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PRODUCT INTRODUCTION · 产品介绍

# BOPS Envelope Window Film

## 信封开窗贴片膜 · 27 μm 高光 / 29 μm 哑光

Biaxially oriented polystyrene film for envelope window patching — chlorine-free, antistatic, food-contact tested.

**Doc. No.** API-PI-BOPS-2026 **Rev.** 1.0 **Date** 2026-11-20 **HS code** 3920300000

| 27 / 29 μm | Chlorine-free | Antistatic | Food contact | 24 h |
|---|---|---|---|---|
| Two calipers 高光 / 哑光 | 无氯 · recyclable in PS stream | 抗静电 · low dusting | 食品接触全部项目合格 | Quotation reply 报价答复 |

## 01 What it is, and where it goes

产品与用途

BOPS window film is a biaxially oriented polystyrene sheet, 27 μm or 29 μm thick, supplied in rolls for envelope window patching. It is glued over the aperture of an envelope, mailer or folding carton before the sheet is folded, so the address or the product shows through a flat, dimensionally stable window instead of an open hole.

BOPS 窗口膜是厚度 27 μm 或 29 μm 的双向拉伸聚苯乙烯薄膜，以卷材供应，用于纸信封、邮寄袋与折叠纸盒的开窗贴合。它在纸张折叠成型之前贴在开窗处，让地址或产品透过一层平整、尺寸稳定的窗口呈现，而不是一个敞开的洞。

Two finishes cover the range. The 27 μm clear grade is the workhorse of high-speed patching: stiff enough to stay flat in a stack, clear enough for machine reading. The 29 μm matte grade diffuses reflection for premium mail and cartons where a soft, non-reflective window is wanted. Both run on the same equipment, at the same settings, with the same adhesive.

两个表面档次覆盖主要用途。27 μm 高光档是高速贴窗的主力：挺度足以在堆垛中保持平整，通透度足以被机器读取。29 μm 哑光档把反射摊开，用于需要柔和无眩光视窗的高端邮件与纸盒。两者在同一台设备、同一组参数、同一种胶下运行。

### Where it is used 应用场景

Business and reply envelopes, padded and board-backed mailers, document folders, and folding cartons for stationery, cosmetics and food — anywhere a paper aperture has to stay flat through the folder, the stacker and the mail stream.

商务与回邮信封、气泡与纸板邮寄袋、文件袋，以及文具、化妆品与食品用折叠纸盒。凡是纸张开窗要挺过糊盒、收叠与整段邮路的地方。

MATERIAL COMPARISON 材料对比

| Point 关注点 | BOPS | PVC | PET |
|---|---|---|---|
| **Stiffness** 挺度 | Rigid chain; the stack stays flat overnight 刚性链，堆垛一夜仍平整 | Plasticiser softens it; window dishes 增塑剂软化，受压塌陷 | Stiffer, but more cutting force 更刚，剪切力更大 |
| **Chlorine / plasticiser** 氯与增塑剂 | Neither 均不含 | Both, and they migrate 均含且会迁移 | Neither 均不含 |
| **Recycling** 回收 | Polystyrene stream 聚苯乙烯回收流 | Restricted in several markets 多国受限 | PET stream, but window film is rarely separated 属 PET 流，但视窗膜很少被分拣 |

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02 · SURFACE · 消光与亮光

# Matt or glossy — the same film, two surfaces

同一种薄膜，两种表面

Which one you want depends on what the window has to do: hide the folds of an insert, or let them show through.

选哪一种，取决于视窗要完成什么：遮住内页的折痕，还是让它们透出来。

### Matt film 消光膜

乳白雾面，成卷供应 · satin, low-reflection face 缎面低反射

Matt goes soft under a reading lamp or a shop spotlight instead of throwing a glare back at the reader, so the print behind the window stays legible. It is the choice for premium mail, cosmetics and gift cartons, and for dark or heavy ink coverage where a glossy window would read as a mirror.

消光在台灯或射灯下泛柔光，而不是把光反回读者眼睛，视窗背后的印刷因此保持可读。高端邮件、化妆品与礼盒，以及深色或大墨量画面——那种画面上亮光视窗像一面镜子——都选它。

### Glossy film 亮光膜

高反光镜面卷 · mirror face, full clarity 镜面高通透

Glossy shows colour at full saturation, which is why it is the default for retail cartons and for windows carrying a logo or a barcode. It also shows fingerprints and dust sooner, so wear gloves on the packing line and wipe the window before the carton is closed.

亮光把颜色以最高饱和度呈现，因此零售纸盒、以及视窗上要印 logo 或条码的场合默认用它。它也更容易显指纹与灰尘，包装线上建议戴手套，并在合盒前把视窗擦净。

> Both run on the patcher at the same settings; only the adhesive coat weight may need a small adjustment, because a matte face wets out more slowly than a glossy one. Neither surface changes the caliper, the yield or the way the roll is wound.
> 两个档次在贴窗机上用同一组参数，只有上胶量可能需微调——哑光面的润湿速度比亮光面慢。表面状态不改变厚度、出膜率，也不改变收卷方式。

## 03 Supply format and measured values

规格与实测性能

Width, core and roll diameter are agreed at order, because a 3-inch core does not fit a machine built for 6-inch chucks, and a 1,200 mm roll does not fit a 1,000 mm unwind. Tell us the machine and we wind to it.

卷宽、纸芯与卷径按订单商定：3 英寸纸芯装不进 6 英寸卡盘，1,200 mm 卷也放不进 1,000 mm 放卷架。告知机台型号，我们按机台收卷。

| Item 项目 | 27 µm clear 高光 | 29 µm matte 哑光 |
|---|---|---|
| **Thickness** 厚度 | 27 ± 5 % µm | 29 µm |
| **Grammage** 面密度 | ≈ 28.7 g/m² | ≈ 30.5 g/m² |
| **Yield** 出膜率 | ≈ 35 m²/kg | ≈ 32.8 m²/kg |
| **Roll width** 卷宽 | To order 按订单 | |
| **Core / diameter** 纸芯与卷径 | To order 按订单 | |
| **Splices** 接头 | Flagged and taped, max. 1 per roll 标记胶接，每卷不超过 1 个 | |
| **Packing** 包装 | Palletised, stretch-wrapped, strapped 上托、缠膜、打包带 | |

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MEASURED VALUES, 27 MM 实测性能

| Property 项目 | | Value 数值 | Unit 单位 |
|---|---|---|---|
| **Thickness** 厚度 | | 27.3 | µm |
| **Tensile strength** 拉伸强度 **MD / TD** | | 49 / 76 | MPa |
| **Elongation at break** 断裂伸长率 **MD / TD** | | 4.9 / 9.3 | % |
| **Coefficient of friction** 摩擦系数 **static / kinetic / peak** | | 0.287 / 0.377 / 0.431 | — |
| **Haze** 雾度 | | 38.0 | % |
| **Gloss 45°** 光泽度 | | 62 | GU |
| **Density** 密度 | | 1.05 | g/cm³ |
| **Surface resistance** 表面电阻 **(antistatic grade)** | To order 按订单 | | Ω |
| **Food contact** 食品接触 | All items pass 全部项目合格 | | — |

04 · PROCESSING · 加工与使用要点

# Running it on the patching line

## 贴窗机上的使用要点

Adhesive follows the paper. Use a water-based window gum on porous uncoated stock, where the water can escape through the fibre; use a hot melt on coated or varnished surfaces, where it cannot. Coat weight is set by the adhesive supplier's window — too little gives fibre tear at the perimeter, too much gives squeeze-out that blocks in the stack and picks up dust on the line.

胶跟着纸走。多孔未涂布纸用水性贴窗胶，水汽可以从纤维中逸出；涂布或上光纸用热熔胶，水汽出不去。上胶量按胶商给出的窗口设定——偏少则周边纤维撕裂，偏多则溢胶，堆垛时粘连、产线上吸灰。

Hold the hall at 18–25 °C and 45–60 % RH. A cold roll taken straight into a warm room blushes, because moisture condenses on the surface faster than it can escape from a wound roll. Keep the film in its wrap until the machine is ready, and let it reach room temperature before unwinding.

车间保持 18–25 ℃、相对湿度 45–60 %。从冷库直接推进暖车间的卷材会发雾——水汽在表面凝结的速度快于从卷内散出的速度。膜在上机前不要拆包装，先回温再放卷。

TROUBLESHOOTING 常见问题

| Symptom 现象 | Usual cause 常见原因 | Action 处理 |
|---|---|---|
| **Edge curl** 翘边 | Shrinkage differential released at the perimeter 周边释放的收缩差 | Lower drying temperature, balance tension 降低干燥温度、配平张力 |
| **Bubbles** 气泡 | Water trapped under a coated stock 涂布纸下夹水 | Switch to hot melt or perforated gum line 改热熔胶或打孔胶线 |
| **Blush** 发雾 | Moisture condensing on a cold film 冷膜表面结露 | Condition rolls to hall temperature 卷材回温至车间温度 |
| **Burr** 毛边 | Worn die or excessive clearance 刀模磨损或间隙过大 | Repitch the die, check clearance 重排刀模、复核间隙 |
| **Blocking** 粘连 | Winding pressure plus residual stress 收卷压力叠加残余应力 | Hold 50–80 N/m, rest before use 控制在 50–80 N/m、用前停放 |

### Storage 储存

Keep rolls upright in the original wrap, away from direct sun and heat sources, and let them condition to hall temperature before unwinding. A roll stored on its side flats the face; a roll stored against a wall picks up a cold spot that prints as a shadow.

卷材立放于原包装内，远离阳光直射与热源；上机前回温至车间温度。卧放的卷材端面会压平；靠墙存放的卷材会出现局部低温，印出来就是一道阴影。

## 05 Packing & export

包装与出运

Rolls travel upright on a pallet, stretch-wrapped and strapped, with corner boards on every roll and a desiccant bag inside the wrap for tropical destinations. The same packing serves two loading patterns: a full container of rolls for a plant running one caliper continuously, or a two- to six-pallet consolidation for a trial order or a converter buying several calipers at once.

卷材立放上托，缠绕膜加打包带，每卷加护角，发往热带地区的在膜内加干燥剂。同一套包装服务两种装柜方式：常年跑同一厚度的工厂走整柜卷装；试单或同时采购几个厚度的加工厂走两到六托的拼箱。

| Destination 目的地 | Loading 装柜 | Quantity 数量 | Gross / volume 毛重 · 体积 |
|---|---|---|---|
| **Bangkok, Thailand** | 1 container, FCL | 636 rolls | 11,037.58 kg · 28.000 m³ |
| **Haiphong, Vietnam** | 40′ HQ, LCL CFS-CFS | 2 pallets | 900 kg · 2.912 m³ |
| **Lagos, Nigeria** | 20′ GP | 6 pallets | 5,231.5 kg · 9.978 m³ |

Shipments are quoted FOB Shenzhen. Less-than-container loads start at 5 t. HS 3920300000. A 20′ GP takes about 18 pallets of rolls; a 40′ HC about 22. LCL shipments are consolidated CFS-CFS, so the pallet is strapped for a shared container and labelled for the destination, not for a single consignee.

报价条款为 FOB 深圳。拼箱 5 吨起。HS 编码 3920300000。20 尺普柜约装 18 托卷材，40 尺高柜约 22 托。拼箱按 CFS-CFS 集拼，托盘按拼箱加固、按目的地标识，而不是按单一收货人标识。

06 · FOOD CONTACT · 食品接触

# Tested, not claimed

## 食品接触：以实测为依据

Window film on a food carton is a food-contact material, and the only defensible statement about it is a measured one. The film is tested on production lots and passes every item: all seven results are within limits. Overall migration stays below one fifth of the limit in aqueous and fatty simulants.

食品纸盒上的窗口膜属于食品接触材料，关于它唯一站得住的表述是实测值。产品按生产批次检测，七项全部合格；水性及油脂类模拟物中的总迁移量均低于限值的五分之一。

| No. | Test item 检测项目 | Result 实测 | Verdict / unit 判定 · 单位 |
|---|---|---|---|
| 1 | **Sensory** 感官 | Colour normal, no odour 色泽正常、无异臭 | Pass 合格 |
| 2 | **Soaking solution** 浸泡液 | Clear, no sediment 无浑浊、无沉淀 | Pass 合格 |
| 3 | **Overall migration** 总迁移量 · **4 % acetic acid, 40 °C, 10 d** | < 2.0 | mg/dm² |
| 4 | **Overall migration** 总迁移量 · **50 % ethanol, 40 °C, 10 d** | < 2.0 | mg/dm² |
| 5 | **Overall migration** 总迁移量 · **isooctane, 20 °C, 2 d** | 2.5 | mg/dm² |
| 6 | **Potassium permanganate consumption** 高锰酸钾消耗量 · **water, 60 °C, 2 h** | < 2.0 | mg/kg |
| 7 | **Heavy metals as Pb** 重金属（以 **Pb** 计）· **4 % acetic acid, 60 °C, 2 h** | < 1 | mg/kg |

The isooctane result, 2.5 mg/dm², is the highest of the three migration tests and the one to watch when a customer specifies a fatty food. It still sits at a quarter of the limit, but it is the value that moves first if resin quality changes.

异辛烷的 2.5 mg/dm² 是三项迁移测试中最高的，也是客户指定油脂类食品时最该盯住的一项。它仍只有限值的四分之一，但树脂质量若有波动，最先动的就是它。

### What ships with the film 随货文件

Every lot leaves with its own certificate: measured thickness, migration results and the production date. Buyers who audit suppliers ask for three consecutive lots; we keep them on file and can send the set.

每一批随货附本批检验报告：实测厚度、迁移量结果与生产日期。做供应商审核的买主通常要连续三批，我们在档，可整套提供。

## 07 What we need to quote

订购与联系

Send the paper grade, the machine model and the destination. With those three we can say which caliper will run, what the yield per thousand windows will be, and how the roll should be wound for your unwind — usually within 24 hours, without a sample round-trip.

请提供纸张克重、机台型号与目的地。有这三项，我们就能说明该用哪个厚度档、每千只视窗的用膜量，以及卷材按你的放卷方式应如何收卷——通常 24 小时内答复，不必先寄样往返。

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| Item 项目 | Terms 条款 |
|---|---|
| **Minimum order** 起订量 | 1 pallet per caliper; LCL from 5 t 单一厚度 1 托起，拼箱 5 吨起 |
| **Price terms** 价格条款 | FOB Shenzhen |
| **Lead time** 交期 | Stocked calipers 7–10 days; special widths to order 常备厚度 7–10 天，特殊卷宽按单 |
| **Documents** 单据 | Proforma invoice, commercial invoice, packing list, certificate of origin, lot certificate 形式发票、商业发票、装箱单、原产地证、检验报告 |
| **HS code** 编码 | 3920300000 |

**What to send us** 询价请提供**.** Paper grade and grammage · patching machine model and unwind direction · roll width and core diameter · caliper (27 µm clear or 29 µm matte) · destination port and target quantity. With these we quote the wound roll, not just the tonne price. 纸张克重与等级 · 贴窗机型号与放卷方向 · 卷宽与纸芯直径 · 厚度档（27 µm 高光或 29 µm 哑光）· 目的港与目标数量。有这几项，我们报的是按机台收卷的价，而不只是每吨价。