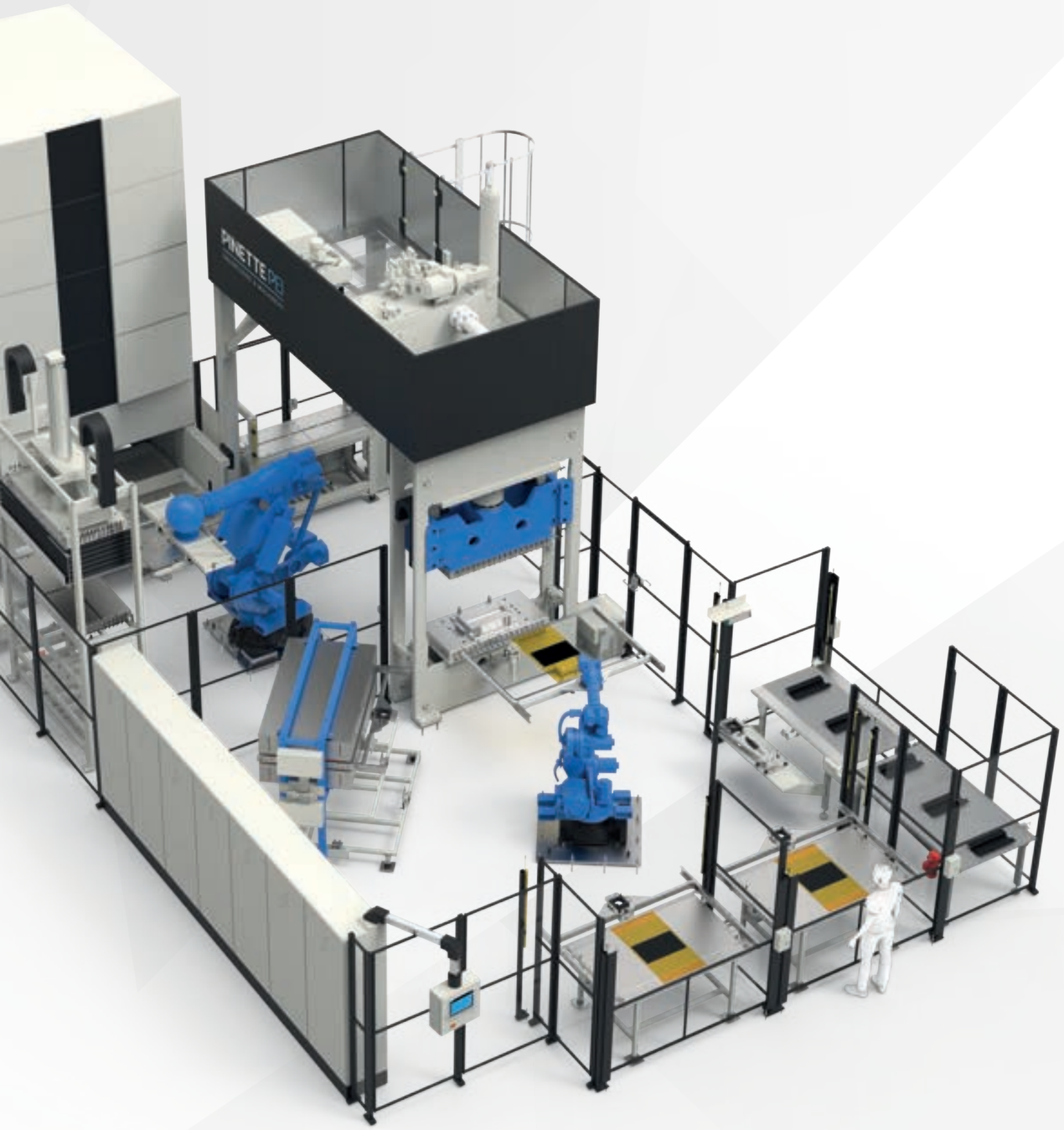
AERONAUTIC INDUSTRY

Aeronautic Industry Solutions

Composite & Metal Forming Solutions

PINETTE PEI

ENGINEERING & MACHINERY



Aeronautic Industry Solutions

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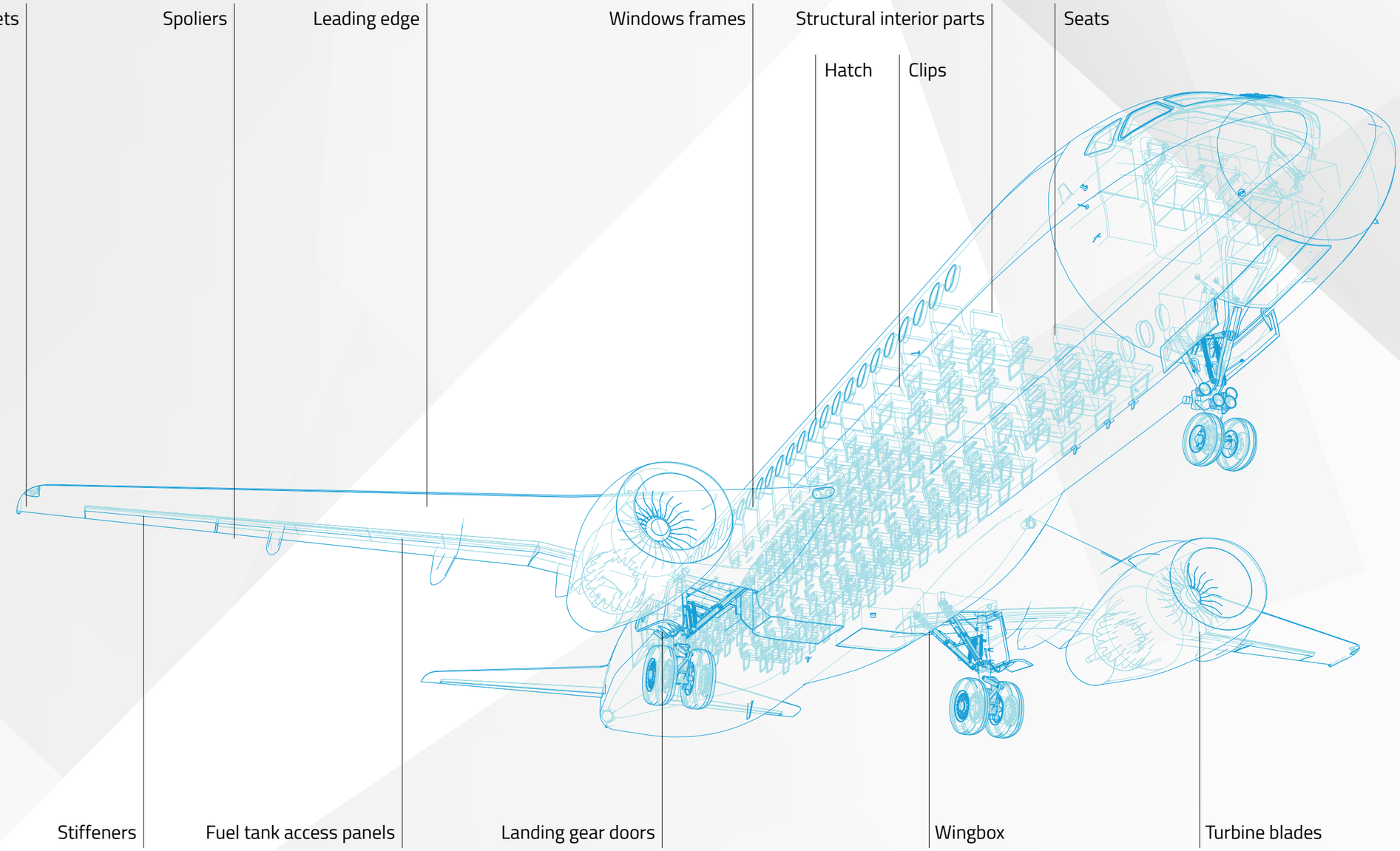
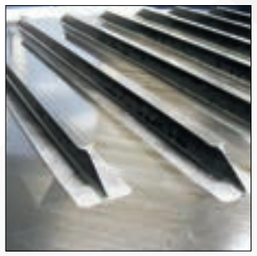


Hatch

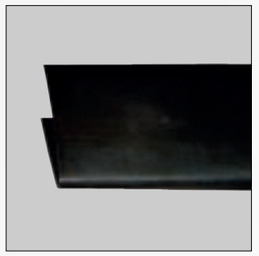


Stiffeners

Fuel tank access panels

Windows frame

Clips

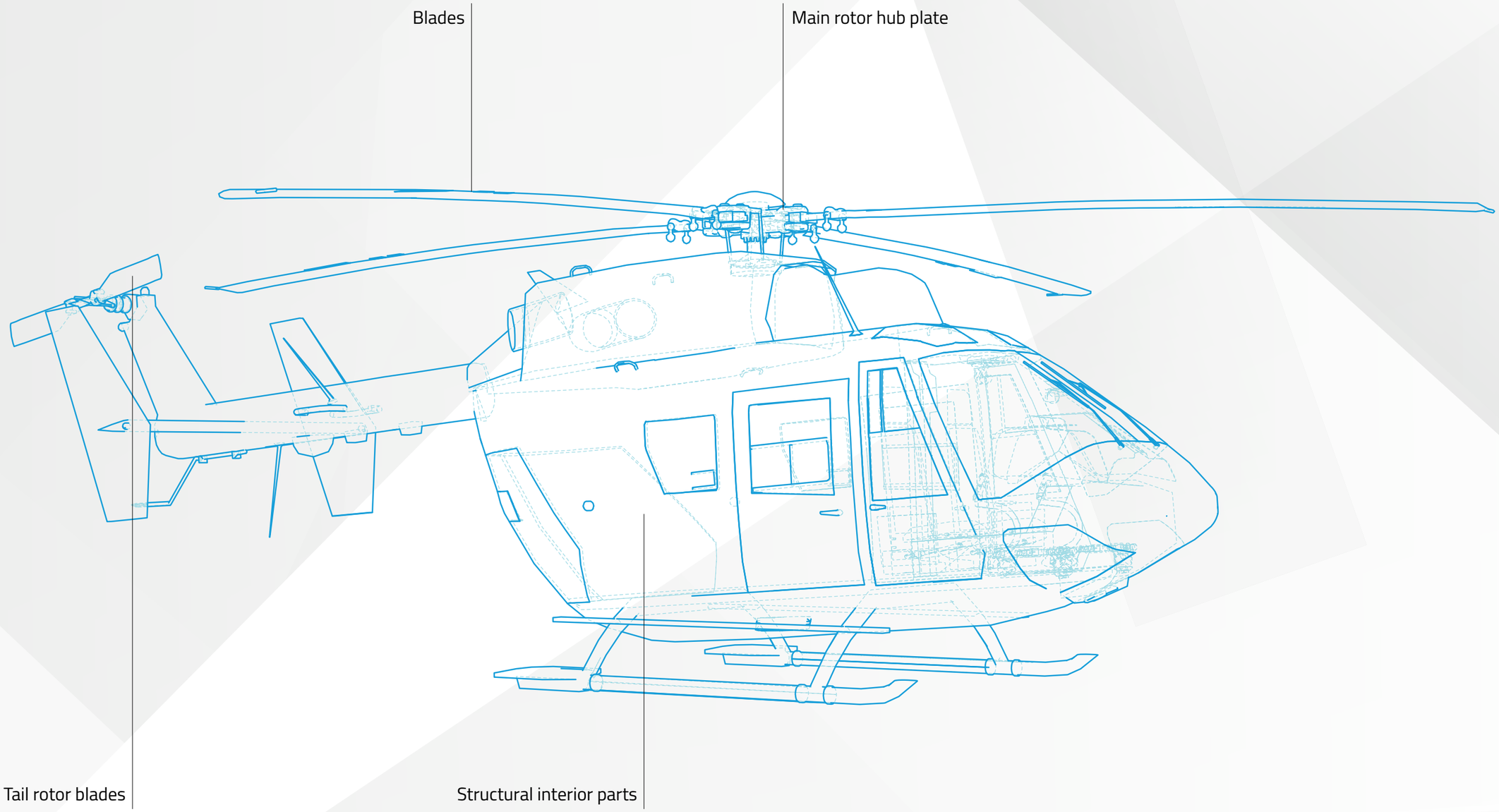


Leading edge

Winglets

Turbofan blade

Aeronautic Industry Solutions



Blades

Main rotor hub plate

Tail rotor blades

Structural interior parts

Consolidation 450°C
Electric Heating

Benefits

- High temperature
- Accurate temperature control
- Homogeneous temperature distribution
- Higher performance material: PEEK

Materials

- PEEK
- PEKK
- PPS
- PEI
- etc.

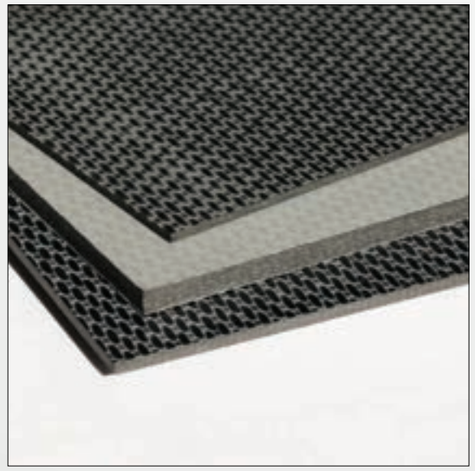
Technical features

- Platen temperature: up to 450°C
- Temperature uniformity: up to ±5°C at 400°C
- Electric heated platens
- Heating rate: from 1 to 20°C/min (on average)
- Cooling rate: from 1 to 15°C/min (on average)
- Cooling system: air and water
- Coordinated pressure & temperature control

Parts

- Fiber reinforced thermoplastic laminate

Process



Fiber reinforced thermoplastic laminate

Laboratory press

395° RTL process

Hot Transfert Fluid Heated Platens

Benefits

- High temperature
- Accurate temperature control
- Great homogeneous temperature distribution
- Faster: heating/cooling rate up to 20°C/min
- Higher performance material: PEEK
- Better production quality: homogeneous crystallisation
- Bigger: capable of being scaled up to very large platen sizes
- Flexible: available as un upgrade for existing presses

Materials

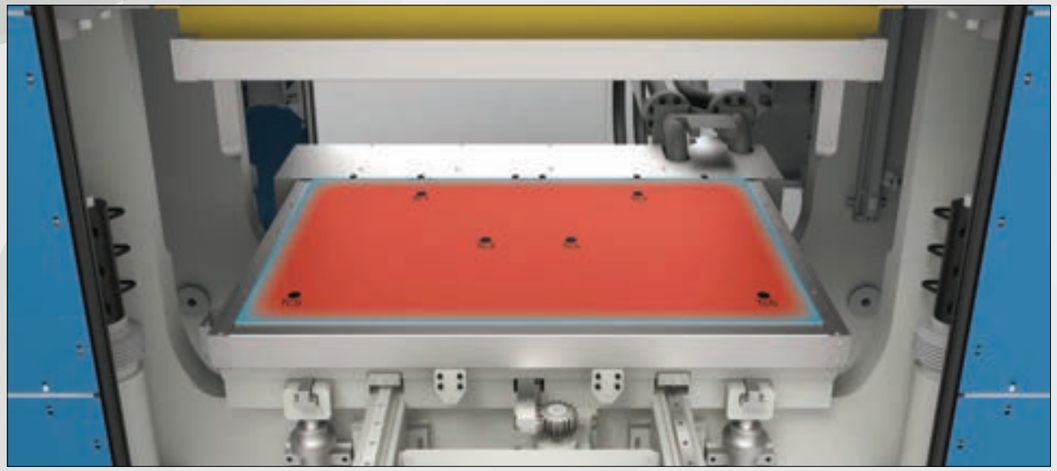
- PEEK
- PEKK
- PPS
- PEI
- etc.

Technical features

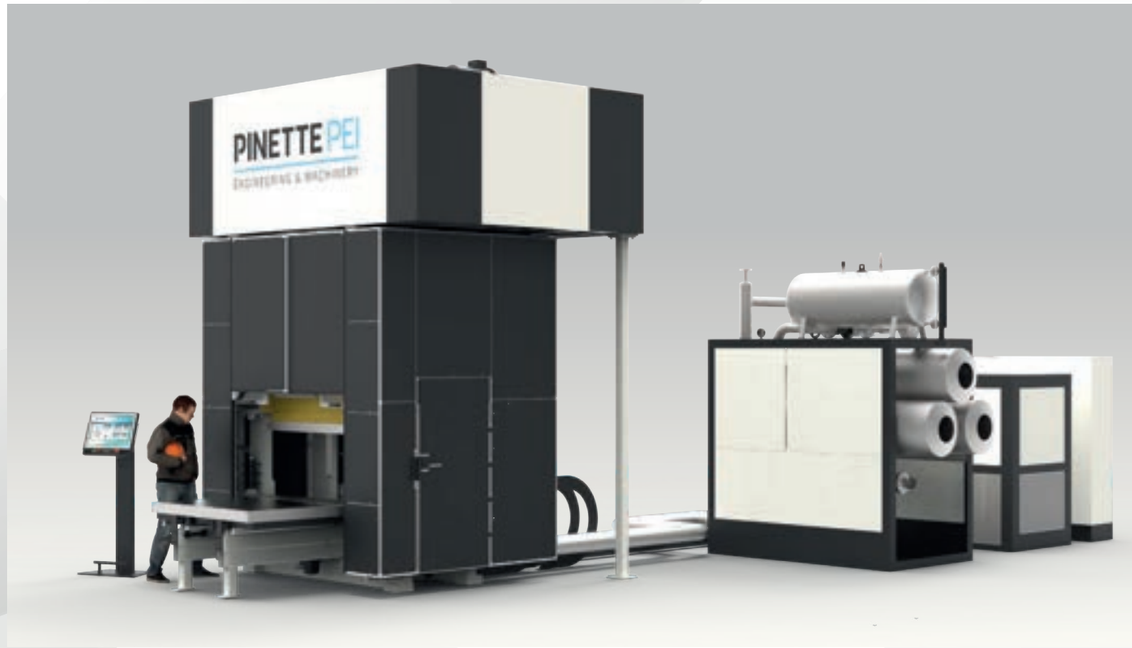
- Heat transfer fluid temperature: 395°C
- Platen temperature: up to 395°C
- Temperature uniformity: up to ±1°C
- Heat transfer fluid heated platens
- Heating/cooling rate: from 1 to 20°C/min (scalable)

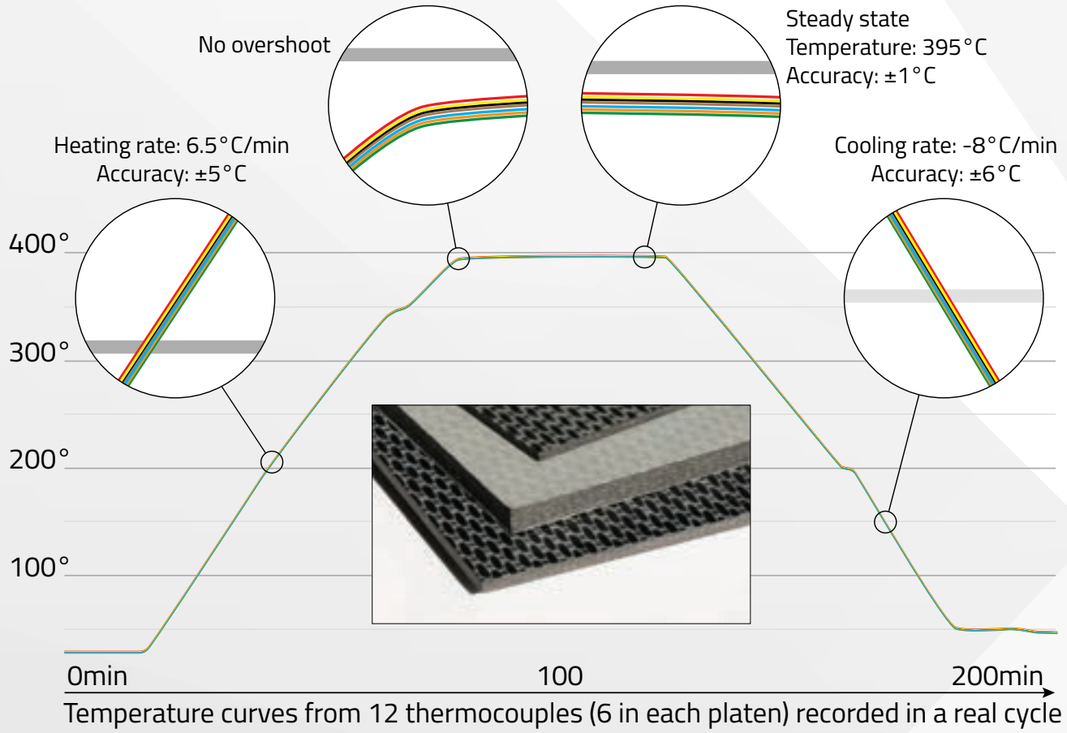
Parts

- Fiber reinforced thermoplastic laminate



Process





Temperature curves from 12 thermocouples (6 in each platen) recorded in a real cycle

Preforming
3D net-shape preforms

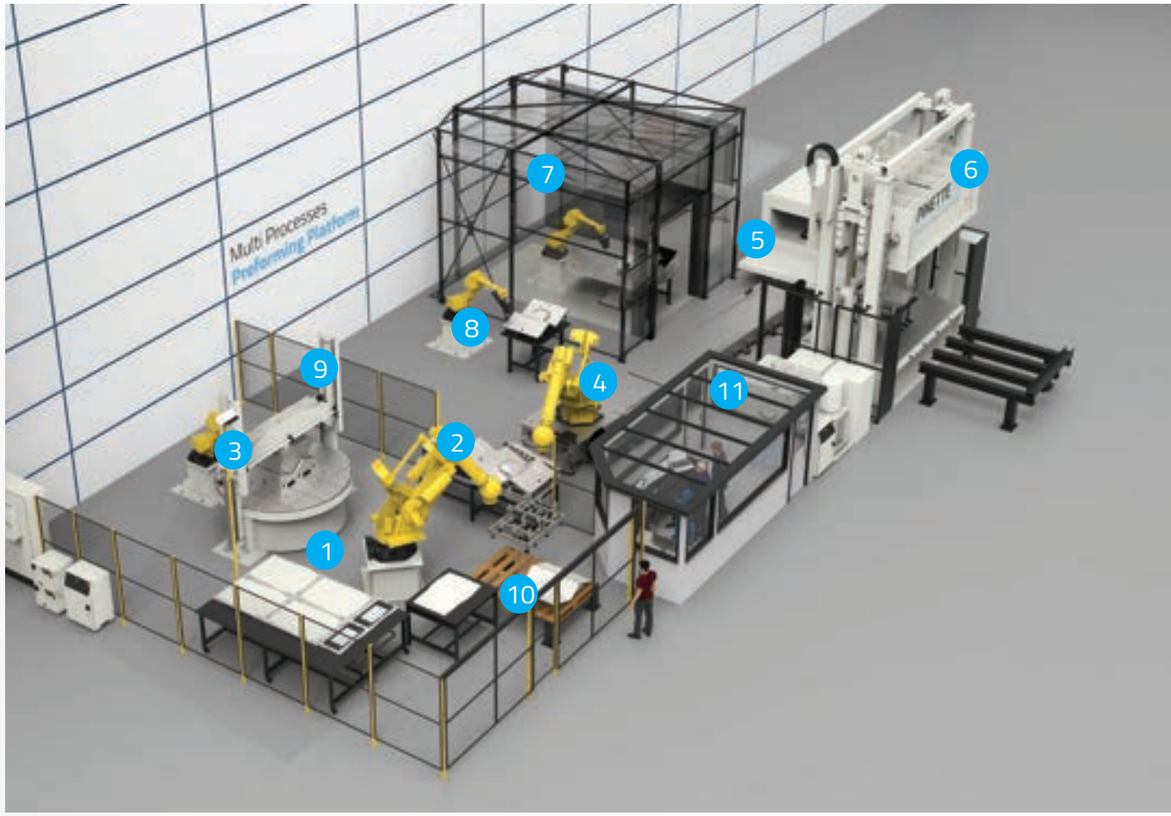
Benefits

- Repeatability
- Accuracy
- Speed/production rate
- Net-shape 3D preform
- Flexibility
- Traceability
- Compact footprint
- Custom solution
- Turnkey line

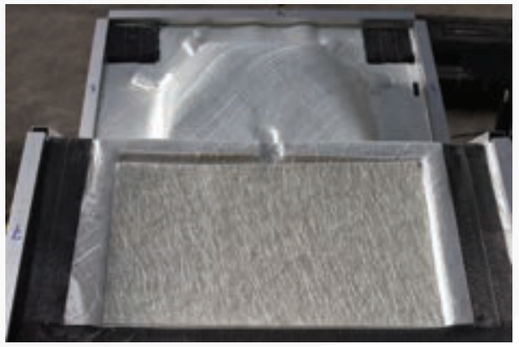
Materials

- Thermoset & thermoplastic prepreg, dry fiber
- Weaving: UD, non-crimp fabric, woven, preconsolidated blank, mat
- Fibre: carbon, glass, aramid, natural
- Form: fabric rolls, blank, tape, kits

Process



1. Material in the loading station
2. Pick and place with custom gripper
3. Accuracy control (Material position adjustment)
4. Handling robot on 7th axis
5. IR oven
6. Hot or cold forming press with SMED
7. AFP (automated fibre placement) cell
8. Fibre projection
9. Automated trimming
10. Net-shape preform unloading
11. Quality data recording



Multi-material, multi-structure net-shape 3D preforme

QSP®

TP preforming, stamping and overmolding
From tape to final part in one minute

Benefits

- Multi-material, multi-thickness
- CFRP
- One minute cycle time
- Net shape design
- Ready for direct assembly
- Robustness and repeatability
- High volume capacity
- Competitive cost

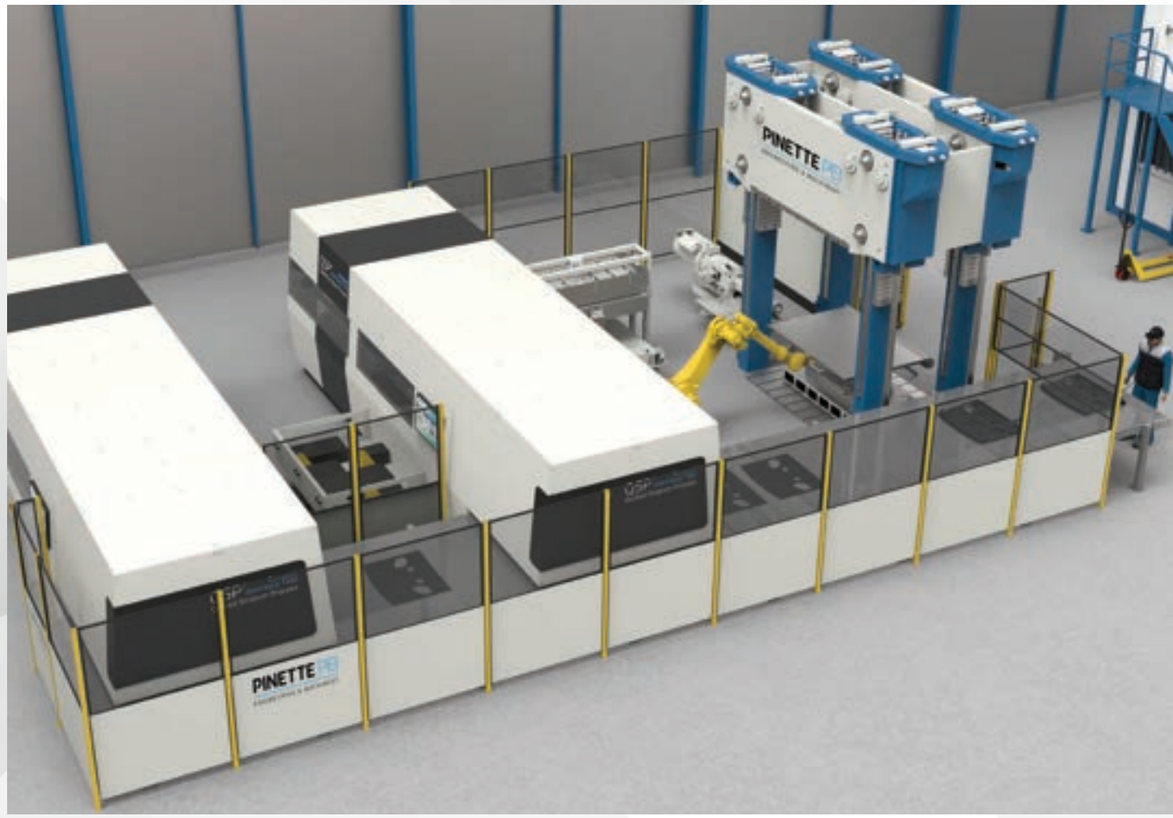
Parts

- Structural parts
- Suspension element
- Seat structure

Multi-thickness demonstrator
(optimised for 0% scrap)

Multilayer back seat

Process



Windows frames

Assembly in mold
“one-shot”

HDF
Hot Drape Forming

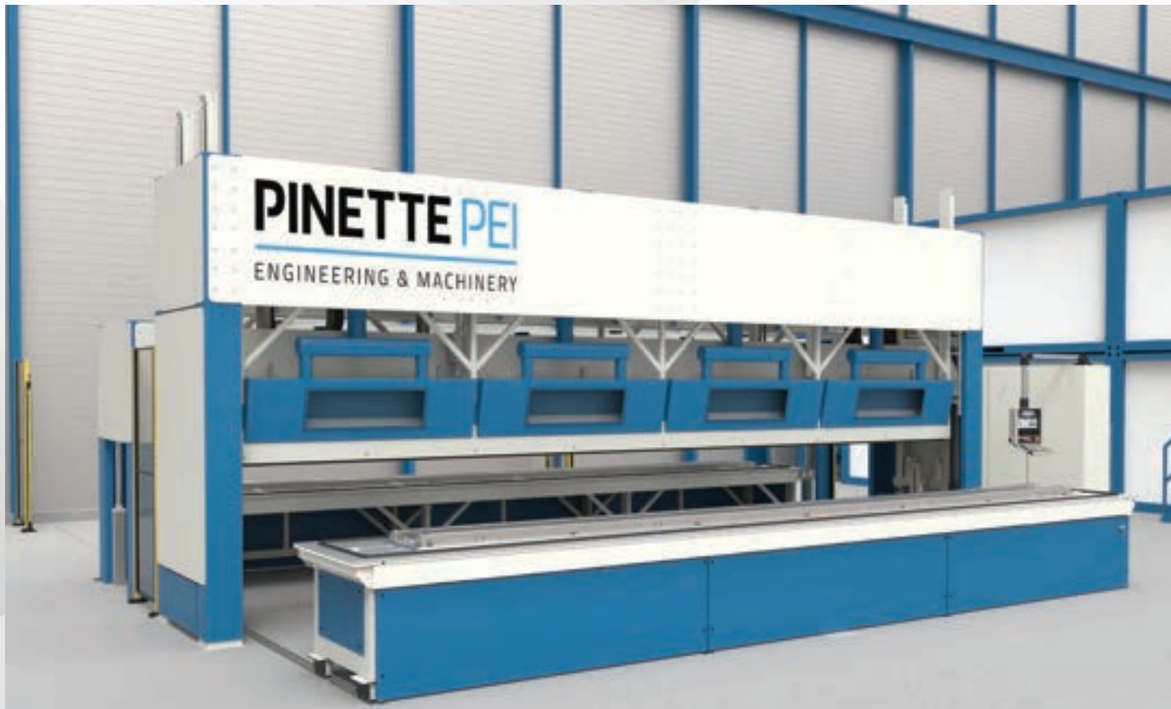
Benefits

- Single or double diaphragm
- Temperature 30°C to 180°C
- Length: up to 20m
- Wrinkle free forming - thickness up to 30 mm
- Up and down stroke controlled by servomotors for perfect control
- Multizone Temperature control and heating regulation for simultaneous multiple densities preforming
- Preform tool identification and position control
- Adapted for class 8 cleanrooms
- Increased production speed
- Reduced labor costs
- Light curtain for safety protection
- Quick Locking System for accurate diaphragm and material positioning
- Fully customizable equipment

Materials

- Fibers : Glass, carbon
- Resins : Thermoset
- Binder : Thermoplastic, Thermoset

Process

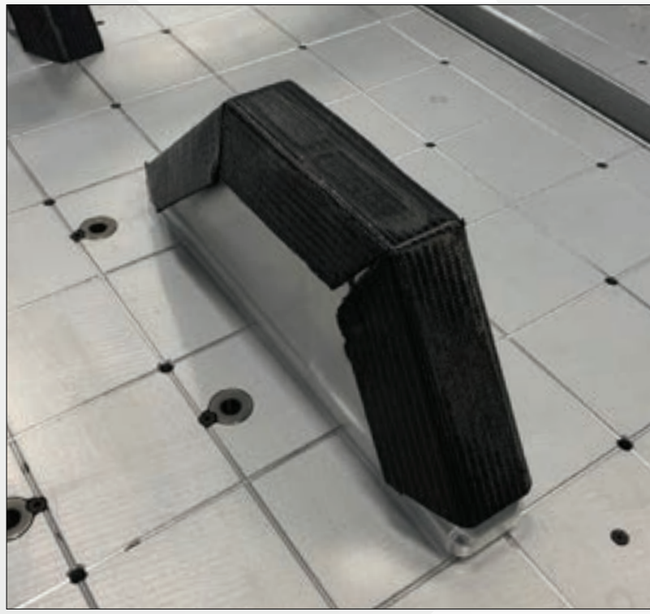


Applications

- Stiffeners
- Spars
- Ribs
- Struts
- Braces

Options

- HMI
- Data acquisition
- Fully moveable multiple vacuum tables
- Vacuum table
- Separate tools heating bank for increased quality and shorter production times
- Controlled heating and cooling rates



Spar preform

C-RTM

JEC GROUP WINNER OF INNOVATION AWARD 2017

C-RTM Process performance

- Thermoplastic & Thermoset resin compatible
- Net-shape
- Two-minute cycle time for large parts
- Repeatability
- Fully automated process
- Inline monitoring
- 100% raw material usage
- High Pressure (HP) injection compatible

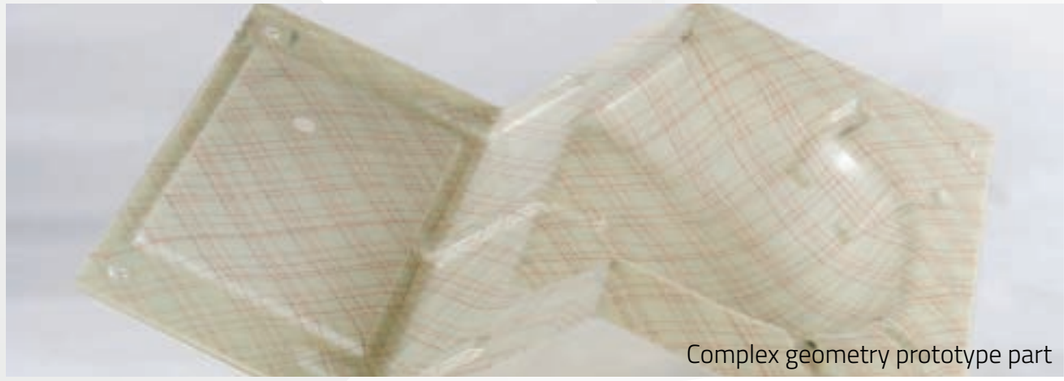
Process

Product performance

- Fibre volume: up to 60%
- Porosity <2%
- No fibre distortion from process
- Yields stable part geometry

Materials

- Fibers: glass, carbon
- Resins: thermoset and thermoplastics



Complex geometry prototype part

RTM Press

Benefits

- Repeatability
- Accuracy
- Reliability
- Traceability
- Custom solution
- Turnkey line

Materials

- Fibers : Carbon, glass, etc.
- Resins : Thermoset, Thermoplastic

Options

- Thermoset or thermoplastics
- Automated shuttle transfer system
- 6 axis robots
- Fully automated production line

Product features

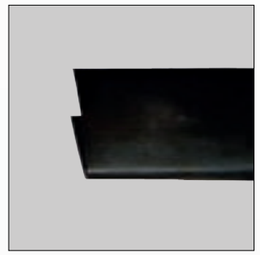
Presses and lines

- Up to 10,000kN
- Platen size up to 10000x2000mm
- Fully programmable
- Injection unit connected to the press
- Shuttle or swing tables
- Ergonomic positioning

Heating cycles

- Heat transfer fluid or electric heating
- Heated and cooled platens or mold
- Up to 300°C
- Temperature accuracy ±3°C
- Programmable temperature/pressure
- Fully programmable heating/cooling rate
- Process parameter monitoring and recording

Process



Leading Edge

Turbine Blades

Stamp forming
TP Production line

Benefits

- High production rate
- Repeatability
- Accuracy
- Traceability
- Custom solution
- Turnkey line
- Fully programmable

Materials

- PPS
- PEI
- PEKK
- PEEK
- PEAK
- LMPEAK

Product features

Stamping press
- Heated platens up to 450°C (for optionnal consolidation)
- Temperature accuracy ±5°C
- Infrared oven up to 450°C
- Up to 30,000kN
- Pressure & temperature control
- Process parameter monitoring and recording

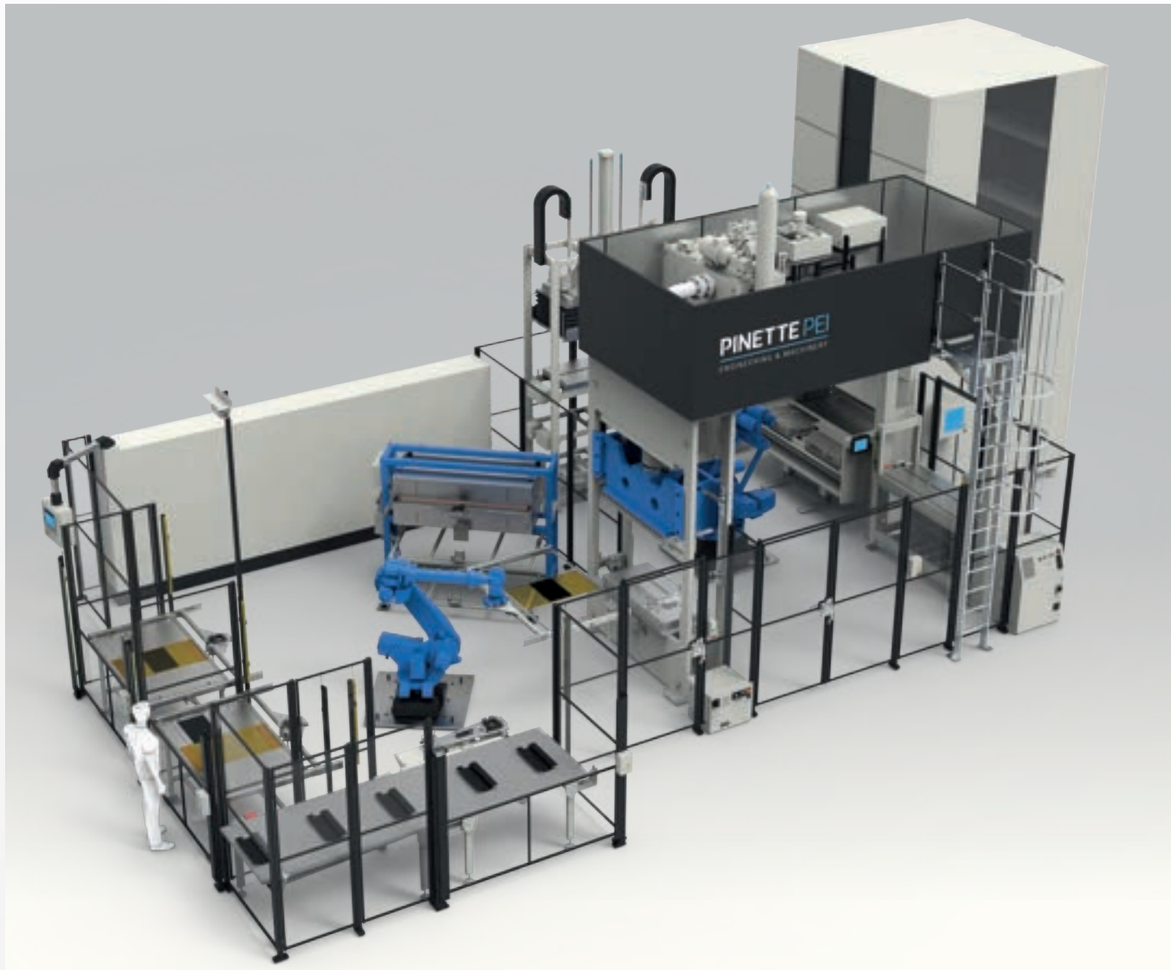
Infrared Oven
- Continuously controlled temperature of blank surface
- Accurate temperature regulation

Options

Automatic Loading / Unloading
- Assistance to blank positioning system
- Blank or film tension system
- Fast transfer by gantry or multi-axis robot

Automatic Tool Change
- Fast transfer by multi axis robot
- Tool preheating
- Tool storage rack

Process



Fuel Tank Access Panel

Clip

Composite Curing

Benefits

- Repeatability
- Accuracy
- Reliability
- Traceability
- Custom solution
- Turnkey line

Materials

- Fibers: carbon, glass
- Themoset resins
- Sandwich core metallic insert


Helicopter Blade

Process

Product features

- Platen size: up to 15 m long
- High level of automation
- Heated and cooled platens
- Heat transfer fluid heating and cooling system
- Temperature: up to 180°C
- Capacity: from 1.5T to 100T
- High pressure: from 0.5 to 8 bars
- Optimised ergonomics
- Press with tilting shuttle table for easy loading/unloading and cleaning outside of the press
- Data acquisition system for production traceability
- Turnkey system: press, heating and cooling system, tools

Honeycomb Forming

Benefits

- Repeatability
- Accuracy
- Reliability
- Traceability
- Custom solution
- Turnkey line

Options

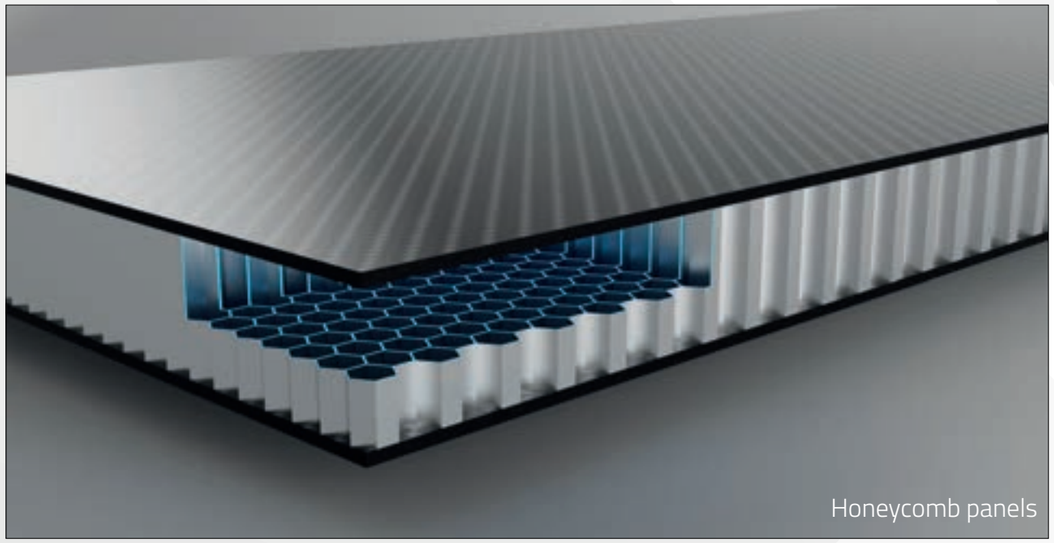
- Loading/unloading table

Materials

- Fibers: carbon, glass
- Thermoset resins
- Core: Nomex, aluminium

Parts

- Interior structural parts



Honeycomb panels

Process

Product features

- Heated platens up to 300°C
- Thermal oil heated platens
- Temperature homogeneity: ± 2°C
- Multi daylights

Laboratory R&D Press

Standard Laboratory Presses

Product Features

- From 100 to 1000kN
- Platen size: from 300x300mm to 600x600mm
- Max temperature: 250 or 450°C
- Heated and cooled platens

Options

- Low force capable
- Force sensor
- Thermoplastic stamping press
- Infra red preheating oven
- Vacuum system
- RTM
- Process parameter monitoring and recording

- Range available in various platen sizes, forces and temperatures
- Bespoke design also available

Examples of custom designed R&D presses

Stamping & Consolidation

Product features

- Electrically heated platens
- Up to 450°C
- Cooling to 60°C
- Temperature accuracy ± 5°C
- Platen size: 600 X 600 mm
- Infrared oven
- 2 axis manipulator

Options

- Separate tool temperature control

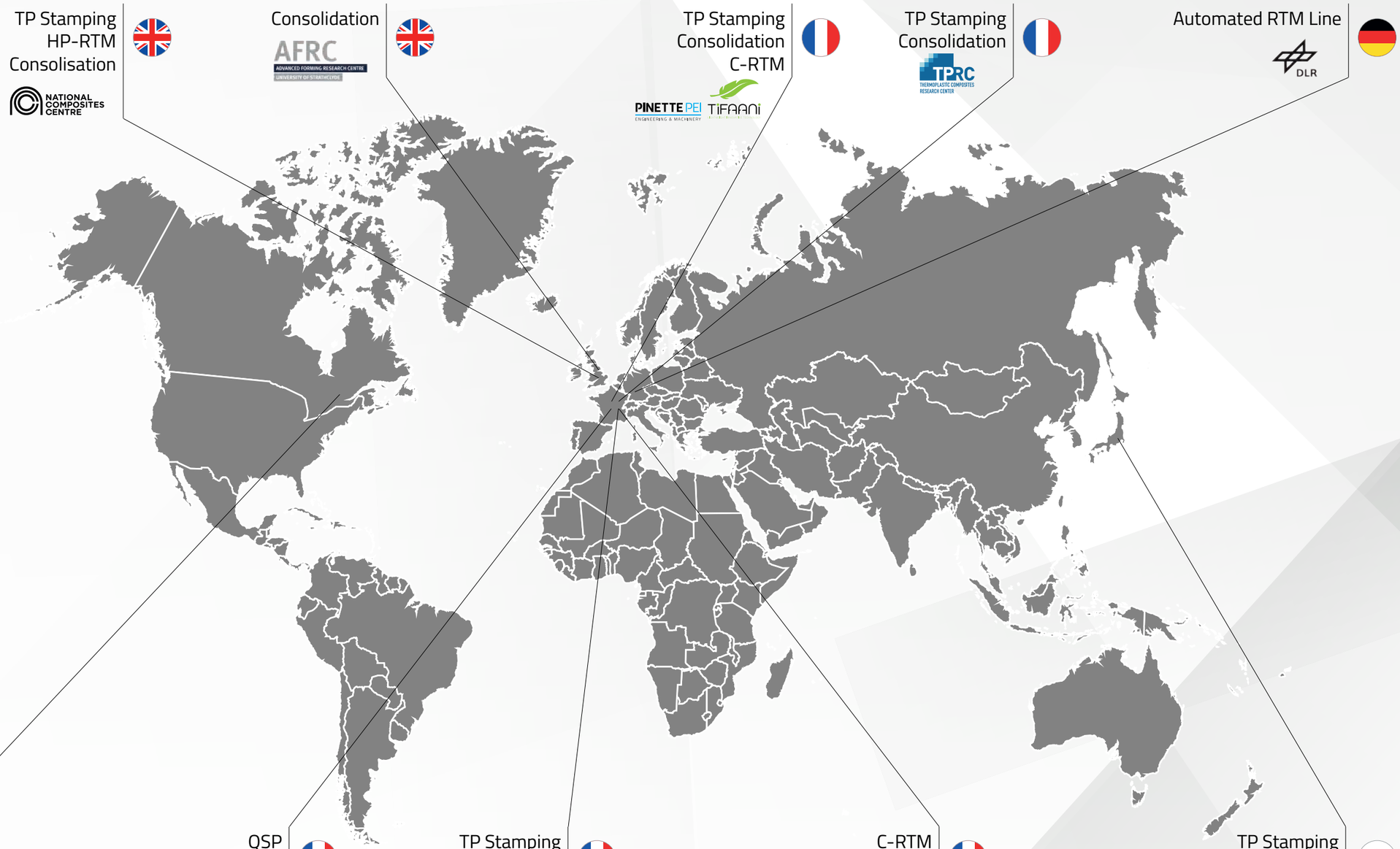
RTM

Product features

- Thermal fluid heating and cooling platens
- Force from 100 to 1000 kN
- Up to 250°C
- Heated and cooled platens
- Temperature accuracy ± 3 °C
- Platen size: 700 X 700 mm
- Integrated injection unit
- Optimised ergonomics
- Process parameter monitoring and recording

Aeronautic Industry Solutions PINETTE PEI

Test centers with PINETTE PEI's presses



High Pressure Hard Armor Press Systems

Our Hard Armor press system enables you to manufacture ballistic protection for every applications.

For defence personnel
Helmets | Vests | Inserts | Shield

For defence vehicle
Marine | Aircraft | Ground based vehicle

Technical Features

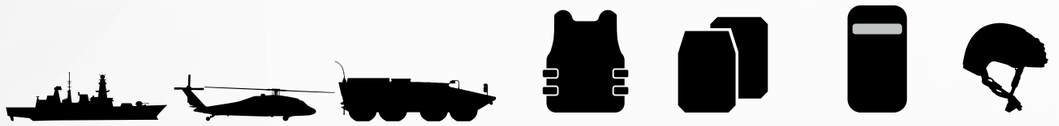
- Single opening press with multidaylight mold
- Press with shuttle bed for easy loading/unloading outside of the press
- Thermal oil heating and cooling system
- Data acquisition system for production traceability
- Turnkey system: press, heating and cooling system, molds

Metric sizes	U.S. sizes
High capacity from 400T to 10 000T	**High capacity** from 440T to 11 023 US ton
high pressure more than 500 bars	**high pressure** more than 7251 psi
Temperature up to 180°C	**Temperature** up to 356°F
Platen size up to 2500 x 1600mm	**Platen size** up to 98.42'' x 62.99''

Process

7000 T press
heating and cooling system | data acquisition system | Mold with 5 level

Applications



Materials

- Aramid
- Kevlar
- Ultrahigh molecular weight polyethylene (UHMWPE)
- Ceramic

Parts

- Ballistic protection
- Spall liner
- Vehicle armor

Stamping Stretch Forming

Metal forming

Benefits

- Tool storage on machine frame
- Synched or independant stretching unit
- Stretching force selection
- Fast stretching tool change over on rotary system
- Repeatability and reliability
- Decreased scrap rates
- Finishing work on parts reduction
- Suitable ergonomics
- Time cycles saving
- Manual operation reduction

Options

- Long aluminium strip storage
- Hydraulic circuits for tool functions with quick couplings

Peripherical Equipment

- Long aluminium strip storage
- Hydraulic circuits for tool functions with quick couplings

Materials

- Aluminium

Parts

- Aerofoil sections

Process

Presse brake for sheet metal forming

Metal forming

Benefits

- High accuracy bending
- Cylinders sensors correct instantly the pressure
- Front console adjustable in height
- High quality and wasteless bending thanks to Laser Control System (LCS)
- Suitable ergonomics
- High productivity

Technical data

- Tandem machines : 2x7 = 14 m
- Folding force : 8000 daN
- Stroke : 500 mm
- Folding speed : 5,6 mm/s
- Tandem folding force : 16000 daN

Materials

- Sheet metal

Parts

- Interior structural parts

Process

12 axis back gauge

XXL ToolBox

Curvature fitting

Technical data

- Closing force : 100 tons
- Size of platens (Slide) 600x900 mm
- Daylight : 1000 mm
- Stroke of pressing platen : 800 mm
- Platen : 1200x2000 mm

Materials

- Aluminium alloys

Parts

- Structural parts

Services

Technical Support and Maintenance

- Hotline and maintenance contracts
- Spare parts
- Retrofit and updates
- Performance optimisation audits and services

Training

- General training
- Operator and maintenance technician training
- Machine maintenance
- Digital controls

R&D Services

- Confidentiality
- Wide range of equipment and processes
- Process parameters (temperature, pressure, time) recording
- Engineer team to assist you
- Processes available:
- Thermoplastic laminate consolidation
- Thermoplastic stamping
- Sheet Molding Compound compression
- Resin Transfer Moding injection (RTM, C-RTM, HP-RTM)
- Ballistic plate thermocompression
- Carbon fabric preforming

Industry 4.0

- Virtual reality for project engineering
- MyPINETTE for remote monitoring
- Vision pack for maintenance
- Virtual reality digital product sharing
- Augmented reality interactive brochure
- VR Staging for immersive training

01/04/22

www.pinetteemidecau.com
For more information, scan the QR code with your smartphone or tablet

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