

3D CAD Export Guidelines for A1A Product Suite

To ensure the best performance and most accurate visuals within the **A1A Product Suite**, please follow the guidelines below when exporting your 3D CAD data.

These practices help minimize file size, reduce polygon count, and prevent scale or alignment issues inside the 3D Lift Plan (3DLP) environment.

1. Align Model Origin and Scale

Proper model alignment and units are essential for accurate placement and scale inside A1A applications.

- **Set the model origin (0,0,0)** near the **base and center** of the object or structure before exporting.

This ensures proper alignment when imported into 3DLP.

- **Verify units before export** — all A1A applications operate in **meters**.

Please export your model using **meters** as the base unit.

Mismatched units (e.g., inches or millimeters) can cause objects to import at the wrong scale.

2. Include Only Outward-Facing Geometry

Any **internal geometry** will not be visible in 3DLP and only adds unnecessary file size and complexity.

Before exporting, remove or turn off the following:

- **Building interiors** (e.g., interior walls or rooms inside structures)
- **Internal mechanical components** (e.g., engines or enclosed machinery)
- **Internal piping and wiring** (e.g., ducting or electrical systems inside machines)
- **Small non-essential details** (e.g., bolts, rivets, fasteners, threads)
- **Non-relevant objects** (e.g., markers, notes, labels, lights, cameras, or 2D construction lines)

Keeping only the **outer shell** of each model provides the best performance and visual clarity.

3. Simplify Mesh Resolution (Tessellation Settings)

When exporting to 3D formats such as `.stp`, `.stl`, `.obj`, or `.dwg`, reduce tessellation quality to lower polygon count.

- Use **medium** or **coarse** quality for export — fine detail is often unnecessary for visualization.
- Look for export parameters such as “**facet deviation**,” “**chord height**,” or “**surface tolerance**.”

Higher tolerance (larger deviation) = fewer polygons = smaller, faster files.

4. Remove Unused Layers and Reference Geometry

- Turn off or delete **hidden layers**, **construction geometry**, and **reference blocks** before exporting.
 - Remove **dimensions**, **annotations**, **measurements**, and **2D drawing elements** that are not part of the visible 3D geometry.
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5. Use Simplified or Visual Representations

If your CAD software supports it, export from a **simplified configuration** or **display state** rather than a full mechanical model.

- **Inventor:** Use *Shrinkwrap* or *Simplify*.
- **SolidWorks:** Use *Defeature* or *Simplified Configuration*.
- **Creo/ProE:** Use *Simplified Representation*.
- **Revit:** Use *3D View Filter* or *Section Box* to limit visible elements.

This approach eliminates small internal parts and reduces processing time significantly.

6. Combine or Merge Small Components

Where possible:

- Merge small assemblies (e.g., bolts, weldments, or repeated fasteners) into single bodies before export.
 - Combining small meshes reduces draw calls and improves performance in 3DLP.
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7. Reduce Material and Texture Complexity

- Avoid high-resolution textures and complex material assignments.
- Use **simple color-based materials** — PBR or multi-layer materials provide no benefit in 3DLP.

- Keep material count to a minimum; too many materials slow down load and render times.
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8. Export Only What's Relevant

- For large sites or projects, export **only the portion needed** for the lift plan.
Example: export just the crane pad, lift object, and nearby structures — not the entire jobsite.
 - This helps ensure quick loading and smoother camera navigation.
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9. Run Cleanup and Optimization Tools Before Export

Most CAD software includes utilities for cleaning and optimizing models before export:

Software	Tools to Run Before Export
AutoCAD	PURGE , OVERKILL , and AUDIT
SolidWorks	Defeature Tool, Simplify Assembly
Inventor	Shrinkwrap, Simplify Environment
Revit	Section Box and 3D View Filter to isolate visible geometry

Running these cleanup tools removes redundant data and dramatically reduces export size.

10. Verify the Result

After export:

- Open your file in a neutral viewer (e.g., Autodesk Viewer, FreeCAD, or eDrawings) to confirm correct scale, alignment, and geometry visibility.
 - Check that there are no missing or inverted faces and that the model sits properly at ground level.
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Summary

Following these steps ensures that your 3D CAD data is:

- Properly **scaled and aligned**
- Free of **hidden or unnecessary geometry**
- **Optimized** for performance and smooth visualization

- Compatible with A1A Product Suite's expected **meter-based coordinate system**

By optimizing your exports, you'll experience **faster loading, smaller files, and smoother performance** inside the A1A Product Suite.