

Rendering within Manufacturing with Autodesk

Dave Wilkinson

Snr Technical Sales Specialist – Autodesk D&M





About the speaker

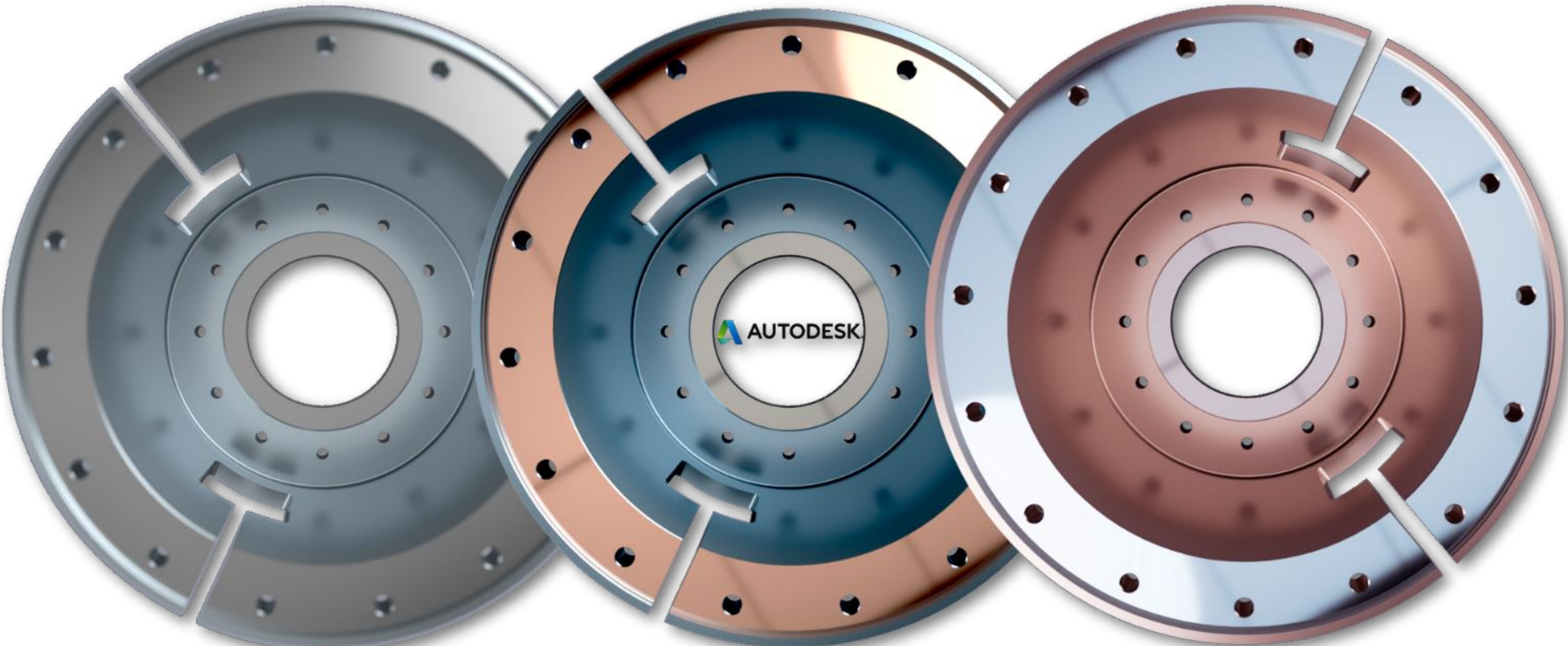
Dave Wilkinson

I joined Autodesk in 2015 following 10 years working in the reseller channel primarily within manufacturing. Prior to this I worked within Manufacturing as a machinist and CAD manager

I have a wide range of interests outside of the CAD world usually involving outdoor pursuits from expedition photography to building canoes, campervans and pretty much anything else involving being outdoors. Cycling to Paris from England & hammock camping in the arctic circle during winter, both which seemed a good idea at the time.....

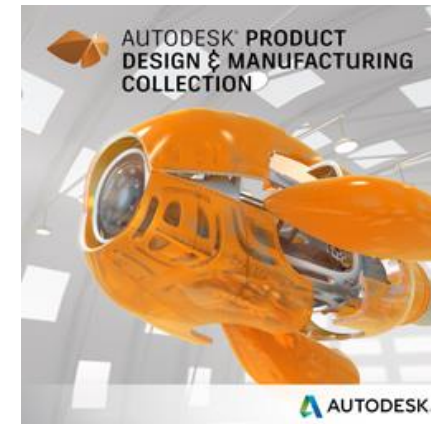
Making pretty pictures.... Or useful images

This class will give an overview of Autodesk's rendering and visualization capabilities from a manufacturing perspective.



What are we going to cover

Design Visualisation

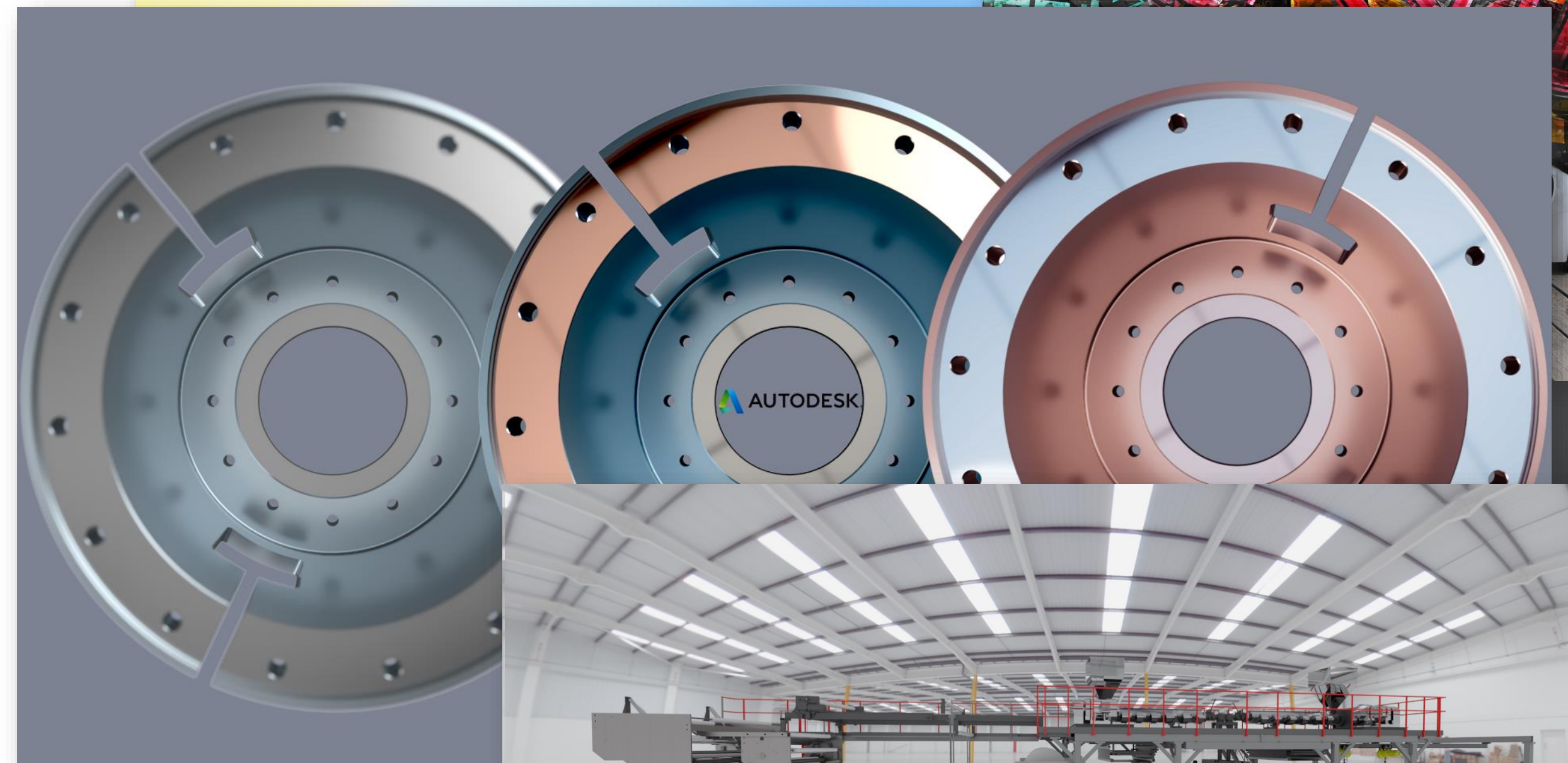
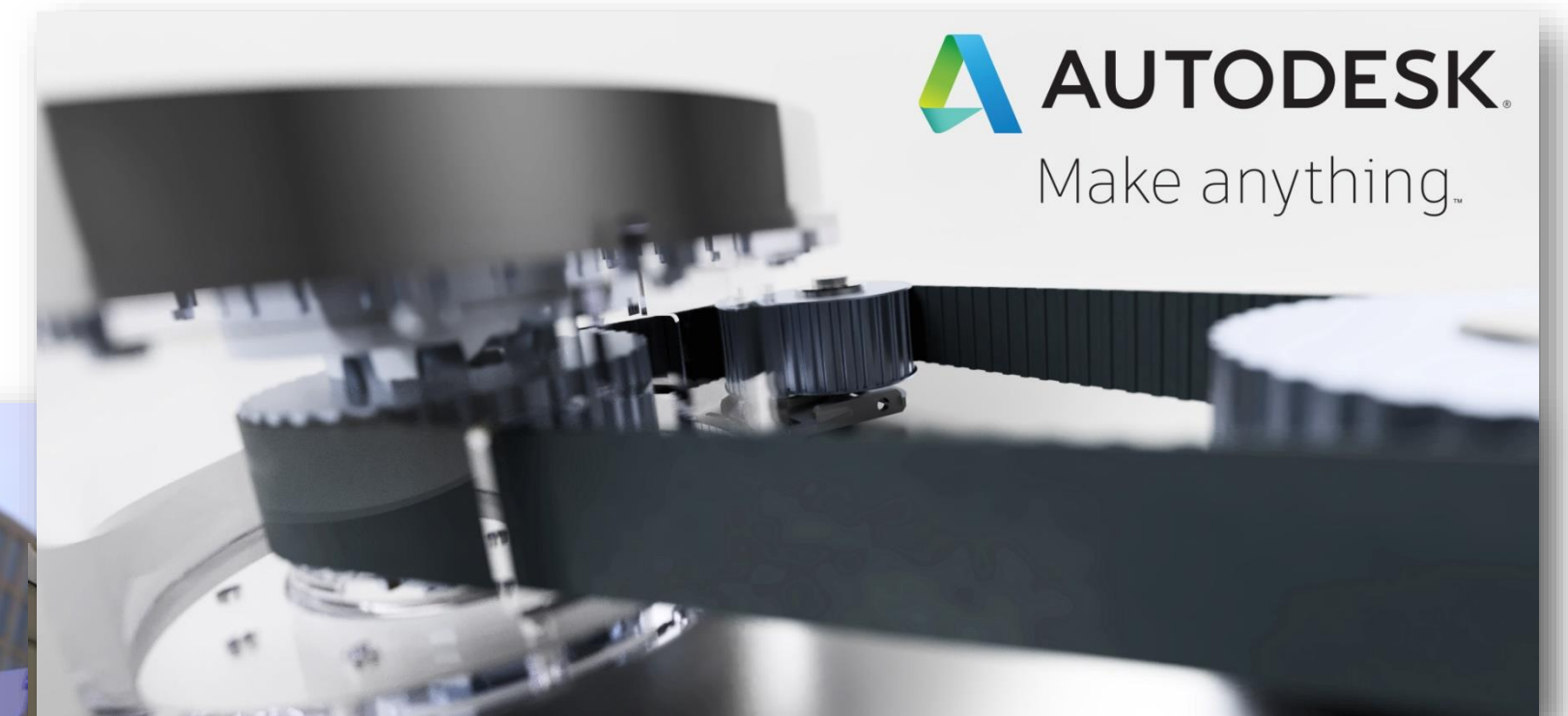


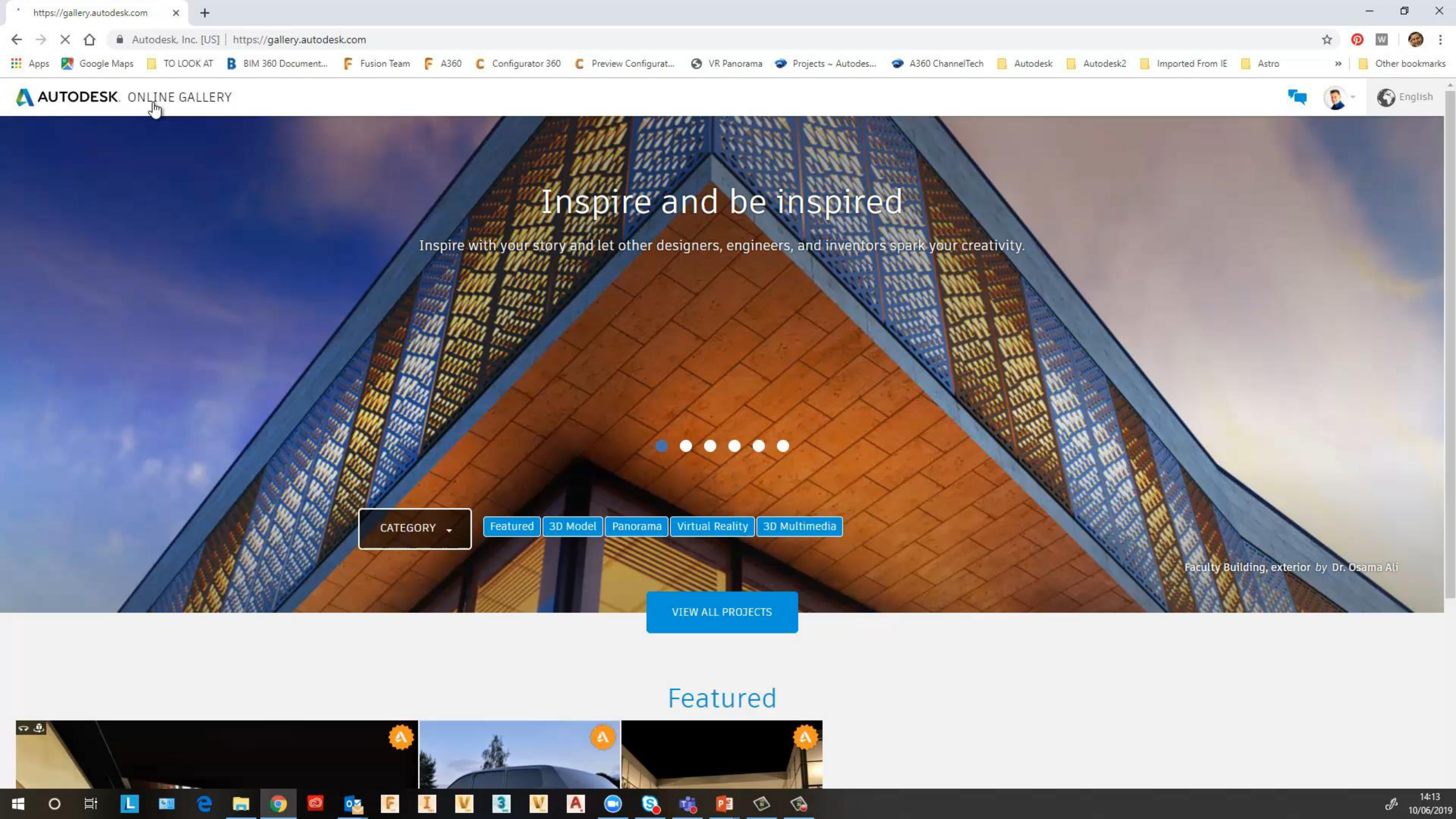
Product Visualisation

Immersive Design Review

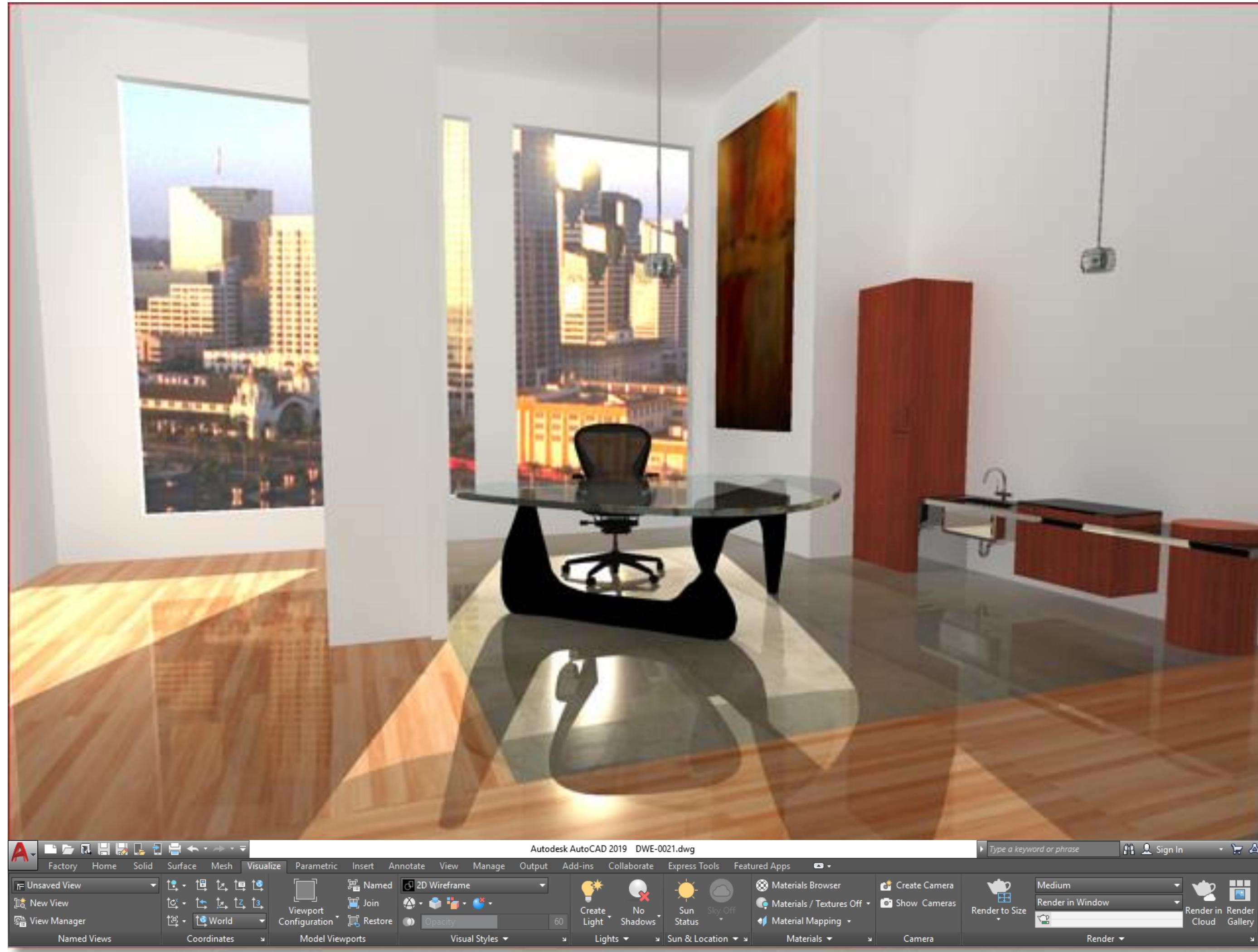
Cloud Rendering

AUTODESK.
Make anything.





 AutoCAD



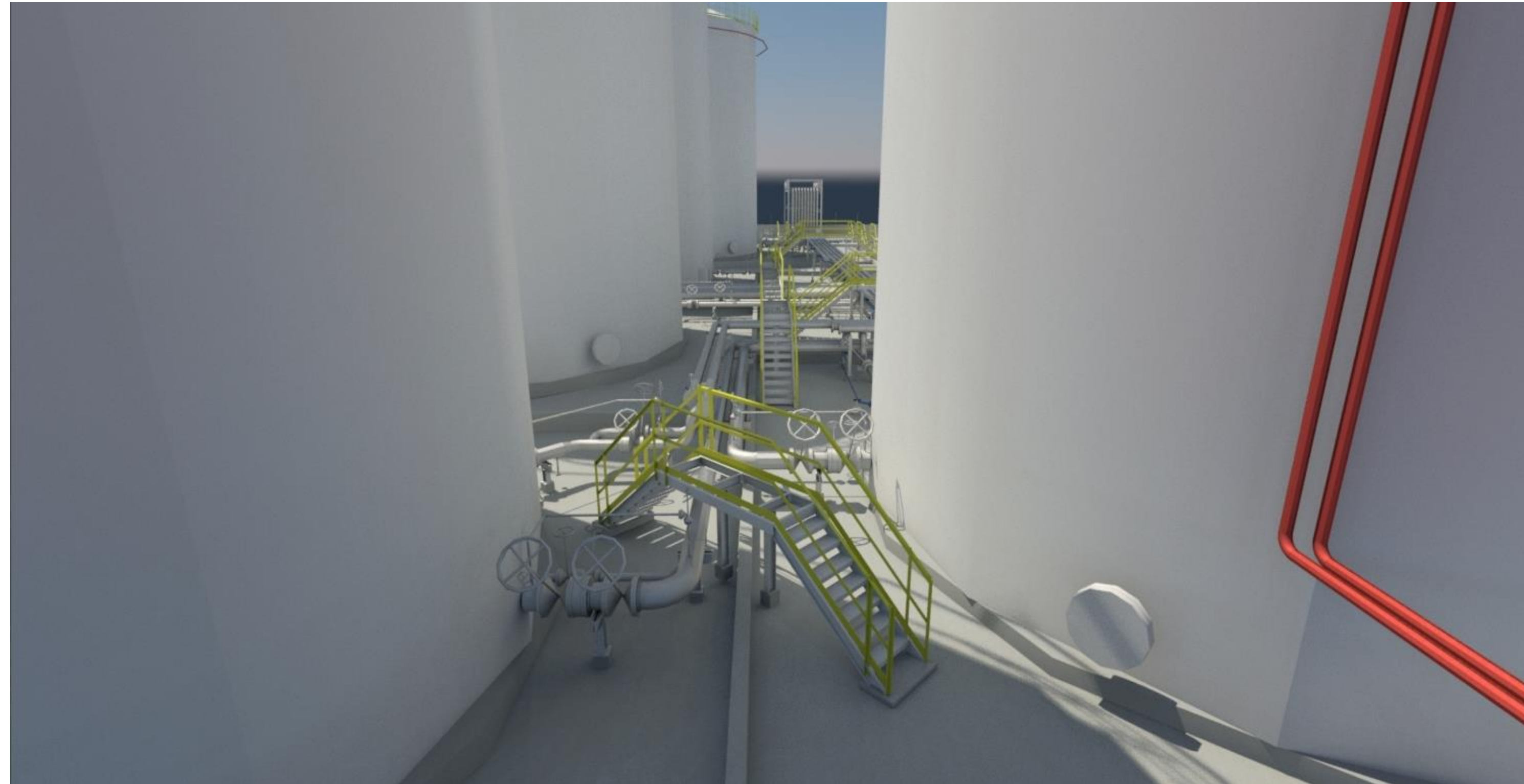
Comprehensive 3D Environment

- Modelling
- Materials & Textures
- Lighting
- Sun & Location lighting
- Camera setups
- Cloud Rendering



Creating imagery from modelling data

Native 3D modellers based on the AutoCAD platform such as Plant 3D. Having render capability with Autocad allows good quality imagery.





Creative output

Using multiple renders and “blending” separate images to produce stylised imagery





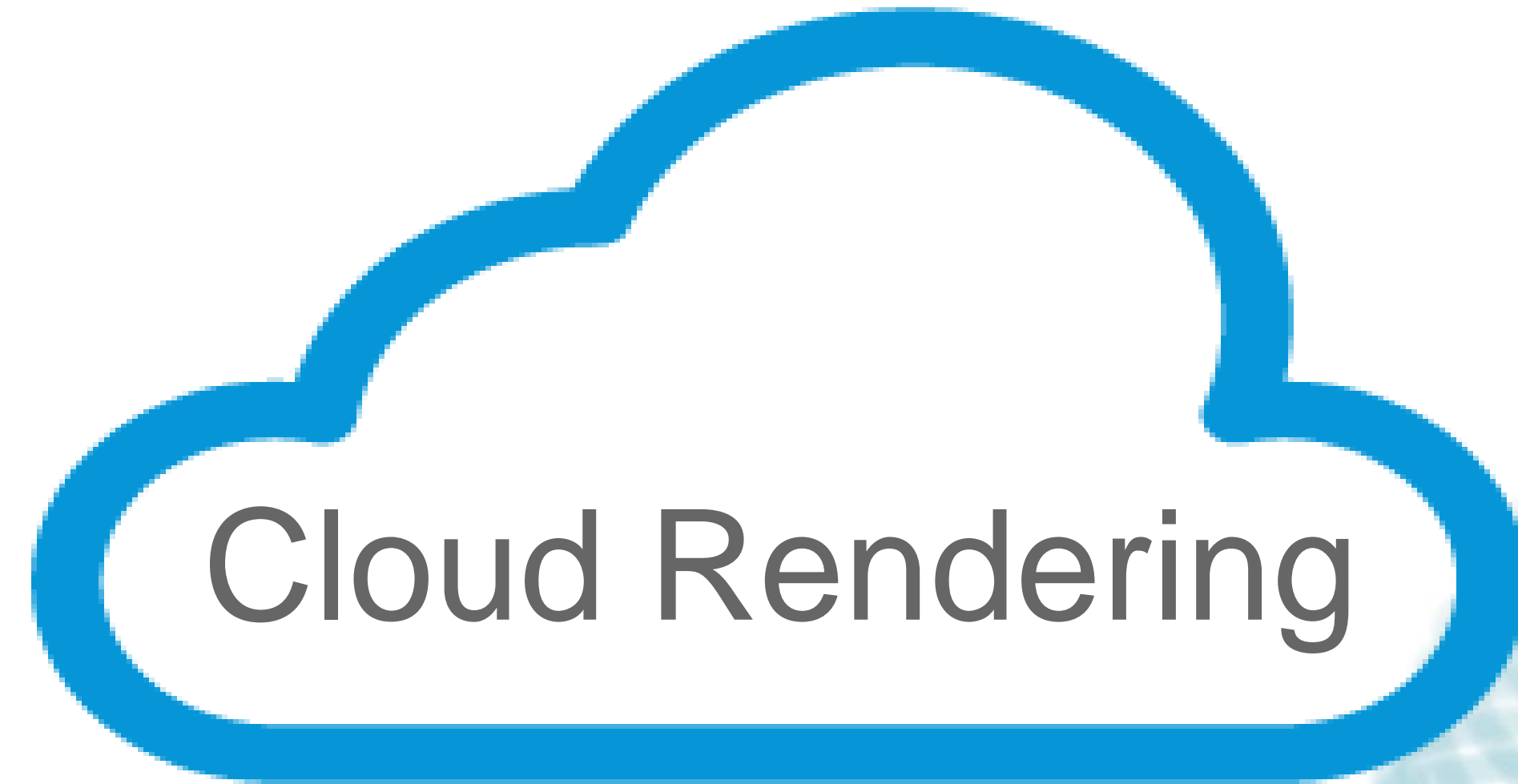
Widely used for 3D modelling in AEC

Has and still is used widely for model creation within AEC.
Rendering is possible but models are widely used within 3DS Max



Rendering of unbuilt Mr. and Mrs. E.A. Smith house designed by Frank Lloyd Wright. Courtesy of David Romero





Cloud Rendering



Cloud Rendering ☁



Photorealistic rendering
Produce stunning, high-quality renderings from designs and models with cloud rendering.

Cloud Rendering ☁

Accessible anytime, anywhere
Submit renders to the cloud
directly through your product and
access them online anytime in the
Gallery.



Image courtesy of Stanislav Stanislavov

Cloud Rendering ☁

Accessible anytime, anywhere
Submit renders to the cloud
directly through your product and
access them online anytime in the
Gallery.



Image courtesy of Stanislav Stanislavov

Cloud Rendering ☁

Panoramas, solar studies, illuminance

Perform solar study renderings, simulate illuminance, and navigate through 360-degree panoramas.

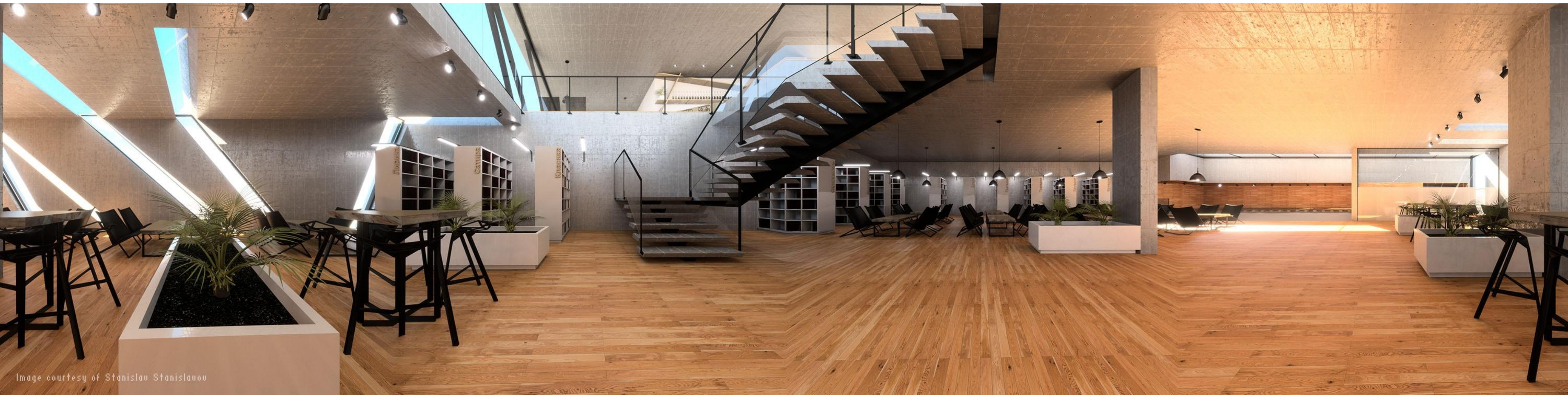


Image courtesy of Stanislav Stanislavov

Cloud Rendering ☁



Image courtesy of John Harris

Advanced materials

Physically based material library with high-resolution textures, additional controls, and dramatic quality improvements.

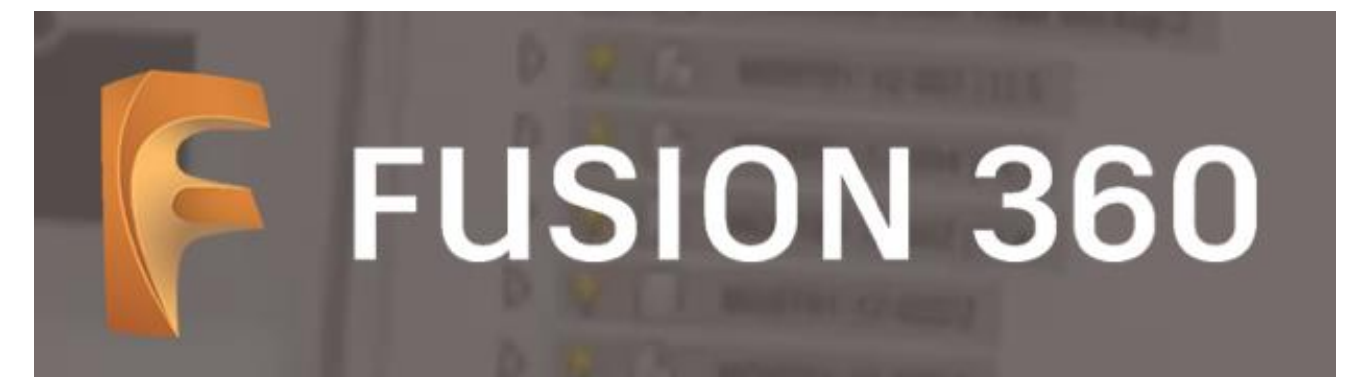
Cloud Rendering



**PRODUCT DESIGN &
MANUFACTURING COLLECTION**



**ARCHITECTURE, ENGINEERING &
CONSTRUCTION COLLECTION**



**MEDIA & ENTERTAINMENT
COLLECTION**





Ewald Egel

Subscription

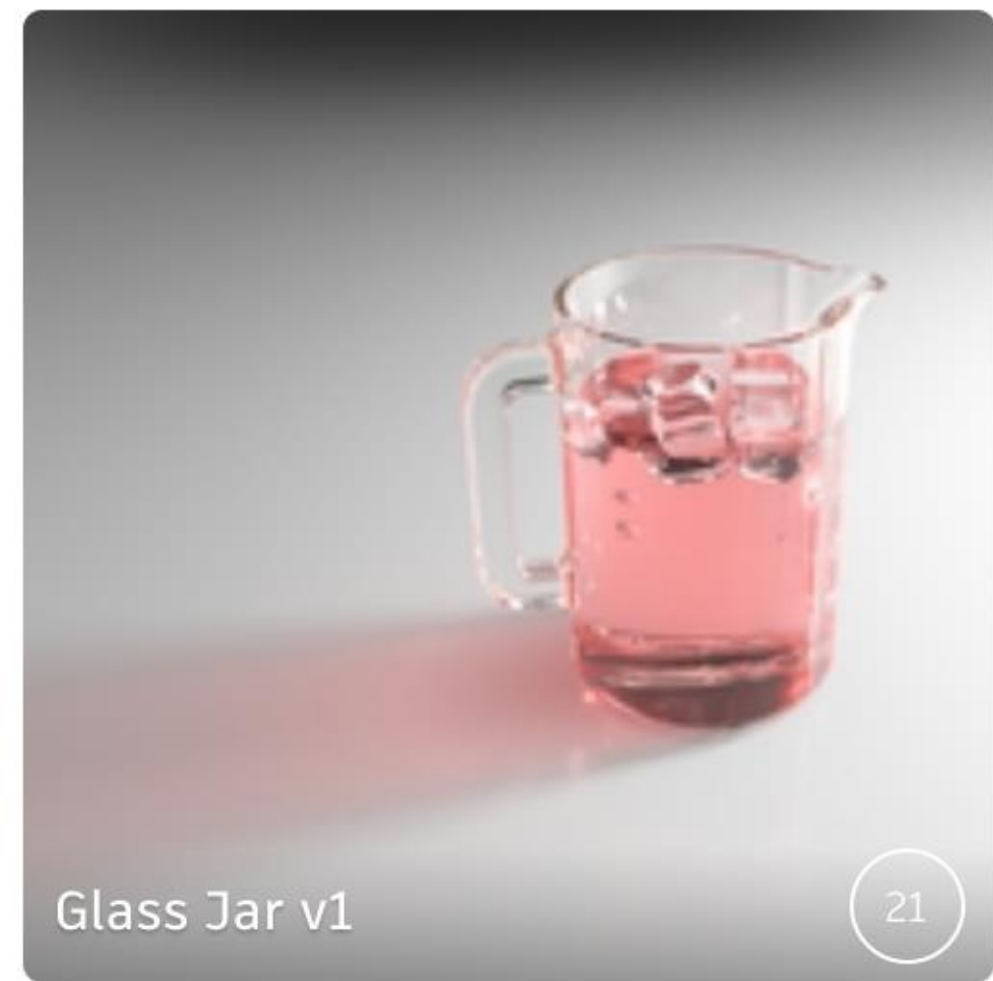
578

Projects

303444

Cloud credits

Search projects...



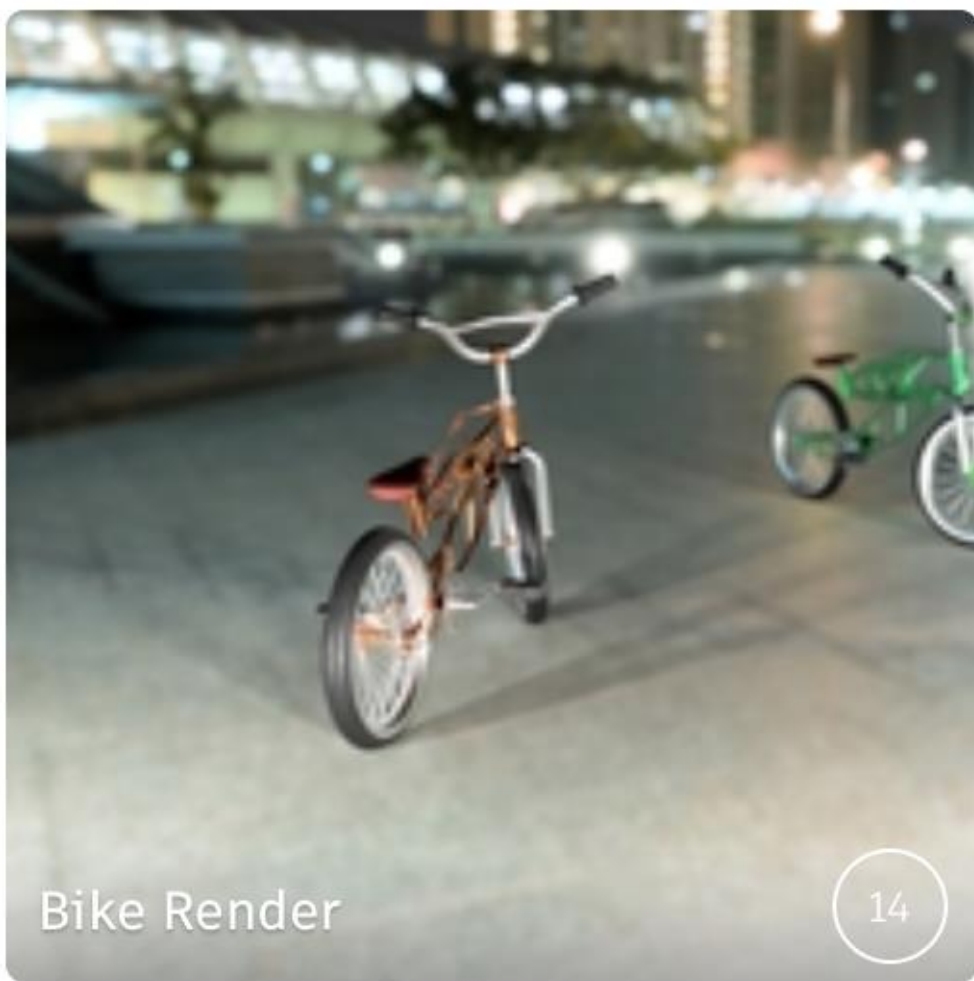
Glass Jar v1

21



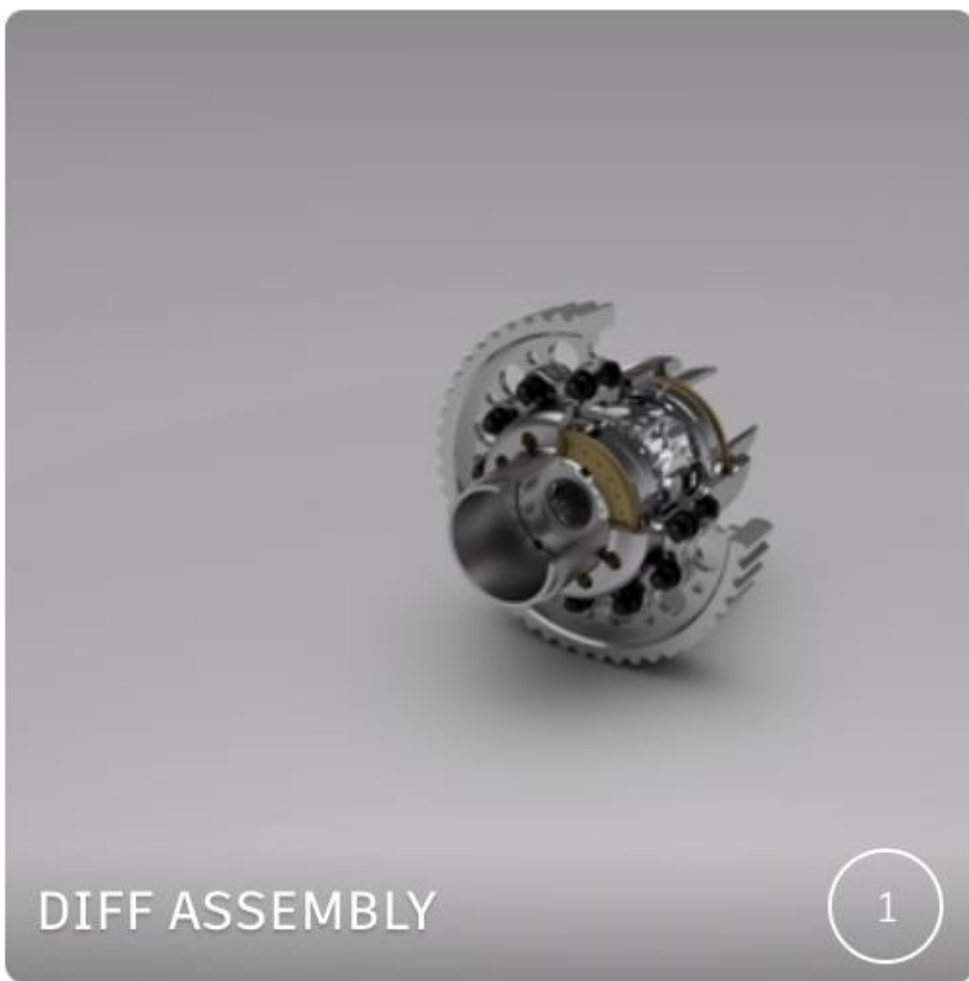
Assembly_Dielectric

1



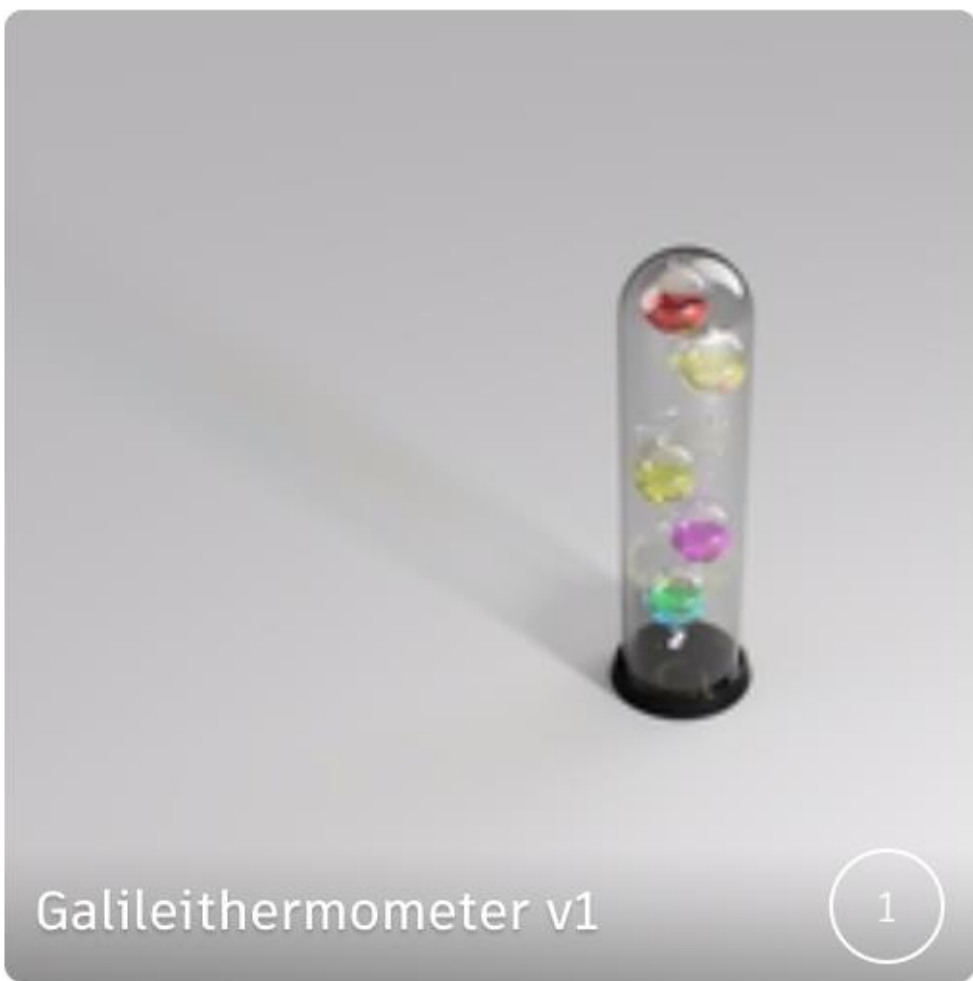
Bike Render

14



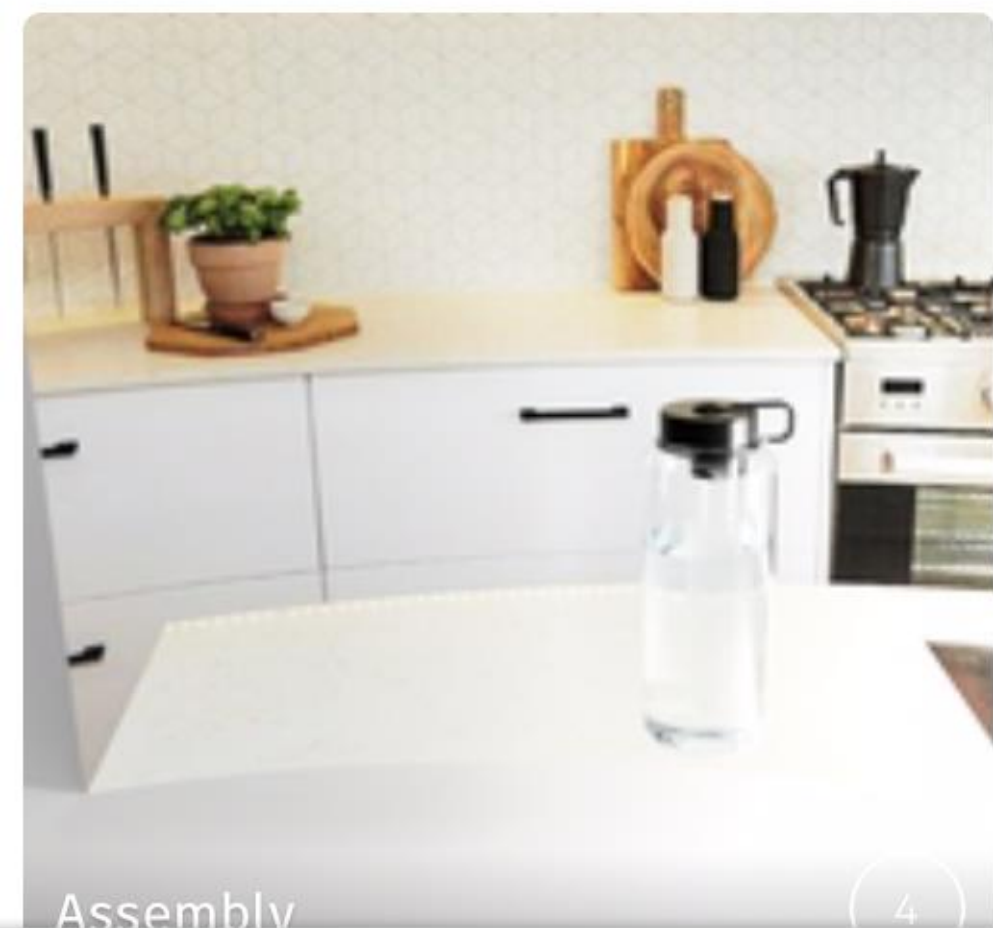
DIFF ASSEMBLY

1



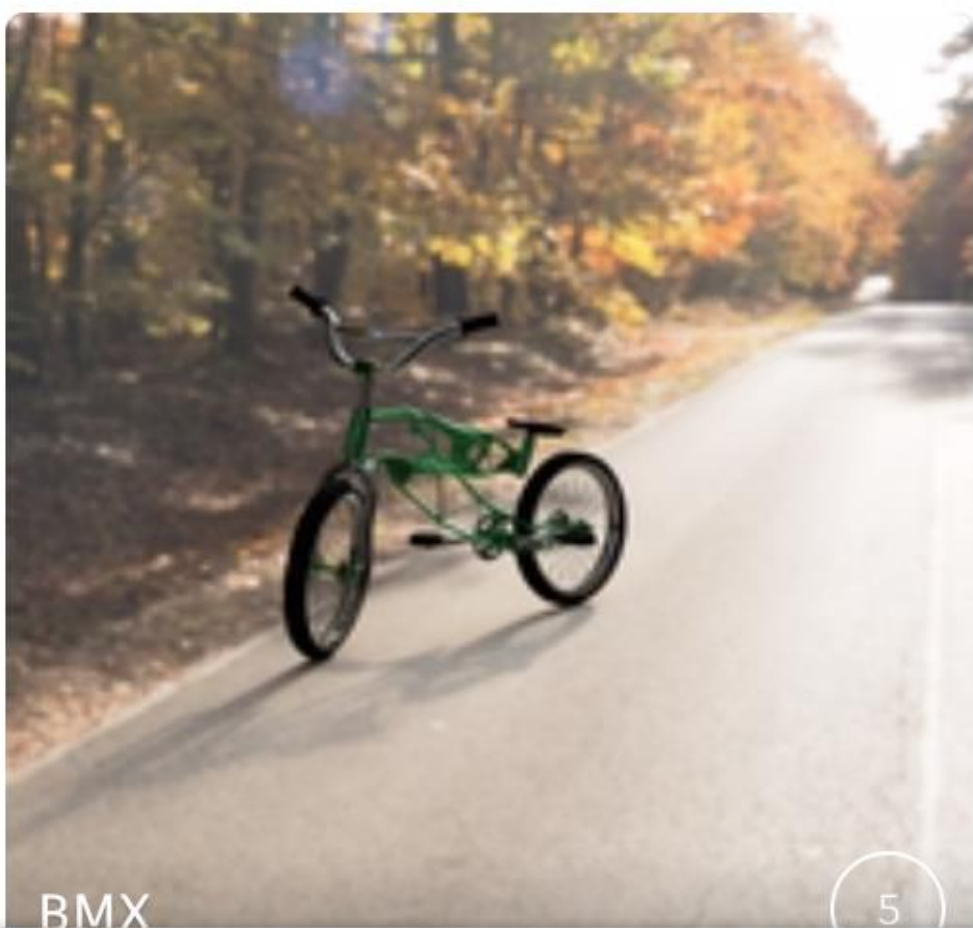
Galileithermometer v1

1



Assembly

4



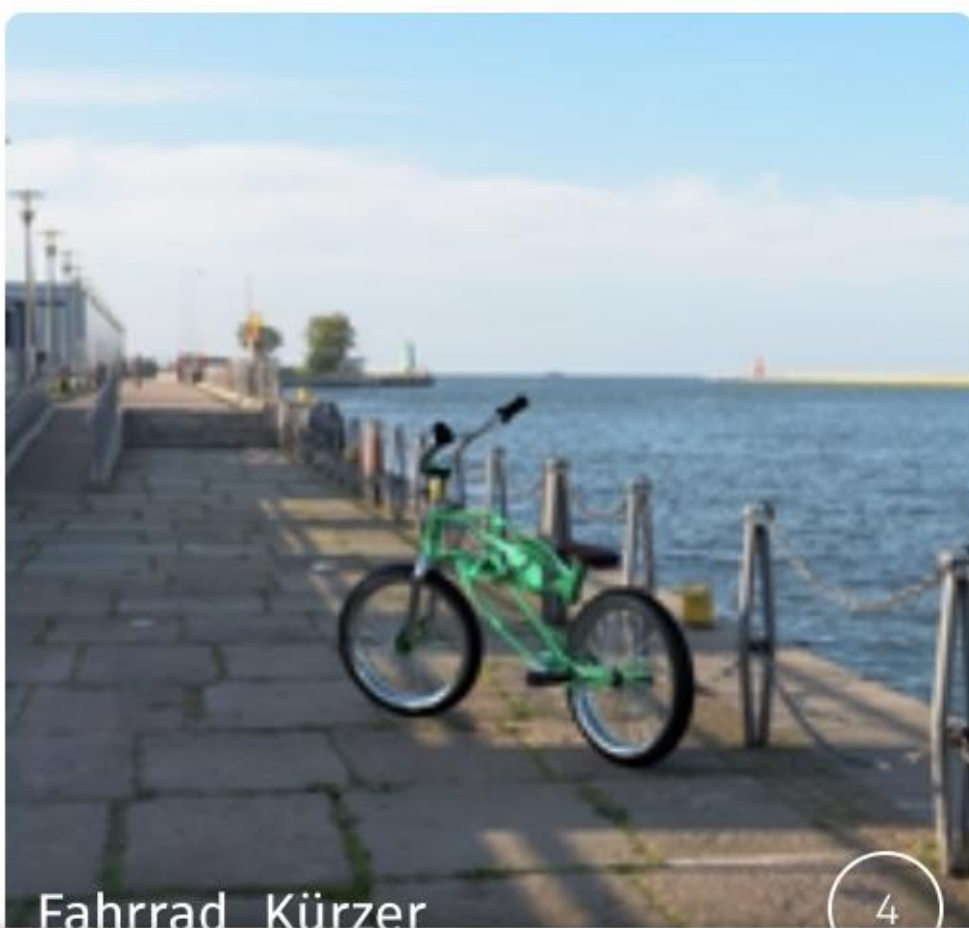
BMX

5



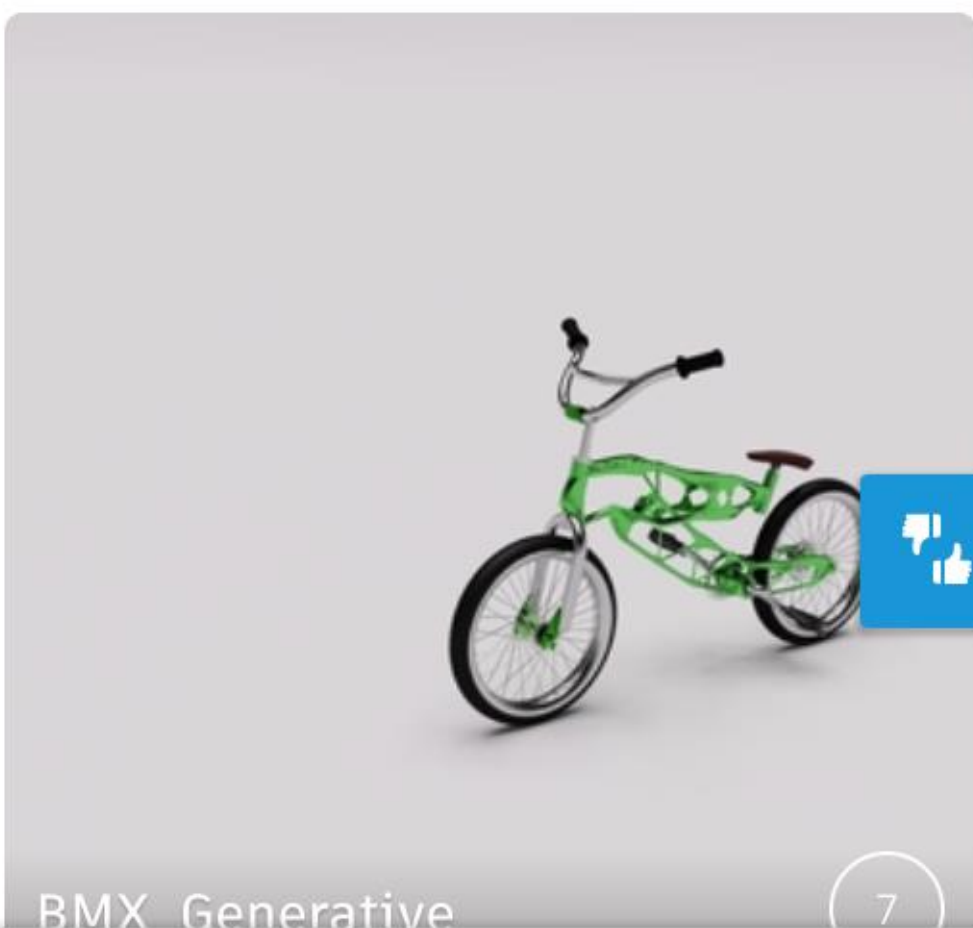
DIFF ASSEMBLY

2



Fahrrad Kürzer

4



BMX Generative

7

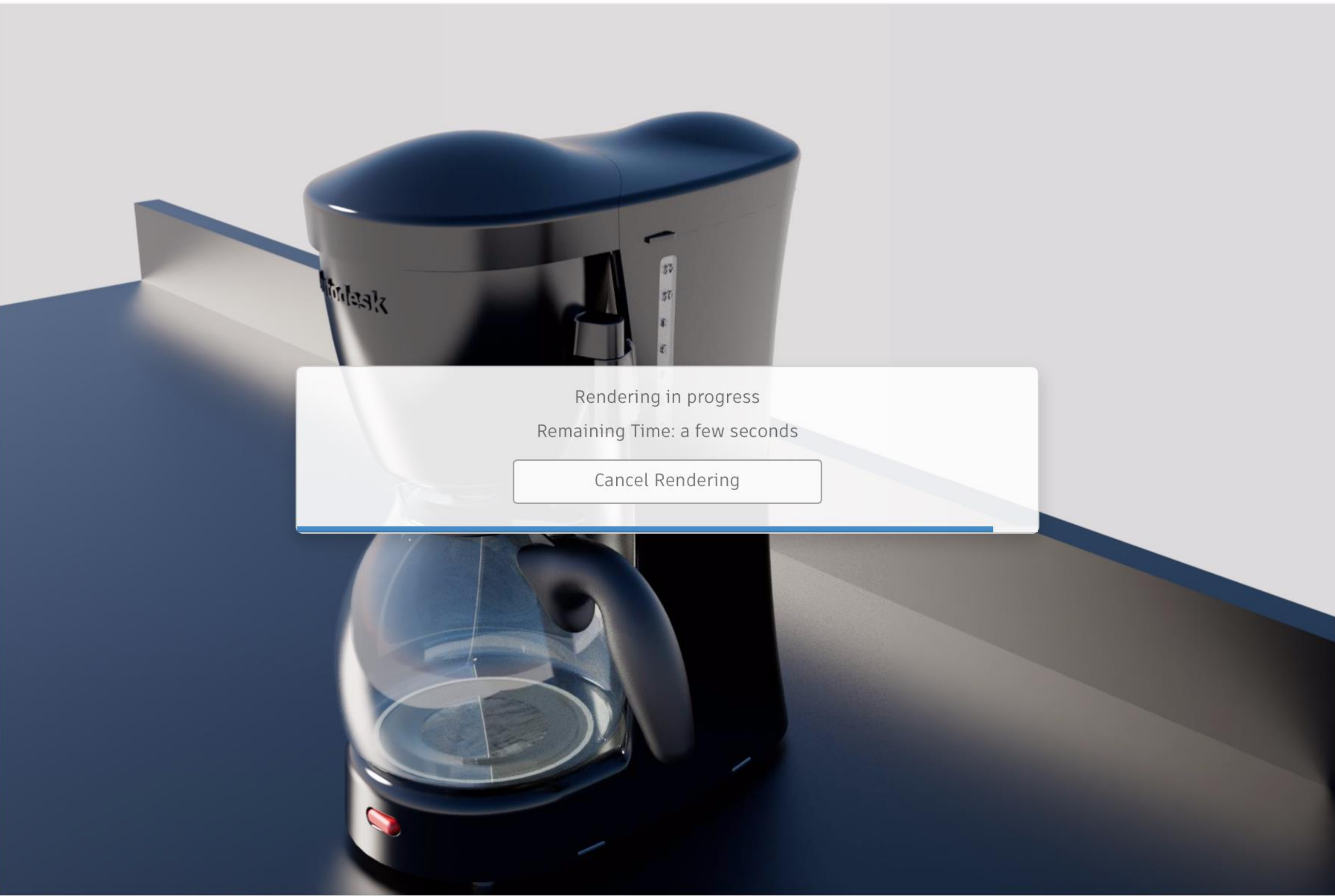
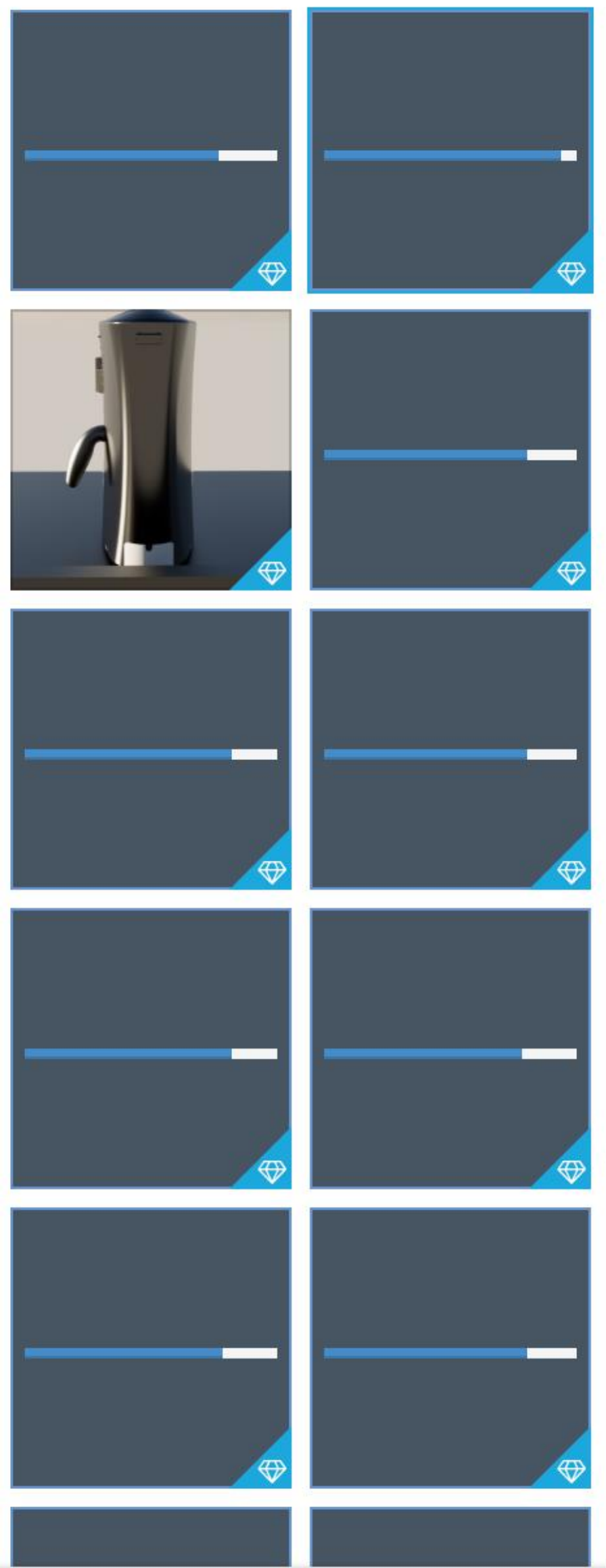




Latest Renderings (14/14) ▾

Rerender

Render as:

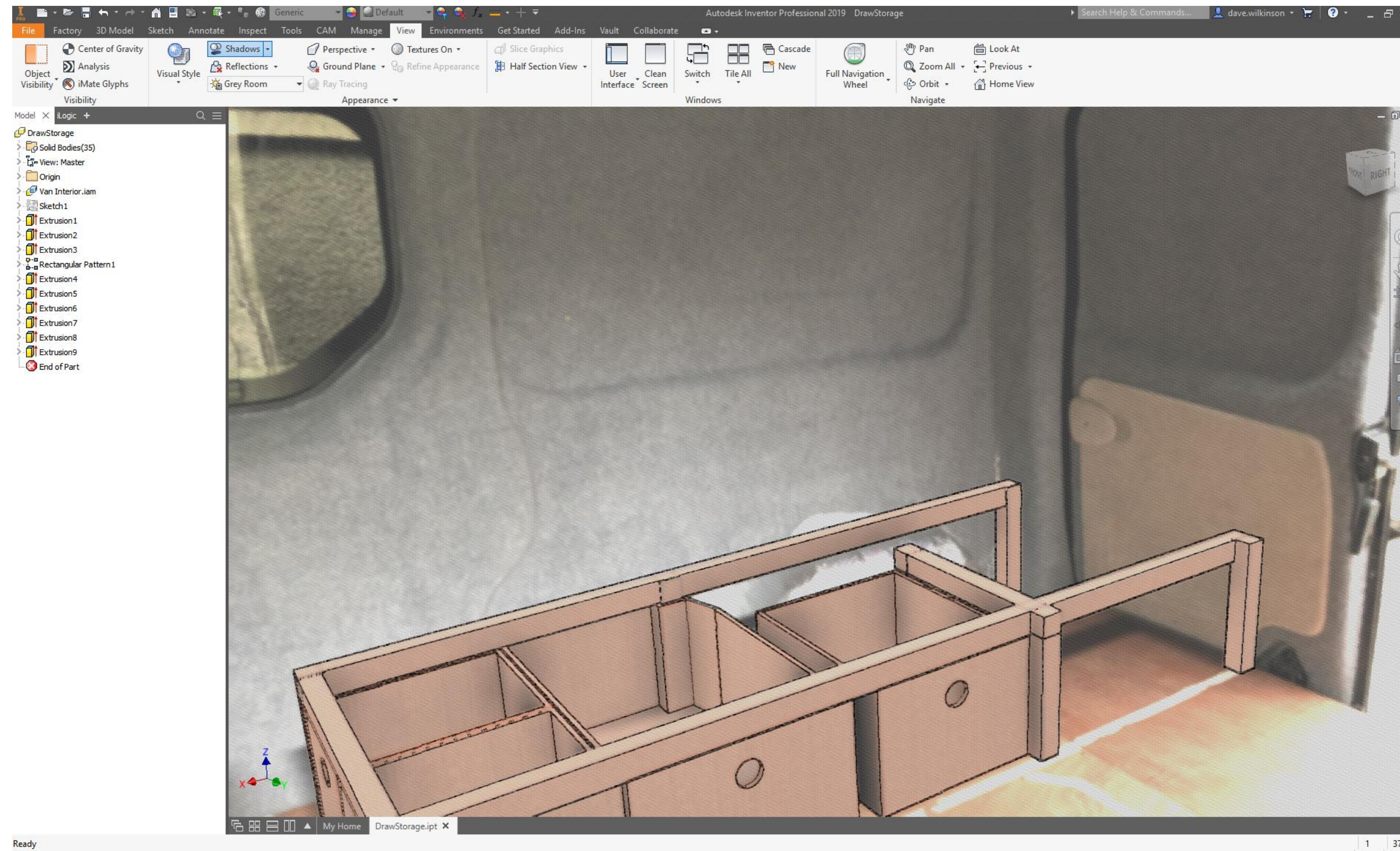


Rendering in progress
Remaining Time: a few seconds

Cancel Rendering



nventor Studio

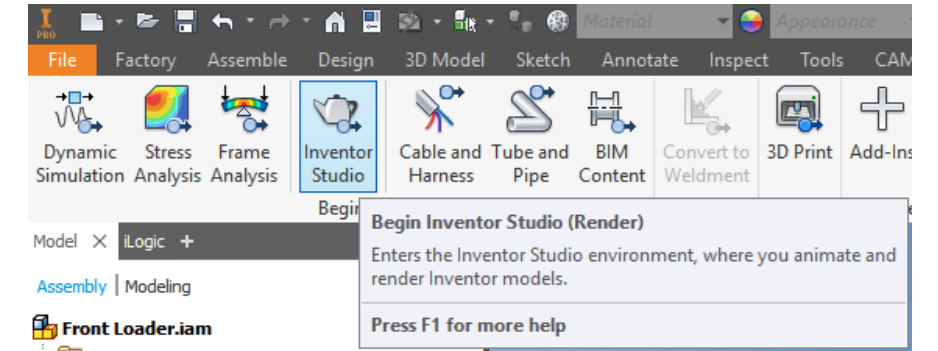


Its not just about Studio!
You can utilise the graphics window to produce some very good results quickly and easily

nventor Studio

Inventor Studio gives...

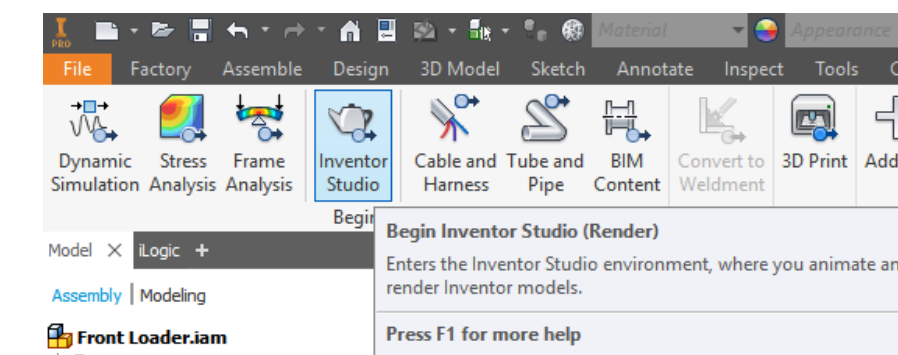
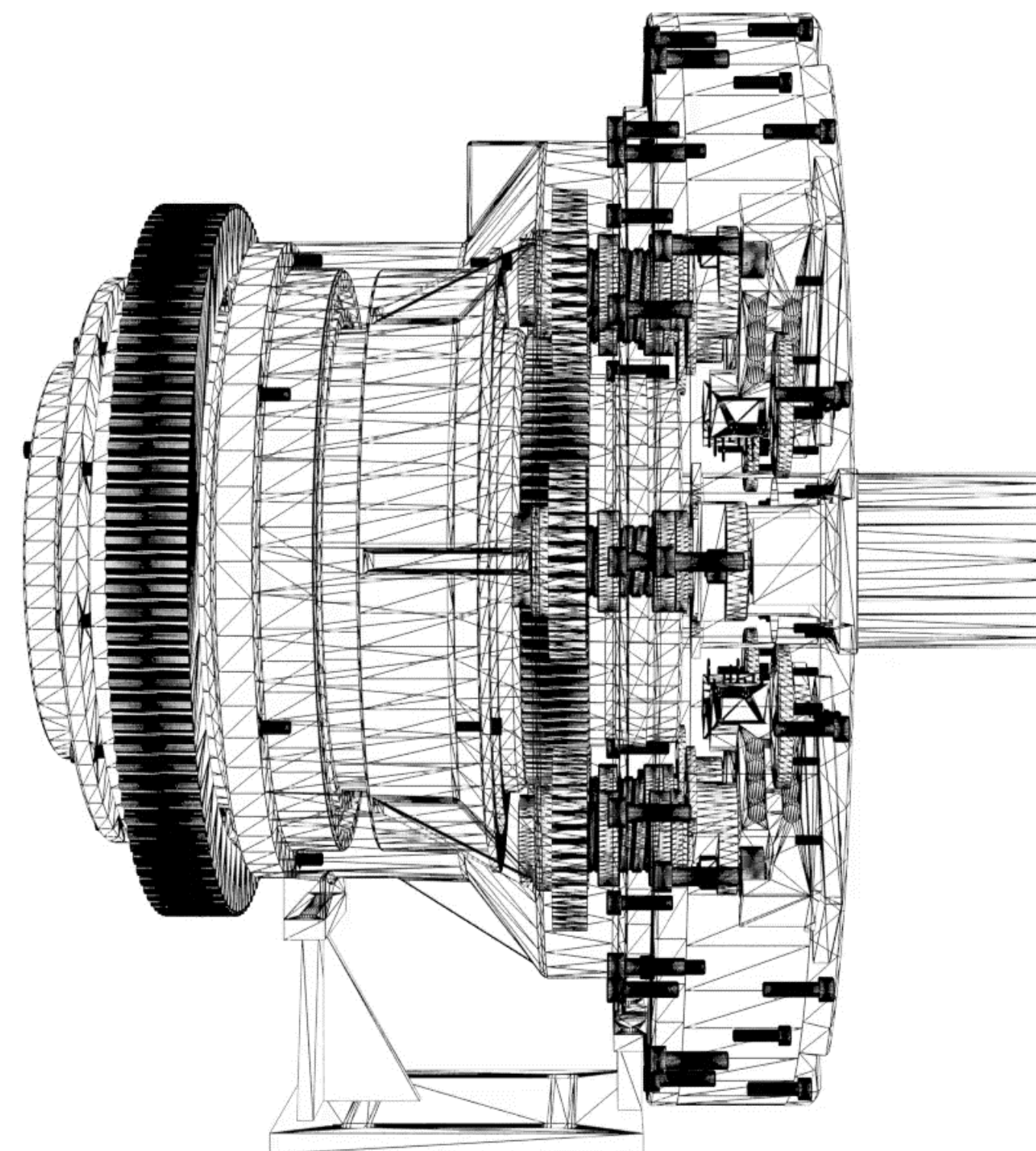
- Lighting setup (Scene and Local)
- Scene lighting & IBL
- Textures & Materials
- Cameras and paths
- Kinematics and animation
- Drive constraints
- Fading components



nventor Studio

Inventor Studio gives...

- Lighting setup (Scene and Local)
- Scene lighting & IBL
- Textures & Materials
- Cameras and paths
- Kinematics and animation
- Drive constraints
- Fading components





Inventor Studio

Inventor Studio gives...

- Lighting setup (Scene and Local)
- Scene lighting & IBL
- Textures & Materials
- Cameras and paths
- Kinematics and animation
- Drive constraints
- Fading components







Industry Standard...

Max is widely regarded as an industry standard for CGI.



Particularly within Architecture

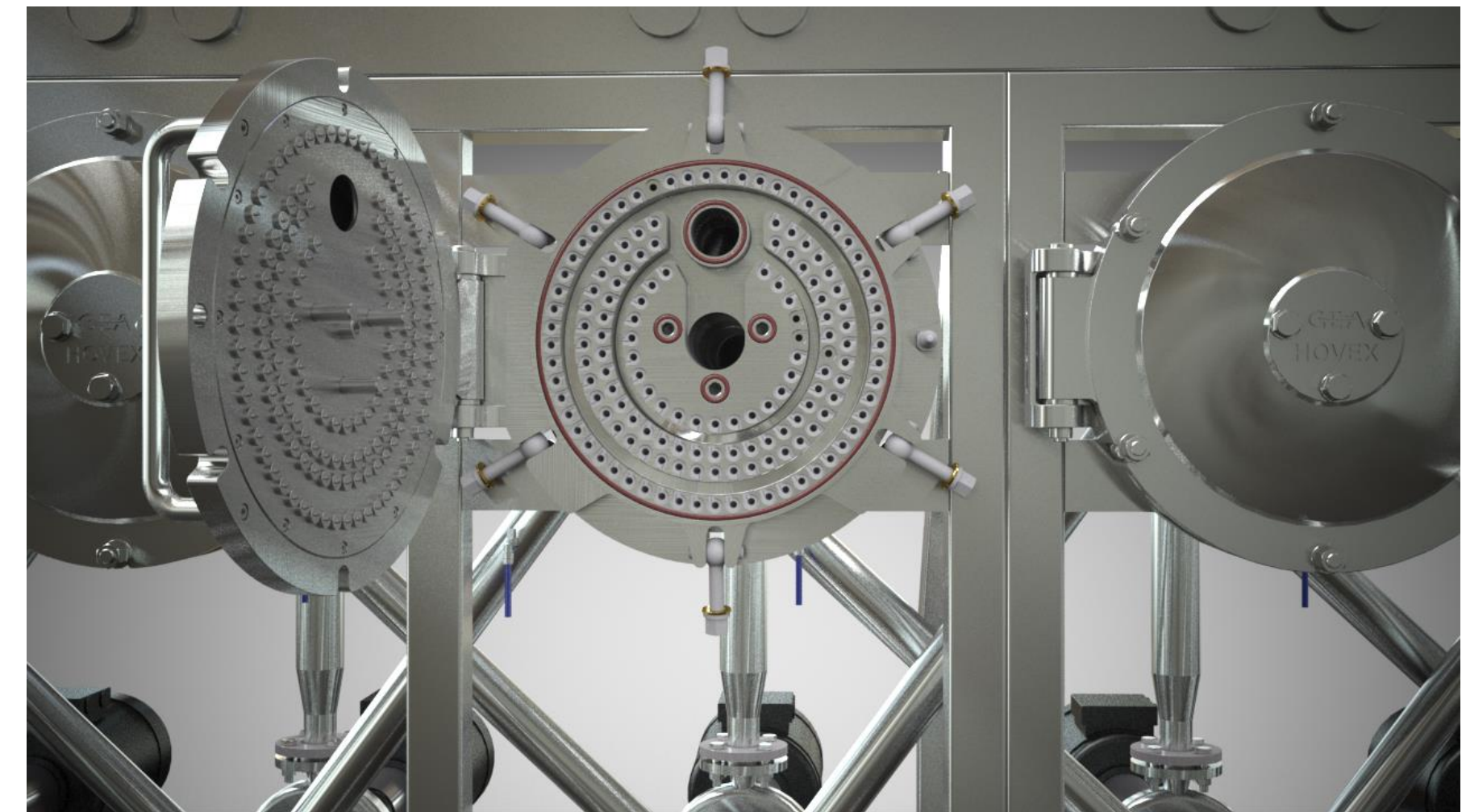
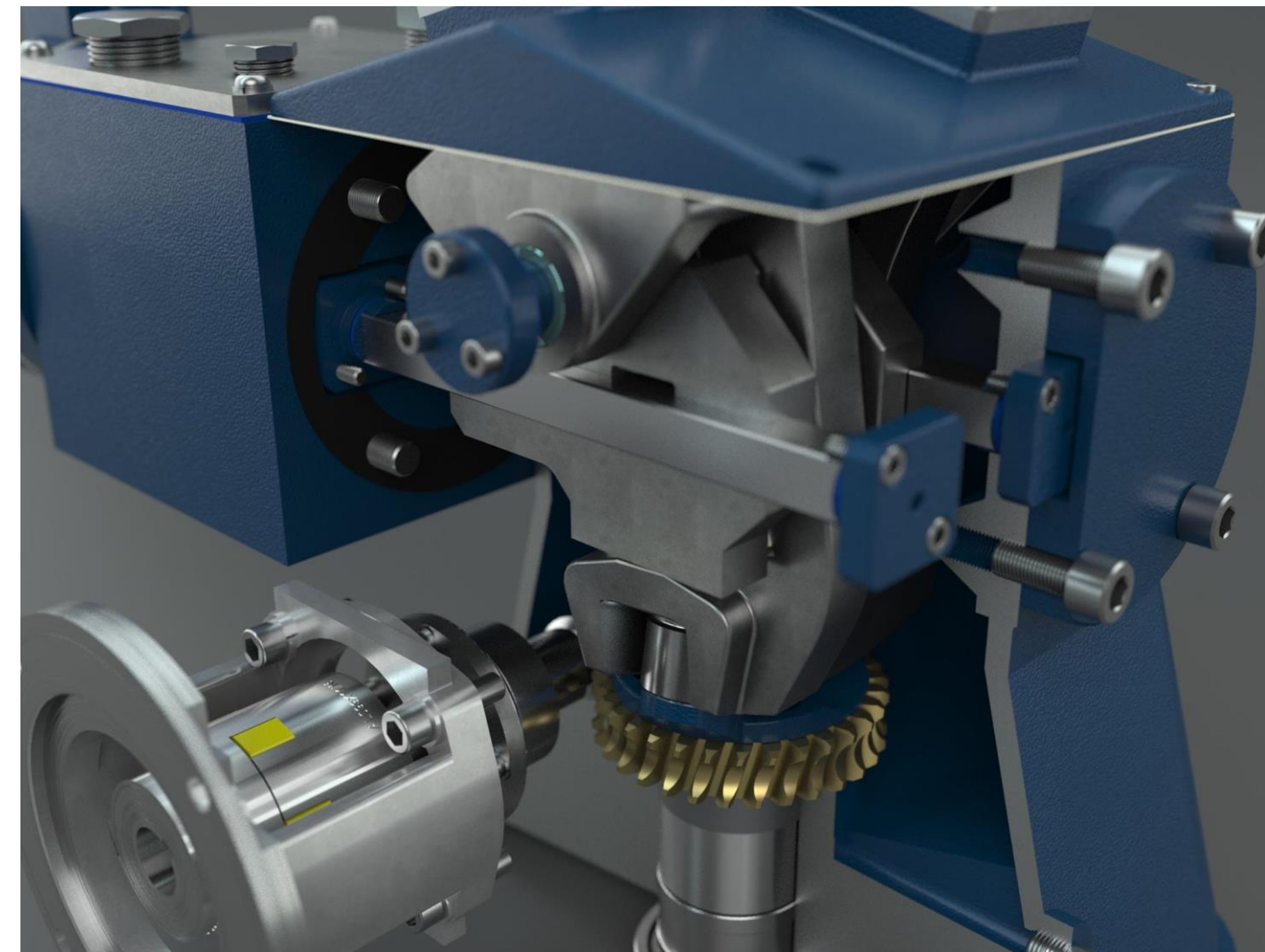




Anime...
Games...
Creative arts...
Advertising...

Product Design and Manufacturing

High quality photorealistic images before a product is real...



Product Design and Manufacturing

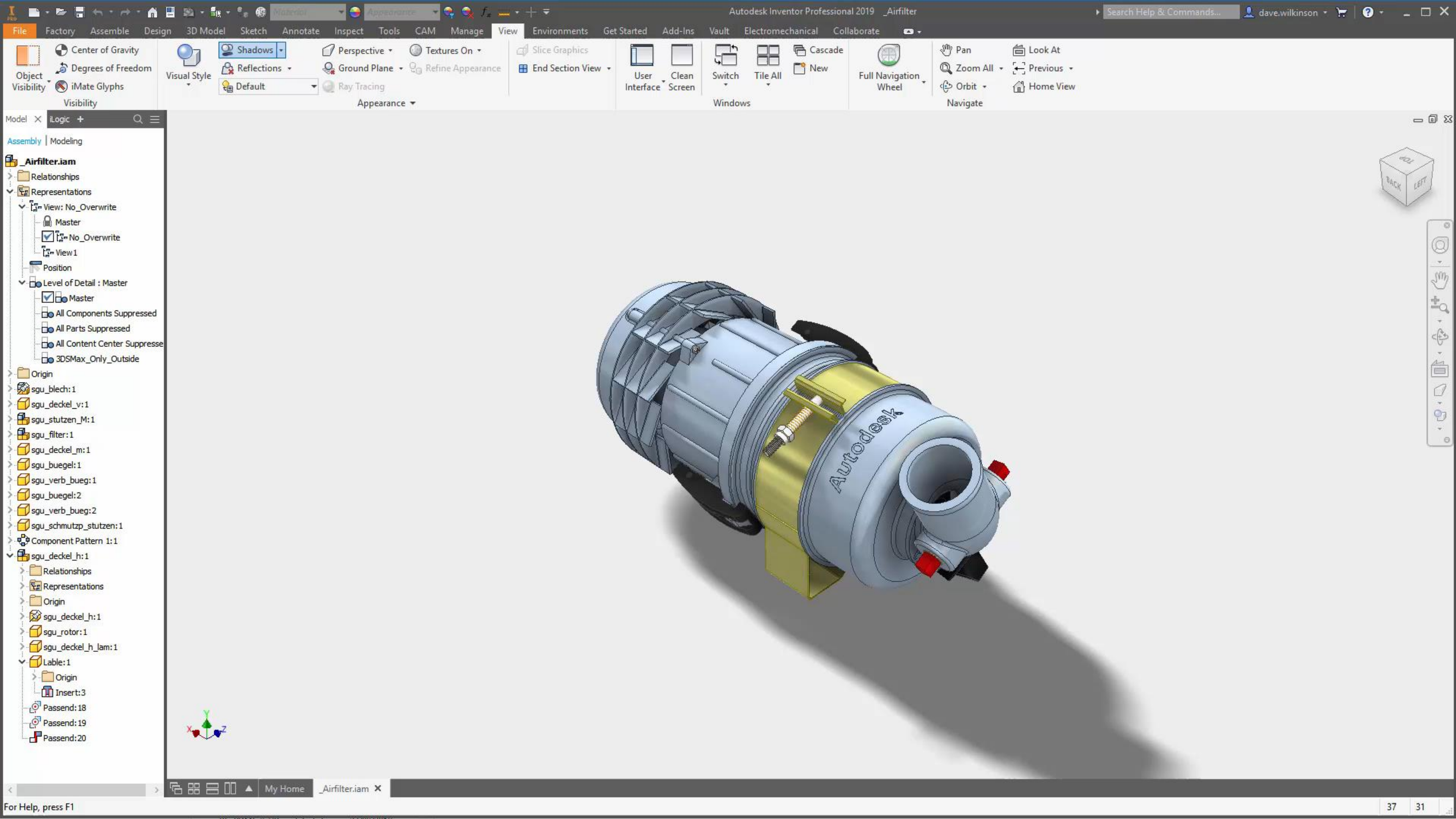
Or tell a story and define a product within that story



Image courtesy of Jomar Machado



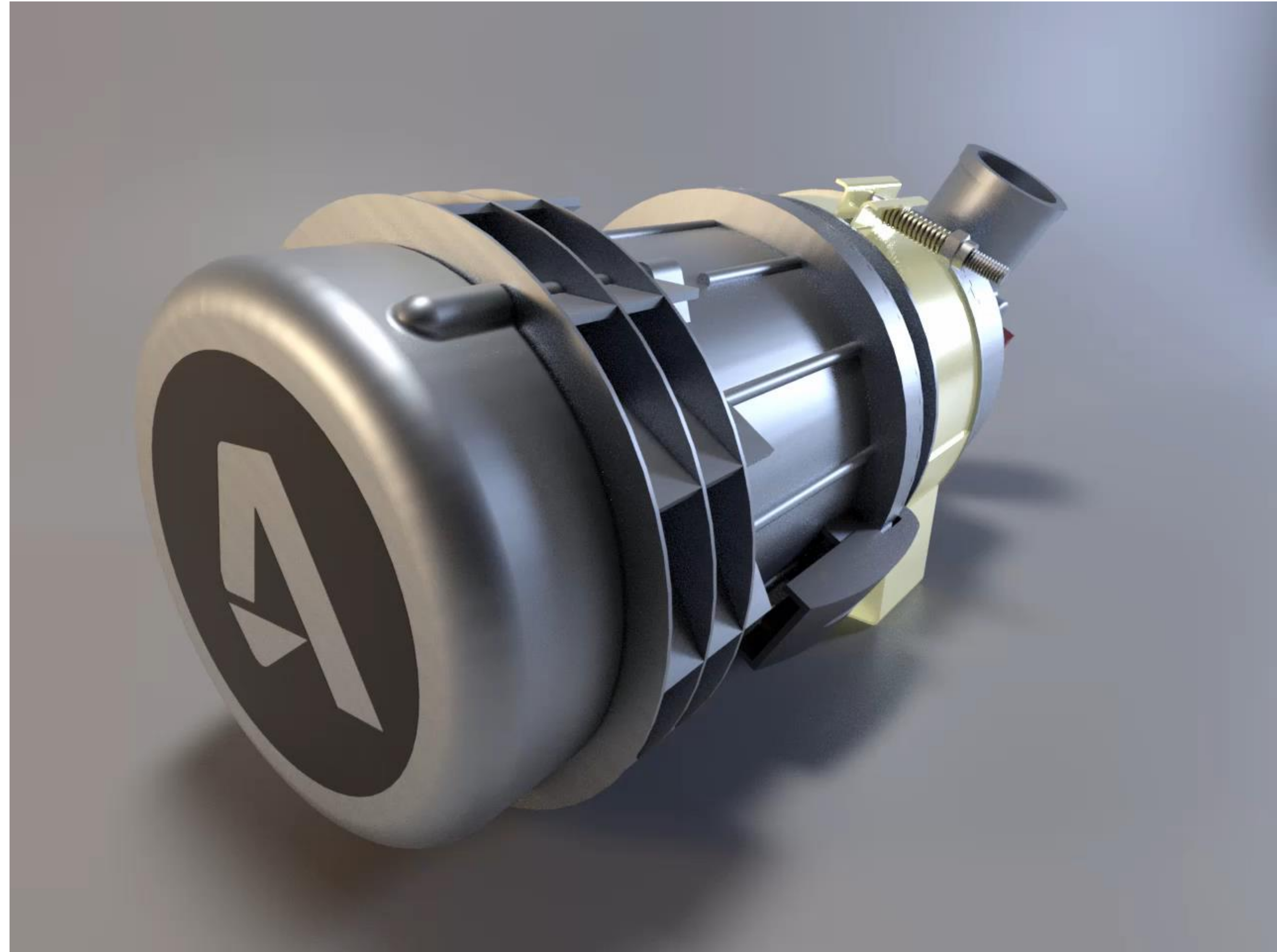
Image courtesy of Joy Mining Machinery





Why use Max.. ?

- Part of your collection entitlement
- Photorealistic imagery
- “Create” images – Just add artistic talent
- Virtual product shoots
- Tell a story
- Make a movie.....!
- Lighting analysis
- Daylight analysis
- Visualize CFD results
- Inventor animations



And you can do all of this in manufacturing too...

3DS Max





Navisworks Manage



Not just Project Review
Navisworks provides Project Review and data aggregation from multiple sources. And it also has rendering capability through desktop or cloud.

Navisworks Manage

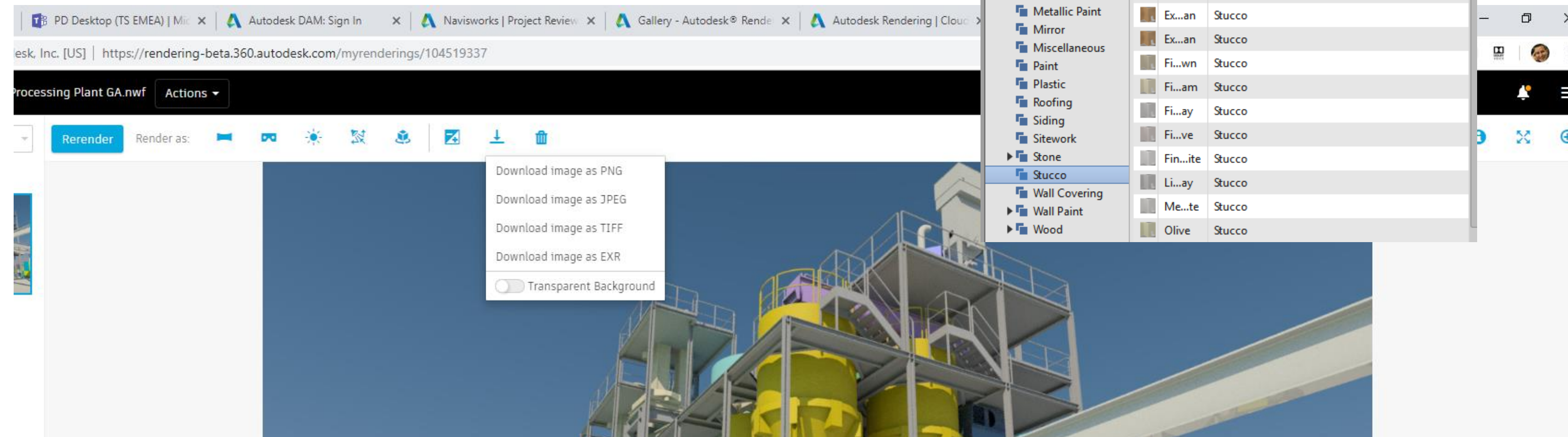
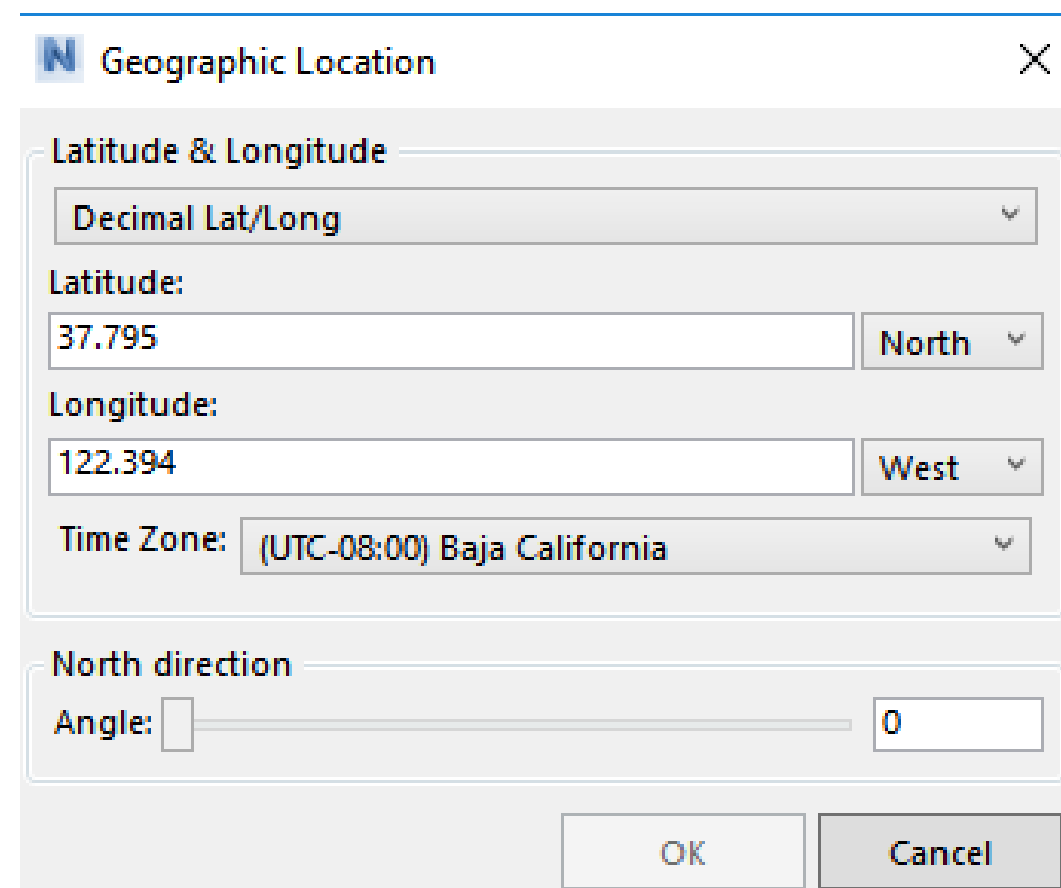
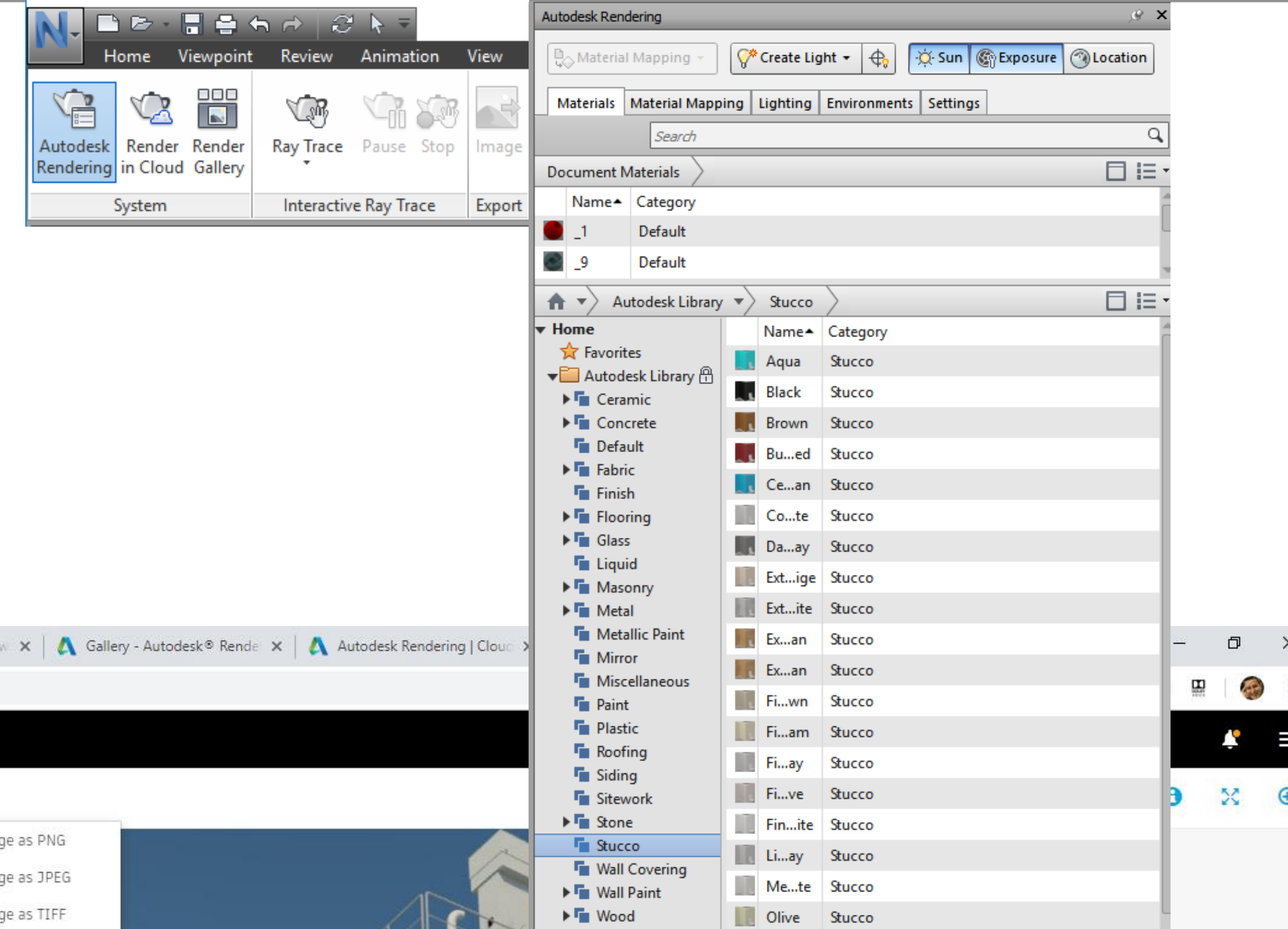
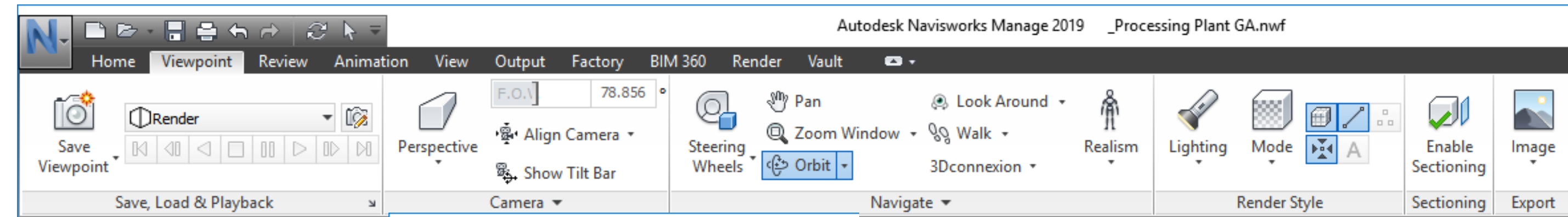


Alpha channel image (Cloud only)

Allowing transparent background for use with other images and scenes etc

Navisworks Manage

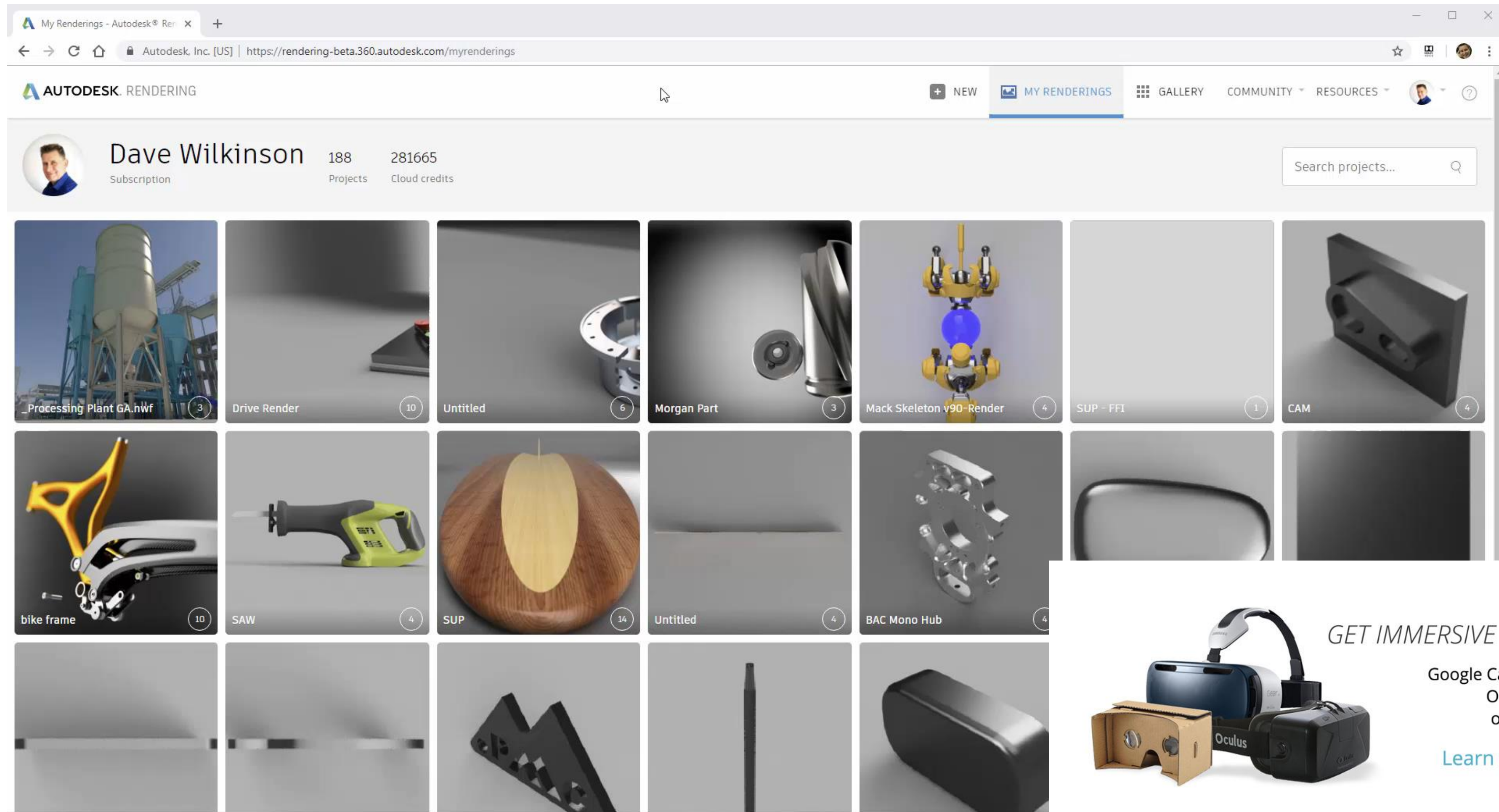
- Named viewpoints
- Easy to setup
- Cloud render
- Autodesk material library
- Material mapping and lighting
- Environment and geographical location setup
- Lighting and exposure settings



Navisworks Manage

Panoramas, solar studies, illuminance

Generate 360 panoramas inc Stereo.



Navisworks Manage

In summary

An effective way to render large projects and datasets, especially when used with cloud rendering. Use the desktop render with Time Limit to setup the view. Save your viewpoint and send to render in the cloud.



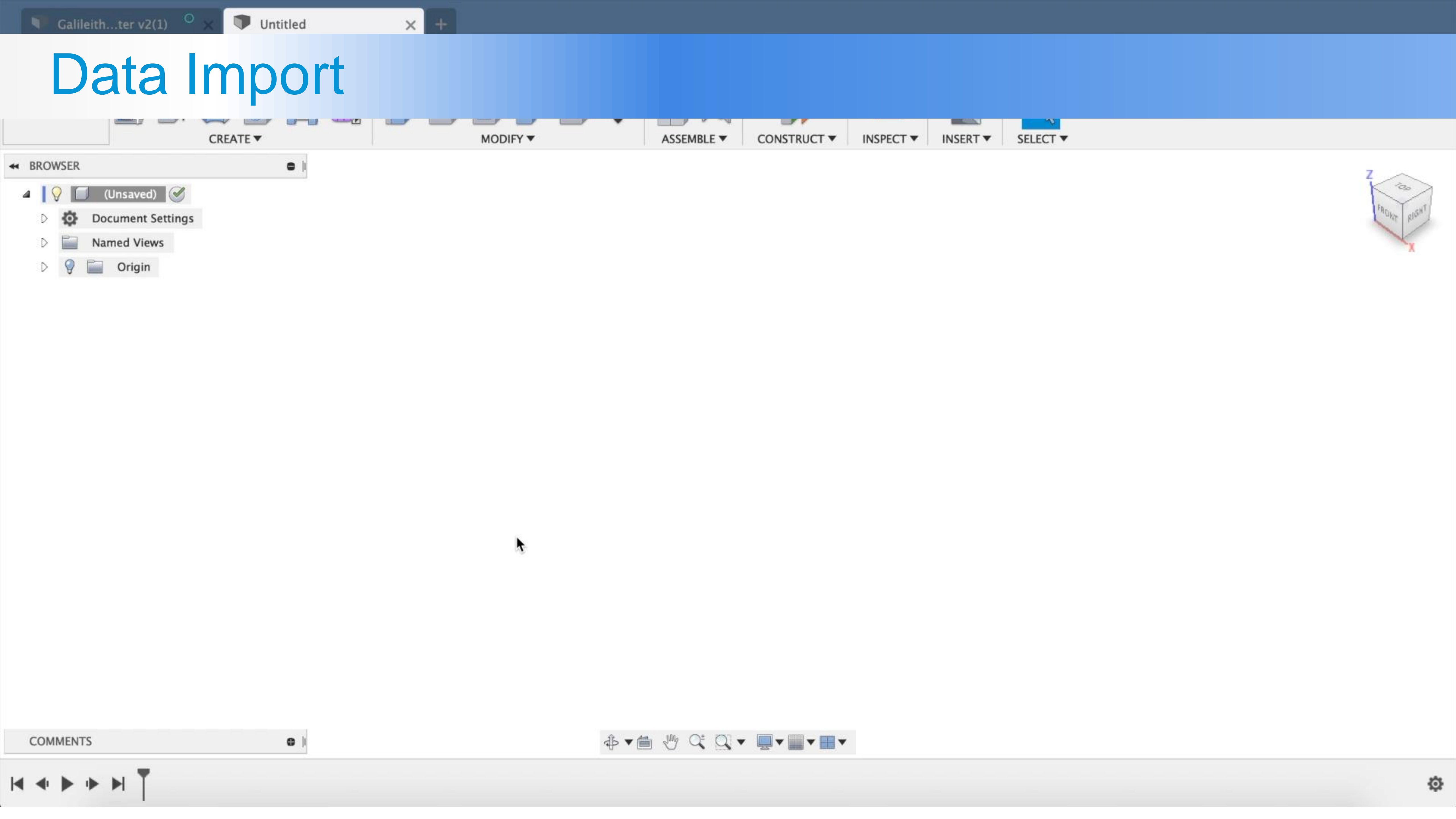


Render Set-Up

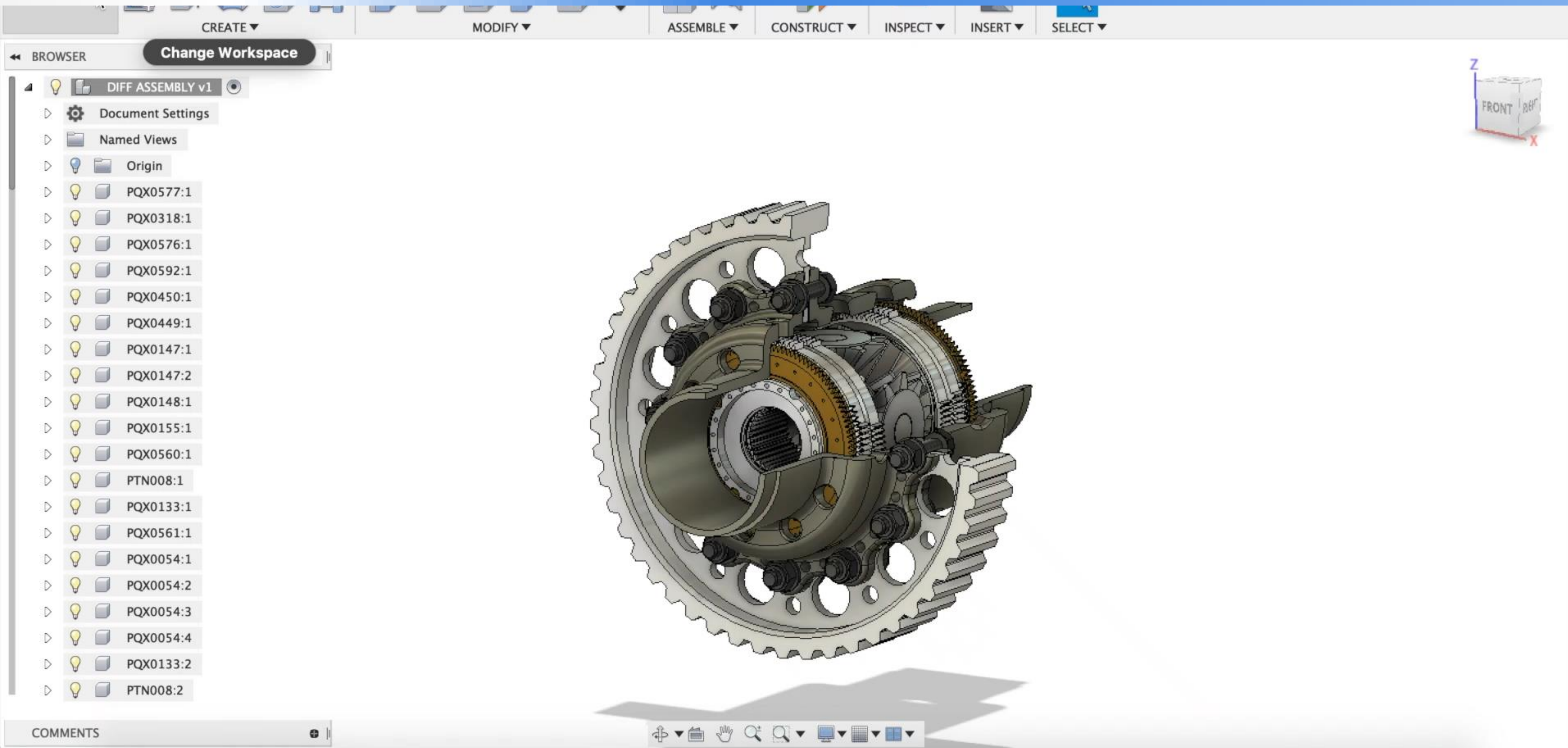
- Import any CAD data
- Easy of use
- Drag & drop materials
- Drag & drop environments



Data Import

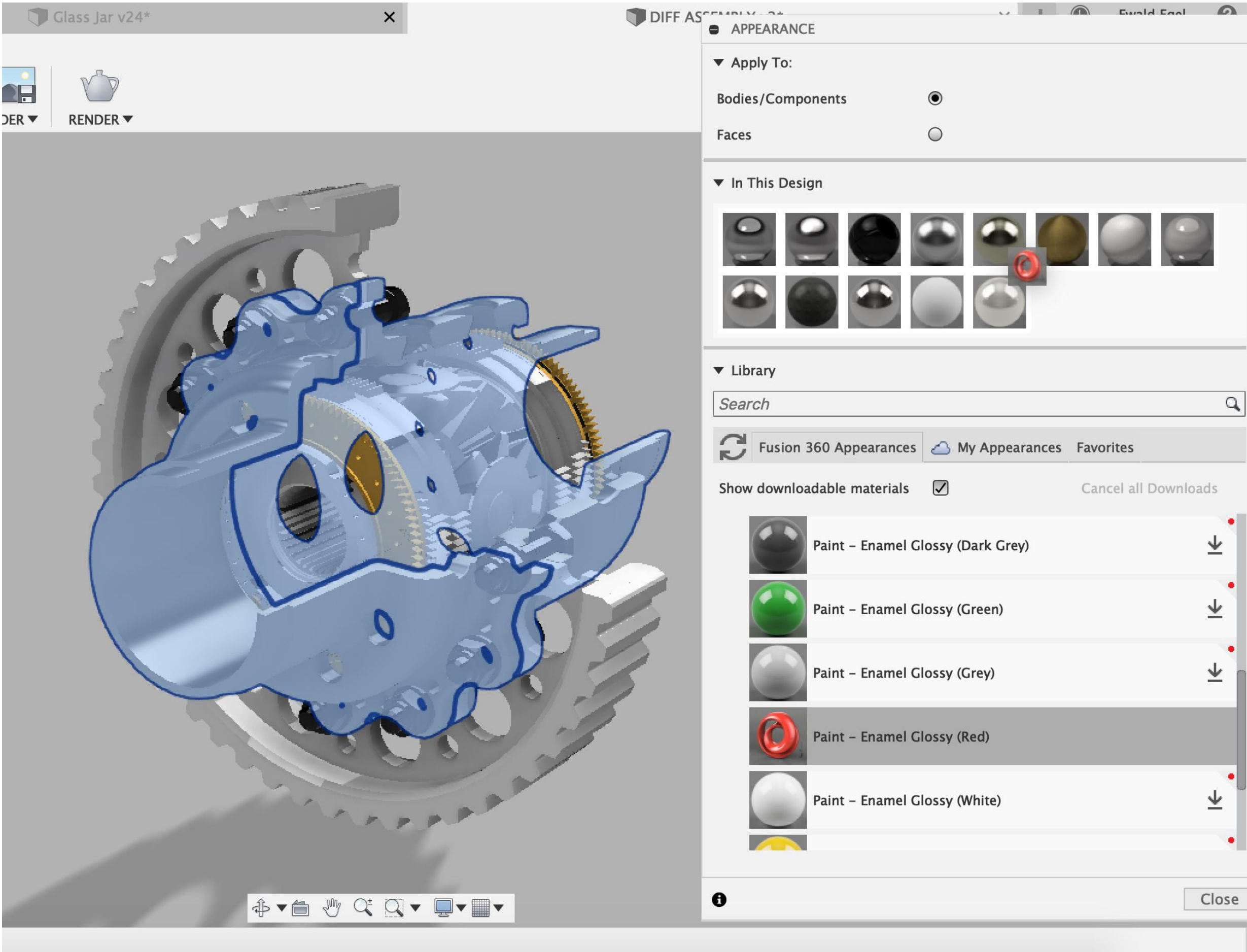
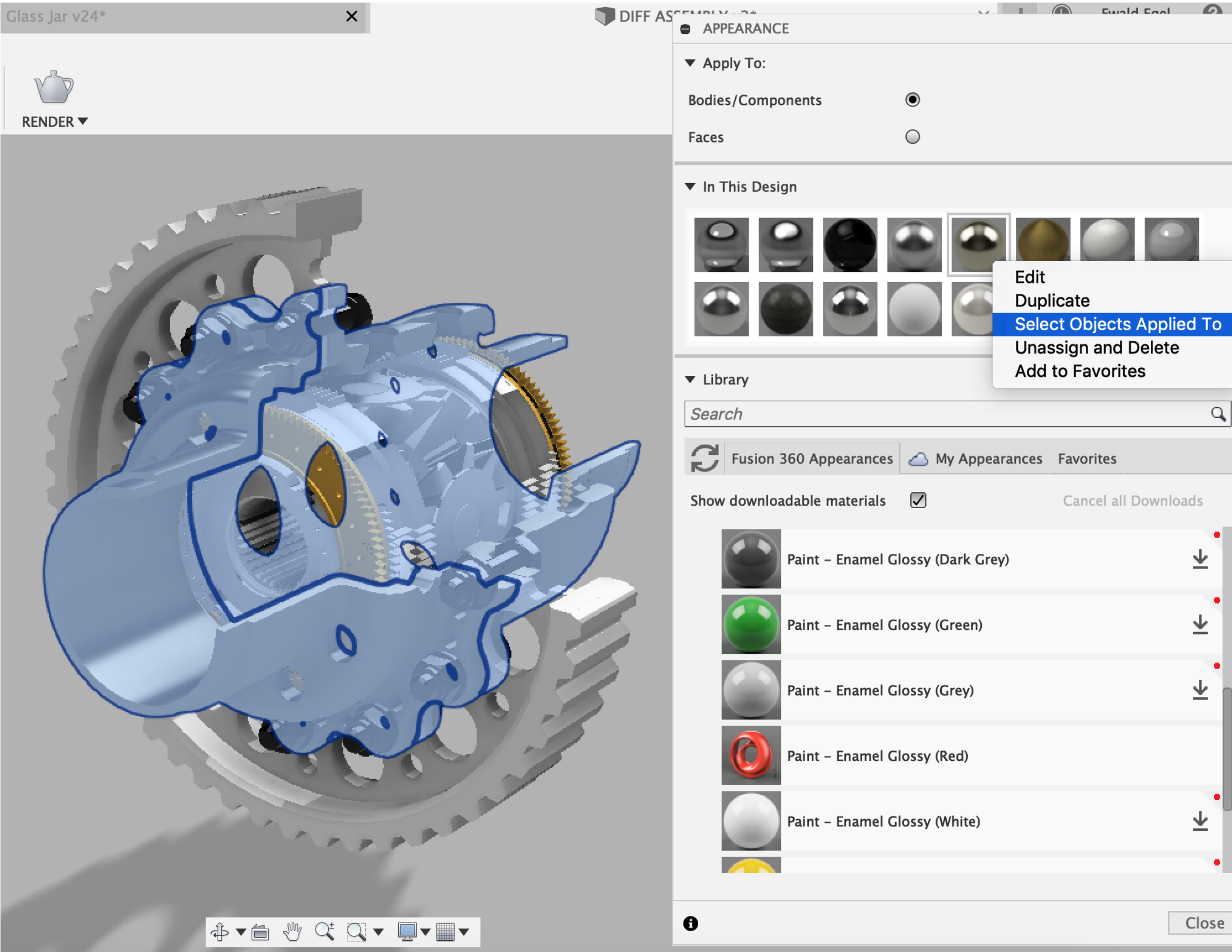


Materials

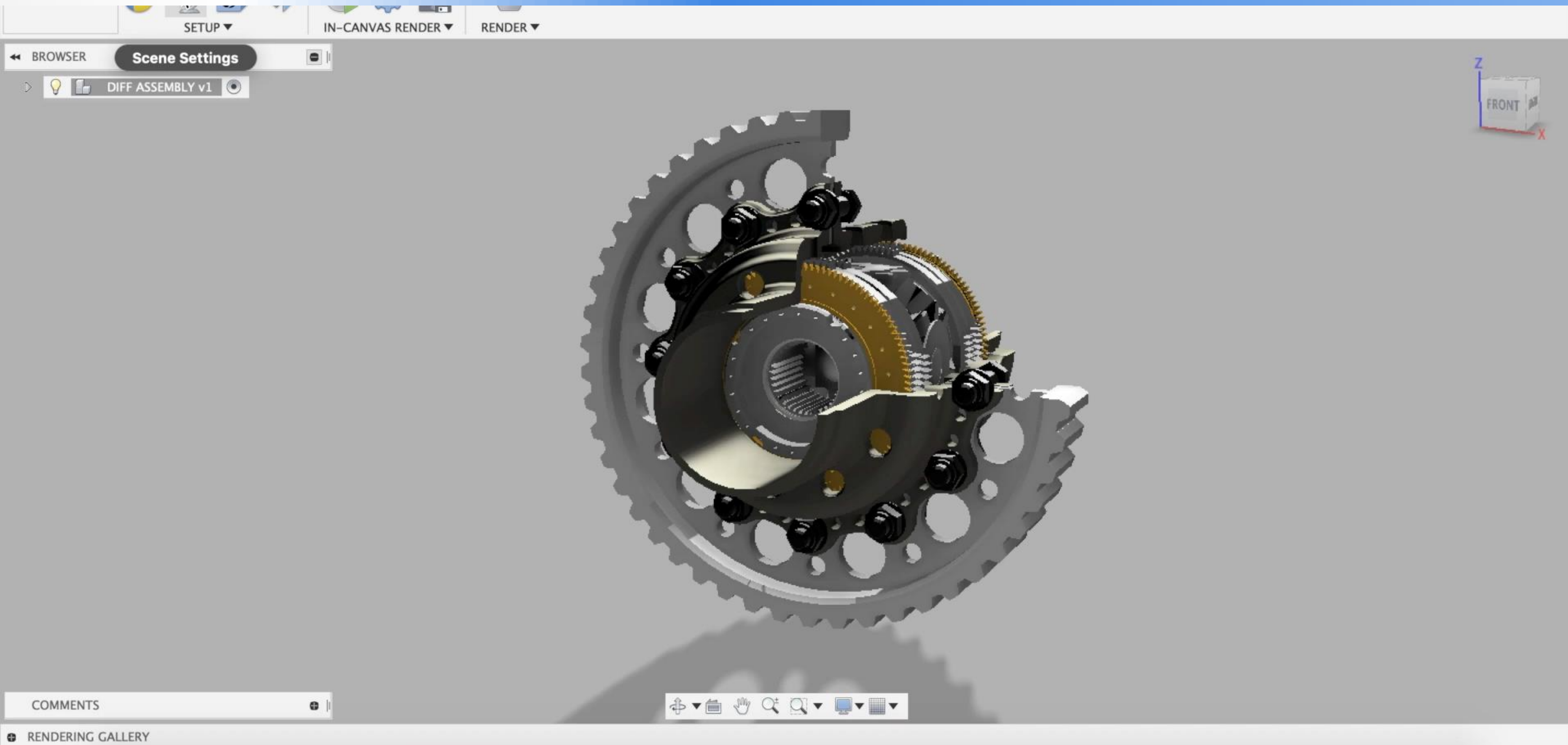


Materials

Apply materials on multiple bodies



Scene Settings



Environments

Galileith...ter v2(1)

Untitled

DIFF ASSEMBLY v1*

SettingsEnvironment Library


SETUP

IN-CANVAS RENDER

RENDER

BROWSER

DIFF ASSEMBLY v1



COMMENTS

RENDERING GALLERY

Position

Background

Color

Position

BackgroundSolid Color

ColorEnvironmentSolid Color

Ground

Camera

Ground Plane

Flatten Ground

Reflections

Roughness [0, 1.0]

Camera

Camera

Focal Length

Exposure [25, -15]

Depth of Field

Center of Focus

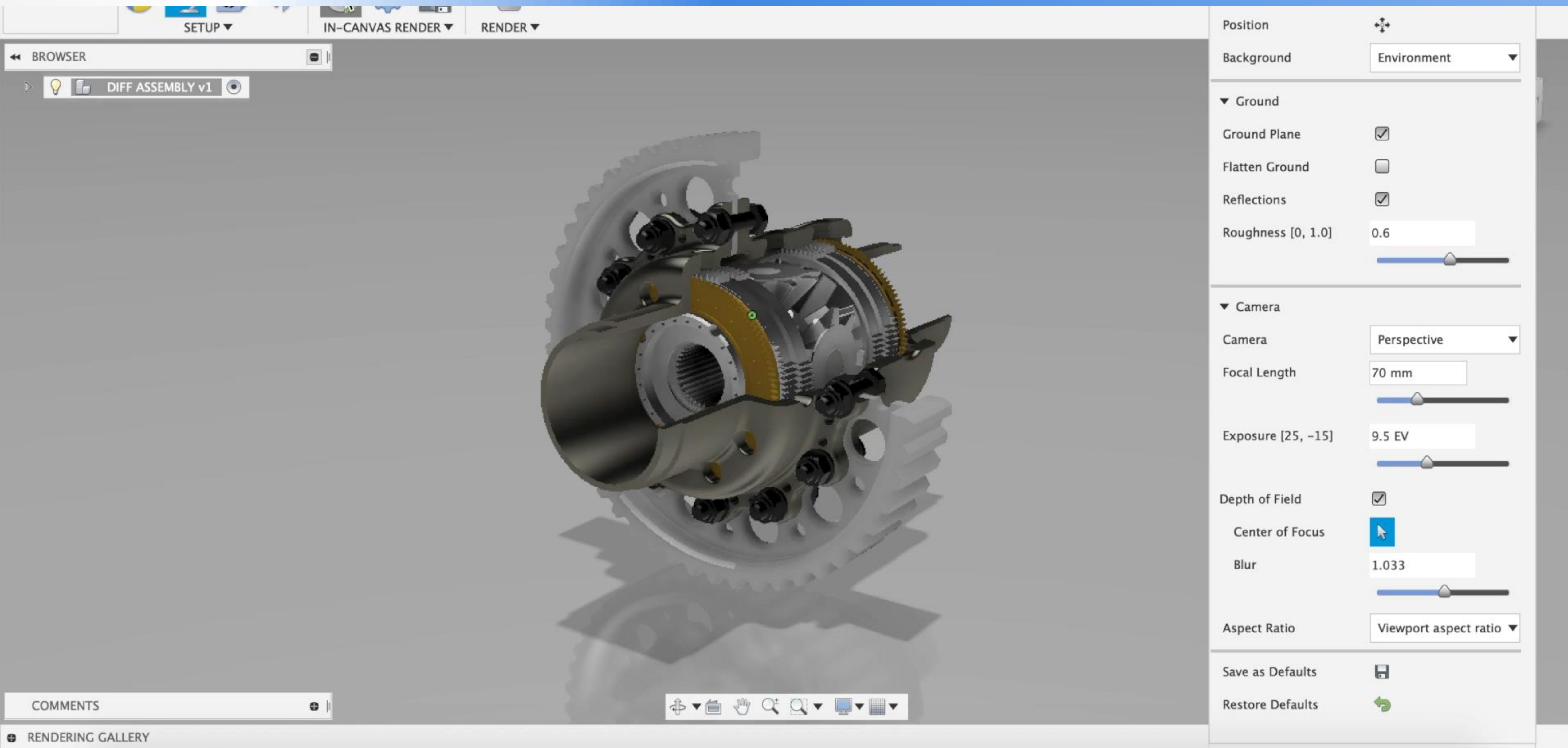
Blur

Aspect Ratio

Save as Defaults

Restore Defaults

Raytracing & Render



Glass & Fluids

- Nested Dielectrics
- Caustics



Modelling Approach

Four main rendering modelling techniques

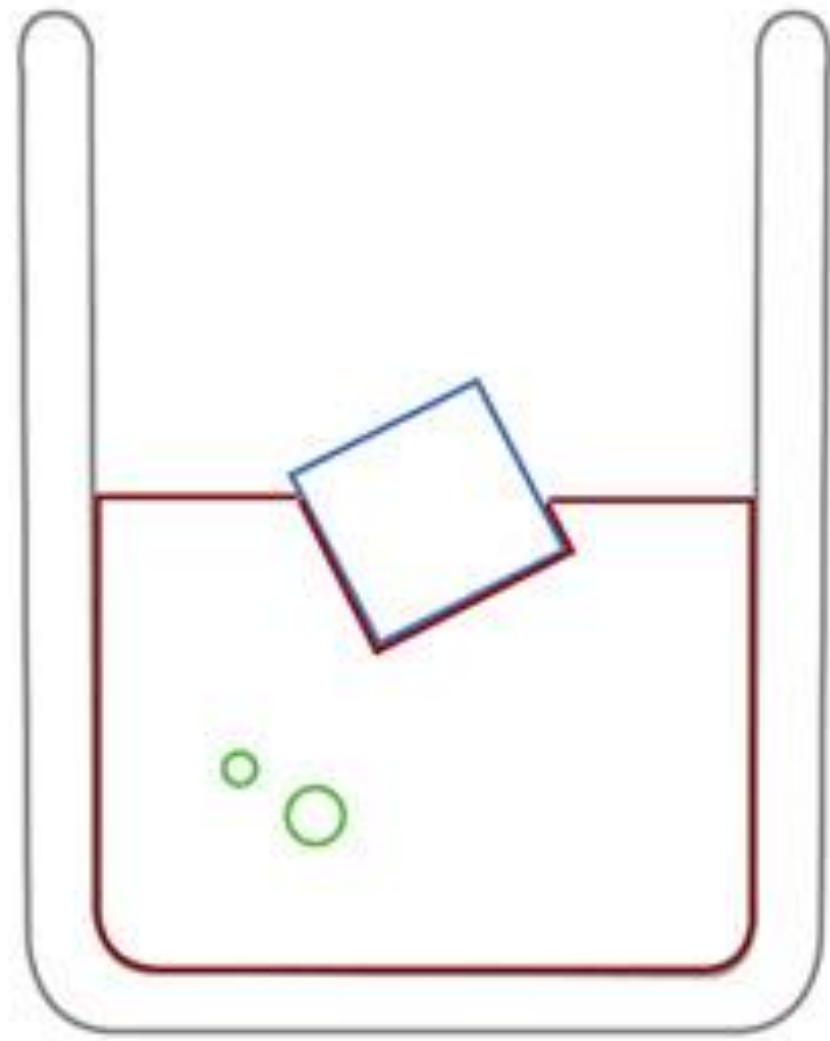


Fig 1

Coincident

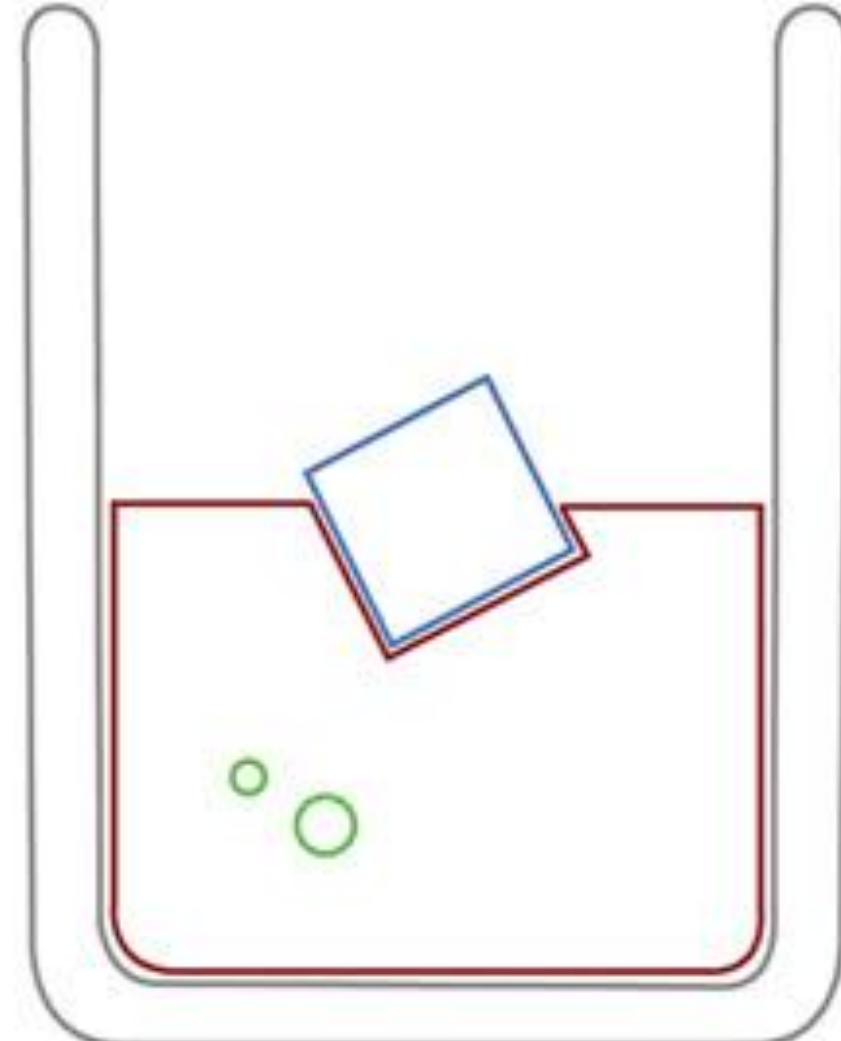


Fig 2

Air Gap

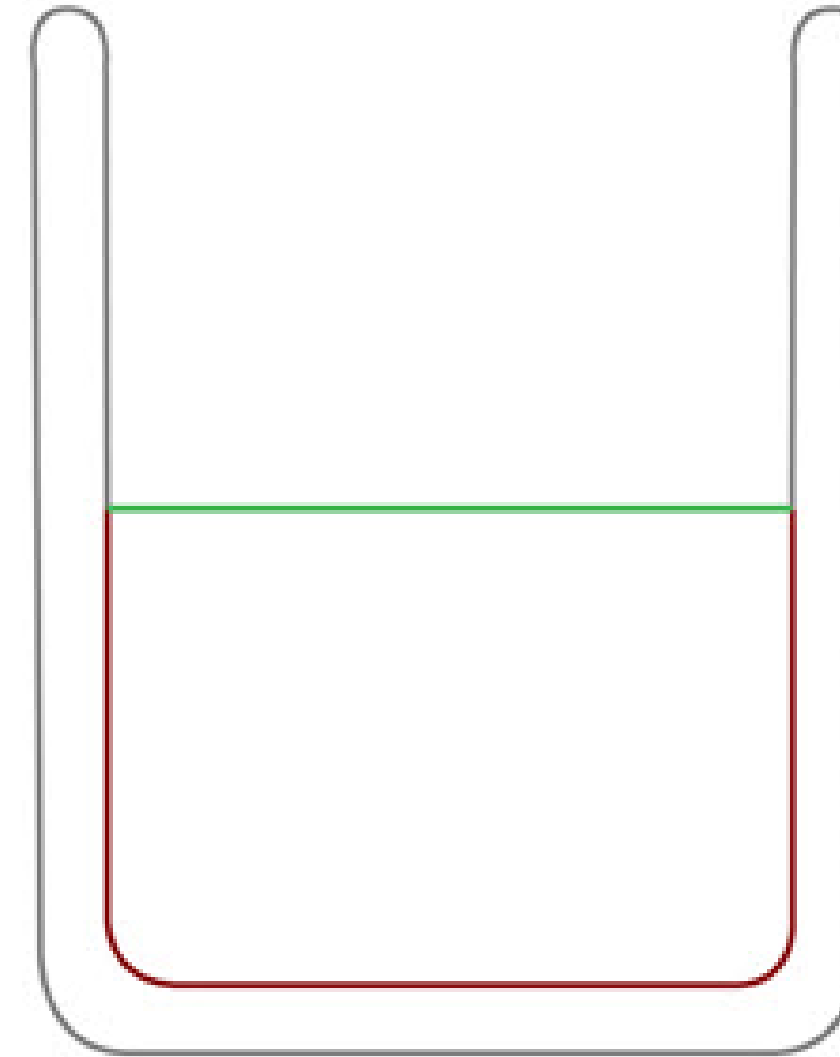


Fig 3

Interfaces

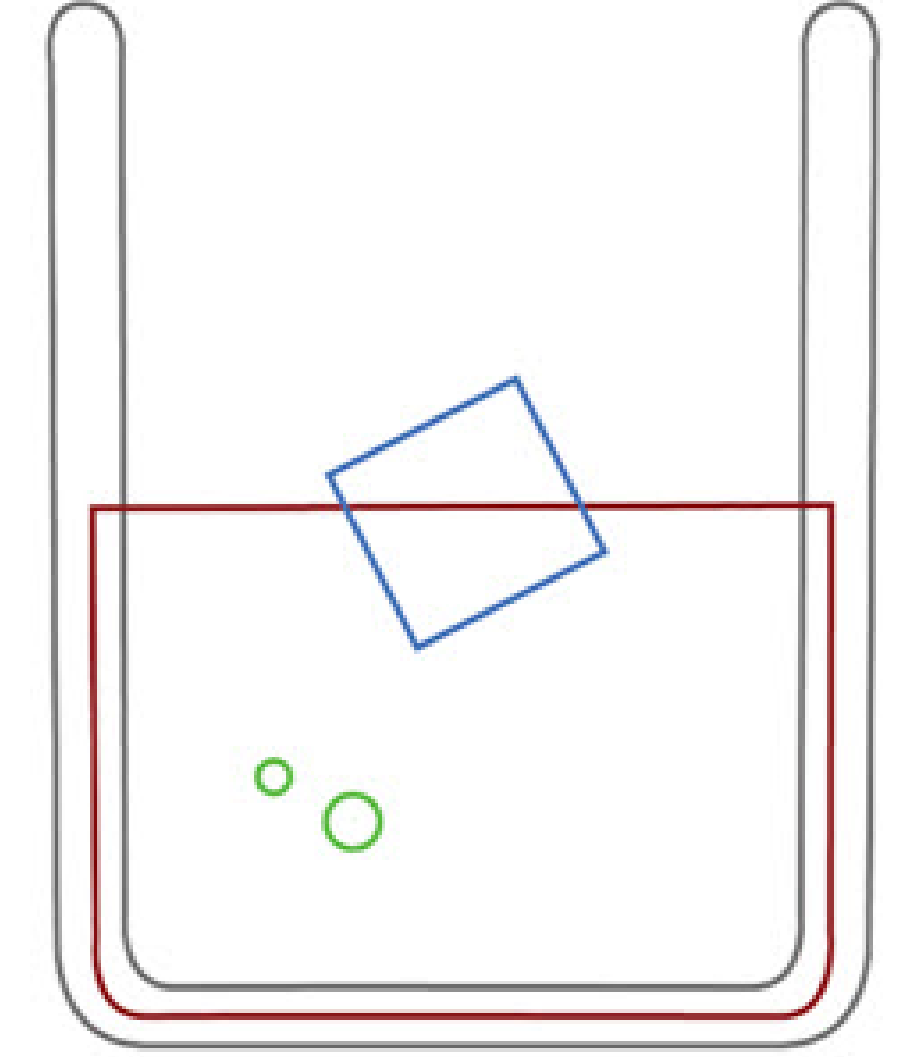


Fig 4

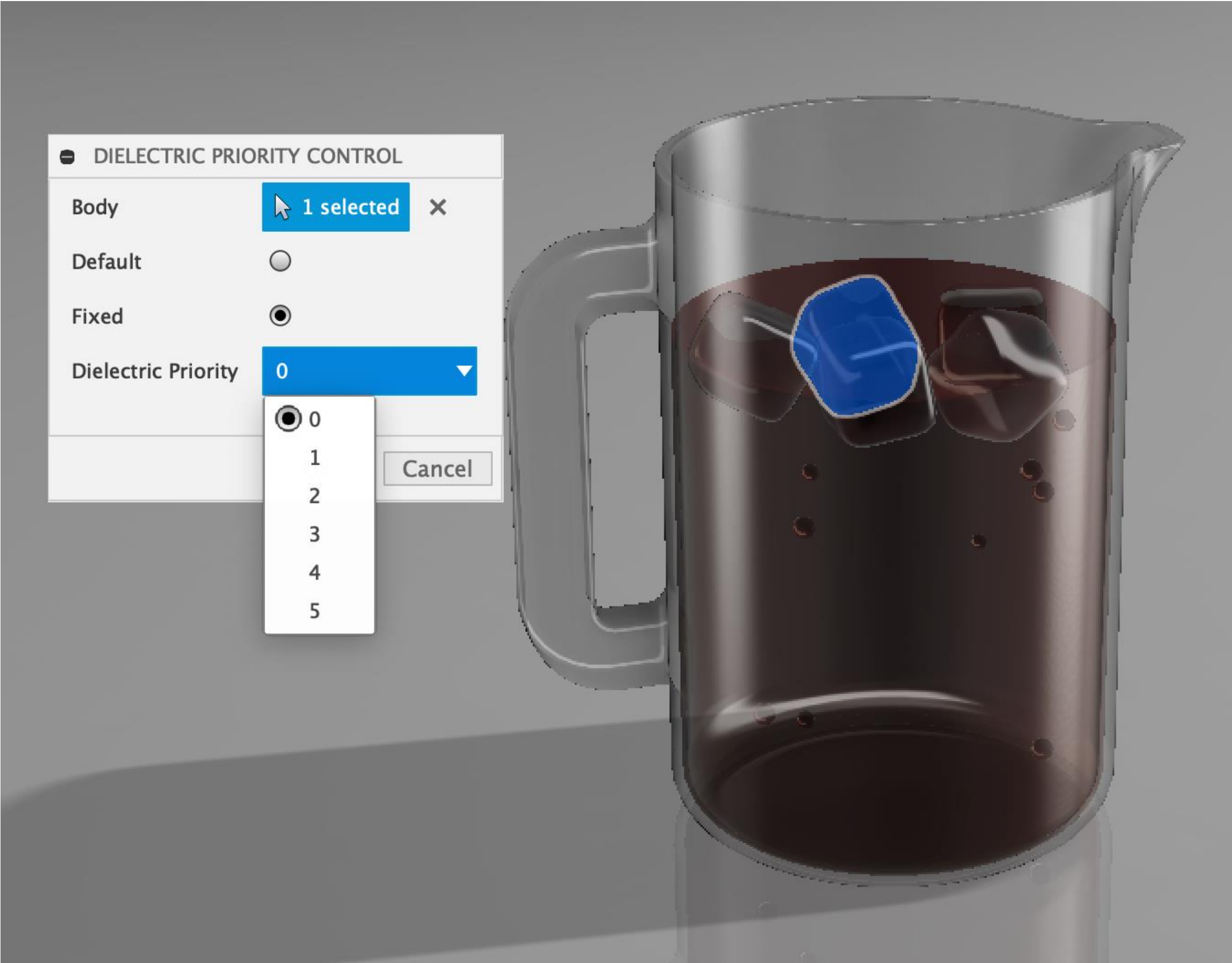
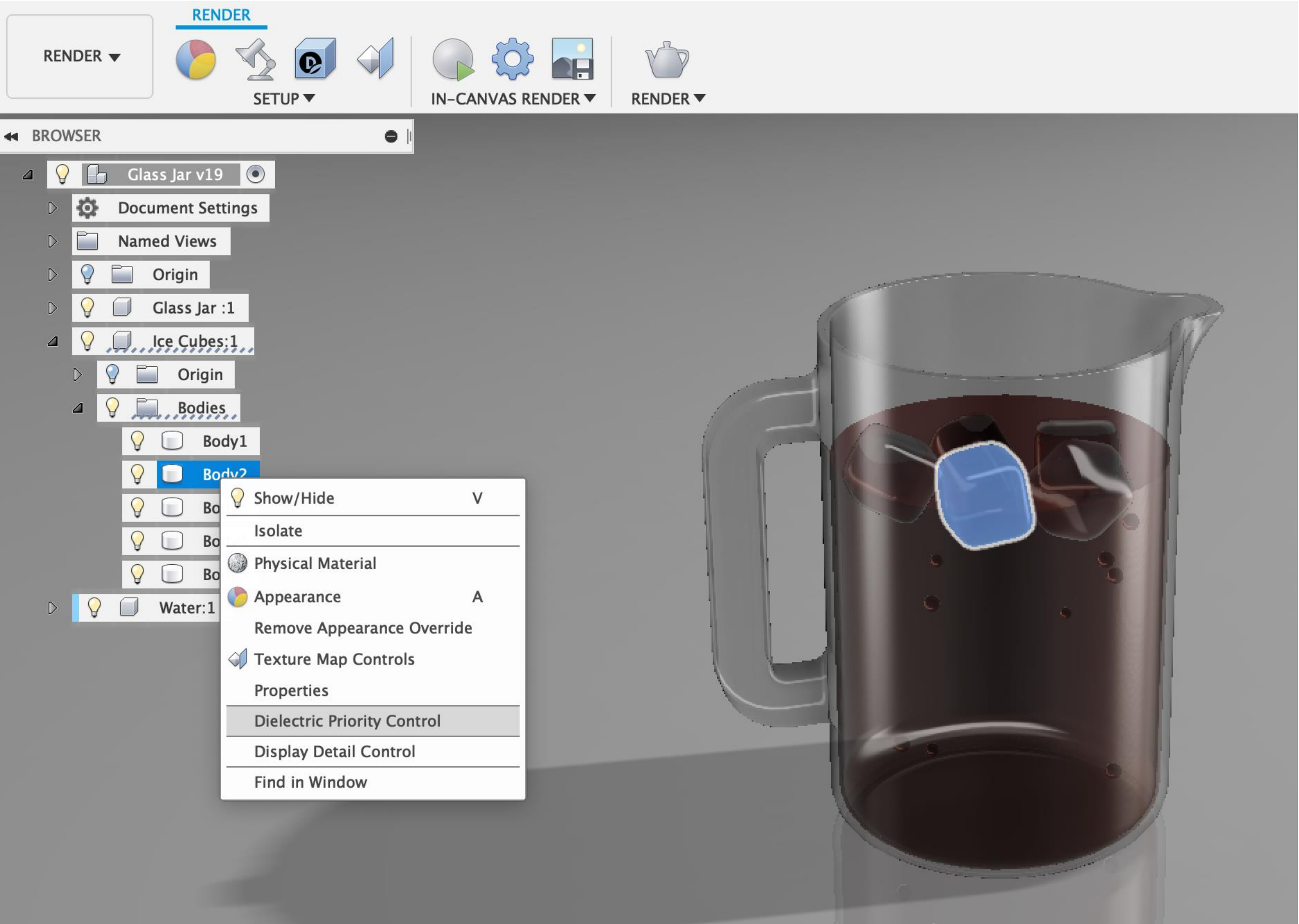
Overlap

DIELECTRIC CONTROL

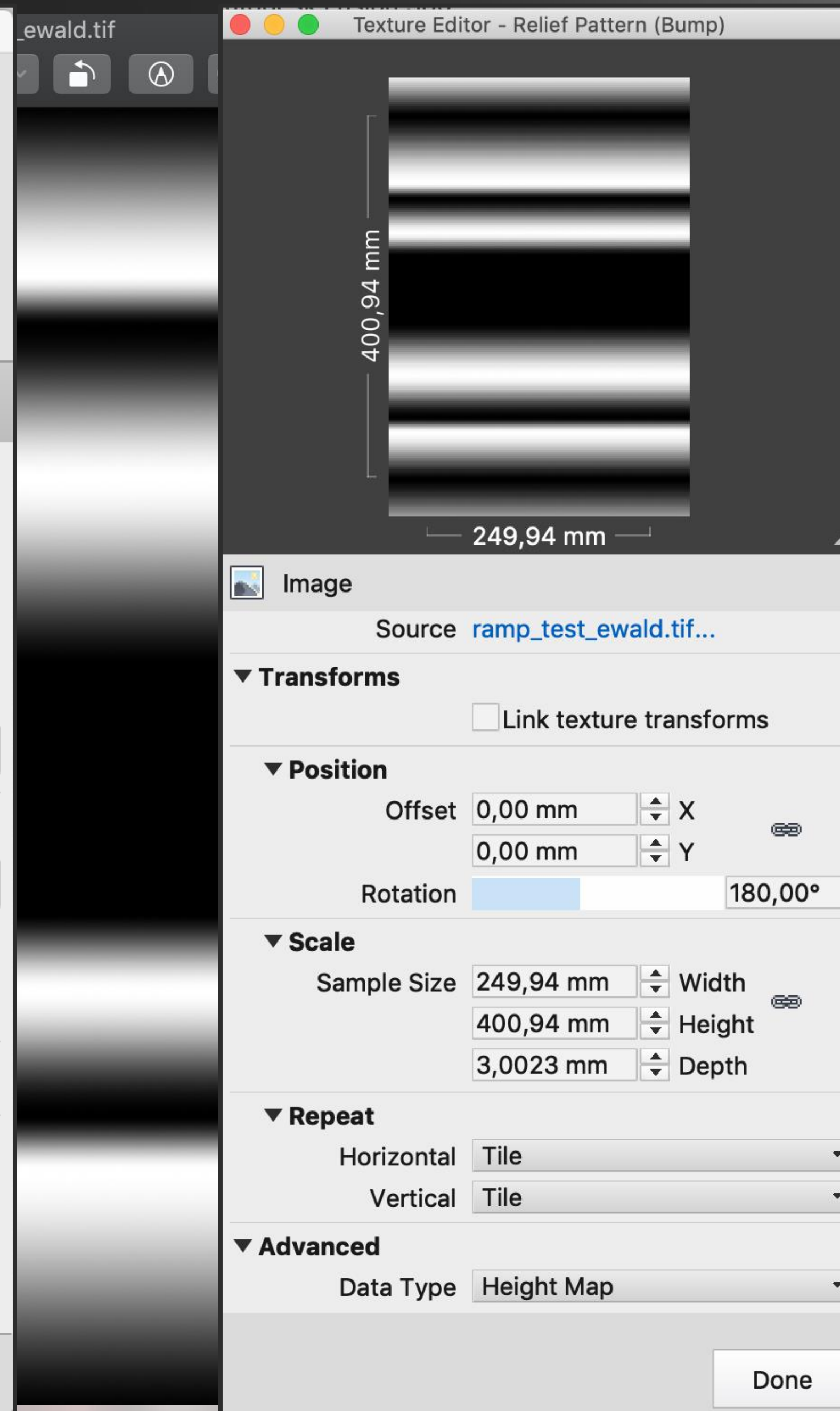
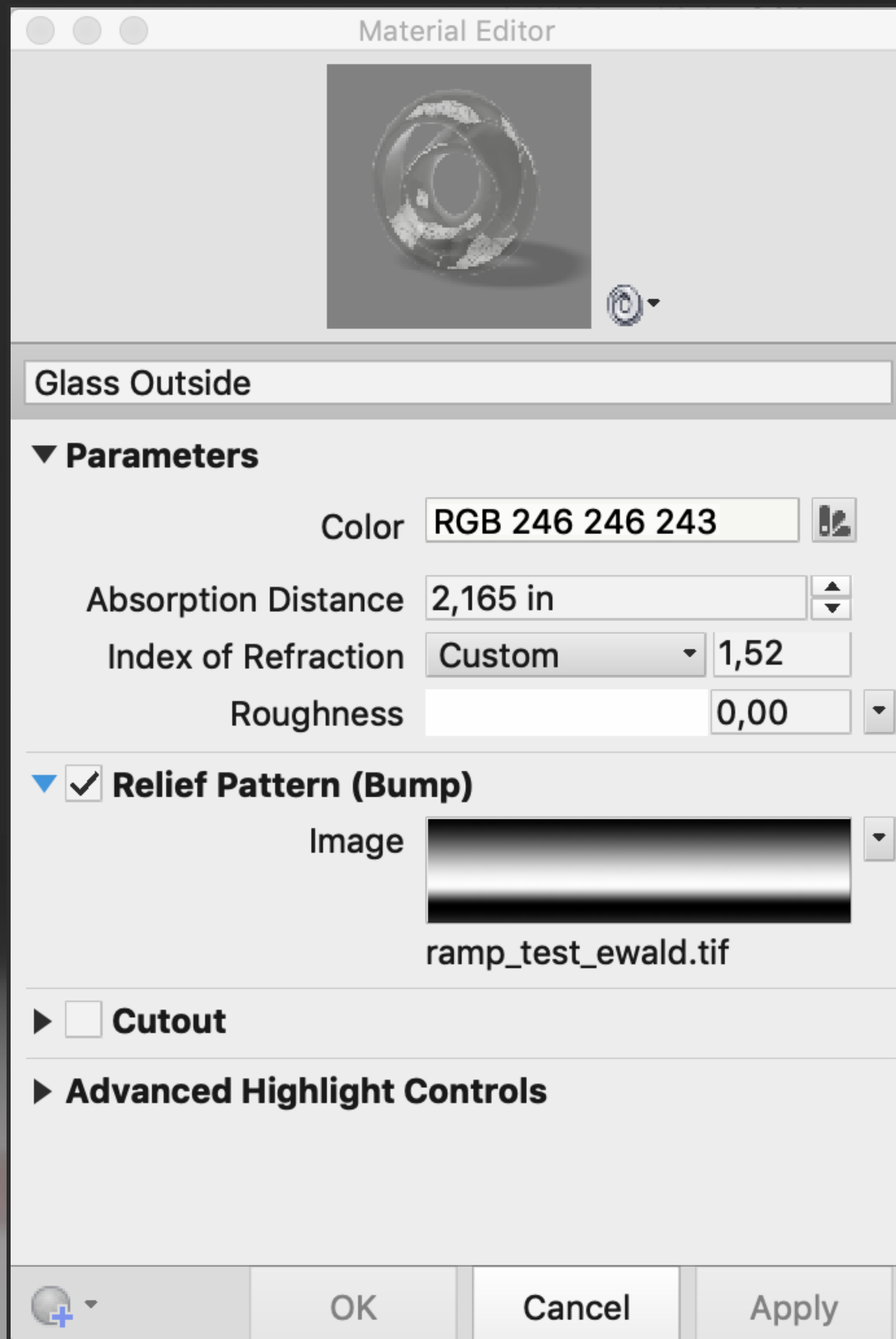


Nested Dielectrics

Define dielectric priorities for shader







A FEW
MOMENTS LATER



Tips & Tricks

External light sources



Depth of field



Add objects as external depth of field

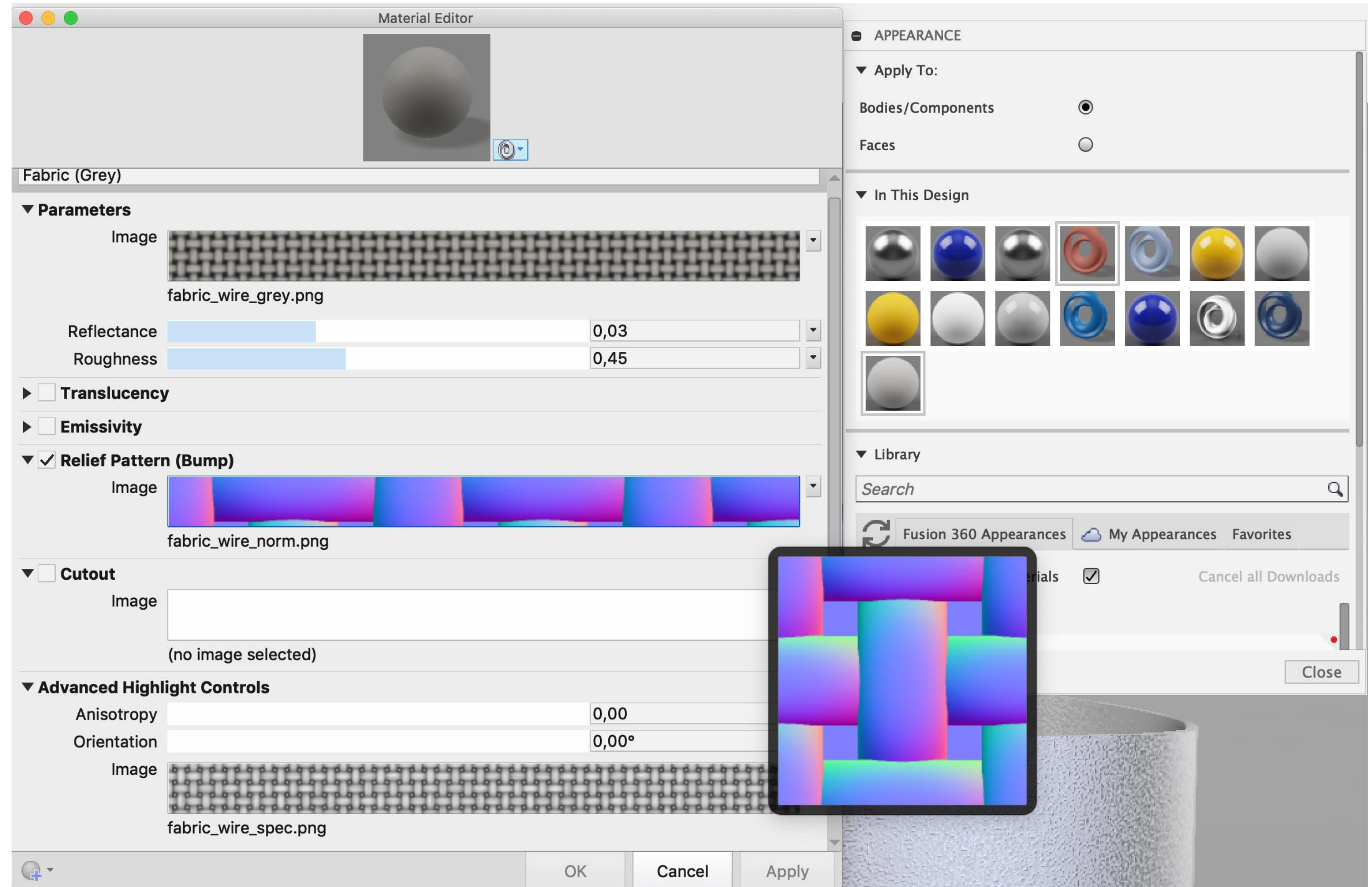


Decals



Advanced Materials

- Insert image parameters
 - Reflectance
 - Roughness
- Insert bump maps for surface structure
- Highlight control settings
 - Anisotropy
 - Falloff





RED Design

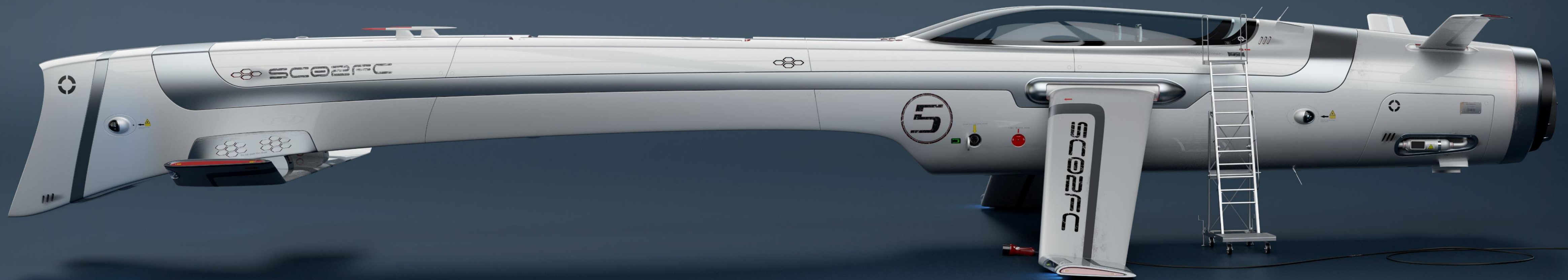


Widely used within Automotive
VRED's roots come from the automotive industry.





A large amount of reference material will relate to automotive and transport.



And all things cool....

VRED Design



Image courtesy of Astro Studios

VRED offers product designers a high end visualisation tool, and also allows product configuration with quick and effective rendering



Music 'Dubstep' by Bensounds.com

Scenegraph

File Edit Create View Select

Scene Graph

Search

- Root
 - Perspective
 - Front
 - Side
 - Top
 - VR_Camera
 - Light_Rotation
 - Environments
 - MODEL_AuroraMK2 - M
 - PACKAGEDATA_JT_CUF
 - _Aquo Bottle - _Aquo E
 - Transform
 - Male
 - Female
 - DirectionalLight
 - Rotation





Manufacturing can also benefit too

VRED's ability to handle large amounts of data with quick and efficient workflow makes it ideal.





Scenegraph

File Edit Create View Select

Scene Graph

Root

- Perspective
- Front
- Side
- Top
- VR_Camera
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- MODEL_AuroraMK2 - M
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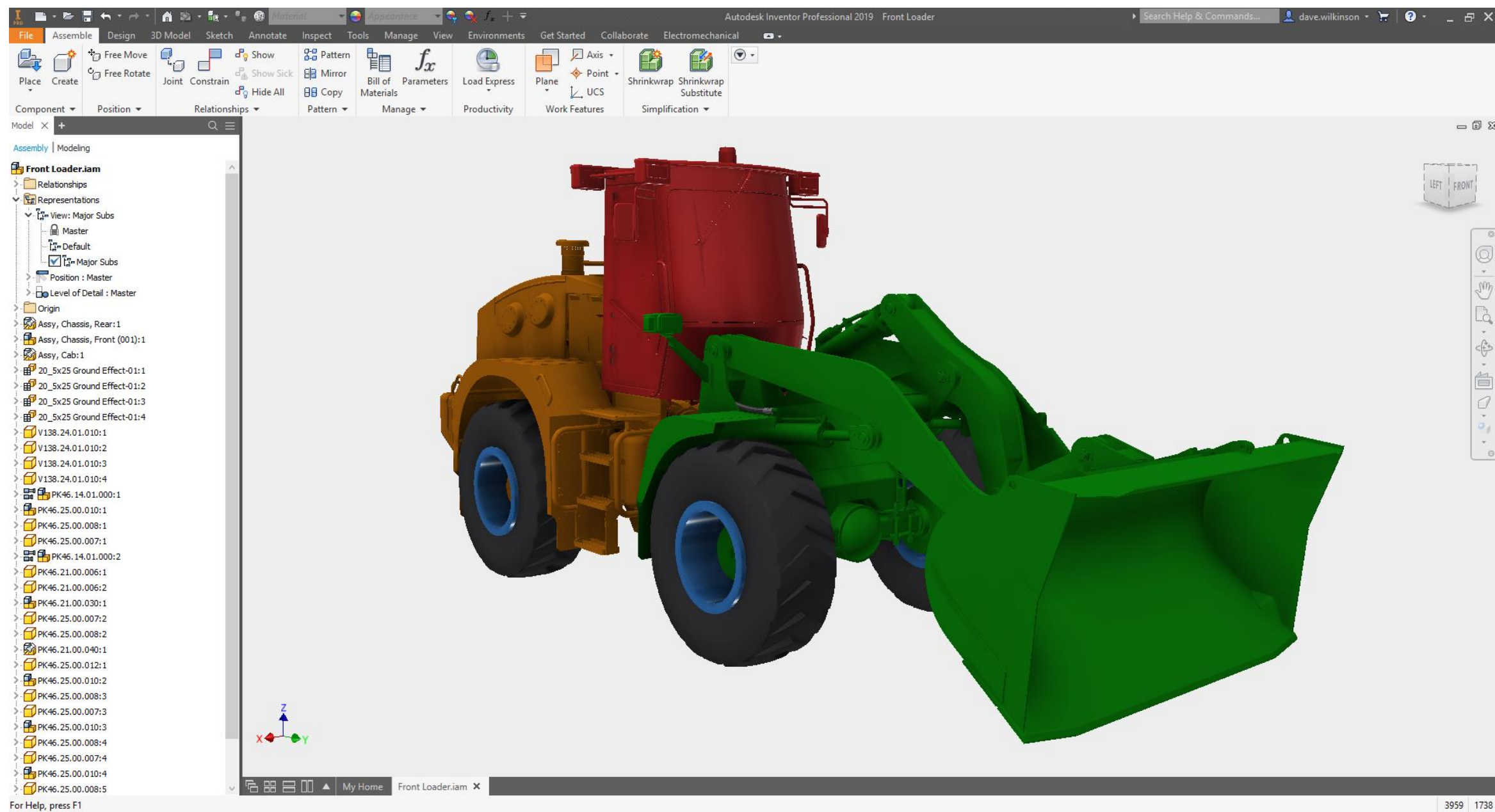
Graph Transform Materials Cameras Clips Curves VSets Render

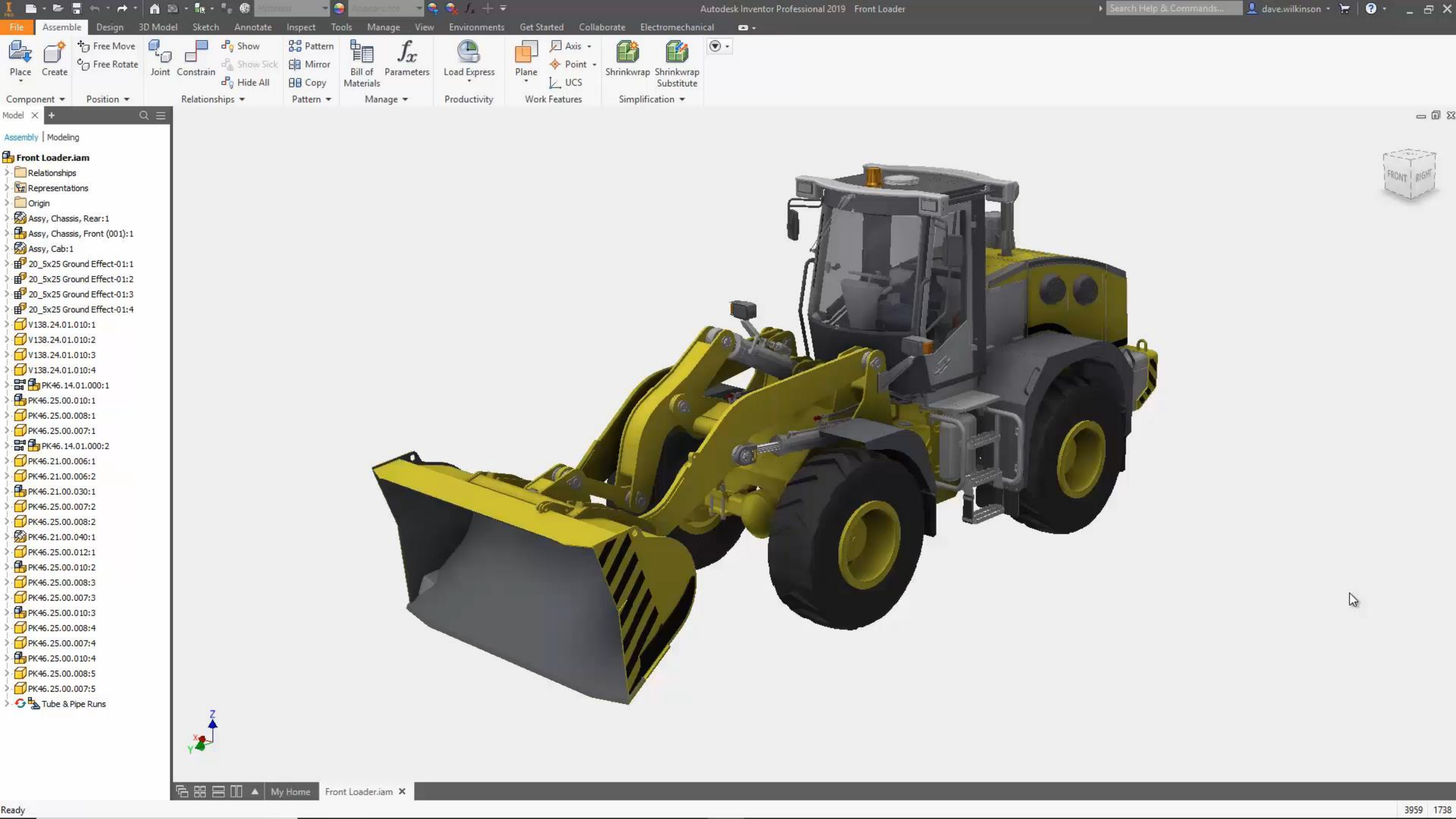




Review engineering design

Raw engineering data can be reviewed within VR.
Immersed in the design as if it were real. Directly from the design tool.



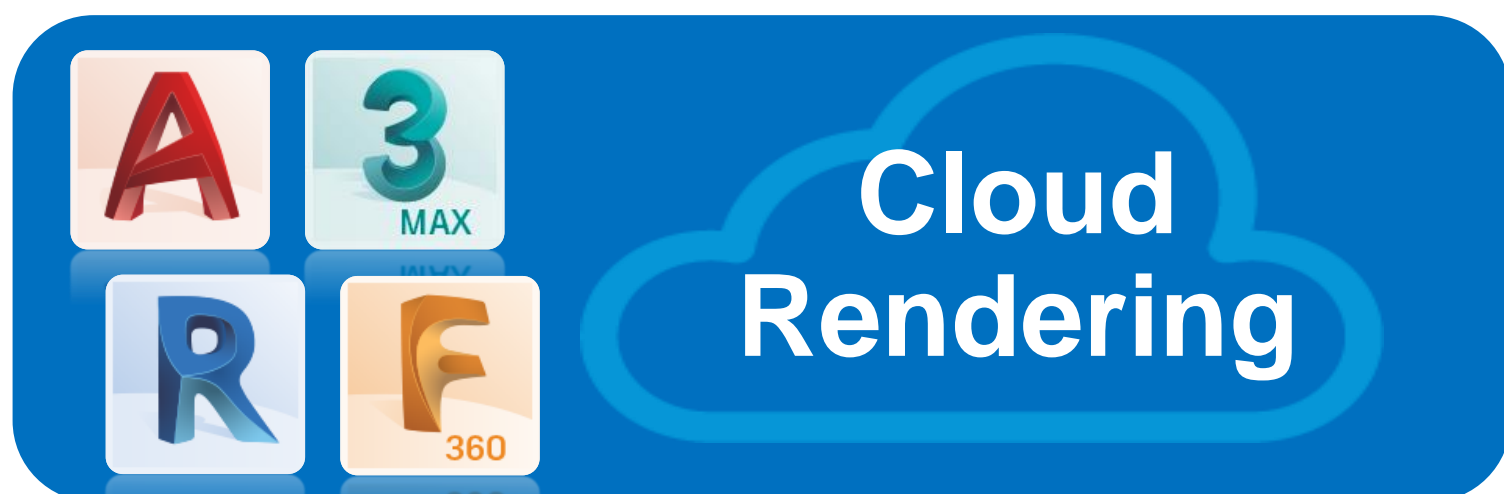
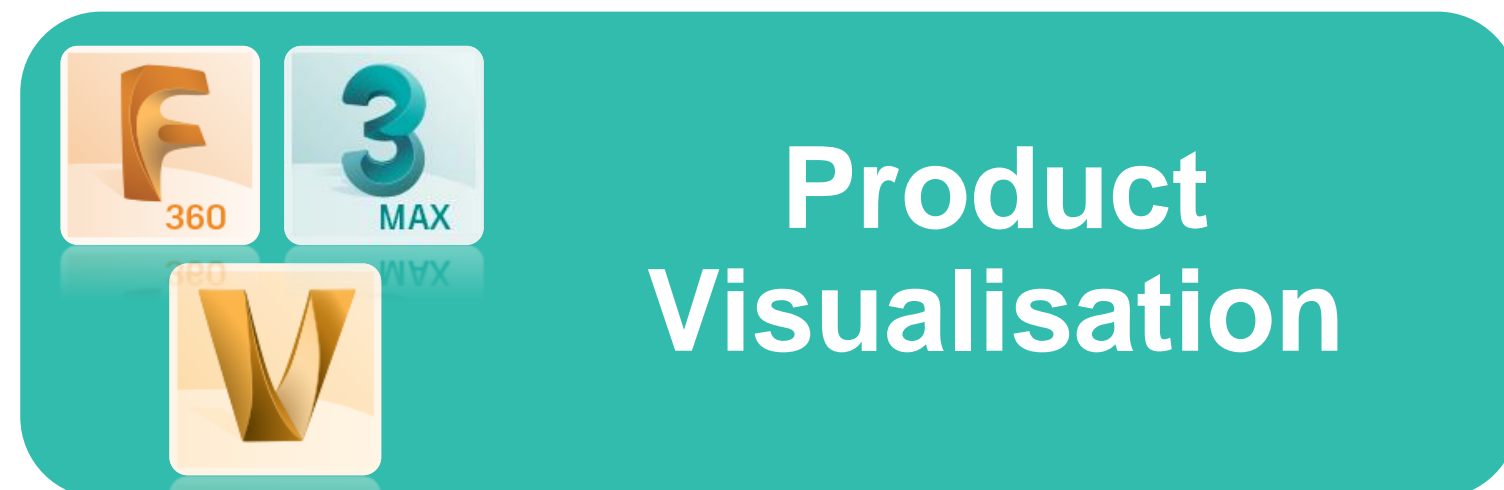
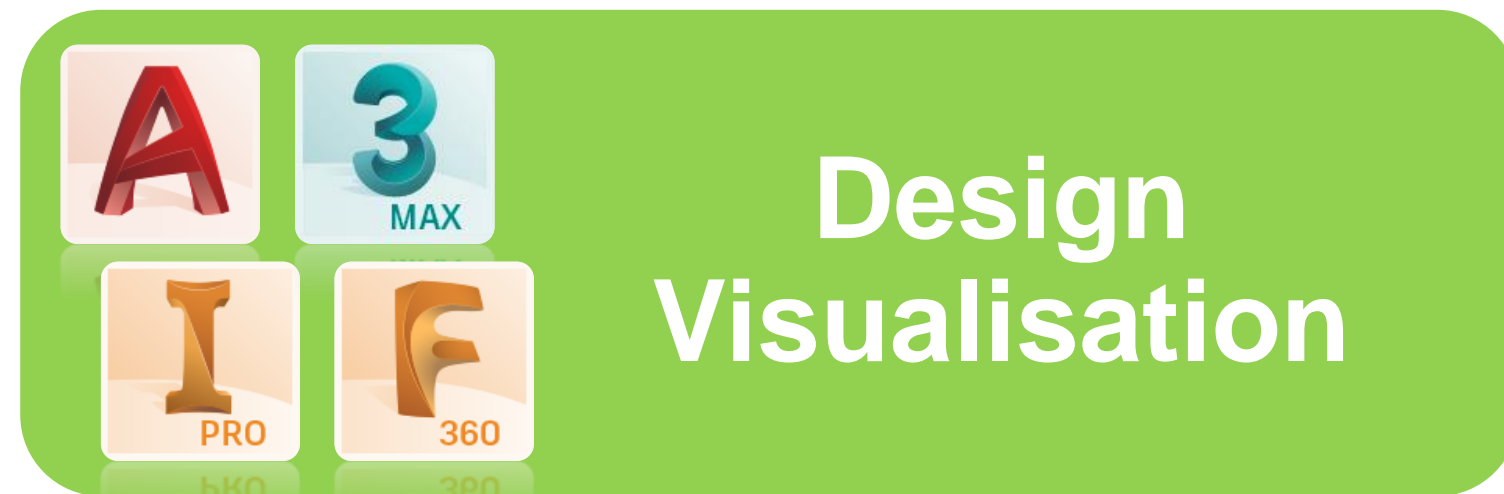


In Summary...

Autodesk's rendering and visualization capabilities are superb as you can see.



What to use where and when ???





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Make anything™

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