

# ROBOTS IN THE METAL INDUSTRY

Robotic solutions  
to work better  
and safer

**DANIELI TELEROBOT LABS**





DANIELI  
TELEROBOT LABS  
ROBOTS  
IN THE METAL  
INDUSTRY

Robotic applications specially designed to improve process operations, making them safer and faster, in each production area: furnace, casting, rolling mills and process lines.

The most advanced alliance between industrial robotics, specifically manufactured for use in harsh environments, and process automation fully compliant with Industry 4.0 systems and architectures.



MELT



SAMPLE



EBT



SCAN



CAST



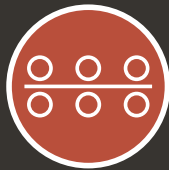
LADLE



MOULD



FINISHING



ROLL



TAG - MARK



DESTRAP



DEBURR



SAMPLE  
PREPARATION



ZINC



SKIM



INGOT



DESTRAP



# ROBOTS IN METAL INDUSTRY

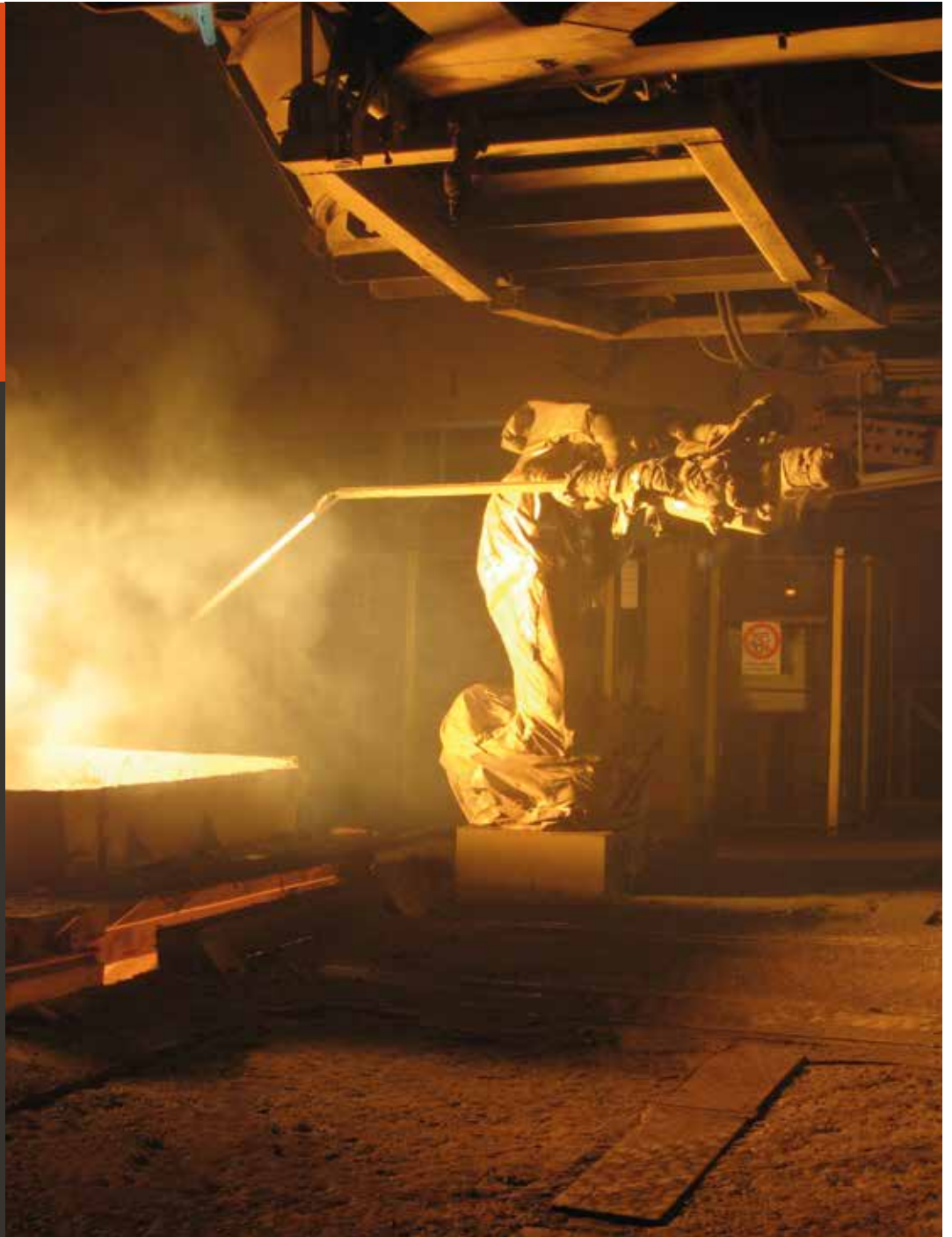


Q-ROBOT is the result of the most advanced integration between industrial robotics and process automation. A set of solutions for each production area allowed the introduction of flexible automation in dangerous locations where human intervention is still essential. An anthropomorphic robot enables

people to be relocated to healthier environments. It easily deals with repetitive and labor intensive tasks which are closely related to poor process quality. However, operators maintain total control of all operating parameters. All Q-ROBOT systems are specifically designed for use in harsh environments with severe pollution.

**QROBOT  
MELT**

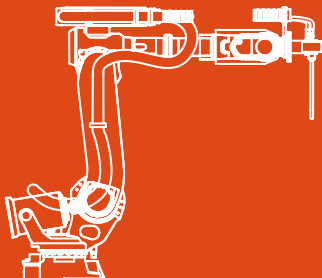
SAMPLE  
EBT  
SCAN





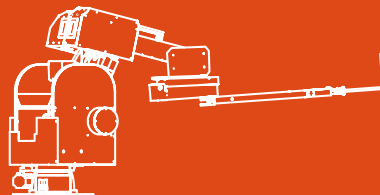
## QROBOT MELT SAMPLE

EAF/LF steel bath temperature measurement and physical samples taking for lab analysis with automatic cartridge loading/unloading. Constant depth and tilt of the lance, compliant with the EAF range of positions, is set and monitored from the HMI; tap to tap time is reduced since EAF can remain in power-on mode during the sampling. The robotic cell is provided with water cooled sampling lance, metal shields and fiberglass thermal dress; the anti-collision function allows the automatic repositioning of the lance in case of solid scraps or obstacles on the trajectory of the robot.



## QROBOT MELT EBT

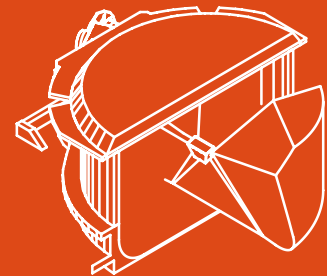
Automatic EBT cleaning, opening and unclogging. Automatic nozzle position acquisition by means of a 3d vision system; remotely operated control of the robot by jog functions through the Joybot portable console.



## QROBOT MELT SCAN

Automatic visual inspection of the internal of the EAF through a 360° video camera mounted on a dedicated tool compliant with the sampling lance (no tool-change required).

All images can be visualized on a PC monitor /tablet/smartphone using the dedicated application integrated in the HMI.



## QROBOT CAST

- LADLE
  - sampling & measurement
  - lancing
  - shroud manipulation
  - tundish powder
  - cylinder preparation
- MOULD
- FINISHING
  - tag
  - mark
  - punch







## QROBOT CAST LADLE

Multifunction Robot cell to allow fully automatic operations in ladle area.

### SAMPLING & MEASUREMENT

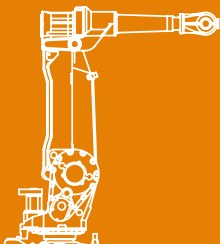
tundish steel bath temperature and chemical composition measurement

**LANCING** nozzle emergency oxygen lancing in case of opening failure

**SHROUD MANIPULATION** Shroud picking and positioning by means of 3D vision system. Repositioning after casting.

**TUNDISH POWDER** automatic powder distributing system to guarantee uniform powder thickness

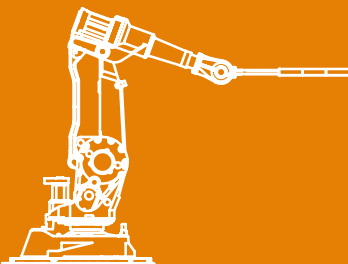
**CYLINDER PREPARATION** ladle sliding gate hydraulic cylinder manipulation and mounting in fully automatic or remotely operated mode.



## QROBOT CAST MOULD

Automatic casting powder dosage and feeding in continuous casting machines with up to four different hoppers.

Optional cast-eye sensor-camera to check the powder thickness and bath coverage.



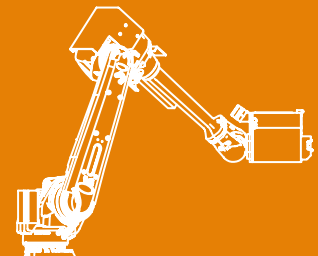
## QROBOT CAST FINISHING

**TAG** tagging system with fully customizable metal labels resistant up to 850°C welded (with/without pins) on billets, blooms, beam blanks; complete products traceability.

**MARK** strings and datamatrix marking system for hot billets and slabs with high temperature powders or molten metal spray; complete products traceability.

**PUNCH** percussion stamping system for quick, deep marking of irregular surfaces with symbols defined by segments. Mono or multi punching heads available depending on specific surface conditions, products or characters/logos required; complete products traceability.

> In collaboration with Green Project (Qualified Danieli Partner for marking & reading system technology) <



## QROBOT ROLL

TAG - MARK  
- tag bundle  
- tag coil  
- mark  
DESTRAP  
DEBURR  
SAMPLE PREPARATION



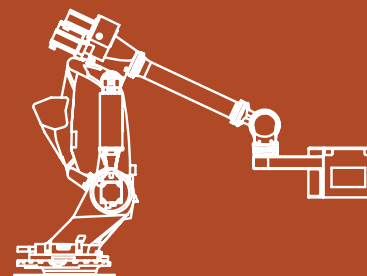
## QROBOT ROLL TAG - MARK

**TAG BUNDLE** automatic label welding system for bundled rods; a 3d vision system is used to identify the “best” bar for label application

**TAG COIL** label clip holding system fixed on the coil strap; a 3D vision system identifies the “best” point for label placing.  
Complete products traceability

**MARK** automatic paint spray marking system in multi (dot matrix) or mono (handwritten-like characters) version for flat products; complete products traceability

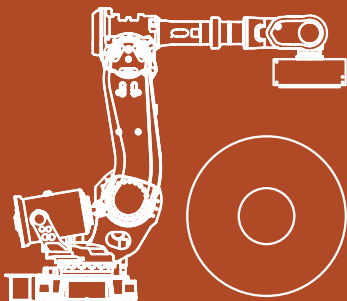
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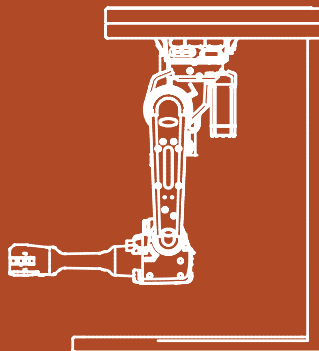
## QROBOT ROLL DESTRAP

Automatic system for strap removal from steel coils, profiles or tube bundles; a 3d video system is used to identify number and position of straps that are cut with a dedicate pneumatic scissor and winded, compacted and ejected as scraps.



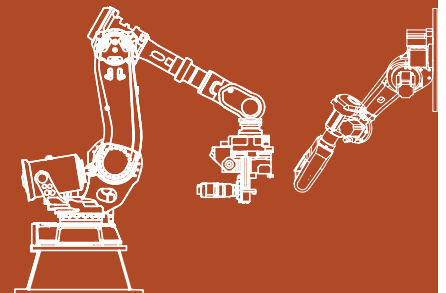
## QROBOT ROLL DEBURR

Stand-alone robotic cell proposed with different custom designs ranging from billets chamfering to heavy blooms deburring and from saw-generated burr to heavy cutting torch effect. A 3d vision system allows the robot to identify and follow edges even in unknown position.



## QROBOT ROLL SAMPLE PREPARATION

Stand-alone fully automatic cell with 2-cooperating robots cell for master samples cutting, deburring and marking downstream the rolling mill area. Positioning and shape of the masters are automatically detected to perform the sample withdrawal and deliver with no auxiliary pusher system or manipulator. The solution can be customized and adapts to existing layouts without any mechanical modification.





QROBOT  
ZINC

SKIM  
INGOT  
DESTRAP

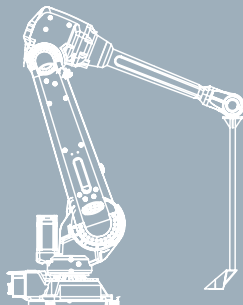






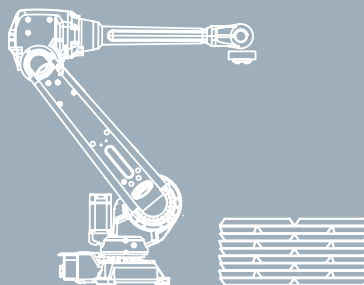
## QROBOT ZINC SKIM

Automatic skimming and dross removal system for zinc baths. A continuous cyclic passing across the surface of the zinc driven by a control system that adapts the skimming speed to the dross production amount in compliance with the bath level.



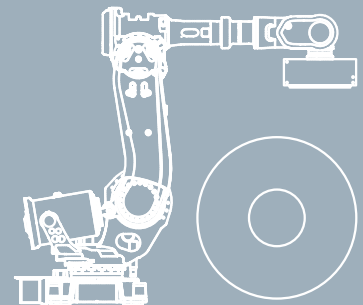
## QROBOT ZINC INGOT

Automatic feeding of the zinc pot with zinc and aluminum ingots or jumbo premixed ingots. Automatic control of zinc pot recipe and Zn-Al consumption, level control, reduction of waves during ingot loading, overall reduction of dross production.



## QROBOT ZINC DESTRAP

Automatic system for strap removal from ingots pallets; a 3d video system is used to identify number and position of straps that are cut with a dedicate pneumatic scissor and winded, compacted and ejected as scraps.



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