

Semi Automatic Z Fold Stacking Machine For Prismatic Lithium Ion Battery Cells

Item Number: FX04



Introduction

Semi automatic Z fold stacking machine for prismatic lithium ion battery cells delivers controlled separator handling, precise electrode alignment, defect prevention, and reliable cell transfer for demanding power battery production.

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Application	Description	Key Benefit
Prismatic power battery pilot production	Builds Z-fold electrode and separator assemblies for rectangular lithium-ion power cells within the supported cell dimensions.	Enables controlled transition from electrode-sheet preparation to assembled cell stacks.
Battery R&D cell prototyping	Supports development teams evaluating electrode sizes, separator materials, layer counts, and same-side tab configurations.	Adjustable layer count within the thickness range supports process experimentation.
Electrode and separator process validation	Repeats controlled unwinding, tensioning, web correction, pickup, secondary positioning, and pressing operations.	Provides defined alignment targets for evaluating stack-formation capability.
Quality-focused cell assembly	Applies air blowing, brush separation, handler shaking, and dust extraction at critical material-handling locations.	Helps control multiple-sheet pickup, missed sheets, and dust during assembly.
Scale-up from manual stacking	Integrates electrode pickup, positioning, separator shifting, pressing, cutting, and transfer into one equipment sequence.	Reduces dependence on fully manual layer placement while retaining operator tape application and cell removal.
Battery manufacturing process engineering	Allows teams to assess cycle timing, separator wrap allowance, manual tail handling, and transfer workflow for a defined cell format.	Makes operational interfaces and machine-controlled process steps clear for line planning.
Materials research laboratories	Assembles multilayer cells using electrode sheets and separator rolls that meet the stated incoming-material requirements.	Supports repeatable stacking studies across compatible sheet and separator dimensions.

Parameter	Specification
Site-facing identifier	FX04
Stacking method	Z-fold stacking
Applicable cell type	Prismatic lithium-ion power battery cell
Separator feed	Motor-driven active unwinding
Separator process controls	Tension control and web correction throughout the process
Electrode pickup	Vacuum-cup handling mechanism picks positive and negative electrode sheets from material boxes
Electrode positioning	Secondary positioning platform before stacking
Pressing arrangement	Four pressing-blade mechanisms with cross action
Blade retraction function	Blade lifts slightly before withdrawal to disengage from electrode sheet and prevent pulling damage
Multiple-sheet and missed-sheet controls	Material-box air blowing, sheet-separating brushes, external vacuum-cup handler shaking action
Dust extraction	Installed at material boxes and secondary positioning station

Parameter	Specification
Stacking completion	Separator cutting followed by cell transfer from stacking platform
Post-stack handling	Manual tape application and manual cell removal
Next-cell operation	Automatic stacking of the next cell begins while post-stack handling is performed
Separator outer wrap	Machine reserves separator during empty stacking; manual tail winding and manual tape application
Stacking speed	1.3-1.6 s/pcs
Auxiliary time	≤ 15 s
Electrode-to-separator alignment accuracy	Center deviation $\leq \pm 0.4$ mm
Separator end-face alignment accuracy	$\leq \pm 0.3$ mm
Adjacent electrode alignment accuracy	$\leq \pm 0.2$ mm
Overall electrode alignment accuracy	$\leq \pm 0.3$ mm
Stack layer count	Settable within the applicable thickness range
Qualified rate	$\geq 98\%$ (defects caused by this equipment only)
Availability	$\geq 95\%$ (failures caused by this equipment only)
Power	2 kW

Material	Incoming form	Length (mm)	Width (mm)	Thickness (mm)	Inner diameter (mm)	Maximum outer diameter (mm)
Electrode sheet	Sheet	50-150	30-90	0.07-0.25	----	----
Electrode tab	----	8-20	8-20	----	----	----
Separator	Roll	----	50-200	0.02-0.04	phi76.2	phi300

Cell parameter	Specification
Thickness H (mm)	5-20
Width W (mm)	30-90
Length L (mm)	50-150
Tab length Q (mm)	$Q \leq 20$
Tab width (mm)	≤ 20
Tab direction	Same side

Requirement	Specification
Electrode length definition	Dimension in the electrode-tab direction, excluding tab length
Electrode powder shedding	No obvious powder shedding
Electrode edge condition	No obvious wavy edge
Burr perpendicular to electrode direction	Less than 15 μ m
Die-cutting error	Less than 0.2 mm
Electrode flatness and deformation	Incoming electrodes shall have no obvious warpage or deformation
Electrode adhesion	Incoming electrodes shall have no obvious adhesion
Separator serpentine bending error	± 0.2 mm/1000 mm