WHAT WE DELIVERED

4×

bearings per carton

A custom PET thermoformed blister tray engineered around a Tier-1 bearing manufacturer's component geometry — turning a 24-piece corrugated carton into a 96-piece nested system, with every bearing fully isolated from its neighbours.

AUTOMOTIVE · BEARING MANUFACTURER · CHAKAN BELT

From 24 bearings per carton to 96 — without a single metal-to-metal contact.

4×	65%	11	8 days
Bearings per carton	Freight cost saved	Months zero rejection	Die turnaround

THE CHALLENGE

A Tier-1 automotive bearing manufacturer supplying global two-wheeler OEMs was shipping precision ball bearings in standard corrugated outer cartons with cardboard divider inserts. The format had three persistent problems:

- Only 24 bearings fit per carton — the dividers themselves ate roughly 40% of the usable internal volume.
- Dividers shifted in transit, letting bearings knock each other and causing visible surface-finish damage on the outer race.
- Incoming-inspection rejections at the OEM were running at approximately 1.2% per lot — a significant cost on a high-volume programme.
- Foam inserts were trialled and ruled out: too expensive at that volume.

OUR SOLUTION

A tray engineered around the bearing, not the carton.

Our in-house design team worked from the actual bearing drawing and the client's existing shipping carton — which they didn't want to change, because the OEM's receiving dock was built around it. The redesign had four core features:

>> Precision-nested cavities.
A custom PET thermoformed tray with cavities shaped to the exact bearing outer race, with inter-cavity ribs that physically separate every bearing from every neighbour. No metal-to-metal contact is possible — in any orientation, during any transit shock.

>> 4× stacking inside the same outer.
Low-profile tray geometry means four nested trays stack inside the client's existing corrugated carton — turning 24 bearings per carton into 96.

>> 180° asymmetric poka-yoke.
One corner of the tray carries an asymmetric notch that only lines up with the carton insert one way. The tray physically will not sit in the carton the wrong way around — eliminating a long-standing operator error at the packing station.

>> Designed to come back.
The tray survives repeated trips in closed-loop freight. Where return-leg logistics are run by the customer, trays go back to the packing station and start again.

BEFORE
24

→ AFTER
96

Bearings per shipping carton — same outer dimensions

> *"The tray paid for its own tooling within the first three months on freight savings alone. The zero-rejection record is the real story."*
> — Head of Logistics, Tier-1 Bearing Manufacturer

WHAT WE BUILT

- Material: PET (food-grade and recyclable)
- Tray geometry: 4-high nested stack
- Tooling: aluminium die, 8 days from design sign-off to first article
- Programme in production since: 2024

Customer name withheld under confidentiality. Full named reference available on request.