Technical Whitepaper

Chip Sleeve / Chip Can Insert · 180° half-cylinder geometry · 5.5 oz stacked-chip canister

DOC-CS-100 Rev C · Inventor: Deanna Fine · Provisional patent application filed

1. Summary

The Chip Sleeve is a rigid, single-piece insert that occupies one half of the cross-section of a standard stacked-chip canister. It is a true 180° half-cylinder with a closed lower end, an open upper end, and a full-height open side, so the chip column bears on both sides of the curved wall. The consumer tilts the can and withdraws the sleeve; the stack rides out intact and sits supported on the sleeve. Nothing about the exterior of the canister changes.

2. Problem

Stacked-chip canisters are deeper than the average adult hand can comfortably reach. Consumers tip the can, shake it, or force a hand down the tube — all of which fracture chips, and the last third of the pack is routinely eaten as fragments or discarded. It is a well-known, universally recognised failure point of an otherwise excellent package.

3. Geometry

Derived from the 5.5 oz canister interior. The curved wall is swept through exactly 180°, giving a half-moon cross-section rather than a wrapping cradle. This is the geometry described in the provisional filing.

Parameter	Nominal	Tolerance
Canister outside diameter	76.1 mm	± 0.5
Canister wall thickness	1.2 mm	± 0.2
Canister inside diameter	73.7 mm	± 0.4
Sleeve curved-wall O.D.	72.9 mm	± 0.15
Radial sliding clearance per side	0.40 mm	0.32 – 0.48
Diametral sliding clearance	0.80 mm	0.64 – 0.96
Wall thickness — PP	0.50 mm	± 0.05
Wall thickness — paperboard	0.65 mm	± 0.08
Arc of curved wall	180°	—

The 0.40 mm per-side radial clearance is a running fit: loose enough to slide freely under light finger load with product in place, tight enough that the sleeve cannot rack or bind inside the tube during withdrawal.

4. Materials

The part is material-agnostic. Two production routes are under evaluation:

— Food-grade polypropylene (PP, PET or rPET) at 0.50 mm wall — thermoformed or injection moulded. Target part mass ~6 g. Highest stiffness-to-mass, best surface finish, tolerant of oil and low humidity.

— Barrier-coated paperboard (SBS or CRB) at 0.65 mm — die-cut, scored and form-wrapped on a mandrel. Target part mass ~3 g. Recycles with the existing composite tube, which is the preferred outcome for most fibre-forward packaging roadmaps.

Paperboard requires a food-safe grease and moisture barrier (PE, PLA or a water-based coating) to prevent oil migration and paper dust. Rigidity is achieved through wall thickness and, if required, a rolled lip along the two straight edges of the half-cylinder.

Note: The 3–6 g mass range is the inventor's stated target and is subject to validation by the licensee's engineering and packaging teams. Final mass depends on substrate, wall thickness, manufacturing process, and any required coatings or secondary features.

5. Structural behaviour

Under withdrawal the sleeve is loaded as a cantilevered open channel. The 180° section has a high second moment of area about the horizontal axis, which is the axis that matters: the load is the weight of the chip column (typically 150–160 g) applied along the trough. At 0.50 mm PP the predicted tip deflection at full extension is a few millimetres — visually rigid, no collapse, no spilled product. The closed lower end acts as a stop that prevents the stack from sliding off the far end during withdrawal.

6. Line integration concept

Stacked-chip canisters are charged through the open base: chips are formed into a continuous column, counted, and pushed into the tube as a single slug before the metal base is seamed on. The proposed Chip Sleeve integration is a co-insertion concept — a magazine at the transfer chute would present a sleeve, the counted column would be lowered vertically into the open trough (never pushed through the closed end), and sleeve plus stack would enter the can as one slug in the existing push stroke.

This is an engineering hypothesis, not a validated production configuration. The number of added modules, station count, cycle time, and any line-speed impact can only be confirmed through a study with the OEM's line engineer and the actual canister, filler, seamer, and conveyor constraints. The goal is one bolt-on module, no second station, and no line-speed penalty.

7. Cost model

Figures are order-of-magnitude estimates for planning only, at volumes typical of a single regional SKU. Final costs depend on validated part mass, material choice, and the OEM's manufacturing process.

Item	PP 0.50 mm	Paperboard 0.65 mm
Resin / board per part	$0.011	$0.006
Conversion per part	$0.008	$0.007
Estimated landed cost	$0.019	$0.013
Tooling (per cavity family)	$45k – $80k	$20k – $35k
Target added part mass	~6 g	~3 g

8. Intellectual property

A provisional patent application has been filed covering the half-cylinder insert geometry — closed lower end, open upper end, full-height open side — and the tilt-and-withdraw method of dispensing a stacked column from a canister. Available for licence on a category or geographic exclusivity basis, per-unit royalty, or outright assignment.

Appendix A — Dimensioned drawing

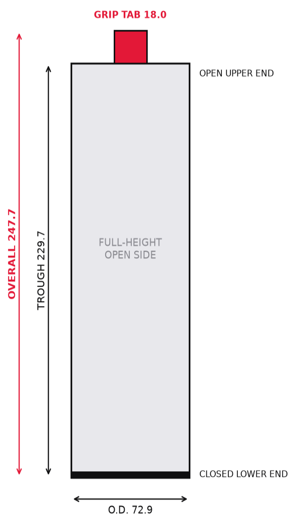
DWG-CS-001 Rev B. Scaled variants exist for 75 mm and 83 mm canister formats; all retain the 180° arc and the 0.40 mm per-side clearance rule.

CHIP SLEEVE / CHIP CAN INSERT

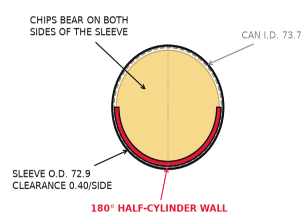
DWG-CS-001 Rev B | 180° half-cylinder geometry per provisional filing | 5.5 oz stacked-chip canister (73.7 mm I.D.) | Units: mm

Inventor: Deanna Fine · dplkvl@aol.com · Provisional patent application filed

SIDE ELEVATION (open side toward viewer)



SECTION A-A · END VIEW



METHOD OF USE · TILT AND WITHDRAW

1 Tilt can toward open side

2 Grip tab clears rim

3 Withdraw sleeve; stack rides out intact

DIMENSION SCHEDULE

PARAMETER	NOM.	TOL.
Canister O.D.	76.1	± 0.5
Canister wall	1.2	± 0.2
Canister I.D.	73.7	± 0.4
Sleeve curved-wall O.D.	72.9	± 0.15
Radial clearance / side	0.40	0.32 – 0.48
Diametral clearance	0.80	0.64 – 0.96
Wall thickness (PP)	0.50	± 0.05
Wall thickness (board)	0.65	± 0.08
Arc of curved wall	180°	± 1°
Trough length	229.7	+0 / −1.0
Grip tab length	18.0	± 0.5
Overall length	247.7	± 1.0
Lower end	closed	integral
Upper end	open	—
Side opening	full height	180° span
Part mass — PP 0.50	12.9 g	± 0.5
Part mass — board 0.65	14.5 g	± 0.6

All dimensions in millimetres. Scaled variants available for 75 mm and 83 mm canister formats. Confidential — provisional patent application filed.