



Antolini Luigi & C.

The colour of stone

STONE ITALIANA
| QuartzStone |
MADE IN ITALY

stoneID 

Global traceability and logistics- production management in natural stone industry

Dr. Marco Ferlini, Project Manager F.C.S. Solutions



F.C.S. Solutions

- IT consulting company founded back in 1995
- 360° IT systems consultancy
- IT structures design and implementation
- SW development and customized solutions
- Owner of a European patent for the stoneID process
- In 2015 FCS Solutions started a new branch, Engineering IDEA, dealing exclusively with the development of RFID and BLE systems





Antolini Luigi & C.
The colour of stone

- Established in 1956 at Sant'Ambrogio di Valpolicella
- Factory surface area at Sega di Cavaion: about 200,000 m², 40,00 of which covered
- It trades more than 1,000 different kinds of natural stone materials (marbles, granites, limestone, onyx, travertines as well as precious stones)
- It exports 30 containers of natural stones/day
- It produces about 1.5 million m² of slabs/year with a daily average of 6,000 m²
- Its stockyard, constantly being renewed, has about 80,000 slabs

STONE ITALIANA
| QuartzStone |
MADE IN ITALY

- Established in 1979 in Verona
- Two production plants, one at Zimella and one at Villesse
- Highly advanced production processes for the manufacture of quartz engineered material
- 65% of its production is intended for export
- Its production is extremely varied, both for the material and for sizes and thicknesses traded

Customers' needs and requirements

- Having an accurate and timely information on the quantity and quality of material in stock
- Performing fast and accurate inventory
- Avoiding both inventory out-of-stock and overflow
- Making the daily management of orders, shipments and inventory of the various materials and possible re-orders more “lean” and efficient
- Tracing all the production process phases
- Guaranteeing an effective and flexible tool to the sales force



Antolini Luigi & C.

The colour of stone

- Slabs obtained from block sawing
- Natural material of different composition and structure → need for a specific adhesive for tags
- Natural material of different composition and structure → variation in permeability to radio waves → need for a feasibility study for the choice of suitable tags and receivers

STONE ITALIANA
| QuartzStone |
MADE IN ITALY

- Slabs obtained from the engineering process of a compound of resins and quartz
- Smooth and compact material → less demanding in the search for the right adhesive for tags
- Smooth and compact material → optimal permeability of the wave signal → possibility of putting the tags inside the compound of resin and quartz

HIGH FLEXIBILITY AND CUSTOMIZABILITY OF THE RFID TECHNOLOGY

Issues specific for the production processes

- Raw material (“Block” or “Slabs Bundles”) is transformed through various process operations → track of the finished product origin is typically lost
- The materials undergo processing operations with water, dust, chemical substances and resins of various kinds → dirt and abrasive products are the common result of stone processing
- Stockyards take very large surfaces and / or are located in several areas → finding the material and locating the storage point is a problem

ANTOLINI's Blocks Stockyard

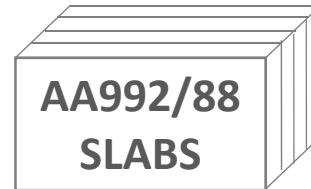


STONE ITALIANA's Raw Slabs Bundles Stockyard



“SLAB NUMBER” Assignment

From the blocks
processing raw
slabs are obtained



TAG
RFID

After sawing, slabs
are individually
labelled



ANTOLINI's Slabs Processing Line

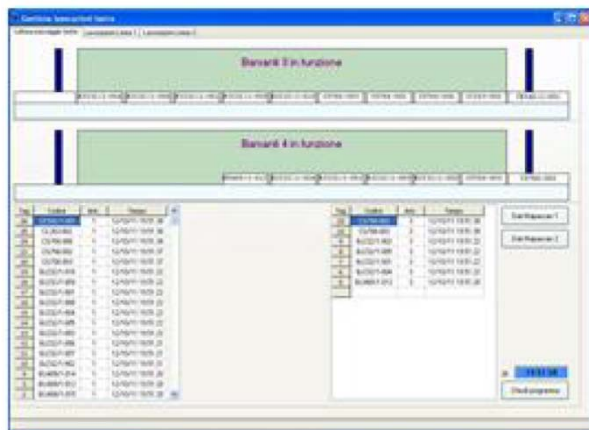


STONE ITALIANA's Slabs Processing Line



Line Control System

The line control SW is fully **automatic** and **user-friendly**



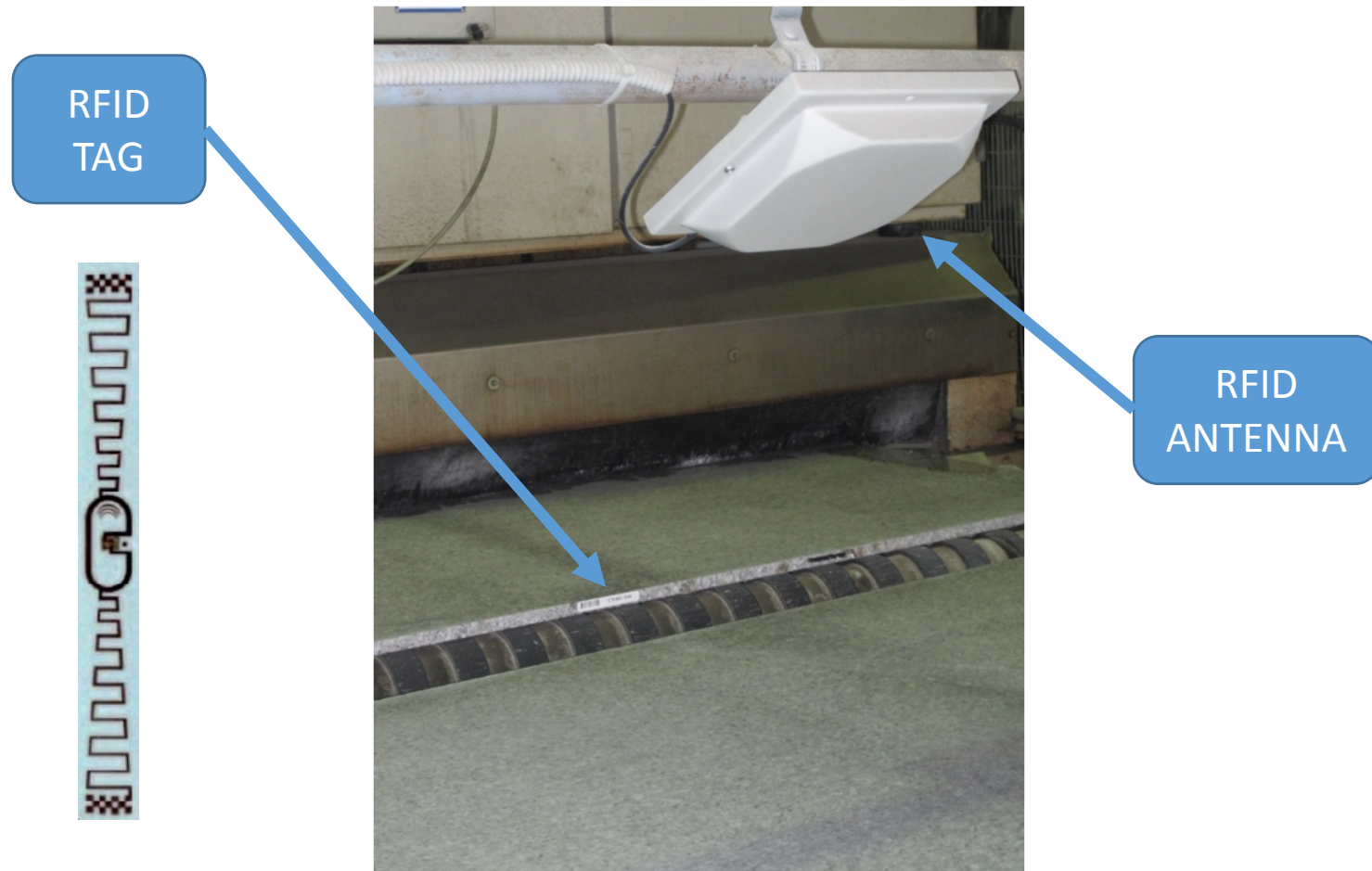
The HW structure is based on a **FEIG** reader, controlling the line through a PLC and can be accessed via an operator panel



Line Processes: Polishing



Line Processes: Polishing



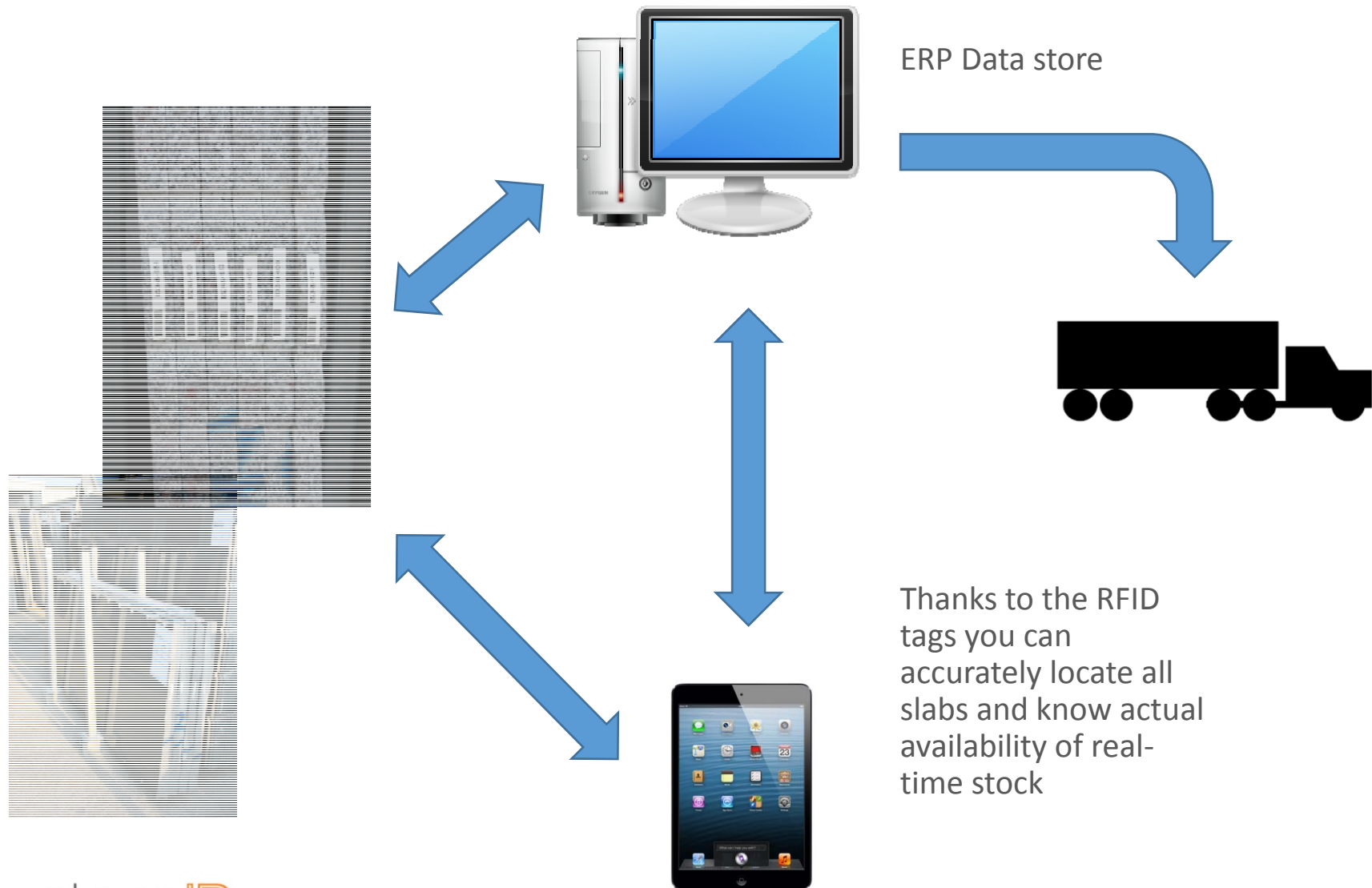
Slabs Stockyard



Slabs Stockyard

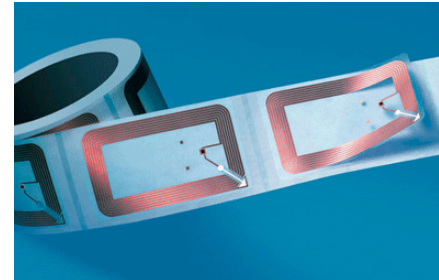


Stocking and Sales



HARDWARE

MOBILE READERS



RFID TAGS

I-PAD - SMARTPHONE



Thanks to the development of ad hoc applications, with some systems you can use “commercial” devices such as I-Pads or smartphones interfacing the RFID system

ANTENNAES



Results achieved

- Materials full traceability
- **Real-time** control of the processing state of blocks and slabs
- **Real-time** control of inventories and availability of materials for sale
- “Geographical” management of the stockyard
- Useful sales tool

Intrinsic benefits of the RFID technology

- Fast and affordable reading obtained without contact between the reading system and the RFID tags
- Performance not affected by environmental factors (dust, mud, grease, noises). The tag can be read even if covered by external agents
- Tags automatic reading on production lines. Human intervention is not necessary, thus limiting the risk of errors and operating costs
- Simultaneous reading of multiple tags. This guarantees reduced times and great reading speed, while maintaining high safety standards and reliability
- Ability to store and modify the information inside the tags. Each tag can store a quantity of data that may vary according to the kind of chip selected
- No moving parts and maintenance both for tags and for readers. Greater reliability and lower maintenance costs

Future Developments

- Our stoneID solutions takes advantage of the intrinsic benefits of the RFID technology for traceability, real-time control of production, logistics and sales
- The possible uses of this technology are countless
- In order to get reliable solutions, a feasibility ad-hoc study is necessary, enabling to select the kind of tags, antennae, receivers and software necessary for each single solution
- **Engineering IDEA**, starting from the experience gained by **FCS Solutions** in the management of the production and logistics management for the natural stone industry, is studying new solutions for a variety of sectors



Future RFID Developments

- In **logistics**, RFID technology and BLE automate inventory management and goods in and out, resulting in reduced time inventory and real-time control of business flows
- In the **retail** environment it guarantees a complete traceability and product visibility at all stages of the supply chain, as well as the possibility of interaction with the end customer in the store. Accurate, reliable and always available for effective proximity marketing
- In **GDO** the RFID technology enables the management of the entire supply chain and inventory control as well as the retail outlets in real time, with the consequent reduction of out of stock and increased sales
- In the field of **shipping and transport**, RFID automates and error-proofs all loading, unloading and delivery phases, with a considerable reduction in work time and complete traceability of the product, providing reliable information from the initial delivery up to the end customer final one



Sviluppi Futuri RFID

- In the **manufacturing** sector the BLE and RFID technologies can be used for the management of goods in and out and during the entire production process, since in a tag can be stored even the transformations that took place at every stage of the process or in any off-line process
- The benefits of RFID and BLE technology can be successful in the **chemical industry and special waste** sectors, where the control and traceability of the products are a priority
- Traceability, safety and ability to integrate RFID tags with various types of sensors such as temperature ones, make it an indispensable tool for the control and traceability of **pharmaceutical products, medical devices and blood bags**



Antolini Luigi & C.

The colour of stone

STONE ITALIANA
| QuartzStone |
MADE IN ITALY



Partner for the RFID & BLE technologies

stoneID 

Dr. Marco Ferlini, Project Manager F.C.S. Solutions