

FORMING THE FUTURE



TURNKEY SOLUTIONS FOR EFFICIENT BATTERY CELL ASSEMBLY

Equipment for Gigafactory Battery Production

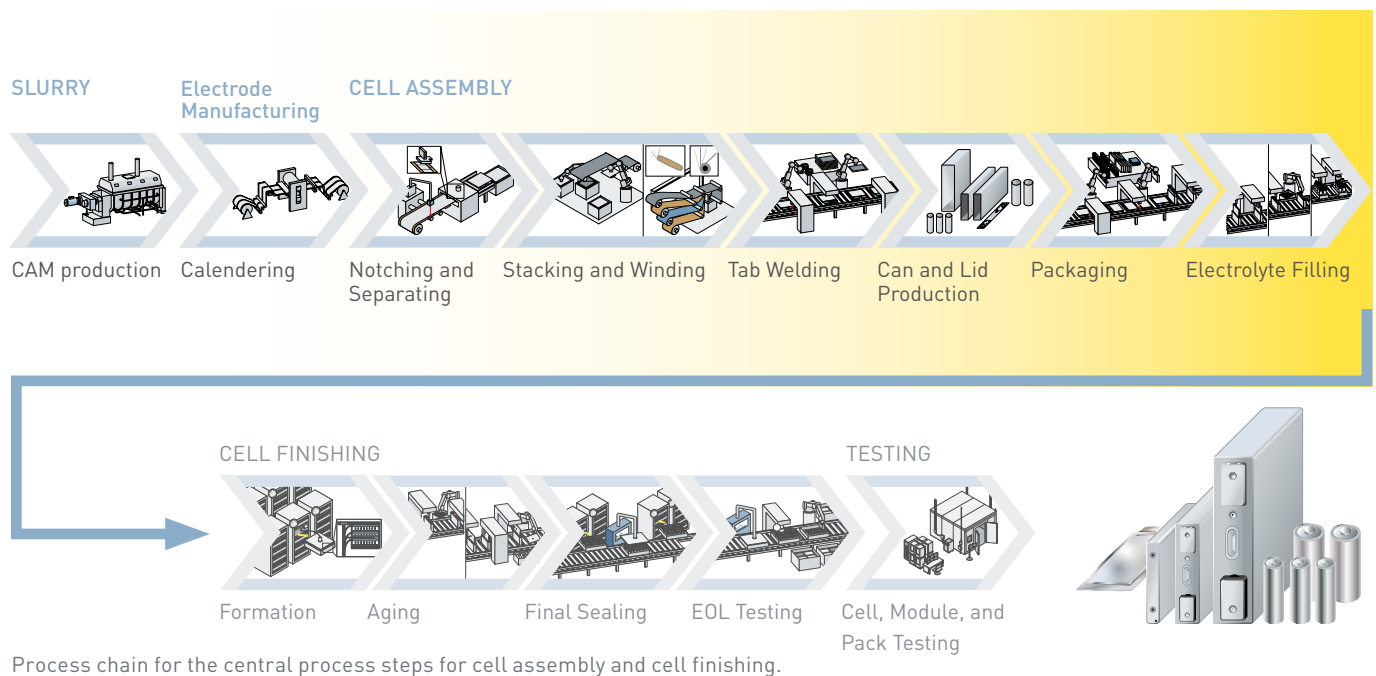
SCHULER 

Member of the ANDRITZ GROUP

BATTERY TECHNOLOGY.

SOLUTIONS FOR EFFICIENT BATTERY PRODUCTION.

For decades now, ANDRITZ has been supplying car manufacturers all over the world with fully automated press lines for the production of body and structural parts for vehicles. Its experience in handling major projects in the industry is correspondingly extensive. Thanks to more than 280 locations in over 80 countries worldwide, proximity to the customer is always guaranteed.



Process chain for the central process steps for cell assembly and cell finishing.

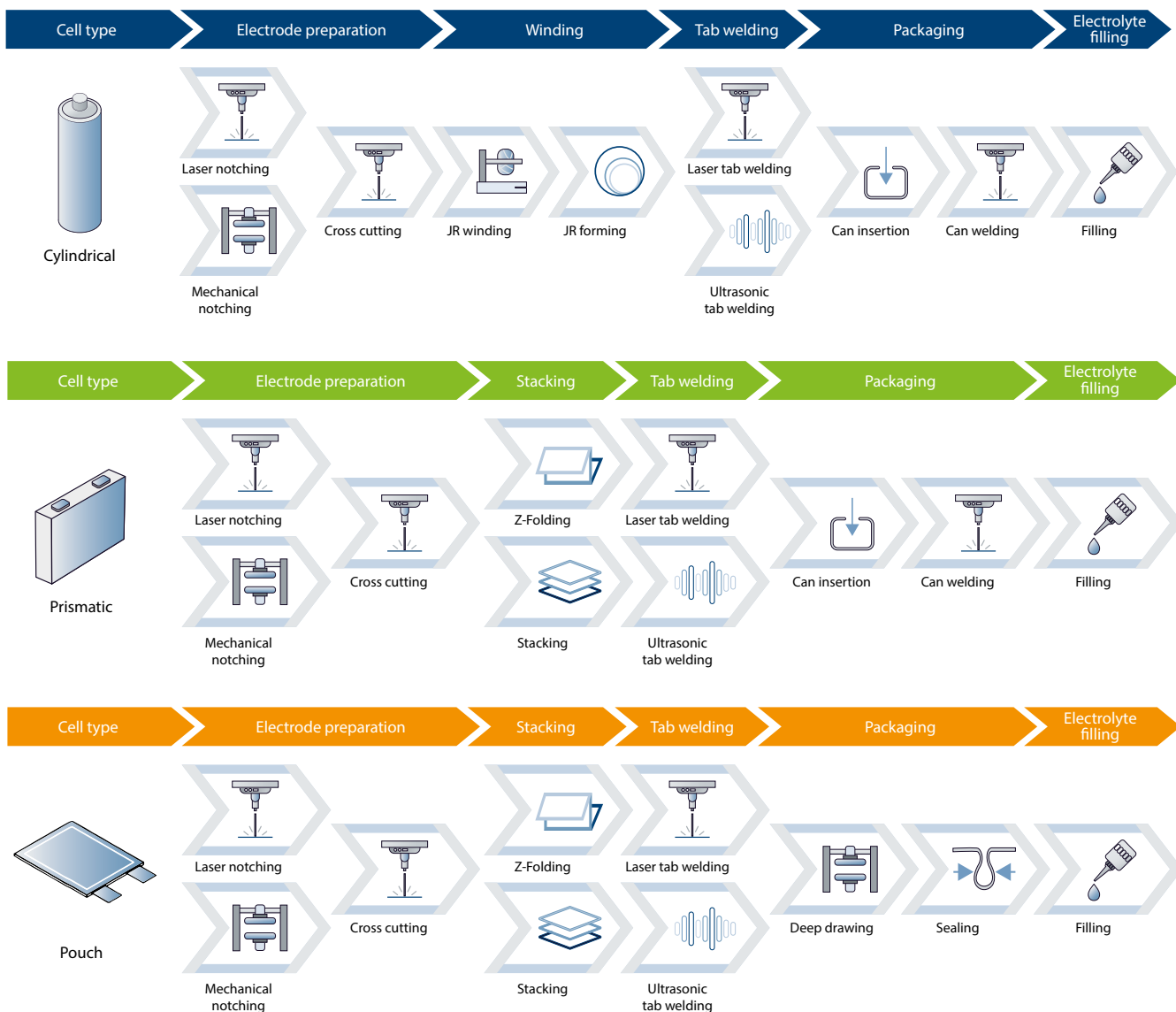
ANDRITZ can also act as a general contractor for battery cell production plants and also draws on its extensive expertise in equipping large-scale plants for the production of pulp or electricity from hydropower. With almost 30,000 employees, ANDRITZ's incoming orders topped the 8.5 billion Euro mark.

ANDRITZ extended its existing product portfolio in the area of battery cell manufacturing.

Beside lab and pilot equipment for lithium-ion batteries as well as future battery generations such as all solid-state batteries, ANDRITZ offers turnkey equipment for gigafactories for battery cell assembly and cell finishing.

EFFICIENT AND RELIABLE BATTERY CELL ASSEMBLY. ANDRITZ: YOUR PARTNER FOR THE ENTIRE PROCESS.

ANDRITZ, with its diverse brands, is a reliable partner for the entire cell assembly process. ANDRITZ offers solutions for all process steps, independent of the cell format. ANDRITZ's expertise makes it possible to meet the challenging requirements of cell manufacturers and to design processes efficiently and reliably.



INNOVATIVE ELECTRODE MANUFACTURING. ANDRITZ CELLCAL BATTERY CALENDER.

ANDRITZ has developed a new calendering concept to overcome the current process limitations. The new calender offers an even load distribution at the calender nip resulting in very good thickness evenness in the product at a width of up to 2,000 mm.



Andritz CellCal calender.

ANDRITZ.

ANDRITZ is a leading supplier for state-of-the-art deflection-controlled calenders within the paper, nonwoven, textile, and special application industries.

ANDRITZ CELLCAL CALENDER.

With its vast expertise and more than 75 years of experience, ANDRITZ has now developed an innovative calender for electrode manufacturing for batteries: the ANDRITZ CellCal calender. This new development offers an even load distribution at the calender nip resulting in very good thickness evenness.

PRODUCT QUALITY

Thickness uniformity, length direction	±1.5 µm
Thickness uniformity, cross direction	±3.0 µm

TECHNICAL FEATURES

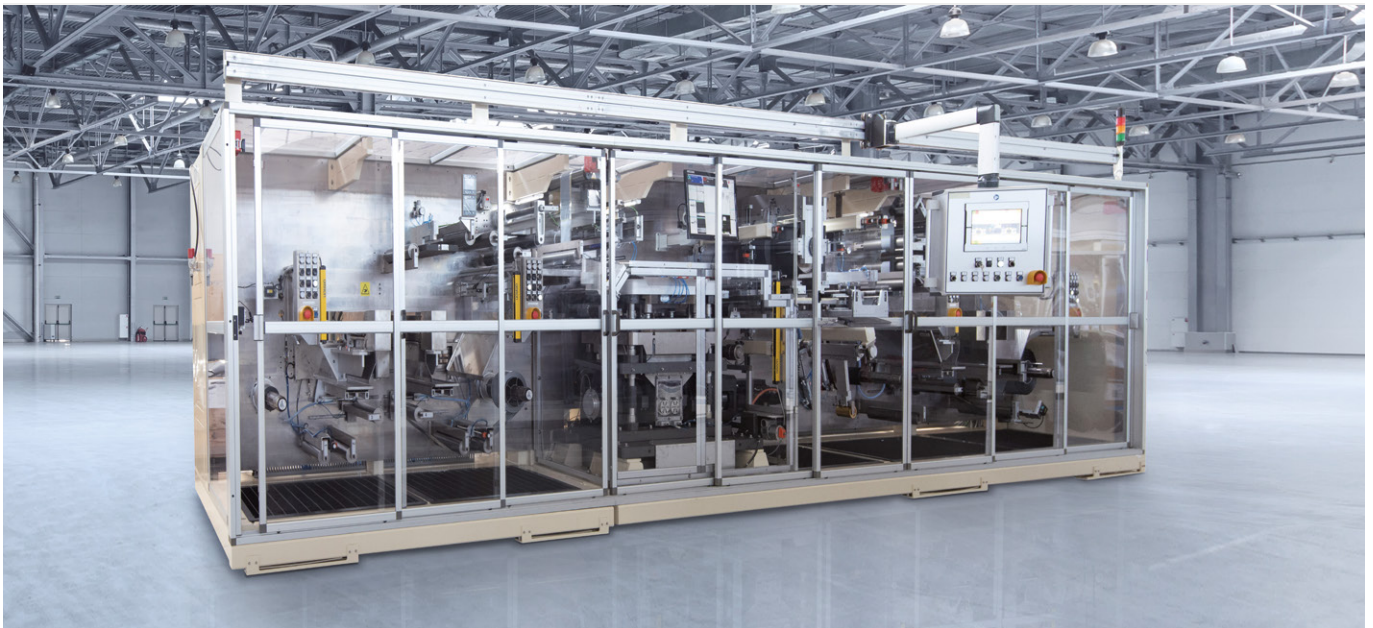
Product width [mm]	up to 2,000
Speed [m/min]	up to 120
Line force [N/mm]	up to 3,500 (higher line force on request)
Roll surface temperature	up to 160 °C
Accuracy of roll temperature	±1°C

BENEFITS

- Even load distribution over the full width
- Stable product quality due to repeatable production conditions and product quality
- Implemented anti-wrinkling solutions
- Gap control by control loop with thickness scanner
- Easy and quick roll change – higher uptimes
- Self-aligning roll bending cylinder design
- Improved temperature distribution results in improved product quality and thickness evenness

INTRODUCING THE NEXT GENERATION: ANDRITZ NOTCHING MACHINES.

High-precision laser notching and punching with modular connectivity for seamless integration.



Roll to roll notcher.

NOTCHING MACHINE.

We are proud to present the next generation of our notching machine, which is now available on the market as a laser notching and punching machine.

All quality and process parameters are measured and adjusted inline using high-precision vision inspection systems, resulting in outstanding cutting quality at high web speeds.

Thanks to the modular machine concept, connection to the downstream processes is possible both as roll to roll and roll to sheet.

ANDRITZ NOTCHING TECHNOLOGY.

PRECISION AND FLEXIBILITY.

Modular design, high web speeds, and customizable options for optimal production efficiency.

TECHNICAL PARAMETERS

General data

Process type	R2R/R2Sheet
Technology	Laser or mechanical
Amount of laser source [#]	1 - 2
Web speed [m/min]	90-120 anode/60-90 cathode
OEE [%]	> 90
CPk value for all requirements according to the drawing needs to be reached	> 1.33 - > 1.67
Dew point	-60° C
Noise level [dBA]	< 75
Clean room	ISO 6/ISO 7

Unwinder

Web width [mm]	0-350/0-650
Core I/D	3-6"
Coil diameter [mm]	up to 850
Web tension	adjustable on HMI
Loading interface	AGV or manually

Laser notching process

Type	single strip/double strip
Laser source	Nano/Pico
Laser power [W max/medium]	Nano 500-1,000/Pico 200

Rewinder / Magazine

Reels [#]	2/4
Magazines	1-n

Footprint machine

Machine length [mm] [depending – single/double strip]	11,000/15,000
Machine web width [mm]	0-350 web/0-650
Machine height [mm]	2,000

CUSTOMER SPECIFIC OPTIONS

- End of roll label sensor
- Sensors to detect roll diameter
- Web breakage detection
- Adjustable web tension unit – Dancer Roll System (to measure, control and stabilize tension automatically), closed loop system
- Front + back label detection sensors (DMC reader)
- Top and bottom cleaning unit (iron + coating particles)
- Splicing detection
- Fully/semi-automatic splicing
- Coating vision for edge position control
- Adjustable edge guiding table
- Tab vision control
- Electrode vision control on top and bottom side
- Marking unit

BENEFITS

- Modular concept
- Automated loading
- High web speed
- Autosplicing/semi-automated splicing unit
- Fullcut solution with roll to sheet
- Small footprint
- Slitting unit

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Schuler offers customized cutting-edge technology in all areas of forming – from the networked press to press shop planning. In addition to presses, our products include automation, dies, process know-how and service for the entire metalworking industry. Within the Metris platform by ANDRITZ, Schuler brings together digital solutions for networking forming technology and develops them continuously to further improve line productivity and availability. For battery production in gigafactories, Schuler provides equipment and services in the process steps of cell assembly and formation. Our customers include automotive manufacturers and suppliers, as well as companies in the forging, household appliance and electrical industries. Presses from the Schuler Group mint coins for more than 180 countries. Founded in 1839 at our headquarters in Göppingen, Germany, Schuler has approx. 5,000 employees at production sites in Europe, China and the Americas, as well as service companies in more than 40 countries. The company is part of the international technology group ANDRITZ.



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