ncc
innovating
for industry

Large equipment directory

nccuk.com

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

General: info@nccuk.com

SME Support: connect@nccuk.com

www.nccuk.com

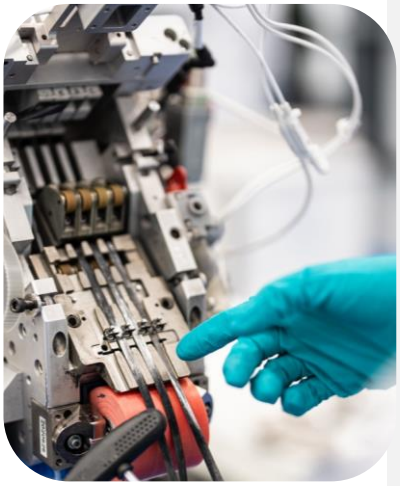
How to work with us

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

1. Enquiry — General: info@nccuk.com; SME Support: connect@nccuk.com
2. Challenge identification — No-fee exploratory meeting + If suitable facility tour
3. Project/services offer
4. Agreement and launch

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

Contents



Fibre depositions

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

Fibre depositions

YouTube Demo – NCC's Filament Winder

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

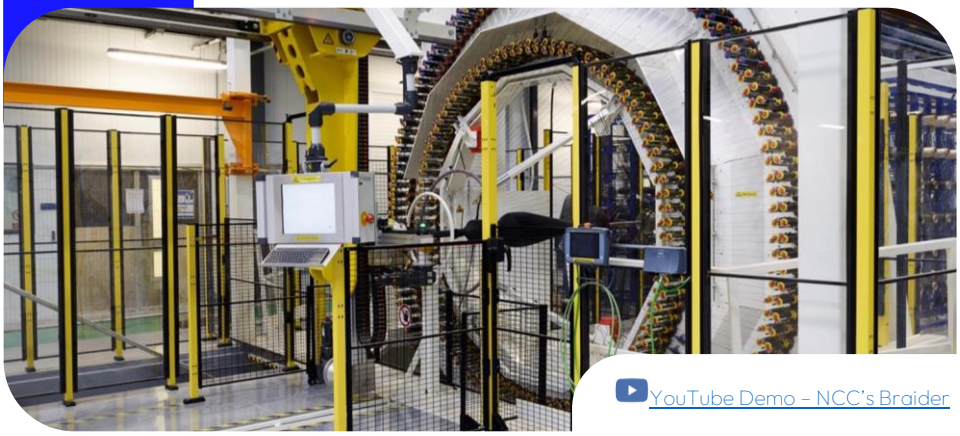
Fibre depositions

YouTube Demo – NCC's Automated Preforming Cell

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

Fibre depositions

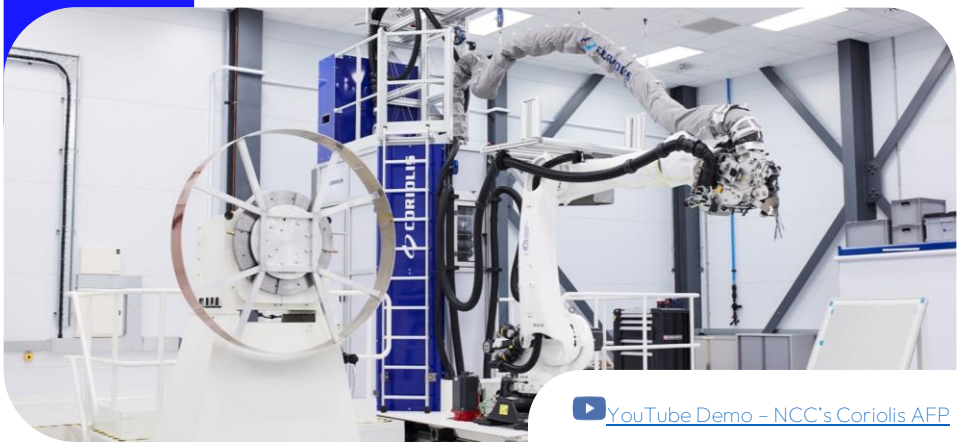


YouTube Demo – NCC's Braider

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

Fibre depositions



YouTube Demo – NCC's Coriolis AFP

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

Fibre depositions

YouTube Demo – NCC's Hybrid AFP/ATL

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

Fibre depositions

YouTube Demo – NCC's UHRD Cell

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

Resin injection

YouTube Demo – NCC's HT-RTM

ISOJET HT-RTM

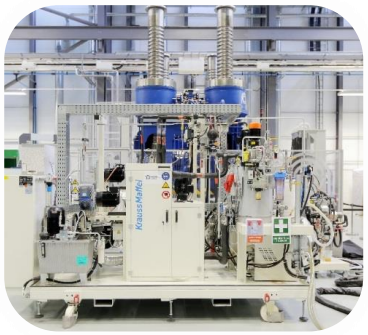
Machine	High Temperature - Resin Transfer Moulding
Capacity	15 litre (Premixed)
Flow rate	Up to 3.5litres/min
Max Pressure	30 bar
Max piston & line temp	300C
Heating rate	Up to 5C/min
Interfacing Equipment	PEI 1100T press Data acquisition: TC, pressure and flow rate
Application	High-Temperature RTM

Resin injection

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

Resin injection



Krauss Maffei HP-RTM

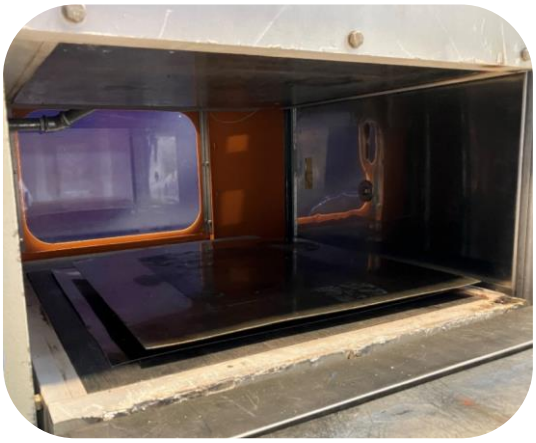
Machine	High Pressure - Resin Transfer Moulding
Flow rate	Up to 5.5kg/min
Max Pressure	220 bar
Max piston & line temp	120C
Interfacing Equipment	PEI 1100T press Data acquisition: TC, pressure and flow rate
Application	High-Pressure thermoset (Epoxy) or thermoplastic (PU)

Resin injection

Composite Integration - LSRI

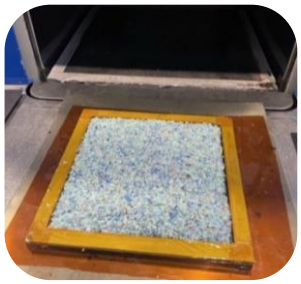
Machine	Large Scale Resin Infusion
Capacity	2 x 200 litre tanks
Flow rate	Single component – 4 L/min Two Component – 20 L/min
Max Pressure	Single component – 10 bar Two Component – 20 bar
Max tank & line temp	150°C
Interfacing Equipment	Any compatible infusion or RTM mould. In-mould pressure sensors can drive the process. Data acquisition: Flow rate, TC, resin pressure
Application	Supporting resin infusion (epoxy) and RTM processes of large-scale components

Mouldings



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



Mouldings

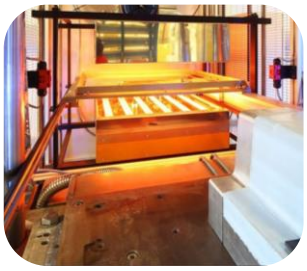
Aeroform Press 150T

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

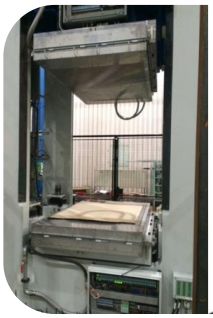
Mouldings

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



Mouldings



YouTube Demo – NCC's RTM using PEI Press

PEI Press 1100T

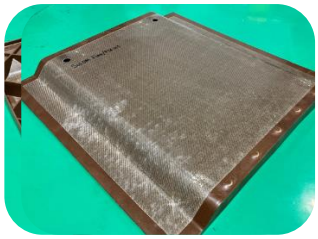
Machine	Heated Press & Thermoplastic Stamping
Max Tool area	1800x1300mm
Stroke	2200mm (Single piston)
Max Pressing Force	1100 Tonnes
Max Closing speed	800mm/s
Max Tool Weight	20T
Max Platen Temp	Primary platen oil: 200C Secondary platen electric: 400C
Additional info	Active cooling platen (10C/min) Fume Extraction RTM Capable Compression Moulding

Mouldings

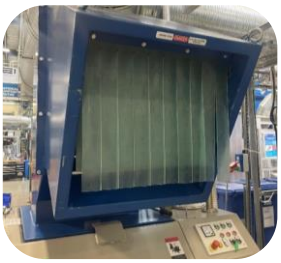
YouTube Demo – NCC's Overmoulder

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



Mouldings



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
Material Type	Thermoset and Thermoplastic Various fibre types
Process Type	Batch
Output	Waste purge compound for overmoulding

Curing

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

Curing

Autoclave 2 – Medium

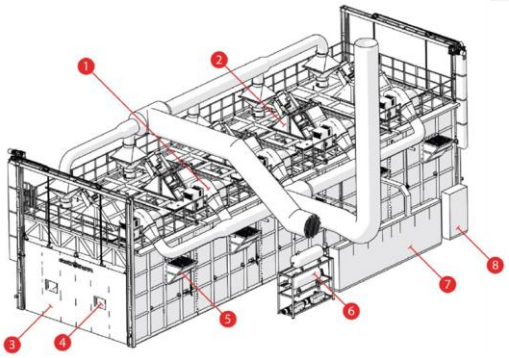
Machine	Autoclave
Max Panel Size	3 x 2 m
Max Height	1.1 m
Max Temp	205°C
Max Pressure	6.9 bar
Max Tool Weight	2 Tonnes (spread evenly)
Atmosphere	Compressed air
Auxiliaries	12x K-type thermocouples 3x vacuum ports

Curing

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

Curing



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

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