

# Automated Laminating Cell

Airborne | 2019

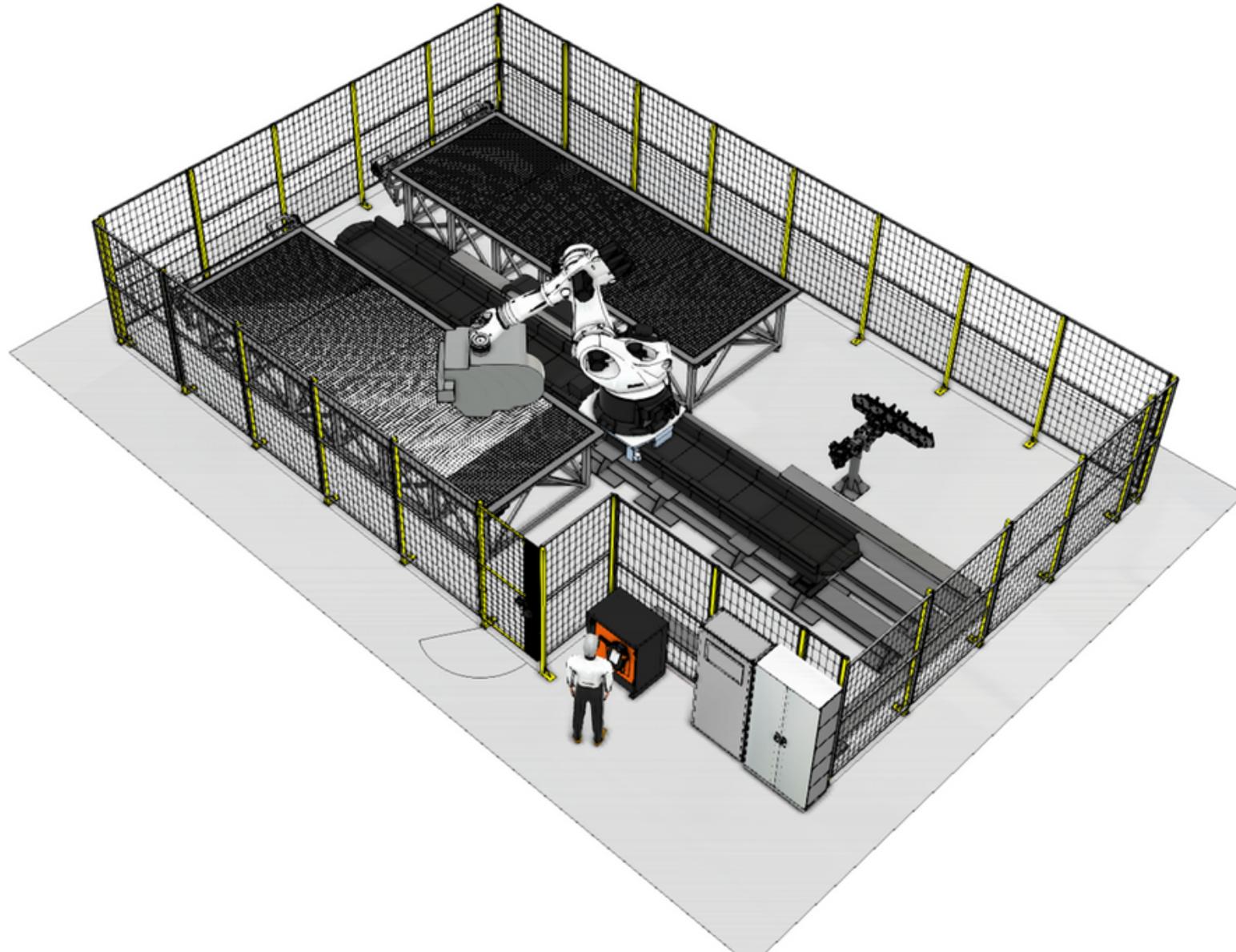


TECHNICAL  
SPECIFICATIONS

**Airborne**

# Automated Laminating Cell

Example layout

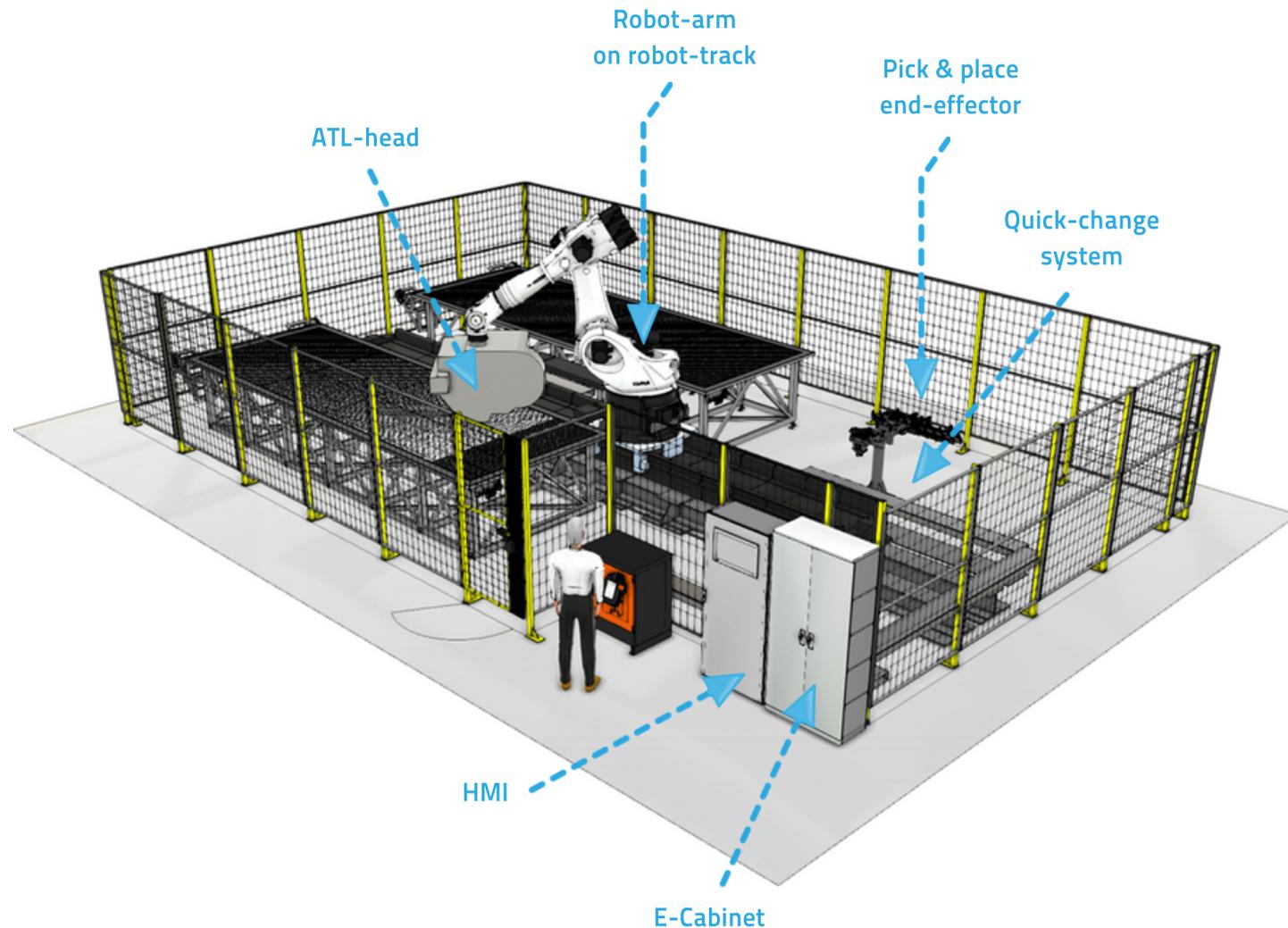


# Automated Laminating Cell

Our Automated Laminating Cell is a multifunctional system that combines robotised tape laying, laminate cutting and pick & place. It is much more affordable than conventional systems, has a small footprint and can easily be adapted depending on requirements.

## The Automated Laminating Cell consists of:

- Robot on linear track
- Automated tool changer for all tools
- Tape laying head with 150 mm tape width
- Ultrasonic cutting head or rolling disc cutter
- Layup table with vacuum for laying on film
  - Hardened steel surface for use with rolling disc cutter
  - Porous surface for use with ultrasonic cutting
- End-effector for pick & place with suction cups
- Electric Cabinet
- Human Machine Interface (HMI)
- Safety fencing

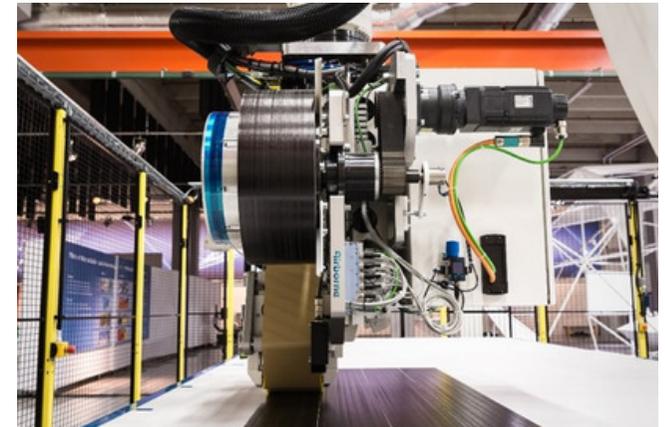
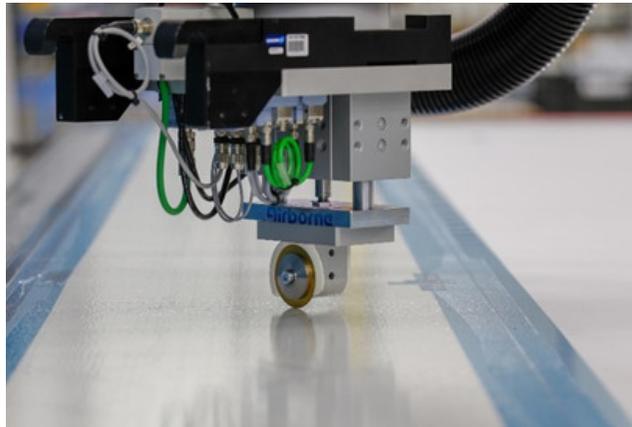
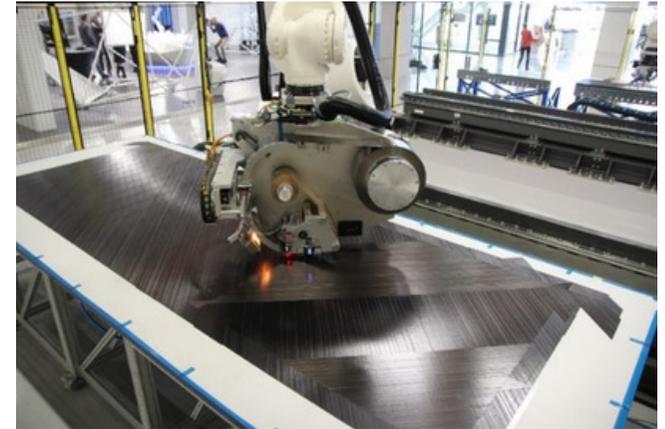


# Automated Laminating Cell

## Performance

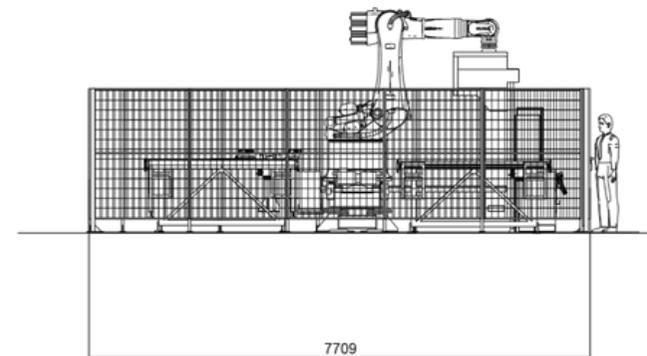
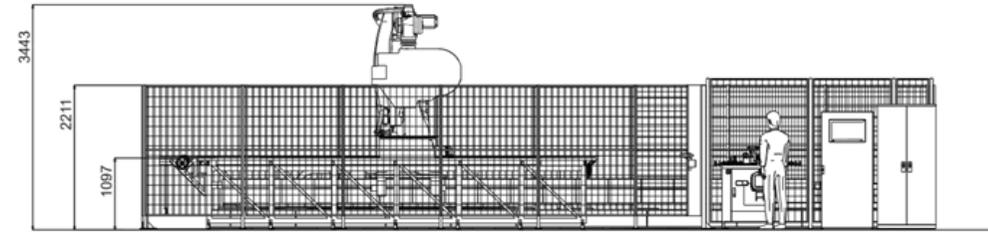
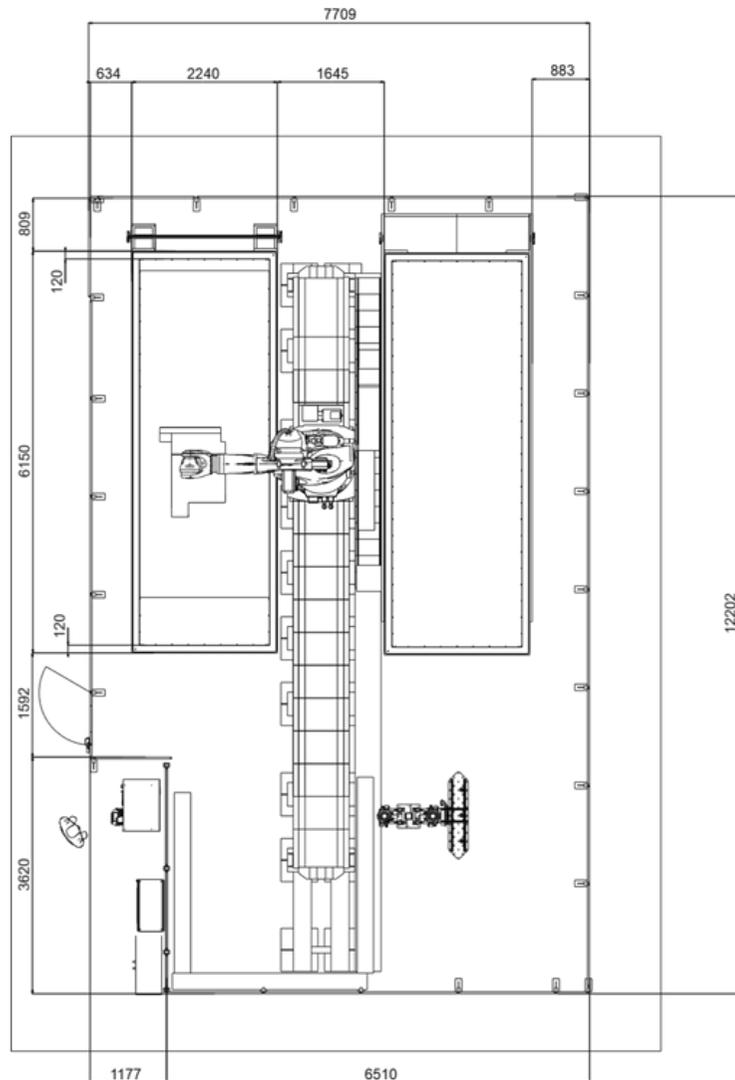
### Performance specifications:

- Assuming an 8-ply laminate with fibre orientations of 0°, 90°, +45° and -45° and a size of 4.0 m x 1.8 m:
  - Max. process speed: 540 m/hr
  - Average Lay down speed: 320 m/hr
  - Areal lay down speed: 48 m<sup>2</sup>/hr
- System performance depends on the laminate to be made, with the course length being the biggest influence.



# Automated Laminating Cell

Required Floor Space

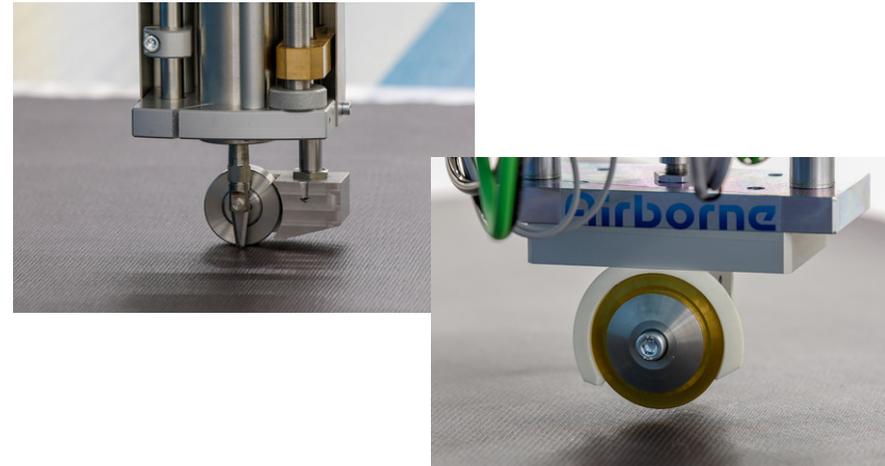
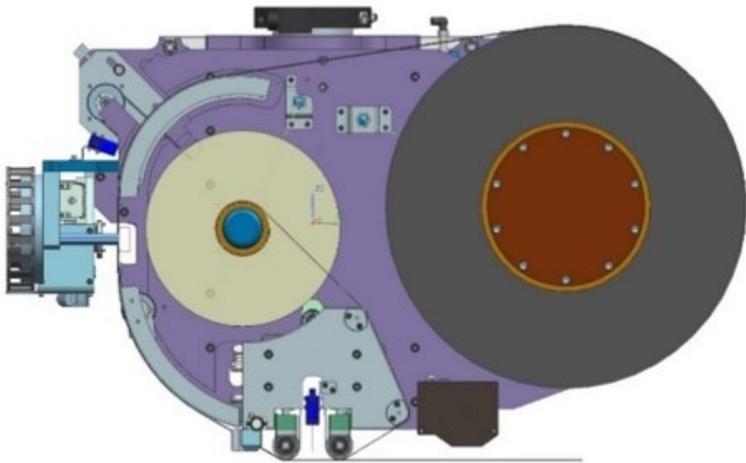


## Floor space utilization:

Approximately 90 m<sup>2</sup> (l: 12 m x w: 7.5 m x h: 2.3m)

# Automated Laminating Cell

## ATL End-Effector & Cutting End-Effectors



### ATL End-Effector:

- Tape laying head (ATL MK2) designed by Airborne
- Unidirectional (UD) tape
- Standard tape width: 150mm
- Optional tape width: 75mm
- Quick tool changer allows for the use of two ATL heads:
  - 75 & 150 mm UD-tape for improved material efficiency
  - 2x 150mm for quick material change and maintenance
- 50kg tape capacity (~ 650m)

### Cutting End-Effectors:

- Ultrasonic knife or rolling disc cutter
- Ultrasonic knife:
  - Combination of springs and rolling wheel to ensure constant cutting depth
  - Rolling wheel can be removed, using robot's z-position to control cutting depth
- Rolling disc cutter
  - Robust mechanical solution
  - Cutting depth controlled by force applied to the cutter in z-direction
  - Force applied by pneumatic cylinder

# Automated Laminating Cell

## P&P End-Effector & Quick Change System



### **Pick & Place End Effector:**

- Trimmed or cut shapes can be offloaded
- Pick & place end-effector consisting of vacuum grippers
- Dedicated design suited to one specific laminate
- Generic grid of individually controlled suction cups

### **Quick Change System:**

- Quick change system to change tools in less than a minute
- Tool changer can switch between ATL head, cutting tool(s) and pick & place end-effectors.





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## About Airborne

As a preferred supplier we design, develop, qualify and manufacture composite products for the most demanding applications. We develop and build machines with the capability to automate manufacturing of composites structures at competitive price levels for a number of industries worldwide. Our ambition is to build a leading physical and digital platform in composite automated manufacturing technologies for small to mid-size composite components. Airborne employs more than 100 highly skilled people. Customers include directly and indirectly companies such as Airbus, Dassault, GKN-Fokker, Gulfstream, Thales Alenia Space.

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