



Product catalog

Battery Research Equipment

Battery Assembly, Testing and Recycling

www.accessr-energy.eu

CONTENT

1. Slurry & Electrolyte Treatment 1

- 1.1. Slurry Filtration
- 1.2. Solvent Treatment

2. Coating 2

- 2.1. Tape Casting
- 2.2. Roll-To-Roll Coating
- 2.3. 3d Printing Coater

3. Calendaring 5

- 3.1. Cold Rolling
- 3.2. Hot Rolling
- 3.3. Lamination
- 3.4. Roll-To-Roll Calendaring

4. Die Cutting & Slitting 8

- 4.1. Die Cutting Pouch Cells
- 4.2. Die Cutting Coin Cells
- 4.3. Slitting

5. Coin Cell Preparation 10

- 5.1. Crimping And Disassembling
- 5.2. Electrolyte injection

6. Pouch Cell Preparation 11

- 6.1. Stacking
- 6.2. Welding
- 6.3. Pouch Case Forming
- 6.4. Sealing
- 6.5. Electrolyte Injection
- 6.6. Hot Pressing

7. Cylindrical & Prismatic Cell Preparation 16

- 7.1. Winding
- 7.2. Grooving
- 7.3. Welding
- 7.4. Electrolyte Injection
- 7.5. Crimping, Disassembling

8. High-Throughput Equipment For Cell Preparation & Automatic Lines 20

9. Battery Materials Analysis 21

- 9.1. Material Conductivity Testing
 - 9.1.1. Compact Powder Conductivity And Electrode Conductivity
 - 9.1.2. Battery Slurry Conductivity
 - 9.1.3. Solid Electrode Conductivity

10. Battery Analysis 23

- 10.1. Electrochemical Testing
 - 10.1.1. Electrochemical Testers
 - 10.1.2. Auxiliary Tools
 - 10.1.3. Battery Analyzer Accessories
- 10.2. Physical Testing
 - 10.2.1. Swelling Testers
- 10.3. Safety Testing

11. Battery Recycling Equipment 27

Appendix: Abbreviations 29

Our Suppliers:



LANHE

Email: contact@accessr-energy.eu

Telephone: +33 (0)5 63 76 08 67

Website: www.accessr-energy.eu

Address: 8 Av. Pierre-Gilles de Gennes
81000, Albi, France

This catalog is not exhaustive, products are constantly being updated.

For customizations, more products and information, please contact us.

1. Slurry & Electrolyte Treatment

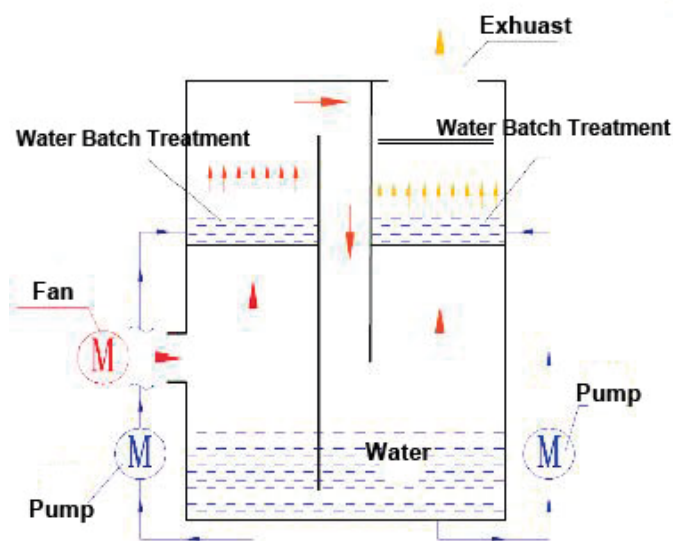
1.1. Slurry Filtration



Magnetic De-ironing Filtration System for Battery Electrode Slurry - MSK-FT02

Process Capacity : 5 L
Magnetic Field Strength : 8000 Gs
Filter : Three mesh 80, 100, 120
Slurry Viscidity : $\leq 15000 \text{ mPa}\cdot\text{s}$
Humidity : 0 - 90 % RH
Deironing Capacity : 8000 - 10000 Gs

1.2. Solvent Treatment



Dual-Filtration System for NMP Vapor Recycling of Battery Cathode Coating - MSK-NMP-1

Processing Method : Water bath type absorption
Processing Capacity : $600 \text{ m}^3/\text{h}$
Water Bath Volume : $\leq 90 \text{ L}$
Working Temperature : 0 - 40 °C
Gas Inlet Temperature : $\leq 150 \text{ °C}$
Water Pump Rate : 17 L/min
Centrifuge Fan : Volume: $2600 \text{ m}^3/\text{h}$, Pressure: 1400 Pa, Power: 1.5 kW
Recycle Rate : 90 % - 95 %
Used to filter the vapor formed from the process of coating and drying with the dual-filtration system

2.1. Tape Casting



Tape Casting Coater with Heated Vacuum Bed - MSK-AFA-H200A

Vacuum Chuck Hotplate Temperature : $\leq 250\text{ }^{\circ}\text{C}$
Temperature Control Accuracy : $\pm 1\text{ }^{\circ}\text{C}$
Coating Area : 400 mm Length x 250 mm Width
Film Applicator : 180 mm Width with micrometer for thickness adjustment
Travel Speed : 1 – 90 mm/s
Ar gas glovebox compatible
Active carbon filter and venting fan installed on the top cover
Optional : Hybrid film applicator upon request



Mini Tape Casting Coater with Bottom Vacuum Chuck - MSK-AFA-HC100

Vacuum Chuck Hotplate Temperature : $100\text{ }^{\circ}\text{C}$
Temperature Control Accuracy : $\pm 1\text{ }^{\circ}\text{C}$
Coating Area : 200 mm Length x 100 mm Width
Film Applicator : 80 mm Width
Travel Speed : 0 – 50 mm/s
Ar gas glovebox compatible
Optional : Hybrid film Applicator upon request

2.2. Roll-to-Roll Coating



Multifunctional Film Coater: Sheet & Roll-to-Roll, Blade or Slot-Die - MSK-H200SR

Heating Temperature : $\leq 120\text{ }^{\circ}\text{C}$
Heating Method : Top IR heating ; Bottom resistance heating
Temperature Control Accuracy : $\pm 1\text{ }^{\circ}\text{C}$
Vacuum Chuck : 600 mm Length x 300 mm Width
Maximum Coating Width : 180 mm for R2R ; 250 mm for sheet coating
Doctor Blade film applicator included
Optional : Slot-Die head upon request



Vertical Double Side R2R Coater - MSK-AFA- DS300-LD

Heating Temperature : ≤ 120 °C
Heating Method : IR heating
Temperature Control Accuracy : ± 1 °C
Coating Width : ≤ 250 mm
Coating Speed : ≤ 800 mm/min
Coating Thickness : 3 – 50 μm
Automatic Coating Alignment : ± 0.2 mm
Coating Thickness Accuracy : ± 5 μm
Reeling/Unreeling Diameter : 300 mm OD & 75 mm ID
Optional : Auto slurry feeder upon request



Roll to Roll Extrusion and Transfer Coating System - MSK-AFA-DE400-CM3

Coating Method : Slot-die and roll-to-roll Coating
Substrate Width : ≤ 380 mm
Coating Speed : ≤ 2 m/min
3 Drying Zone With Each Zone Length : 1.5 m
Drying Temperature : ≤ 150 °C Uniformity ± 5 °C
Coating Speed : ≤ 2 m/min (refers to Graphite Coating with Viscosity: 2000 mPa·s, Solid content : 45 %, Single side dry thickness : 90 μm)
Coating Pattern : Continuous coating, intermittent coating
Functionalities : Substrate tension control ; unwinding, haul-off and rewinding with guiding function ; Hot air curved oven ; PLC control, HMI operation
Slot-die Coating :

- Slot Die Size : 420 mm Length x 135 mm Width x 120 mm Height
- Coating Width : ≤ 360 mm
- Single Side Dry Thickness : 30 – 150 μm (Continuous coating); 30 – 100 μm (Intermittent coating)
- Thickness Accuracy : ± 2 μm
- Slot-die Adjustment : Automatic, display accuracy 1 μm

Roll-to-Roll Coating :

- Blade Size : $\Phi 100$ mm
- Coating Width : 50 – 360 mm
- Single Side Dry Thickness : 30 – 150 μm (Continuous coating) 30 – 100 μm (Intermittent coating)
- Thickness Accuracy : ± 3 μm
- Adjustment : Automatic, display accuracy 1 μm

2.3. 3D Printing Coater



Automatic 3D Printing Coater with Four Nozzles that uses Slurry Extrusion Lamination (SEL) technology - TOPEM20

Working Temperature : $\leq 100\text{ }^{\circ}\text{C}$

Coating Area : 100 mm Length x 100 mm Width

Nozzle Diameter : $\geq 0.06\text{ mm}$

Structure Forming Accuracy: 0.01 mm

Printing Accuracy : $\pm 0.01\text{ mm}$

Slurry Viscosity : $0.0003 - 1.4 \cdot 10^6\text{ mPa} \cdot \text{s}$

Substrate Holder : vacuum chuck

Moving Speed : $\leq 100\text{ mm/s}$

Slurry Type : any kinds of anode, cathode and electrolyte slurries with appropriate solid-content and viscosity

Printing Software : Simplify 3D

Compatible Software : Gura/Microsoft3DBuilder/Slic3r/Skeinforge

3.1. Cold Rolling



Electric Cold Roller Press with Optional Steel, Ceramic and PTFE Rollers - MSK-HRP-MR100DC

Roller Dimension : 100 mm Φ x 100 mm Width
Rolling Speed : 5 – 40 mm/s
Rolling Gap : 0 – 1.2 mm
Gauge Accuracy : \pm 0.01 mm
Material Hardness : \leq 50 HRC
Ar glove box compatible
Optional : ceramic coated roller (for Lithium metal sheets); PTFE roller for Lithium foil with copper foil
Ar glove box compatible



Cold Rolling Press with Digital Pressure Display with Roll-to-roll option - MSK-2150-PD

Roller Dimensions : 94 mm Φ x 150 mm Width
Rolling Speed : 10 – 50 mm/s
Rolling Gap : 0 – 1.3 mm (customizable up to 2 mm max.)
Digital Gauge Accuracy : \pm 0.01 mm
Rolling Pressure : \leq 4 T
Material Hardness: \leq 50 HRC
Ar glove box compatible

3.2. Hot Rolling



Electric Roll to Plate Hot Press - MSK-HRP-300

Roller dimensions : 96 mm Φ x 220 mm Width
Working temperature : \leq 200 °C
Heating rate : \leq 4 °C / min
Temperature control accuracy : \pm 3 °C
Rolling speed : 5 – 45 RPM
Roller Gap : 0 – 1.8 mm
Dial Gauge accuracy : \pm 0.005 mm
Hardness of material : \leq 50 HRC
Ar glove box compatible



Hot Rolling Press with Digital Pressure Display - MSK-HRP-04B

Roller Dimensions : 96 mm Φ x 220 mm Width
Working Temperature : \leq 200 °C
Heating Rate : \leq 4 °C/min
Temperature Control Accuracy : \pm 5 °C
Rolling Speed : 0 – 40 mm/s
Roller Gap : 0 – 2 mm
Digital Gauge Accuracy : \pm 0.004 mm
Material Hardness : \leq 45 HRC
Ar glove box compatible

3.3. Lamination



Economic Hot Laminating Press - EHX-365

Laminating width : ≤ 365 mm
Laminating temperature : ≤ 130 °C
Laminating speed : 1 - 5 m/min
Material of the top/bottom rollers : SS304 steel
Digital force sensor : pressure adjust to the top roller



Hot Rolling Double-Sided Laminating Press with 1200 kg Force and Different Width Options - JTFM380

Roller dimensions : 192 mm Φ x 380 mm Width
Laminating temperature : 60 - 130 °C
Laminating speed : 0.5 - 30 m/min
Material of the top roller : A3 steel
Material of the bottom roller : high-temperature rubber

2.4. Roll-to-Roll Calendering

Roll to Roll Heating Calender for Either Hot Rolling One Layer or Laminating Two-Layer Foil - HRP-03RRL

Roller dimensions : 200 mm Φ x 250 mm Width
Working temperature : ≤ 110 °C
Heating rate : 3 °C/min recommended
Temperature control accuracy : ± 2.5 °C
Rolling speed : 5 - 45 rpm
Roller Gap : 0 - 2 mm
Dial gauge accuracy : ± 0.01 mm
Maximum linear speed : 60 mm/s
Hardness of material : ≤ 50 HRC



Automatic Alignment Control Unit



Roll to Roll Heating Calender with Pressure Control Up to 15T - MSK-H2300-ER

Roller dimensions : 200 mm Φ x 300 mm Width

Working temperature : ≤ 200 °C

Temperature control accuracy : ± 2 °C

Rolling speed : ≤ 4 m/min

Roller Gap : 0 - 1.5 mm

Rolling thickness accuracy : ± 1.5 μ m

Hardness of material : 50 HRC

Hydro-pressure regulating system ensures stable pressure during operation

Real-time pressure displays with data logging

4. Die Cutting, Slitting

4.1. Die Cutting Pouch Cells



Compact Precision Pneumatic Die Cutter for Pouch Cells - MSK-180SP

Cathode Die : 56 mm Length x 43 mm Width
Anode Die : 58 mm Length x 45 mm Width
Customized dies upon request : maximum dimensions 120 mm Length x 80 mm Width
Cutting accuracy : ± 0.1 mm
Ar glove box compatible
Air compressor not included:
- inside glove box, compressed inert gas such as Ar ;
- outside glove box, compressed air



Semi-Automatic Die Cutter for Pouch Cell Electrodes - MSK-180-N

Cathode Die : 56 mm Length x 43 mm Width
Anode Die : 58 mm Length x 45 mm Width
Customized dies upon request : maximum dimensions 200 mm Length x 200 mm Width
Cutting accuracy : ± 0.1 mm
Built-in IR sensor for hand protection

4.2. Die Cutting Coin Cells



Compact Precision Pneumatic Disk Cutter for Coin Cells - MSK-180SC

Electrodes Cutting Die : 15 mm Φ
Separator Cutting Die : 19 mm Φ
Customized dies upon request
Cutting Accuracy : ± 0.1 mm
8 pcs round electrode per cut
Ar glove box compatible
Air compressor not included: - inside glove box, compressed inert gas such as Ar ; - outside glove box, compressed air

4. Die Cutting, Slitting



Compact Precision Disc Cutter with 4 Sets of Cutting Die (15, 19, 20 & 24 mm) - MSK-T-07

Hole diameter : 24 mm
4 sets of cutting dies included : 15 mm, 19 mm, 20 mm and 24 mm Φ
Customized dies upon request (including O-ring)
Sperator need be cut with an A4 paper for better result
Ar glove box compatible

4.3. Slitting



Semi-Automatic Slitting Machine for Electrodes for Cylinder Battery - MSK-CSE-300

Cutting width for each section : 58 mm, 58 mm, 56 mm, and 56 mm
Cutting blades : 10 spherical blades
Cutting speed : 0 – 4 m/min
Cutting thickness : 100 – 300 μ m
Width customization : 25 – 250 mm



Roll to Roll Continuous Slitting Machine - MSK-540-II

Roller width : 380 mm
Reeling/Unreeling Φ : \leq 250 mm
Automatic unwinding correction, accuracy : \pm 0.5 mm
Cutting width : 30 – 300 mm
Cutting blades : 10 spherical blades
Cutting speed : 1 – 5 m/min
Cutting thickness : 10 – 300 μ m

5. Coin Cell Preparation

5.1. Crimping, Disassembling



Digital Pressure Controlled Electric Crimper - MSK-160E

Coin cell size : CR2016 , CR2025 , CR2032 , and CR2450
Pressure adjustment range : 0 - 1.35 T
Disassembling dies available upon request
Crimping die core for 3-Electrode 2032 coins cell available upon request
100 pcs CR2032 cases are included
Ar glove box compatible



Rotary Coin Cell Crimping Machine with controlled pressure- MSK-HT-16

16 positions for 16 coin cell crimping dies in one single run
Coin cell size : CR2016 , CR2025 , CR2032
Pressure adjustment range : 0 - 1.5 T
Disassembling dies available upon request
Assembling die for CR2325, CR2450 available upon request
Ar glove box compatible

5.2. Electrolyte injection



Automatic Digital Bottletop electrolyte Dispenser - BD-50ML-LD

Maximum volume : 50 mL
Accuracy : Class A, with 2 decimal place readings
Ar glove box compatible

6. Pouch Cell Preparation

6.1. Stacking



Automatic Layer by Layer Stacking Machine for Pouch Cell - MSK-111A-E

Type of stacking : Z-type
Auto electrode pick-up & stacking via vacuum suction manipulator
Maximum stacking slot size : 200 mm Length x 150 mm Width
Maximum stacking thickness : 15 mm
One set of 80 x 50 mm stacking die fixtures is included for immediate use



Pouch Cell Stacking Machine for Solid State Battery - MSK-111A-SSB

Stacking Method : layer by layer
Auto electrode pick-up with shacking function for Li stacking
Standard Stacking Electrode Size : 58 mm Length x 45 mm Width
Customizations are available upon request
Maximum customized stacking slot size : 100 mm Length x 90 mm Width
Maximum Stacking Thickness : 15 mm
Ar glove box compatible

6.2. Welding



Desk-Top Ultrasonic Metal Welder with Touch-Screen Digital Controller - MSK-800W

Maximum Output Power : 800 W
Welding Area : 4 mm Length x 4 mm Width
Preset welding programs for Al and Cu
One set of welding head and the base pre-installed
A modified version of MSK-800W-AR can be safely used in the Ar gas condition

6. Pouch Cell Preparation



Ultrasonic Metal Welder with Touch-Screen Digital Controller - MSK - 4200W

Maximum output power : 4200 W
Welding Area : 12 mm Length x 4 mm Width
Customized welding heads are available upon request
Preset welding programs for Al and Cu
One set of the welding head and the base is pre-installed

6.3. Pouch Case Forming



Compact Pneumatic Pouch Cell Case Forming Machine - MSK-PN120

Standard die size : 62 mm Length x 45 mm Width x 3/4/5/6 mm Depth
Maximum customization pouch cell dimensions : 160 mm Length x 125 mm Width
Punching pressure : 1000 kg
Aluminium film thickness range : 0.10 - 0.20 mm



Pouch Cell Case Forming Machine - MSK-120

Standard die size : 62 mm Length x 45 mm Width x 3/4/5/6 mm Depth
Maximum customization pouch cell dimensions : 150 mm Length x 120 mm Width x 6 mm Depth
Punching pressure : 5000 kg
Aluminium film thickness range : 0.10 - 0.20 mm

6. Pouch Cell Preparation

6.4. Sealing



3-in-1 Sealer for Pouch Cells - MSK-115-III

Operations : preliminary top / side & final vacuum sealing , vacuum degassing
Maximum sealing temperature : 250 °C
Maximum Sealing dimensions : 200 mm Length x 150 mm Width
Edge sealing width : 5 mm
Sealin pressure : 0 - 7 kg/cm²
Maximum vacuum level : - 90 kPa
Ar glove box compatible



Large Vacuum Sealer with Electrolyte Injection and Vacuum Standing for Pouch Cell - MSK-115A-H

Maximum Pouch Cell Dimensions : 500 mm Length x 350 mm Width x 20 mm Height
Electrolyte injection could be done under different vacuum levels
Sealing Blade Width : 10 mm (standard)
Customizable up to 15 mm
Sealing Blade Length : ≤ 550 mm
Maximum Temperature: 250 °C
Vacuum Range: down to -95 kPa
Maximum Sealing Pressure : 0.7 Mpa

6.5. Electrolyte Injection



Vacuum Electrolyte Injection System for Pouch and Cylindrical Cells - MSK-113-CP

Maximum Pouch Cell Dimensions : 180 mm Length x 180 mm Width x 12 mm Thickness
Cylinder cells : 4680 (18650/21700 are achievable with an adapter at extra cost)
Sealing Width : 6 mm (Customizable)
Sealing Length : ≤ 180 mm
Sealing Thickness : 0 - 0.5 mm
Sealing Temperature : 50 - 220 °C
Temperature Control Accuracy : ± 2 °C
Electrolyte Injection Volume : 0.3 - 100 ml
Maximum Vacuum Level : - 95 kPa
Ar glove box compatible

6. Pouch Cell Preparation



Vacuum Electrolyte Injection System for Large Pouch Cell - MSK-113-PVL

Maximum Pouch Cell Dimensions : 370 mm Length x 360 mm Width x 12 mm Thickness
Sealing Width : 6 mm (Customizable)
Sealing Length : \leq 380 mm
Sealing Thickness : 0 – 0.5 mm
Sealing Temperature : 25 – 220 °C
Temperature Control Accuracy : \pm 2 °C
Electrolyte Injection Volume : 0.3 – 100 ml
Maximum Vacuum Level : - 95 kPa
Ar glove box compatible

6.6. Hot Pressing



Hot-Press for Pouch Cell SEI Formation - MSK- YLJ- HP10KN

Working Temperature : \leq 150 °C
Temperature Control Accuracy : \pm 5 °C
Working Pressure : 0.2 – 0.7 MPa
Pneumatic Cylinder Travel Distance : \leq 95 mm
Working Area : 260 mm Width x 160 mm Length



Lamination Hot-Press - YLJ- HP80

Working Temperature : \leq 200 °C
Temperature Control Accuracy : \pm 1 °C
Working Pressure : 0.4 – 0.8 MPa
Pneumatic Cylinder Travel Distance : \leq 200 mm
Working Area : 200 mm Width x 150 mm Length

7.1. Winding



Semi-Automatic Winder for Cylindrical and Prismatic Cells - MSK-112A-E

Maximum Cylindrical Cell Size : 46100

- Winding Round Needle Size : 3.5 mm OD
- Electrode Winding Size : 14 – 46 mm OD, 30 – 100 mm Length

Prismatic Cell Size : 158 mm Length x 110 mm Width (adjustable) x 6 mm Thickness

- Winding Square Needle Size : 158 mm Length x 1100 mm Width
- Electrode Winding Size : 14 – 46 mm OD, 30 – 100 mm Length, 30 – 90 mm Width, max. 10 mm Thickness

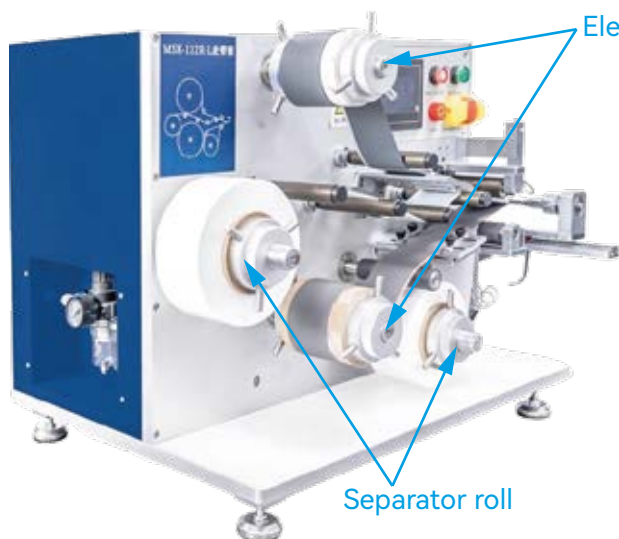
Guiding Roller Width : 120 mm

Separator Roll Diameter : 76 mm – 250 mm

Winding Speed : ≤ 100 RPM

Electrode & Separator Alignment Accuracy : $\leq \pm 0.5$ mm edge roughness

Adjustable parameters : tension, winding speed, winding cycles



Automatic Winding Machine for Cylindrical Battery - MSK-112R-L

Cylindrical Cell Size: 4680, 21700, and 18650

Winding Round Needle Size : 3.5 OD

Maximum Electrode Winding Size : 250 mm Φ x 100 mm Width

Winding Speed : ≤ 300 RPM

Maximum Electrode Roll Material Size : 250 mm Φ x 100 mm Width

Maximum Separator Roll Material Size : 150 mm Φ x 100 mm Width ; ≥ 9 μ m Thickness

Guide Roller Width : ≤ 100 mm

Winding Speed : ≤ 300 RPM

Adjustable parameters : electrode guide slot positioning, guide groove position, width, winding speed, number of winding circles

7.2. Grooving



Desk-top Semi-Automatic Grooving Machine - MSK-500-L

Cylindrical Cell Size : 4680 - 46120 or 50100
For different types of cells grooving dies sets are required

Grooving Depth : 0.8 - 2.0 mm

Grooving Width : Standard 1.2 mm, 0.9 - 1.5 mm

Grooving Accuracy : ± 0.1 mm



Desk-top Semi-Automatic Grooving Machine for Cylinder Cells - MSK-500

Cylindrical cell size : CR123 / 18650 / 26650 / 32650 / AA, grooving dies sets are required

Grooving depth : 1.2 - 2.0 mm

Grooving width : 1.1 - 1.5 mm

Grooving accuracy : ± 0.1 mm

7.3. Welding



Single Point Pneumatic Spot Welder for Welding Bottom Tap of Cylinder Cell - MSK-330A

Maximum output power : 3000 W

Welding Thickness : 0.03 - 0.25 mm

Material : Ni-tab welding

Pressure applied on the welding needle can be adjusted



Laser Welding System for Prismatic Cells with tab welding and Top lid seal - MSK-LW-S2000

Maximum output power : 3500 W
Prismatic cell tab welding : 600 mm Length x 300 mm Width x 300 mm Height
Prismatic cell top lid sealing : 600 mm Length x 300 mm Width x 300 mm Height
Maximum prismatic cell size : 600 mm Length x 500 mm Width x 300 mm Height
Laser Beam : $M^2 < 1.3$; Power adjustable : 10 – 100 % ; Stability : $< 2 \%$
Positioning : CCD Camera positioning ; Accuracy : 0.02 mm
Water cooling included

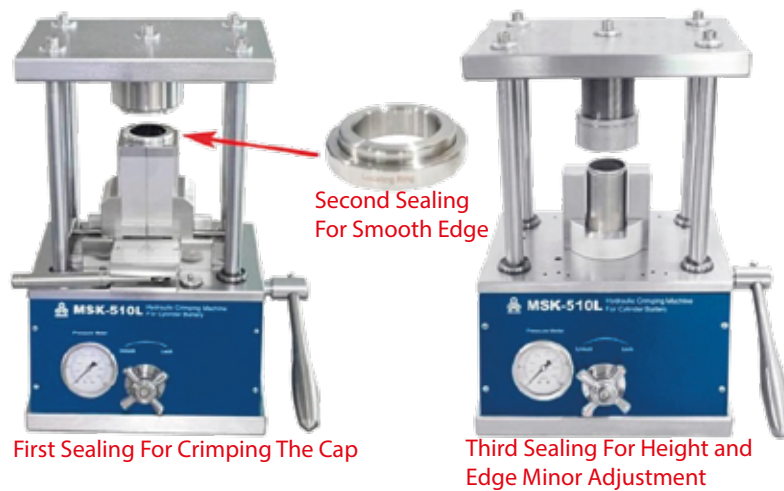
7.4. Electrolyte Injection



Automatic Precision Electrolyte Injection Station for cylindrical cells - MSK-113-A

Type of cell : Coin cell CP1254 ; Pouch cell TWS1054B ; Cylindrical cell 18650
Regular electrolyte injection : 0.1–1.8 ml/s
Microinjection : 0.02 – 20 ml/s
Injection accuracy : $\pm 0.5 \%$
Weighing accuracy : $\pm 0.01 \text{ g}$
Injection speed : $\leq 450 \text{ ml/min}$
Electrolyte dispenser : 0.3 % accuracy ; filling volume 1.8 ml/charge
Can be customized to be put in a glovebox

7.5. Crimping, Disassembling



Hydraulic Sealing Machine for Cylindrical Cases - MSK510L-4680

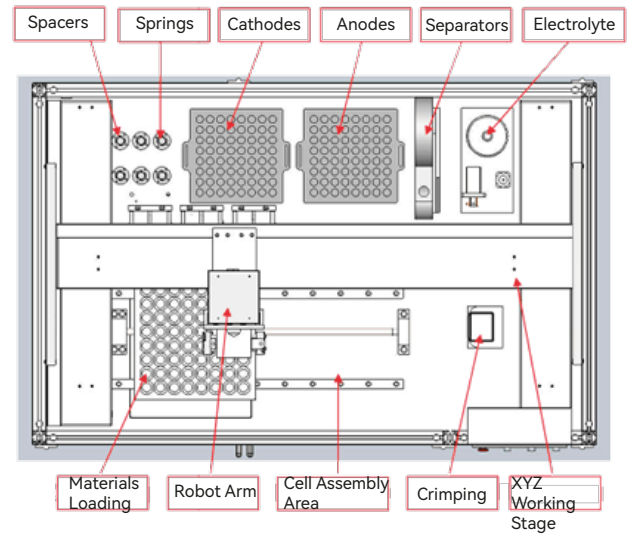
Cylindrical Cell Size : 4680 , 4695 , 46100 , 46120
Driving Force : ≤ 5 T
Standard Crimping Die : 46 mm Φ x 80 – 120 mm Length
Customization for 50100 Cylindrical cell upon request
Maximum Crimping Distance : 40 mm
Ar glove box compatible



Compact Disassembling Cutter for Cylindrical Cases - MSK- 530

Cylindrical Cell Type : 18650 (Optional for 21700, 26650, or 32650)
Slicing Motor Speed : 1000 RPM
Micrometer Accuracy : 0.05 mm
5 pcs carbide cutting blades included
Ar glove box compatible

8. High throughput equipment for cell preparation and automatic lines



High Throughput Coin Cell Assembling System Up to 64 Cells Per Hour - MSK-HTBA

- Coin Cell Type : CR2032 (Customization coin cell size upon request)
- Working Environment Temperature : 25 °C ; Accuracy : ± 3 %
- Humidity : 30 – 90 % RH
- Channels : 64 (8 x 8 layout)
- Crimping Pressure : 400 – 1200 kg
- Assembly Deviation : ± 0.5 mm
- Assembling Speed : 50 cells/hour
- Electrolyte Injection Accuracy : ± 0.001 %
- Control : Digital through PLC screen
- Tracking System is included



High Throughput Coin Cell Assembling and Crimping Machine – MSK-HT-64

- Coin Cell Type : CR2032 and coin cells with 20 mm Φ (Other coin cells are available upon request)
- Channels : 16
- 2 pcs of module tray included
- Crimping Pressure : 500 – 700 kg
- Assembly Deviation : ± 0.5mm
- Assembling Speed : 60 cells/hour
- Electrolyte Injection Accuracy : ± 0.001 %
- Ar glove box compatible

10.1. Electrochemical Testing

10.1.1. Electrochemical Testers



Micro current range tester - CT3002A

Voltage Range : 5 V
Current Range : Current 1 : 1 mA / 2 mA / 5 mA / 10 mA (Options) ; Current 2 : 10 mA / 20 mA / 50 mA / 100 mA (Options)
Working Mode : Constant current charge & discharge, constant voltage charge & discharge, constant power charge & discharge, constant resistance discharge, CC-rate, DC-rate, DCIR, Rest
Channels : 1 / 2 / 4 / 8 (Options)
Input Impedance : $\geq 1 \text{ M}\Omega$
Output : Four electrodes (Support tri-electrode test)
Voltage Accuracy : $\pm 0.05 \% \text{ FS}$
Current Accuracy : $\pm 0.05 \% \text{ FS}$
Resistance Accuracy : $\pm 0.1 \% \text{ FS}$
System Time Accuracy : $\pm 1 \text{ s}$ (No accumulated error)



Precision Battery Tester - M340A

Voltage Range : 5 V
Current : Current 1 : 100 μA ; Current 2 : 1 mA ;
Current 3 : 10 mA ; Current 4 : 100 mA
Working Mode :
HOLD/CC/CV/CCCV/CRATE/CP/CR/CPLUSE/CSLO
PE/DC/DV/DCDV/DRATE/DP/DR/DPLUSE/DSLOPE
Channels : 8
Input Impedance : $\geq 10 \text{ G}\Omega$ (Input base current $< 0.5 \text{ nA}$)
Output : Four Electrodes (Support reference electrode test)
Time Accuracy : $\leq \pm 5 \mu\text{s/s}$ (Equipment autonomous control, no communication and other time delay errors)
Minimum Step Time : 20 ms
Minimum Pulse Time : 2 ms
Voltage Accuracy : $\pm 0.01 \% \text{ FS}$
Current Accuracy : $\pm 0.01 \% \text{ FS}$

10.1.2. Auxiliary Tools



Temperature auxiliary

Input Power : $\leq 5 \text{ W}$
Input Impedance : $\geq 1 \text{ M}\Omega$
Temperature Measurement Range : $-50 \text{ }^\circ\text{C} - 200 \text{ }^\circ\text{C}$
Temperature Measurement Accuracy : $\pm 1 \text{ }^\circ\text{C}$
Sampling Time : 960 ms
Channels : 16
Noise : $\leq 50 \text{ dB}$



Pressure auxiliary

Input Power : $\leq 5 \text{ W}$
Input Impedance : $\geq 100 \text{ M}\Omega$
Voltage Measurement Range : 1.5 mV – 5 V
Voltage Measurement Accuracy : $\pm 0.03 \% \text{ FS}$
Time Of Each Channel Routing Inspection : 3 ms
Channels : 16/32 (Options)
Noise : $\leq 50 \text{ dB}$

10. Battery Analysis

10.1.3. Battery Analyzer Accessories



Coin cell clip (5A)



Alligator clip (5A-10A)



Polymer pouch cell clip (5A-10A)



Polymer pouch cell clip (20A-60A)



Tinned battery jig (100mA-60A)



Tinned battery clamp (100A-1000A)

Battery analyzer accessories

- Coin - cell clips
- Crocodile clips
- Pouch cell clips
- Cables
- Cell holders



8 layer rack



20 layer rack

10.3. Safety Testing



Hydraulic Driven Crushing Tester w/ Remote Controller for Battery Test (IEC62133 & UN38.3) - MSK-TE904

Force : 1000 N – 15 kN

Force Accuracy : $\pm 1\%$

Pressing Plate Diameter : 150 mm Φ

Crushing Speed : 1 – 100 mm/s

Chamber Size : 750 mm Width x 700mm Depth x 700 mm Height

Double-layer Anti-explosion Chamber : Inside chamber : 1.5 mm thick cold-rolled SS304 with tensile strength > 500 MPa ; Outside chamber : 1.5 mm thick annealed A3 steel with tensile strength > 400 MPa

Explosion-proof Window : 5 mm thick anti-explosion glass with double sides anti-explosion film

Maximum Measurement Space : 200 mm x 200 mm x 200 mm

Payload : ≤ 60 kg

Meet UN38.3.4.6 standard for single cell

11. Battery Recycling Equipment



Vacuum filtration kit - VF-20L

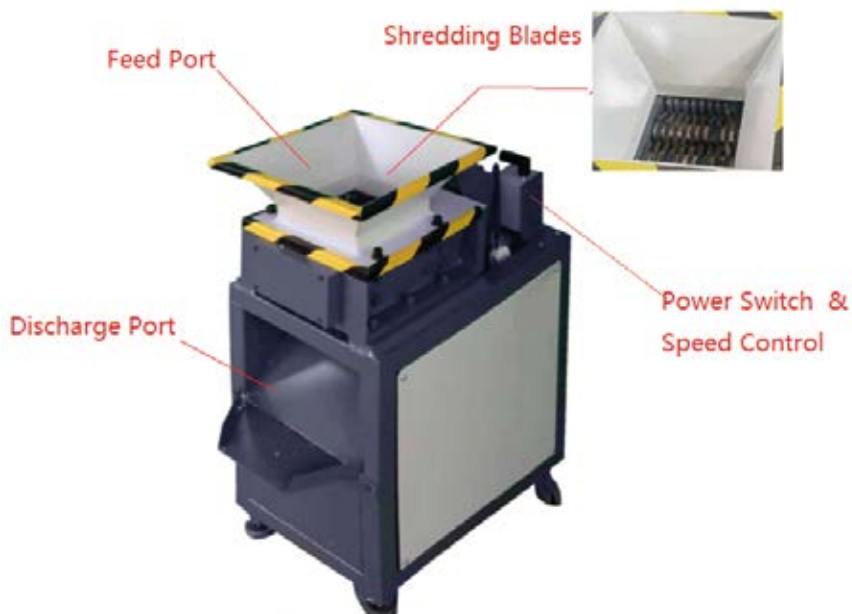
Glass Tank Capacity : 10 L
Glass Type : Borosilicate
Temperature Range : - 50 - 500 °C
Graduation Range : 2000 - 8000 ml
Oilless vacuum pump

Rotary Evaporating and Distilling system - RE-1002

Stirrer Capacity : 10 L
Collector Capacity : 5 L
Speed Range : 0 -120 RPM in both directions
Stroke (for lifting) : 150 mm
Temperature Range : RT - 99 °C by water bath ; ≤ 200 °C by oil bath
Temperature Control Accuracy : ± 0.2 °C
Evaporating Speed : Approximately 3.2 L/hour for water and 8.6 L/hour for ethanol
Oilless vacuum pump and water chiller are included



11. Battery Recycling Equipment



Heavy-duty Shredder with Speed Control for all types of Li-Ion Batteries - E-180

Types Of Waste Batteries : all
Rotating Shaft Diameter : 35 mm Φ
Rotating Speed : 0 – 25 RPM
Moment Of Torsion : 400 Nm
Blade Material : H13 tool steel (21 pcs)
Maximum Capability : 20 kg/hour for metallic materials , 100 kg/hour for plastics



Vacuum Aspiration System for liquid recovery and recycle - EQ-VAC-600

Vacuum Aspiration Rate: 1 – 15 ml/s
Vacuum Range : 0 – 450 torr
Autoclave Parts : 4 L bottle , tubing , handle , hydrophobic filter
Dimensions : 240 mm Length x 180 mm Width x 450 mm Height
Equipped level sensor for liquid overflow protection
Widely used in lapping, polishing, spin coating, dip coating and Li-ion batteries' research

Abbreviations

Gs : Gauss, a unit of magnetic flux density
RH : Relative Humidity
HMI : Human-Machine Interface
Hybrid film applicator : Doctor blade + Slot die
PP : Polypropylene
PTFE : Polytetrafluoroethylene
R2R : Roll to Roll
IR : Infrared
OD : Outside Diameter
ID : Interior Diameter
Φ : Diameter
PVD : Physical Vapor Deposition
RPM : Revolutions Per Minute, a unit of rotational speed
CNC : Computer Numerical Control
pcs : pieces
RH : Relative Humidity
CC-Rate : Charge C-Rate
DC-Rate : Discharge C-Rate
DCIR : Direct Current Internal Resistance
CC : constant Current Charge
CV : constant Voltage Charge
CCCV : constant Current constant Voltage Charge
CP : constant Power Charge
CR : constant Resistance Charge
CPLUSE : Pulse current Charge
CSLOPE : Slope current Charge
DC : constant Current Discharge
DV : constant Voltage Discharge
DP : constant Power Discharge
DR : constant Resistance Discharge
DPLUSE : Pulse current Discharge
CSLOPE : Slope current Discharge
FS : Full Scale
SOC : State Of Charge
ex : Example
RT : Room Temperature



This catalog is not exhaustive, products are constantly being updated.
For customizations, more products and information, please contact us.

Information herein is subject to change without notice.
Accessr assumes no liability for any errors that may appear in this document.



website ACCESSR

Email: contact@accessr-energy.eu

Telephone: +33 (0)5 63 76 08 67

Website: www.accessr-energy.eu

Address:

8 Av. Pierre-Gilles de Gennes

81000, Albi, France