LWO Importer 1.70 - User Guide

LWO Importer makes it quick and easy to import Lightwave mesh files directly into Unity without having to first convert them to another format (eg **.fbx**) each time.

This means you can share the exact same LWO files you use in Lightwave with your Unity project, and this provides some serious advantages:
- You can immediately see any changes you make to your lightwave model in Unity. Simply save the mesh in Lightwave, switch to Unity and the mesh will be reimported automatically with the new changes.
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- Layer names, hierarchy and pivot-points are retained. The model will be organised in Unity exactly as it is in Lightwave.
- Duplication of files means more to manage and more that can go wrong. Simpler is better!
- .LWO files are light-weight binary files and this means your Unity project takes less space and becomes more portable.

Usage Couldn't Be Easier
Import the LWOImporter package into your Unity project. Thats it! Unity should now be able to import any .lwo files in your Unity project.

Feature Details
- Supports .**LWO** files created in Lightwave from version 6.0 up to Lightwave 2019 (**LWO2** and **LWO3** files).
- Imports Triangles, Quads and NGons, which means there is no need to convert your polygons to triangles first in Lightwave. The Delaunay triangulation algorithm that LWO Importer uses means that in many cases, the triangles it creates are more optimal than Lightwave's own Triple command.
- Supports NGon polygon geometry with multiple holes, just as Lightwave does.
- Imports Subdivision surfaces as Catmull-Clarke surfaces, with an option for the number of iterations to use. Also supports all subdivision texture interpolation types except for *Across discontinuous edges*.
- Subpatch Weight maps are supported, allowing you to define how smooth/hard Subpatched vertices should be. Works for both Subpatch and Catmull-Clarke surfaces.
- Supports surface smoothing angles to enable you to quickly create hard edged objects.
- Converts Standard and Principled BSDF Lightwave Materials to approximately equivalent Unity materials. Support for basic node-based materials that use the following node types: Image, Scalar, Color Layer, NormalMap.
- Automatic detection of LDR / HDR / URP projects and generation of appropriate materials to match the render pipeline.
- Provides ability to remap the imported materials to pre-existing editable materials in your Unity project.
- Layer hierarchy is imported and retained, along with the layer names and pivot positions. Each layer becomes a GameObject.
- Hidden layers are imported with the MeshRenderer component disabled. If you want the hidden layer to be visible in Unity simply enable the MeshRenderer component.
- Morph Targets are supported and imported as BlendShapes, with a default weighting of 1.0.
- Vertex Weight maps are supported, and work in combination with **LWS Importer** to provide a complete boned animation solution.
- Vertex Color Maps are supported and a simple example shader is provided to enable you to see them.
- Smoothing Groups (LW2019 feature) are supported, allowing you to define hard edges within your models

Limitations
- One and two point polygons are ignored.
- Spline Curves are not supported and are ignored.
- Lightwave Subpatch surfaces are converted as Catmull-Clarke surfaces. However the texture mapping options actually work for the Catmull-Clarke algorithm in LWO Importer. In Lightwave (as of v2019.03) these are broken!
- Subdivision texture interpolation mode *Across discontinuous edges* is not supported. It will use *Subpatch* instead.
- Complicated node-based materials may not import correctly without some tweaking.

• If the texture file exists in the Unity project that it will be assigned to the material. The one caveat to this is if you have multiple textures that use the same name in different places throughout your project. In this case, it is important that the textures paths in Lightwave use a relative mapping, with the root defined as the Content Directory, and that this should remain unchanged in Unity, eg:

```
<Assets>
       <Content Folder>
               objects/
                       mesh.lwo
               images/
                       texture.png
```

If there is any ambiguity between which texture to use, a warning will be displayed in the Log.

• Vertex Color Maps applied to a specific surface using a Vertex Color Node are not supported. When creating a new Vertex Color Map in Lightwave, in the dialog box ensure that *Apply To Surface (none)* is selected.

• NGons with duplicate vertices will likely cause the triangulation algorithm to fail. When this happens a warning will be output in the Log. To fix this, select the offending polygon in Lightwave and use Merge Points (Automatic).

• Importing multiple Vertex Texture Maps (UV Maps) is not supported. If LWO Importer finds a layer with more than a single UV Map it will use the first one found, and give a warning in the Log. However it is possible to generate a secondary uv map automatically (see **Mesh**).

• Texture mapping other than UV Mapping (eg Projection Mapping) is not supported. UV Mapping must be used in order for textures to display correctly.

Materials

Lightwave and Unity handle materials differently, one being 3D rendering/animation software and the other a game engine, therefore the conversion of Lightwave Materials to Unity Materials is approximate. However many of the material attributes are similar. Principled BSDF materials from Lightwave will be converted to Unity's Standard Shader (Autodesk Interactive), and Lightwave Standard Materials will be converted to Unity's Standard Shader (Specular setup).

Editor Options

Mesh

Generate Tangents (Default Off) - If you want to apply a normal map to the material of the mesh, you should enable this.

Import BlendShapes (Default On) - Any BlendShapes are imported by default but if you don't require them you can uncheck this.

Catmull-Clarke Iterations. If your model contains any subdivision surfaces then they will be converted to polygons using a Catmull-Clarke subdivision algorithm. This slider specifies the number of iterations to use when creating the mesh, ranging from 0 to 4. 0 will not subdivide the mesh at all. An element of caution is required here as ramping the slider up to 4 may result in very expensive meshes.

Index Format
16 bit (Default) will cause the generated Mesh to be split into multiple SubMeshes with no greater than 65,535 vertices. However this will ensure compatibility with a wider range of target hardware.
32 bit means the vertex count of a single mesh can be as high as 4,294,967,295. However, this takes more memory and is not guaranteed to work on all target hardware.

Generate Lightmap UVs (Default Off) - Automatically creates an unwrapped secondary uv map for use with baked shadows and lighting.

Generate Scene Hierarchy Data (Default On) - Creates and attaches a LWOHierarchy component to the resulting root level game object. This is used by LWS Importer in order to recreate the scene hierarchy for this object, as well as any weight map data associated with Bones. If this object is not part of a scene or LWS Importer is not being used, this can be disabled.

Normals
Normal Generation Method:
1. Weighted Average (Default). A commonly used technique for generating normals, where the relative sizes of the polygons are taken into account. Larger polygons tend to influence the normal direction more than smaller polygons.
2. Lightwave Style. This mimics Lightwaves normal generation algorithm, which simply uses the cross product between the first and last edges of each polygon.

Smooth Over Varying Surfaces (Default Off) - Lightwave defaults to hard edges between different surfaces in the same mesh. LWOImporter gives you the option to override this behaviour and use smooth normals across polygons that share vertices, even if they have different materials.

Use Smoothing Angles (Default On) - Smoothing angles in materials will determine where hard edges in the mesh will appear. With this option unchecked, smoothing angles are ignored and the mesh will always be smoothed across shared points.

Log Output
Processing Time - (Default Off) shows how many milliseconds it took to import and process the file. There are 1000 milliseconds in a second.

Extra Warning Options: provides a drop down list of options - select as many or as few as you want.
• *Insufficient Vertices in Polygons* - only polygons with 3 or more vertices are supported. 1 and 2 point polygons will be ignored but you might want to strip them out of your model.
• *Degenerate Polygons* - Polygons that have 2 or more vertices in the same position are regarded as degenerate as it may impact normal and smoothing generation.
• *Bad Texture Paths* - if LWO Importer has been unable to resolve any texture file paths than it will display a warning for each missing texture. See Limitations - Textures.

Materials
Texture Overrides Base Value (Default On) - In Lightwave, applying a texture to a channel means the channels base color or value is ignored. If you uncheck this box, the texture will be multiplied with the base color/value of the material, and while this means it will not look exactly the same as it does in Lightwave, in can be useful.

Remap Matching Materials Names
Checking this box will add any materials that already exist in the Unity project to the Remapped Materials list, so long as their names match. ie: a .lwo file with a material called 'Bricks' will have it's imported material replaced for a material that already exists in the Unity project so long as the name of the material is 'Bricks'. If there are multiple materials with the same name in the Unity project, the first one will be used.
Materials that are automatically remapped in this way are un-editable in the Remapped Materials list. To remove them, uncheck this box.

Remapped Materials
This section enables you to swap out the un-editable imported materials for editable ones that you have created separately in your Unity Project. It is possible to select the imported materials in your Unity Project window from under your imported .lwo file and duplicate them (CMD/Ctrl D). This will create new materials in Unity which you can use as a basis for your remapped materials.

Material remapping is dynamic*, which means if there are no materials to remap, this list will be empty. To add a remap slot tap the '+' button. Available materials to remap will show in a drop-down list. Choose the material you wish to remap and then drag a material onto the Material slot next to it. To delete a remapping slot tap the '-' button next to it.

* Meshes imported using versions of LWO Importer earlier than v1.4 will show a button labelled 'Reimport asset to enable'. Once reimported, any previously remapped materials will be automatically converted to use the new system.

Materials are matched for remapping based on their name. This means that adding and deleting materials in Lightwave of a previously imported model should have no consequences. However, when you rename a material in Lightwave then the remapping in LWOImporter will be lost. In this case, the remapped material name will display in red and show as 'Missing' and you will need to select the new name for the material in the drop-down list.

Please email feature requests and bugs to: *info@virtualescapes.no*
If you have a .lwo file that you think **LWO Importer** should be able to import but it is not doing, send me an email, ideally with the .lwo file attached and I'll do my best to debug the problem and get it working!