

PRACTICAL GUIDE · 2026

Robotic palletizing **done right**

Components, choosing the robot and the gripper, safety, project preparation, costs and funding: everything you need to automate your end of line with confidence.



CONTENTS

What you will find in this guide

01	Why robotize palletizing?	3
02	The components of a robotic palletizing system	4
03	Industrial robot or collaborative robot?	5
04	Choosing the right gripper	6
05	Safety first	7
06	Preparing your project: the checklist	8
07	Costs, payback and funding	9
08	The steps of a project with Probot	10

Who is this guide for?

Plant managers, production managers, engineers and owners of manufacturing SMEs who still palletize by hand, or who want to replace an aging palletizer. No robotics knowledge is required.

Palletizing is often the last manual step of a production line: boxes to lift, turn and stack, hundreds of times a day. It is also one of the simplest and most profitable tasks to automate. This guide gives you the benchmarks to make the right choices, ask your suppliers the right questions and avoid the most common mistakes.

Why robotize palletizing?



Palletizing by hand ties up one or more employees in a repetitive, physically demanding, low-value task.

1. Cope with labour shortages

End-of-line jobs are among the hardest to fill and keep filled. A robot handles palletizing on every shift and frees your employees for more interesting work: quality control, line operation, maintenance.

2. Protect your team's health

Lifting, turning and stacking loads all day exposes workers to musculoskeletal disorders, especially in the back and shoulders. Handing these movements over to a robot reduces injuries, absences and the related costs.

3. Gain consistency and quality

A robot places every box in exactly the same spot, following the same pattern. Pallets are more stable, better aligned and better protected in transit, which means fewer damaged products and returns.

4. Keep up with the line

The robot works at your line's pace, with no breaks and no end-of-shift slowdown. You can increase output without adding end-of-line staff.

Signs it is time to automate

- You struggle to hire or retain end-of-line staff.
- Employees report pain, or injuries are reported at this station.
- Palletizing limits your line speed.
- Poorly built pallets cause damage or customer complaints.

The components of a robotic palletizing system



A robotic palletizer is a set of components working together. Knowing them helps you compare offers.

The robotic arm

The heart of the system. Most are **articulated** robots (4 to 6 axes), **gantry** (Cartesian) robots and, for light loads at high speed, **delta** robots. Three criteria: **payload** (box + gripper weight), **reach** (pallet height and size) and **number of axes**.

The gripper (end-of-arm tool)

It picks the product: **vacuum cups** for closed boxes, **clamps** for cases and heavy loads, **forks or fingers** for bags. A good gripper makes all the difference in stability and speed (see chapter 04).

Sensors and vision

Proximity and photoelectric sensors to detect boxes and pallets, force sensors and sometimes a vision system to read a barcode or check product orientation.

The controller and software

The “brain” that coordinates movements and talks to surrounding equipment. The software is used to create pallet patterns and adjust speed. The simpler it is, the more independent your team will be.

Conveyors and pallet handling

Roller, belt or chain conveyors to bring products in; empty-pallet and full-pallet stations, sometimes a pallet dispenser, so the robot never has to stop.

Safety and integration

Emergency stops, light curtains, laser scanners or the robot’s built-in safety functions (chapter 05). And, if needed, a connection to your ERP or warehouse management system (WMS) for real-time tracking.

Industrial robot or collaborative robot?



Both technologies palletize very well. The right choice depends on your speed, your loads and the space available.

Criterion	Industrial robot	Collaborative robot (cobot)
Speed	Very high: ideal for high-volume lines.	Moderate: suits most SME end-of-line needs.
Loads	Up to several hundred kilograms.	Lighter loads (for example up to 40 kg for our palletizer).
Safety	Fence or protected perimeter required.	Can work near employees without a fence, based on the risk assessment.
Floor space	Larger (fenced cell).	Compact: fits into an existing line.
Installation	An integration project of several weeks.	Fast, especially with a ready-to-use solution.
Programming	Often handled by an integrator.	Simple: your team can change patterns itself.
Investment	Higher (robot, cell, safety, integration).	Lower and more predictable.

Our advice

If your line produces a few boxes per minute and space is tight, a collaborative palletizer is usually the simplest and most profitable choice. For very high speeds or very heavy loads, an industrial robot in a protected cell is the way to go. When in doubt, have your line assessed: the answer depends on your actual numbers.

Choosing the right gripper



The gripper is the part that touches your product. A poor choice means slipping boxes, deformed bags or a slower line than planned.

The main gripper types

- **Vacuum:** the most common solution for closed cardboard boxes, fast and versatile.
- **Clamp:** for open cases, trays or heavier loads that need to be squeezed.
- **Fork or finger:** for bags (flour, pellets, pet food) that must be supported from below.
- **Combined:** some grippers mix vacuum and clamps, or also handle slip sheets and empty pallets.

Questions to ask yourself

- **What packaging?** Closed box, open case, bag, shrink wrap, smooth or porous surface.
- **What weight and dimensions?** Note the smallest and largest formats to palletize.
- **One box or several at a time?** Picking two boxes per cycle can double the speed.
- **How many formats?** If you change products often, a **quick-change** gripper reduces downtime.
- **What environment?** Dust, cold, humidity or washdown can affect the choice of materials and cups.

The right reflex

Have your real products tested, including the most damaged or lightest boxes. It is the only way to validate the grip before installation.

Safety first



Every robot, even a collaborative one, needs a risk assessment before it goes into service.

A risk assessment for every installation

It considers the robot, the gripper, the load carried, the speed and where your employees move around. It determines the protection needed: a fence, detection zones or built-in safety functions.

Reference standards

- **ISO 10218 (parts 1 and 2):** safety requirements for industrial robots and their integration.
- **ISO/TS 15066:** guidelines for collaborative applications (allowable contact forces and pressures).
- **CSA Z434:** the Canadian standard for industrial robots and robot systems.

Common safety equipment

For an industrial robot

- Fence and interlocked doors
- Light curtains at access points
- Laser scanners
- Emergency stops

For a cobot

- Force and speed limiting
- Stop on contact detection
- Slow-down zones
- Emergency stops

Key takeaway

“Collaborative” does not mean “no precautions.” A cobot can often run without a fence, but only if the risk assessment confirms it for your application.

Preparing your project: the checklist

Gather this information before requesting a quote: you will get a more accurate offer, faster.

Your products

- ☐ Packaging types (box, case, bag...)
- ☐ Dimensions and weight of each format
- ☐ Number of formats and how often they change
- ☐ Photos of products and current pallets

Your production

- ☐ Current and target speed (boxes per minute)
- ☐ Number of shifts and days per week
- ☐ Number of lines to palletize
- ☐ Employees assigned to palletizing

Your pallets

- ☐ Pallet type and dimensions
- ☐ Maximum full-pallet height
- ☐ Pallet patterns (layers, orientation)
- ☐ Slip sheets, labelling, stretch wrapping

Your space

- ☐ Plan or photos of the end-of-line area
- ☐ Available floor space and height
- ☐ Forklift traffic
- ☐ Power supply and compressed air

Also think about...

Your growth plans (new products, a second line), your hygiene requirements (food, pharmaceutical) and who will be responsible for the robot day to day.

Costs, payback and funding



What makes up the cost of a project

The robot and its controller, the gripper, conveyors and pallet stations, safety equipment, installation, programming and training. A ready-to-use solution bundles most of these and makes the budget more predictable.

Calculating your payback

Annual savings = labour costs assigned to palletizing (wages and benefits, per shift) + avoided costs (injuries, absences, damaged products, overtime).

Payback period (years) = net investment (after financial assistance) ÷ annual savings.

Example reasoning: if palletizing ties up one full-time person on two shifts, annual savings are calculated on two full salaries with benefits. Run the numbers with your own figures: that is what will convince your management.

Financial assistance

In Québec and Canada, several programs reduce the cost of an automation project:

- **Tax credits** on manufacturing equipment (for example Québec's investment and innovation tax credit – C3i).
- **Accelerated tax deductions** on manufacturing equipment.
- **Loans on favourable terms** (BDC, Investissement Québec).
- **Training grants** for your employees.

Conditions change often: see our [Financial Assistance Programs](#) page and check with your accountant. Many programs require you to apply **before** buying.

The steps of a project with Probot

Our FANUC collaborative palletizer arrives ready to use. Here is how a project unfolds.

- 1 Line assessment.** We analyze your products, pallets and speed using the chapter 06 checklist.
- 2 Detailed quote.** You get the price and the technical description, also useful for your funding applications.
- 3 Setup in the app.** Box dimensions, pallet patterns, speed: everything is set in the Probot app, which also lets you run a demo before buying.
- 4 Delivery and start-up.** The palletizer plugs in and starts in about 5 minutes, with no safety fence.
- 5 Training.** Operator training is built into the app, step by step.
- 6 Follow-up and maintenance.** Our team provides preventive maintenance and responds fast when production stops.

Let's talk about your end of line

Send us your checklist: we will get back to you with an assessment and a custom quote.

 +1 (418) 948-0909 ·  info@probotsystems.com

probotsystems.com/en/palletizer

This guide is provided for information purposes. The standards, funding programs and conditions mentioned may change; confirm them with the organizations concerned. © 2026 Probot Systems Inc., 8895 rue des Cordiers, Suite 300, Lévis, Québec G6Y 0K5.