

**RECYCLE
100**

Recycle 100 (9th ISLC)

September 2nd 2025 – Kota
Kinabalu, Malaysia

***Pursuing the target of “zero operators on the floor”
with the Engitec Lead Ingot Caster***

Speaker:

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AGENDA

- 1) Introduction
- 2) The target of Zero Operators on the Floor
- 3) Engitec Ingot Caster
- 4) Automatic operations of the Ingot Caster
- 5) Other Projects on the Lead Casting



INTRODUCTION_1

- More than 40 years at the service of the Lead Industry

- Historical ILA Member



- ABR Member soon



- Active contributions for BCI (USA), Fenibat (Brasil), ILZDA (India), ISLC (Asia), ABC (Asia), ILZSG (Portugal)



- Engitec presence in the world:
 - HQ (Milan, Italy)
 - N. 3 Workshops (Italy)
 - EGMT (Shanghai, China)
 - ENGITEC USA (Q4, 2025)
 - ENGITEC INDIA (2026)



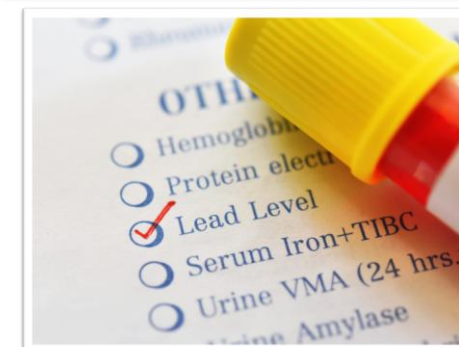
INTRODUCTION_3

- 90 Plants realized in the world
- Technologies for the Full Cycle of Lead Production
- Green Field Projects
- Retrofit and improvement of existing Plants
- Special Projects for non-battery Lead Applications (i.e. Mining sources)



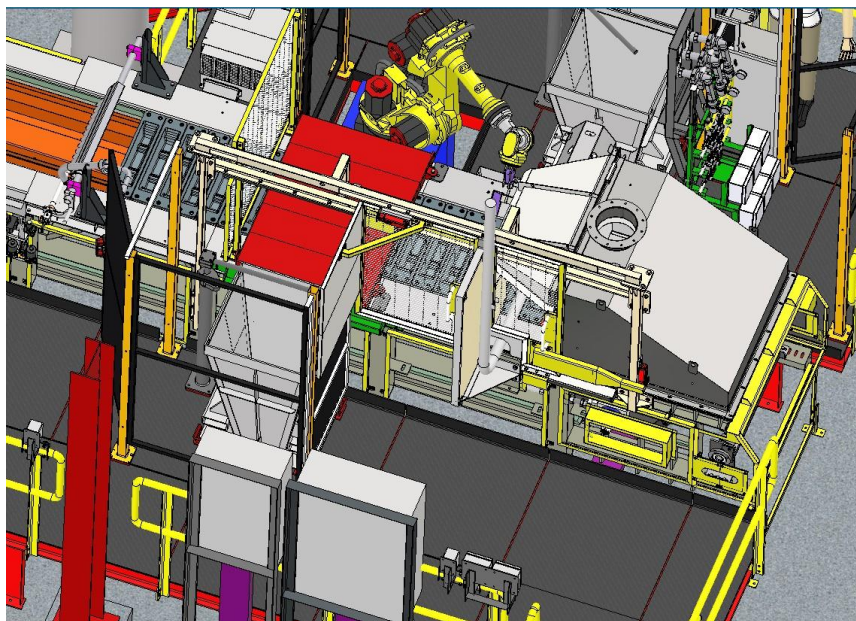
THE TARGET OF ZERO OPERATORS ON THE FLOOR

- Lead Industry is under a permanent magnifying glass
- Lead in Atmosphere and Lead in Blood levels reduction (EU: 30 μ g/dl from Q2, 2026; 15 μ g/dl from 2029)
- Engitec is working hard to support our Industry to achieve higher results
- Conceptual target of “Zero Operators on the Floor”

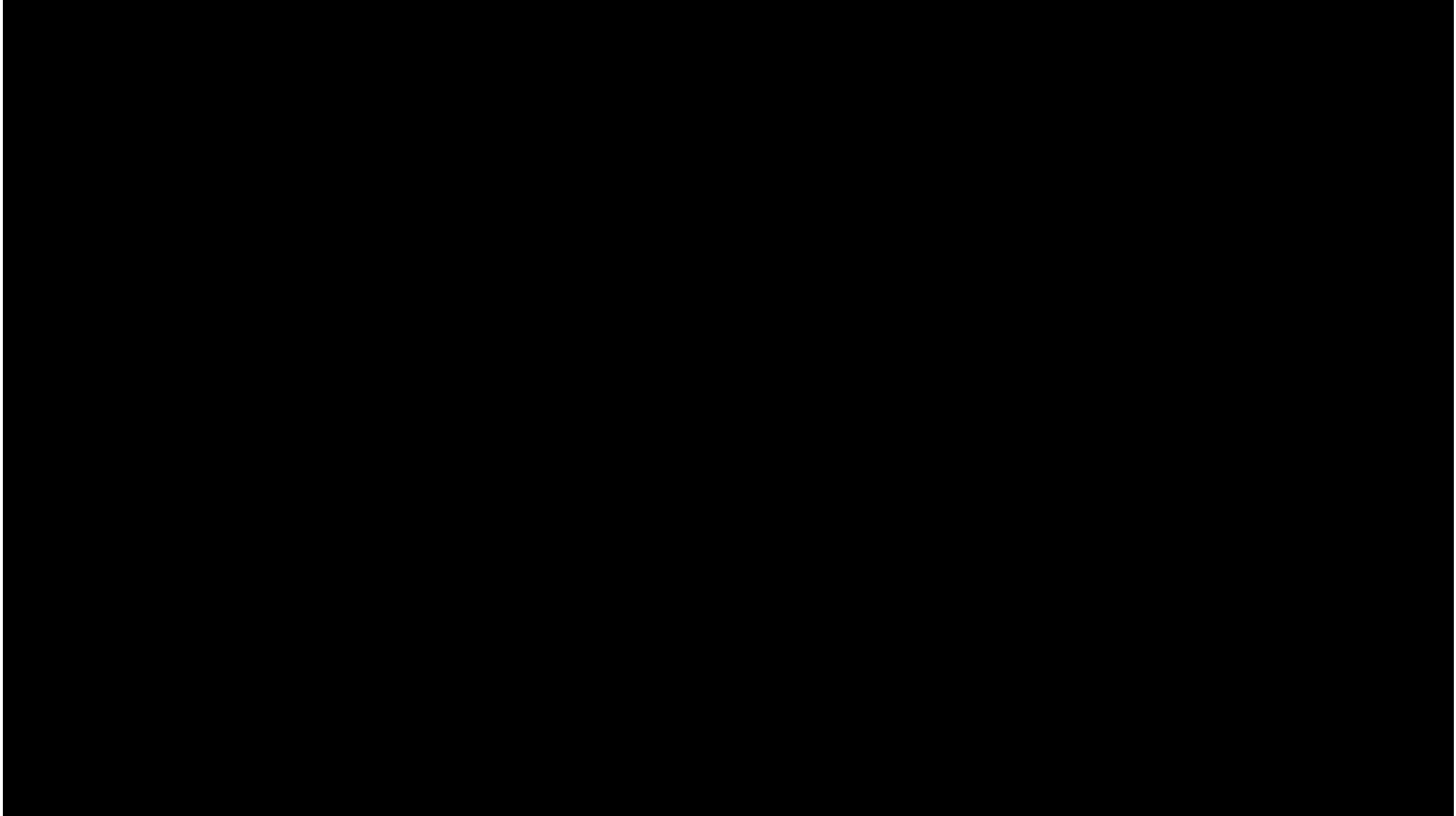


ENGITEC INGOT CASTER: DIFFERENT SIZES, SAME PHILOSOPHY

- From the smallest Engitec Ingot Caster of CX[®] Smart (**4 tph**)... to the biggest Engitec Ingot Caster (**40 tph**)

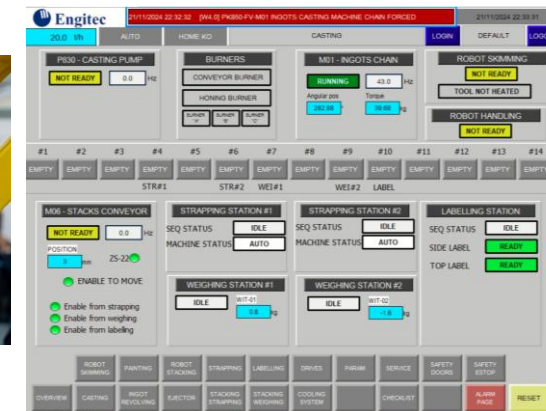
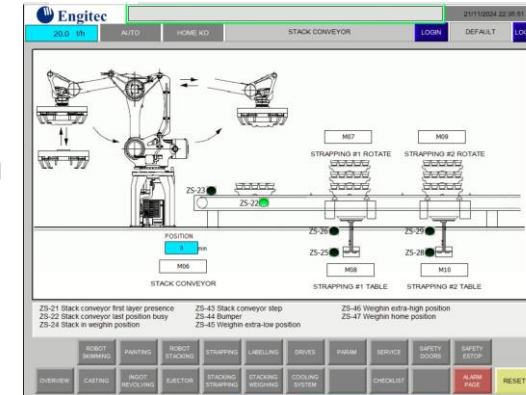


ENGITEC INGOT CASTER - VIDEO



FOCUS ON THE AUTOMATION

- Engitec Ingot Caster has achieved incredible results in terms of Automation and Data Collection
- Qualitative and Quantitative Analysis and Reporting
- Production Trends
- Encoder for individual moulds tracking
- Auto-synchronization of the Caster main operation (i.e. stamping, painting, lowering device, etc.), according to the casting belt speed



THE ROBOTIZED SKIMMING OPERATIONS

- Skimming Robot synchronized with the speed of the casting belt
- System composed by:
 - Pre-heating station
 - Robot
 - Skimming paddles
 - Discharging Bin
- HMI operator panel for selection of pre-defined Skimming cycles



THE AUTOMATIC OUT-OF-SPEC INGOTS REMOVAL

- In-line multi-points measurement of the ingot compliance with the specification
- Automatic ejector for out-of-spec ingots
- Statistical data recording for the ingot rejection



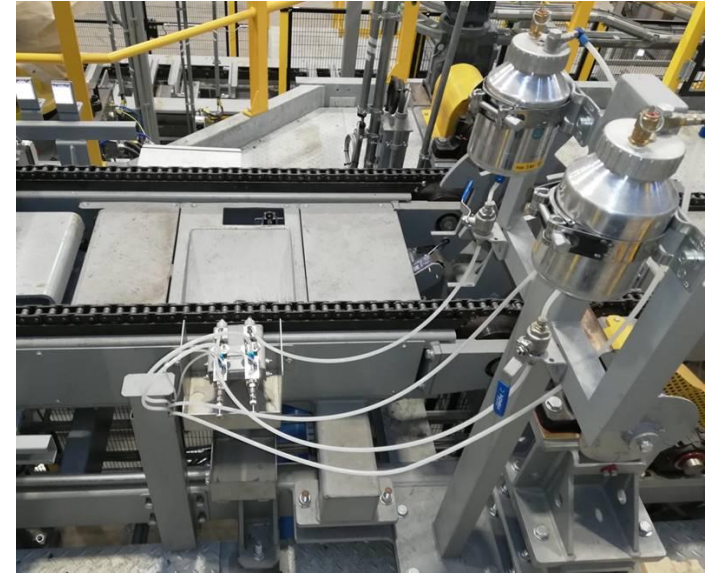
THE ROBOTIZED STACKING OPERATIONS

- 5 axis Stacking Robot for layers formation and final stacks preparation
- Engitec special design for the clamp with pneumatic opening
- On-board ingots presence control



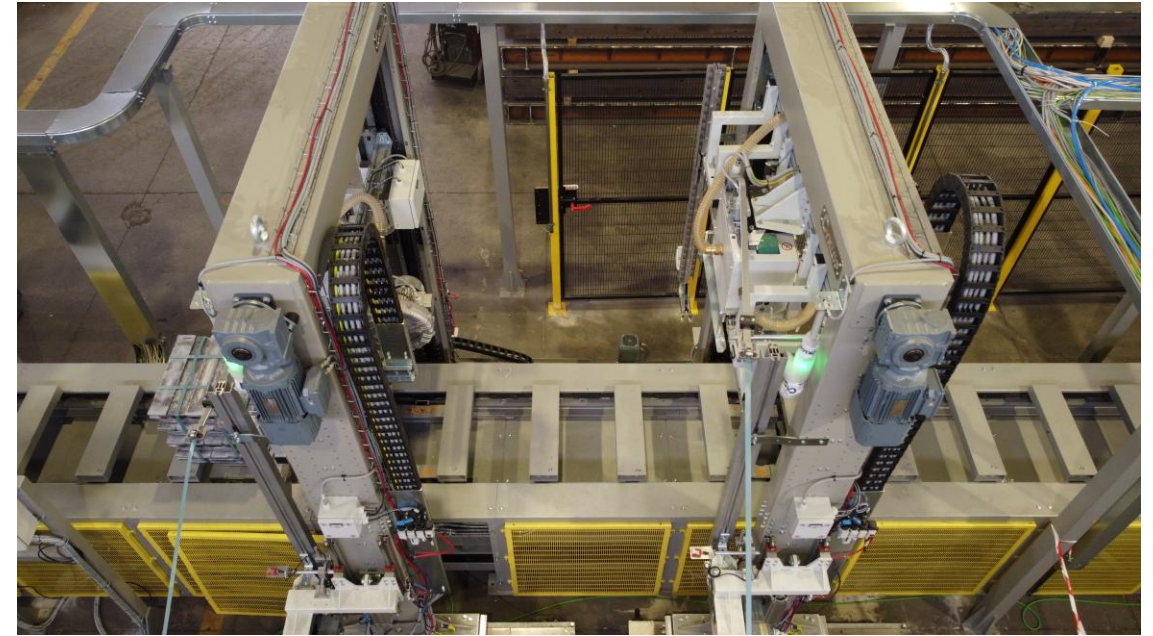
THE AUTOMATIC PAINTING STATION

- Automatic painting of the single ingot with two or more marking guns
- Water based paints
- Adjustable pots diameter
- Multi-colors selection
- Drops collection
- Cleaning cycles for the colors changing
- HMI selection of the painting cycle



THE AUTOMATIC STRAPPING OPERATIONS

- Single or double Automatic Stacks strapping stations
- Plastic or Metallic straps
- Lifting and rotating table
- HMI selection of strapping program (2 straps or 2x2 straps)



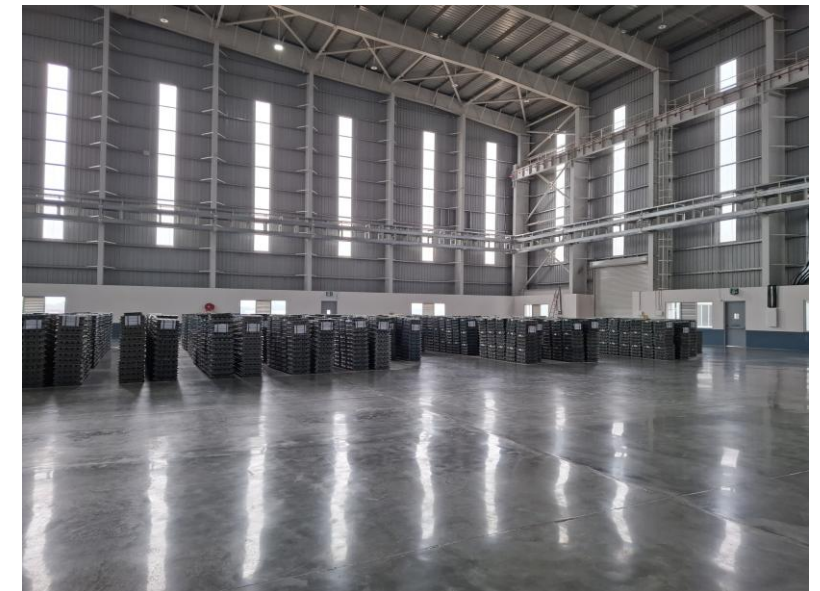
THE AUTOMATIC WEIGHING AND LABELING

- In-line weighing stations
- Fiscal scale accuracy
- Integrated data communication between weighing station and label printing station
- Automatic labeling of the final stacks with QR code for production tracking
- HMI selection of the labeling position
- Laser Marking (testing complete)



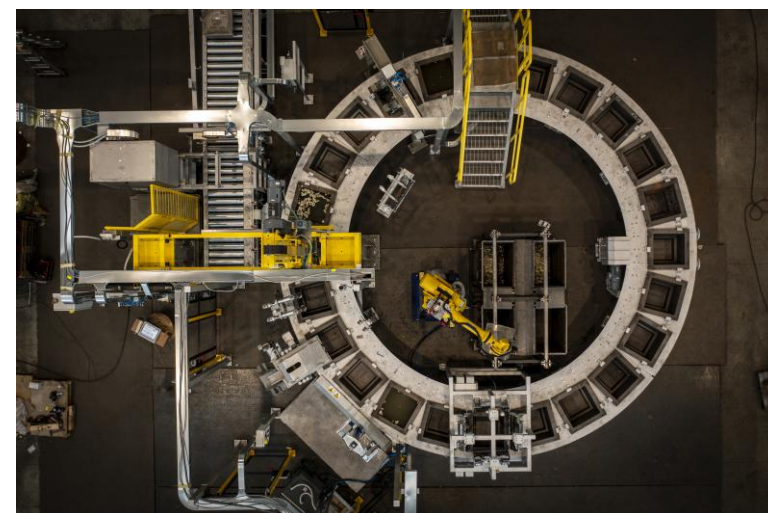
THE AUTOMATIC STACKS HANDLING AND WAREHOUSING

- Automatic stacks discharging system via Robotized Overhead Crane
- Stacks automatic warehousing
- Qualitative (type of alloys) and quantitative data storage



OTHER PROJECTS ON THE LEAD CASTING

- Multi-weight Ingot Caster (realized)
- Fully automatic 1 ton Block Casting Carrousel with the same automation of the Ingot Caster (realized)
- Video camera for surface cracks detection and AI algorithm (ongoing)
- Casting Pump frequency automatic regulation for uniform weights (ongoing)



*Our experience
at the service of the Lead Industry*



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Thank You For Your Time!

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