亞太工業集團
Asia Pacific Industry Group Co., Limited

ASIA PACIFIC INDUSTRY GROUP CO., LIMITED
Tel +0086-551-64687285
Email sales@boppfilmsales.com
www.boppfilmsales.com · www.apigcl.com

BOPP Film for Capacitor — Type MPP (MPP01 / MPP02 / MPP03)

电容器用双向拉伸聚丙烯薄膜 — MPP 型（普通型 / 准高温型 / 高温型）

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APIG-TDS-BOPP-MPP-2018	**Rev. 1.0**	**2018-09-25**	**Technical Data Sheet / 技术数据表**

1. CHARACTERISTICS 1. 特点

Produced from imported ultra-high-purity electrical grade homopolymer polypropylene resin by the flat-film biaxial stretching process. The film offers good thickness uniformity, high mechanical strength and excellent electrical properties; capacitors wound from it show low dielectric loss and high insulation resistance. Ordinary film has a heat resistance characteristic value of 70 ℃, the quasi high-temperature type 85 ℃, and the high-temperature type 105 ℃.

采用进口超高纯度电工级均聚聚丙烯树脂，经平膜法双向拉伸制成。厚薄均匀性好、机械强度高、电气性能优异，卷制的电容器介质损耗小、绝缘电阻高。普通型薄膜耐温特性值 70 ℃，准高温型 85 ℃，高温型 105 ℃。

2. APPLICATION 2. 应用范围

Mainly used in metallized-film capacitors and foil-film capacitors, such as AC motor capacitors, low-voltage parallel power capacitors, energy-saving lamp capacitors, capacitors for hybrid vehicles and DC capacitors.

主要用于金属化膜电容器与箔式电容器，如交流电动机电容器、低压并联电力电容器、节能灯具电容器、混合动力汽车用电容器、直流电容器等。

3. FILM SIZE SPECIFICATION 3. 薄膜尺寸规格

规格 Size	单位 Unit	3D	4D	5D	6D	7D	8D	9D	10D	12D
厚度 重量法 Thickness WMV		2.8	3.8	4.8	5.8	6.8	7.8	8.8	9.8	11.8
厚度 机械法 Thickness MMV		3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	12.0
平均厚度偏差（WMV） Average thickness deviation		±2			±1					
成品膜卷宽度 Width of finished film roll		500 ±2、620 ±2，或根据客户需求分切 500±2, 620±2 or cut to customer requirement								
内径（DΦ） Inner diameter		Φ76.2、Φ152.4								
外径（D） Outer diameter	mm	Φ420 ~ Φ600								

Special specifications will be discussed separately.
特殊规格另行协商。

4. THICKNESS DESIGNATION 4. 厚度表示方法

The nominal film thickness is indicated by the central value of the thickness (an integer such as 3, 7, 10, 15) plus a mantissa (one decimal place) or its letter code. For MPP film the nominal value refers to the gravimetric thickness (WMV); for RPP / RRPP film it refers to the mechanical thickness (MMV, ten-layer method). Example: MPP8D means a WMV thickness of 7.8 μm; RPP12L means an MMV thickness of 12.0 μm.

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薄膜厚度的标称值以厚度中心值（整数值，如 3、7、10、15）加尾数（小数点后一位）或其代码表示。本公司 MPP 膜厚度标称值为重量法厚度（WMV）；RPP / RRPP 膜厚度标称值为机械法厚度（MMV，十层法）。示例：MPP8D 表示 WMV 厚度为 7.8 μm; RPP12L 表示 MMV 厚度为 12.0 μm。

尾数 Mantissa	代码 Code	尾数 Mantissa	代码 Code
−0.4	B	+0.1	V
−0.3	C	+0.2	W
−0.2	D	+0.3	X
−0.1	E	+0.4	Y
0	L	+0.5	Z

5. TECHNICAL FEATURES (TYPICAL VALUES) 5. 技术特征（典型值）

项目 Item	方向 Dir.	单位 Unit	MPP01 普通型 Ordinary	MPP02 准高温型 Quasi HT	MPP03 高温型 High temp.	测试标准 Standard
密度 Density		g/cm³	0.905 ±0.005			GB/T13542.2-2009/11
熔点 Melting point		℃	168 ±2	170 ±2	172 ±2	GB/T13542.2-2009/23
拉伸强度 Tensile strength		MPa	150	155	160	GB/T13542.2-2009/11
		MPa	250	280	300	GB/T13542.2-2009/11
断裂伸长率 Elongation at break		%	140			GB/T13542.2-2009/11
		%	50			GB/T13542.2-2009/11
弹性模量 Elastic modulus		MPa	2500	2600	2800	GB/T13542.2-2009/11
		MPa	3200	3600	4000	GB/T13542.2-2009/11
热收缩率 Thermal shrinkage		%	3.5	3.2	2.8	GB/T13542.2-2009/23
		%	1.0	0.8	0.6	GB/T13542.2-2009/23
浸润张力 Wetting tension		mN/m	38			GB/T13542.2-2009/10
表面粗糙度 Surface roughness		μm	0.10 ±0.02		0.08 ±0.02	GB/T13542.2-2009/8
介电强度（DC，平均值）BDV		V/μm	600			GB/T13542.2-2009/18.2.2
摩擦系数（静/动）Coefficient of friction		—	(0.7–0.9) / (0.6–0.8)			GB/T10006-1988
相对介电常数 Relative permittivity		—	2.2			GB/T13542.2-2009/17.1
体积电阻率 Volume resistivity		Ω·m	> 10^{15}			GB/T13542.2-2009/16.1
介电损耗因数 Dissipation factor		—	2.0 × 10□⁴			GB/T13542.2-2009/17.1

The above parameters are not a technical agreement and are for reference only.
以上参数非技术协议，仅供参考。

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6. ELECTRICAL WEAKNESS POINTS 6. 电弱点

标称厚度（μm） Nominal thickness	电弱点数（个/m²，300 V/μm） Electrical weakness points
≤ 4	≤ 1.0
5	≤ 0.8
6	≤ 0.7
7	≤ 0.6
8	≤ 0.4
9	≤ 0.3
≥ 10	≤ 0.2

7. CHEMICAL PROPERTIES 7. 化学特性

项目 Item	指标 Value
灰分 Ash content	< 30 ppm
氯含量 Chlorine content	< 10 ppm
水含量 Water content	< 50 ppm

Section 8 (curve of tensile strength) and section 9 (curve of BDV versus film thickness) are graphs; no data points were printed, so they are not attached here.
第 8 节（拉伸强度曲线）与第 9 节（介电强度与薄膜厚度关系曲线）为图示，未印数据点，本版不附图。

8. PACKING 8. 包装

Each roll is wrapped in a polypropylene bag after slitting and inspection to isolate dust and particles. Both sides of the roll are fixed with foam gaskets, support plates and plugs, then packed in carton boxes to prevent squeezing in transport. Cartons are strapped, stacked on wooden pallets and wrapped with stretch film against dust, particles and moisture. Standard pallet sizes: 1140 × 1140 mm and 1100 × 700 mm (□ also stated).

每一卷薄膜在分切和检验后用聚丙烯塑料袋包裹，以隔离粉尘与颗粒;膜卷两侧使用泡沫垫片、支撑夹板、堵头固定，防止运输中受挤压，并用纸箱包装、打包、托盘堆垛。堆垛后缠绕塑料薄膜，再次隔绝粉尘、颗粒与水汽。托盘尺寸：1140 × 1140 mm、1100 × 700 mm（另述 □）。

9. STORAGE 9. 储存

Avoid any form of impact during storage. Keep the storage environment dry and below 30 ℃. Do not store the rolls for long periods, as this affects performance; storage of more than one year is not recommended, and film stored longer than one year should have its properties re-evaluated.

储存过程中应避免任何形式的冲击;储存环境保持干燥，温度不高于 30 ℃;膜卷不宜长时间储存，否则影响使用性能;建议储存时间不超过 1 年，超过 1 年应对膜卷各项性能重新评估。

10. LABELLING 10. 标签

Each roll carries two labels with the basic roll data, one on the outer surface of the carton and one inside the packaging. Label fields and their meaning:

每一卷膜在包装箱内与包装箱外各有一张载明膜卷基本信息的标签。标签字段及其含义如下：

字段 Field	含义 / 示例 Meaning / example
编号 Roll No.	生产年份 + 大膜卷编号 + 分切号位，例：152534101（15 = 2015 年，2534 = 大膜卷号，101 = 分切号位）
型号 Film type	MPP01 普通型 / MPP02 准高温型 / MPP03 高温型
厚度 Nominal thickness	重量法标称厚度及其代码，例：7B
宽度 Width	膜卷宽度（mm）
长度 Length	膜卷长度（m）
接头 Number of joints	该膜卷的接头个数，并标注接头位置（m）

字段 Field	含义 / 示例 Meaning / example
重量 Weight	膜卷净重（kg）
电晕处理面 Corona side	outside / inside
卷芯内径 Core diameter	76 mm 或 152 mm
等级 Product class	优等品 F / 合格品 Q
检验 Checker	检验员代号
班次 Shift	分切该膜卷的班组
生产日期 Date of production	年 / 月 / 日

Values and texts