R&D Scale Cylinder/Coin/Pouch Cell Flow-Chart with MTI's Battery Equipment

**Material Synthesis**
1. Furnace to sinter:
   - Rotary Tube Furnace with 100mm OD Quartz Tube, 1200C Max. - OTF-1200X-4-R
2. Ball mill to unify grain size:
   - Bench-Top Planetary Automatic Ball Mills with 4 Alumina Jars (4x500ml) - MSK-SFM-1

**Slurry Mixing**
Big Size:
   - Vacuum Mixer with 5L Water Cold Stainless Steel Tank and Vacuum Pump - MSK-SFM-6
Small Size:
   - Desk-Top Variable Speed Vacuum Mixer (150/500ml) with Build-in Vacuum Pump, Vibration Plate & Two Containers - MSK-SFM-7

**Coating and Drying**
Big Size:
   - Automatic Battery Electrode Coating System with Slurry Feeder, Coater, Roll (Un)Winder and Drying Oven, MSK-AFA-E300
Small Size:
   - Automatic Film Coater with Cover Heater, Vacuum Pump & Micrometer Film Applicator (110 or 220VAC) - MSK-AFA-III
**Calendering/Pressing**

Big Size:
300mm Width Pressure Controllable Electric Rolling Machine for Battery Electrodes MSK-HRP-E2300

Small Size:
Precision 4" Hot Rolling Press/Calender up to 130°C - MSK-HRP-01

---

**Slitting (For Pouch and Cylinder Cell only)**

Will be available within 1 month from MTI, Item number is MSK-T-Slitting

---

**Drying**

Bench-Top Vacuum Oven (16x13x14", 53L, 250°C) With 28 Segments Temperature Controller - EQ-DZF-6050 series

---

**18650 Cylinder Line**

- **Tab Ultrasonic Welding**
  - Desk-Top Ultrasonic Metal Welder, 40KHz, 220V - MSK-800

**Coin Cell Line**

- **Electrode Disc Cutting**
  - Precision Disc Cutter with Standard 16, 19, 20 and Optional 3-24mm Diameter Cutting Die- MSK-T-10

**Pouch Line**

- **Pouch Case Forming**
  - Pouch Cell Case/Cup Forming Machine for Aluminum-Laminated Film - MSK-120
Winding
Semi-Automatic Winding Machine for Electrodes of Cylinder Cell - MSK-112A-Cylinder

Glove Box
Large Glove Box (122Wx90Hx 76D, CN) with Gas Purification System and Digital Control - EQ-VGB-6

Electrode Die Cutting
Semi-Automatic Die Cutter of Electrodes for Stacking Pouch Cell MSK-180

Deep Welding
Precise Pneumatic Point Welding Machine for Professional Li-on Battery Research- MSK-330A

Electrolyte Injection (in glove box or dry room)
Bottletop Electrolyte Digital Dispenser with 1000mL Stainless Steel Bottle: 1-10ml adjustable -BD-10ML

Tab Ultrasonic Welding
Desk-Top Ultrasonic Metal Welder, 40KHz, 220V - MSK-800

Case Grooving
Desk-top Semi-Auto Grooving Machine for 18650 Cylinder Cell - MSK-500-18650

Coin Cell Crimping
Compact Hydraulic Crimping Machine: One for All Button Cells of CR2016, CR2025 & CR2032 and Optional Die for CR2325 or CR2450 -- MSK-110

Electrode Stacking
Semi-Automatic Stacking Machine for Pouch Cell - MSK-111A
**Glove Box**
- Large Glove Box
  - (122Wx90Hx 76D, CN)
  - with Gas Purification
  - System and Digital Control
  - EQ-VGB-6

**Heat Sealing**
- Compact Heating Sealer for
  - Sealing Pouch Cell
  - Laminated Aluminum Case-MSK-140

**Electrolyte Injection (in glove box or dry room)**
- Bottletop Electrolyte Digital Dispenser with 1000mL
- Stainless Steel Bottle: 1-10 ml adjustable -BD-10ML

**Glove Box**
- Large Glove Box
  - (122Wx90Hx 76D, CN)
  - with Gas Purification
  - System and Digital Control
  - EQ-VGB-6

**Vacuum Standing (in glove box or dry room)**
- Vacuum Standing Box for Professional Li-on Battery
- Research- MSK-170

**Electrolyte Injection (in glove box or dry room)**
- Bottletop Electrolyte Digital Dispenser with 1000mL
- Stainless Steel Bottle: 1-10 ml adjustable -BD-10ML
Case Crimping (in glove box or dry room)
- Desk-top Hydraulic Sealing
- Machine for 18650 Cylinder
- Cell MSK-510-18650

Formation
- 8 Channels Battery Analyzer (6-3000mA, up to 5V) with
- Laptop and Software for
- R&D all Rechargeable Cells
- BST8-3

Vacuum Standing (in glove box or dry room)
- Vacuum Standing Box for
- Professional Li-on Battery
- Research - MSK-170

Vacuum Heat Sealing (Primary Sealing)
- Compact Vacuum Sealer for
- Preparing Polymer Li-Ion
- Cell - MSK-115A

Formation
- 8 Channels Battery Analyzer (6-3000mA, up to 5V) with
- Laptop and Software for
- R&D all Rechargeable Cells
- BST8-3
**Vacuum Heat Sealing (Final Sealing)**

- Compact Vacuum Sealer for Preparing Polymer Li-Ion Cell - MSK-115A

---

**Testing**

8 Channels Battery Analyzer (6-3000mA, up to 5V) with Laptop and Software for R&D all Rechargeable Cells - BST8-3

---

**Note:**

Battery consumables like coin/cylinder cell case or pouch cell case material are not included in above flow-chart, please visit [http://www.mtiixtl.com/batterycapacitorequipment.aspx](http://www.mtiixtl.com/batterycapacitorequipment.aspx)

Both the products and fabrication process from MTI are subject to change without notice, please visit our website for the update; if you have any questions, please call us at 1-510-525-3070 or email to info@mtixtl.com.