



# Drawing symbols in Figma - User guide

Use the Engineering Symbols Tool to export clean SVG files supported by the Symbol Editor.

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# 1. Introduction

## 1.1 Purpose of this guide

This guide shows how to use Figma and the Engineering Symbols Tool plugin in Figma to prepare and export symbols that then can be uploaded to the PCA RDL Platform using the PCA Symbol Editor.

## 1.2 What this guide covers

You will learn how to:

- Draw symbols correctly in Figma.
- Use the Engineering Symbols Tool plugin to check and clean up your symbol.
- Export your symbols as PCA-compatible SVG files that are ready to be uploaded.

## 1.3 Prerequisites

Before you start, make sure you have:

- A valid Figma account (free or organization license).
- Engineering Symbols Tool Figma plugin
- Basic knowledge of Figma and how to draw vector shapes in Figma.

## 1.4 About this guide's audience

This guide is intended for designers and engineers who create vector symbols and export them to SVG format.

You don't need to understand the technical details of SVG code — the Engineering Symbols Tool plugin in Figma handles that for you.

However, it's important to follow the instructions carefully because PCA requires a very specific kind of SVG file. Most design tools (including Figma, Illustrator, and Visio) export SVGs with extra formatting and effects that the PCA platform cannot read.

By using this guide and the plugin, you ensure that your exported SVGs meet the PCA "geometry-only" requirements and can be imported directly without manual correction.

## 1.5 Related documentation

- PCA Symbol Editor - User Guide  
can be found on <https://www.posccaesar.org/pages/documentation>

# 2. Supported SVG's

When you create symbols for PCA, it's important to understand that the PCA Symbol Editor only reads the geometry of an SVG — not its visual styling. That means PCA doesn't look at colors, line thickness, gradients, or effects. It only cares about the actual shapes you've drawn, described as coordinates in the SVG file.

## 2.1 What “geometry-only” means

In simple terms, PCA reads only the path data — the instructions that tell a computer how to draw lines and curves. This data is stored inside something called the `d` attribute of the `<path>` element in the SVG. Anything that isn't part of a path (like circles, text, or images) is ignored when the symbol is imported.

So even if your drawing looks right in Figma, it might not import correctly unless it's made entirely of valid paths. The Engineering Symbols Tool plugin helps you clean up the SVG for export.

## 2.2 Why the plugin is needed

Most design programs (including Figma) add extra information to SVG files — things like colors, strokes, masks, or effects. PCA can't use these. The Engineering Symbols Tool plugin converts your artwork into a clean, single-layer shape that PCA understands. It also adjusts the paths so that what you see visually (like line width or filled areas) is preserved in the geometry.

## 2.3 The role of fill rules

In PCA, filled areas are determined by the direction in which paths are drawn. If two paths are drawn in opposite directions (one clockwise and one counterclockwise), the inner one will appear as a hole — like the inside of a ring or the outline of a rectangle. This is controlled by something called the non-zero fill rule, which PCA requires for all symbols.

The plugin helps you correct fill rules automatically. Red areas in the preview mean something needs fixing; green means the area is correct and ready for export.

## 2.4 Why colors and strokes are removed

You might wonder why PCA removes all visual styling. The reason is that symbols in PCA are meant to be controlled by client applications — for example, a P&ID viewer can highlight symbols, change colors, or show status dynamically. By stripping everything except geometry, PCA ensures the symbol can be styled consistently in any application.

## 2.5 What this means for you

When creating symbols:

- Focus on drawing clean, simple shapes.
- Avoid text, gradients, shadows, or decorative effects.
- Group your final geometry into one “Design” group.
- Let the plugin handle the export and validation.

If you follow these steps, your symbol will always be ready for use in PCA without manual fixes.

# 3. Using Figma to Draw the SVG

## 3.1 Why Figma is used

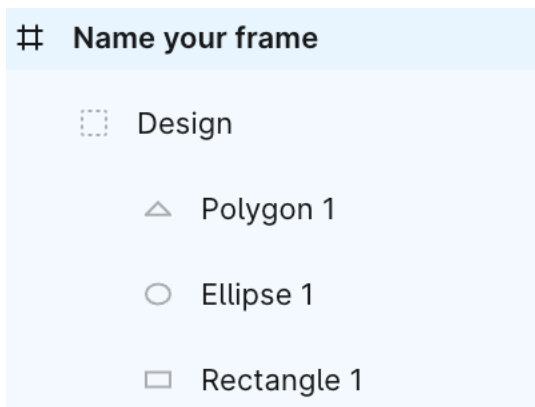
Figma is the preferred tool for creating PCA symbols because it:

- Produces clean SVG structures supported by PCA.
- Runs directly in the browser (no installation).
- Enables shared workspaces and collaboration.
- Promotes consistent symbol geometry and export formats.

## 3.2 Setting up your workspace

To make things easier and more consistent:

- Create one frame per symbol.
- Set the frame to match the symbol’s intended width and height. Height and width must be multiples of 12.
- Name each frame clearly so others can find it later.
- Keep your workspace tidy — it helps when collaborating with others.
- All layers that make up your symbol must be grouped. The group must be named “Design”.



*Figure 1: Hierarchy you must have in order to use the Engineering Symbols Tool plugin.*

### 3.3 Design principles

Use these simple do's and don'ts:

Do:

- Keep shapes clean and simple.
- Use basic geometric forms.
- Align objects carefully to the grid.

Don't:

- Use text, gradients, shadows, or filters.
- Combine shapes with masks or boolean operations.
- Add effects or strokes — the plugin will handle these visually if needed.

### 3.4 Layer and naming conventions

- Place all geometry for a symbol inside one frame.
- Group all drawing elements into a group called "Design".
- This helps the plugin recognize what to process during export.

# 4. The Engineering Symbols Tool Plugin

## 4.1 Purpose of the plugin

This is where the plugin takes care of the technical parts for you.

The Engineering Symbols Tool plugin prepares your symbol for export, performing cleanup operations, and validating that your SVG meets PCA requirements.

It can:

- Flatten groups into a clean <path> structure.
- Enforce the non-zero fill rule.
- Simulate stroke width through geometric expansion.
- Generate a properly named "Symbol" export layer.

## 4.2 Running the plugin

To run the Engineering Symbols Tool plugin in Figma follow these steps:

1. In Figma, click on the Main menu dropdown icon in the top right corner.
2. Select Plugins → Manage plugins...
3. A window appears where you can search for plugins.
4. Type "PCA Engineering Tool".
5. Click on the "PCA Engineering Tool" plugin.
6. The PCA Engineering Tool plugin is now running.

## 4.3 How to use the plugin

Follow these steps:

1. Select the frame layer for your symbol and ensure all elements are in a group called "Design".
2. Make sure the plugin is running (see section 4.3) and choose the Export tab.
3. Click Create Export Layer — this generates a clean version named "Symbol".
4. If you see a message about "Export Layer Fill Rule", switch to the Fill Rule Editor tab:
5. The red areas indicate that something needs fixing. Click the red area to make it green. The color green indicates that it has a valid fill rule.
6. Click on the black outlines to change the path direction if needed.
7. Go back to the Export tab to preview the final symbol.
8. Click the button Export as SVG and choose where to save the SVG file.
9. Your file should now meet PCA's geometry-only and non-zero fill requirements for SVG files.

## 4.4 Verifying the exported file manually

- Open the SVG in a browser to confirm visual correctness.
- Optionally open in a text editor to ensure clean structure (<path>, <g> elements).
- The file is now ready for upload to the PCA Symbol Editor.