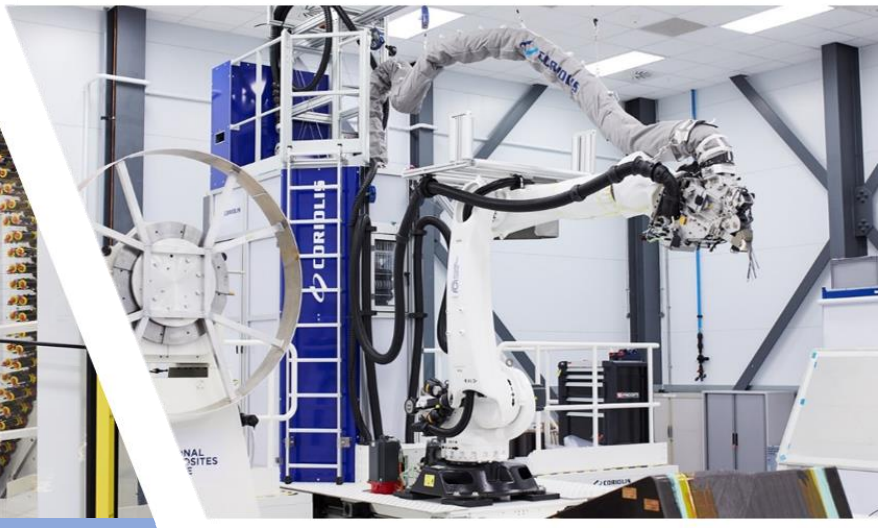
NATIONAL COMPOSITES CENTRE



Large Equipment Directory

nccuk.com



Progressing your Research and Development

The National Composites Centre (NCC) is an independent, open-access technology centre.

The 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

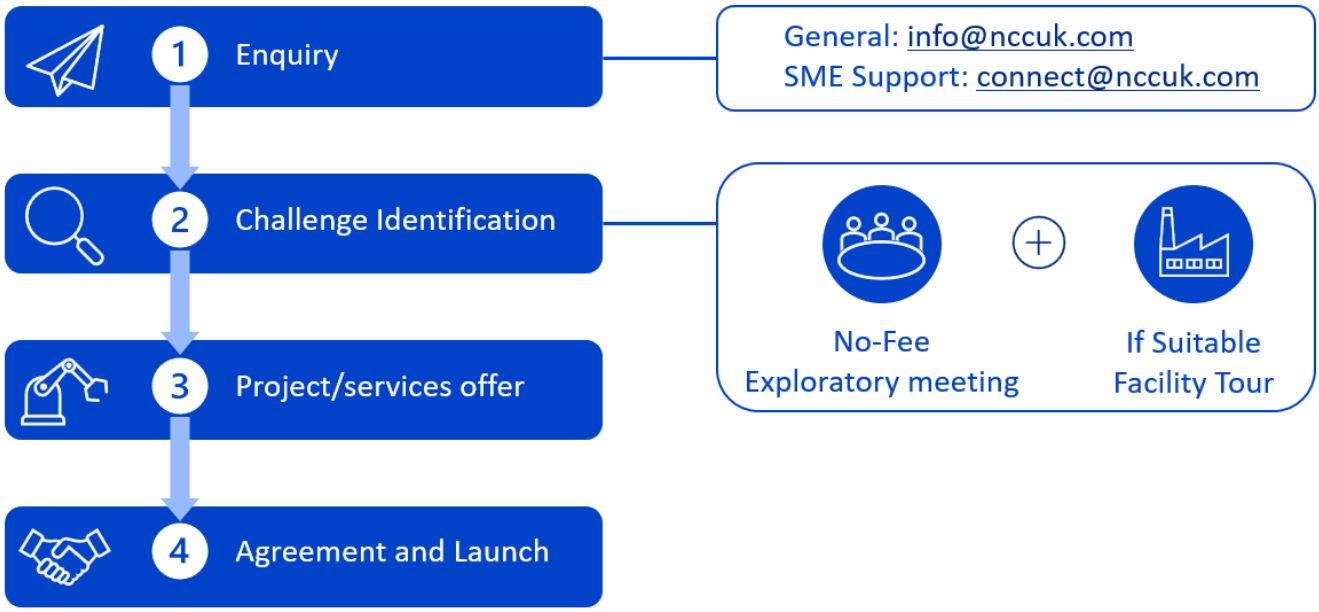
General: info@nccuk.com

SME Support: connect@nccuk.com

www.nccuk.com

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 the NCC or digitally.

This is offered at no fee to clients.

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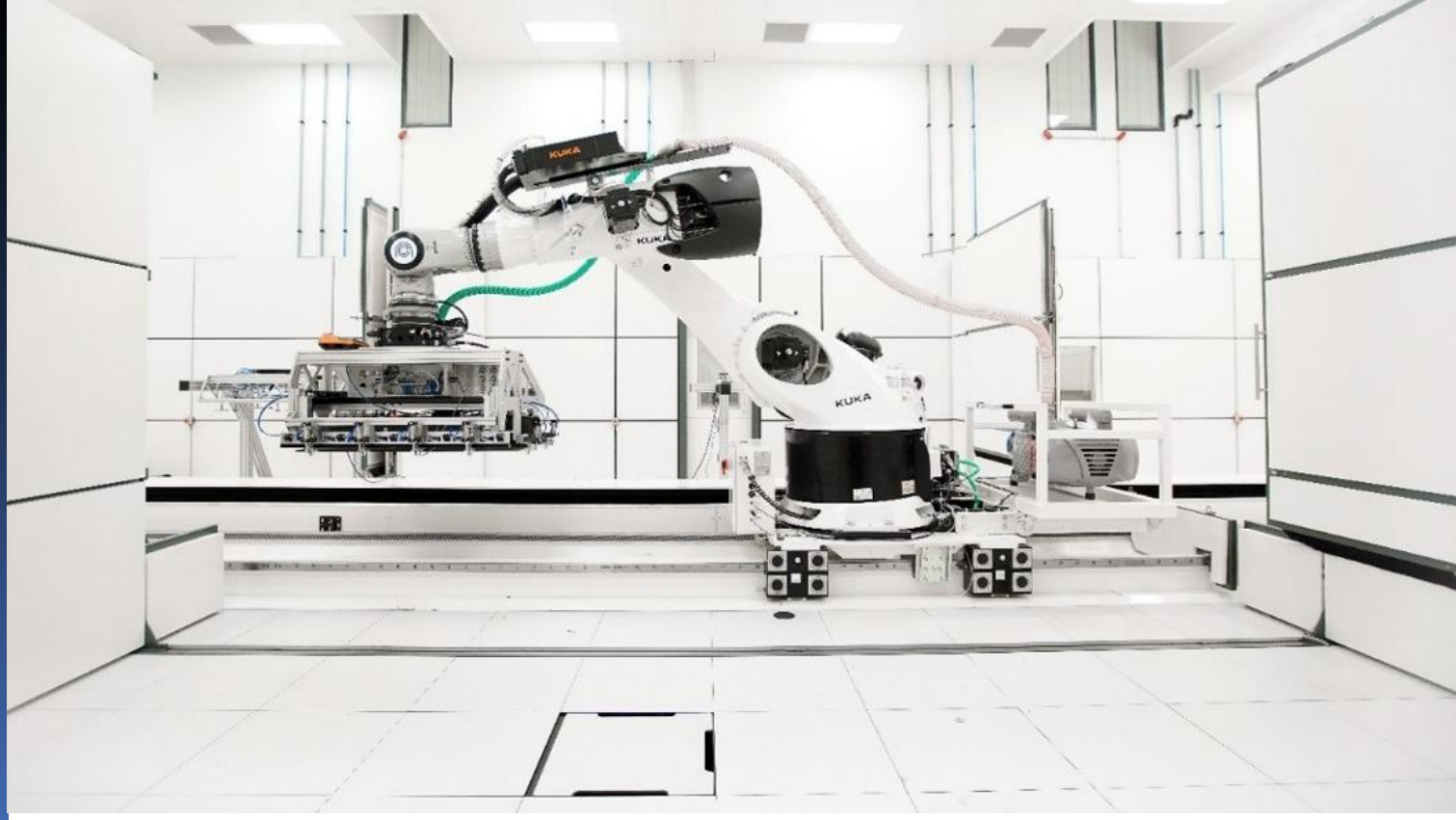
Tailored Fibre Placement - Tajima Machine

Machine	***Tailored Fibre Placement (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 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

Cygnet-Texkimp - Filament Winder

Machine	***Filament Winder***
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: - Tow-preg – up to 150N per tow - Dry – up to 10N per tow
Wet-out system	Spreader System and Coating Drum
Auxiliaries	Rotisserie oven IR lamp Extraction Shrink tape dispenser
Software	Cadfil

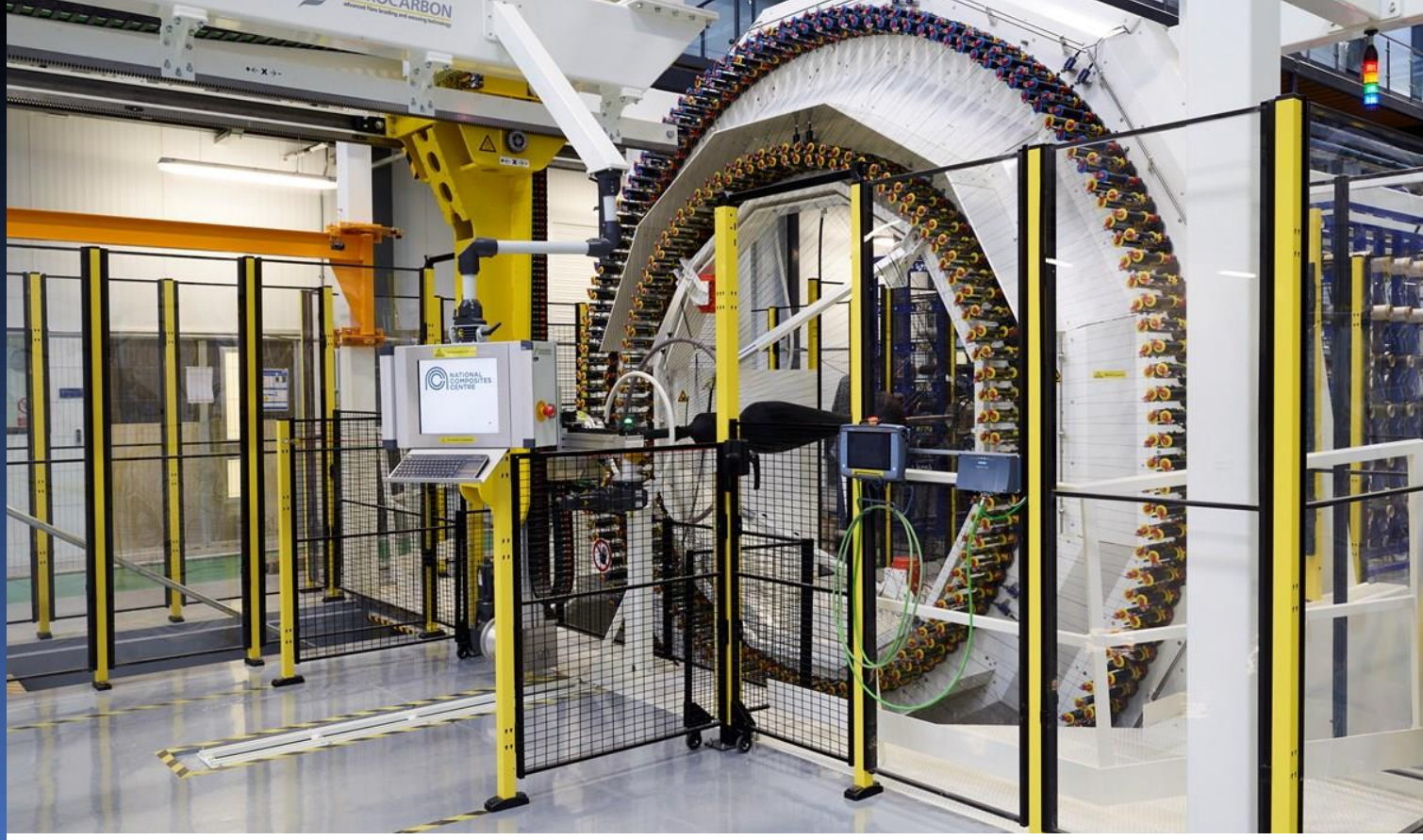
YouTube Demo – NCC's Filament Winder



Loop Technology – Automated Preform Cell

Machine	***Automated Preform Cell (APC)***
Robots	Kuka 300kg payload 2.5m reach 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 Ultrasonic trimming knife Contactless Metrology Fibre angle measurement & defect detection
Material Types	Dry Fibre Thermoset Prepreg Thermoplastic Prepreg
Application	Dry Fibre preform manufacture & inspection. End effector test and development

YouTube Demo – NCC's Automated Preforming Cell



Eurocarbon - Twin-Ring Axial Braider

Machine	***Overbraider***
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 Inner ring: 192 radial, 96 axial
Material	Glass, Carbon, Aramid, Basalt, Jute
Traverse System	Gantry
Auxiliaries	Extraction Bobbin winder Tow twister
Monitoring	In-process angle and coverage

YouTube Demo – NCC's Braider

Automated Fibre Placement - Coriolis C1

Machine	***Automated Fibre Placement (AFP) / Tensioned Fibre Placement (Filament Winding)***
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 Horizontal: 6 tonnes
Auxiliaries	Infrared heater Laser heater Humm3 flashlamp USK ultrasonic knife Renishaw probe
Applications	Complex 3D geometry

YouTube Demo – NCC's Coriolis AFP

AFP/ATL Electroimpact (EI)

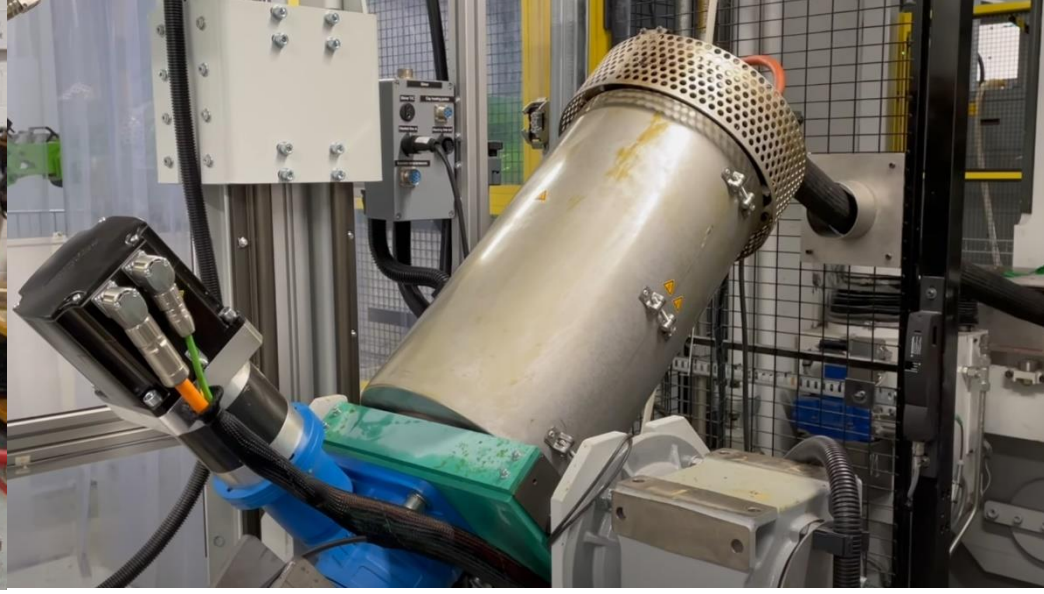
Machine	***Automated Fibre Placement (AFP) / Automated Tape Laying (ATL)***
Number of Tows	AFP: 8 ATL: 1
Tow Width	AFP: 12.7 mm ATL: 75 / 200 / 300 mm
Material	AFP: Thermoset tape, Dry fibre tape, Thermoplastic tape ATL: Thermoset tape
Max Working Area	4.5 x 11.8 m
Tool Positions	Vertical and Horizontal
Max Tool Weight	Vertical: 25 tonnes Horizontal: 9.07 tonnes
Auxiliaries	Infrared heater Humm3 flashlamp USK ultrasonic knife Renishaw probe Laser projection
Applications	Wing covers, Fuselage sections, Rocket stages

YouTube Demo – NCC's Hybrid AFP/ATL

Ultra-High-Rate Deposition (UHRD) Pilot Line

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

YouTube Demo – NCC's UHRD Cell



ISOJET HT-RTM

Machine	***High Temperature - Resin Transfer Moulding***
Capacity	15 litre (Premixed)
Flow rate	Up to 3.5litres/min
Max Pressure	15 bar
Max piston & line temp	300C
Heating rate	Up to 5C/min
Interfacing Equipment	PEI 1100T press Data acquisition: TC, pressure and flow rate
Application	High-Temperature RTM

YouTube Demo – NCC's HT-RTM

CI-JET HT-RTM

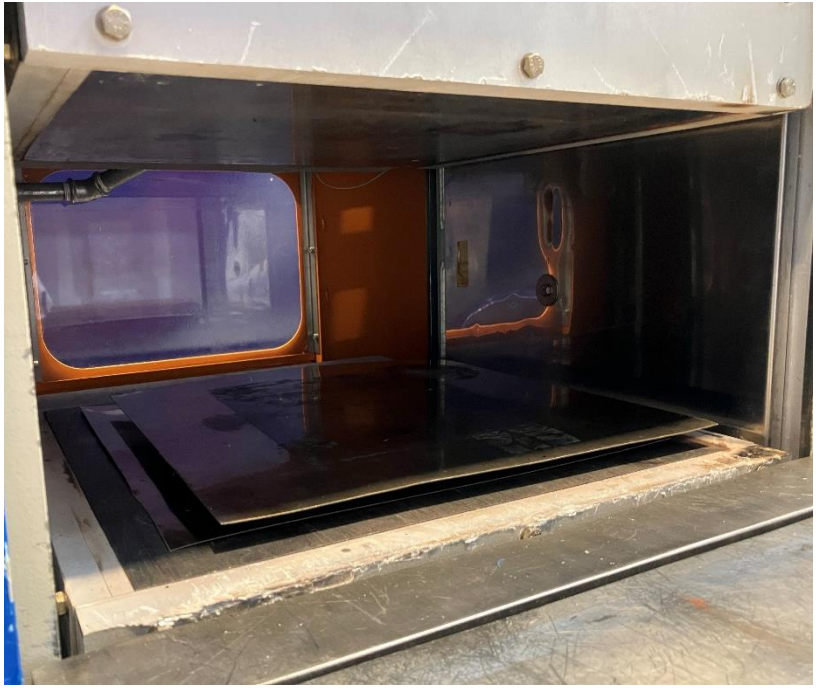
Machine	***High Temperature - Resin Transfer Moulding***
Capacity	25 litre (3 part possible)
Flow rate	Up to 10litres/min
Max Pressure	9 bar
Max piston & line temp	100C
Interfacing Equipment	PEI 1100T press Hare 100T Press Data acquisition: TC, pressure and flow rate
Application	High-Temperature RTM

Krauss Maffei HP-RTM

Machine	***High Pressure - Resin Transfer Moulding***
Flow rate	Up to 5.5kg/min
Max Pressure	220 bar
Max piston & line temp	120C
Interfacing Equipment	PEI 1100T press Data acquisition: TC, pressure and flow rate
Application	High-Pressure thermoset (Epoxy) or thermoplastic (PU) Complex operationally – Speak to NCC

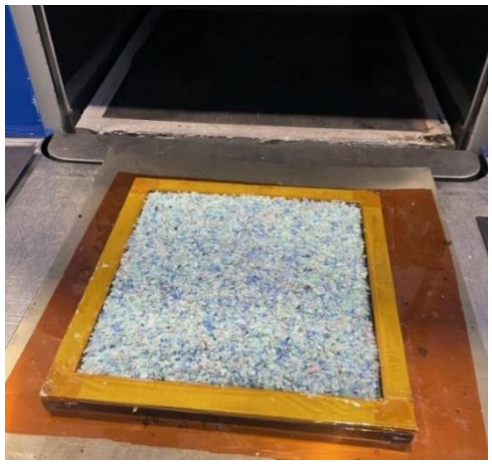
Composite Integration - LSRI

Machine	***Large Scale Resin Infusion***
Capacity	2 x 200 litre tanks
Flow rate	Single component – 4 L/min Two Component – 20 L/min
Max Pressure	Single component – 10 bar 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. Data acquisition: Flow rate, TC, resin pressure
Application	Supporting resin infusion (epoxy) and RTM processes of large-scale components



BIPEL Press 50T

Machine	***Smooth Platen - Heated Press***
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

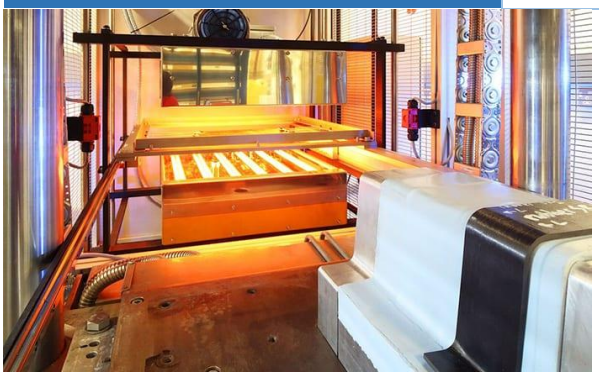


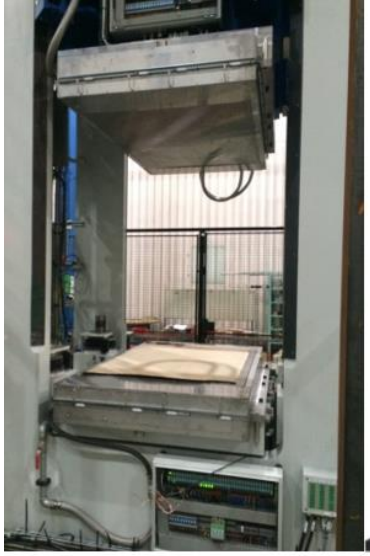
Aeroform Press 150T

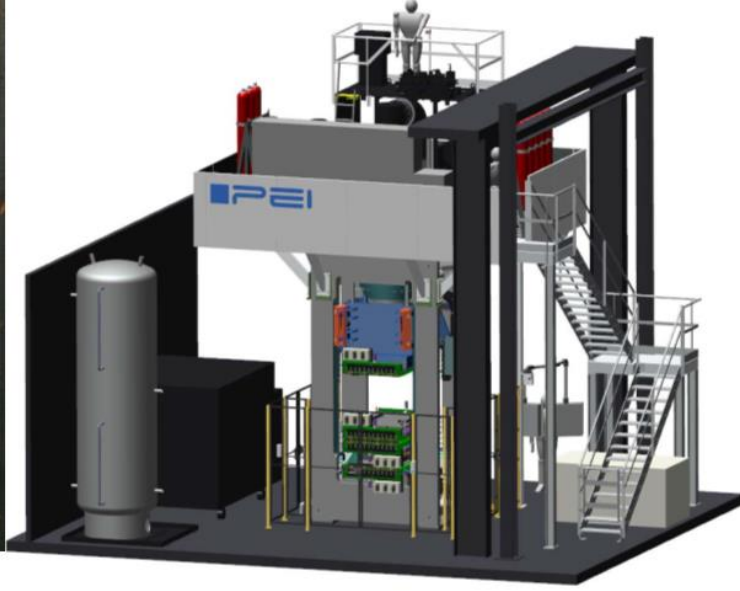
Machine	***Heated Press***
Max Tool area	1500x1200mm
Stroke	750mm (6 pistons)
Max Pressing Force	150 Tonnes
Max Platen Temp	400C
Additional info	Active platen cooling Compression moulding

Hare Press 100T

Machine	***Heated Press & Thermoplastic Stamping***
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 Compression moulding Medium Wave IR heater Shuttle transfer system







PEI Press 1100T

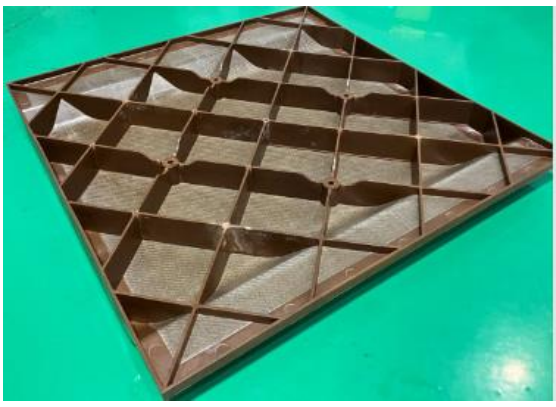
Machine	***Heated Press & Thermoplastic Stamping***
Max Tool area	1800x1300mm
Stroke	2200mm (Single piston)
Max Pressing Force	1100 Tonnes
Max Closing speed	800mm/s
Max Tool Weight	20T
Max Platen Temp	Primary platen oil: 200C Secondary platen electric: 400C
Additional info	Active cooling platen Fume Extraction RTM Capable Compression Moulding

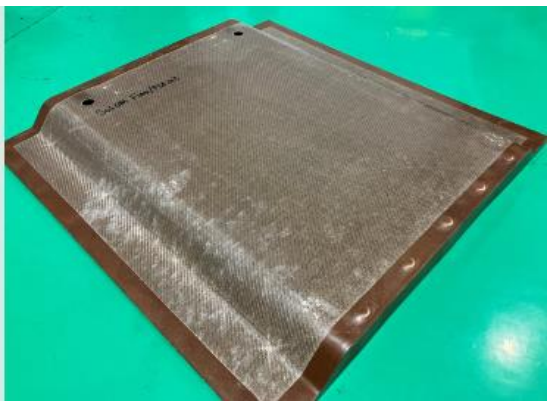
YouTube Demo – NCC's RTM using PEI Press

Engel Injection Overmoulding 1700T

Machine	***Injection moulder & Organosheet Overmoulder***
Max Tool area	1800x1400mm
Stroke	2400 mm
Max Pressing Force	1700 Tonnes
Max Tool Temperature	180C
Max Barrel Temperature	450C
Auxiliaries	Infrared heating oven Organosheet transfer robot Re-grinder Moulding compound dryer Moisture analyser

YouTube Demo – NCC's Overmoulder





Zerma Granulator

Machine	***Granulator (Auxiliary of overmoulder)***
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 (check with Paul S)
Material Type	Thermoset and Thermoplastic Fibre type? (check with Paul S)
Process Type	Batch
Output	Waste purge compound for overmoulding

Autoclave 1 - Large

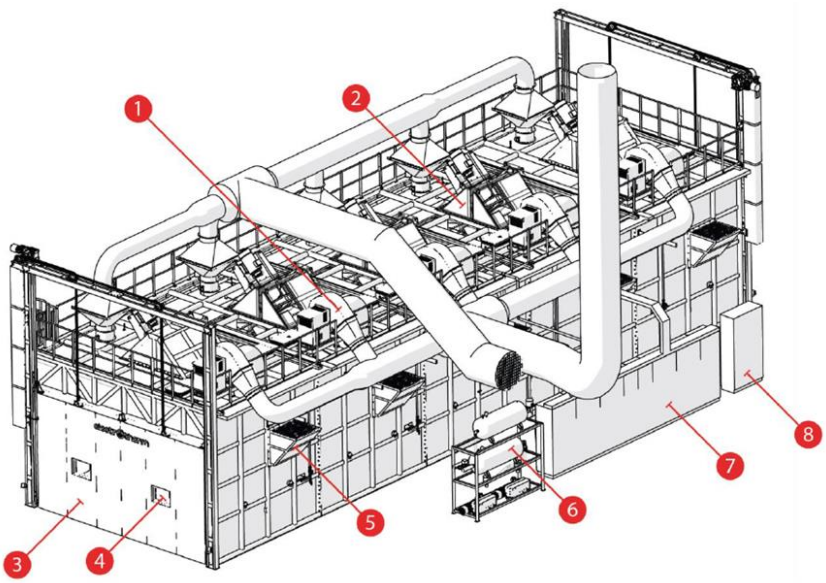
Machine	***Autoclave***
Max Panel Size	10 x 2.9 m
Max Height	2.3 m
Max Temp	405°C
Max Pressure	13 bar
Max Tool Weight	15 Tonnes (using the existing trolleys)
Atmosphere	Nitrogen
Auxiliaries	30x N-type thermocouples 4x vacuum ports

Autoclave 2 – Medium

Machine	***Autoclave***
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)
Atmosphere	Compressed air
Auxiliaries	12x K-type thermocouples 3x vacuum ports

Autoclave 3 - Small

Machine	***Autoclave***
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 16x vacuum ports



Electrotherm Oven

Machine	*Oven*
Max Panel Size	20 x 5 m
Max Height	3 m
Max Temp	250°C (±5°C)
Atmosphere	Air
Auxiliaries	100 K-type thermocouples 32 vacuum ports

GET IN TOUCH

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