



紡織用綠色接著劑及機能性材料

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Integrity ❖ Teamwork ❖ Innovation ❖ Efficiency

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機能性織物用塗佈及接著劑

- PUR(濕氣反應型熱熔膠)
- PUD(水性PU-Foam coating)
- PUD(水性PU-Artificial Leather)
- Acrylic、PUD(Light coating)
- Acrylic、(Full bonding)
- Fluorine-Free Water-repellent Agent
- Other innovative materials

100% Solid content PUR for textile lamination

Reactive Polyurethane Hot Melt

Product NO.		PUR-216	PUR-163C	PUR-165	
Viscosity c.p.s)	90℃	11,000	7,300	70℃	8,100
	100℃	6,500	4,100	75℃	6,300
	110℃	3,550	3,500	80℃	4,400
	120℃	2,900	2,600	90℃	2,600
Application Temp. (℃)		95~110	95~110	75~85	
Curing Time (HR)		48~72			
Water Repellent Grade		4~5	5	4~5	
Features		• C/P 值高 • 手感柔軟 • 耐水解性佳 • 針對前撥布貼合效果佳 • Fabric/Fabric • Fabric/Film	• 膠膜具透濕功能性 • 手感柔軟 • 耐水解性佳 • 針對前撥布貼合效果佳 • Fabric/Fabric • Fabric/Film	• 適合低溫操作 • 手感柔軟 • 耐水解性佳 • 針對前撥布貼合效果佳 • Fabric/Fabric • Fabric/Film	
Cleaner		T-AA016			

Performance of PUR for textile lamination

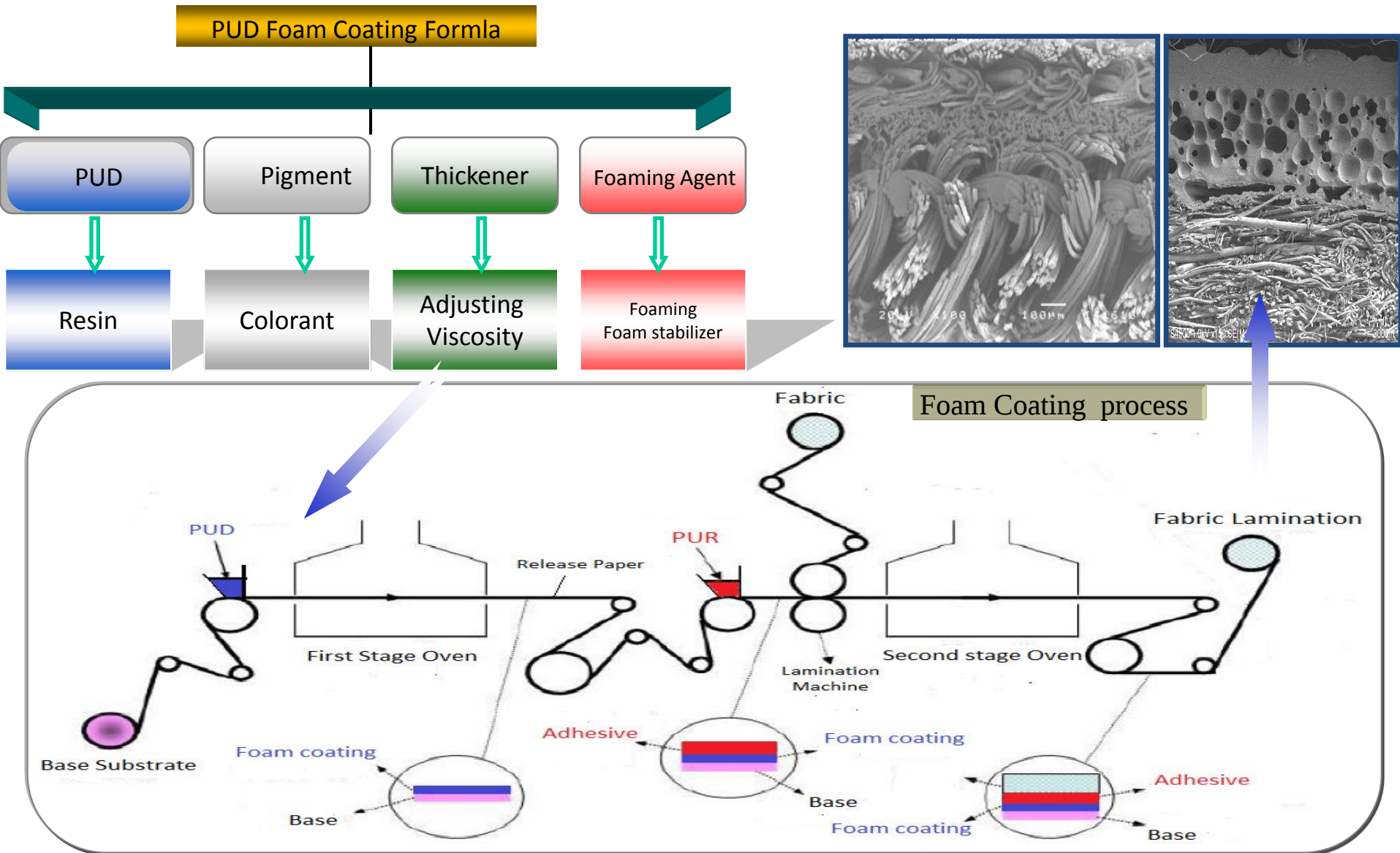
Reactive Polyurethane Hot Melt

測試項目	wash	PUR-216	PUR-163C	PUR-165
耐水壓(mmH ₂ O) JISL 1092	HL0	11,000	30,170	*
	HL5	8,000	30,430	*
透濕度(g/m ² .24hr) JISL 1099 B1	HL0	25,000	51,498	*
	HL5	20,000	43,923	*
剝離強度(Lb/in) ASDM D2724	HL0	WP 5.0/WF 4.7	WP 2.0/WF 1.9	*
	HL5	WP 3.9/WF 4.2	WP 1.3/WF 1.5	*

PUR-216測試條件:
 加工面布: N66/Spandex=95/5
 點貼輪: 600/100
 點貼溫度:110 °C

PUR-163C測試條件:
 加工面布:
 PET/Spandex=86/14
 點貼輪: 600/100
 點貼溫度:105 °C

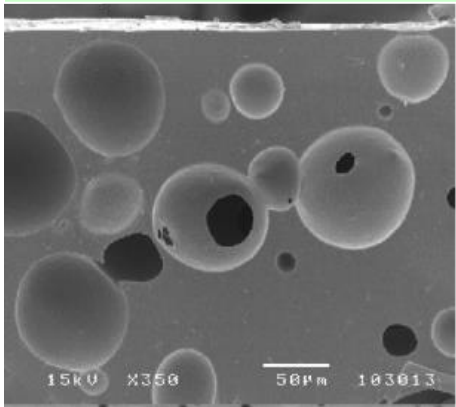
Water Based PU (PUD) for Foam Coating



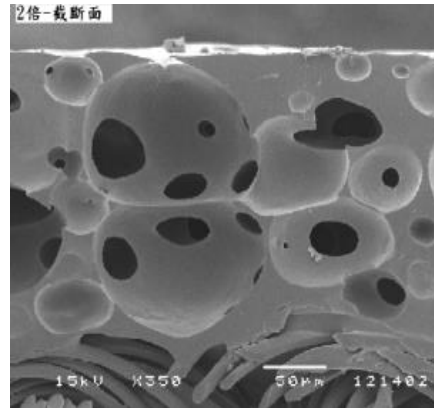
Foam Coating 發泡膜泡沫密度不同-SEM

(350倍)

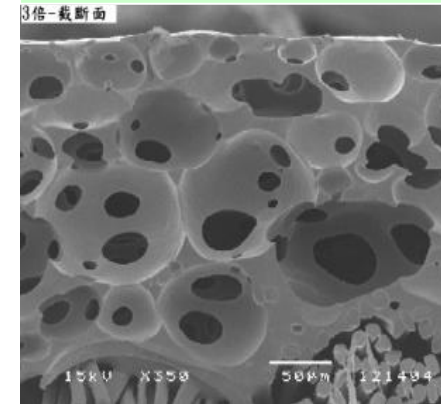
發泡密度 0.8 g/cm^3
(發泡倍比1.25倍)



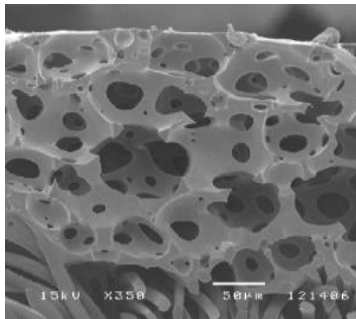
發泡密度 0.5 g/cm^3
(發泡倍比2.0倍)



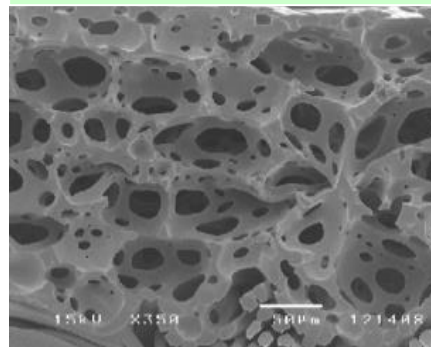
發泡密度 0.33 g/cm^3
(發泡倍比3.0倍)



發泡密度 0.25 g/cm^3
(發泡倍比4.0倍)



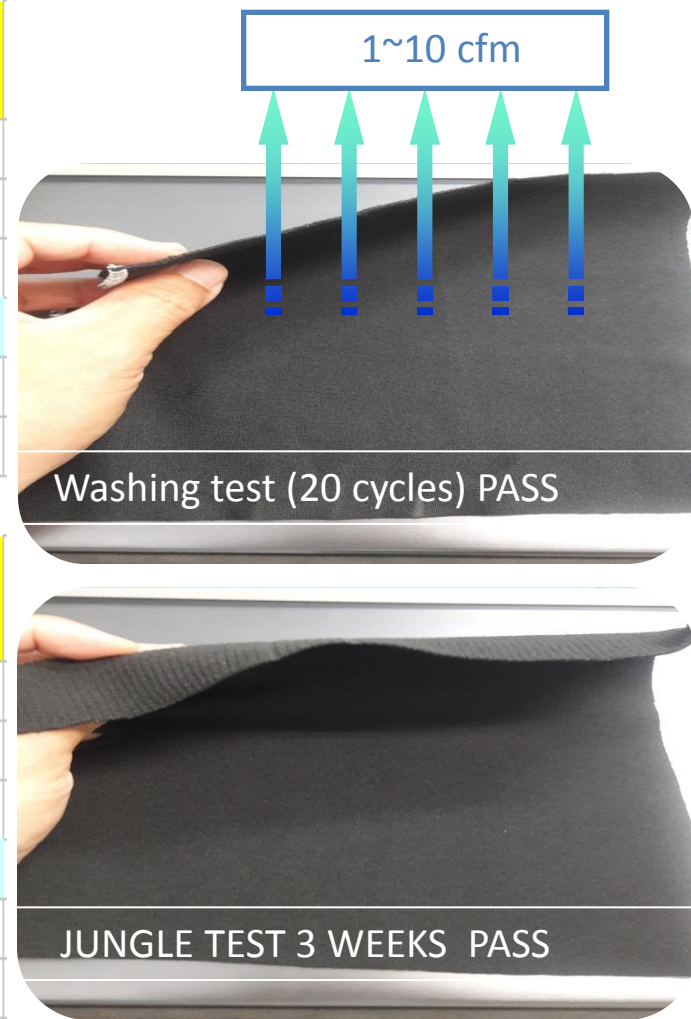
發泡密度 0.2 g/cm^3
(發泡倍比5.0倍)



Performance of PUD for Foam Coating

	100% Modulus (kgf/cm ²)	200% Modulus (kgf/cm ²)	300% Modulus (kgf/cm ²)	Tensile Strength (kgf/cm ²)	Elongation (%)
T-UE170(original)	15.59	18.80	21.14	117.07	1563.85
one week aging	13.68	16.45	18.57	74.43	1747.92
wet film	9.35	11.14	12.45	11.54	1596.15
recession percentage					
one week aging	12.25%	12.53%	12.17%		
wet film	40.03%	40.74%	41.13%		

	100% Modulus (kgf/cm ²)	200% Modulus (kgf/cm ²)	300% Modulus (kgf/cm ²)	Tensile Strength (kgf/cm ²)	Elongation (%)
Competitor(original)	13.55	14.92	15.75	52.11	1990.32
one week aging	11.16	12.55	13.75	53.86	1709.50
wet film	7.62	8.16	8.16	25.28	1990.38
recession percentage					
one week aging	17.64%	15.88%	12.71%		
wet film	43.80%	45.31%	48.21%		

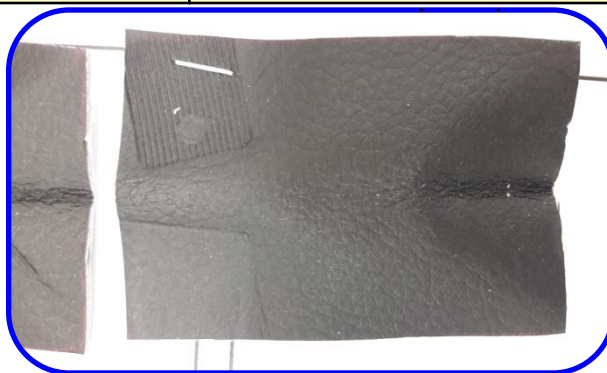


Performance of PUD for Artificial Leather

Test Date	Name of product	Water Borne PU Skin layer/Water Borne PU Adhesive						
Test Item	Unit	Orientation	Result			AVG	Standard	Remark
		Substrate	1	2	3			
Adhesion Strength	N/cm					>3 kgf/cm	>3 kgf/cm	
Flexometer Test (normal)	cycles	fabric	>125000 cycles				>125000@25°C	No rupture of skin or seperation from substrate
		Spilt	>125000 cycles					
Flexometer Test (subzero)		fabric	>40000 cycles				>40000@-10°C	No rupture of skin or seperation from substrate
		Spilt	>40000 cycles					
Flexometer Test (subzero)		fabric	>40000 cycles				>40000@-20°C	No rupture of skin or seperation from substrate
		Spilt	>40000 cycles					



Flexometer Test (RT)



Flexometer Test (-10°C)



Flexometer Test (-20°C)

Acrylic (Light coating)

品名-1	規格	評價
T-DM3000	Solid content固成份	40±2 %
	Viscosity黏 度	≤100 cps (25°C/LVT)
	pH	3±1
	離子性	非離子
	成份	丙烯酸酯共聚物

產品物性:

1. 手感柔軟回彈性佳
2. 疏水性(可以提升產品物性)
3. 相容性佳，能與陰/陽離子助劑混合
4. AEPO free



Acrylic (Light coating)

品名-2	規格	評價
DM-341E	Solid content固成份	40±1.5 %
	Viscosity黏 度	≤100 cps (25°C/LVT)
	pH	5±1
	離子性	弱陰離子性
	成份	可塑性共聚物

產品物性:

1. 豐厚柔軟手感
2. 疏水性(可以提升產品物性)
3. AEPO free

Acrylic (Full bonding)

品名	規格	評價
T-DM0048	Solid content固成份	45±2 %
	Viscosity黏度	2000cps±500 cps (25°C/LVT)
	pH	5±1.5
	離子性	陰離子
	成份	丙烯酸酯共聚物

產品物性:

1. 手感柔軟、適合一次接著三層貼織物
2. 單膜疏水性佳(可以通過產品雨淋測試)
3. 具有3cfm以下低透氣性及保暖性
4. 適合彈性面布、或四面彈
5. 低成本高獲利商品



織物無氟撥水防虹吸效果

ZDHC 2020 無氟要求

撥水特性: WNF-TS30 ,

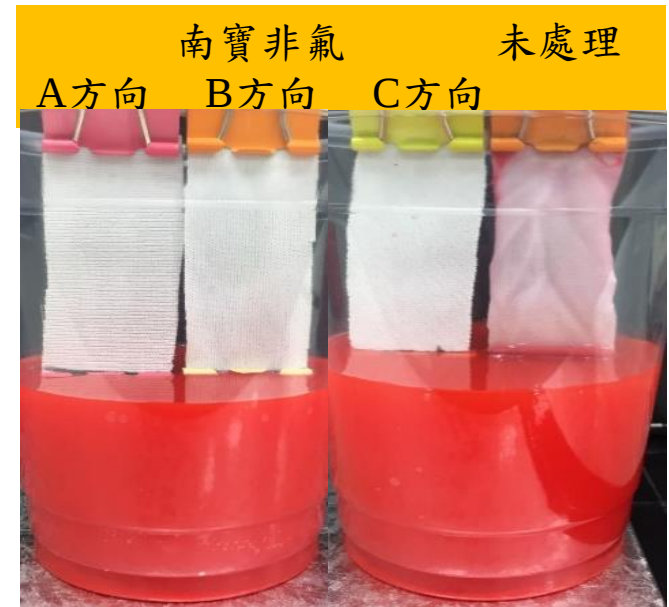
- 高撥水(ISO 5級/Nike G90)
- 優異的耐水壓
- 不影響後續接著



防虹吸特性: NP-T80 ,

- Nike G18測試，織物12小時後(17小時以上)，通過

防虹吸测试



實驗17h後

水性無氟撥水效果

Nanpao vs. Commercial Product

Product Code	WNF-TS30 (Nanpao)	Commercial Product	WNF-TS30 (Nanpao)	Commercial Product	WNF-TS30 (Nanpao)	Commercial Product
Type of Textile	100%PET (75D*75D)		100%Nylon (70D*160D)		Elastic textile (T/S=86/14)	
Hydrophobicity (*1) (ISO) (HL0)	4+	5	4	4	5	5
After 30 times Washed (*2) Hydrophobicity (ISO) (HL30)	4	4	3+	3+	4	4
Permeability of Surface Coating (ex : light coating)	No Penetrate	No Penetrate	No Penetrate	No Penetrate	-	-
Peel strength (gF) (use paper tape) Blank(Untreated) 230~280gF	278.71 /280.74	284.95 /288.7	226.13 /228.6	222.27 /227.82	289.53 /282.01	287.92 /280.76

*1 : According to AATCC 22 / ISO 4920 (Nike G90) test.

*2 : According to AATCC 135 test (Laundry Machine → Wash&Dehydrate 75 min + Dryer 15min)

- 撥水度與市售品相當，均可達80/30，滲膠性與市售品無明顯差異，接著力與未處理布料相當，不影響後續接著。

撥水處理織物與中底貼合後拉力測試

布種	處理劑	拉力測試結果		
		附膠情形	I.B.S	F.B.S
未處理	UE312	雙面膠	5.726 材破	3.07 材破
			5.864 材破	3.41 材破
	UE8SF+5%CL-16	雙面膠	4.598 材破	3.24 材破
			3.420 材破	4.42 材破
SNF-T80 (油性無氟)	UE312	布不附膠	5.660	5.656 材破
			6.132	4.874
	UE8SF+5%CL-16	布不附膠	5.031	10.635
			4.963	5.598 材破
WNF-TS12 (水性無氟) (Acrylic type)	UE312	布不附膠	3.648	8.290
			3.493	4.126
	UE8SF+5%CL-16	布不附膠	7.793	8.154
			6.169	13.324
WNF-TR125 (水性無氟) (PU type)	UE312	布不附膠	7.275	4.18
			7.200	2.54
	UE8SF+5%CL-16	布不附膠	6.389	4.1
			6.171	4.13

測試布樣：Polyester布(客戶提供3D-083(5YD)，85% CD-Polyester+15% Spandex)

油性無氟撥水效果

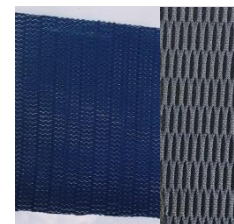
Hydrophobicity (*1) (ISO)		Commercial Product		P791 (Nanpao)		P792 (Nanpao)
Drying Condition	Spraying times	Dipping	Spray	Dipping	Spray	Spray
Dry at RT 1 hour	1 time	3-	2-	3-	3-	3-
	2 times	3	2+	3-	3-	3-
	3 times	-	-	3	3-	3
Dry at RT overnight	1 time	3	2	3+	3	3-
	2 times	3	3-	3+	3+	3
	3 times	-	-	4-	3+	3

*1 : According to Nike G90 (AATCC 22 / ISO 4920) test.

After Washed(*2) Hydrophobicity (ISO)	Commercial Product	P791 (Nanpao)	P792 (Nanpao)
HL 0	3	3	3
HL 1	3	3	3+
HL 2	3-	3-	3+
HL 3	3	3-	3+
HL 4	3-	2+	4 ⁻
HL 5	2+	2	4 ⁻

*2 : Washable test (Laundry Machine → Wash 40 min + Dehydrate 5 min + Dryer 10min)

Substrate



南寶撥水劑產品類別

Product	Type	Result	Solid content	Ratio of Bath	Dry Condition
WNF-T80	Solvent Base Non-fluorine	ISO 5-grade	1~3%	Use directly	Room temp. × 1 day or High temp. × 3 min
WNF-TR125(A)/(B)	Water Base Non-fluorine (PU base)	ISO 5-grade	A: 12.5% B: 24.5%	A:B:H ₂ O =12:0.5:87.5	150-180℃ ×1~3 min
NP-TR25(A)/(B)	Water Base Non-fluorine (PU base, high conc.)	ISO 5-grade	A: 25% B: 24.5%	A:B:H ₂ O =24:2:74	150-180℃ ×1~3 min
WNF-TS12(A)/(B)	Water Base Non-fluorine (Acrylic base)	ISO 4-grade	A: 12.5% B: 30%	A:B:H ₂ O = 12:1.2:86.8	150-180℃ ×1~3 min
WNF-TS30(A)/(B)	Water Base Non-fluorine (Acrylic base, high conc.)	ISO 5-grade	A: 30% B: 30%	A:B:H ₂ O =2.5~10 : 0.5~2 : 97~88	150-180℃ ×1~3 min
WF-SJ72(A)/(B)	Water Base C6 Fluorine (Acrylic base)	ISO 5-grade	A: 20% B: 30%	A:B:H ₂ O =6:0.6:93.4	150-180℃ ×1~3 min
WF-SJ92(A)/(B)	Water Base C8 Fluorine (Acrylic base)	ISO 5-grade	A: 20% B: 30%	A:B:H ₂ O =6:0.6:93.4	150-180℃ ×1~3 min

Application of Non-fluorine Water Repellent Agent



綠色材料在鞋材的應用



符合ZDHC 2020環保要求
無氟撥水劑



高吸震發泡中底

高反彈發泡中底



低污染原抽色紗

高耐磨低熔點鞋面布



生質發泡中底

3D列印鞋墊/鞋底



吸震材料不同比例測試標準及性能

Test Items	Units	Test Methods	T-AA300	T-AA375	T-AA350
吸震材料T-AA300 添加比例	%		100	75	50
硬度(shore C)	°C	ASTM D2240	29.5	41	53
密度density	g/cm ³	ASTM D297	0.204	0.2261	0.2469
反撥彈性Rebound(%)	%	ASTM D2632	5~6	11~12	20~21
抗拉強度 Tensile Strength	Kg/cm ²	ASTM D412	8.43	13.54	16.61
撕裂強度 Tear Strength	N/mm	ASTM D624	4.2	6.1	8.6
Split Tear Strength	N/mm	ASTM D3574	1.6	2	2.9

高彈/吸震EVA材料反彈性能比較

一般EVA



生物質吸震



高彈



高彈發泡板材特性

發泡材料物性

項目 Item	NER-8372	測試方法 Measurement Method
硬度Hardness SHORE C	25	ASTM D2240
密度Density(g/cm3)	0.1912	ASTM D297
反撥彈性Rebound(%)	65	ASTM D2632
抗拉強度Tensile Strength (Kg/cm2)	7.17	ASTM D638
撕裂強度Tear Strength (N/mm)	2.9	ASTM D624
壓縮永久變形Compression Set	14.84	ASTM D3574 (50°Cx6hr)
Split Tear Strength (N/mm)	1.9	ASTM D3574

高彈材料不同比例及與商品比較

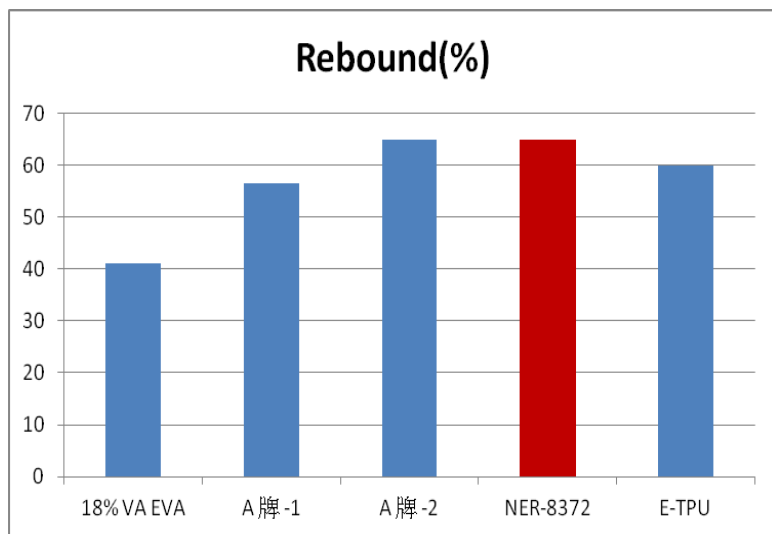


Figure-1、反撥彈性與其他材料比較

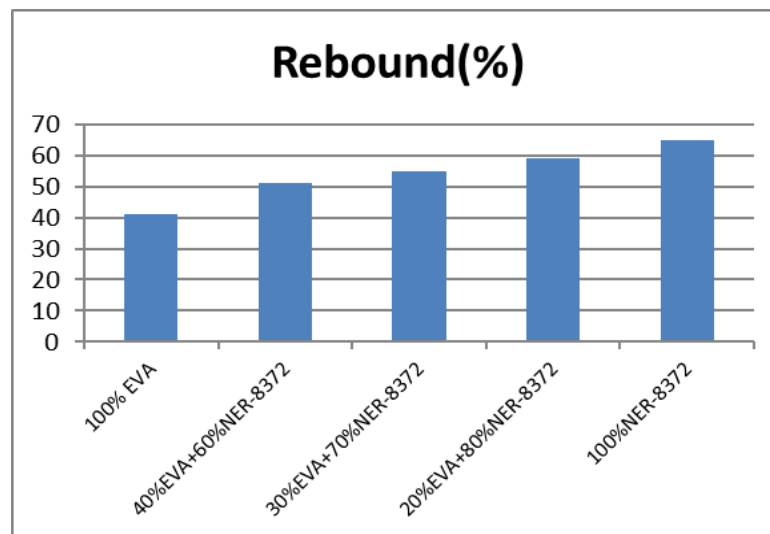


Figure-2、不同添加比例反撥彈性差異

NER-8372的反撥彈性與其他材料比較(Figure-1)，較一般EVA大幅增加，亦優於E-TPU材料，且與國際大廠A牌-2牌號具相同水準。而不同添加比例之反撥彈性比較如Figure-2所示。

生質EVA/生質PU材料

- 環保高性能材料
- 彈性/吸震效果
- 極佳消臭效果
- 獨特的木材顏色外觀及味道
- 硬度提升



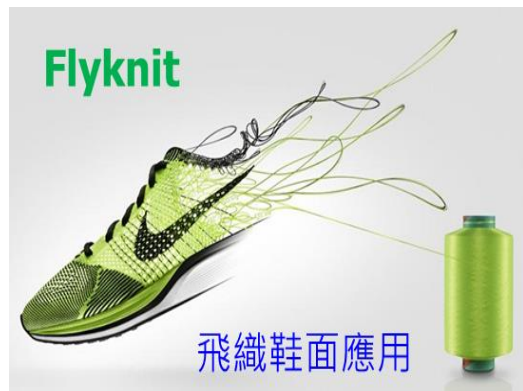
項目	一般EVA	生質EVA	吸震EVA NP-AVE-5	生質吸震 EVA材料	一般PU Foam	生質PU Foam
Bio content (%)	0	10	0	10	0	13
密度 g/cm ³	0.12	0.22	0.19	0.19	0.1	0.13
Rebound (%)	49	52	4	4.5	50	30
硬度 SHORE C	30	57 ↑	12	17 ↑	32	58 ↑
醋酸消臭率	21%	-	-	89%		
氨氣消臭率					25%	90%
應用	中大底		中底、鞋墊		鞋墊、家具、床墊	

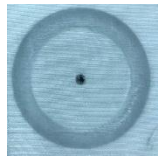
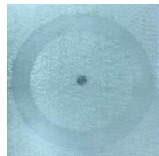


Shock absorption
Bio-based EVA

自動化加工低熔點紗鞋面編織布

高耐磨織布性能測試



編號	市售耐磨布料	導入低熔點FOY之布料
處理條件	未作任何處理	170°C x 1.5熱壓
磨耗損失率(%) (H18磨頭荷重1Kg)	7.07 (200次磨破)	1.22 (300次未磨破)
	 	 



1. 獲核准臺灣專利(發明第I 624490號)具硬挺及耐磨之低熔點聚酯複合材料 2017.11
2. 獲核准韓國專利(第10-1899713號)具硬挺及耐磨之低熔點聚酯複合材料 2018.08
3. 獲核准中國專利：鞋面、皮包表面、衣服表面硬挺及耐磨的結構(新型專利)

低熔點聚酯紗綠色循環經濟



低熔點聚
酯粒合成

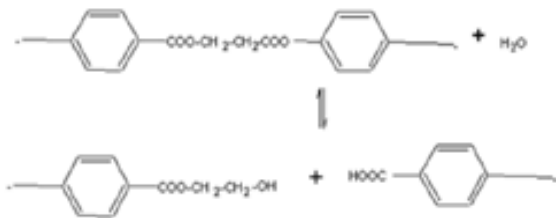


抽紗

膜材、接著劑、塗料



聚酯降解



編織鞋面



回收



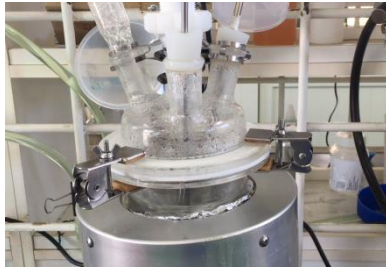
Circular Economy of Waste Polyester

Waste Polyester Yarn and textile can be recycle to Insole and furniture

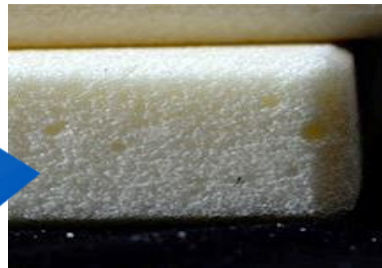
Waste Yarn 、 textile



Reaction 、
Formulation



PU foam



Insole 、 Furniture

