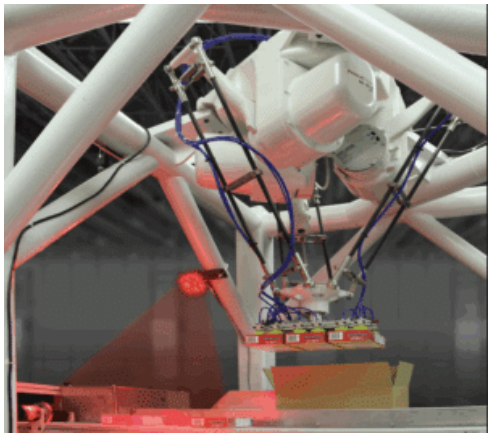
Core Technologies in Robotic Case Packing



Choosing the Right Technology for Your Case Packing Application

Case packing is a critical step in the end-of-line production process, focusing on the placement of products into a case for shipping or storage. This is part of a larger, integrated system that can include case erecting, conveying, sealing, and palletizing. At Cross Automation, we specialize in providing and integrating these solutions to create cohesive and efficient production lines. With automated case packing systems, we can offer robotic case erecting, or we can integrate existing or off-the-shelf case erectors and case sealers as part of a system.

Core Technologies in Automated Case Packing

Cross will design a specific case packing system that seamlessly integrates into an existing production line. The choice of technology is tailored to the specific application, considering factors such as throughput, product handling needs, and desired level of automation. The primary technologies used include:

- **Industrial Robotics**: These are high-speed, high-payload systems ideal for applications requiring rapid and precise movements. Industrial robots can achieve speeds up to 30-40 picks per minute for case packing. To ensure safety, they must be fully contained and guarded.
- **Collaborative Robotics**: Operate at lower speeds and payloads compared to industrial robots, but they can function alongside human workers with minimal or no guarding. This makes them suitable for applications where flexibility and direct interaction are desired. They typically achieve speeds of up to 15-20 picks per minute.
- **Servo-Driven Cartesian Systems**: Also known as Cartesian robots or linear modules, these systems use servo motors for precise, controlled linear motion. They are capable of high speeds, often matching industrial robots at nearly 30-40 picks per minute, and are well-suited for applications requiring specific linear movements.
- **Pneumatic Handling**: This technology uses compressed air to power actuators for picking and placing products. Pneumatic systems are generally simpler and more cost-effective for slower-speed applications, operating at speeds of up to 15-20 picks per minute, similar to collaborative robots.

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A fundamental component of any automated case packing system is the custom end-of-arm tool (EOAT). This is a crucial element our engineers will design and build for each unique application. The EOAT is the part that physically handles the product, and it can be equipped with various grippers, suction cups, or other mechanisms to accommodate products of any size, shape, and material—including delicate or flexible items.

Key Capabilities and System Integration

Beyond the core technology, a successful case packing operation requires careful integration and attention to the entire production flow. Cross offers several integrated capabilities to enhance the functionality and efficiency of the system:

- Product Conveying, Grouping, and Arranging: The system which supports the material handling necessary to prepare products for the case packer. This includes conveying products to the case packing area and arranging them in a specific orientation or group for efficient picking by the EOAT.
- Vision-Guided Product Handling: A vision system, which consists of a camera and programming, can locate and track products on a conveyor belt. The case packing system can then use this data to adjust its movements to pick up products regardless of their exact position or orientation, correcting them as needed before placing them in the case.
- Case Erecting and Sealing: While the core focus is case packing, Cross can integrate off-the-shelf case erectors and sealers or provide robotic solutions for these tasks. This allows for a complete, end-to-end automated process from case formation to final sealing.
- Ancillary Systems: Additional systems can be integrated for quality control and data management, including:
  - Barcode/RFID scanning: Verifies that the correct product is being placed into the case.
  - Weight verification: An in-line checkweigher confirms the final case contains the expected product weight.
  - Labeling and Printing: Applies labels or prints information directly onto the case.
  - Line Cohesion: Ensures that the case packing system seamlessly communicates and integrates with other machinery on the line and throughout the plant.

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Versatility and Industry Expertise

Case packing systems can be designed to accommodate a wide range of product types and industry needs. They can accommodate rigid, semi-rigid, or flexible packaging and are adaptable to variable product shapes, sizes, weights, and quantities. Case packing can also be configured for either horizontal or vertical orientations.

Cross has extensive experience in motion control and robotics, with a history of providing engineered solutions since 1958. This expertise allows us to apply technologies across various industries, including food, consumer products, automotive, medical devices, and pharmaceuticals, while adhering to any specific industry standards or requirements.