

# 布料數位資產建構導入 AI 應用與成功案例解析

以 AI 為核心，打造紡織產業的數位資產管理

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Manager

(一)

# 紡織產業數位轉型趨勢 與布料數位化DPC介紹



# 紡織產業的數位斷層



## 高成本的設計開發流程

開發打樣流程常需數週往返寄送，增加布料耗損及運送成本，導致決策延遲、上市時程拉長。



## 供應鏈透明度不足

內部跨部門或外部往來，布料來源、庫存與認證難即時掌握，需花數天回覆客戶需求，錯失合作機會。



## 資產管理效率低落

布卡、Excel、檔案各自分散，設計師找一塊布常需耗時數天，資產難以被重複利用。



## 永續壓力日益增加

樣布寄送與樣品多次重工造成資源浪費與碳排，與產業日益重視的永續承諾相互衝突。



# 紡織&成衣業的數位轉型

## AI 應用情景

1. **服裝設計與打樣**：分析潮流與圖像 → 提供色彩、圖案、設計建議
2. **生產製造**：自動化縫製與檢測 → 降低成本、提升品質
3. **庫存物流**：最佳化配送與智能分類 → 提升交貨效率
4. **行銷零售**：數據分析消費行為、虛擬試穿、圖像搜索 → 改善顧客體驗

上游：聚焦技術升級與研發

中游：強化供應鏈與效率

下游：設計、零售導入 AI，  
提升體驗與行銷力



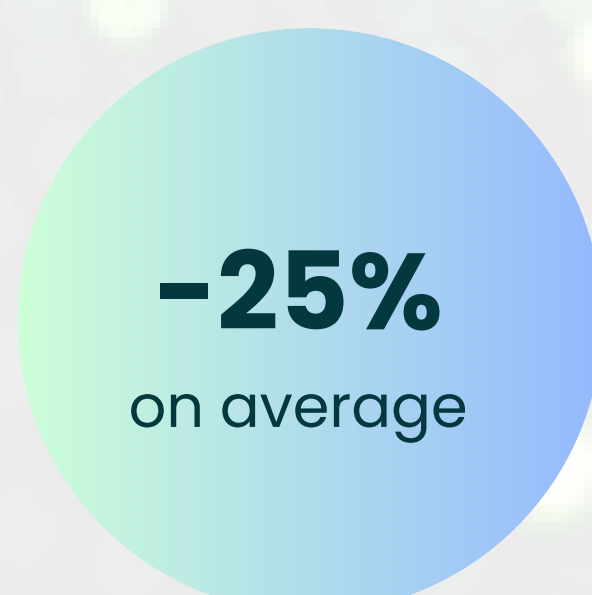
# 3D 設計的全球市場預測(2025–2030)



品牌採用率

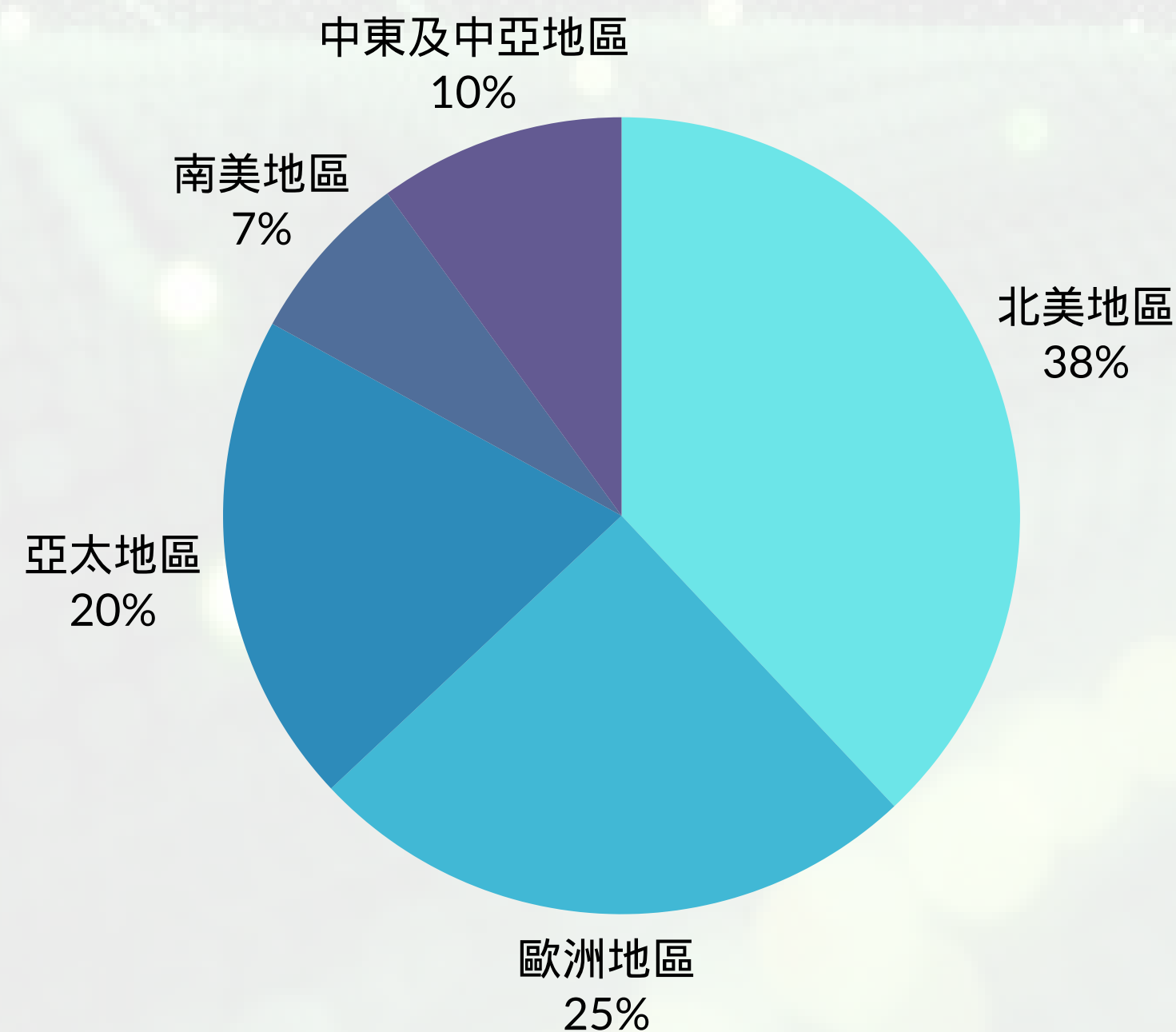


市場規模



上市時間

## 3D設計之全球市佔率



(Virtue Market Research, 2024)



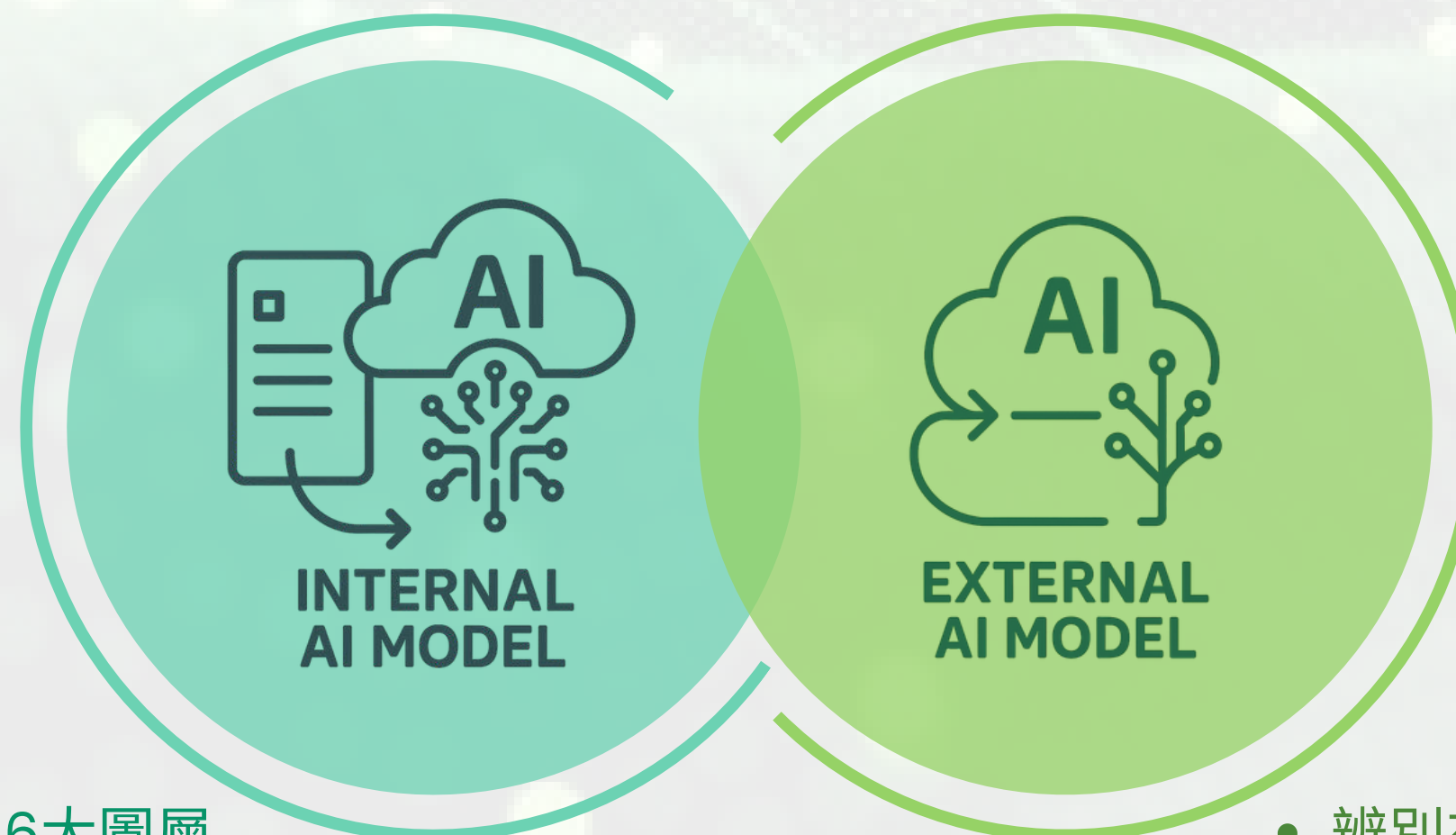
# 專利 AI 模型 - 產業級安全與創新標準

## AIGC引擎

- 150,000+ 紡織資料集訓練
- 布料專用模型
- 自定義生成式 AI
- AI 搜尋/生成/分析整合

### 內部開發的AI模型

### 外部的AI模型



- 生成布料6大圖層
- 分析布料物理數據
- 織紋循環辨識
- 紋理拼合

- 辨別布料種類
- AI 以圖搜圖
- 語意文字搜尋
- 紡織業生成式AI



# TextileCloud – AI應用範疇

## Smart Upload (智慧上傳)

AI 自動辨識資料，減少人工輸入

## Auto Tiling (自動拼接紋理)

AI 辨識布料圖樣並生成無縫重複紋理

## AI Physics (AI生成物理數據)

自動生成布料物理參數，加速設計探索與驗證

## AI Digital Drape Output (AI生成布料展示圖)

提供高品質布料視覺效果，用於設計與行銷展示

## Prompt-Based Exploration (AI材料搜尋)

透過 AI 與真實布料資料進行靈感探索

提升效率・降低成本

AI 工作流程加速布料開發與應用

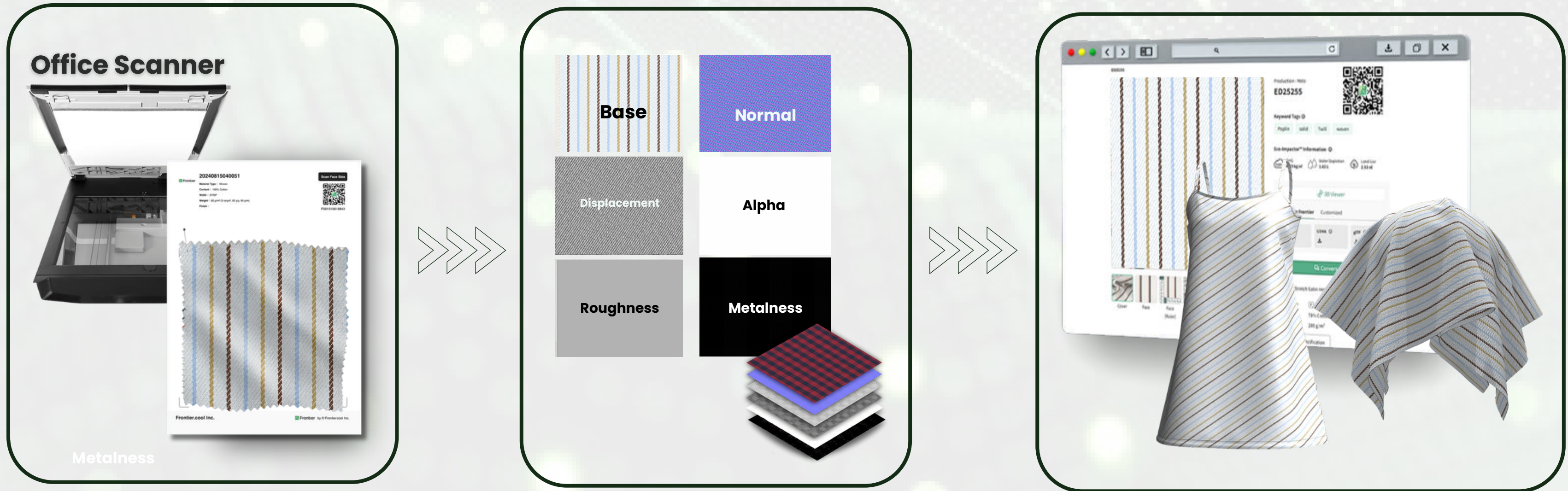




# TextileCloud – AI 紡織雲端解決方案



# TextileCloud - 數位孿生布料建立流程



只需3-5分鐘

- 生成用於真實模擬的 6 種布料圖層
- 演算布料3D物理數據
- 整合布料材質詳細資訊
- 生成永續數據

**1-1**

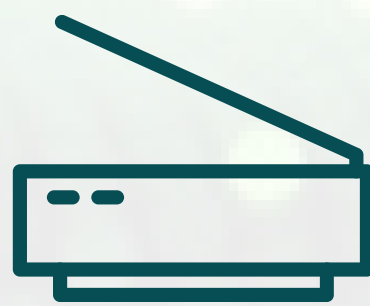
數位布料實作：  
資產上傳與建立



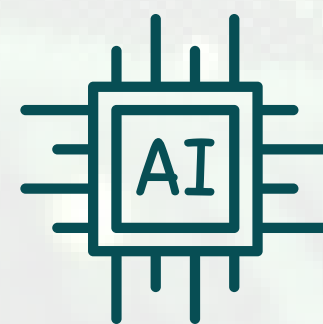
# TextileCloud – 布料數位化工作流程



布廠  
品牌  
設計師



辦公室  
事務機



Frontier  
AI 引擎



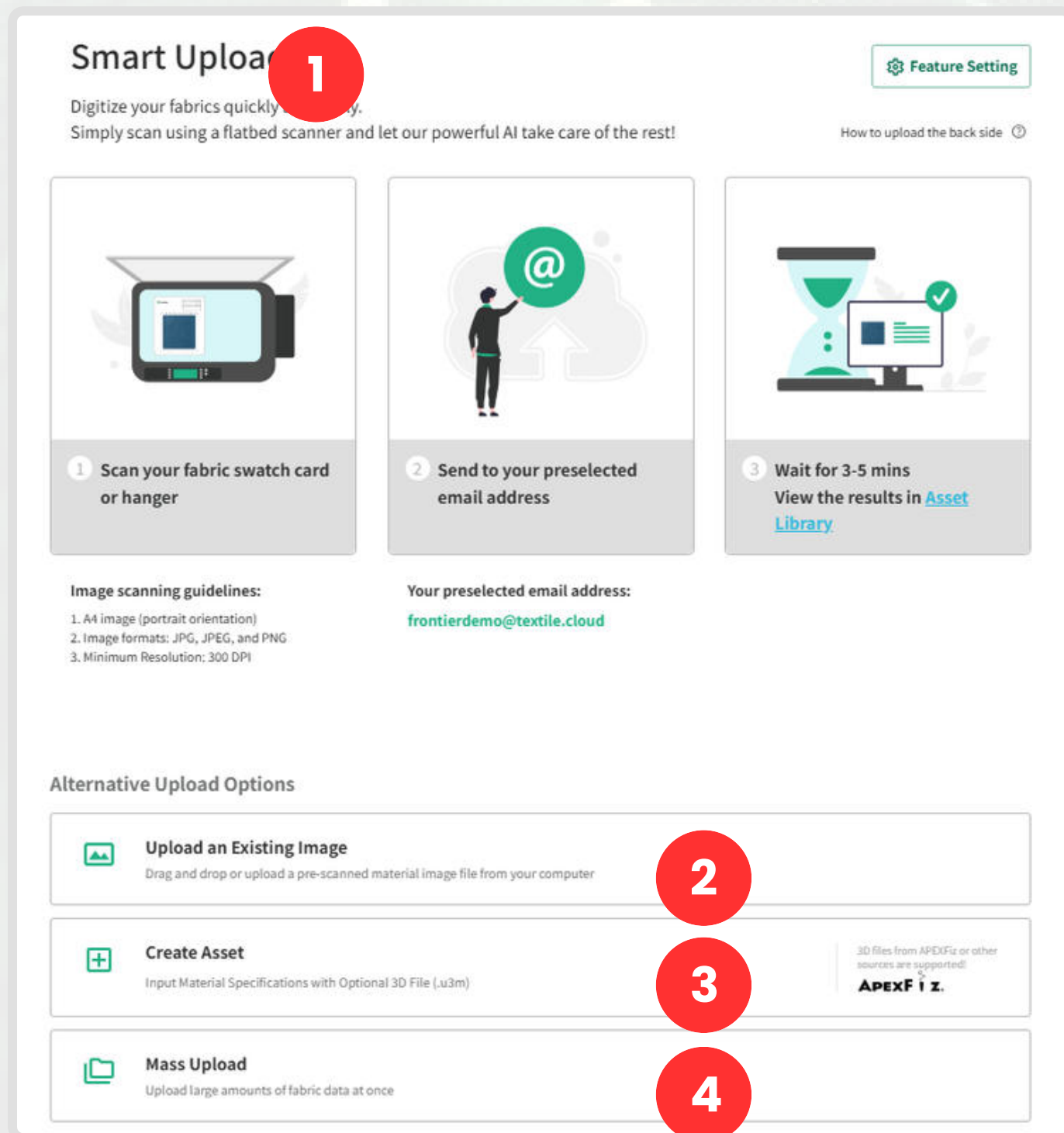
客戶端

Scalable Data • Ownership • Easily Deployable

無需特殊設備 | 快速導入使用



# SMART UPLOAD 流程介紹



# 布料數位化 DPC：上傳演練示範

## 上傳方式一：智慧上傳 via Scanner

### Smart Upload

Digitize your fabrics quickly and easily.  
Simply scan using a flatbed scanner and let our powerful AI take care of the rest!

[Feature Setting](#)

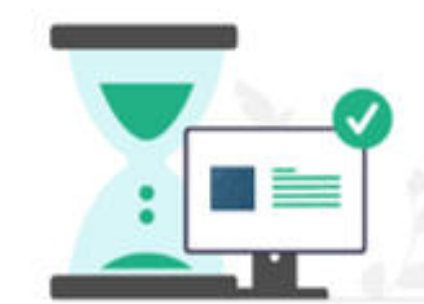
How to upload the back side ⓘ



1 Scan your fabric swatch card or hanger



2 Send to your preselected email address



3 Wait for 3-5 mins  
View the results in [Asset Library](#)

**Image scanning guidelines:**

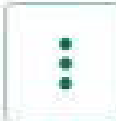
- 1. A4 image (portrait orientation)
- 2. Image formats: JPG, JPEG, and PNG
- 3. Minimum Resolution: 300 DPI

Your preselected email address:  
[frontierdemo@textile.cloud](mailto:frontierdemo@textile.cloud)

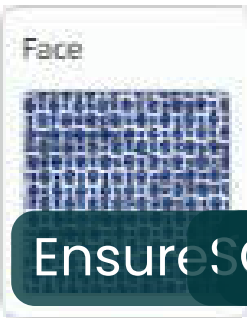
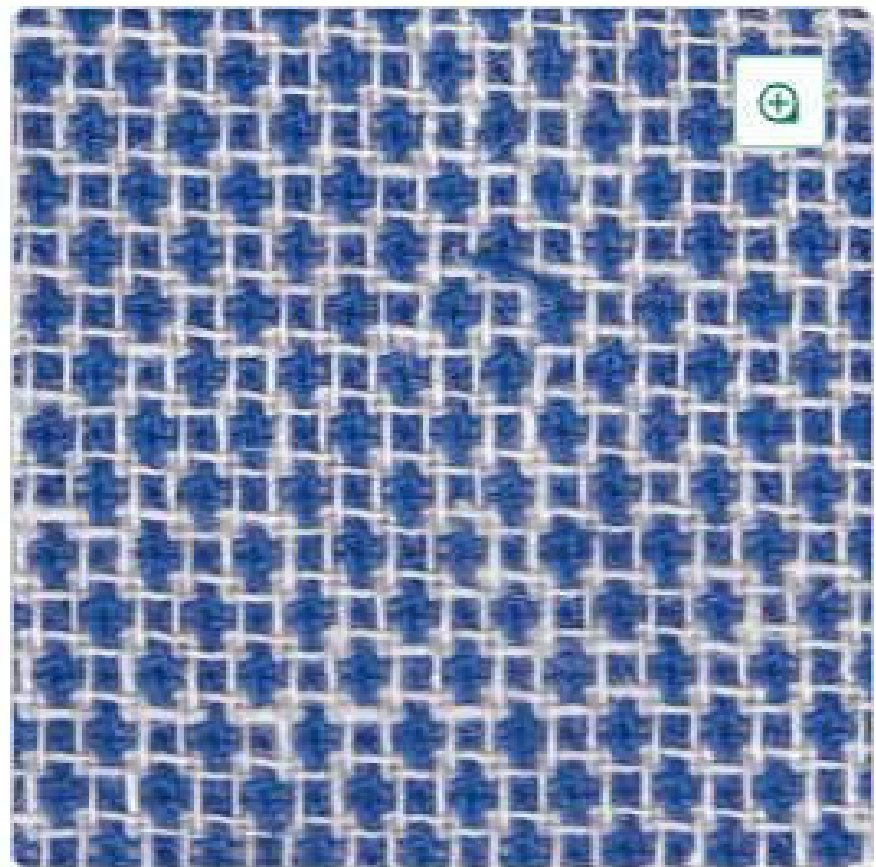
所有訂閱組織皆有一組專屬的上傳專用 EMAIL

Item Number

20250903145444



Edit



### Specifications



### Tags

Tags help others discover this asset faster. More tags, more visibility.



### Certifications

Showcasing certifications builds credibility with both key players and everyday users



### Pricing

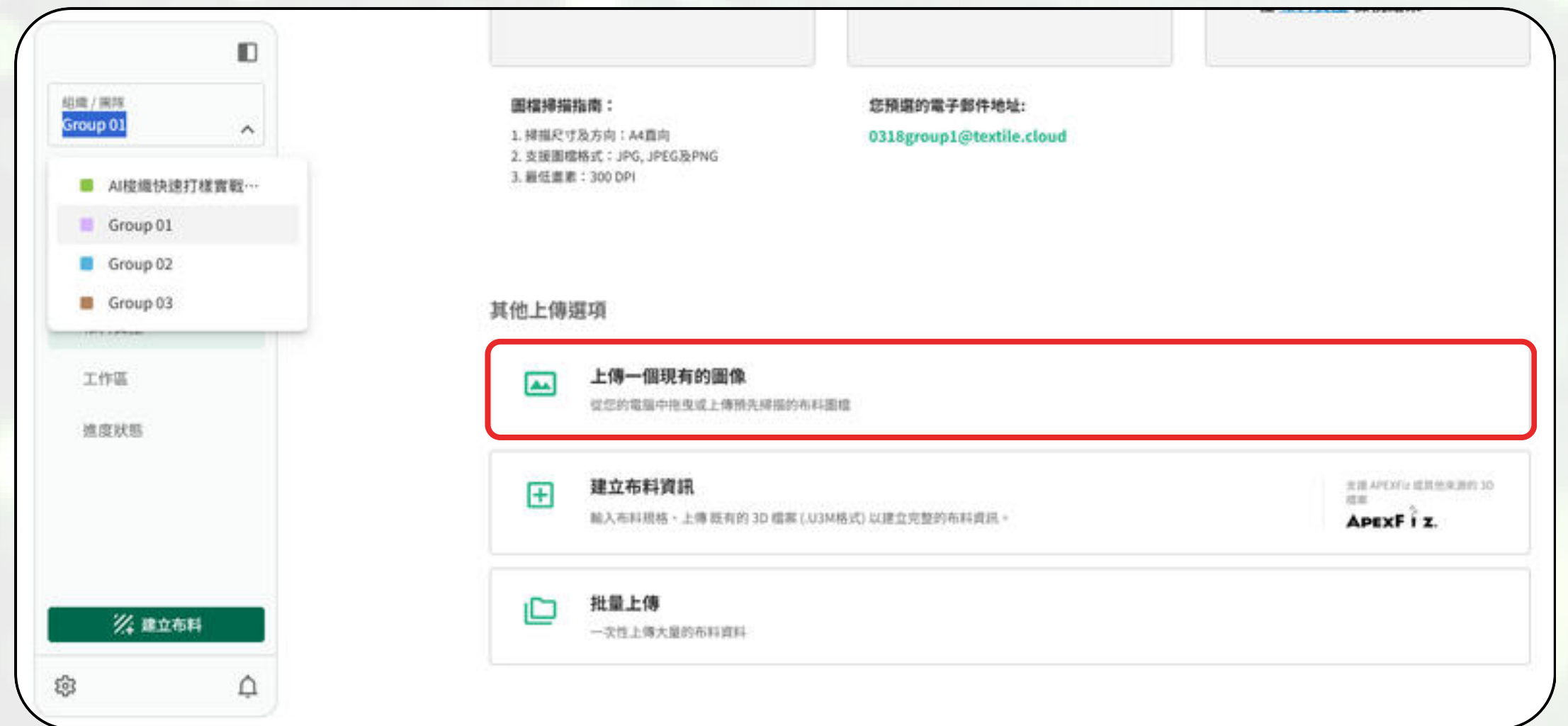


Once your fabric image is uploaded, then the sales process. Ensure! Go to the scanner setting, and set resolution to  $\geq 300$  DPI. needed

# 布料數位化 DPC：上傳演練示範

## 上傳方式二：圖片上傳

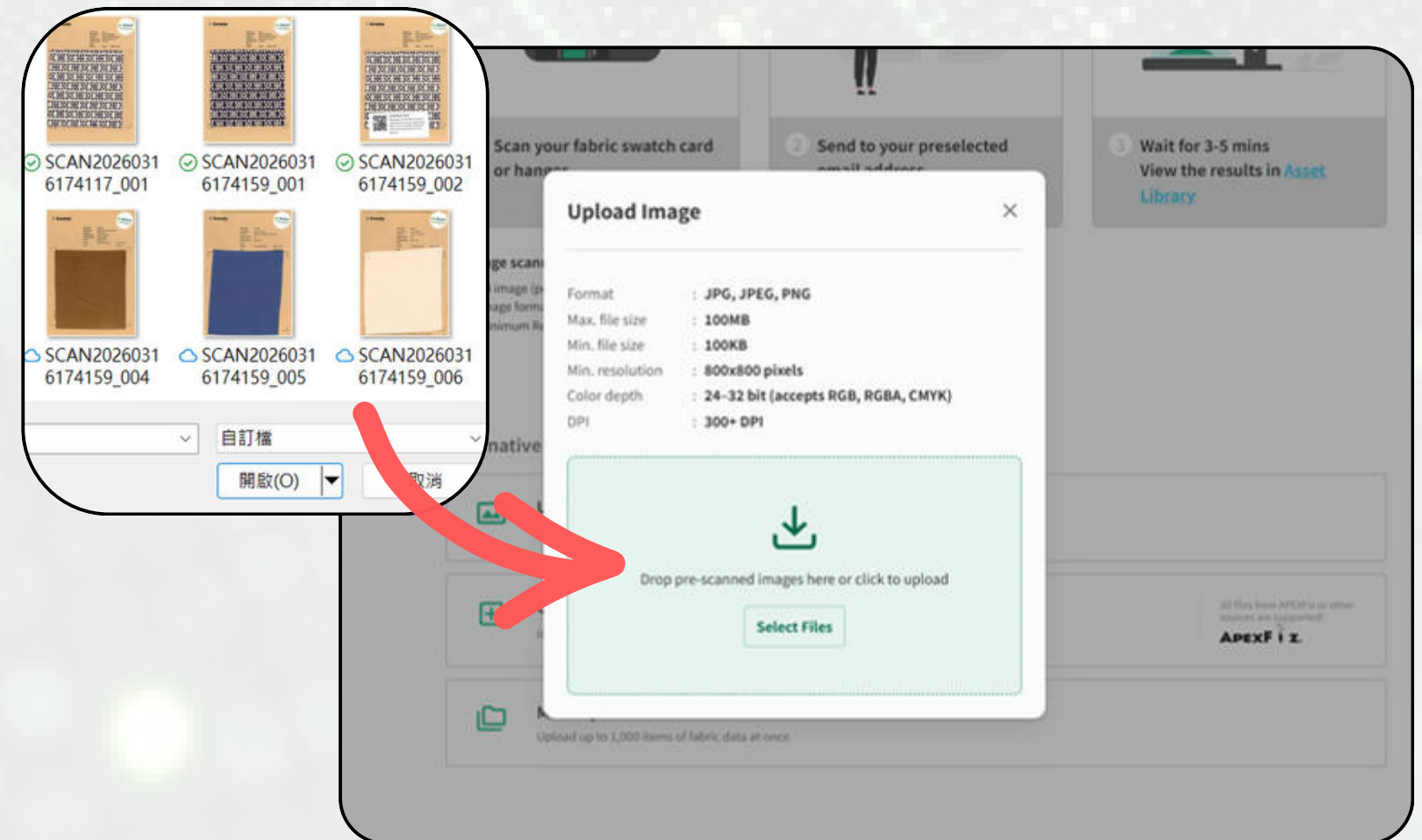
- 選任1片已掃描完成、儲存至地端電腦的的布片檔案
- 點選「布料資產」開始上傳
- 點選「上傳一個現有的圖檔」



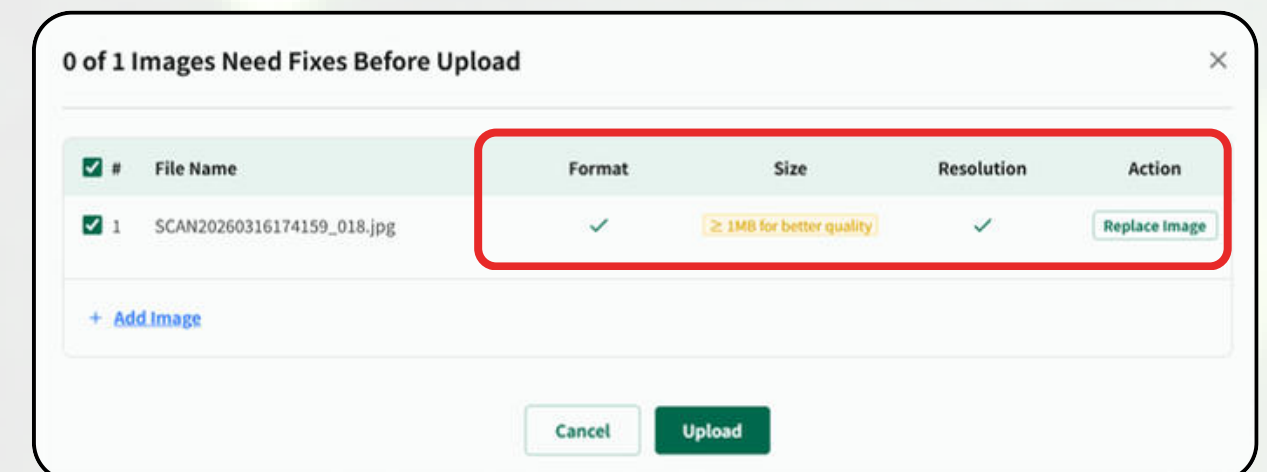
# 布料數位化 DPC：上傳演練示範

## 上傳方式二：圖片上傳

- 畫面中將顯示出上傳檔案格式建議規格
- 選擇欲上傳的圖檔
- 同右側圖片，系統將自動偵測布片是否符合規格，若顯示出紅字錯誤，則須重新更換圖片
- 可選擇單次上傳或上傳多個圖像
- 完成上傳後，可至Asset Library確認



請留意圖檔格式須具備：  
支援格式：JPG, JPEG及PNG  
最低畫素：300 DPI

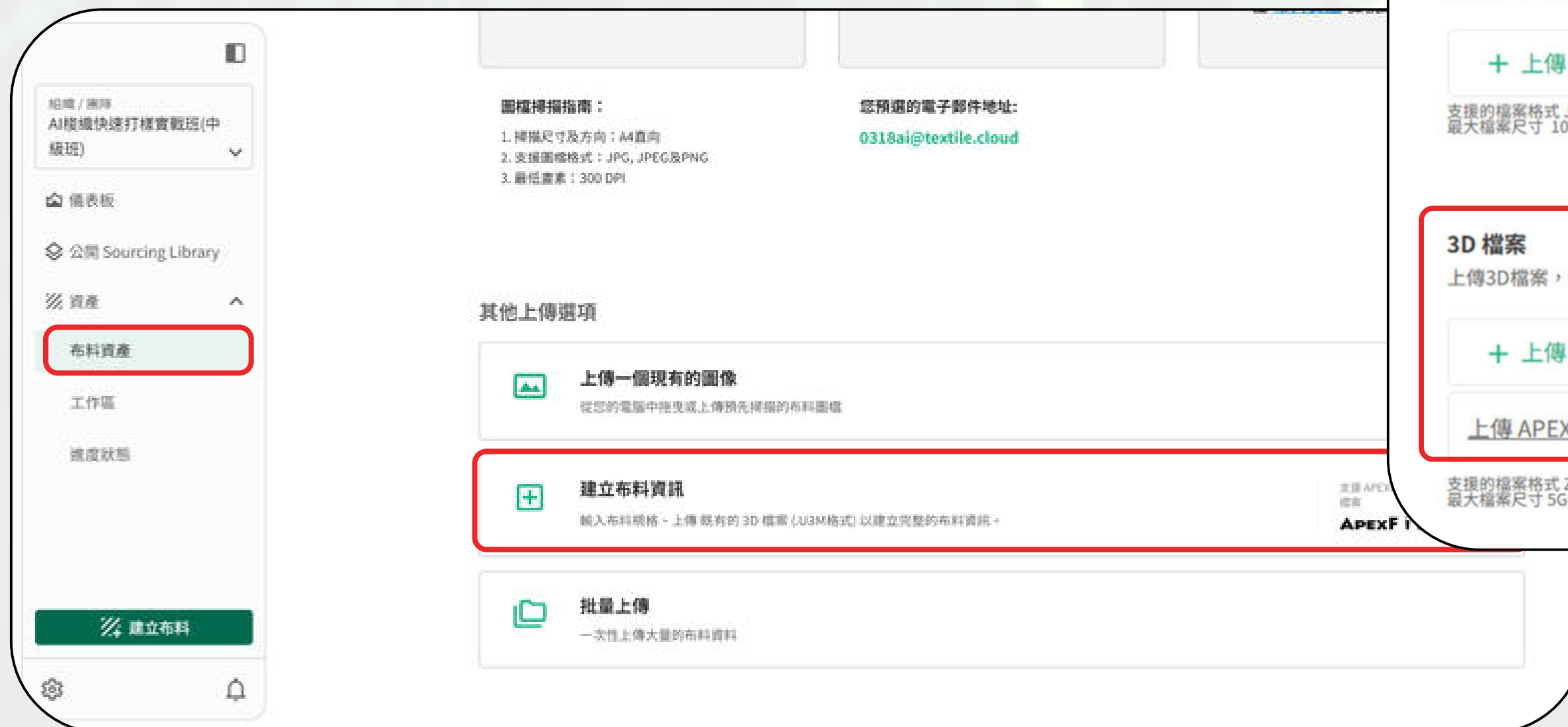




# 布料數位化 DPC：上傳演練示範

## 上傳方式三：Apexfiz/ U3m檔案

- 在建立布料中點選「建立布料資訊」> 上傳檔案

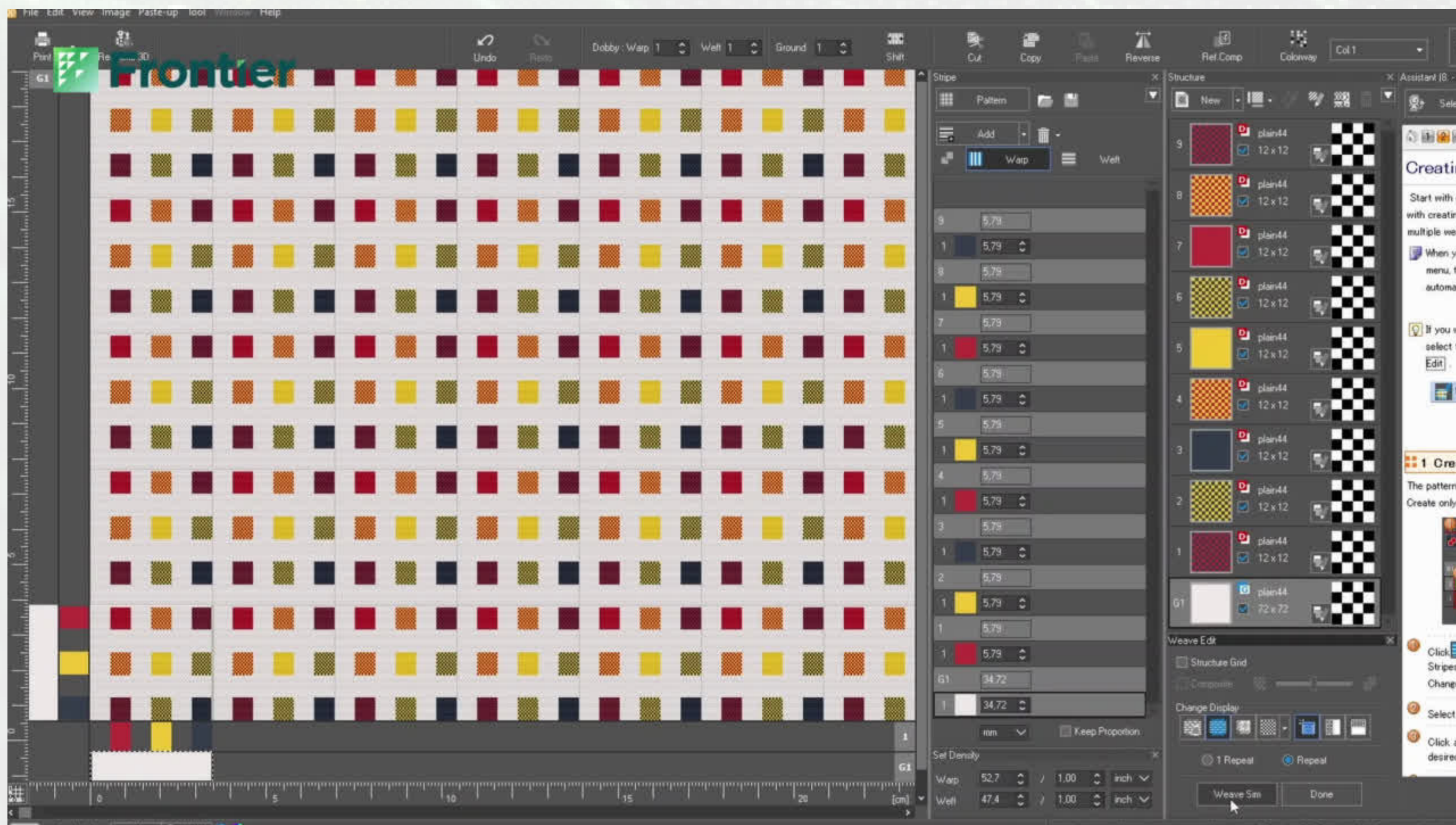


請留意U3M資料夾內的檔案格式，  
必須是**JPG/PNG** (無法上傳TIFF檔)





# 布料數位化 DPC：上傳演練示範



# 布料數位化 DPC：上傳演練示範

## 上傳方式四：批量上傳

- 請至指定雲端連結挑選任3片掃描好的布片檔案，下載至電腦中
- 左側欄位點擊進入自己的Group
- 點選「布料資產」開始上傳
- 點選「**批量上傳**」

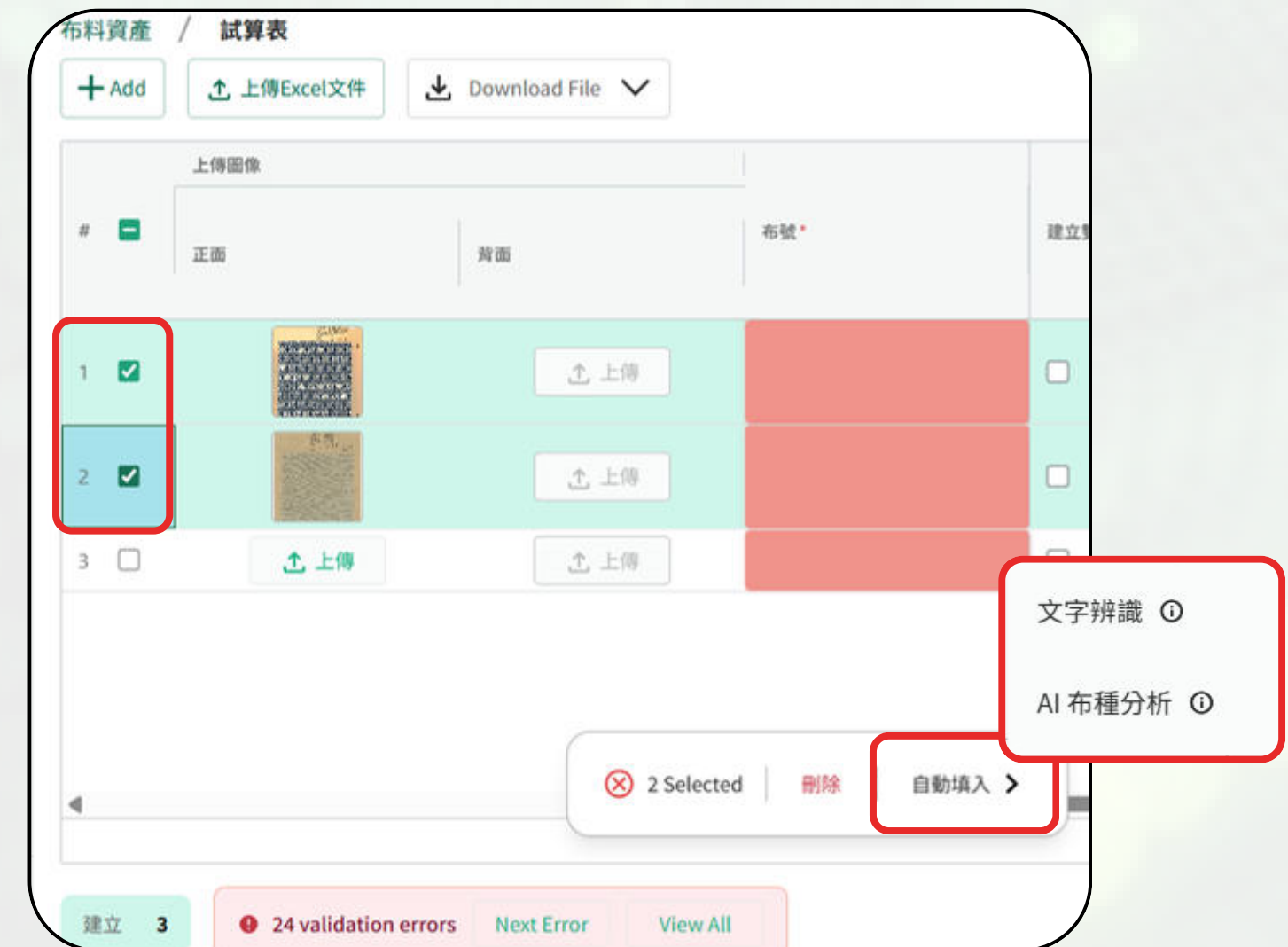
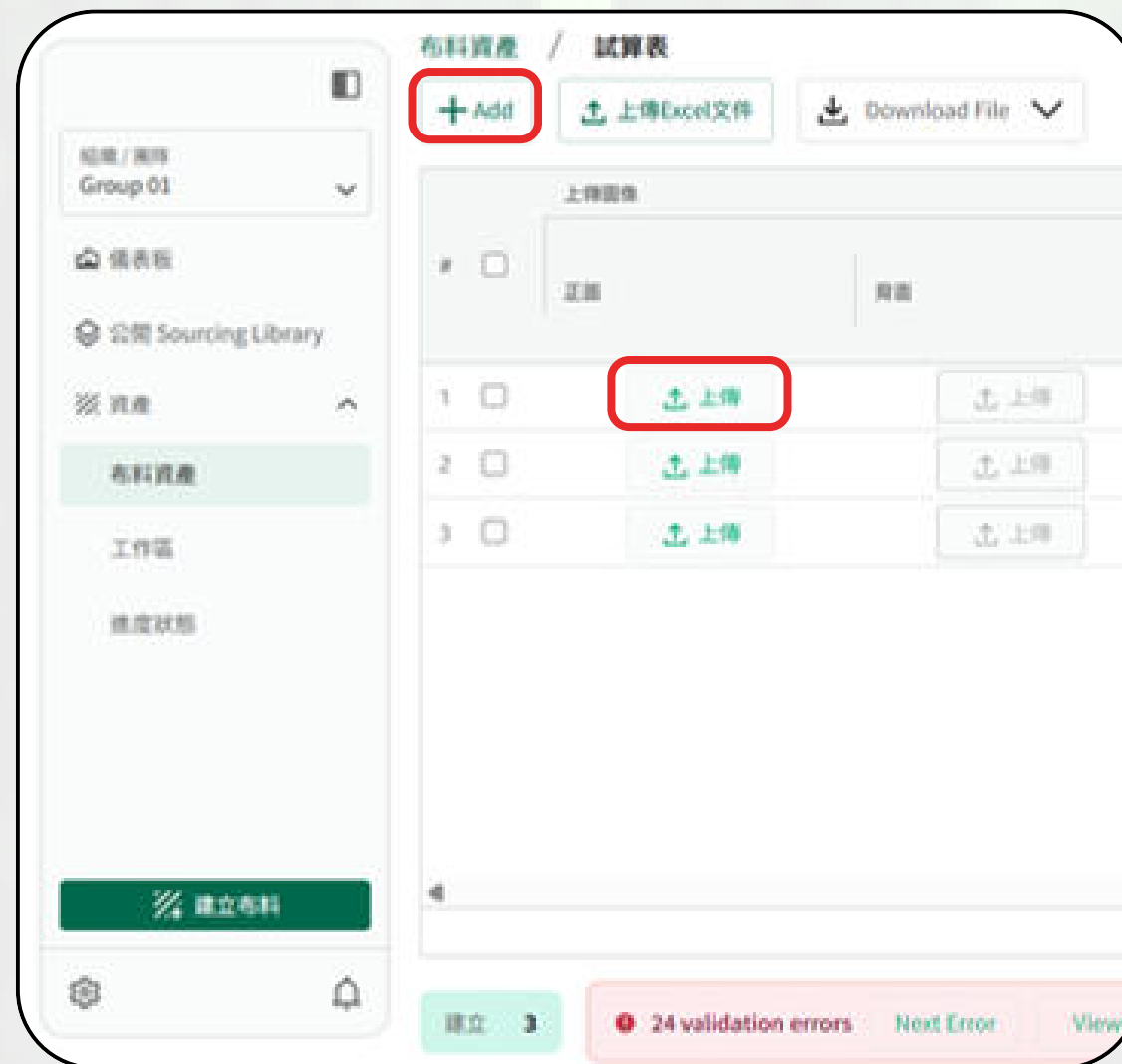
請留意圖檔格式須具備：  
支援格式：JPG, JPEG及PNG  
最低畫素：300 DPI



# 布料數位化 DPC：上傳演練示範

## 上傳方式四：批量上傳

- 點擊左上方「**Add**」新增試算表欄位
  - 依序上傳3塊布片圖檔
  - 批次勾選#小框格
  - 點選下方「**自動填入**」
- >>>文字辨識
- >>>AI布種分析
- 檢查是否尚有必填欄位，  
確認下方無錯誤訊息
  - 完成上傳



# 布料數位化 DPC：上傳演練示範



# 布料數位化 DPC：上傳演練示範

## ● 雙面布料上傳說明：

- 若正背面皆有標籤，即可將下圖的QR CODE 標籤與背面布料一同掃描，系統即會自動將正背面布料配對。



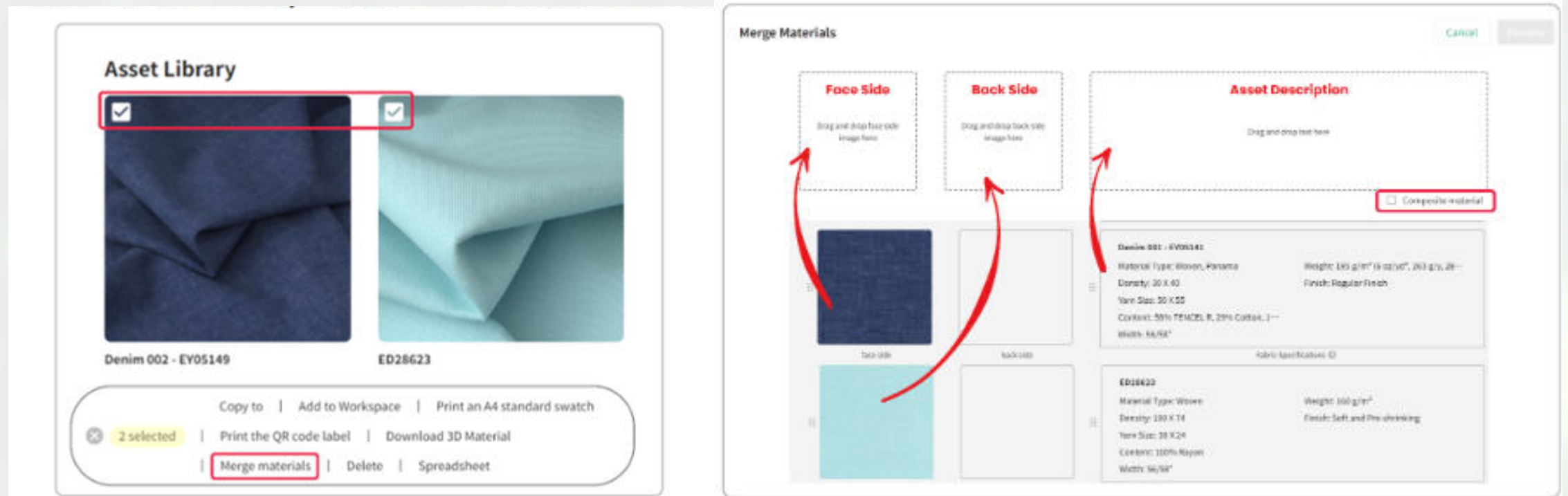
### Scan Back Side

請將此QR Code置於布卡或吊卡的右上角，並且一起掃描。每次掃描布料背面時都需重複此動作。

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- 若背面沒有標籤或SWATCH標籤墨水顏色較淡導致系統無法辨識資訊，則可透過[合併]建立雙面布料

1. 分別上傳正、背面布料
2. 從布料資產中選取兩個布料，勾選對應的選取方塊，然後點擊[合併布料]。
3. 點擊按鈕後，系統開啟「合併布料」視窗，選取對應的資訊後按[預覽]即可完成建立。



**1-2**

數位布料實作：  
資產頁面編輯

# 布料數位化 DPC：頁面編輯示範

- 所有已完成上傳的資產，皆可以於平台進行資訊新增、編輯、刪除等動作
- 欄位中，共有**5個必填欄位**，須完成才可進行儲存及後續動作

The screenshot displays the 'Asset Library / EY06563' page. On the left is a sidebar with navigation links: Organization / Group (Apparel Brand Group), Material Intelligence (Beta), Dashboard, Public Sourcing Library, Assets, Asset Library (selected), Workspace, Progress Status, Mood Board (Beta), and Thread Board (Beta). At the bottom of the sidebar is a 'Create Asset' button. The main content area shows the 'Item Number' as 'EY06563' and a large image of a dark fabric with a white star pattern. Below the image are three smaller thumbnails labeled 'Cover', 'Face', and 'Face (Roller)'. To the right is the 'Specifications' section, which contains several input fields. Two fields are highlighted with red rectangles: 'Cuttable Width' (with a value of 60 and a unit dropdown set to 'inch') and 'Weight' (with a value of 196 and a unit dropdown set to 'g/m²'). Other fields include 'Full Width' (value 61, unit 'inch'), 'Country of Origin' (dropdown set to 'Taiwan' with a 'Public' toggle), 'Season' (dropdown set to 'Select Season' with a 'Year' input and 'Public' toggle), and a 'Remarks' text area with the placeholder 'Add any additional fabric information here'. 'Cancel' and 'Save' buttons are located at the top right of the specifications section.



# 布料數位化 DPC：頁面編輯示範

- 欄位中，共有**5個必填欄位**，須完成才可進行儲存及後續動作

The screenshot displays the '3D Material' editor interface. On the left is a sidebar with navigation options: Organization / Group (Apparel Brand Group), Material Intelligence (Beta), Dashboard, Public Sourcing Library, Assets, Asset Library (selected), Workspace, Progress Status, Mood Board (Beta), and Thread Board (Beta). At the bottom of the sidebar is a 'Create Asset' button. The main content area is titled '3D Material' and includes a 'Created in Frontier' section with a 'Customized' toggle. The 'Face Side' section contains three required fields, each marked with a red asterisk and highlighted by a red box: 'Material Type' (set to 'Woven'), 'Construction Type' (set to 'Dobby'), and 'Content' (a table with two rows: 'Polyester' with a value of '54' and 'Rayon' with a value of '40'). Below these fields is an 'Add Content' link and a 'See more' link. The 'Custom Fields' section shows a warning '(6 incomplete)'. The 'Tags' section at the bottom states 'Tags help others discover this asset faster.'

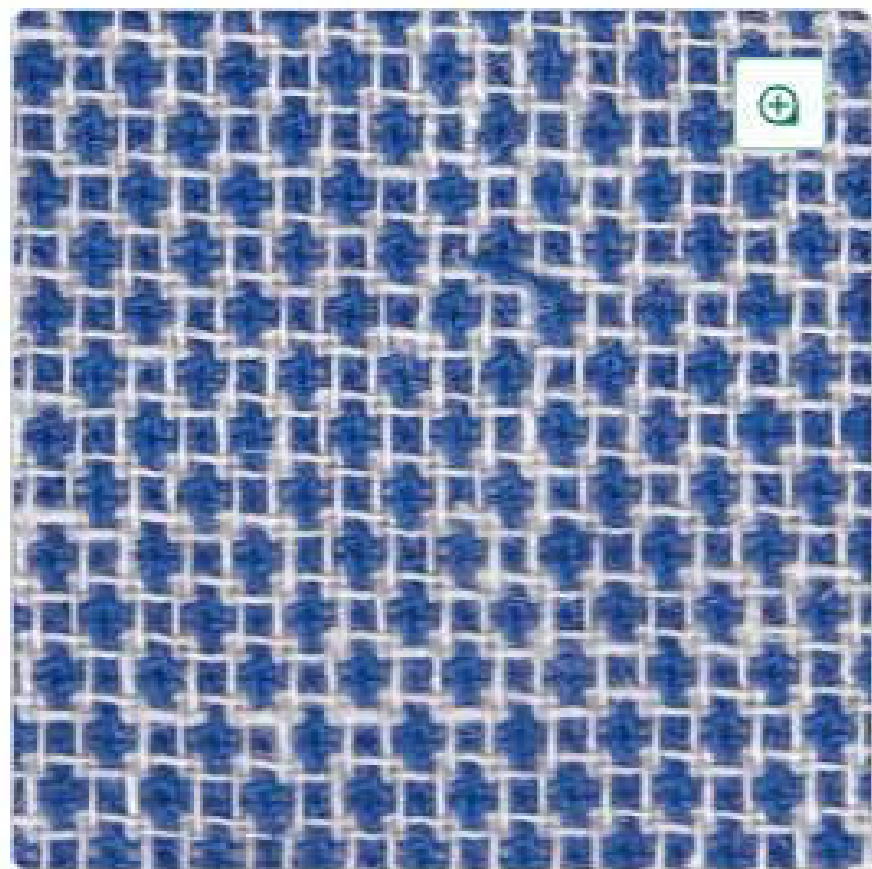


Item Number

20250903145444



Edit



### Specifications

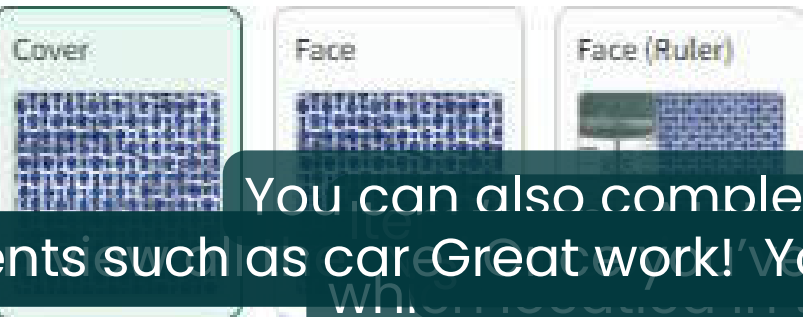
### Tags

Tags help others discover this asset faster. More tags, more visibility.

### Certifications

Showcasing certifications builds credibility with both key players and everyday users

### Pricing



You can also complete your fabric's data by adding private and public tags. Attachments such as car Great work! You've now completed adding your fabric's data. It also be uploaded here.



# 布料數位化 DPC：頁面編輯示範

Face Side Middle Side Back Side

Material Type <sup>\*</sup>

Woven

Construction Type <sup>\*</sup>

Ripstop

Content <sup>\*</sup>

Recycled Nylon 100 %

+ Add Content

See more

- 若為三層布，可於欄位填寫中間層的加工資訊、特殊功能性等內容

- 平台提供單面布、雙面布的資訊編輯（可選擇相同成分或設定不同資訊）

Face Side Middle Side Back Side

Accelerate Material Information Entry

To simplify the input information, only the necessary fields are displayed here. After saving, you can view the complete information, and the entered fields will be presented in a deep gray background for easy identification

See less

Features

Add keywords related to this product so buyers can search for it with ease

Finish List

Select options or Enter the finish info



# Custom Fields 自訂欄位

強化不同團隊與布料資料的一致性，打造符合企業流程的管理模式

Custom Fields

You can add custom field sections and fields within them according to your needs

Specifications

Pricing

Yarn Detail

Supplier Detail

Buyer Detail

Supplier Email

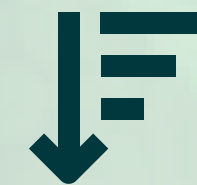
+ Add Field

| Field Name | Field Type                      | Apply to                                  | Public                              | Required                 | Actions                                      |
|------------|---------------------------------|-------------------------------------------|-------------------------------------|--------------------------|----------------------------------------------|
| Style      | Multiple Select (Dropdown List) | Woven Knit Leather                        | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <div><div></div><div></div><div></div></div> |
| Pattern    | Text                            | Woven Knit Leather Non-woven Trims Others | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <div><div></div><div></div><div></div></div> |
| Color      | Text                            | Woven Knit Leather Non-woven Trims Others | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <div><div></div><div></div><div></div></div> |
| Sequential | Flowchart                       | Woven Knit                                | <input type="checkbox"/>            | <input type="checkbox"/> | <div><div></div><div></div><div></div></div> |

+ Supplier Detail

+ Buyer Detail

+ Collection Name



依照企業需求彈性建立欄位  
客製化新增/編輯/排序資料欄位



支援資料匯出  
所有自訂欄位皆可隨資料一併匯出，  
方便整合與後續應用。

**1-3**

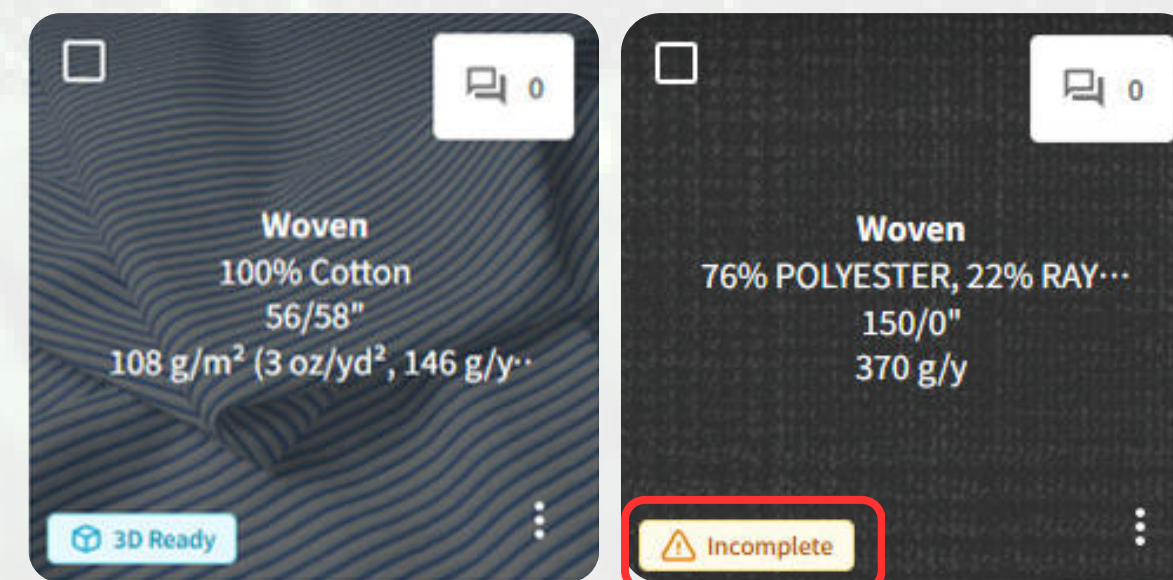
數位布料實作：  
建立**3D**資產

# 布料數位化 DPC：建立3D資產

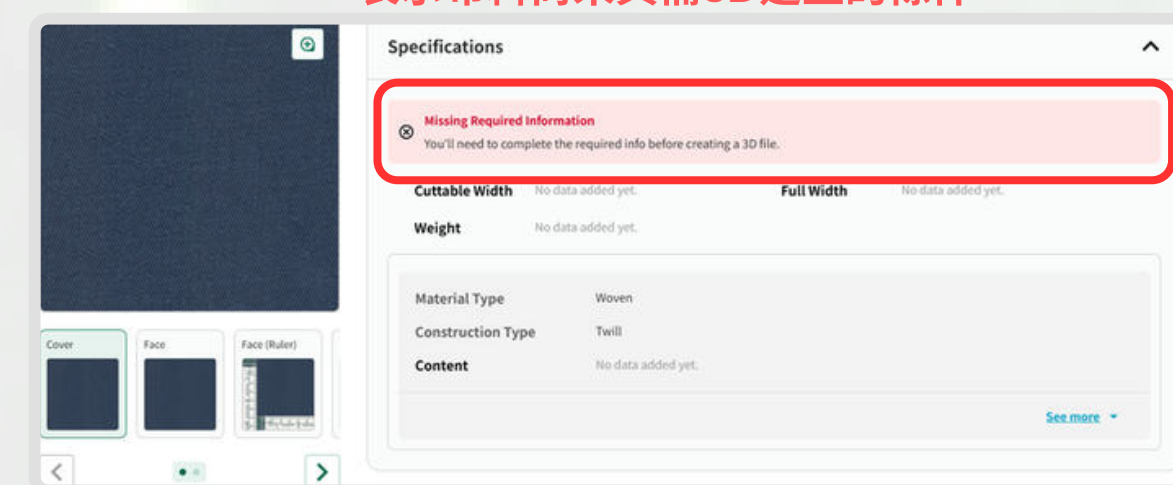
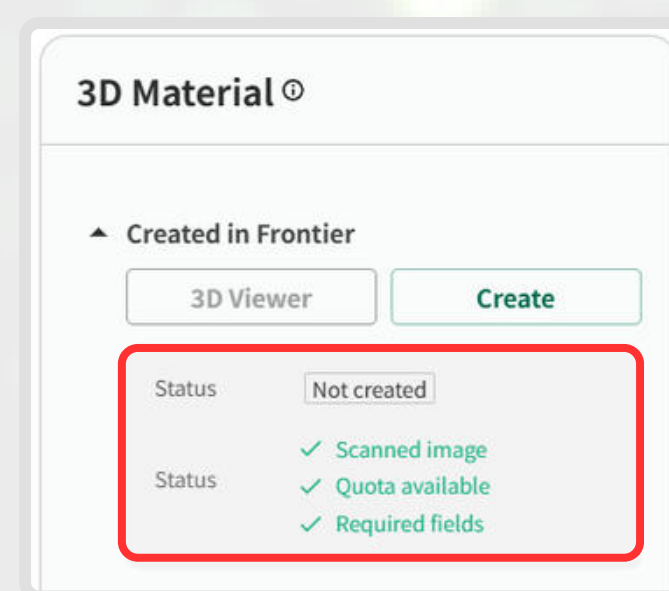
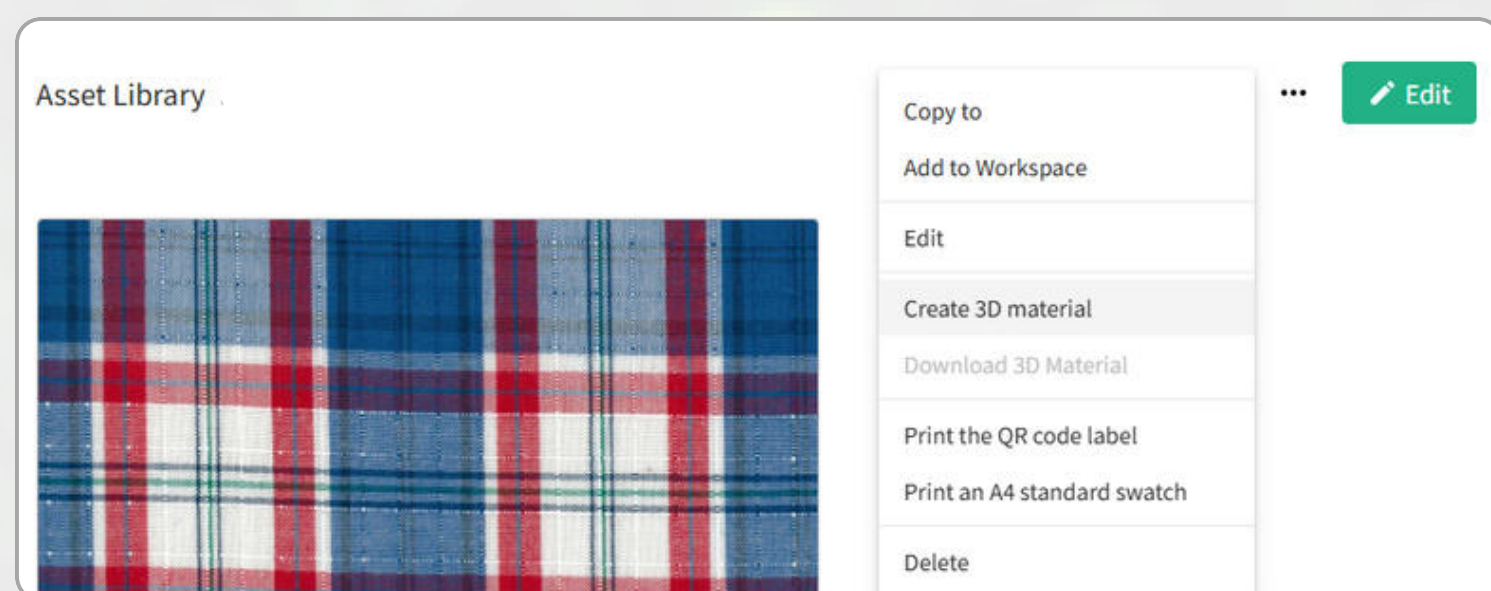
- 在建立好數位布料後，點擊該布料並選取[Edit] > 展開選單找到[Create]選項，只要達到以下要求，即可開始建立 3D 布料。

## 建立3D的必要條件：

- ※ 已完成圖片掃描/上傳（解析度300dpi以上）
- ※ 具備3D生成額度
- ※ 已完成必填欄位填寫:布種、成分、重量、幅寬(可裁/全幅)

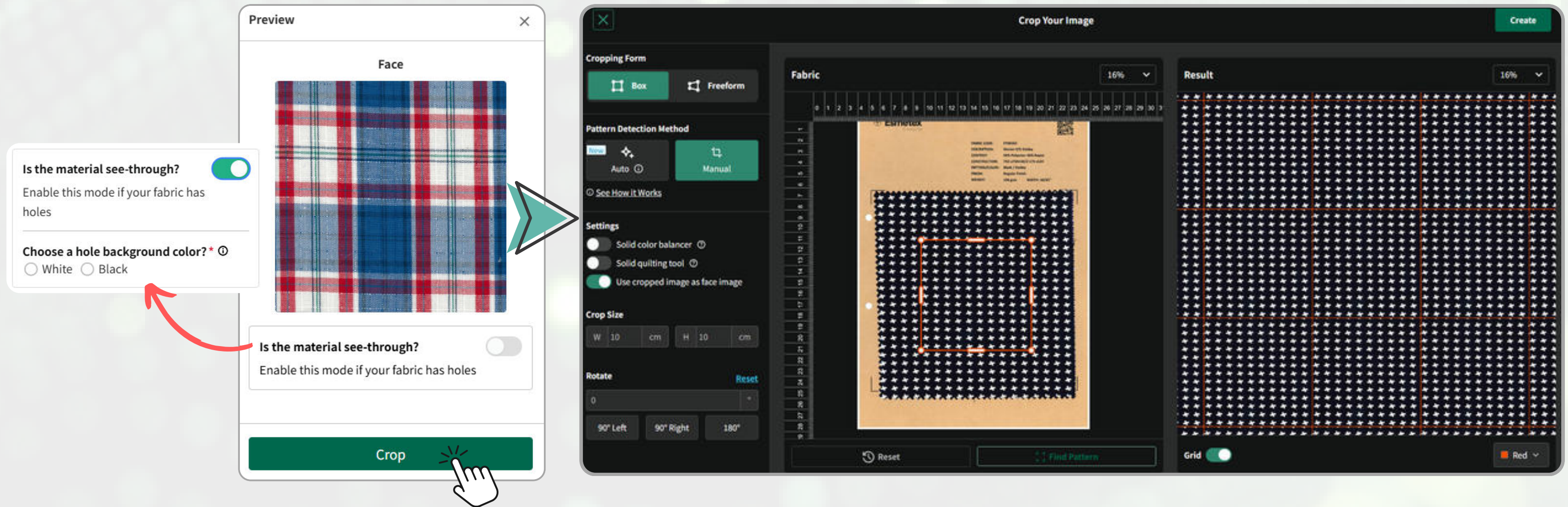


當布片左下方出現驚嘆號圖示，或是編輯欄位時出現紅色底框的提醒，表示布料尚未具備3D建立的條件



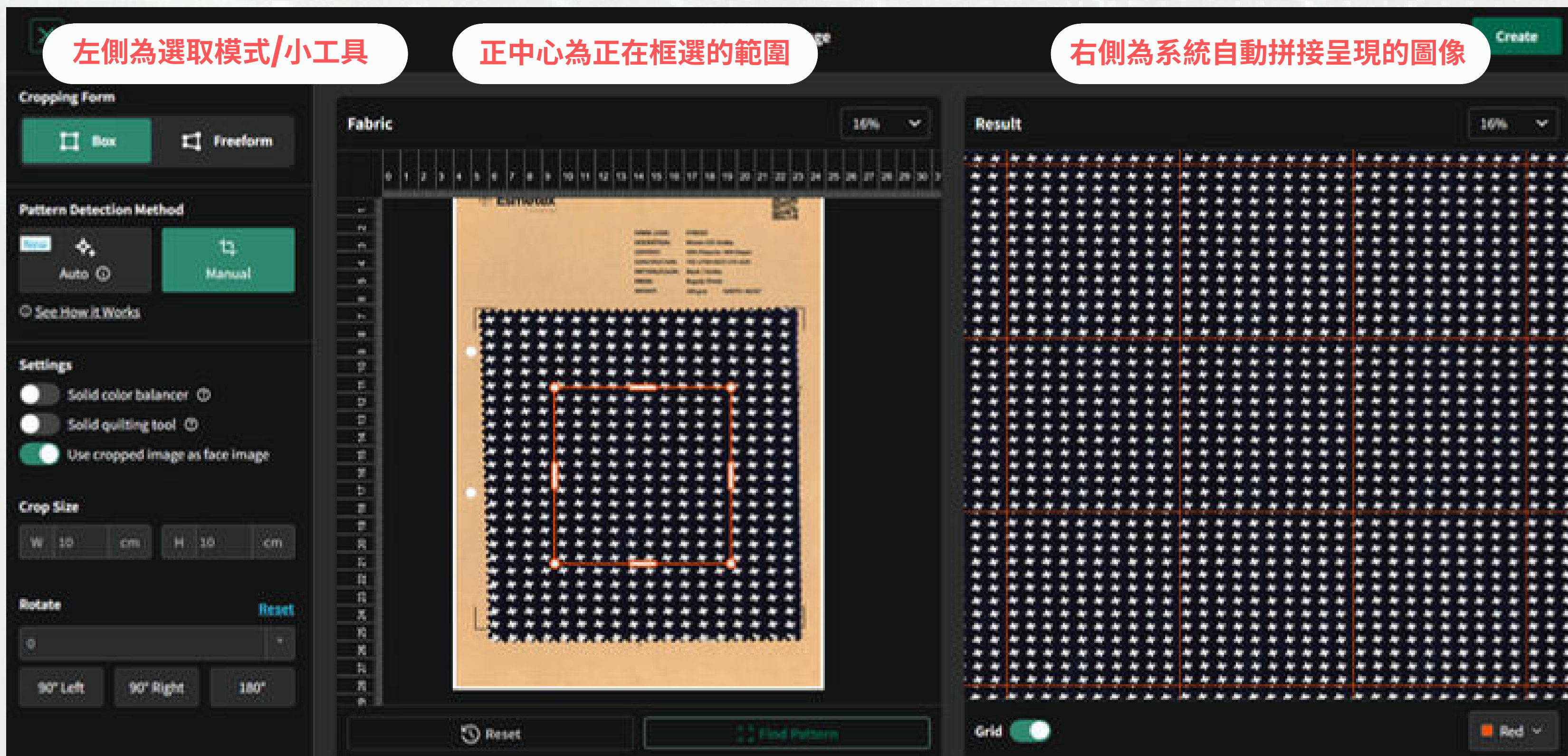
# 布料數位化 DPC：建立3D資產

- 確認擷取的布片後，須留意布料是否為**可透視**的布料，選擇 AI 去背的背景顏色。
- 點擊[Crop]後，進入到裁切編輯頁面。





# 布料數位化 DPC：建立3D資產



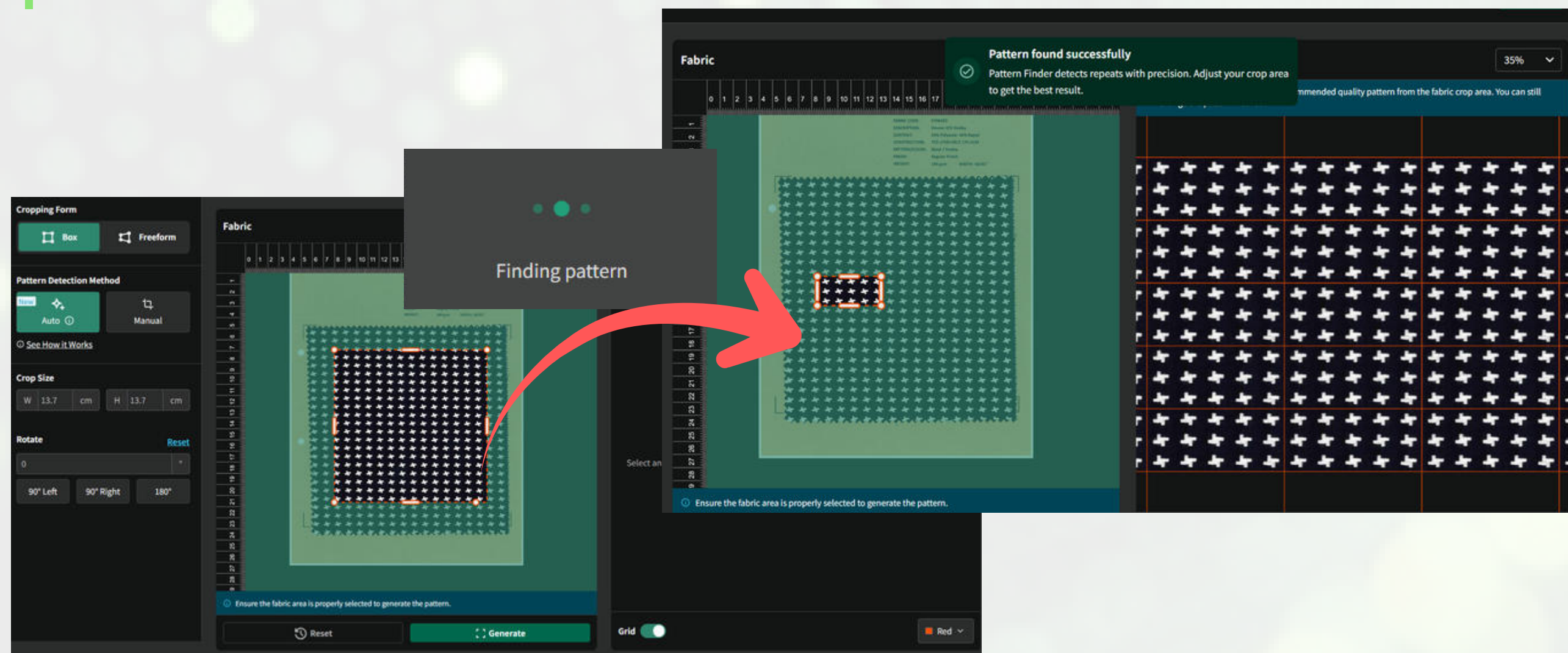
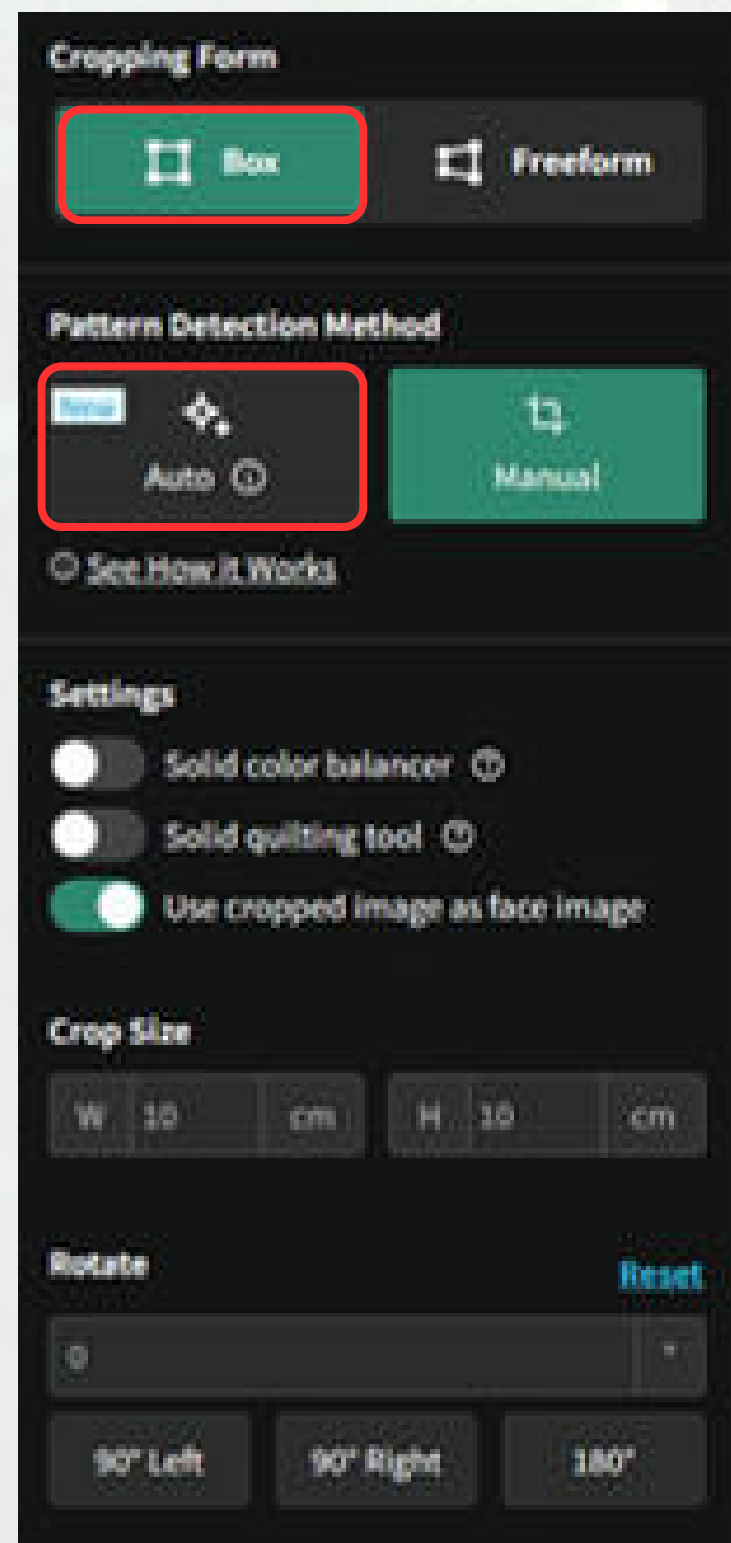


# 布料數位化 DPC：建立3D資產

## 圖案/圖紋布料：

- 選擇 Box—確認選取框的範圍足夠大，可以完整涵蓋花紋；
- 使用 Auto Tool + Generate 利用 AI 快速辨識圖紋。

請留意格紋及圖紋布料皆應平整、對齊地掃描，才可獲得最佳辨識效果





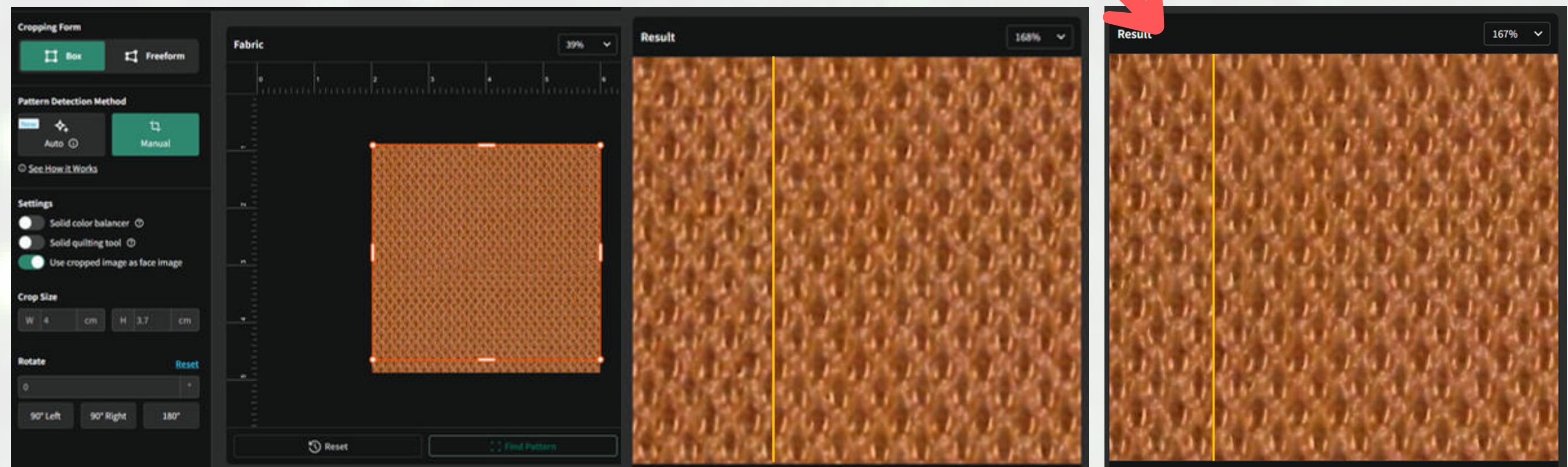
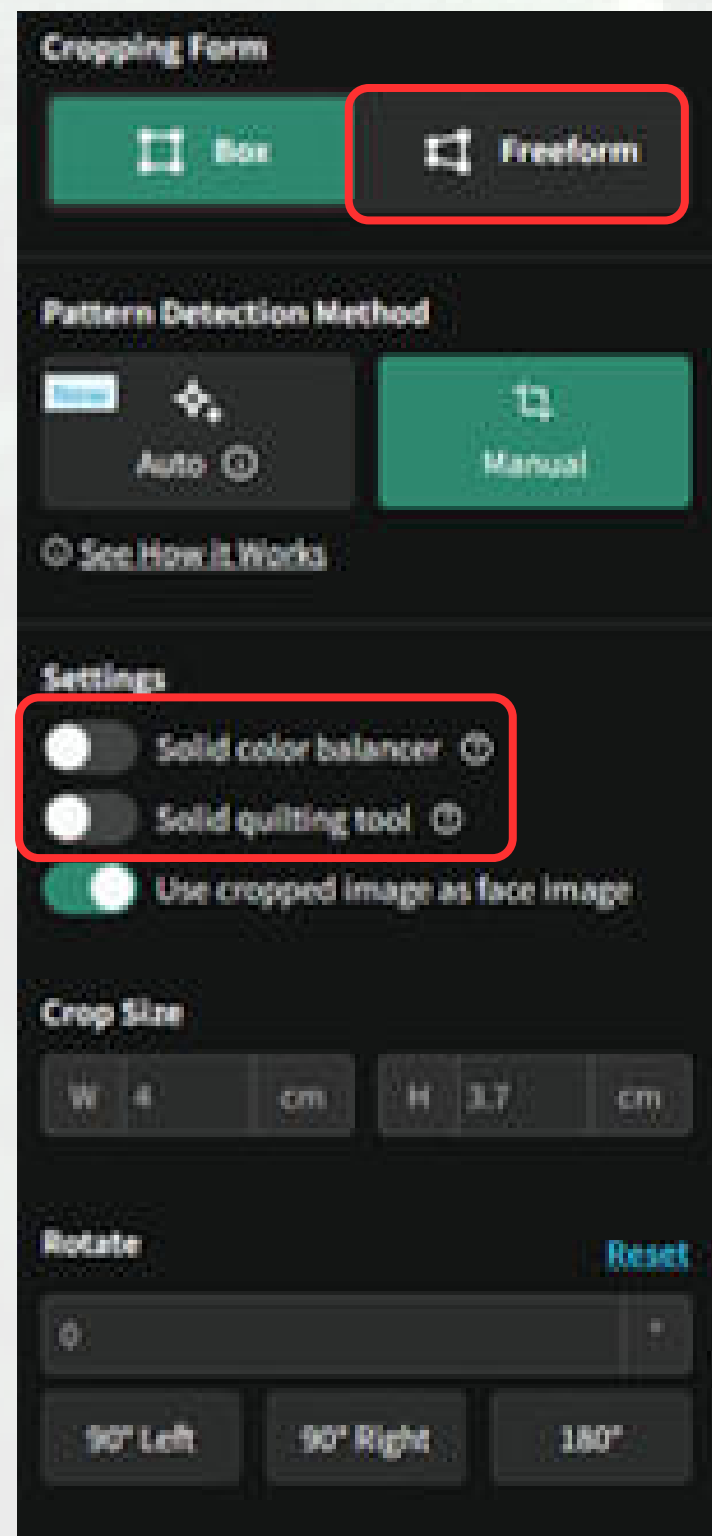
# 布料數位化 DPC：建立3D資產

## 素色/單色布料：

- 使用 Freeform 工具選取特定區域；
- 使用進階工具 Solid Quilting 工具和 Solid Color Balancer，優化布料效果。

**SOLID COLOR BALANCER (色彩平衡器)**：適用於素色布料顏色不均勻時

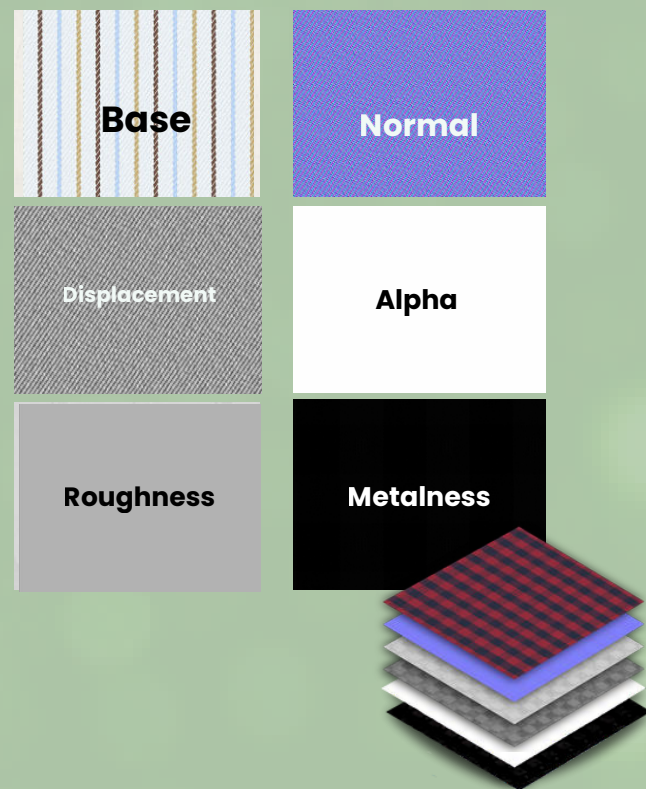
**SOLID QUILTING TOOL (純色拼接工具)**：適用於素色布具明顯拼接線時



# 布料數位化 DPC：建立3D資產

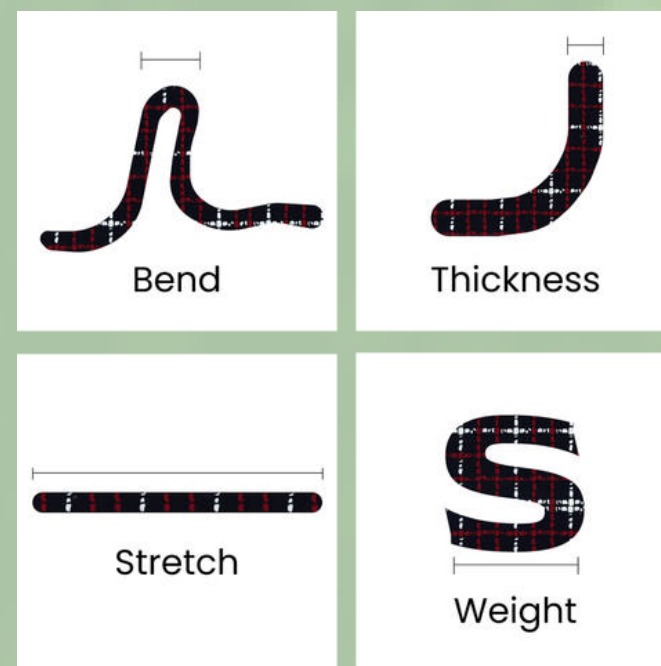
## 完成 3D 後，會得到什麼？

1



Texture Map

2



Physical Properties

3



3D model

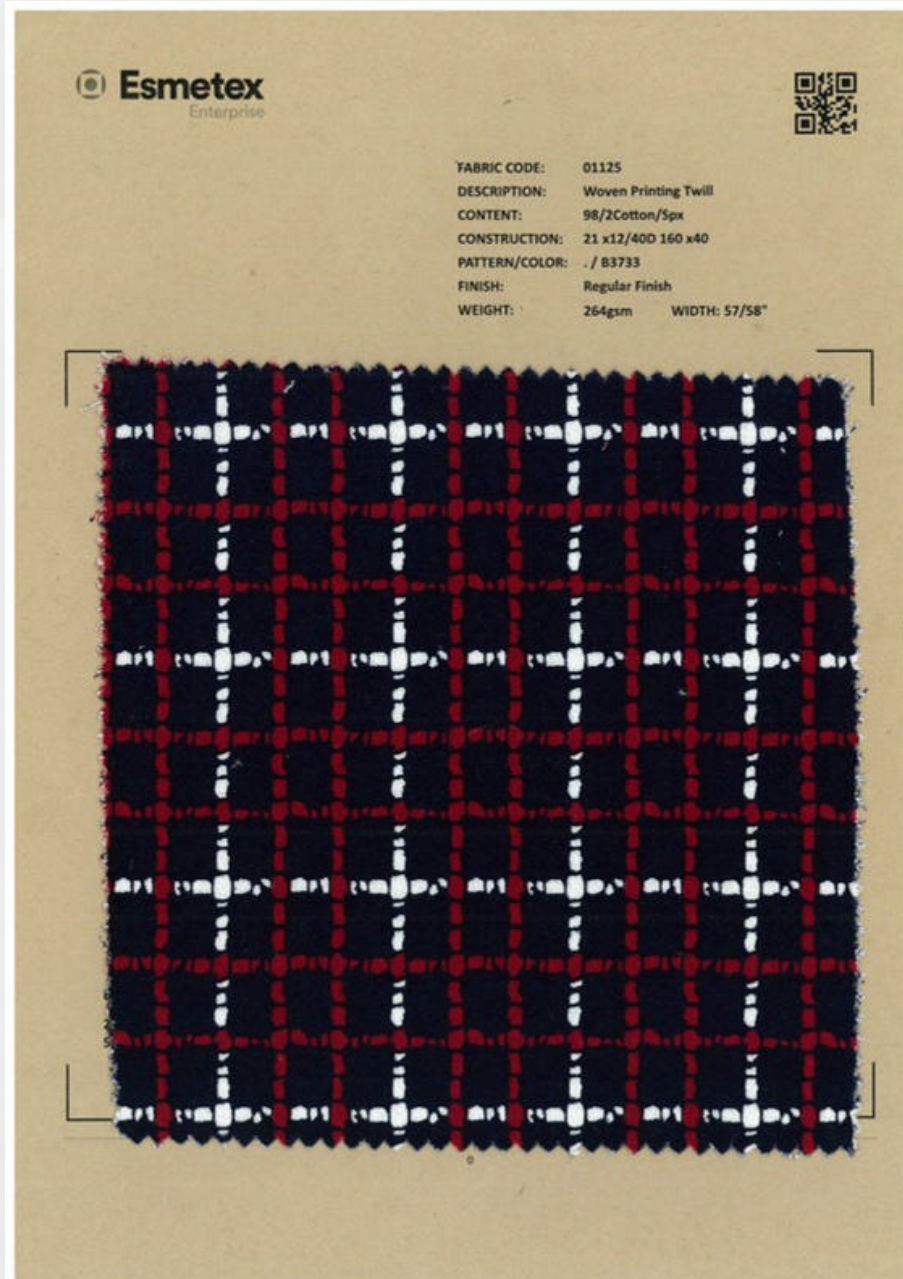
4



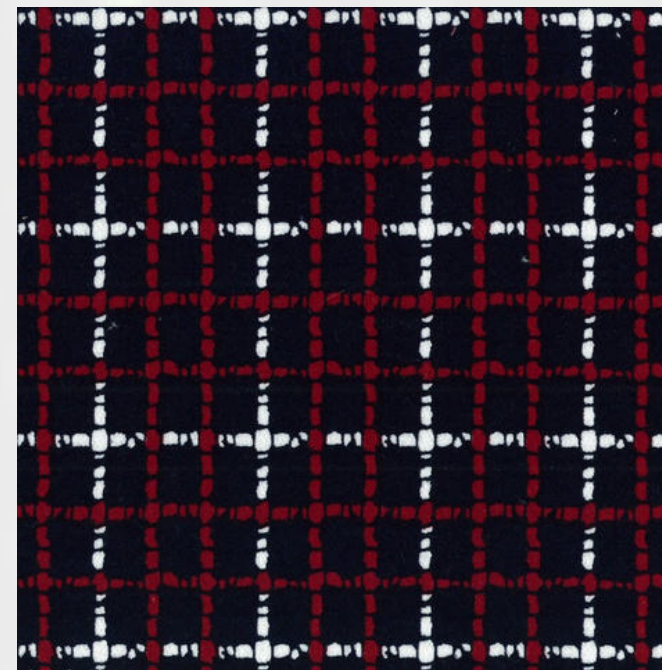
Digital Drape

# 布料數位化 DPC：AI 如何輔助建立3D布料

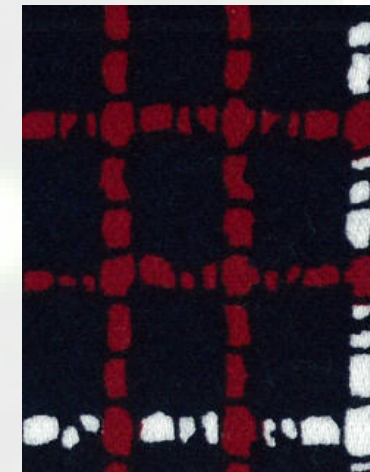
## 布版色卡



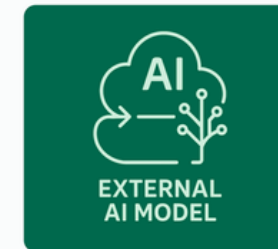
## 偵測布料



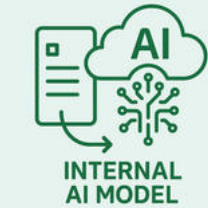
## 判斷布料花紋



## 花紋疊拼為完整布料



YOLOX 物件偵測 AI 模型  
YOLOX object detection



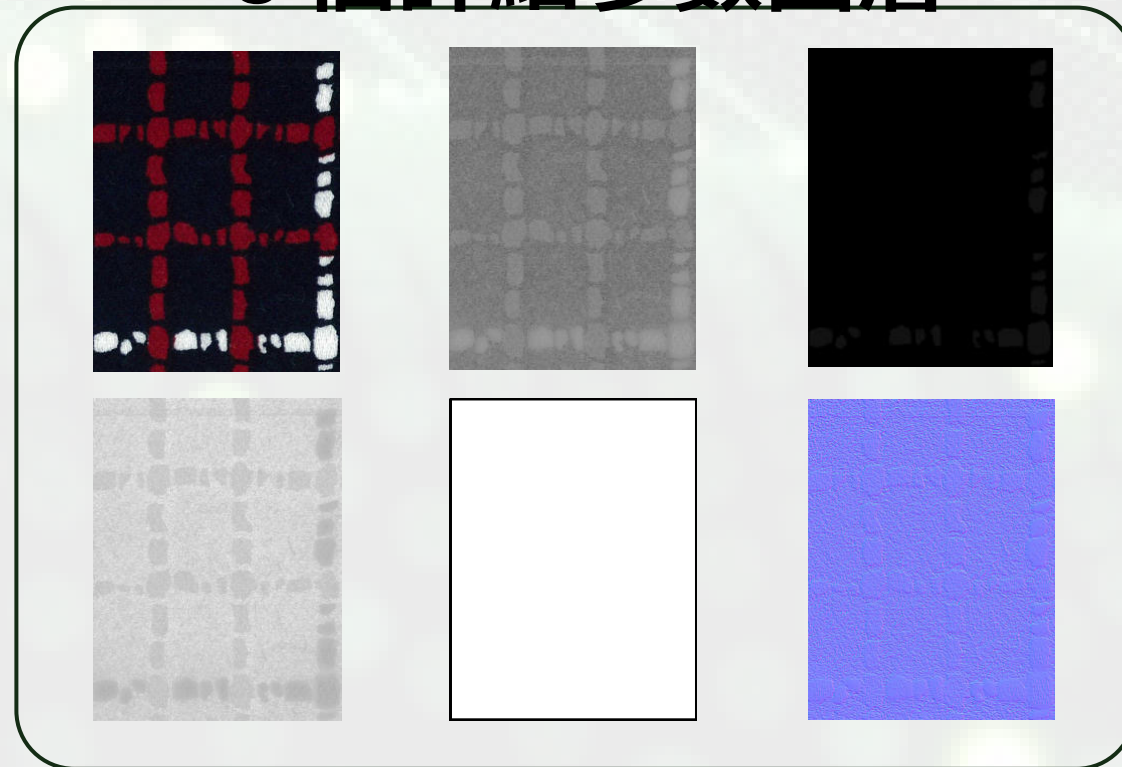
重複花紋偵測演算法  
Repeating Pattern Detect algorithm  
無縫平鋪生成演算法  
Seamless Tiling algorithm

# 布料數位化 DPC：AI 如何輔助建立3D布料

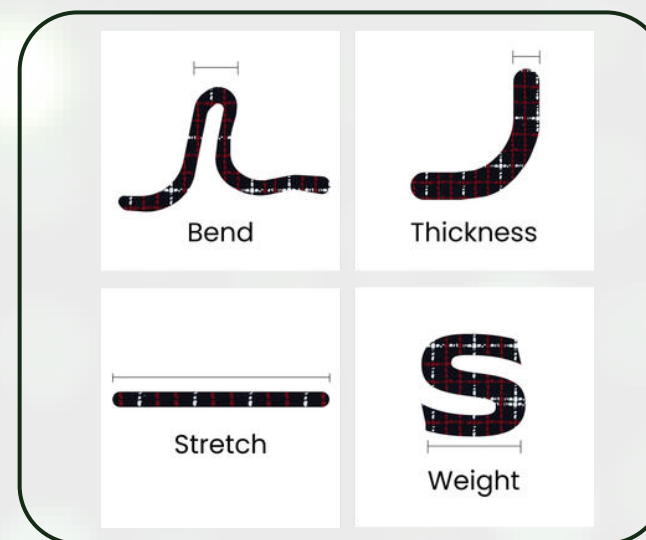
布料圖片



6 個詳細參數圖層



布料物理數據



數位布料資產

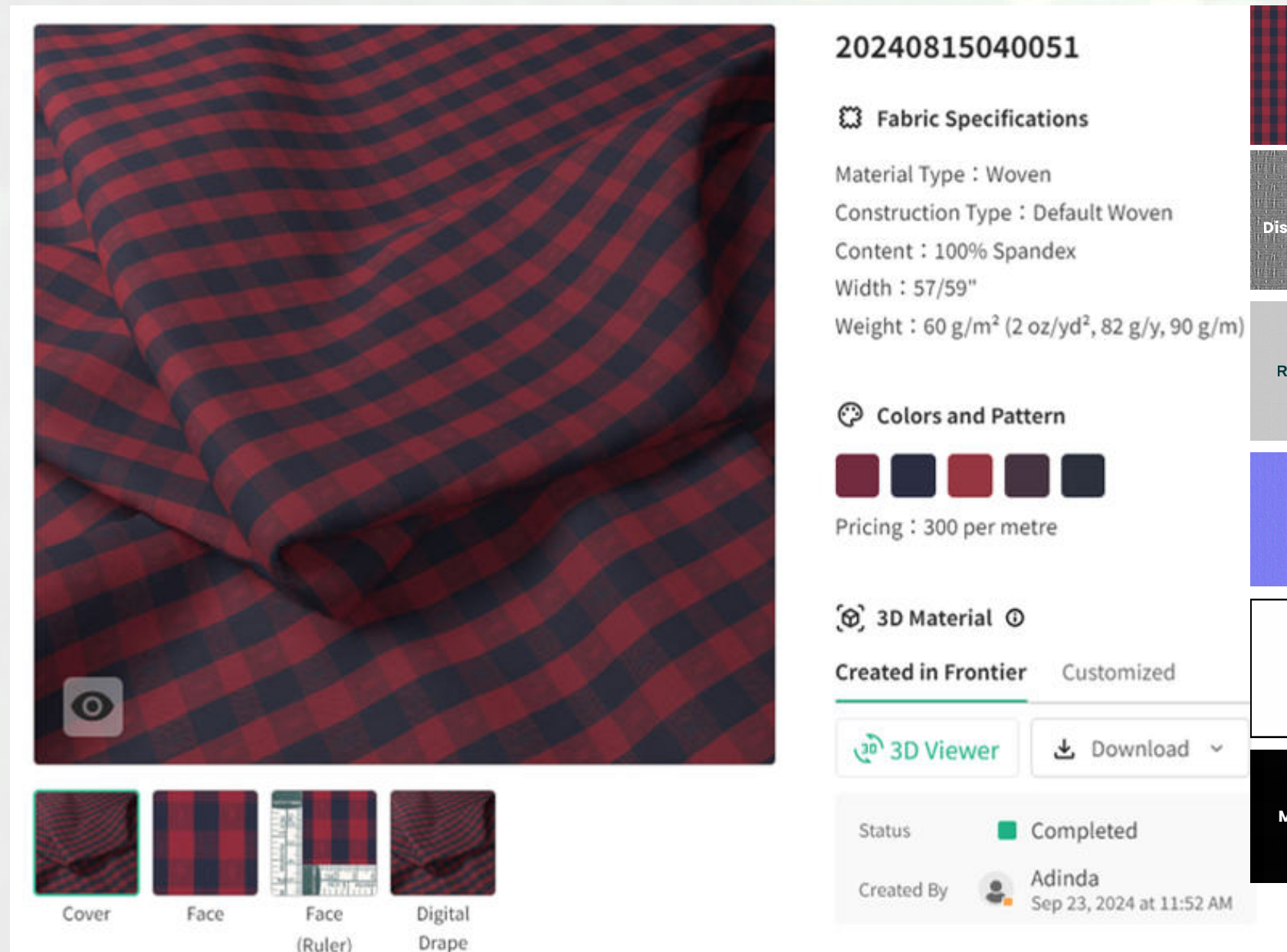


# 布料數位化 DPC：建立3D布料

- AI 依據掃描布片的資訊、圖樣、生成逼近真實布料的 Digital Drape
- 可應用於前期設計開發確認、客戶溝通、行銷展示等



# 布料數位化 DPC：布料檔案與軟體整合應用



我們所提供的3D檔案規格:

**U3M / U3MA / GITF / zFab**

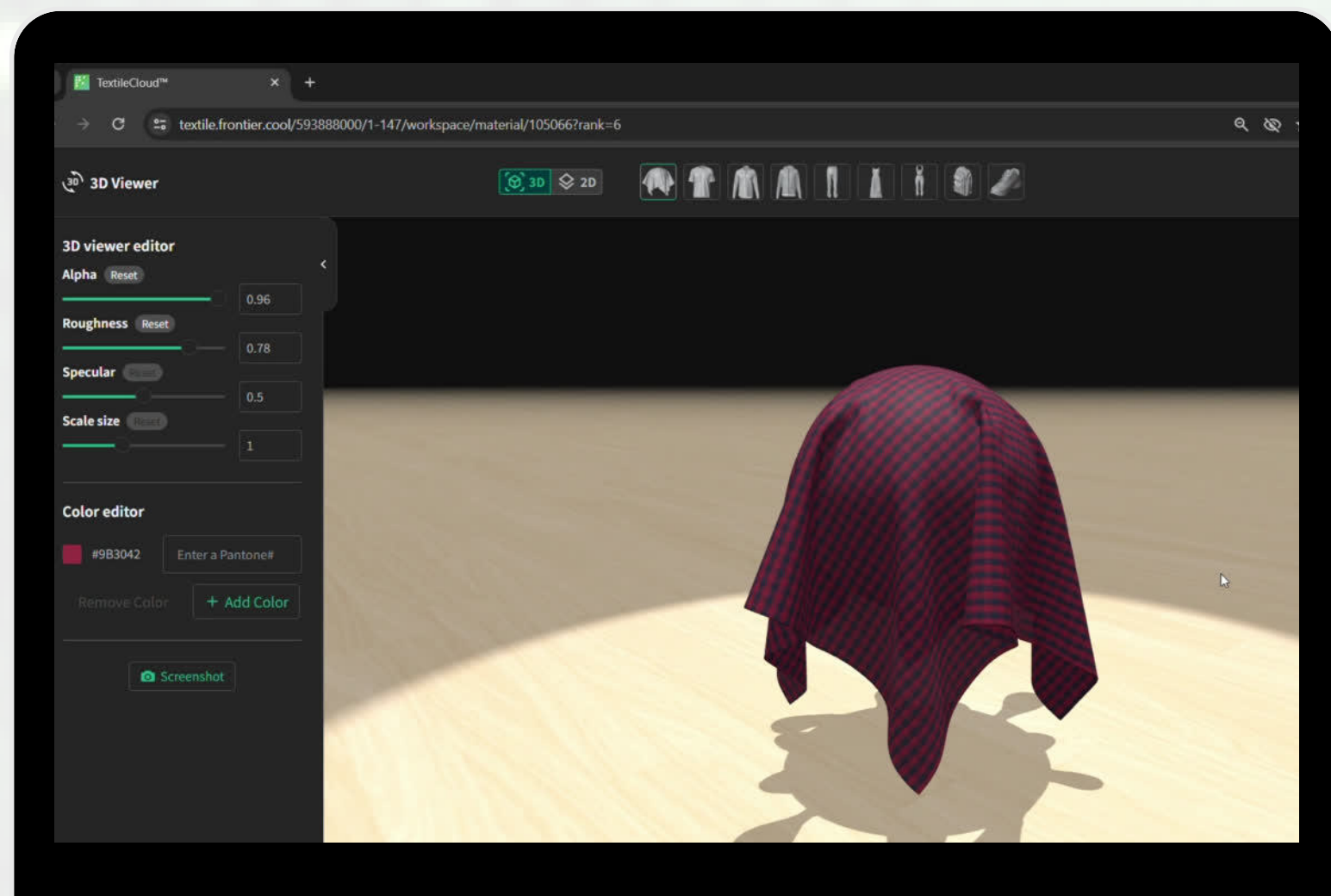
任您應用於以下3D設計軟體:



**SHIMA SEIKI**



# 布料數位化 DPC：快速應用



## 3D Viewer

模擬布料服裝效果  
加速客戶溝通效率

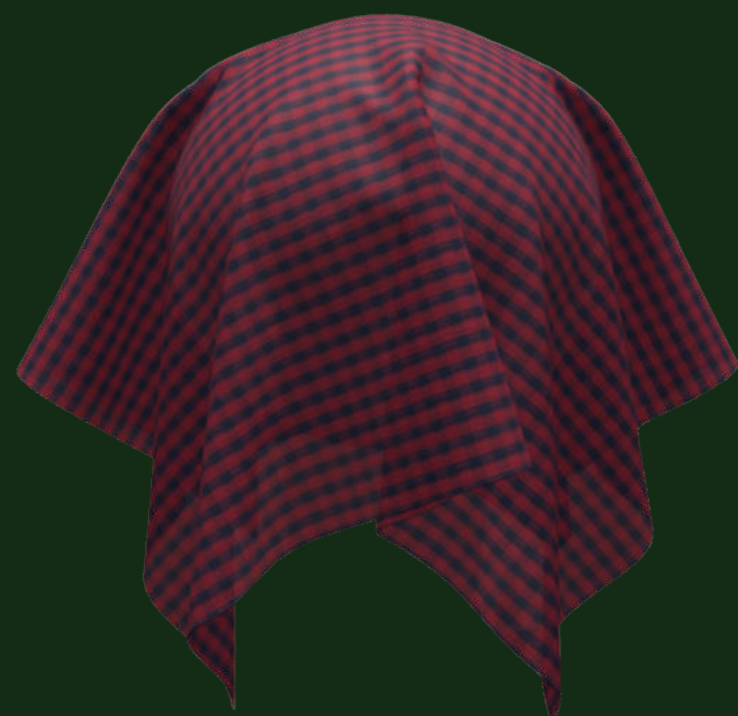
- 快速視覺拼接參考
- 理想花紋比例參考



# TextileCloud – 高效的數位化流程

## 18X FASTER

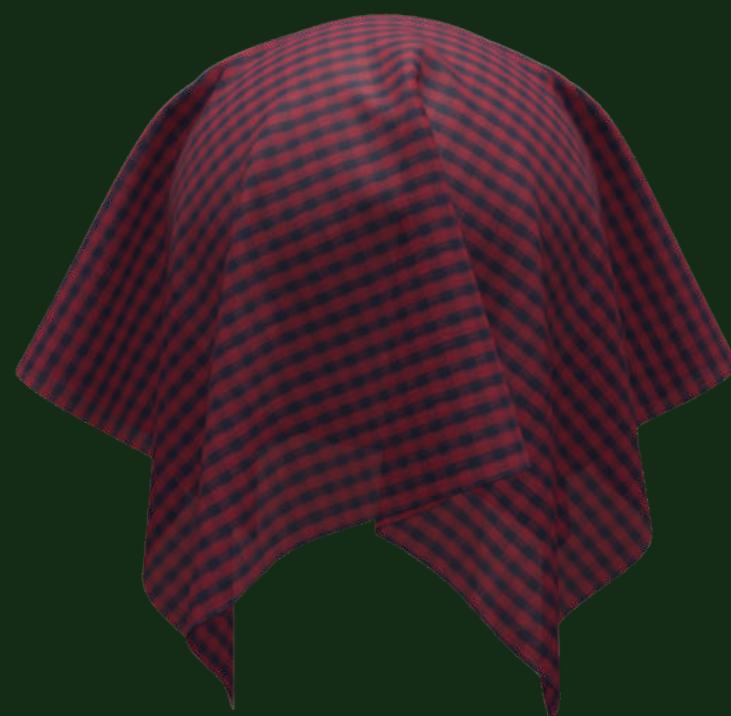
TextileCloud™ AI



3-5 MINUTES

VS.

傳統布料數位化流程

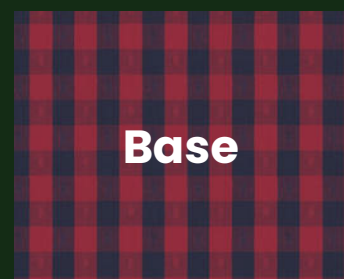


90 MINUTES

AI 驅動

布料物理特性&垂墜效果

- ✓ 快速預覽布料外觀、手感、輪廓效果
- ✓ 幫助設計師在數秒內完成初步評估
- ✓ 適合產品開發初期進行設計概念驗證



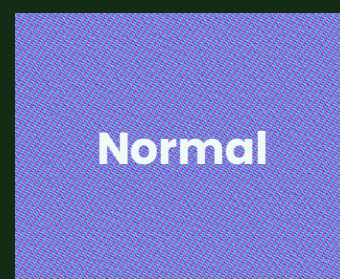
Base



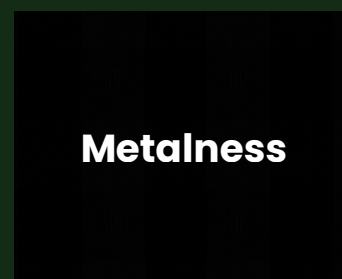
Displacement



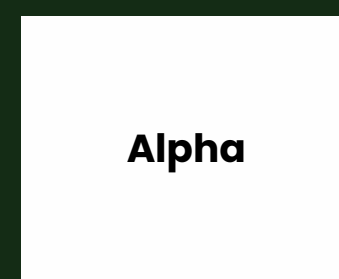
Roughness



Normal



Metalness



Alpha



# TextileCloud - 數位資產頁面

