

# Creating a Battery Cell

A guide to R & D equipment for  
Pilot line set ups



# R&D Scale Cylinder / Coin / Pouch Cell Flow Chart

The below listing is a step-by-step guide of how to produce a Li-ion Battery Cell using MTI Corp equipment & materials.  
The equipment indicated has various sizes and specifications, therefore it can be customised to meet your requirements.



# R&D Scale Cylinder / Coin / Pouch Cell Flow Chart

## Calendering/ Pressing

### Option 1 (Large Size)

MTI product: [12" Width x 8"Dia. Pressure Controlled Electric Rolling Machine \(Calender\) for Battery Electrodes - MSK-E2300A](#)



### Option 2 (Small Size)

MTI product: [100°C Max. 4" Width Electric Hot Rolling Press with Variable Speed \( Ar Gas Compatible\) - MSK-HRP-01](#)



## CYLINDER CELL (18650) LINE



## COIN CELL LINE



## POUCH CELL LINE

## Slitting

MTI product: [Roll to Roll Edge Slitting Machine \(Max.300mm W\) for Single Strip of Cylindrical/Pouch Battery - MSK-540](#)



## Slitting

MTI product: [Roll to Roll Edge Slitting Machine \(Max.300mm W\) for Single Strip of Cylindrical/Pouch Battery - MSK-540](#)



# R&D Scale Cylinder / Coin / Pouch Cell Flow Chart

**MTI product:** [NRTL Certified 53L 200°C Vacuum Oven](#) (16.3x13.6x14.7", 1.9 Cu-Ft) with [Digital Temperature Controller - DZF-6050-ETL](#)



## Drying

CYLINDER CELL (18650)

COIN CELL LINE

POUCH CELL LINE

## Winding

**MTI product:** [Manual Winding Machine for Electrodes of Pouch Cell - MSK-112A-P](#)



## Electrode Disc Cutting

**MTI product:** [Precision Disc Cutter with Standard 16, 19, 20mm Dia. Cutting Die and 3 – 24 mm Dia. Optional Die – MSK-T-10](#)



## Pouch Case Forming

**MTI product:** [Pouch Cell Case/Cup Forming Machine for Aluminum-Laminated Films with Optional Die - MSK-120](#)



## Tab Ultrasonic Welding

**MTI product:** [Desk-Top 800W Ultrasonic Metal Welder \( Tabbing \) with TouchScreen Digital Controller, 40KHz MSK-800W](#)



## Glove Box

**MTI product:** [Glove Box with H2O & O2 Purification System and Openable Front Window – EQ-VGB-60P-LD](#)



## Electrode Die Cutting

**MTI product:** [Compact Pneumatic Electrode Die Cutter for Pouch Cell – MSK-180S](#)



# R&D Scale Cylinder / Coin / Pouch Cell Flow Chart

## CYLINDER CELL (18650)

## COIN CELL LINE

## POUCH CELL LINE

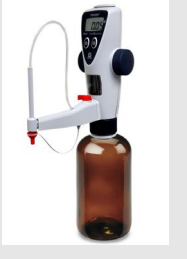
### Deep Welding

**MTI product:** [Single Point Pneumatic Welding Machine for Cylinder Cell Assembling](#) - MSK-330A



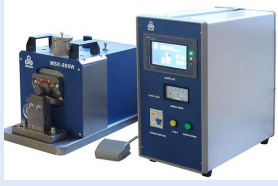
### Electrolyte Injection (within glove box or dry room)

**MTI product:** [Automatic Digital Bottle Dispenser with one 32 Oz Glass Bottle for 0 – 50 mL Electrolyte](#) – BD-50ML-LD



### Tab Ultrasonic Welding

**MTI product:** [Desk-Top 800W Ultrasonic Metal Welder \(Tabbing\) with TouchScreen Digital Controller, 40KHz MSK-800W](#)



### Case Grooving

**MTI product:** [Desk-top Semi-Auto Grooving Machine for Various Cylinder Cell](#) - MSK-500 Series



### Coin Cell Crimping

**MTI product:** [Hydraulic Crimper for All Types of Coin Cells with 100 Pcs CR2032 Case](#) (use outside glovebox) - MSK-110



### Electrode Stacking

**MTI product:** [Manual Stacking Machine for Layer by Layer Pouch Cell](#) - MSK-111A



### Glove Box

**MTI product:** [Glove Box with H2O & O2 Purification System and Openable Front Window](#) – EQ-VGB-6OP-LD



### Heat Sealing

**MTI product:** [Compact Heating Sealer for Sealing Laminated Aluminum Case of Pouch Cells 3.2 mm Sealing width](#) MSK-140



# R&D Scale Cylinder / Coin / Pouch Cell Flow Chart

## CYLINDER CELL (18650)

### Electrolyte Injection (within glove box or dry room)

MTI product: [Automatic Digital Bottle Dispenser with one 32 Oz Glass Bottle for 0 – 50 mL Electrolyte – BD-50ML-LD](#)



### Vacuum Standing (within glove box or dry room)

MTI product: [Electrolyte Diffusion & Degassing Chamber for Professional Li-on Battery Research - MSK-170](#)



### Case Crimping (within glove box or dry room)

MTI product: [Hydraulic Crimping Machine for Cylindrical Cases \(Optional: 32650, 26650, 21700, 18650, CR123, AA, AAA etc\) - MSK-510M series](#)



## COIN CELL LINE

## POUCH CELL LINE

### Glove Box

MTI product: [Glove Box with H2O & O2 Purification System and Openable Front Window – EQ-VGB-60P-LD](#)



### Electrolyte Injection (within glove box or dry room)

MTI product: [Automatic Digital Bottle Dispenser with one 32 Oz Glass Bottle for 0 – 50 mL Electrolyte – BD-50ML-LD](#)



### OPTIONAL: Vacuum Standing/Degassing (within glove box or dry room)

MTI product: [Electrolyte Diffusion & Degassing Chamber for Professional Li-on Battery Research - MSK-170](#)





# R&D Scale Cylinder / Coin / Pouch Cell Flow Chart

**CYLINDER CELL (18650)**

**COIN CELL LINE**

**POUCH CELL LINE**

**MTI product:** [8 Channel Battery Analyzer \(0.002 mA- 1 mA, up to 5V\) with Adjustable Cell Holder and Laptop & Software – BST8-WA](#)



**Testing**

**Vacuum Heat Sealing (Primary Sealing)**

**MTI product:** [Compact Vacuum Sealer for Preparing Pouch Cell with Optional Stack-Up or Split Configuration - MSK-115A](#)



**Formation/Testing**

**MTI product:** [8 Channel Battery Analyzer \(0.002 mA- 1 mA, up to 5V\) with Adjustable Cell Holder and Laptop & Software – BST8-WA](#)



**Vacuum Heat Sealing (Final Sealing)**

**MTI product:** [Compact Vacuum Sealer for Preparing Pouch Cell with Optional Stack-Up or Split Configuration - MSK-115A](#)



All consumables & materials are available e.g. Films & Foils, Tabs, Battery Powders, Li Discs, Cell Cases

**MTI product:** [Pouch Cell Consumables & Materials](#)





# How To Create a Coin Cell

**A step-by-step guide of how to produce a  
Li-ion Battery Coin Cell  
using MTI Corp Equipment & Materials**





# Li-ion Coin Cell Fabrication & Equipment Flow Chart

The below listing is a step-by-step guide of how to produce a Li-ion Coin Cell using MTI Corp equipment & materials. The equipment indicated has various sizes and specifications, therefore can be customised to meet your requirements.



## PROCESS 1: Electrode Sheet Preparation



# Li-ion Coin Cell Fabrication & Equipment Flow Chart

## PROCESS 2: Cell Assembly

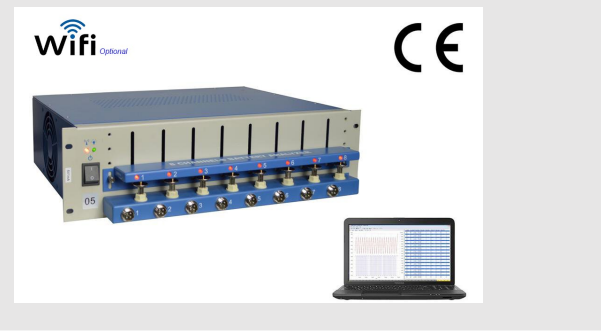


# Li-ion Coin Cell Fabrication & Equipment Flow Chart

## PROCESS 3: Battery Testing

**Step 12:** Battery Analyzer to test the coin cell's performance

MTI product: [8 Channel Battery Analyzer \(0.002 mA- 1 mA, up to 5V\) with Adjustable Cell Holder and Laptop & Software – BST8-WA](#)



**Step 12a (Optional):** Battery Resistance Tester to measure battery's internal resistance

MTI product: [Internal AC Resistance Tester for All Batteries \(AC@1KHZ, 1 - 3999 m-ohm\) - EQ-MSK-BK300](#)





# How To Create a Pouch Cell

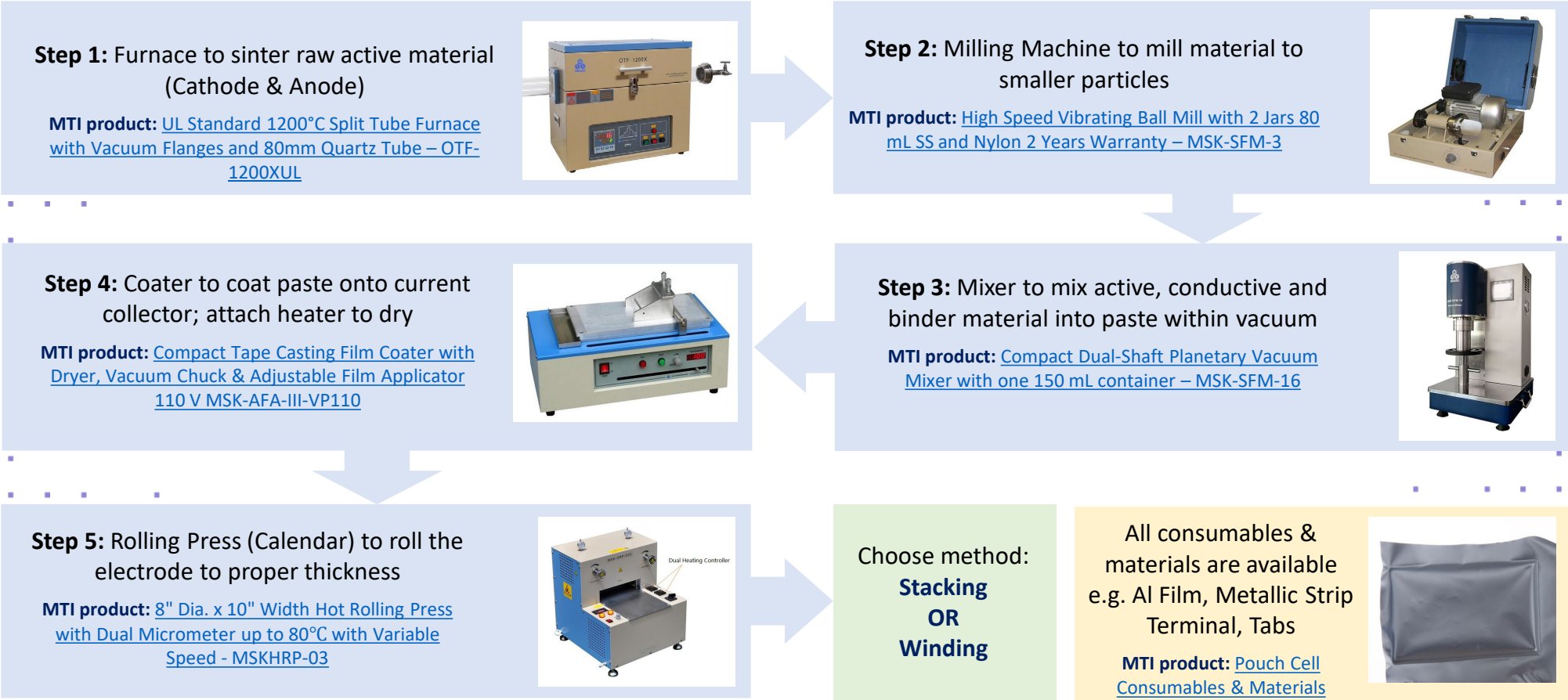
**A step-by-step guide of how to produce a Li-ion Battery Pouch Cell using MTI Corp Equipment & Materials**



# Li-ion Pouch Cell Fabrication & Equipment Flow Chart

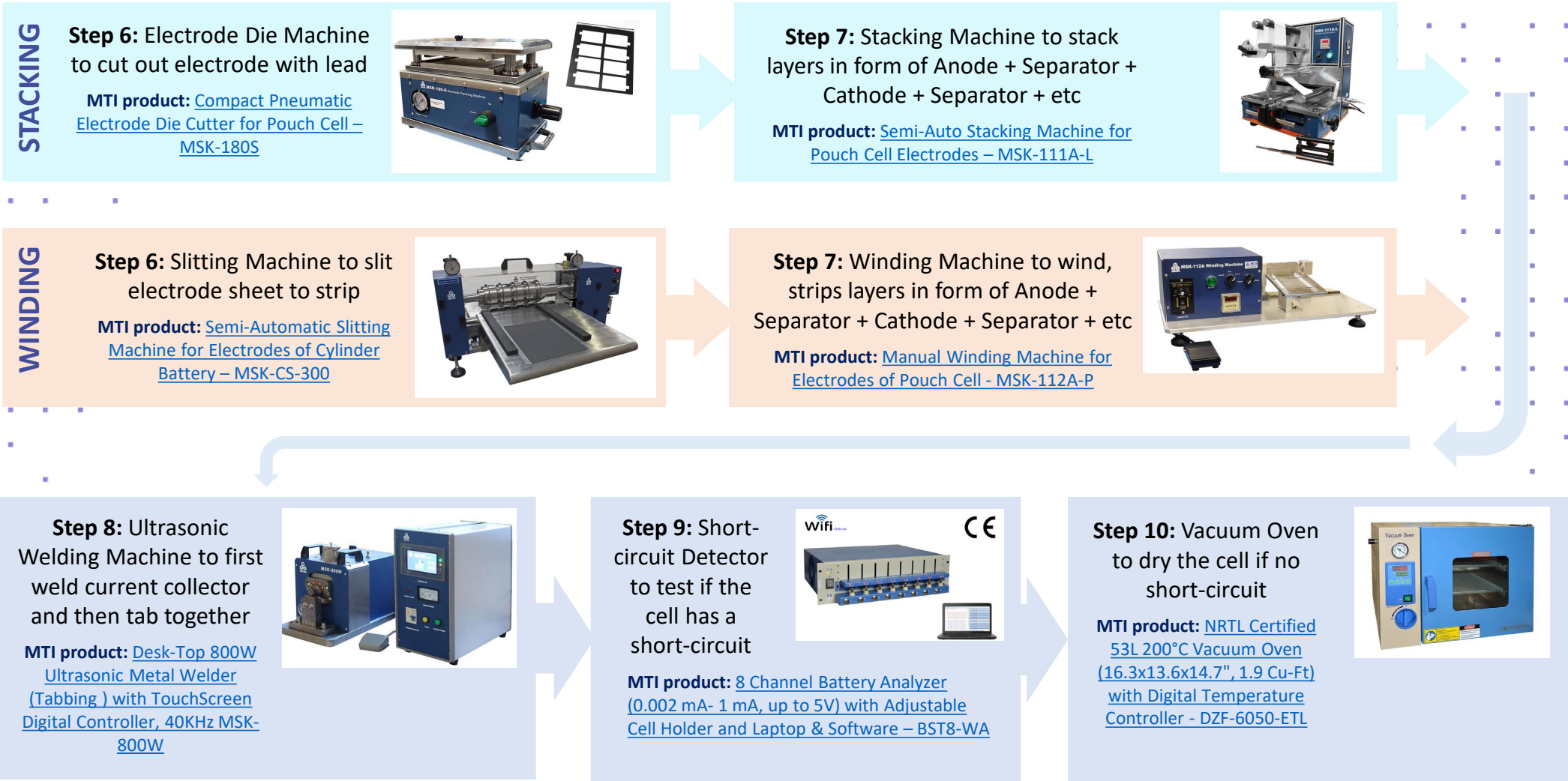
The below listing is a step-by-step guide of how to produce a Li-ion Pouch Cell using MTI Corp equipment & materials. The equipment indicated has various sizes and specifications, therefore can be customised to meet your requirements.

## PROCESS 1: Electrode Sheet Preparation



# Li-ion Pouch Cell Fabrication & Equipment Flow Chart

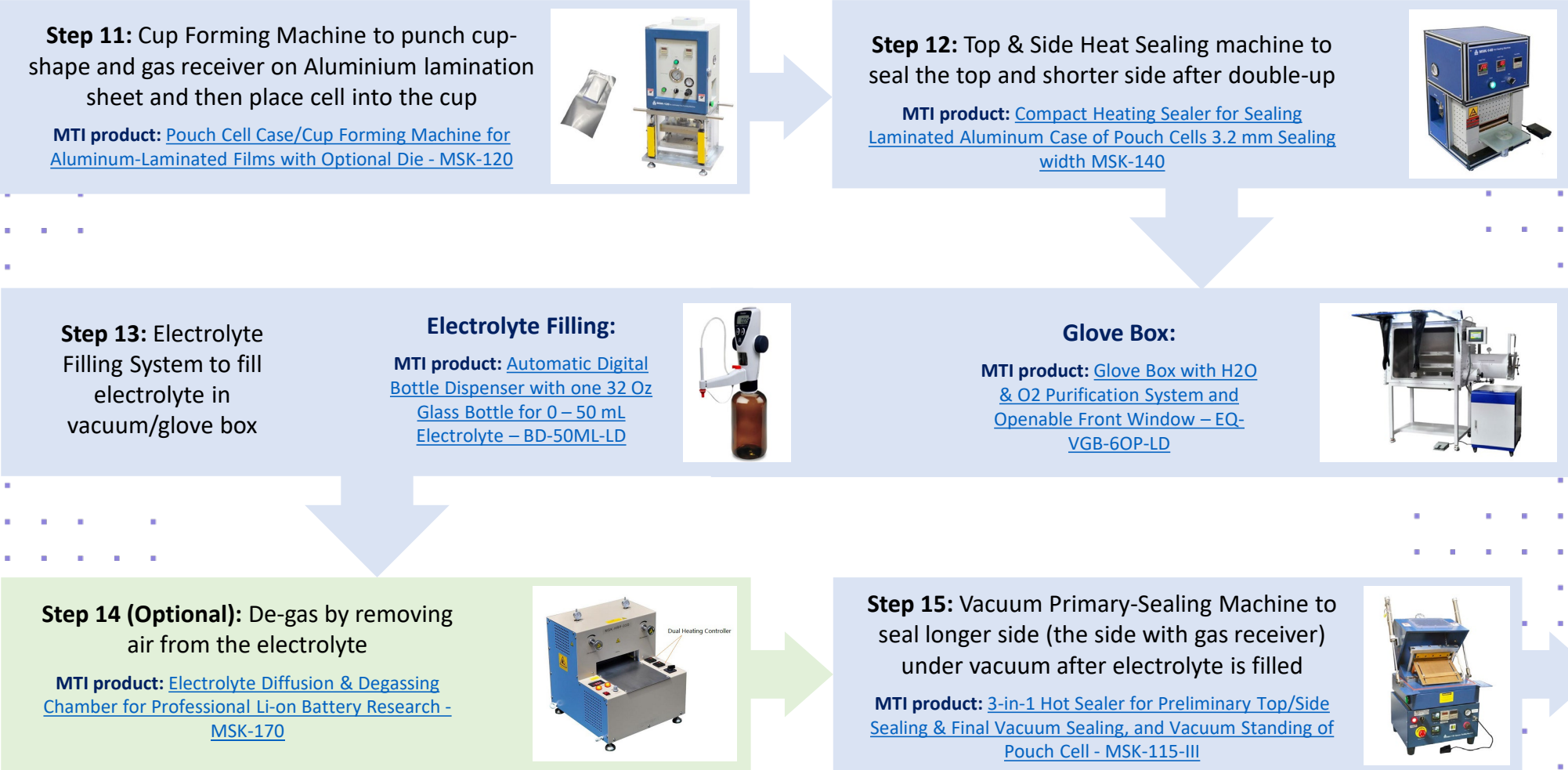
## PROCESS 2: Cell Assembly





# Li-ion Pouch Cell Fabrication & Equipment Flow Chart

## PROCESS 3: Case Formation & Sealing



# Li-ion Pouch Cell Fabrication & Equipment Flow Chart

## Step 16: Battery Analyzer *(Analyzer as per Step 9)*

to Charge/Discharge the cell for battery formation and drive the unnecessary gas caused by electrode chemical reaction into gas receiver. *(A clamp may be applied on the battery to drive gas)*

**MTI product:** [8 Channel Battery Analyzer \(0.002 mA- 1 mA, up to 5V\) with Adjustable Cell Holder and Laptop & Software – BST8-WA](#)



**Step 17: Cutting off the gas receiver and Vacuum Sealing Machine for final sealing on the cutting edge under vacuum conditions within glove box** *(Sealer as per Step 15 & Glove Box as per Step 13)*

**MTI product:** [3-in-1 Hot Sealer for Preliminary Top/Side Sealing & Final Vacuum Sealing, and Vacuum Standing of Pouch Cell - MSK-115-III](#)



## PROCESS 4: Battery Testing

**Step 19a (Optional): Battery Resistance Tester to measure battery's internal resistance**

**MTI product:** [Internal AC Resistance Tester for All Batteries \(AC@1KHZ, 1 - 3999 m-ohm\) - EQ-MSK-BK300](#)



**Step 19: Battery Analyzer to test the coin cell's performance** *(Analyzer as per Step 9)*

**MTI product:** [8 Channel Battery Analyzer \(0.002 mA- 1 mA, up to 5V\) with Adjustable Cell Holder and Laptop & Software – BST8-WA](#)



**Step 18 (Optional): Trim pouch cell case to shape**

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