

# **LABELFORGE V2**

Premium User Manual

Advanced Agentic 3D Packaging Workflow

Version 2.0



# 1. Environment Setup

LabelForge V2 is a pipeline hub designed to seamlessly connect your 2D artwork to industry-standard 3D software. Upon launching the application for the first time, you must configure your Digital Content Creation (DCC) tool paths in the **Setup** tab.

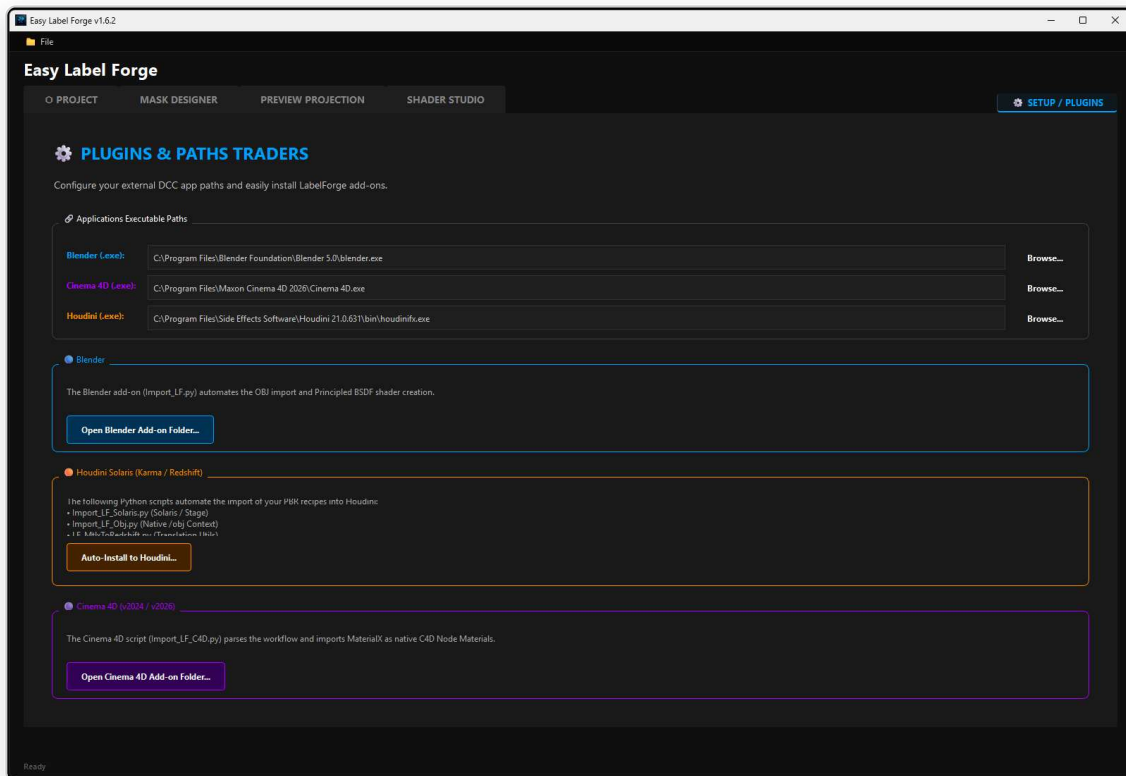


Figure 1.1: Configuring the Setup environment.

## Required & Optional 3D Applications

- **Blender (Required):** LabelForge uses Blender's powerful geometry engine in the background. It is strictly required for advanced features like *Smart UV Box Unwrapping* and mesh processing. Ensure the path points to your `blender.exe`.
- **Cinema 4D (C4D) / Houdini (Optional):** If you provide paths to these applications, LabelForge will enable direct one-click bridge exports. This allows

the software to automatically launch your 3D application, rebuild your materials, and setup your scene for rendering.

## 2. Project Load & File Prerequisites

### ⚠️ CRITICAL: Adobe Illustrator (.ai) Prerequisites

Before loading an `.ai` file into LabelForge, your Illustrator document MUST meet these specific conditions for accurate parsing:

1. **Vectorize Text:** All text elements must be vectorized (Select Text > Type > Create Outlines).
2. **PDF Compatibility:** When saving your `.ai` file, the "**Create PDF Compatible File**" checkbox must be selected in the save dialog.
3. **Cut Lines Naming:** The layer or folder containing your die-cut lines (used for Smart UV Box unwrapping) MUST be named exactly `LF_CUT`.

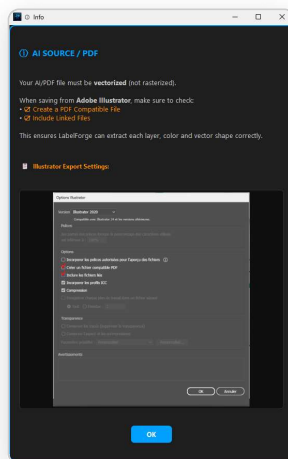


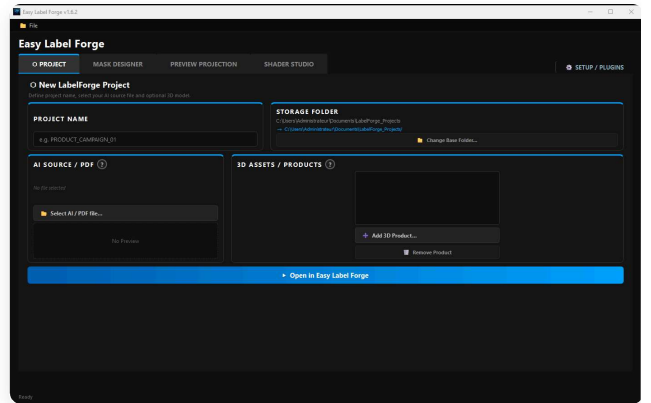
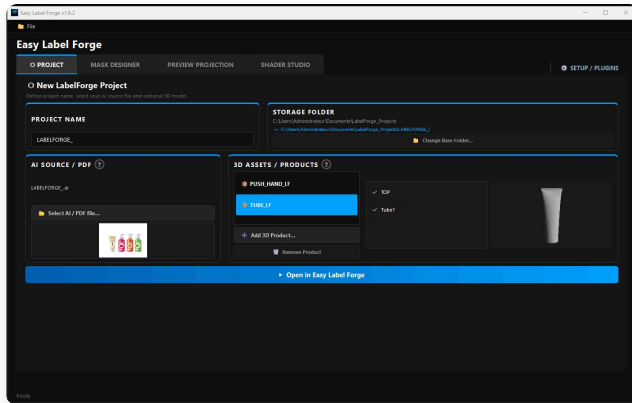
Figure 2.1: Illustrator file preparation requirements.

### Creating or Loading a Project

Once your artwork is prepared, you can load your project.

- Click on the **Load Project** button or drag and drop your `.ai` file directly into the application.

- LabelForge will parse the file, extracting embedded assets and layer hierarchies instantly.



## 3. Mask Designer Overview

The **Mask Designer** is the heart of LabelForge. It allows you to precisely define which parts of your 2D artwork apply to your 3D geometry using advanced masking, snapping, and layer management.

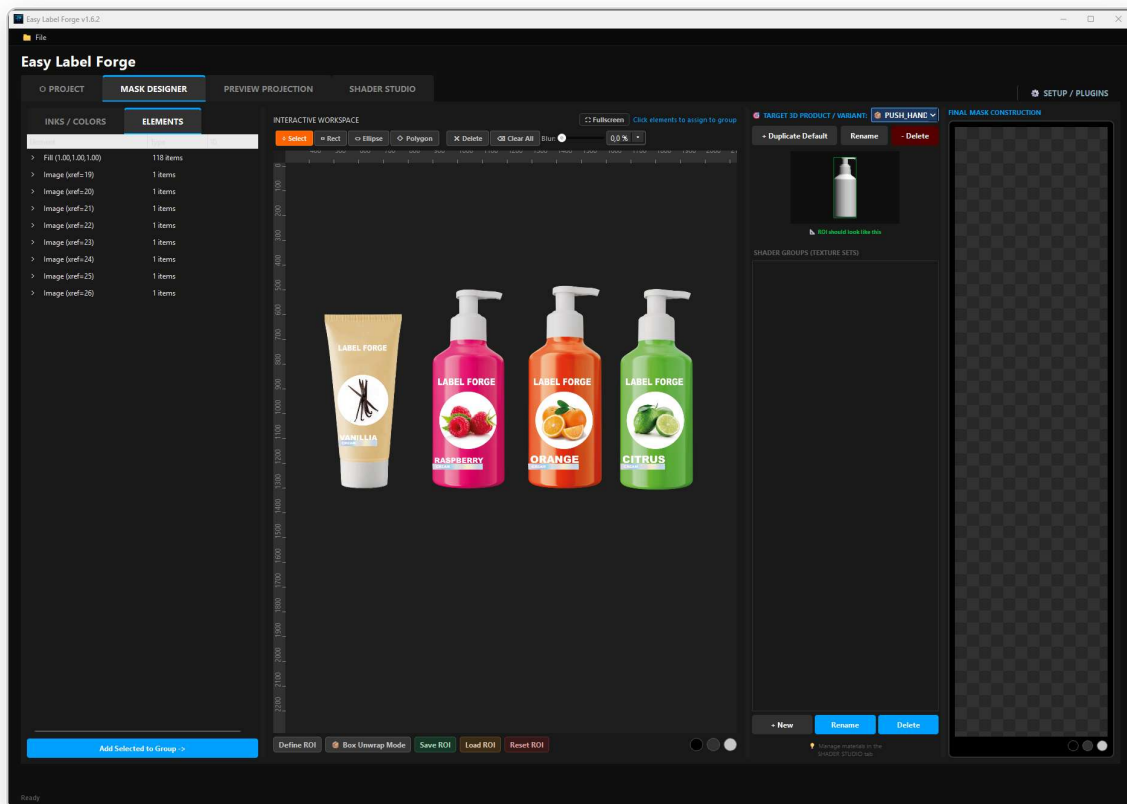


Figure 3.1: The Mask Designer Interface.

### Interface Breakdown

The Mask Designer interface is divided into several powerful sections:

1. **Interactive Canvas:** The central workspace where your artwork is displayed. You can pan, zoom, and draw directly on this area.
2. **Rulers & Guides:** High-precision rulers frame the canvas. Click and drag from the rulers to create magnetic guides. (Hold **ctrl** to move existing guides).

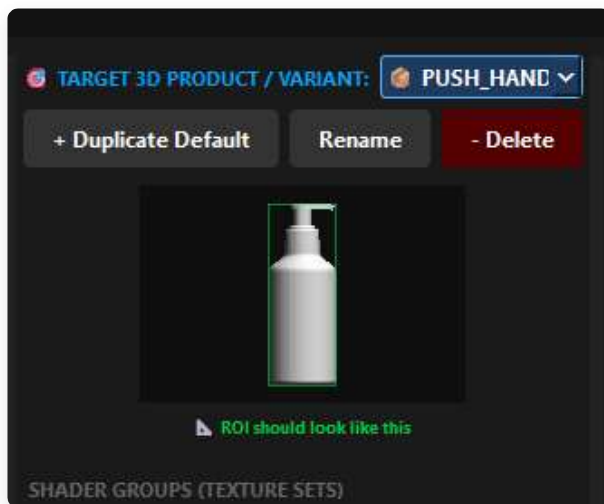
**3. Toolbars (Target 3D, ROIs, Groups):** The right-side panels allow you to manage the relationship between your 2D design and the final 3D objects.

## 4. Mask Designer: In-Depth Tools

### Target 3D Assets

The **Target 3D** panel allows you to link your 2D regions to specific 3D products or meshes.

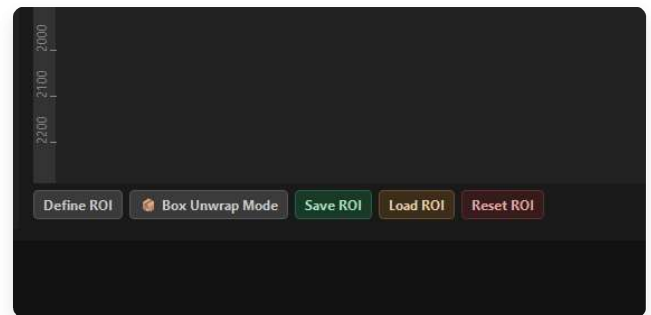
- If your artwork contains labels for multiple items (e.g., a bottle, a box, and a cap), you can manage them here.



### Defining ROIs (Regions of Interest)

An ROI isolates a specific area of your artwork.

- Select the **ROI tool** and draw a bounding box.
- You can create multiple ROIs if you have multiple designs on one page.
- ROIs automatically snap to your magnetic guides for pixel-perfect precision.



### Interactive Shape Tools

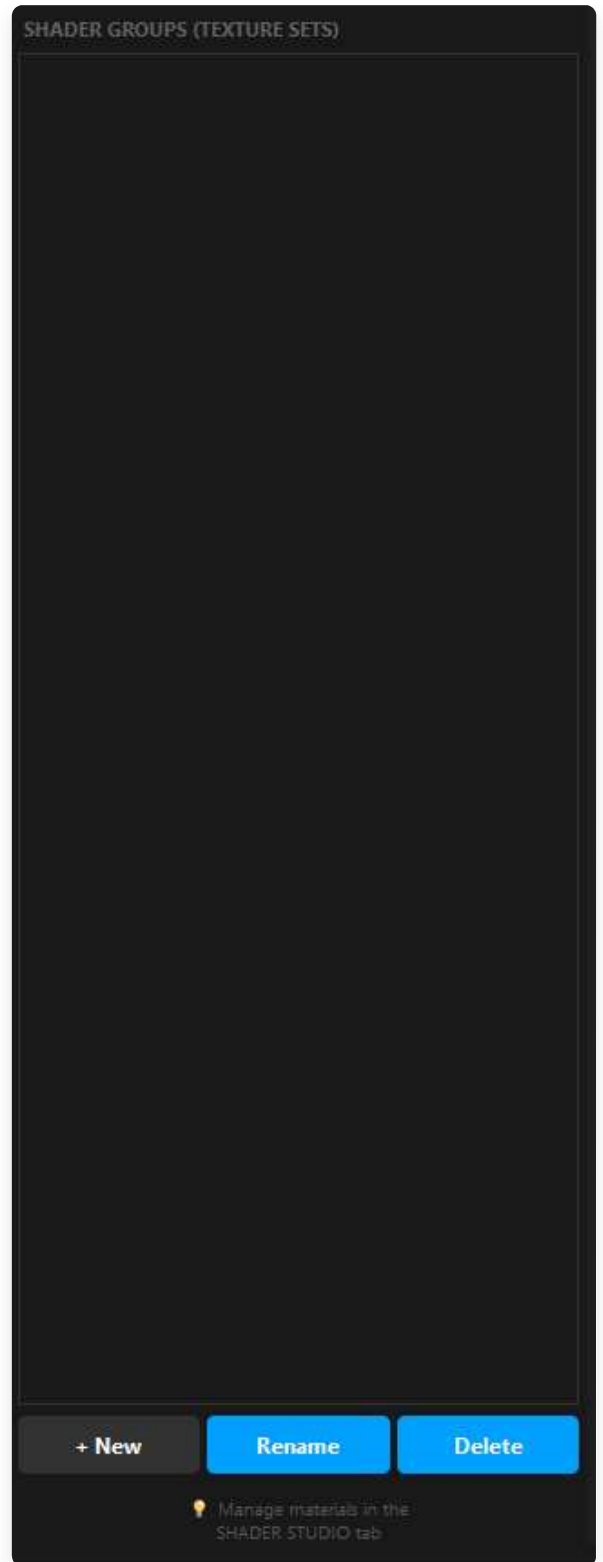
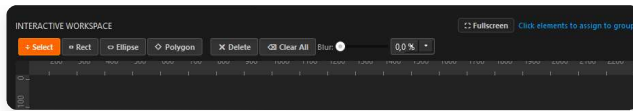
LabelForge provides vector-style drawing tools directly inside the Mask Designer to create custom opacity masks or cutouts.

- Use the **Rectangle, Ellipse, or Polygon** tools.
- Hold **ctr1** while drawing to subtract from an existing shape.
- **Precision Movement:** Once selected, use the **Arrow** keys to nudge shapes. Hold **shift + Arrow** for larger steps. You can also resize shapes dynamically using their handles.

### Layer Groups & Advanced Panel

The **Groups** panel reads the native layers from your AI file.

- Identify which layers contain Metallic foils, Spot UVs, or Embossing.
- **Advanced Tab:** The Elements Tree and Inks/Colors list are neatly tucked away in the **ADVANCED** collapsible panel to save screen space.
- **Undo System:** Made a mistake? Press **ctr1 + z** to undo any action or shape movement in the Mask Designer.



## 5. 3D Preview & Projection

Switching to the **Preview Projection** tab brings your 2D artwork to life. This viewport uses zero-copy OpenGL acceleration for instant feedback.

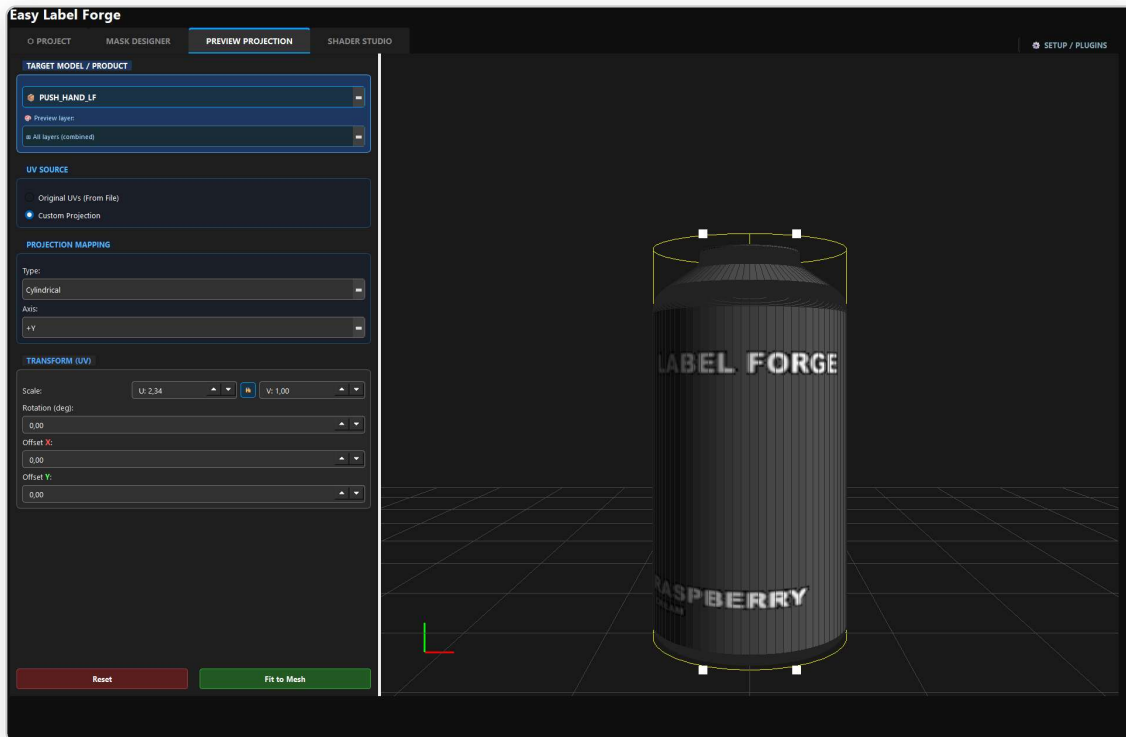


Figure 5.1: The 3D Viewport projecting 2D artwork onto imported geometry.

### Mapping Your Artwork

Once your OBJ or USD model is loaded, LabelForge maps the defined ROIs to the geometry based on the active **Projection Algorithm**:

- **Planar:** Projects the artwork flat onto the geometry on a specific axis (X, Y, or Z). Perfect for flat objects.
- **Cylindrical:** Wraps the artwork 360 degrees. The engine precisely calculates the mesh's circumference to prevent stretching.

- **Smart UV (Unwrap):** Ideal for folding cartons. If you drew cut-lines (LF\_CUT layer) in Illustrator, this mode connects with Blender to generate a perfect unwrapped UV map.

## 6. Shader Studio & Export Pipeline

The final step in the workflow is the **Shader Studio**. Here, your Layer Groups are converted into production-ready PBR (Physically Based Rendering) maps and sent to your DCC of choice.

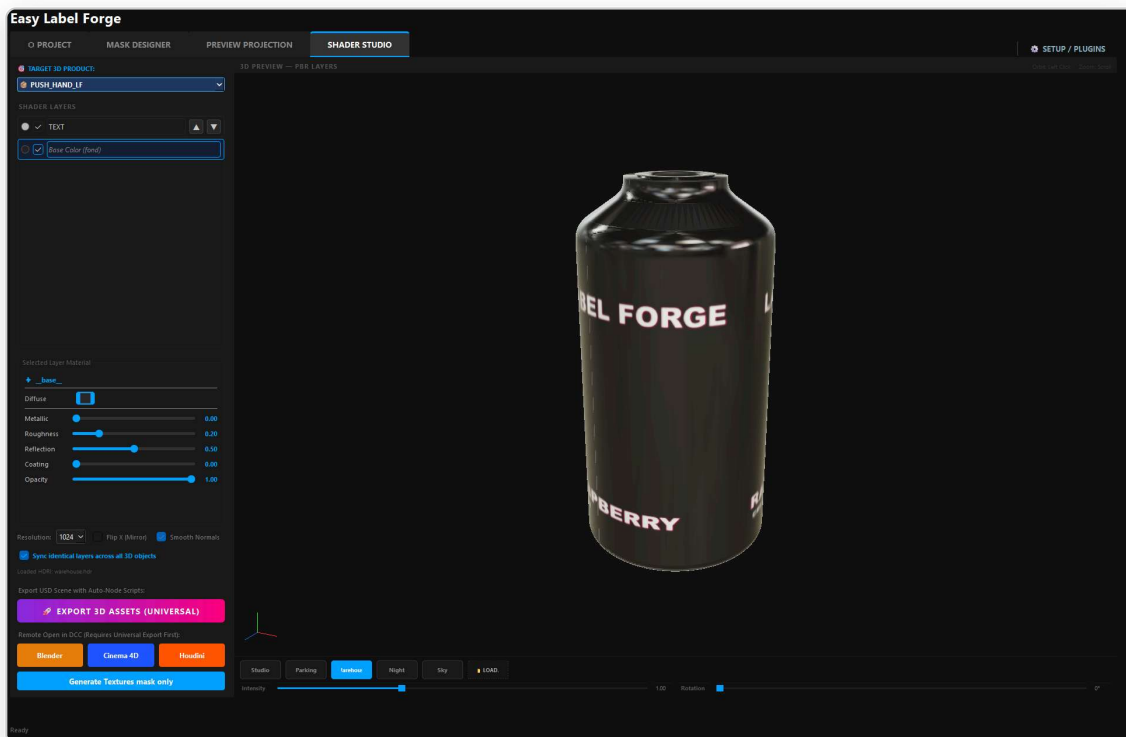


Figure 6.1: The Shader Studio, configuring material properties before export.

### Configuring Material Layers

The Shader Studio maps the layers extracted from your AI file into rendering channels:

- **Roughness / Gloss:** Define how shiny or matte specific parts of your packaging are.
- **Metallic:** Convert hot-foil layers directly into metallic masks.
- **Opacity / Bump:** Generate height maps based on your artwork hierarchy.

## Exporting to 3D Applications

LabelForge is deeply integrated with industry-standard 3D software.

- **Generate Textures Mask Only:** Quickly export square-formatted masks (with baked cylindrical wrapping when necessary). *Note: Trial versions will include an embedded watermark.*
- **Universal Textures:** Clicking "Export 3D Assets" generates standardized textures at up to 4K resolution.
- **DCC Direct Bridge (Houdini & C4D):** Triggering the bridge will automatically launch your 3D app, reconstruct the shader network, and prepare a ready-to-render scene instantly!

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**Thank you for using LabelForge V2.**

Precision Engineering for 3D Packaging Professionals.

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