PICKING THE

Tailor-made robotic systems for the ceramic industry.

In **Polytec** we develop tailor-made **robotic systems** for the ceramic and stone industry. The availability and in-depth knowledge of technology, such as **3D** vision systems and self-learning software which are implemented in the robots, allow us to **build robotic islands** which can **automatically manage** a wide variety of tasks such as:

- pick and place, •
- batching, •
- pallet preparation for dispatch, using order processing software pallet • developed by Polytec.

This method of approaching **intralogistics** pursues the same **goals in every** department:







SAFETY

more **EFFICIENCY**

more QUALITY







With the PolyMOVE Bin picking system, for the preparation of material on pallets ready for dispatch, we can:

- reduce the number of loads handled by operators, .
- increase production efficiency.

A revolution that starts from the end.

PolyMOVE, our robotic bin picking system represents the transition from manual to automatic palletisation: a revolution that starts from the end.

Benefits of the **PolyMOVE** system:







greater operator safety: no handling of heavy packs, forklift driving only

customisable according to the system layout









traceable



Iperceramica, an Italian chain of shops selling floor and wall tiles, parguet, sanitary ware and bathroom furniture, has installed our PolyMOVE Bin picking system in its warehouse, for the preparation of materials on pallets ready for dispatch.

Pallets are normally prepared manually with all the associated difficulties, creating a bottleneck that is not easy to manage; especially in spring and summer, when the construction and renovation market typically experiences peaks of up to 30% compared to other periods of the year, with a consequent increase in critical issues.

Iperceramica decided to **invest in our system** with the following goals:



to reduce the handling of heavy loads by operators when preparing pallets for dispatch



to increase production efficiency with the introduction of a robotic island



to standardise the preparation of pallets for dispatch

Depalletisation.

The robotic island we produced for Iperceramica covers a total area of 200 square metres with two 6-axis robots: the first robot, which handles the depalletising of materials, runs on a slide (7th axis), turns on a linear axis and picks up the scheduled material from one of the 20 loading bays (10 per side).

Thanks to a 3D vision system implemented on a gripper, the robot recognises the pack and automatically decides the best picking sequence of the individual bay to then position it on the conveyor belt.

Palletisation.

The second robot is used for palletisation: it picks up the individual boxes of tiles at the end of the conveyor belt and deposits them in the perfect order according to the data processed by a sophisticated algorithm. This algorithm calculates the exact sequence so that the operation is carried out safely, optimising the space on the pallet and avoiding any possible overturning which could occur during the cycle until the loading operation has been completed, ready for dispatch.

Palletisation is carried out on two output roller conveyors, placed at right angles to the main conveyor belt and slide, on which one of the two robots moves. Each of these areas consists of a space dedicated to the progressive formation of the pallet and a safe area in which the operator can complete the cycle with labelling, first packing, where required, quality control or picking for transport to packaging.



Repeatability of 0.15 mm, with a torgue difference on the 6th axis, respectively up to 1,177 Nm (version 2.7) and 1,569 Nm (version 3.0).



IPERCERAMICA'S ROBOTIC ISLAND





5 additional load on forearm





maximum horizontal reach

POLYTEC & IPERCERAMICA:

dynamic warehouse management.

The match between Iperceramica's needs in warehouse management and Polytec's skills in automation and robotics has given rise to an extension of the project with a second phase, which includes two innovative solutions that represent an absolute novelty in the world of ceramics:

- the implementation of a new system for the intelligent composition of trays, capable of feeding the robotized palletizing island with boxes of tiles, or bundles, for order fulfillment;
- dynamic warehouse handling through "Voyager 200" AGVs fleet, enginee-• red and built internally by Polytec.





Our software to manage automation with the utmost precision.

The robot used for palletisation can pick up every single box of tiles and deposit it in the perfect order, according to data processed by the software we have **designed**. The application algorithm calculates the exact sequence so that the work is carried out safely, optimising the space on the pallet and avoiding any critical issues which could occur during the cycle until the loading sequence has been completed.

Until now, the **picking of the boxes** had never been automated. Thanks to the artificial vision algorithms which we have developed, it is possible to identify the exact position and conformation of the boxes so that the robot can pick them up correctly and safely. The key to the automated picking of the boxes lies precisely in the artificial intelligence algorithms which allow the pick-up trajectories to be constantly optimised.

But the software that we have developed does not just control the automated functions dedicated to interaction with the robots, it also handles all the **alarms** and systems communications, actuator control and image analysis for the grip test.





Artificial vision systems to avoid potential human errors in the handling phases.

Thanks to the **3D vision system** which we implemented on the gripper, the robot **automatically assesses how to pick up the pack** from the individual bays and deposits it on a conveyor belt.





FROM ABOUE



Trays and AGVs for a faster and easier pick-up of the material by the robots.

We designed a **robotic system of metal trays** fitted with RFID sensors for identification to **feed the palletisation islands**.

To **handle the trays in all the production phases**, we designed automatic AGVs for the optimal management of loading and unloading.

Our goal is **to optimise the production of the palletisation island** so that it can even work for 24h with a minimum number of operators.





OPTIMISATION



A handling system based on AGV trajectories that self-adapt for correct warehouse management.

The trays are filled and emptied via a **two-way chain**.

The AGV forklifts are accessorised with independent lifting systems which pick up and transport the trays, running along the entire length of the chain for optimal management of the loading and unloading cycle.





ADAPTATION



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