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ADVANCED METHODS AND EQUIPMENT FOR PLATE MAKING

LONDRINA-BRASIL MAIO

25-27 MAY
2025

WIRTZ GLOBAL LOCATIONS

1 HEADQUARTERS | 4 MFG CENTERS | 8 SALES OFFICES



ADVANCED METHODS AND EQUIPMENT FOR PLATE MAKING

What are we trying to accomplish with Advanced Processes?

- Continuous Production / Increased Efficiency
- Reduced Exposure
- Reduced Emissions
- Tighter Tolerances
- Increased Automation/Reduced Labor
- Increased Up-time
- Process Control
- Reduced Set-up
- Improved Maintenance
- Reduction in Cost / Increased Profits
- Reduced Footprint
- Flexibility
- Improved Operator Safety and Satisfaction
- Drive for Market Sustainability

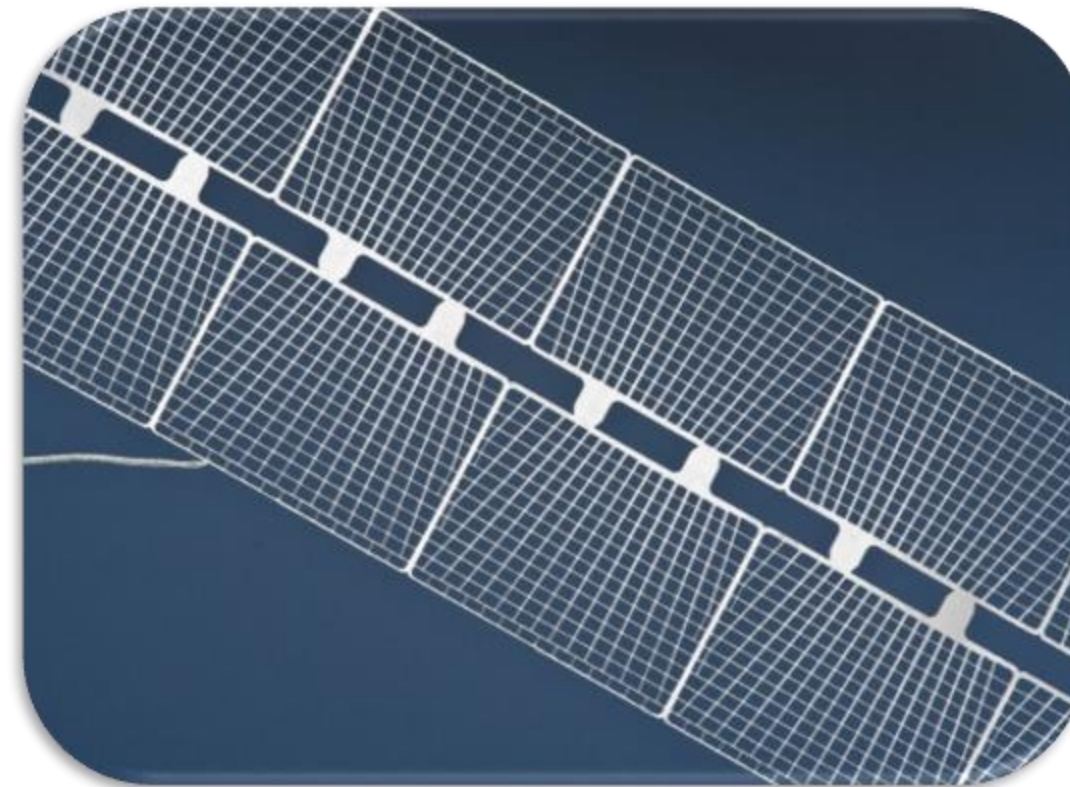
ADVANCED METHODS AND EQUIPMENT FOR PLATE MAKING

Advanced Grid Making

- ConCast
- ConCast - ConRoll
- Gravity Flow Caster

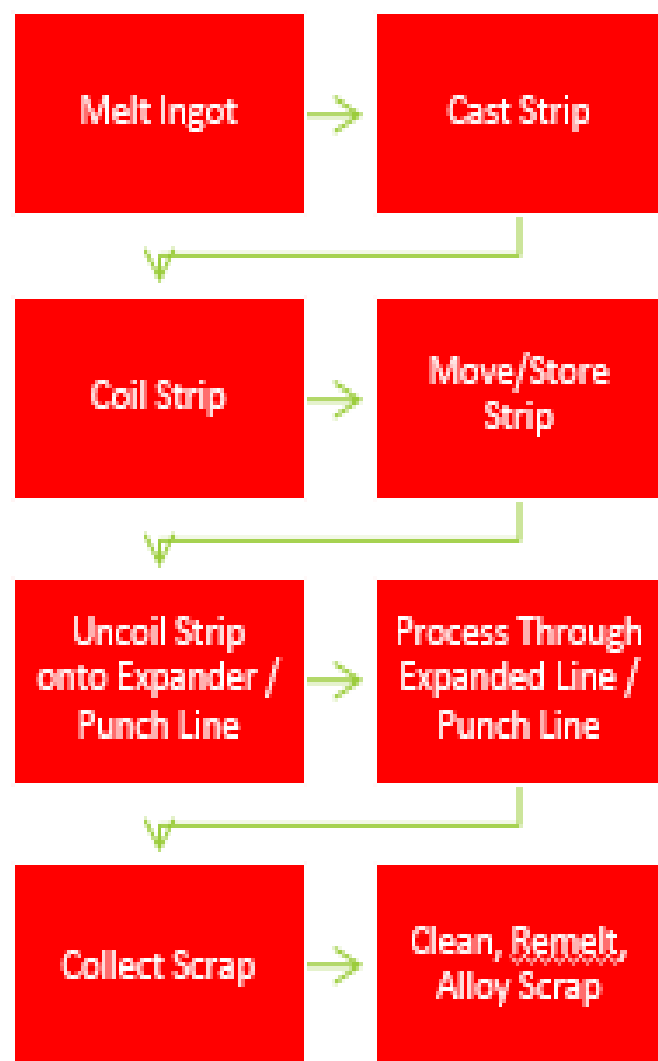
Advanced Plate-Making

- Steel Belt Pasting
- Continuous Cutting Solutions
- Advanced Handling Solutions



CONCAST / CONROLL GRID MAKING TECHNOLOGY

Expanded / Punch Process



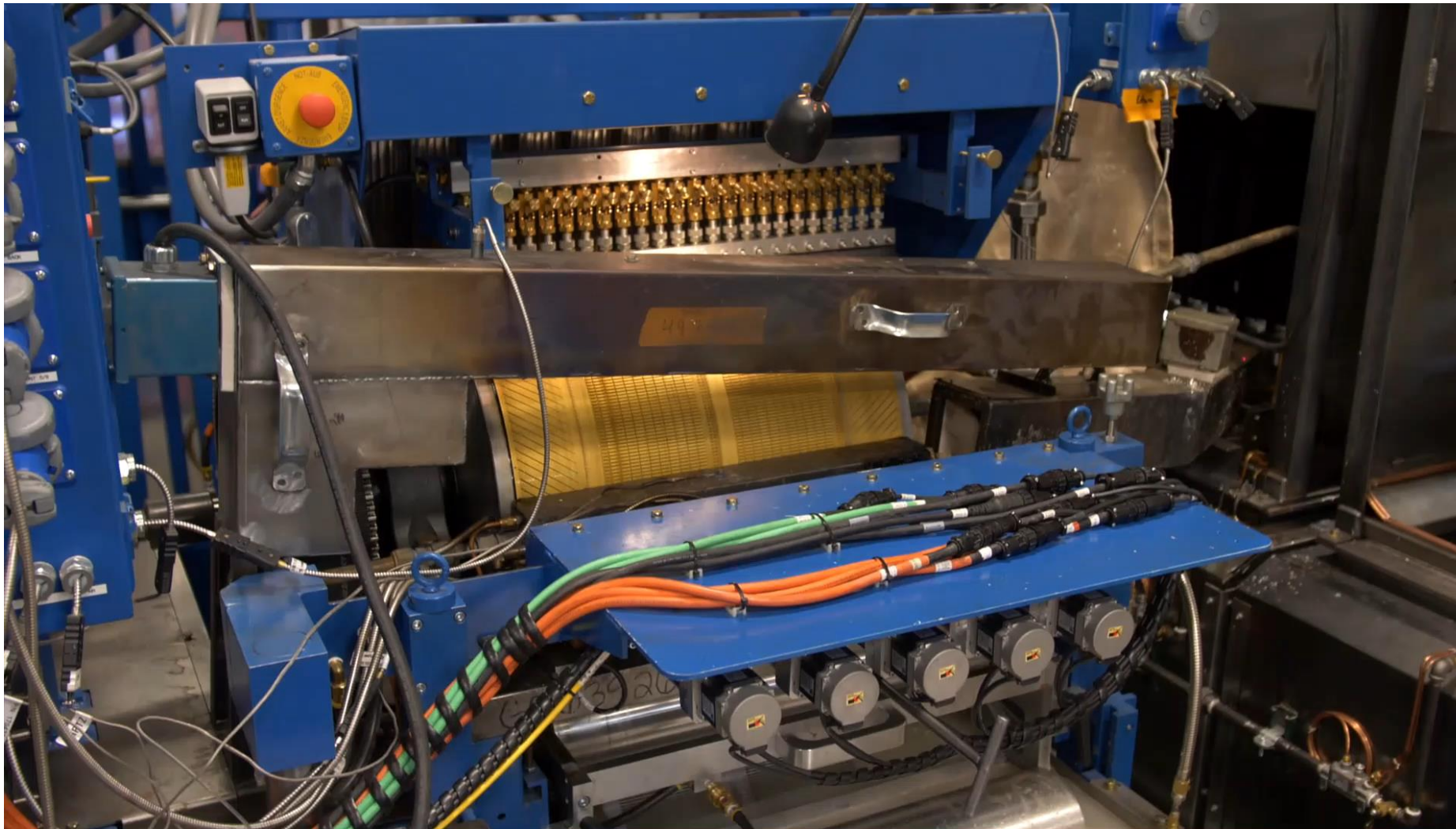
WIRTZ Concast Process



Benefits of the ConCast Technology

- Continuous Full Frame Grid Casting Technology
- Negative Grids
- No Remelt, 100% “As Cast” grid
- Maximum System Flexibility
 - Grid Design
 - Alloy (Calcium/Pure Lead)
 - Cast Thickness Range (.025” up to .120”)
- Most Cost Effective Process for Full Frame Grids— A Requirement for AGM

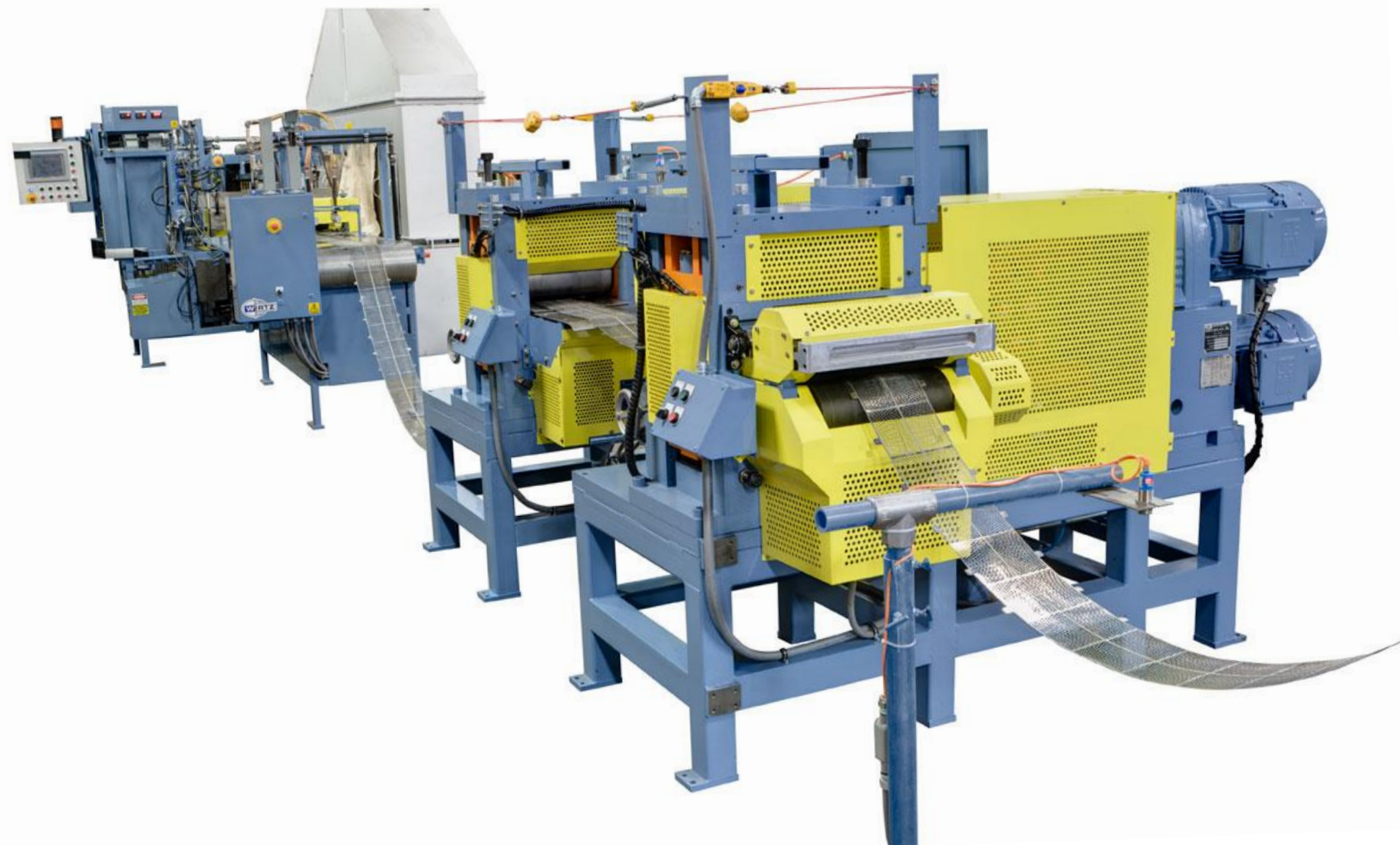
CONCAST – PURE LEAD



PURE LEAD Continuous Casting

- Continuous TPPL/ Pure Lead Grid Casting Technology
- 20+ years of experience with Pure Lead Concast
- Negative and Positive Grids
- Process Flexibility
 - Alloy
 - Grid design – Thickness, width, grid design
 - Cast Thickness Range (.025" up to .120")
- Most Cost Effective Process for Pure Lead Grid Manufacturing

CONCAST / CONROLL GRID MAKING TECHNOLOGY

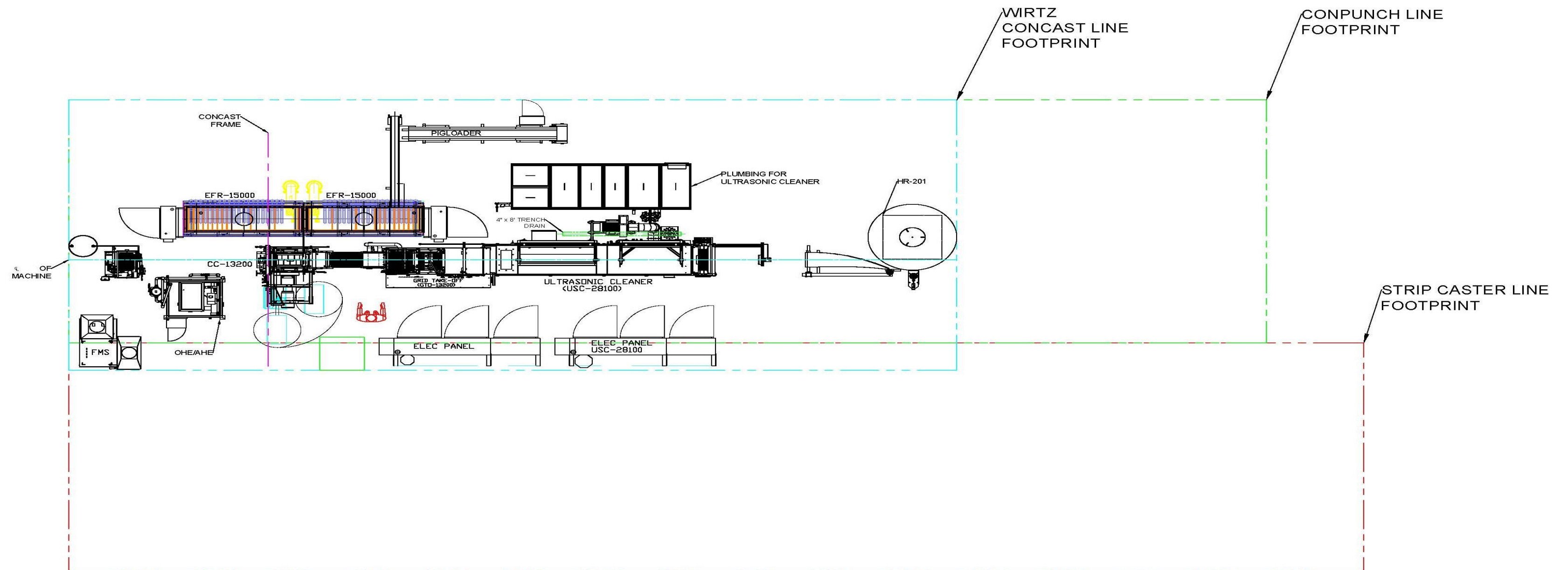


Benefits of the ConRoll Technology

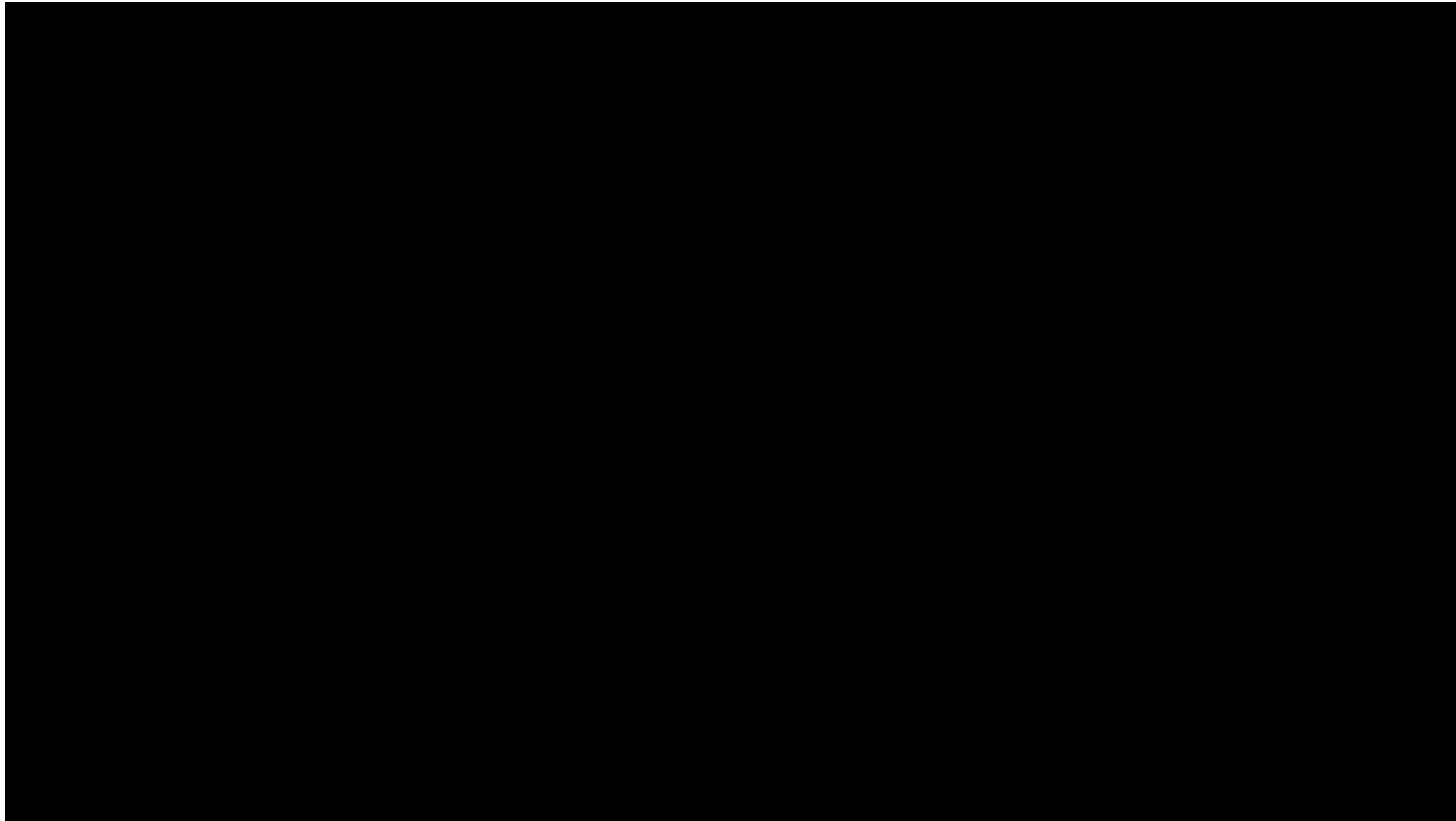
- Continuous Full Frame Grid Casting Technology
- Positive Grids
- No Remelt
- Maximum System Flexibility
 - Calcium or Pure Lead
 - Positive and Negative Grids
- Compact End of Line Footprint
- Batteries using ConRoll Grids Routinely Exceeded 14 weeks in J2801 Cycle Testing

CONCAST / CONROLL GRID MAKING TECHNOLOGY

The Most Space Efficient System on the Market - Best ROI



GRAVITY FLOW CASTER – LAUNCH VIDEO



GRAVITY FLOW CASTER GRID MAKING TECHNOLOGY



GRAVITYFLOW
C A S T E R

Benefits of the GFC Technology

- Continuous Full Frame Grid Casting Technology
- Alloy Agnostic
- Limited Remelt
- Optimized Grain Structure
- Flexible System
 - Calcium, Antimony
 - Casting Thickness Similar to Book Mold
- Compact System Footprint
- No Lubricant / No Waste Water

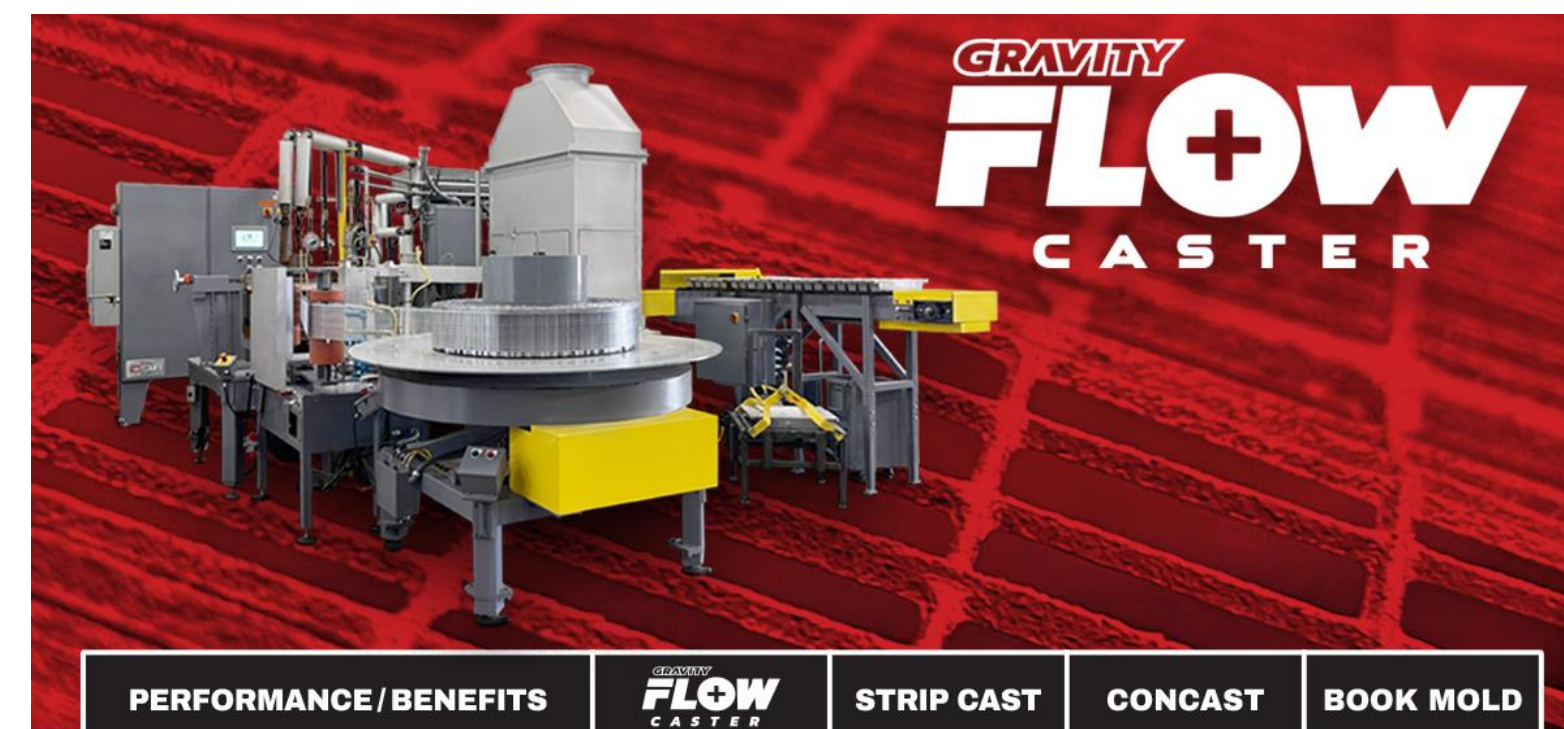
GRAVITY FLOW CASTER GRID MAKING TECHNOLOGY

Alloy Agnostic

- Calcium/ Antimony
- First Continuous Antimony Casting System
- 2-5% Antimony Successfully Casted

Reduce Exposure / Emissions / Energy / Waste Water

- Top Gate Frame Is Remelt
- Systems Runs on 7,000lb Furnace
- No Lubricant Used In Process
- Continuous Operation – Eliminate Handling

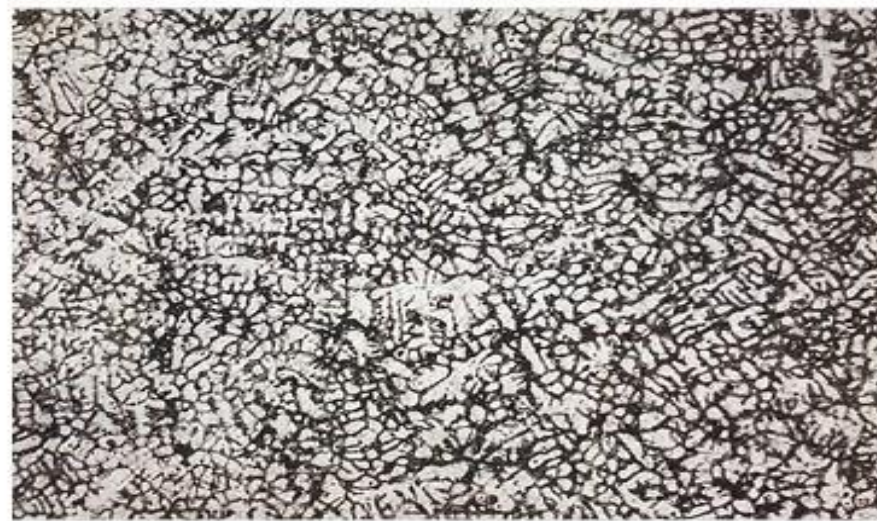


PERFORMANCE / BENEFITS	GRAVITY FLOW CASTER	STRIP CAST	CONCAST	BOOK MOLD
ALLOY COMPATIBLE	●●●●●	●●●●○	●●●○○	●●●●●
GRAIN STRUCTURE	●●●●●	●○○○○	●●●○○	●●●●●
SCRAP	●●●●○	●○○○○	●●●●●	●●●○○
FLOOR SPACE	●●●●○	●○○○○	●●●○○	●●●●●
AUTOMATED CONTINUOUS OPERATION	●●●●●	●●●●●	●●●●●	●●○○○
NUMBER OF OPERATORS REQUIRED	●●●●●	●●●○○	●●●●●	●●●●●
EASE OF OPERATION	●●●●○	●●●○○	●●●○○	●●○○○
EMISSIONS	●●●●●	●○○○○	●●●●●	●●●○○
SPEED	●●●○○	●●●●●	●●●●●	●○○○○
PASTE-ABILITY	●●●●●	●●○○○	●●●●○	●●●●●
TRAINING REQUIRED	●●●●○	●●●○○	●●●○○	●●○○○
CAPEX	●●●●○	●○○○○	●●●○○	●●●●●

* RATINGS: ●○○○○=WORST ●●●●●=BEST

GRAVITY FLOW CASTER GRID MAKING TECHNOLOGY

Optimized Grain Structure – Uniform and Homogenous



GRAVITY CAST



CONCAST



GRAVITY FLOWCAST



GRAVITY FLOW CASTER GRID MAKING TECHNOLOGY

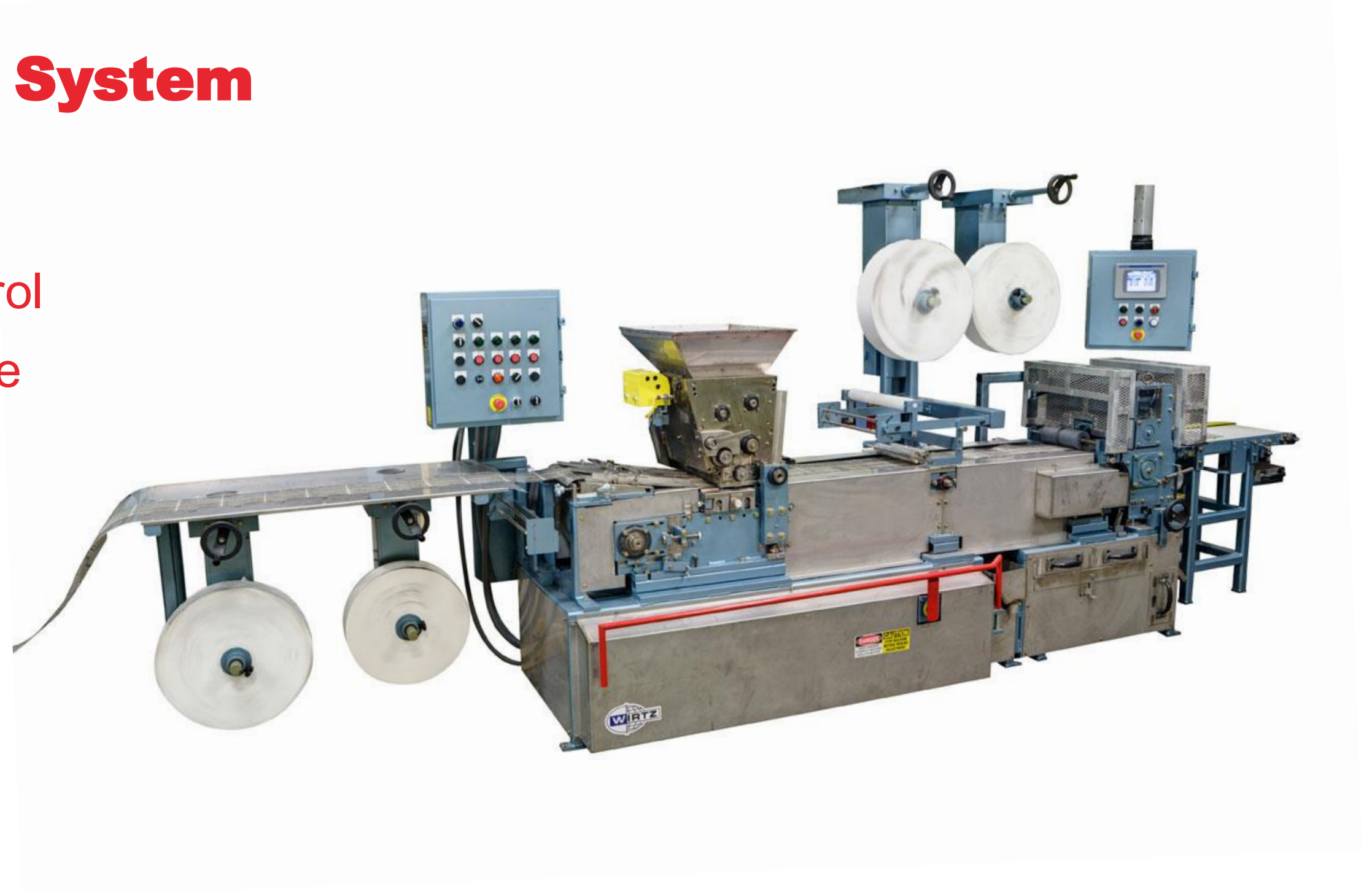
Optimized Space Requirements



STEEL BELT PASTING / CUTTING

Combination SBP/ Cutter System

- Design Flexibility
- Industry Leading Tolerance Control
- Overpaste – Two-Sided Coverage
- Speed
- Multiple Cutting Solutions
- Wirtz Patented Improvements



STEEL BELT PASTING – ADVANCED TECHNOLOGY



Benefits of the SBP Technology

- Flexibility
 - Punch, Expanded, ConCast / ConRoll, Gravity Flow
- Tolerance Control
- +/- .002" Thickness Control
- Servo Thickness Adjustment in increments of .0005"
- Closed Loop Thickness Adjustment (Patented)

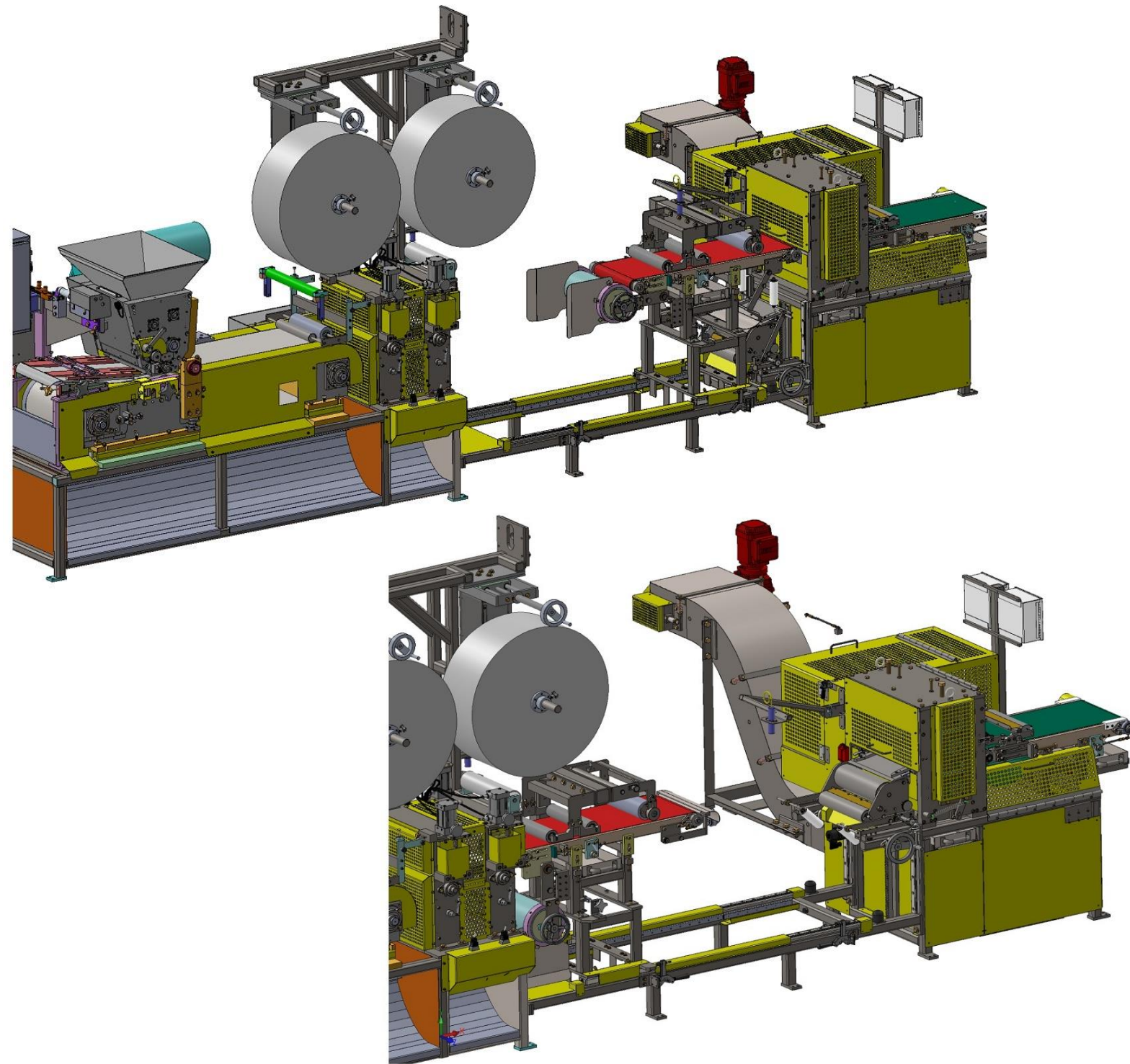
STEEL BELT PASTING – ADVANCED TECHNOLOGY



Benefits of the SBP Technology

- Overpaste Capability
- Adjustable Overpaste Capability for Bottom Coverage
- Speed
 - Common Speeds Between 125-150ft/min (38-45m/min)
 - Systems Running up to Approx. 200ft/minute (60m/min)
- AGM Paper Ready

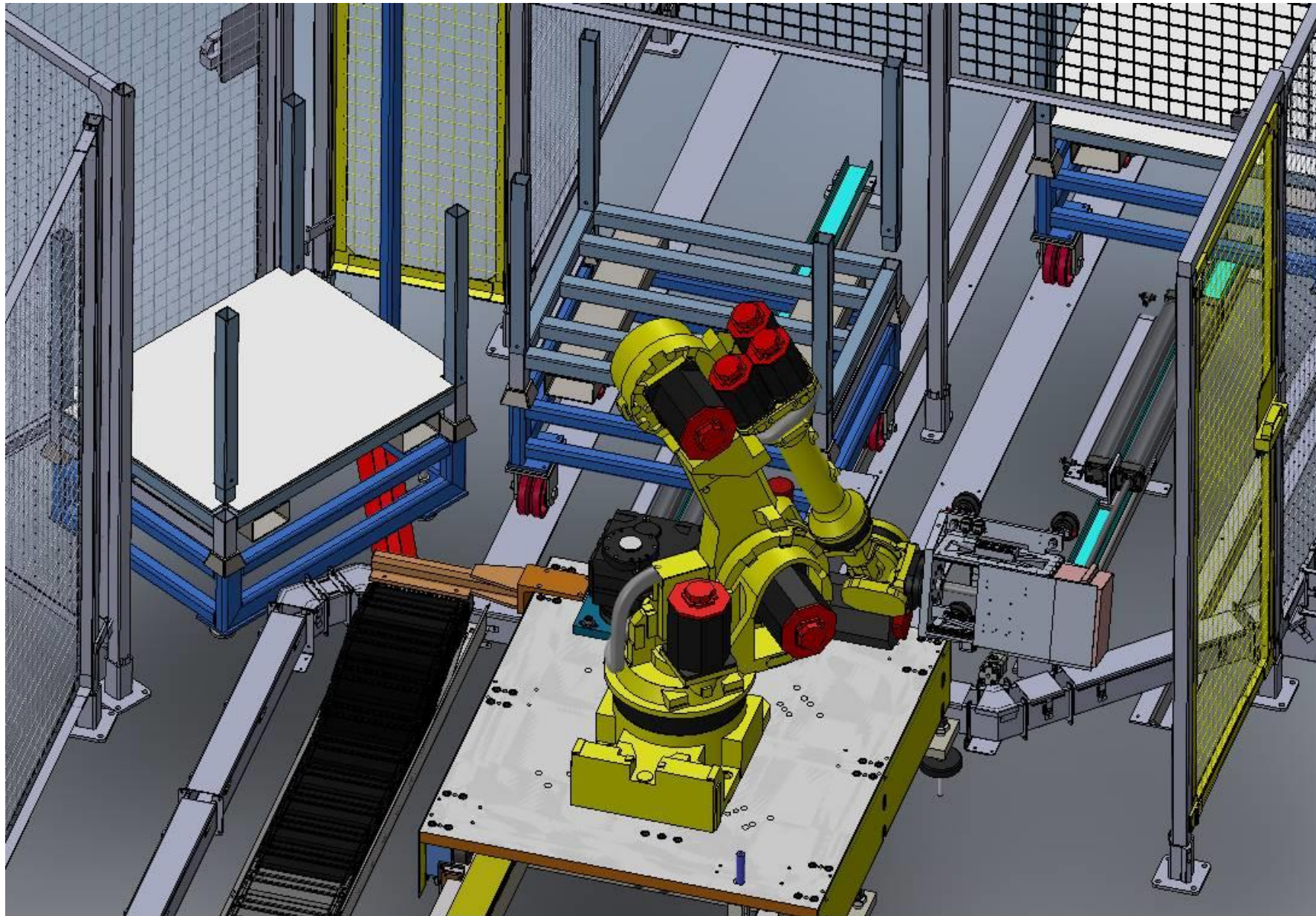
STEEL BELT PASTING – ADVANCED TECHNOLOGY



Benefits of the Integrated Wirtz Cutting Technology

- Integrated Single Machine Solution
- Flexibility
 - Proven system to run ConCast / ConRoll, Punch, Expanded, and Gravity Flow Caster in one machine
- Cutter Options
 - Mechanical Cutters
 - Electronic Cutters
 - TPPL Cutters
 - Interchangeable in one machine

ADVANCED HANDLING / AUTOMATION SOLUTIONS



Automation Solutions

- Robotic Integration Into Lines
 - Palletizing
 - High Speed Robotic Stacking
 - Custom Solutions
- Integrated Vision Systems
- Automated Set-up
 - RFID Embedded Tooling (*Patent Pending*)
 - Integrated Servo Automation

ADVANCED METHODS AND EQUIPMENT FOR PLATE MAKING

SUMMARY

- **ConCast** – Most affordable method to manufacture full frame grid, with zero remelt, in the smallest footprint, allowing for maximum grid design flexibility
- **ConRoll** – A ConCast add on for positive grid manufacturing
- **Gravity Flow Caster** – Allows continuous casting of all alloys, limited remelt, grid design flexibility
- **SBP Line** – Proven continuous system for all grid strips, with tightest tolerances, and high speeds

THANK YOU