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背板规格书

PV Backsheet Specification

JOLYWOOD



2008

成立于
Established in

2014

上市于
IPO

10+

全球子公司
Subsidiaries globally

4000+

全球员工数量
Global employees

4

业务版块
Business segments

新材BU、电池BU、组件BU、应用BU
New Material BU、Cell BU、Module BU、
Application BU



集团简介
GROUP PROFILE



苏州中来光伏新材股份有限公司，即“中来新材”，专注光伏先进材料研发制造，是全球太阳能背板领导者。与杜邦、大金等国际一流公司保持长期战略合作，可生产全系列背板产品，产能3.2亿平米。中来FFC双面涂覆型背板，品质卓越，可靠性高，2008年面世以来，终端“0”投诉。2018年底，中来首创太阳能透明网格背板，积极推进光伏组件双面化，凭借有机无机杂化纳米合金核心技术-豪博客技术，中来新材透明背板独步全球。

截至2023年，FFC双面涂覆型背板累计发货超8.3亿平米。中来背板累计发货超12.67亿平，配套光伏电站规模超253GW。

Jolywood (Suzhou) Sunwatt Co., Ltd, the leader in global PV backsheet market, focused on the development and manufacturing of advanced photovoltaic materials. It has long-term strategic cooperation with international first-class companies such as DuPont and Daikin. It has a full range of backsheet with annual production capacity of 320 million square meters. Jolywood FFC double-coated backsheet has excellent quality and high reliability and there is no complaints from endusers since 2008. At the end of 2018, Jolywood pioneered the solar transparent mesh backsheet and actively promoted the double-sided photovoltaic modules. With the core technology of organic-inorganic hybrid nano alloy, Jolywood's transparent backsheet technology become the leader in worldwide backsheet industry.

By the end of 2023, FFC double-coated backsheets shipped over 830 million square meters. Cumulative Jolywood backsheets shipments exceed 1.267 billion square meters for power station 253 GW.



253GW

累计出货配套光伏电站规模
(截止2023)

Accumulative shipment for power station
(By the end of 2023)



830 Million m²

FFC出货量
(截止2023)

Accumulative shipment of FFC
(By the end of 2023)



320 Million m²

年产能

Annual backsheet capacity



16 YR

终端“0”投诉

No complaints from endusers



TOP 50

新能源科技创新企业

New energy technology
innovation enterprise



TOP 500

全球新能源企业

Global new energy enterprise



产品介绍

PRODUCT INTRODUCTION



双面涂覆系列 FFC Series

产品特点

PRODUCT FEATURE

- 

FFC//PET//FFC

双面氟、膜胶一体化结构
- 

独特技术

采用等离子化学改性技术和氟硅烷表面接枝技术
- 

兼容性

可按客制化要求定制，最大宽幅1400mm
- 

FFC//PET//FFC

Membrane-adhesive integrated structure with double-side fluorine coated.
- 

Unique technology

Applying plasma chemical modification and fluoro-silanition surface grafting techniques.
- 

Compatibility

Backsheet can be made to order with width up to 1400mm.

产品认证

PRODUCT CERTIFICATION

太阳能背板国家标准、行业主要起草单位之一
One of the major units for drawing Chinese National Solar Backsheet Standard.



		FFC-JW30(plus)	FFC-JW3010	FFC-JW3010(plus)	FFC-JW3020(plus)
产品信息 Product Information					
结构 Strcture		FFC//PET//FFC	FFC//PET//FFC	FFC//PET//FFC	FFC//PET//FFC
总厚度 Total thickness		315μm±15μm	275μm±5%	310μm(-10μm/+15μm)	315μm±15μm
各层厚度 Thickness of each layer		FFC(Air side): 25μm PET: 275μm FFC(EVA side): 15μm	FFC(Air side): 13μm PET: 250μm FFC(EVA side): 12μm	FFC(Air side): 13μm PET: 285μm FFC(EVA side): 12μm	FFC(Air side): 10μm PET: 300μm FFC(EVA side): 5μm
系统电压 System voltage		1500V	1000V	1500V	1500V
颜色 Colour		黑/白 Black/White	黑/白 Black/White	黑/白 Black/White	白 White
产品指标 Product Index					
拉伸强度(MD)(N/mm²) Tensile strength	GB/T 13542.2-2009	≥120			
拉伸强度(TD)(N/mm²) Tensile strength	GB/T 13542.2-2009	≥120			
断裂伸长率(MD)(%) Elongation at break	GB/T 13542.2-2009	≥100			
断裂伸长率(TD)(%) Elongation at break	GB/T 13542.2-2009	≥100			
热收缩率(MD)(%) Heat shrinkage rate150℃×30min	GB/T 13542.2-2009	≤0.6			
热收缩率(TD)(%) Heat shrinkage rate150℃×30min	GB/T 13542.2-2009	≤0.5			
涂层附着力(等级) Coating adhesion (grade)	GB/T 9286-1998	0级(grade 0)			
与EVA粘接强度(初始)(N/10mm) Bond strength with EVA (initial)	GB/T 2790-1995	≥60			
与EVA粘接强度(N/10mm) Bond strength with EVA (85℃*85%RH,1000h)	GB/T 2790-1995	≥40			
击穿电压(kV) Breakdown voltage	GB/T 13542.2-2009	≥18			
有效绝缘层厚度DTI(um) Distance through insulation	IEC TS 62788-2	≥300	≥150	≥300	≥150
水蒸气透过率 WVTR(g/m²·d)	GB/T 26253-2010	≤2.0	≤2.5	≤2.0	≤2.0
老化测试 Aging Test					
耐湿热老化试验(85℃*85%RH, 2000h) Hygrothermal aging resistance test		IEC TS 62788-2	不分层、不起泡、Δbs≤2 No stratification, no foaming, Δbs≤2		
氙灯老化试验(2000h) Xenon lamp aging test		IEC TS 62788-2	不分层、不起泡、不褶皱、Δbs≤2 No stratification, no foaming, no folding, Δbs≤2		
沸水处理 Boiling water treatment (boiled for 24h)	外观检查 Visual inspection	GB/T 17748-2008	不分层、不起泡、不褶皱、无脱落、无粉化 No stratification, no foaming, no folding, no shedding, no pulverization		
	涂层附着力(等级) Adhesion of coatings(grade)	GB/T 9286-1998	0级(grade 0)		

透明/透明网格系列 Transparent (Mesh) Series

产品特点 PRODUCT FEATURE

- ☉ 高透光率

透明区400~1100nm波段透过率>93%
- ☉ 发电量增益（对比双玻）

1.63%
- ☉ 轻量化

采用透明背板可将组件重量降低17%~20%，从而减少运输和安装成本
- ☉ 高可靠性

通过紫外500kWh/m²加严测试，完全满足组件30年使用要求
- ☉ 兼容性

可按客制化要求定制片材/卷材，最大宽幅1400mm
- ☉ High transmittance

The transmittance of the transparent area > 93%.
- ☉ Power generation gain (Compared to bifacial dual glass)

1.63%
- ☉ Light-weight

Module weight can be reduced by 17%~20%，shipping and installation cost can be reduced.
- ☉ Higher reliability

Successfully passed strict test : 500kWh/m²UV test, DH 2000h and so on.
- ☉ Compatibility

Sheet packing / roll packing can be customized with a maximum width of 1400mm.

产品认证 PRODUCT CERTIFICATION

太阳能背板国家标准、行业标准的主要起草单位之一
One of the major units for drawing Chinese National Solar Backsheet Standard.



		FFC-JW30(plus) FFC-JW30M(plus)	
产品信息 Product Information			
结构 Strcture		FFC//PET//FFC	
总厚度 Total thickness		White mesh: 335μm Black mesh: 325μm	
各层厚度 Thickness of each layer		FFC(Air side): 25μm PET: 275μm FFC(EVA side): 15μm White mesh: 10μm /Black mesh: 10μm	
系统电压 System voltage		1500V	
网格颜色 Mesh Colour		黑/白 Black/White	
产品指标 Product Index			
拉伸强度(MD)(N/mm²) Tensile strength	GB/T 13542.2-2009	≥120	
拉伸强度(TD)(N/mm²) Tensile strength	GB/T 13542.2-2009	≥120	
断裂伸长率(MD)(%) Elongation at break	GB/T 13542.2-2009	≥100	
断裂伸长率(TD)(%) Elongation at break	GB/T 13542.2-2009	≥100	
热收缩率(MD)(%) Heat shrinkage rate150°C×30min	GB/T 13542.2-2009	≤0.6	
热收缩率(TD)(%) Heat shrinkage rate150°C×30min	GB/T 13542.2-2009	≤0.5	
涂层/网格区域附着力(等级) Coating/grid area adhesion (grade)	GB/T 9286-1998	0级 (grade 0)	
与EVA/POE粘接强度(N/10mm) Bond strength with EVA/POE	GB/T 2790-1995	≥60	
网格与EVA/POE粘接强度(N/10mm) Bond strength between mesh and EVA/POE	GB/T 2790-1995	≥60	
击穿电压(kV) Breakdown voltage	GB/T 13542.2-2009	≥16	
水蒸气透过率 WVTR(g/m²·d)	GB/T 26253-2010	≤2.0	
反射区域反射率(%) Reflectivity of reflective region (400-780nm)	ASTM E424-71-2015	≥70	
透光区域透光率(%) Transmittance in translucent region (400-1100nm)	ASTM E424-71-2015	≥93	
老化测试 Aging Test			
耐湿热老化试验(85°C*85%RH, 2000h) Hygrothermal aging resistance test		IEC TS 62788-2	不分层、不起泡、Δb≤2 No stratification, no foaming, Δb≤2
氙灯老化试验(2000h) Xenon lamp aging test		IEC TS 62788-2	不分层、不起泡、不褶皱、Δb≤2 No stratification, no foaming, no folding, Δb≤2
沸水处理 Boiling water treatment (boiled for 24h)	外观检查 Visual inspection	GB/T 17748-2008	不分层、不起泡、不褶皱、无脱落、无粉化 No stratification, no foaming, no folding, no shedding, no pulverization
	涂层/网格区域附着力(等级) Coating / mesh area adhesion (grade)	GB/T 9286-1998	0级(grade 0)

黑色高反系列

Black High Reflectivity Series

产品特点

PRODUCT FEATURE

- 外形美观

独特的网格设计，实现组件全黑外观

兼容性

可按客制化要求定制，最大宽幅1400mm

高反射率

反射率≥75%（780nm-1100nm）

功率提升

与常规黑色相比，组件功率提升10W以上（182mm电池144版型）
- Beautiful appearance

Unique mesh design to achieve all black appearance of modules.

Compatibility

Backsheet can be made to order with width up to 1400mm.

High Reflectivity

Reflectivity≥75%（780nm-1100nm）

Power output raising

More than 10 watt power can be increased compared with regular black（182mm battery version 144）

产品认证

PRODUCT CERTIFICATION

太阳能背板国家标准、行业标准的主要起草单位之一
One of the major units for drawing Chinese National Solar Backsheet Standard.



		FFC-JW3010BM(plus)	FFC-JW3010(plus)	FFC-JW3010(plus)
产品信息 Product Information				
结构 Strcture		FFC//PET//FFC/Mesh	FFC//PET//FFC	FFC//PET//FFC
总厚度 Total thickness		310μm(-10μm/+15μm)	310μm(-10μm/+15μm)	310μm(-10μm/+15μm)
各层厚度 Thickness of each layer		FFC(Air side): 13μm PET: 285μm FFC(EVA side): 12μm Black mesh: 10μm	FFC(Air side): 13μm PET: 285μm FFC(EVA side): 12μm	FFC(Air side): 13μm PET: 285μm FFC(EVA side): 12μm
系统电压 System voltage		1500V	1500V	1500V
颜色 Colour		白背板黑网格 White backsheet Black mesh	双面黑 Double side Black	内黑外白 Eva side-black and air side-white
产品指标 Product Index				
拉伸强度(MD)(N/mm²) Tensile strength		GB/T 13542.2-2009	≥120	
拉伸强度(TD)(N/mm²) Tensile strength		GB/T 13542.2-2009	≥120	
断裂伸长率E(MD)(%) longation at break		GB/T 13542.2-2009	≥100	
断裂伸长率(TD)(%) Elongation at break		GB/T 13542.2-2009	≥100	
热收缩率(MD)(%) Heat shrinkage rate150℃×30min		GB/T 13542.2-2009	≤0.6	
热收缩率(TD)(%) Heat shrinkage rate150℃×30min		GB/T 13542.2-2009	≤0.5	
涂层附着力(等级) Coating adhesion (grade)		GB/T 9286-1998	0级 (grade 0)	
与EVA粘接强度(初始)(N/10mm) Bond strength with EVA(initial)		GB/T 2790-1995	≥60	
与EVA粘接强度(N/10mm) Bond strength with EVA (85℃*85%RH, 1000h)		GB/T 2790-1995	≥40	
击穿电压(kV) Breakdown voltage		GB/T 13542.2-2009	≥18	
水蒸气透过率 WVTR(g/m²·d)		GB/T 26253-2010	≤2.0	
老化测试 Aging Test				
耐湿热老化试验(85℃*85%RH, 2000h) Hygrothermal aging resistance test		IEC TS 62788-2	不分层、不起泡、Δb≤2 No stratification, no foaming, Δb≤2	
氙灯老化试验(2000h) Xenon lamp aging test		IEC TS 62788-2	不分层、不起泡、不褶皱、Δb≤2 No stratification, no foaming, no folding, Δb≤2	
沸水处理 Boiling water treatment (boiled for 24h)	外观检查 Visual inspection	GB/T 17748-2008	不分层、不起泡、不褶皱、无脱落、无粉化 No stratification, no foaming, no folding, no shedding, no pulverization	
	涂层/网格区域附着力(等级) Coating / mesh area adhesion (grade)	GB/T 9286-1998	0级(grade 0)	

低水透背板系列 / Low Water Vapor Transmission Rate Series

产品特点 / PRODUCT FEATURE

- 低水透
水蒸气透过率≤0.1g/m².day
- 兼容性
满足HJT等新型N型电池的封装要求

- Water vapor transmission rate
≤0.1g/m².day
- Compatibility
Meet the encapsulating requirements of new N-type solar cell such as HJT

产品认证 / PRODUCT CERTIFICATION

太阳能背板国家标准、行业标准的主要起草单位之一
One of the major units for drawing Chinese National Solar Backsheet Standard.



		FFC-JW30A	FFC-JW30A(plus)	FFC-JW30(plus)
产品信息 Product Information				
结构 Strcture		FFC/Al foil/PET/FFC	FFC/Al foil/PET/FFC	FFC//PET//FFC
总厚度 Total thickness		313±5%	363±5%	315μm±15μm
各层厚度 Thickness of each layer		FFC(Air side): 13μm Al foil:30μm Adhesive:8μm PET: 250μm FFC(EVA side): 12μm	FFC(Air side): 13μm Al foil:30μm Adhesive:8μm PET: 300μm FFC(EVA side): 12μm	FFC(Air side): 25μm PET: 275μm FFC(EVA side): 15μm
系统电压 System voltage		1000V	1500V	1500V
网格颜色 Mesh Colour		黑/白 Black/White	黑/白 Black/White	透明 Transparent
产品指标 Product Index				
拉伸强度(MD)(N/mm²) Tensile strength	GB/T 13542.2-2009	≥120	≥120	≥120
拉伸强度(TD)(N/mm²) Tensile strength	GB/T 13542.2-2009	≥100	≥100	≥100
断裂伸长率E(MD)(%) longation at break	GB/T 13542.2-2009	≥100	≥100	≥100
断裂伸长率(TD)(%) Elongation at break	GB/T 13542.2-2009	≥100	≥100	≥100
热收缩率(MD)(%) Heat shrinkage rate150℃×30min	GB/T 13542.2-2009	≤0.6	≤0.6	≤0.6
热收缩率(TD)(%) Heat shrinkage rate150℃×30min	GB/T 13542.2-2009	≤0.5	≤0.5	≤0.5
层间剥离强度 Interlaminar peeling strength(N/10mm)	GB/T 2790-1995	≥4	≥4	N/A
与EVA粘接强度(初始)(N/10mm) Bond strength with EVA(initial)	GB/T 2790-1995	≥60	≥60	≥60
与EVA粘接强度(N/10mm) Bond strength with EVA (85℃*85%RH, 1000h)	GB/T 2790-1995	≥40	≥40	≥40
有效绝缘层厚度DTI Distance through insulation (um)	IEC TS 62788-2	≥150	≥300	≥300
水蒸气透过率 WVTR(g/m²·d)	GB/T 26253-2010	≤0.1g/m².day	≤0.1g/m².day	≤0.1g/m².day
老化测试 Aging Test				
耐湿热老化试验(85℃*85%RH, 2000h) Hygrothermal aging resistance test		IEC TS 62788-2	不分层、不起泡、Δbs2 No stratification, no foaming, no foaming, Δbs2	
氙灯老化试验(2000h) Xenon lamp aging test		IEC TS 62788-2	不分层、不起泡、不褶皱、Δbs2 No stratification, no foaming, no folding, Δbs2	
沸水处理 Boiling water treatment (boiled for 24h)	外观检查 Visual inspection	GB/T 17748-2008	不分层、不起泡、不褶皱、无脱落、无粉化 No stratification, no foaming, no folding, no shedding, no pulverization	
	涂层/网格区域附着力(等级) Coating / mesh area adhesion (grade)	GB/T 9286-1998	0级(grade 0)	
	层间剥离强度 Interlaminar peeling strength(N/10nm)	GB/T 2790-1995	≥4	N/A

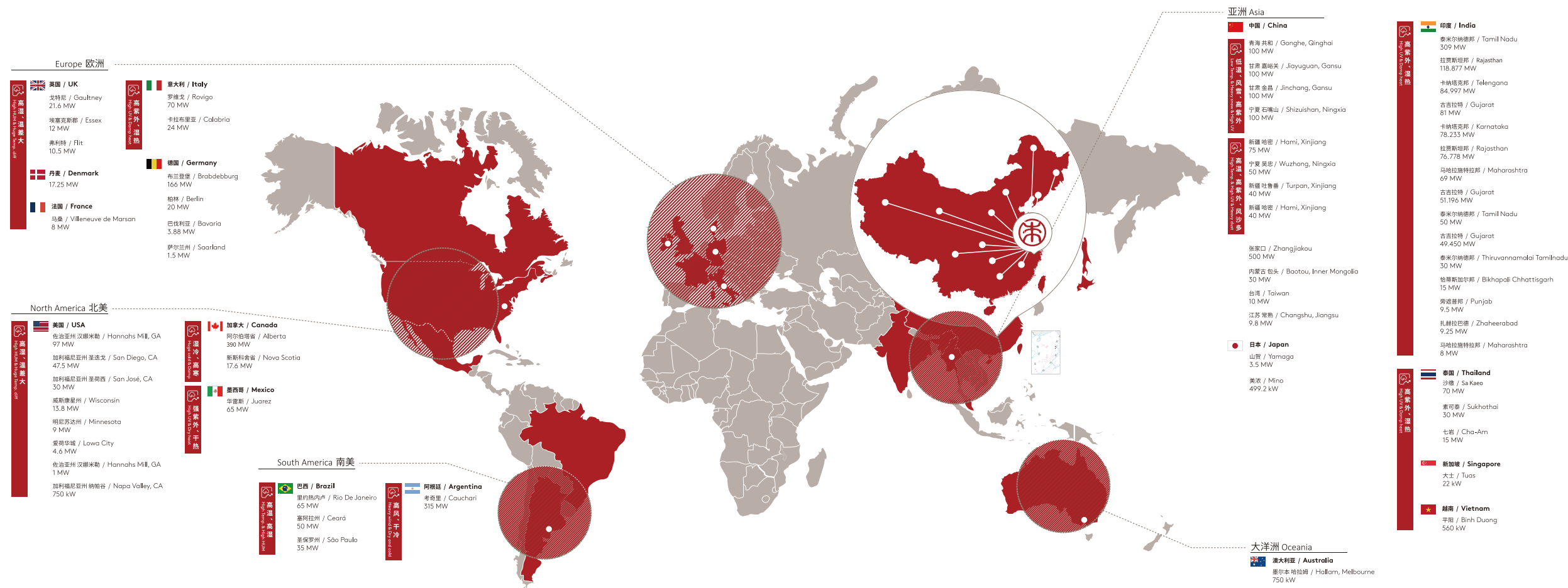


项目案例

CASE STUDY

中来FFC双面涂覆型背板累积发货超**8.3亿平**
Jolywood FFC double-coated backsheets shipped over 830 million square meters.

中来背板总发货超**12.67亿平**
Cumulative Jolywood backsheets shipments exceed 1.267 billion square meters.



全球FFC背板分布网络(典型案例)

Global Distribution Network(FFC Backsheet)



▲
50 MW
中国 / China
中来FFC背板 (建设于2008年) / Jolywood FFC Backsheet (Built in 2008)



▲
9.8 MW
中国 / China
中来FFC背板 (建设于2013年) / Jolywood FFC Backsheet (Built in 2013)

13 MW
英国 / UK
中来FFC背板 (建设于2015年) / Jolywood FFC Backsheet (Built in 2015)





▲
315 MW
阿根廷 / Argentina
中来FFC背板 (建设于2018年) / Jolywood FFC Backsheet (Built in 2018)



▲
20 MW
德国 / Germany
中来FFC背板 (建设于2012年) / Jolywood FFC Backsheet (Built in 2012)

Jolywood
中来背板与光同在
光赋予能量 背板给予爱



▲
65 MW
墨西哥 / Mexico
中来FFC背板 (建设于2015年) / Jolywood FFC Backsheet (Built in 2015)



100 MW
中国 / China
中来FFC背板 (建设于2012年)
Jolywood FFC Backsheet (Built in 2012)

97 MW
美国 / USA
中来FFC背板 (建设于2016年)
Jolywood FFC Backsheet (Built in 2016)



9.2 MW
乌克兰 / Ukraine
中来FFC背板 (建设于2015年)
Jolywood FFC Backsheet (Built in 2015)



3 MW
泰国 / Thailand
中来FFC背板 (建设于2015年)
Jolywood FFC Backsheet (Built in 2015)





▲
300 MW
印度 拉贾斯坦邦 / Rajasthan, IND
中来透明背板 (建设于2019年) / Transparent Series Backsheet Of Jolywood (Built in 2019)



◀
14MW
英国 惠特彻奇 / Whitchurch, UK
中来FFC背板 (建设于2019年)
Jolywood FFC Backsheet (Built in 2019)



▲
20 MW
德国 / Germany
中来FFC背板 (建设于2012年) / Jolywood FFC Backsheet (Built in 2012)