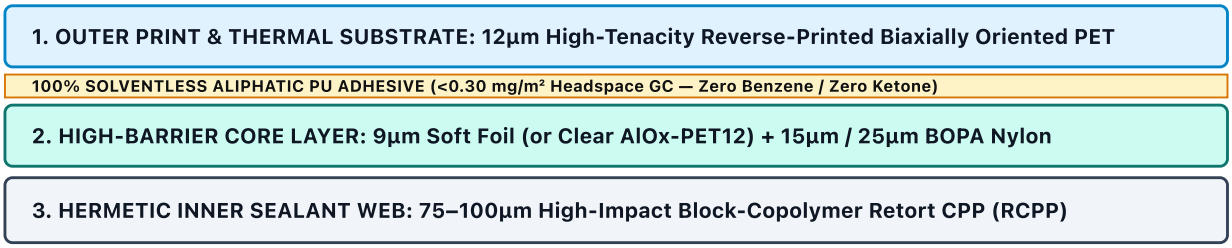
121°C / 135°C High-Temperature Autoclave Retort & Dual-Ovenable Pouches — Engineering TDS

4-Ply Foil & Microwave-Safe Clear AlOx Laminates Validated to FDA 21 CFR 177.1390 & EU 10/2011

1. MULTI-LAYER CROSS-SECTIONAL POLYMER STACK



Functional Layer	Verified Polymer & Micron Gauge	Converting & Lamination Process
Thermal Outer Web	12µm High-Tenacity Reverse-Printed Biaxially Oriented PET	Heat-Resistant Polyurethane Ink System (Up to 140°C)
Barrier & Puncture Core	9µm Soft Foil (or Clear AlOx-PET12) + 15µm / 25µm BOPA Nylon	Henkel Aliphatic Retort PU Adhesive (Zero PAA Migration)
Autoclave Sealant	75–100µm High-Impact Block-Copolymer Retort CPP (RCPP)	Withstands 135°C × 45 min Counter-Pressure Sterilization

2. LABORATORY PHYSICAL, BARRIER & MIGRATION TEST MATRIX

Parameter	Verified Factory Value	Instrument / Condition	Standard
FDA Retort Compliance	21 CFR 177.1390(c) Laminate Extraction @ 135°C × 60 min	Extractives < 0.4 mg/in² (Limit: 1.5)	SGS / Intertek Verified
EU Specific Migration	Primary Aromatic Amines (PAA) Non-Detectable (<0.002 mg/kg)	Overall Migration < 1.6 mg/dm² in Olive Oil	EU Reg. No 10/2011
Post-Retort Seal Strength	≥ 58 N / 15mm across Gusset Transitions after 135°C Cycle	Inter-Ply Bond ≥ 6.8 N / 15mm (Zero Tunneling)	ASTM F88 / JIS Z 0238
Hydrostatic Burst & Bone Guard	Burst ≥ 0.19 MPa | Dual-BOPA Puncture ≥ 24 N	24-Month Ambient Shelf Life (F0 = 8–18)	ASTM F1140 / D1709
205°C Dual-Ovenable Option	Heat-Stabilized PET / Self-Venting Ovenable Co-Polyester	Safe in Conventional Oven (205°C) & Microwave	FDA 21 CFR 177.1630

FlexPouchMFG™ Line Qualification & CAD Standards

3. HIGH-SPEED FILLING MACHINE & HEAT-SEALING OPERATING WINDOW

Pre-Made Rotary & Inline Pouch Fillers

Validated on Toyo Jidoki, Mespack, Volpak, Bossar & Rezpack (35–90 ppm). Bag flat camber <1.0 mm ensures 99.8% vacuum pick-up reliability. Recommended jaw pressure: 0.28–0.35 MPa; dwell: 0.45–0.70 s.

VFFS / HFFS / Stick-Pack Web Tracking

Calibrated kinetic COF (μk = 0.19 ± 0.03) prevents forming-collar stick-slip on Syntegon/Bosch, Viking Masek, Rovema & Ilapak lines up to 600 packs/min. Heavy-wall 76 mm / 152 mm cores.

4. PRE-PRESS ARTWORK BLEED, PHOTO-EYE MARK & ZIPPER/VALVE CLEARANCES

CAD Dieline Element	Mandatory Tolerance	Production & Filling-Line Purpose
Outer Bleed & Safety Margin	+3.0 mm bleed · -4.0 mm inner text safe zone	Eliminates white edge flash during high-speed rotary slitting (±0.15 mm)
Heat-Seal & Gusset Ink Mask	Optional matte/heat-resistant overprint lacquer	Prevents jaw ink transfer at 145°C–195°C sealing temperatures
Photo-Eye Registration Mark	10 mm × 5 mm solid high-contrast block (≥85%)	Clear unobstructed track for SICK / Keyence optical cut-off sensors
Laser Tear Score & Zipper Axis	Zipper center 32–38 mm from top; laser score -12 mm	Clean consumer thumb-opening without tearing into zipper flange
Barcode / DataMatrix Contrast	Opaque double-white ink backing (≥82% reflectance)	Guarantees ANSI Grade-A retail & GS1 / Chestny ZNAK scan rates

Complimentary Pre-Production Line Trial Policy: Prior to bulk printing, Alex Gao's engineering lab dispatches free unprinted trial pouches or 50–100m test rolls matching exact micron structure so your co-packer can verify jaw temperatures, autoclave F0 profiles, or 50°C cosmetic stability.

5. FACTORY-DIRECT TIERED REFERENCE MATRIX (HP INDIGO DIGITAL VS. 10-COLOR ROTOGRAVURE)

Format / Specification	HP Indigo Digital	Mid-Scale Run	High-Volume Rotogravure
85g–100g Wet Cat/Dog Food Retort Pouch	5,000 pcs ($0.115)	20,000 pcs ($0.072)	**50,000+ pcs ($0.052)**
250g–350g Ready-Meal / Tuna / Curry Pouch	2,000 pcs ($0.185)	10,000 pcs ($0.108)	**50,000+ pcs ($0.076)**
Clear AlOx Microwave-Direct Retort Pouch (250g)	3,000 pcs ($0.210)	10,000 pcs ($0.126)	**50,000+ pcs ($0.089)**
1kg–3kg Foodservice Catering Institutional Retort	2,000 pcs ($0.390)	10,000 pcs ($0.255)	**30,000+ pcs ($0.182)**

6. CLEANROOM EXPORT CARTON, PALLETIZATION & BATCH COA PROTOCOL

Stage	Standard Operating Specification	Verification Document
Inner Sanitary Liner	Antistatic food-grade virgin PE inner bag heat-sealed inside cleanroom	ISO Class 8 Lot Traceability Label
Export Corrugated Box	Double-wall 5-ply BC-flute Kraft carton (ECT ≥ 44 lb/in · gross ≤ 18 kg)	Drop-Tested Carton Corner Guards
FCL / LCL Palletization	Heat-treated ISPM-15 fumigation-free pallets + LLDPE stretch hood + desiccant	Container Loading Photo Report
Mandatory Release COA	MOCON OTR/WVTR, Instron ASTM F88 seal curve & Agilent 8890 GC solvent chromatogram	PDF + Printed COA in Carton #1

Request Your Custom 1:1 Vector Dieline & Free 25-Pouch Sample Kit (2-Hour SLA):

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