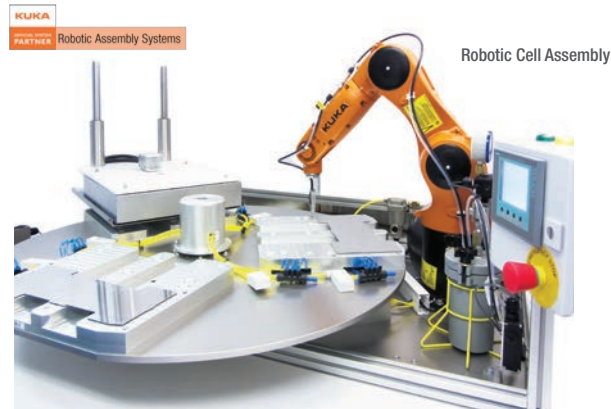


Manufacturing Equipment For Fuel Cells and Batteries



Greenlight's automation division specializes in the fabrication of custom manufacturing equipment.

Available products include:

- Robotic fuel cell assembly equipment
- Automated inspection, test and measurement
- Automated battery manufacturing equipment
- Flow battery manufacturing equipment
- PLC and motion control systems

Assembly Press and Leak Testers for Fuel Cell Stacks

- » Used for the assembly and leak testing of full stacks
- » Hydraulic or servo ball-screw press actuation
- » Press optionally tilts down to horizontal, and twists along the axis of the stack

Features:

- Press force: 120kN (or higher)
- Optional strap tensioning and welding available
- Press accuracy: $\pm 2.0\%$
- Optional integrated leak testing available



Fuel Cell MEA Manufacturing Equipment

- » For accurate assembly of multi-layer MEAs

Available Equipment:

- Membrane coating
- MEA assembly, lamination and cutting
- Optional GDL teflonation



Automated Stack Docking System

- » Docking system with quick-connect fittings for rapid connection to test rigs
- » Allows off-line connection of fuel cell stacks, maximizing test station utilization
- » Adjustable height trolley for mating to work surfaces/test stations

Connections Available:

- Fuel, oxidant, cooling water / WEG
- Load cables, CVM and additional I/O



Materials Characterization

Used to measure thickness, resistance and permeability of carbon fiber substrate or entire electrode

Equipment Rating (numerous configurations available)

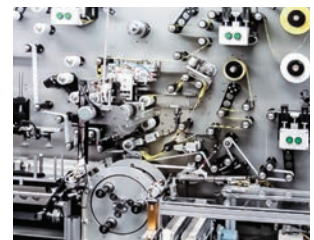
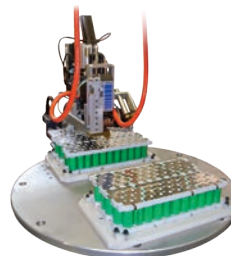
- Compressive force: 2kN
- Stroke of press: 40 mm
- Sample size: 300mm x 700mm
- Accuracy of thickness measurement: ± 1 micron



Automated Battery Manufacturing Equipment

Inspection equipment, fixturing and tooling, including:

- » Progressive dies
- » Cap crimping machines
- » Electrolyte wetting machines
- » Handling machinery
- » Pick and place machines
- » Cell and pack testers
- » Laminators
- » Slitters/rewinders
- » Coating machines
- » Data collections systems



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