



**ANDRITZ  
SCHULER**

# DEFENSE PRODUCTS



**ANDRITZ**



**FORGING LINE FOR SHELL PRODUCTION**

# Ammunition.



Shells D= 90/ 105/ 120/ 155mm and cartridges

## FORGING LINE FOR SHELL PRODUCTION

ANDRITZ Schuler accompanies you from the parts development phase to final manufacturing – and beyond.

As a global market leader in the field of Forging Lines, ANDRITZ Schuler possesses unique knowledge of the entire process chain.

## TURN-KEY SOLUTIONS FROM A SINGLE SOURCE

In-house process development and know-how

- for an optimized order process
- department for forging tool development
- simulation with continuous development and improvement

## PRODUCT DEVELOPMENT AND LAUNCH

- ANDRITZ Schuler remains on the construction site beyond installation and commissioning
- Support of incorporation of the dies and the system as a system supplier until good parts are produced.
- General Contractor – Project Responsibility by ANDRITZ Schuler

## YOUR BENEFITS

- Turnkey lines from a single source, including post-processing solutions
- Efficient manufacturing of high-quality components through advanced shell forming processes and specialized tooling knowledge
- End-to-end process and product assistance delivered by a team deeply skilled in shell manufacturing techniques
- Short delivery times and fast production of good parts, with proof from internationally renowned references

## ANDRITZ SCHULER CAPABILITIES

Benefit from our extensive experience in process engineering, press design, and die engineering and fully equipped automated forging-line we've got you covered:

- Take advantage of our advanced process expertise for efficient manufacturing solutions.
- Leverage our sophisticated process development to transform our capabilities into your success.



Forging line and nosing line for shell production

## PRODUCT PORTFOLIO: TURN-KEY MANUFACTURING LINE FOR 90-155MM SHELLS

- Shell production line from billet to forged shells
- In-House Engineering for die technology
- Nosing Line can be offered optionally
- Flexible Line Design to customers' requirements
- Machining of the shells
- Heat treatment
- Autonomous connection of the cells including smart buffer system



**VACUUM ISOTHERMAL FORGING PRESS**  
MH 2000 with removable furnace chamber

# Aerospace Systems.



6,300 kN Isothermal forming press

## HIGH DEFORMATION DEGREE WITH ISOTHERMAL FORMING

- Die and workpiece have the same, constant temperature throughout the isothermal forming process.
- Complex geometries with high dimensional accuracy can be manufactured, and parts with high degrees of deformation are feasible.

## PRECISE FORMING OF HIGH-PERFORMANCE LIGHT-WEIGHT MATERIALS

Light-weight materials such as titanium, aluminum, inconel and nickel-based alloys, magnesium and increasingly titanium-aluminide can be formed with a high degree of deformation and free of residual stress.



Compressor blade, disk and blisk for jet engine



Engine in action

## YOUR BENEFITS

- Turnkey delivery including isothermal vacuum system, optionally removable
- High-precision and variable control of slide speed and slide force, also at extreme eccentric loads
- Dynamic force control with high energy efficiency
- Active parallelism closed loop control
- Precise temperature control

## SPECIAL BENEFITS FOR VACUUM ISOTHERMAL FORGING

- Various sizes with press force up to 200 MN and more
- Vacuum atmosphere reduces or prevents the formation of oxides on the surface
- Improved surface quality and reduction of post-processing steps such as descaling



**CLOSED-DIE FORGING PRESS**

MH 30000

# Aerospace.



Bulkhead F35



Landing gear



MH 3000 multifunctional press for variety of uses



Closed die forging

Ring preform forging

Extrusion closed die forging

Upsetting planishing, open die forging

Multifunctional presses - high flexibility for different part families



Large closed die press MH 14000

## LARGE CLOSED DIE PRESSES

Hydraulic forging presses set new benchmarks for industrial forging performance. Engineered for outstanding force and extended travel distances, these machines excel in the most demanding environments. Capable of delivering up to 550 MN of force and more, each press is built to handle specialized applications where strength and precision are non-negotiable, with a working travel of several metres. Renowned for their power, reliability, and versatility, hydraulic forging presses are the top choice for industries seeking unparalleled efficiency and quality in high-performance forging.

### YOUR BENEFITS

- Customized press sizes up to 550 MN and more
- Special design for minimized machine height available to fit in existing infrastructure
- High stiffness of the system with special design as proven concept
- Simple and cost-efficient foundation
- Reduced dynamic load due to minimized moving weights
- Multifunctional presses - high flexibility for different part families

# Lightweight Solutions.



**COMPOSITE PRESSES**  
CHAP 3600



Ballistic protective vests

**PRODUCT RANGE OF PRECISION COMPONENTS**  
We offer a wide range of custom-formed components manufactured using advanced press technology, tailored to meet your production needs:

- Ballistic protection solutions (protective vests)
- Crossmembers for land system vehicles
- Reinforcement parts



Unmanned aerial vehicle (UAV)

**COMPOSITE COMPETENCY ALONG THE WHOLE VALUE CHAIN**  
Innovative system solutions from ANDRITZ Schuler combine most modern components and proven modules into highly automated production lines. We provide consulting services along the entire value chain.

It is possible thanks to our technical expertise about materials for lightweight construction and multi material mix, which for example will allow production of stable and lighter hybrid parts made of steel with fiber-reinforced plastics. In addition, our specialists also provide consulting for constant process improvement and flexible systems.

## HYBRID PART MANUFACTURING



**LIGHTWEIGHT APPLICATIONS**

- Fuselage parts / UAV (unmanned aerial vehicle) airframes
- Radar panels / Flight surfaces / Seats, doors and hatches / Avionics and electronics enclosures

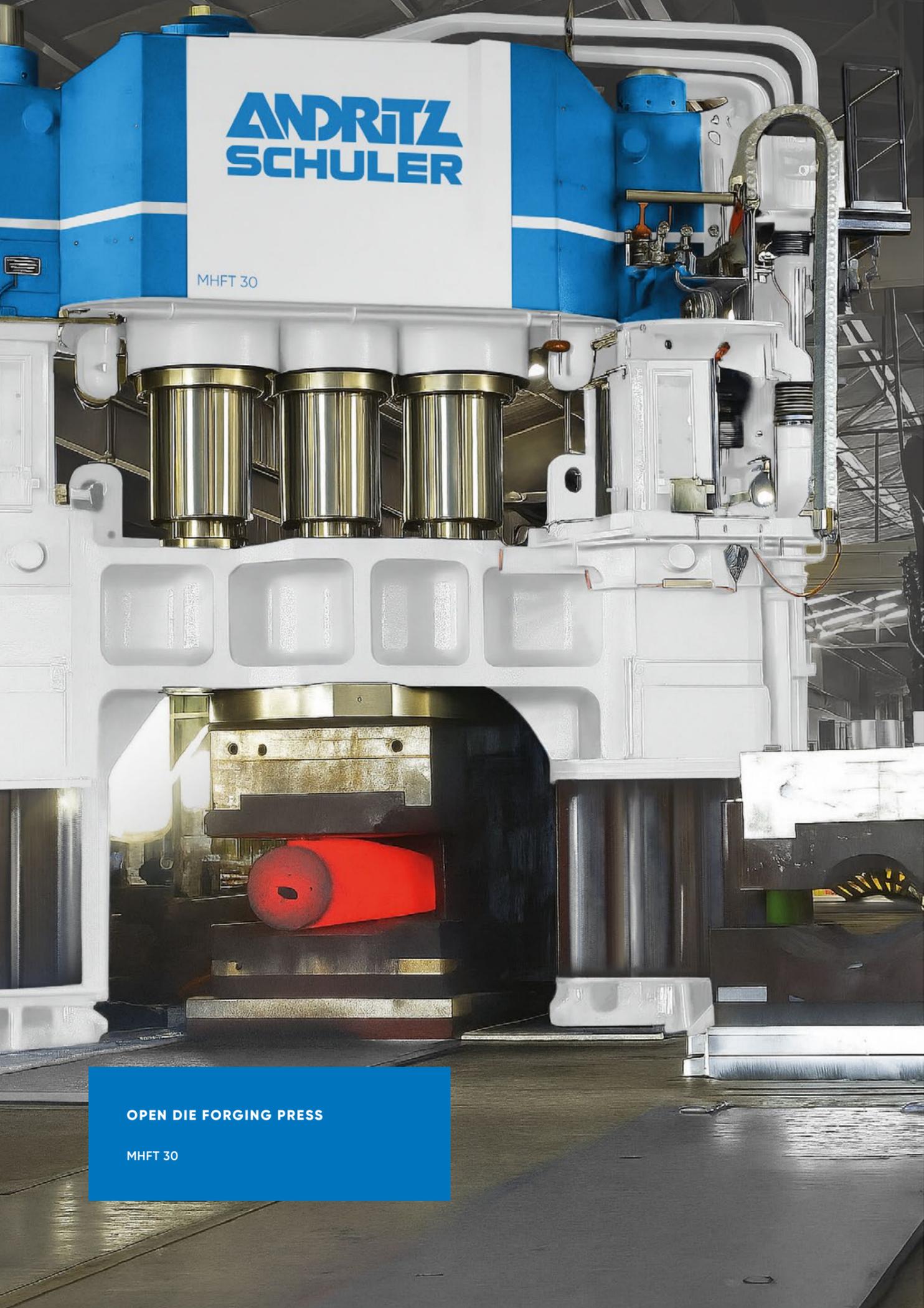
**ANDRITZ SCHULER COMPOSITE CAPABILITIES**

Our hydraulic press systems are suitable for series production of:

- SMC (Sheet Moulding Compound) components
- GMT (Glass Mat Thermoplastics) components
- RTM (Resin Transfer Moulding) components
- LFT (Long Fiber Reinforced Thermoplast)

**YOUR BENEFITS**

- Turn-Key solutions from a single source
- Various processes and hybrid solutions can be implemented
- RnD and trial prototyping possible
- highly automated production lines



**ANDRITZ  
SCHULER**

MHFT 30

**OPEN DIE FORGING PRESS**

MHFT 30

## Land Systems.



B-pillar component, material DP1000



Defense Land System



Forged truck wheel with tool sequence for aluminum wheels



Tanks equipped with tracks, gun barrels, wheels, rings and other parts

### **NEW POSSIBILITIES TO PROCESS ADVANCED MATERIALS**

In a variety of applications including developing ultra-high strength steel in the die, processing advanced composite materials, and drawing complex and deep metal designs, our hydraulic press technology has proven high quality for maximum productivity

### **VEHICLE WEIGHT REDUCTIONS**

New approach to vehicle structures and structural fittings

- Hydroforming hollow tubular components allow a freedom of design for vehicle structures and structural fittings as well.
- Advances in die designs now make this process more attractive for lower volume production.
- Advanced Component Strength

### **ALUMINUM WHEELS**

- Hydraulic presses with high press forces make it possible to forge aluminum wheels with superior properties
- Improved mechanical properties, lighter weight, good chemical resistance, and almost unlimited design options.

### **OPEN DIE FORGING PRESSES**

- According to the requirements pull down (MHFU-series) as well as push down concepts (MHFT-series) in two or four column design can be provided.
- Typical products, such as slabs, shafts, sleeves, rings, gun barrels, wheels, and special forgings, can be manufactured.

### **YOUR BENEFITS**

- Increase structural rigidity
- Improve strength
- Reduce weight
- Process high-tech materials
- form complex geometries

### **ANDRITZ SCHULER CAPABILITIES**

We have innovative solutions to meet the requirements of modern vehicle design. Whether metal forming, stamping, forging, hydroforming and working with high strength steels, we have experience.



**HYDRAULIC SUBMARINE PRESS**  
DH 8000

# Naval Systems.



Naval task force



Defense submarine system

### HYDRAULIC SHIPYARD PRESSES

Creative design solutions unlock new potential for piping and structures in naval and marine system engineering, delivering innovation, efficiency, and reliability for the shipbuilding industry.

Our advanced presses provide comprehensive line control with a fully integrated Machine Monitoring System and robust Track and Trace capabilities, ensuring complete oversight and traceability throughout the production process.

The handling systems are customizable for manual, semi-automatic, or fully automatic operation, providing maximum flexibility and efficiency for moving plates within the press. Incoming goods inspection is also part of our solutions: all incoming material is thoroughly checked for variations, such as in thickness, to guarantee only the best results. Our Visual Quality Inspection system utilizes advanced 3D vision technology to enable real-time process adjustments.

It continuously compares the target and actual shapes of bent plates, ensuring optimal results by maximizing precision, reducing errors, and saving valuable time and resources.

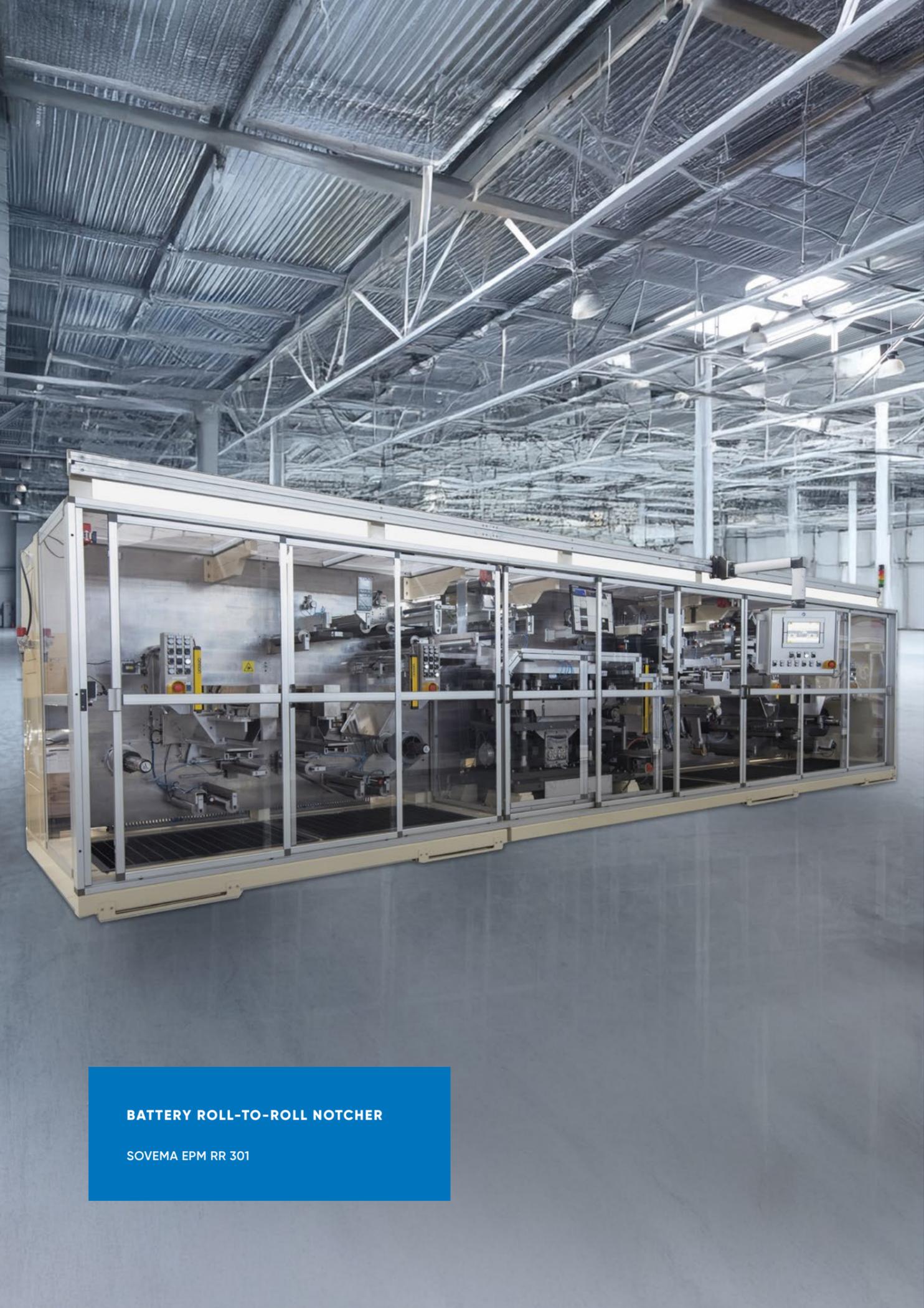
As your reliable partner and turnkey provider, ANDRITZ Schuler delivers not only presses, but also comprehensive automation, dies, and all necessary peripheral equipment—ensuring a seamless, high-performance production process tailored to your shipyard’s needs.

- YOUR BENEFITS**
- Improve strength
  - Fewer components within an assembly
  - Reduce weight
  - Streamlined design
  - Autonomous part handling for various part designs

### EXEMPLARY PARAMETERS

Pressforce:	8,000 t
Bolstersize:	4,500 mm × 3,000 mm
Slide size:	9,000 mm × 1,500 mm
Die space:	2,500 mm
Slide stroke:	1,500 mm
1x moving bolster with:	2 × 5,000 mm

**Another customized size available as well...**



**BATTERY ROLL-TO-ROLL NOTCHER**

SOVEMA EPM RR 301

# Tailored Equipment for Battery Manufacturing.

Reliable. Precise. Backed by ANDRITZ

### TRUSTED RELIABILITY

With decades of experience in high-performance manufacturing, ANDRITZ Schuler stands for uncompromising reliability and engineering excellence. As part of the globally renowned ANDRITZ Group, we combine deep industry knowledge with the strength of a leading international technology provider—ensuring your mission-critical battery production is in the best hands.

### RAPID DEPLOYMENT AND ADAPTABILITY

Fast commissioning and flexible configurations ensure quick readiness for dynamic defense needs.



Submarine battery technology



Military robot dog with integrated battery technology

### INNOVATION IS AT THE CORE OF EVERYTHING WE DO

At ANDRITZ Schuler, we continuously develop technologies to meet the evolving demands of defense battery and supercapacitor production. From advanced automation to smart quality control, our solutions set new industry standards.

## MILITARY BATTERY TYPE APPLICATIONS

Battery Type	Military Applications
Li-Ion	Radios, drones, mobile power units
LiPo (semi-solid electrolyte)	UAVs, lightweight portable systems
NiMH	backup power
Primary Lithium	Missiles, sensors, emergency systems
Zinc-Air	Long-term sensors, low-power devices
Silver-Zinc	Submarines, aerospace, compact high-power
Thermal Batteries (Solid State)	Missile systems





## BATTERY FORMATION LINE

FLP 400

# Battery Production.

From Prototype to Series – Modular and Efficient

## TAILORED FOR MISSION-CRITICAL PERFORMANCE

Our battery manufacturing solutions are designed to meet the highest military standards. From advanced process security to robust machine construction, every feature ensures reliability under extreme conditions.

Modular systems, cleanroom compatibility, and full traceability provide flexibility and compliance for demanding applications. Combined with cutting-edge welding technologies and secure IT integration, ANDRITZ Schuler delivers the confidence you need for strategic energy solutions.

## COMPREHENSIVE SOLUTIONS FOR CELL PRODUCTION

ANDRITZ provides individual machines for key processes such as notching, stacking, winding, electrolyte filling, and formation for large-scale cell production. In addition, we offer lab and pilot assembly lines as well as precise testing equipment to ensure accuracy and reliability from pilot to mass production.



Unmanned aerial vehicle with battery technology



Military vehicle with battery technology

## YOUR BENEFITS

- 1. Process Security**  
Redundant sensors, real-time monitoring, emergency protocols
- 2. Material and Format Flexibility**  
Supports cylindrical, prismatic, pouch cells; specialized electrode materials
- 3. Cleanroom Ready**  
Enclosed housings, air filtration, ISO-certified integration
- 4. Modular & Scalable**  
From pilot to series production; expandable for new cell types
- 5. Advanced Welding**  
Laser & ultrasonic welding for precise, secure connections
- 6. Traceability**  
Full documentation, MES integration for military standards
- 7. Robust Design**  
Built for extreme conditions; durable for remote/mobile sites
- 8. Cybersecurity**  
Data protection, encrypted military IT



# SERVICE MADE FOR YOU

## ACCELERATE THE DIGITAL TRANSFORMATION OF YOUR FORMING TECHNOLOGY!

Embark on the path to digitalization with ANDRITZ! Optimize your production processes – reliable, uncomplicated, and tailored to your needs.

**YOUR PARTNER FOR MORE PRODUCTIVITY: FOR ALL MACHINES – INCLUDING NON-ANDRITZ BRANDS.**



Discover more:  
[andritz.com/Metris\\_Metalsforming\\_en](http://andritz.com/Metris_Metalsforming_en)



## METRIS ANDRITZ DIGITAL SOLUTIONS IN METALFORMING.



**Track and Trace**  
**Up to 50% less scrap**  
Continuous component tracking and storage of quality characteristics



**Machine Vision**  
**Over 100 systems in operation**  
Complete visibility – from blank to finished part



**Energy Monitor**  
**15% energy savings**  
Energy optimization through linking production and energy data



**Digital Services**  
**24/7 availability**  
Customer portal, spare parts, remote support also via smart glasses and OT cyber security



**DigiSim®**  
**Over 190 systems in operation**  
Maximum productivity from the very first stroke with a digitally simulated forming process

## WHEN BUSINESS AS USUAL BECOMES TOTAL SATISFACTION. WE REDEFINE SERVICE.

ANDRITZ Schuler Service provides personalized, needs-based, and straightforward solutions made for you. Because the perfect service is precisely what you require. And that's what you'll get from us.

**WE KEEP OUR SERVICE PROMISE.**



Discover more:  
[service.schulergroup.com](http://service.schulergroup.com)



## DISCOVER NOW HOW THE NEW ANDRITZ SCHULER SERVICE CAN BENEFIT YOU.



Quick help with your system  
**24/7 Hotline & Remote Support**



Service centers worldwide  
**Field Service**



Quick and easy  
**Spare Parts Service**



For ANDRITZ Schuler or third-party presses  
**Smart Modernization Solutions**



Remain flexible at all times in production  
**More than 400 Used Presses**



Increase efficiency with digital solutions  
**Metris – Digital Solutions**



Achieve your financial and ecological goals  
**Eco-Form Package & Energy Monitor**



## THE ANDRITZ SCHULER COMPETENCE

Offering 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 ANDRITZ Metris platform, we combine digital solutions for networking forming technology and develops them continuously to further improve line productivity and availability. For battery production in gigafactories, we provide equipment and service in many process steps specially for cell assembly and formation. Our customers include automotive manufacturers and suppliers, as well as companies in forging, household appliance and electrical industries.

### HYDRAULIC

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### SCHULERGROUP.COM/DEFENSE



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