Visualize your Design with Autodesk technology

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Sr. Technical Sales Specialist

AUTODESK. UNIVERSITY

About the speakers

Ewald Egel

Technical Specialist – Fusion 360, Autodesk DACH

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Joined Autodesk in 2016. Product focus is the Fusion 360 platform

Master's degree in engineering and business, and 2 years in a project management role at Siemens

Demir Ali

Sr. Technical Specialist – Design & Manufacturing, UK and Ireland

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Joined Autodesk in 2012. Focus is the Product Design & Manufacturing Collection, Vault and VRED

Over 20 years' experience working with the Autodesk manufacturing portfolio.

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

AutoCAD

AutoCAD

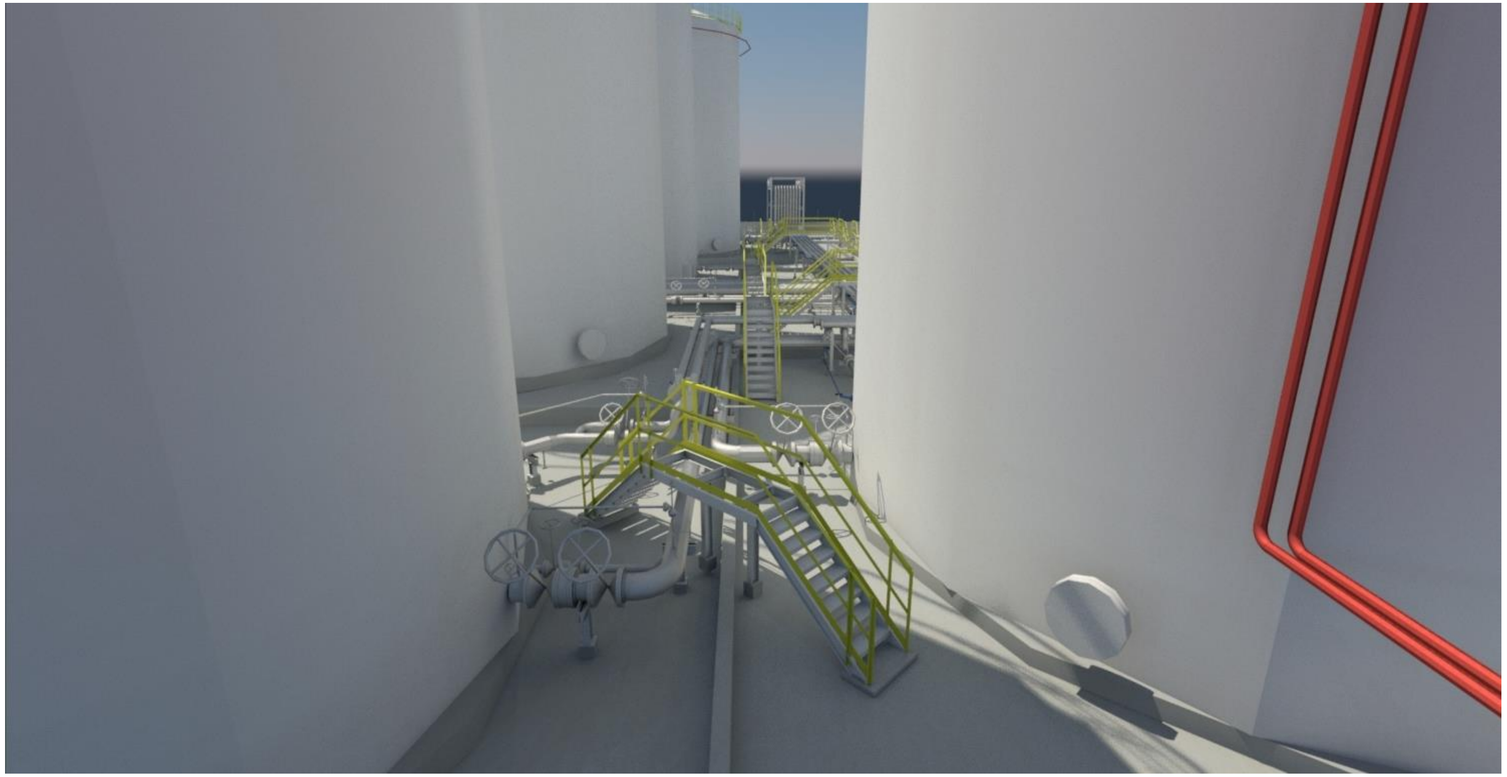
Comprehensive 3D Environment

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

AutoCAD

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.



AutoCAD

Creative output

Using multiple renders and “blending“ seperate images using Sketchbook / Photoshop to produce styalised imagery

AutoCAD

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

Autodesk Customer Success Story

David Romero

COMPANY
David Romero
LOCATION
Madrid, Spain
SOFTWARE
AutoCAD®
3ds Max®

Spanish architect David Romero recreates lost Frank Lloyd Wright buildings with AutoCAD

"I model the buildings in AutoCAD, and it's virtually all done there. These were real works of art. I hope my work can show the beauty of what we have lost."

— David Romero
Architect and Founder
Hooked on the Past

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

Spanish architect David Romero simply wanted to expand his 3D modeling skills. A fan of Frank Lloyd Wright's work since he was an architecture student, he decided to model one of Wright's buildings: the Rose Pauson house that was finished in 1942 but burned to the ground in 1943. He chose this particular structure because 3D tools serve precisely this purpose—the ability to see something that does not exist.

As Romero progressed with his very first rendering of the Pauson house, he realized the tremendous possibilities at hand and an entirely new passion. He started his website "Hooked on the Past" to explore the history of architecture, and he has now completed stunning renderings of Wright's E.A. Smith house, Trinity Chapel, and the Larkin Administration Building. Romero also works closely with the Frank Lloyd Wright Conservancy. And he captured quite a bit of media interest from Wired to The New York Times, too.

Here, Romero shares how he uses AutoCAD to help create these renderings, the process, and what he believes Wright would think about technology today.

Can you tell us a little bit more about the process of taking Frank Lloyd Wright's drawings or photos and transforming them into digital 3D renderings?

First, I collect all possible information about the work in question: blueprints, plans, elevations, perspectives, photographs, etc. With this information, I model the building in AutoCAD, and it's virtually all done there. If there are photographs or perspectives drawn by hand by Wright, these give me an idea of the materials and final image of the building.

I then export it to 3ds Max where I add the lights, cameras, and textures, as well as details of furniture and vegetation. Finally, once I have the renders made, I usually make small adjustments to the final images in Photoshop.

What was the most challenging part of the renderings you've done so far and how did you overcome it?

For the Larkin Administration building, creating the sculptures was a real challenge. With the Pauson house, making a convincing

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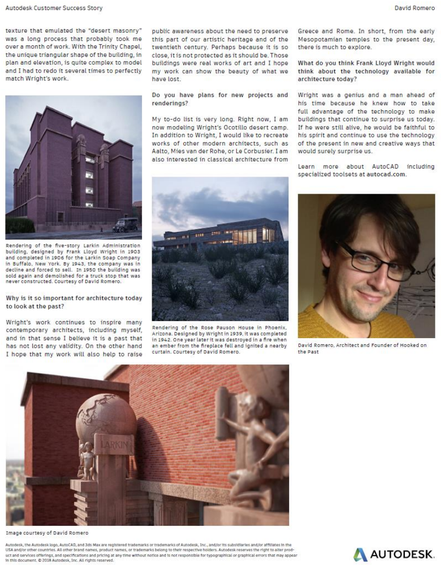

Autodesk Customer Success Story

David Romero

texture that emulated the "desert masonry" was a long process that probably took me over a month of work. With the Trinity Chapel, the unique triangular shape of the building, in plan and elevation, is quite complex to model and I had to redo it several times to perfectly match Wright's work.

Rendering of the five-story Larkin Administration building, designed by Frank Lloyd Wright in 1903 and completed in 1906 for the Larkin Soap Company in Buffalo, New York. By 1943, the company was in decline and forced to sell. In 1950 the building was sold again and demolished for a truck shop that was never constructed. Courtesy of David Romero.

Why is it so important for architecture today to look at the past?

Wright's work continues to inspire many contemporary architects, including myself, and in that sense I believe it is a past that has not lost any validity. On the other hand I hope that my work will also help to raise public awareness about the need to preserve this part of our artistic heritage and of the twentieth century. Perhaps because it is so close, it is not protected as it should be. Those buildings were real works of art and I hope my work can show the beauty of what we have lost.

Do you have plans for new projects and renderings?

My to-do list is very long. Right now, I am now modeling Wright's Ocotillo desert camp. In addition to Wright, I would like to recreate works of other modern architects, such as Aalto, Mies van der Rohe, or Le Corbusier. I am also interested in classical architecture from

Rendering of the Rose Pauson house in Phoenix, Arizona. Designed by Wright in 1939, it was completed in 1942. One year later it was destroyed in a fire when an ember from the fireplace fell and ignited a nearby curtain. Courtesy of David Romero.

Greece and Rome. In short, from the early Mesopotamian temples to the present day, there is much to explore.

What do you think Frank Lloyd Wright would think about the technology available for architecture today?

Wright was a genius and a man ahead of his time because he knew how to take full advantage of the technology to make buildings that continue to surprise us today. If he were still alive, he would be faithful to his spirit and continue to use the technology of the present in new and creative ways that would surely surprise us.

Learn more about AutoCAD including specialized toolsets at autocad.com.

David Romero, Architect and Founder of Hooked on the Past

Image courtesy of David Romero

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Cloud Rendering

Cloud Rendering

Photorealistic rendering

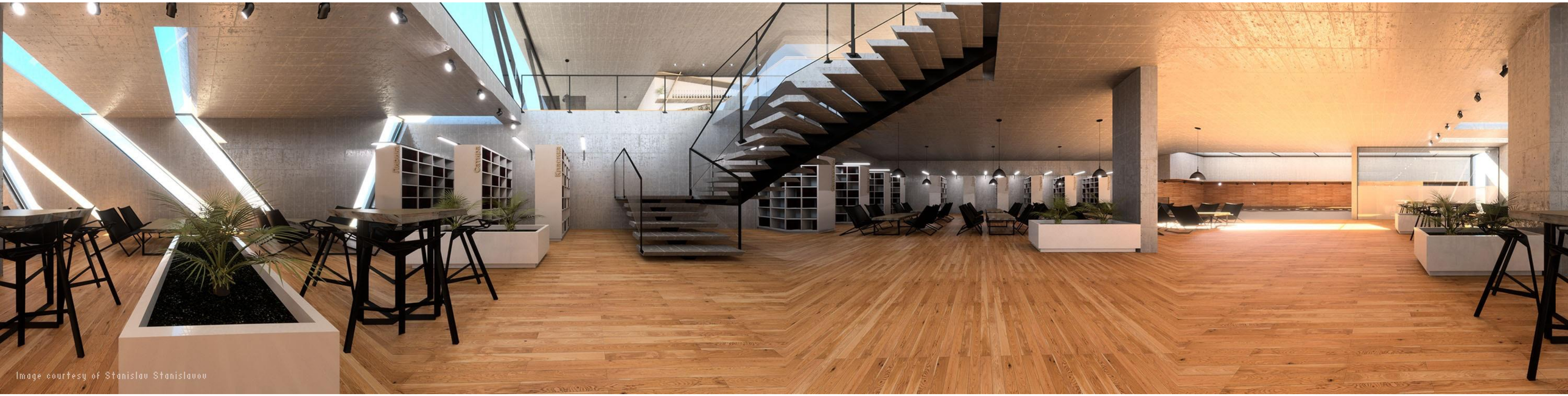
Produce stunning, high-quality renderings from designs and models with cloud rendering.

Cloud Rendering

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

Cloud Rendering

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



Cloud Rendering

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
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AUTOCAD®

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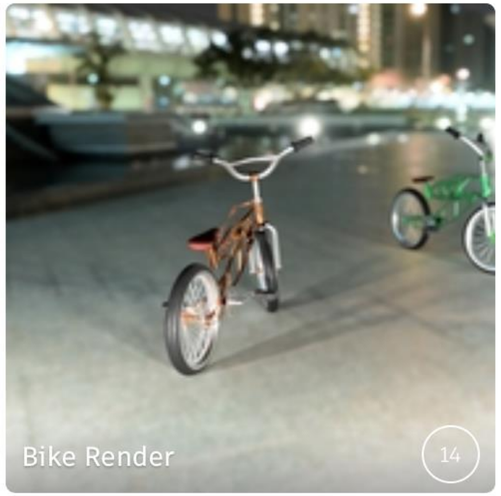
Ewald Egel

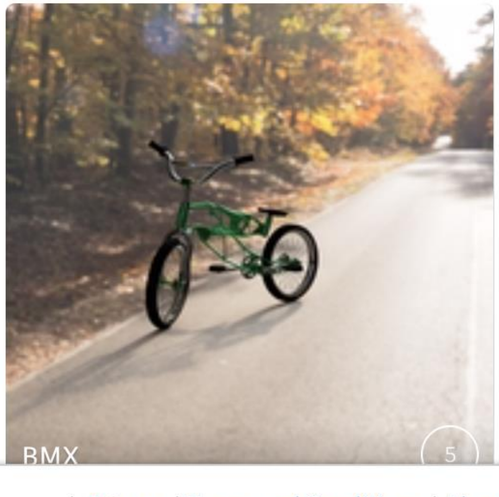
Subscription

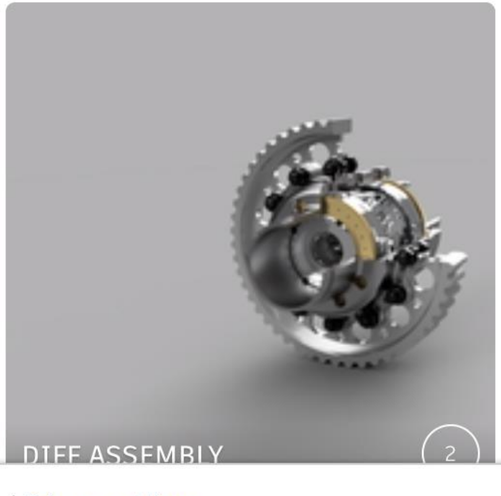
578 Projects

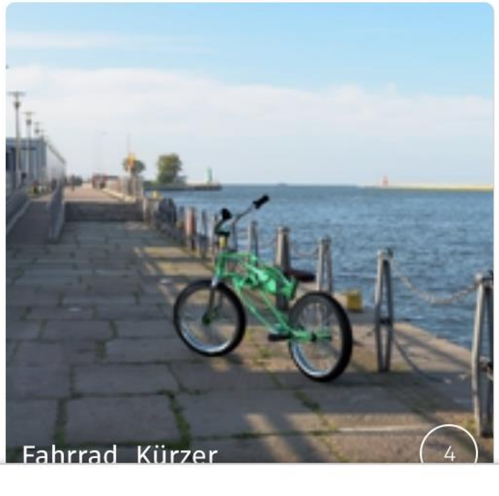
303444 Cloud credits

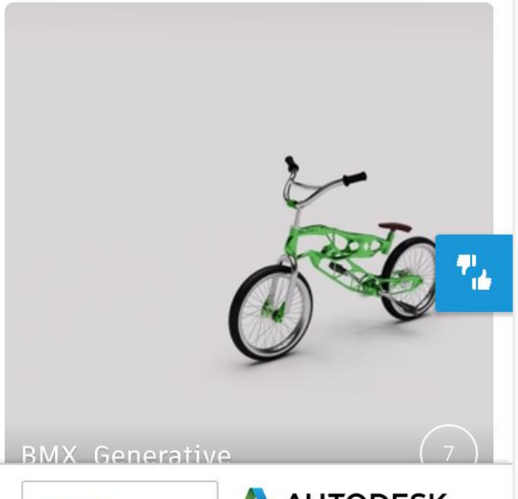
Search projects...











English

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Latest Renderings (14/14)

Rerender | Render as:

English

AUTODESK.

Inventor Studio

Inventor Studio

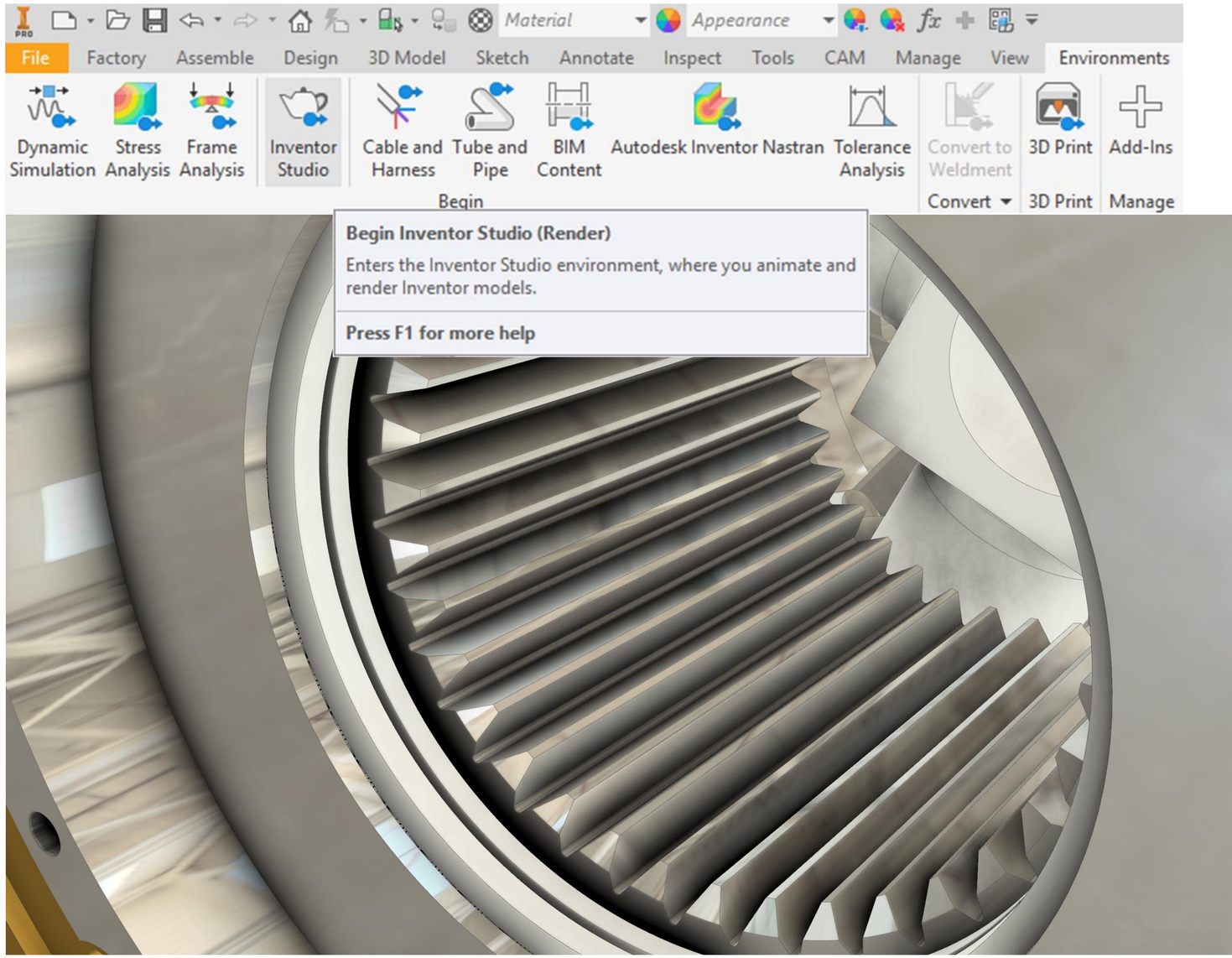
Its not just about Studio!

You can utilise the graphics window to produce some very good results quickly and easily

Inventor Studio

Inventor Studio gives…

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



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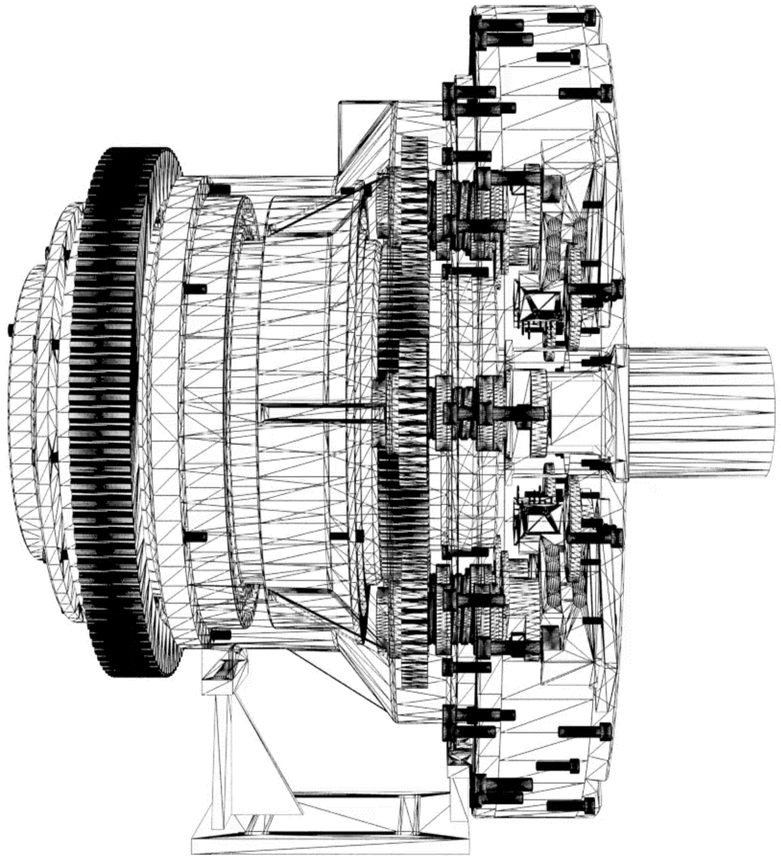

Inventor Studio

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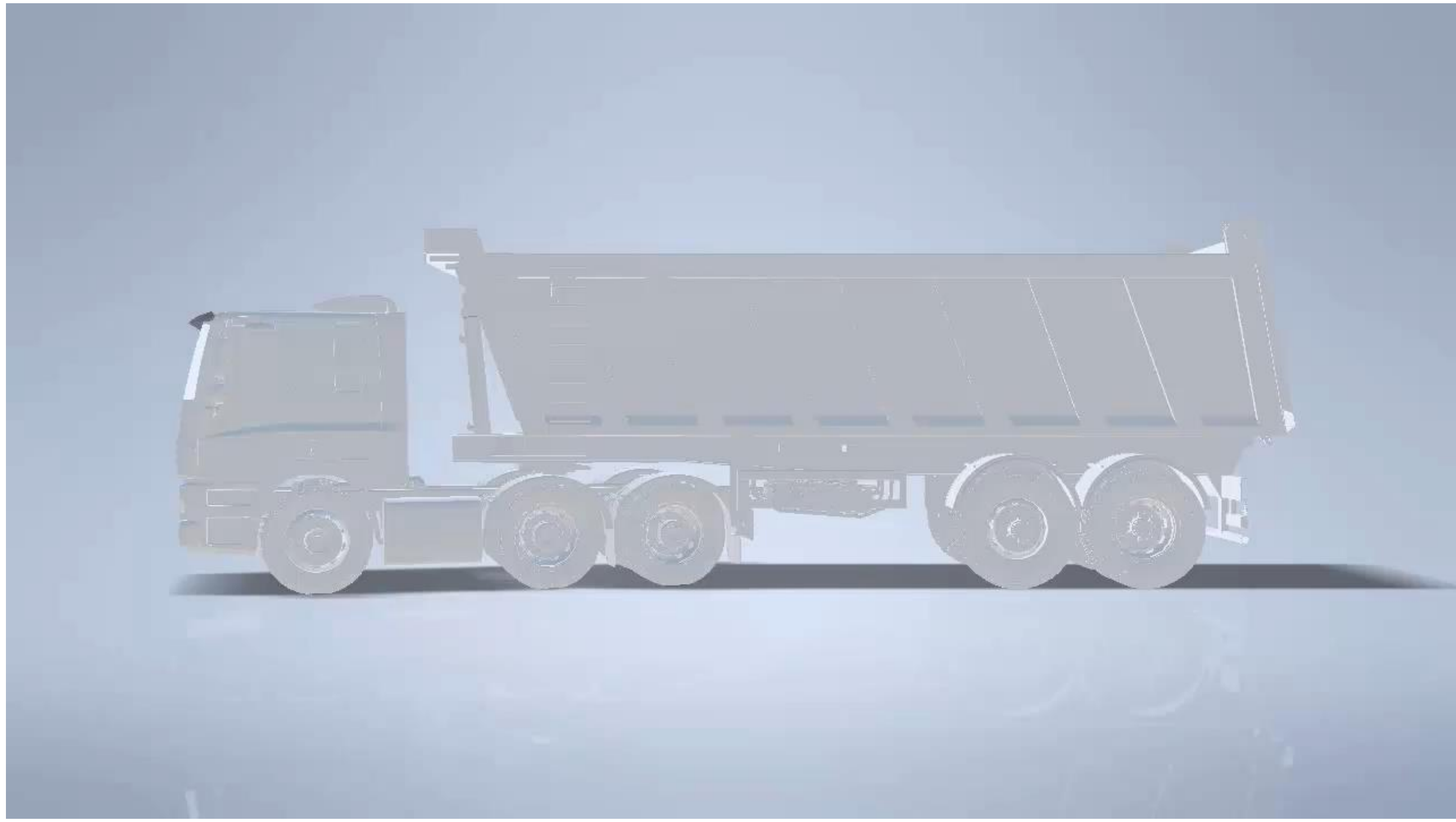


3DS Max

3DS Max

Industry Standard…

Max is widely regarded as an industry standard for CGI.

3DS Max

Particularly within Architecture

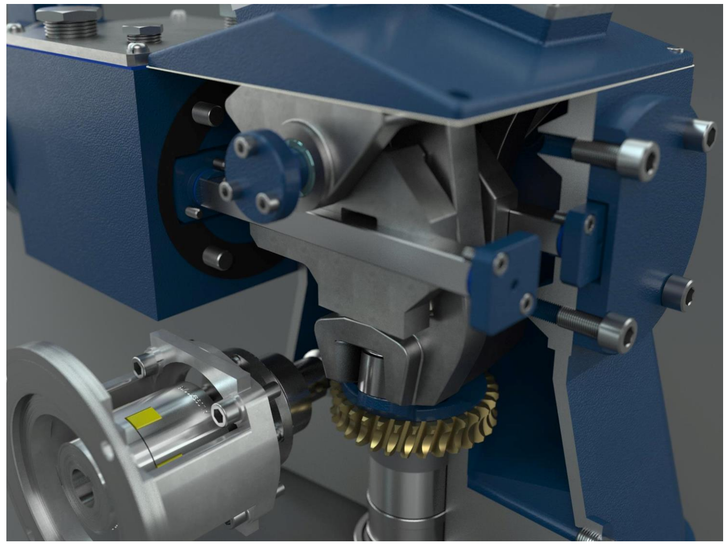
3DS Max

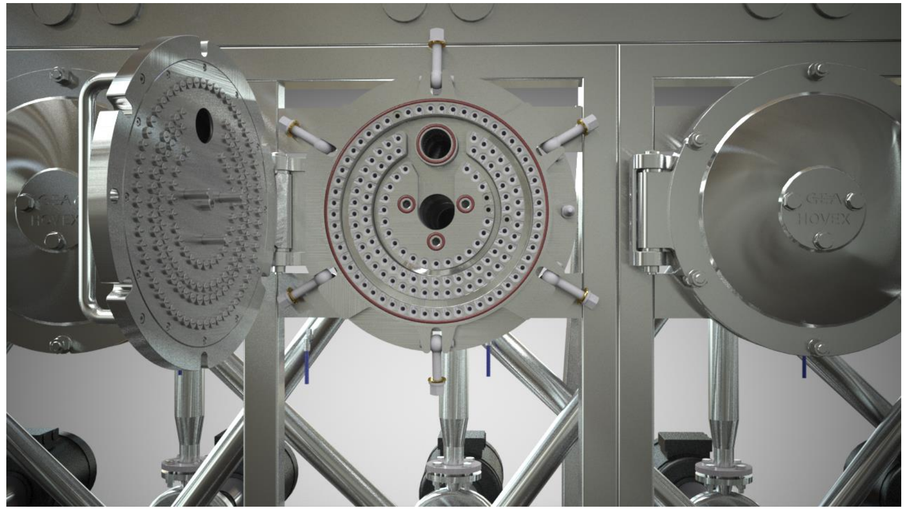
Anime…
Games…
Creative arts…
Advertising…

3DS Max

Product Design and Manufacturing

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





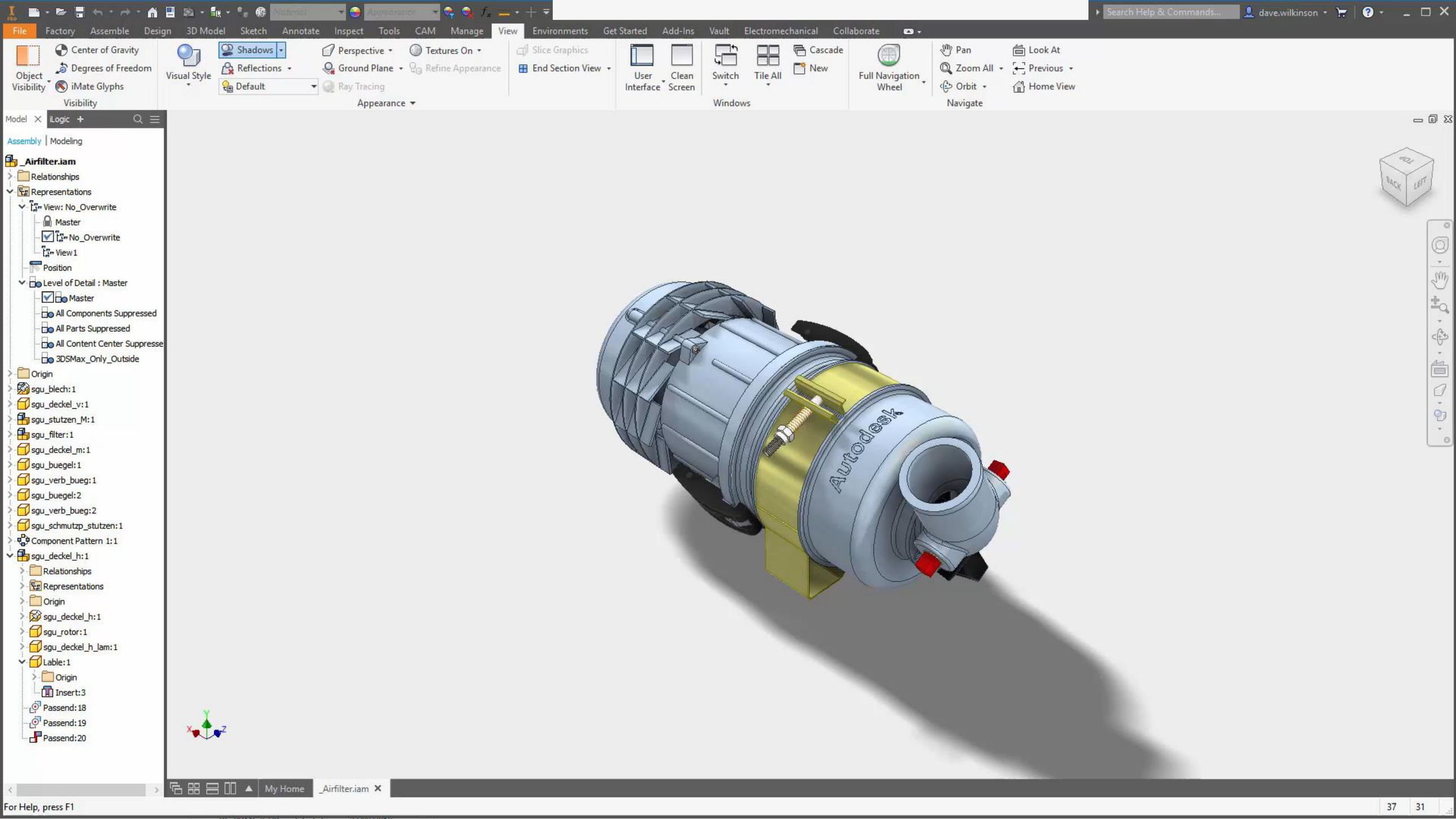
3DS Max

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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Sketch
Annotate
Inspect
Tools
CAM
Manage
View
Environments
Get Started
Add-Ins
Vault
Electromechanical
Collaborate
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Center of Gravity
Degrees of Freedom
iMate Glyphs
Visibility
Visual Style
Shadows
Reflections
Default
Perspective
Ground Plane
Ray Tracing
Textures On
Refine Appearance
Slice Graphics
End Section View
Appearance
User Interface
Clean Screen
Switch
Tile All
Cascade
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3DSMax_Only_Outside
Origin
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sgu_stutzen_M:1
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sgu_deckel_m:1
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Lable:1
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Passend:18
Passend:19
Passend:20
Autodesk
My Home
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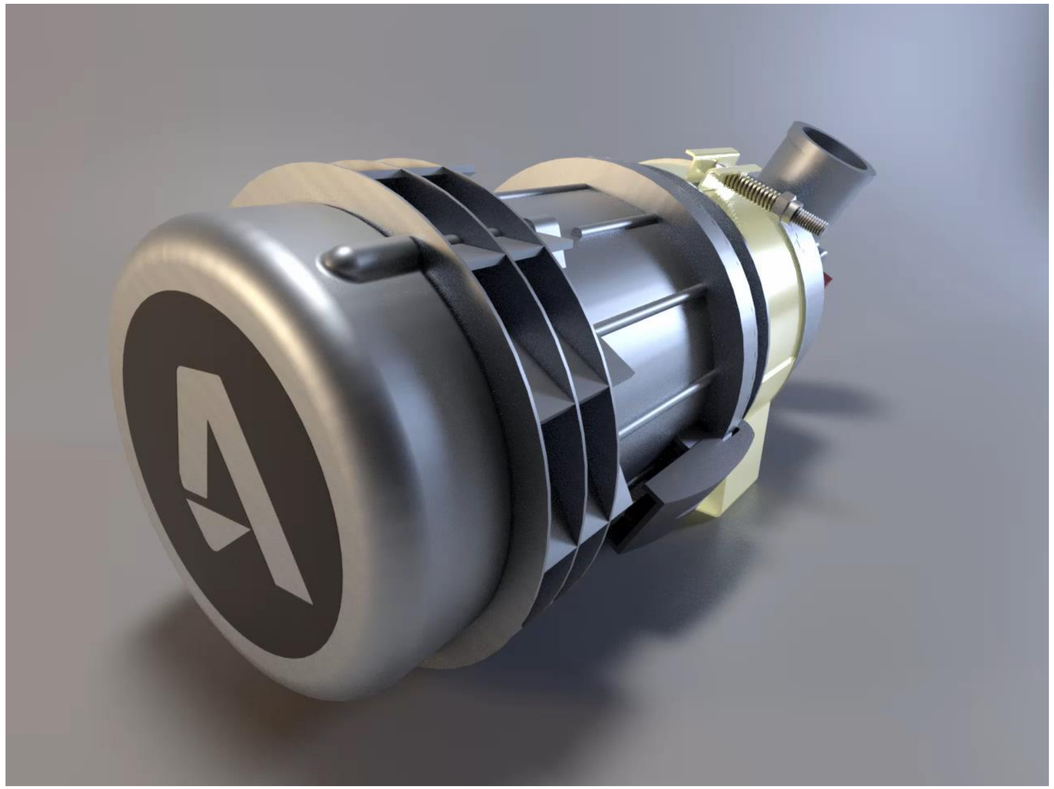
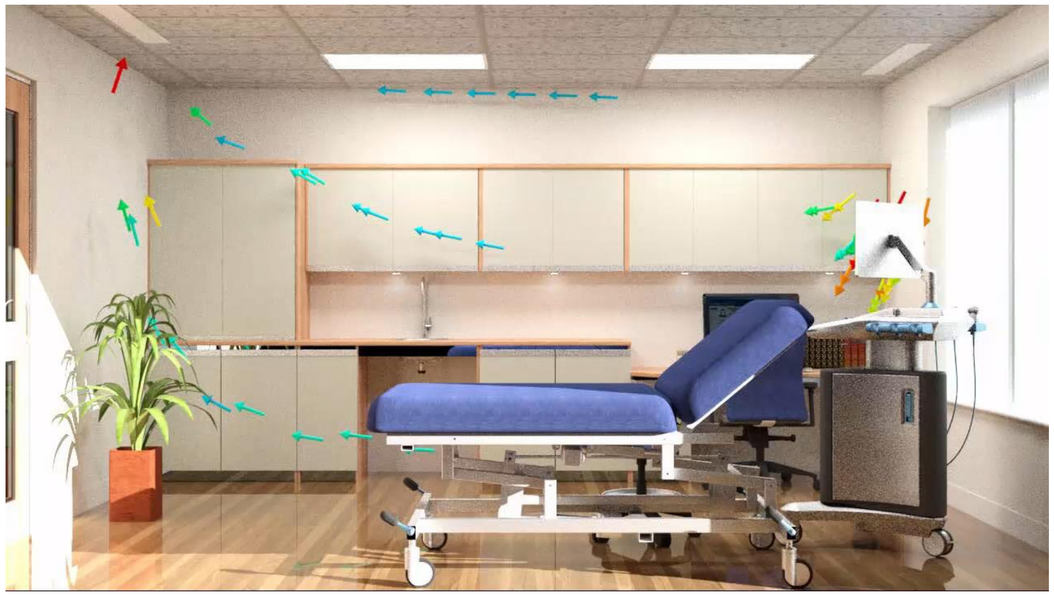
For Help, press F1
37
31

DS Max

Why use Max.. ?

- Included with Autodesk’s Collections
- Photorealistic imagery
- Virtual product shoots
- Tell a story
- Make a movie….!
- Lighting analysis
- Daylight analysis
- Visualize CFD results
- Reuse Inventor animations





DS Max


MAX
LIQUID
Honey
Density: 1440
Viscosity: 17.0
Surface Tension: 0.04

Navisworks

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.

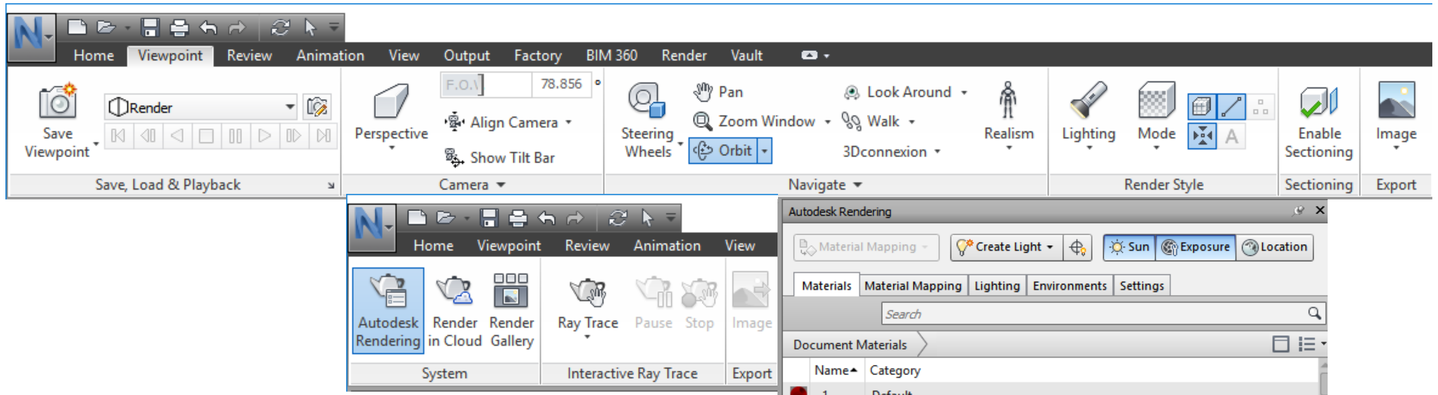
Navisworks Manage

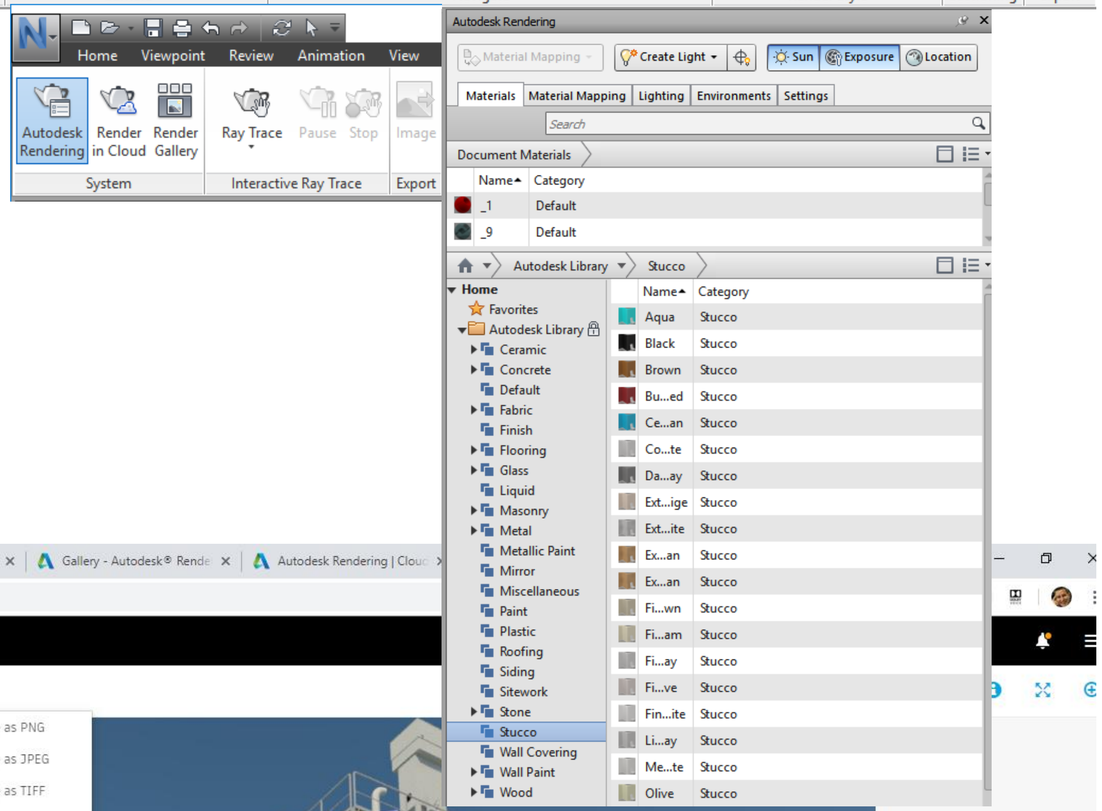
Alpha channel image (Cloud only)

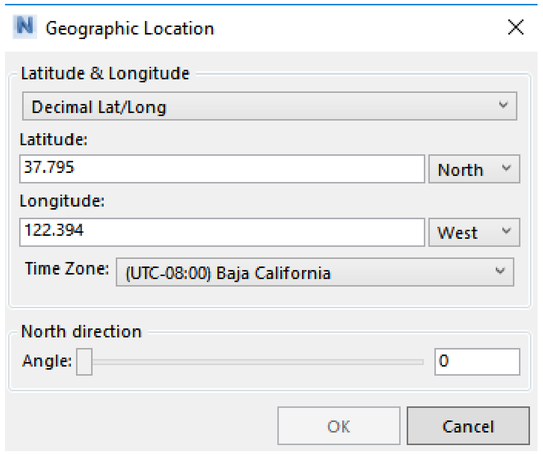
Allowing transparent background for use with other images and scenes etc

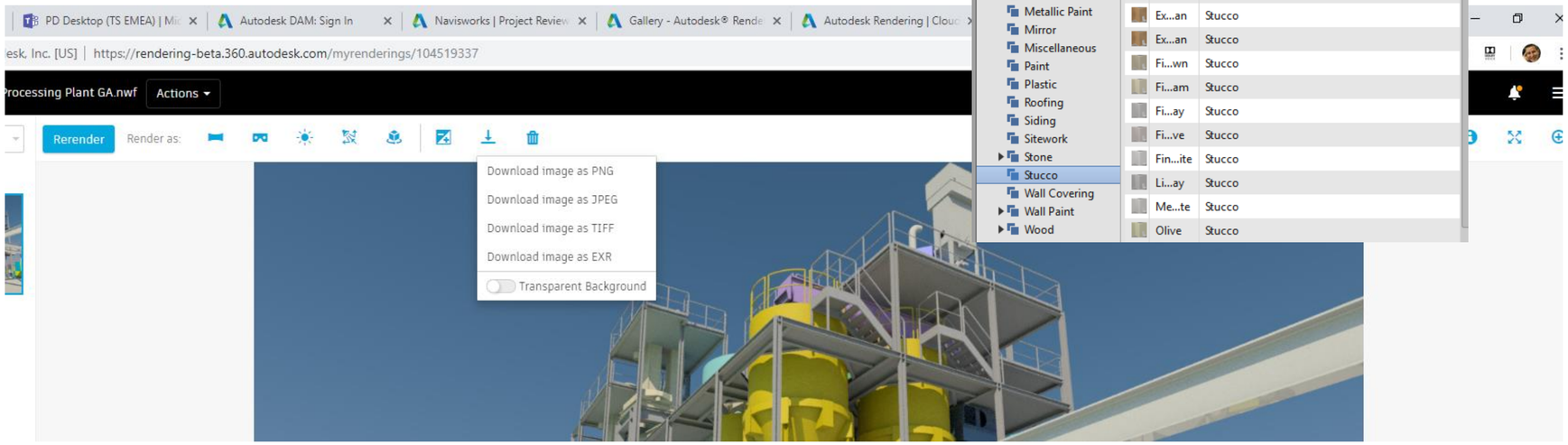
Navisworks Manage

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





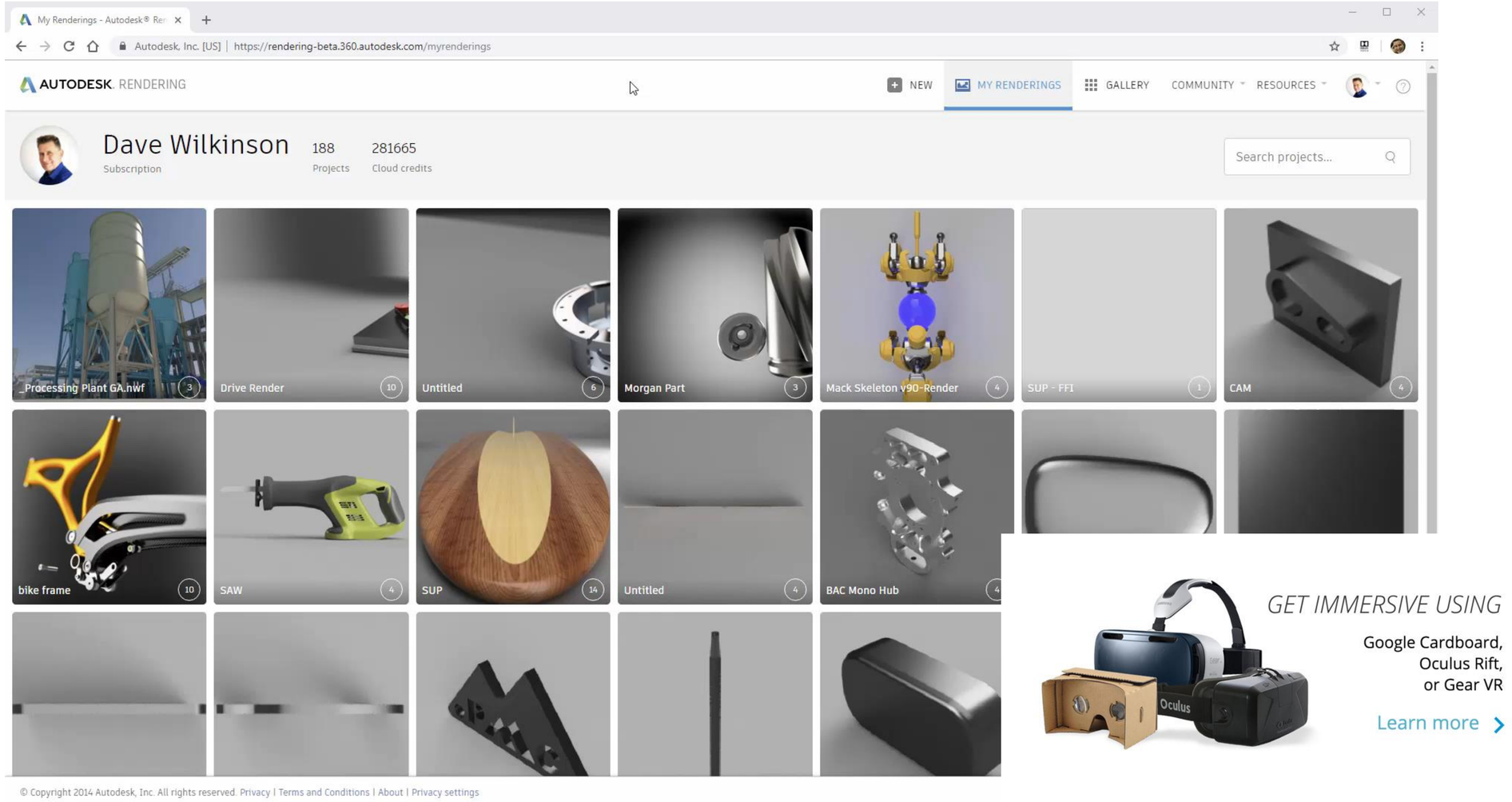




Navisworks Manage

Panoramas, solar studies, illuminance

Generate 360 panoramas inc Stereo.



Navisworks Manage

In summary

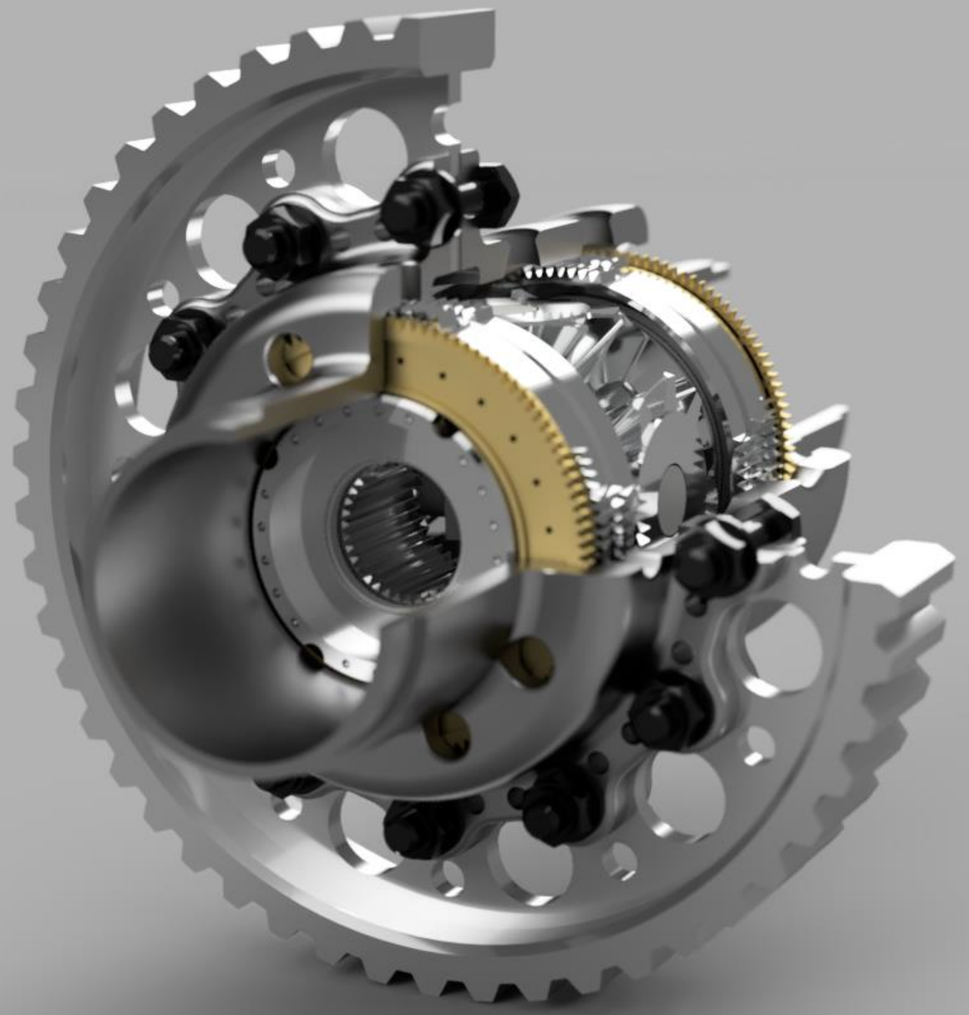
An effective way to render large projects and datasets, especially when used with cloud rendering.
Use the desktop render with Time Limit to setup the view.
Save your viewpoint and send to render in the cloud.

Fusion 360

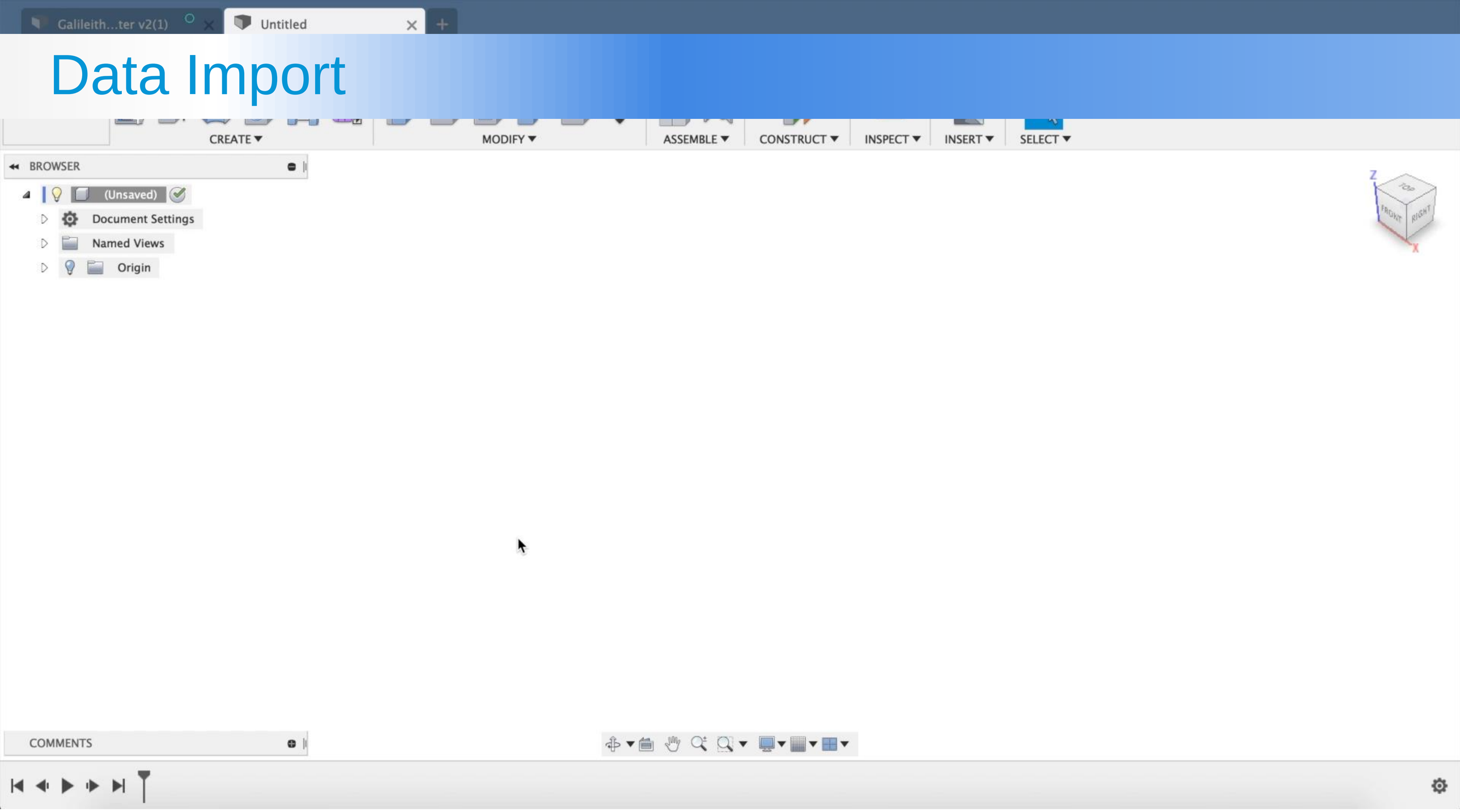
Fusion 360

Render Set-Up

- Import any CAD data
- Materials library
- Easy of use:
  - Drag & drop materials
  - Drag & drop environments
- Tips & Tricks



Data Import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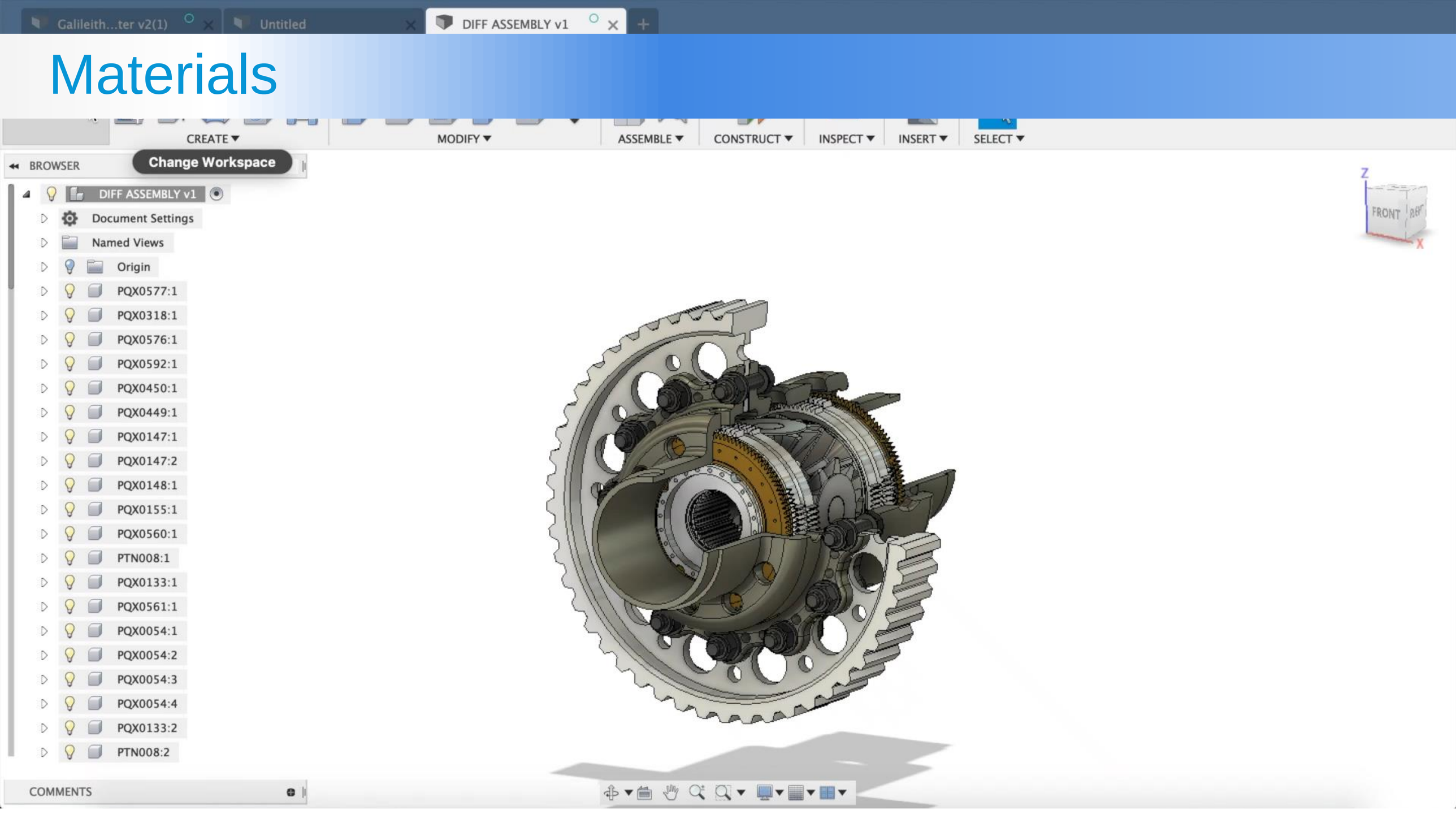
Materials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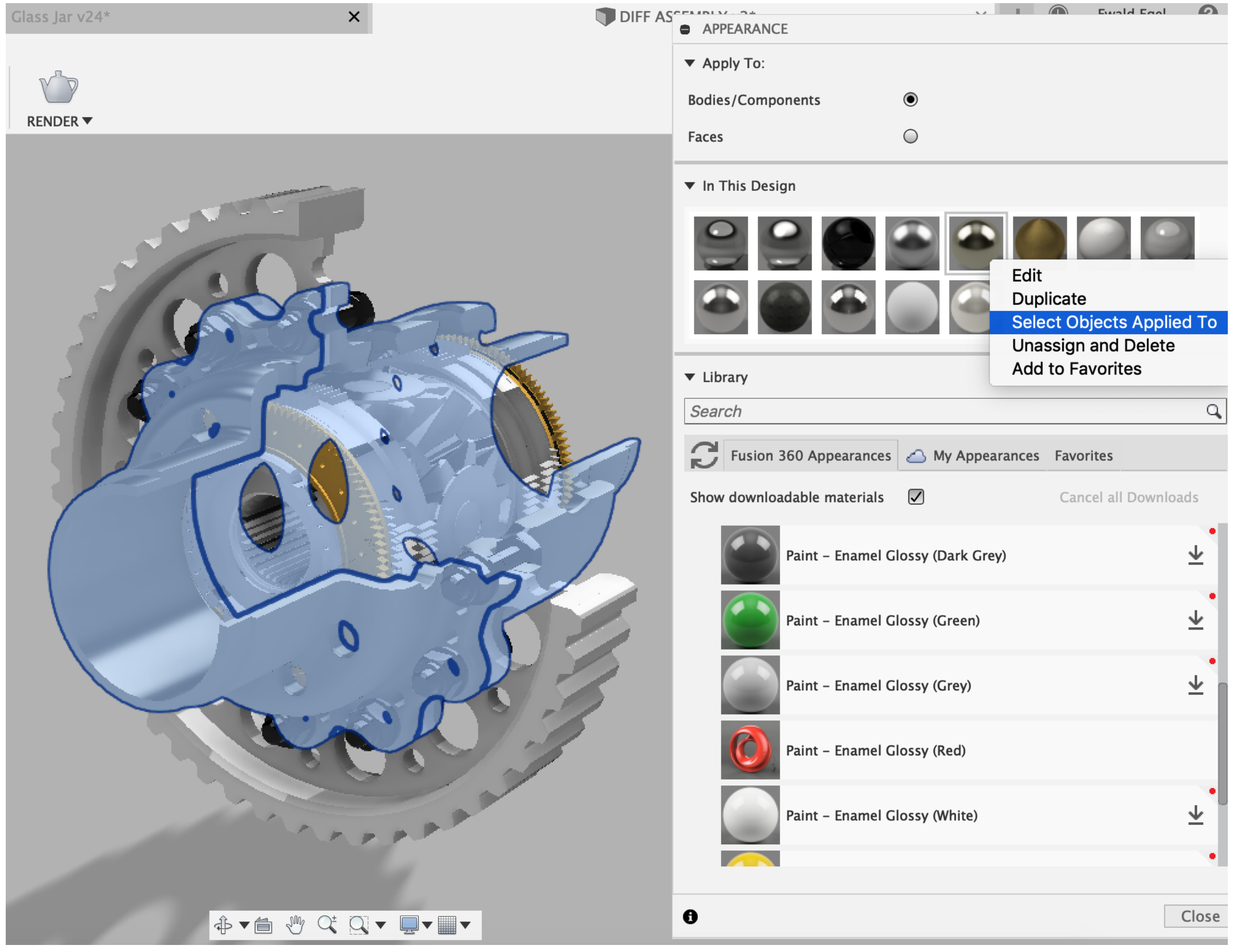
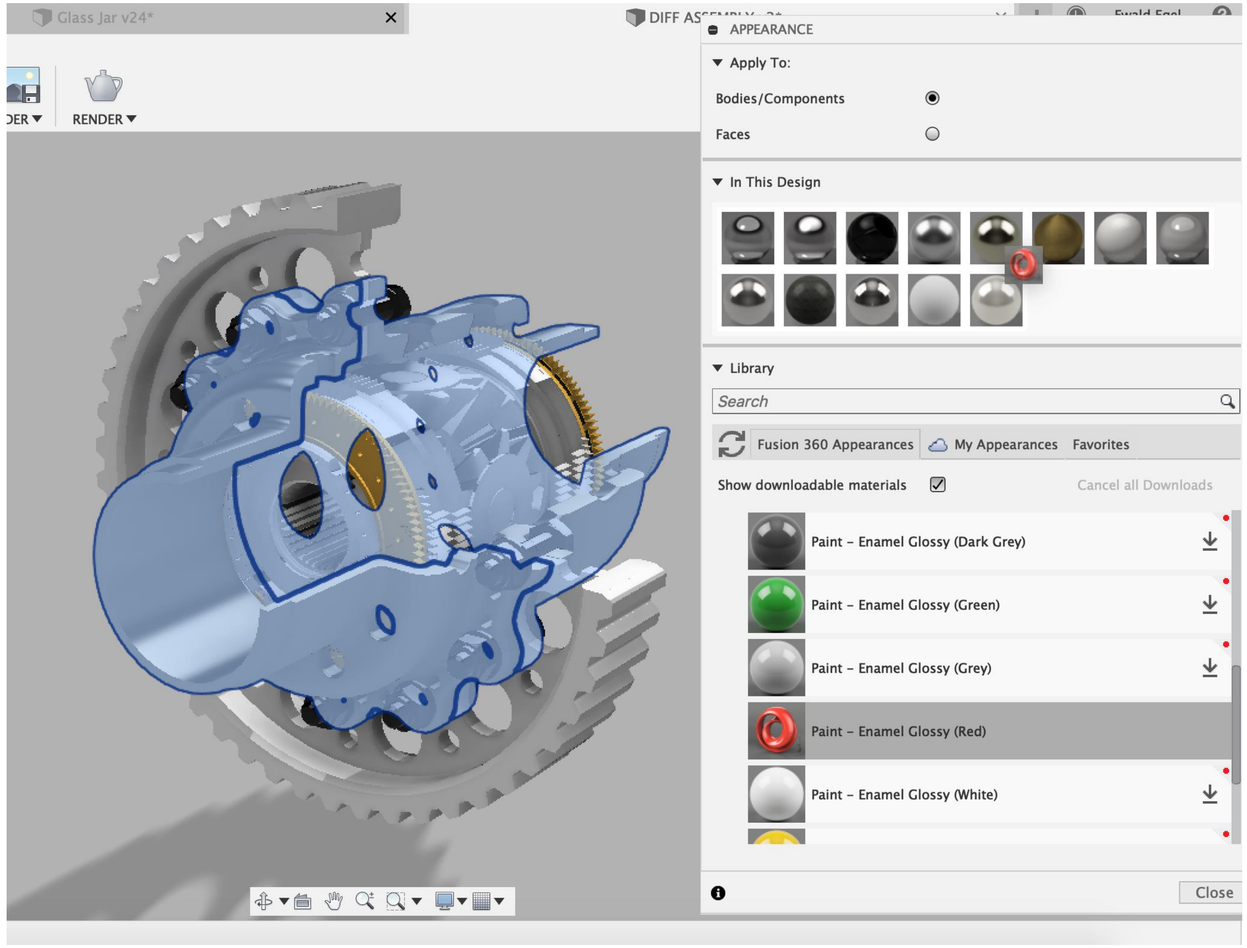
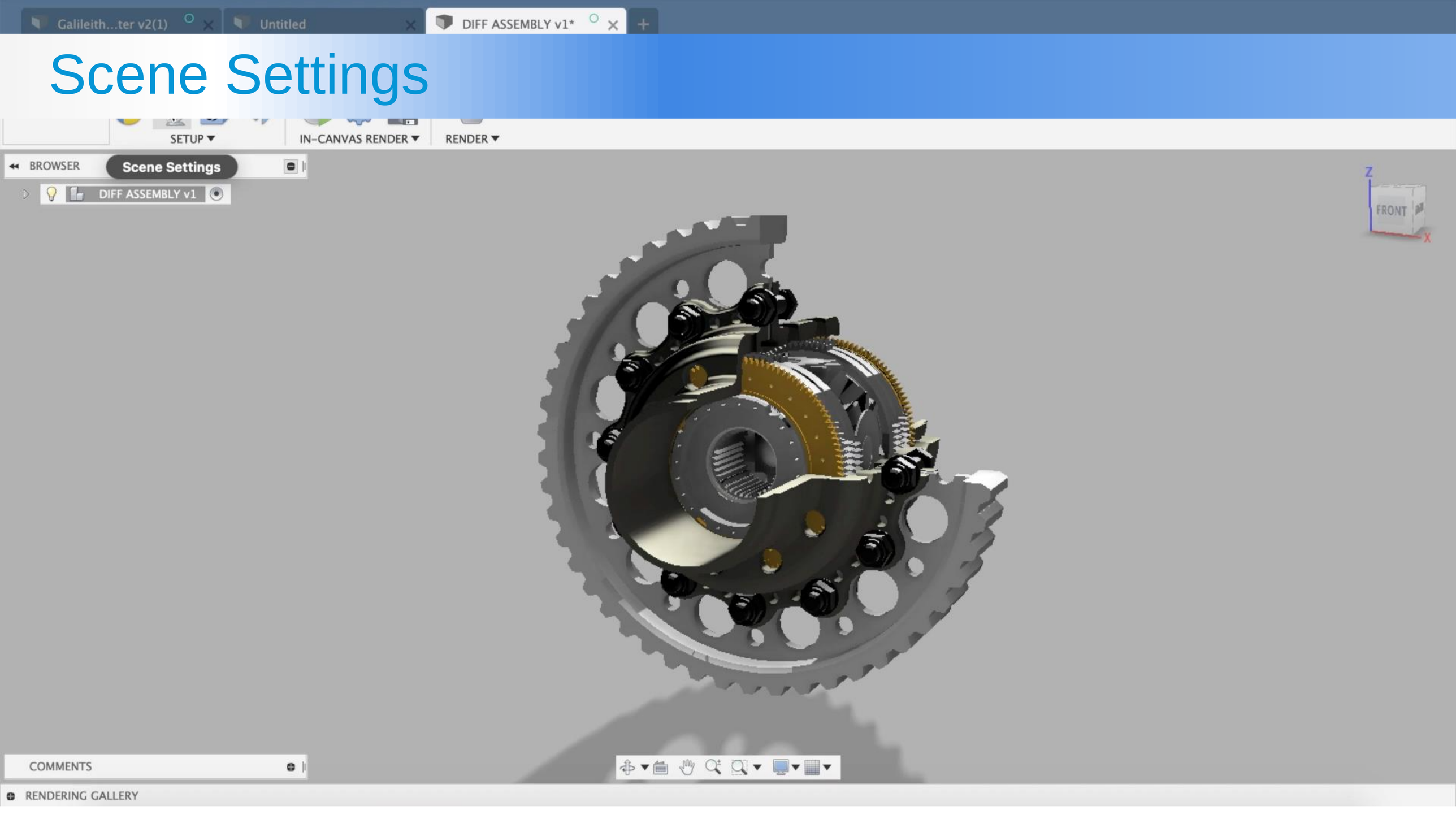
Materials

Apply materials on multiple bodies

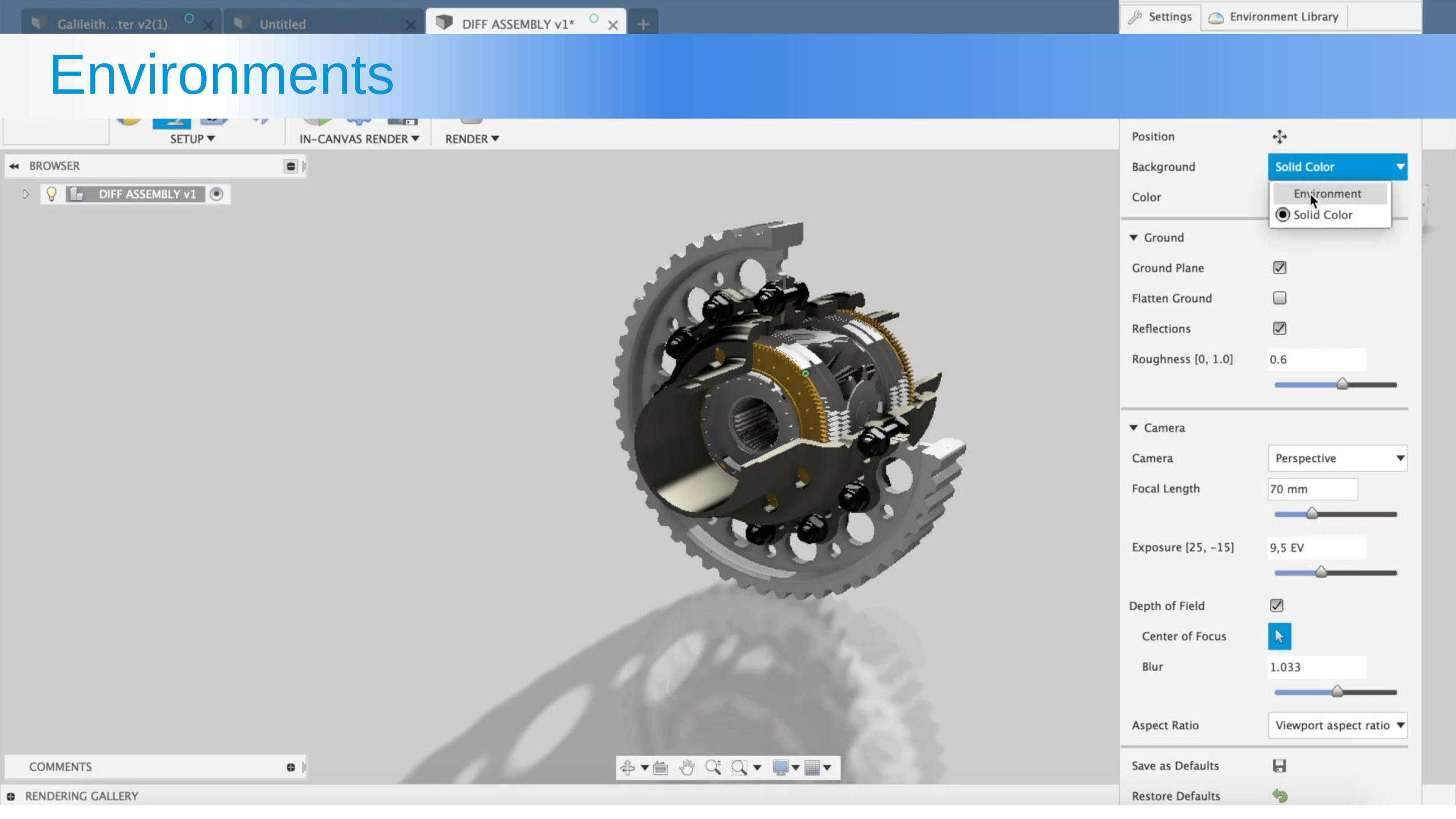




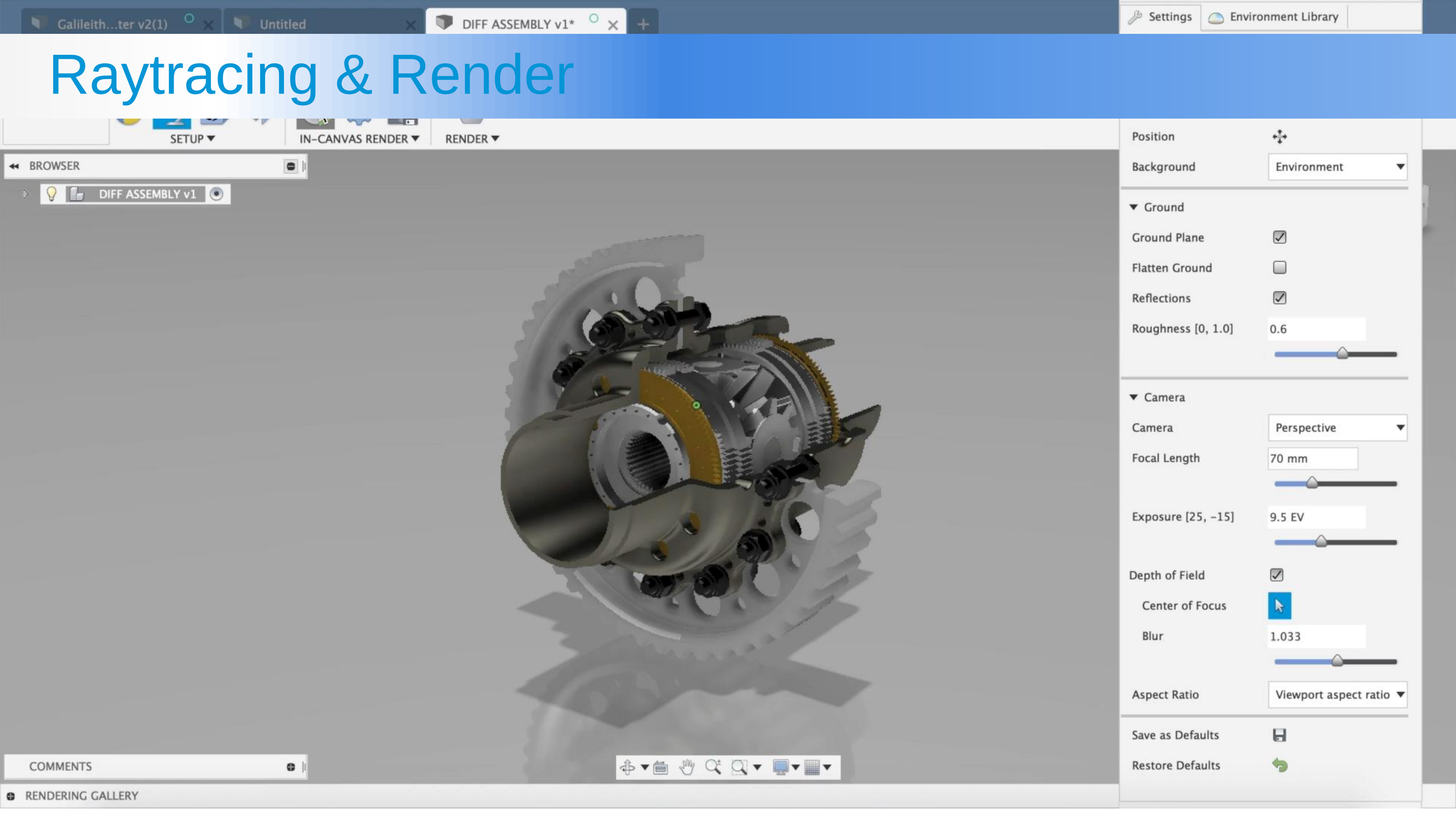
Scene Settings



Environments



Raytracing & Render



Glass & Fluids

- Nested Dielectrics
- Caustics

Modeling approach

Four main render modeling techniques

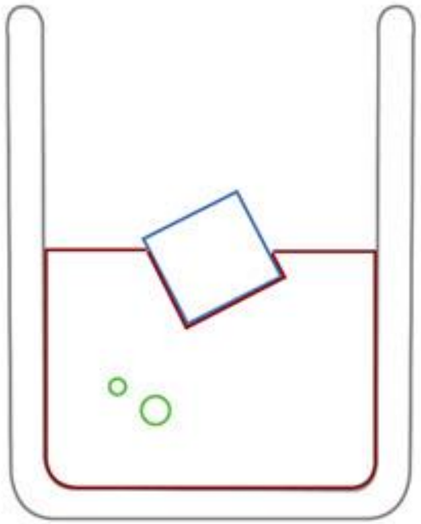


Fig 1

Coincident

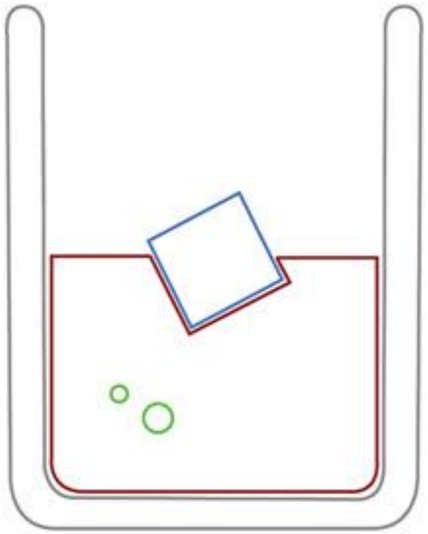


Fig 2

Air Gap

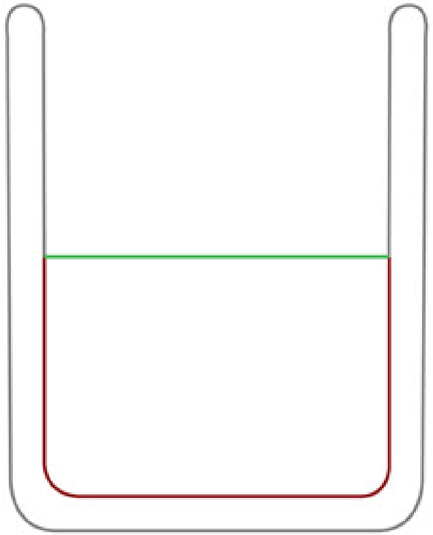


Fig 3

Interfaces

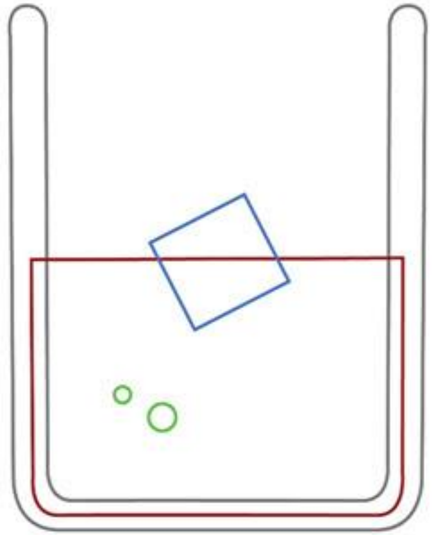


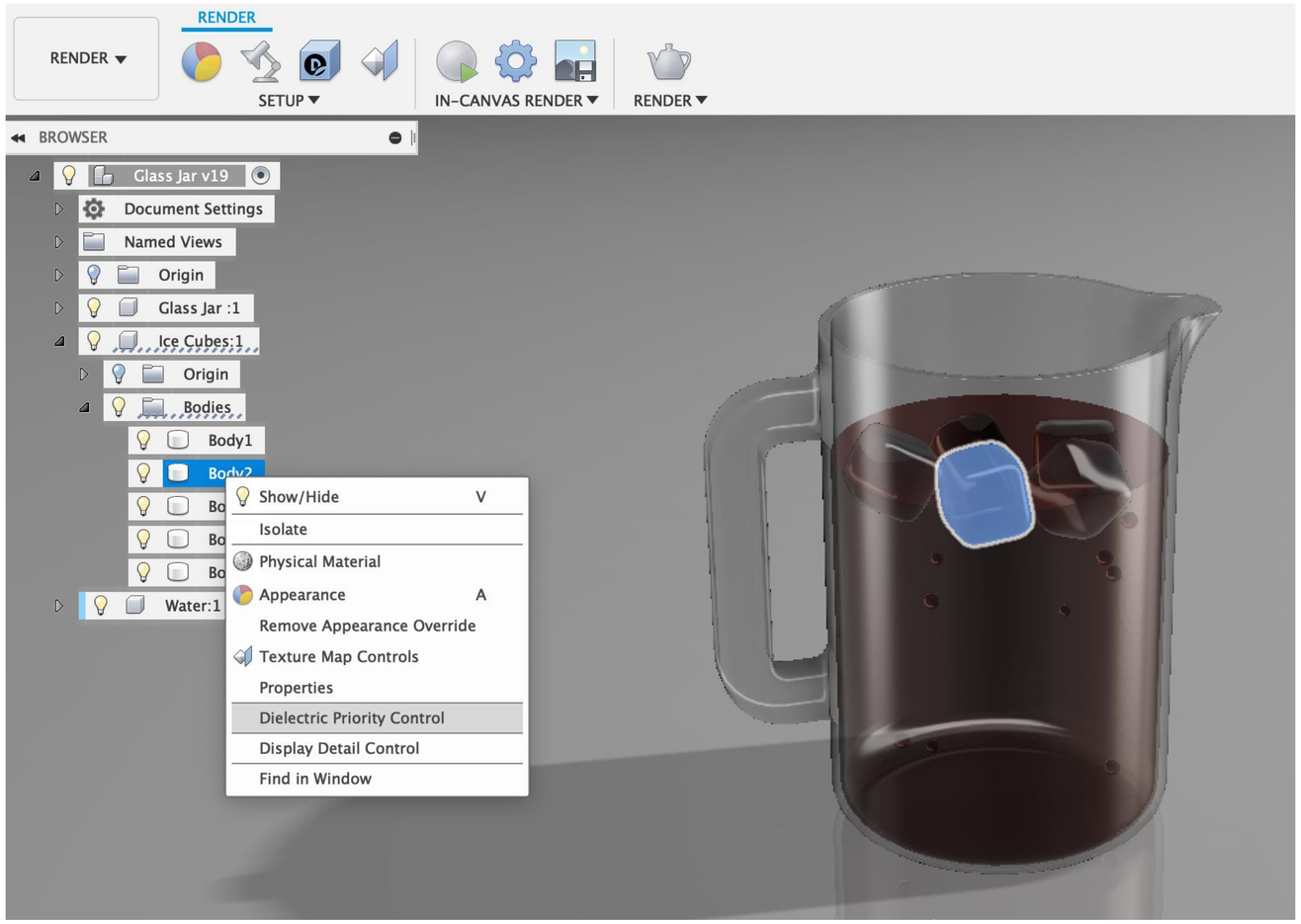
Fig 4

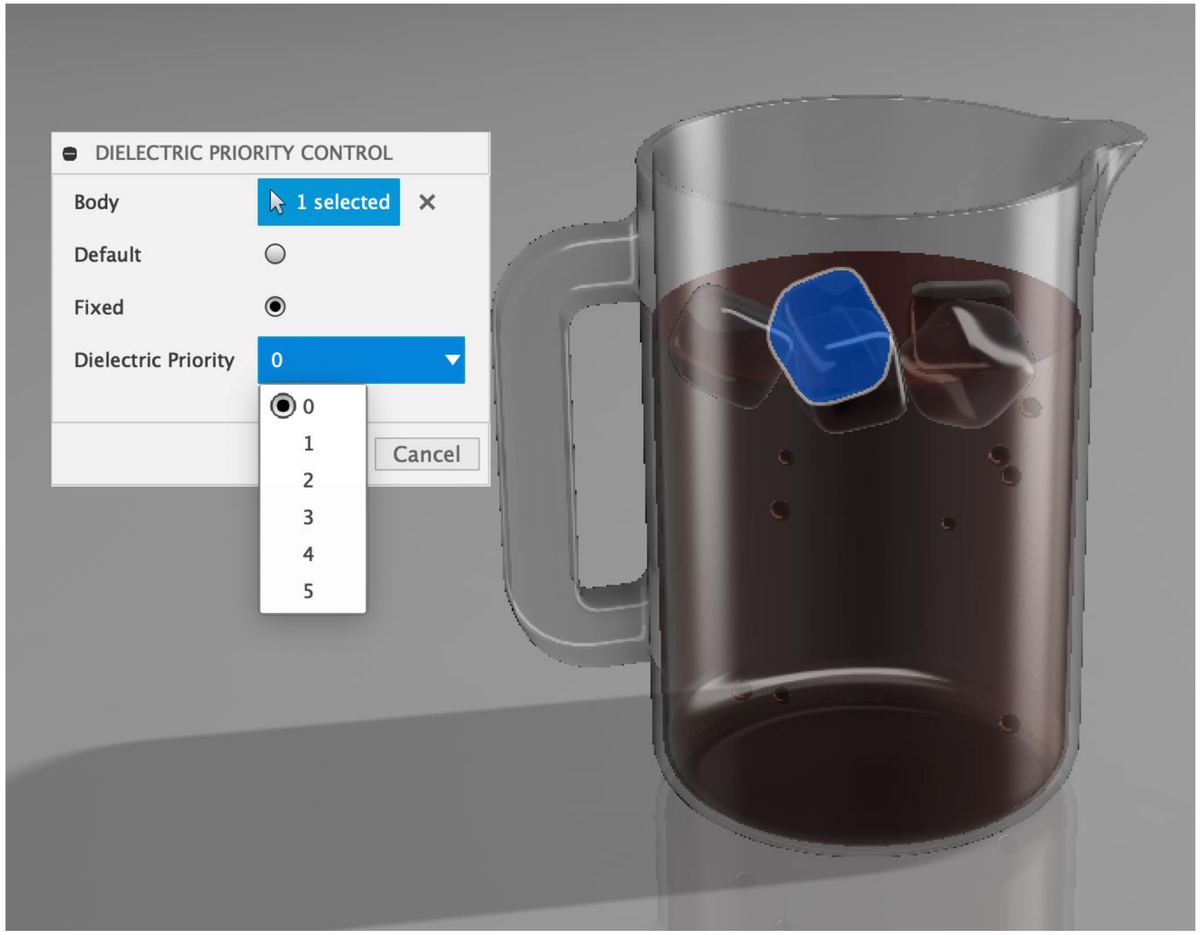
Overlap

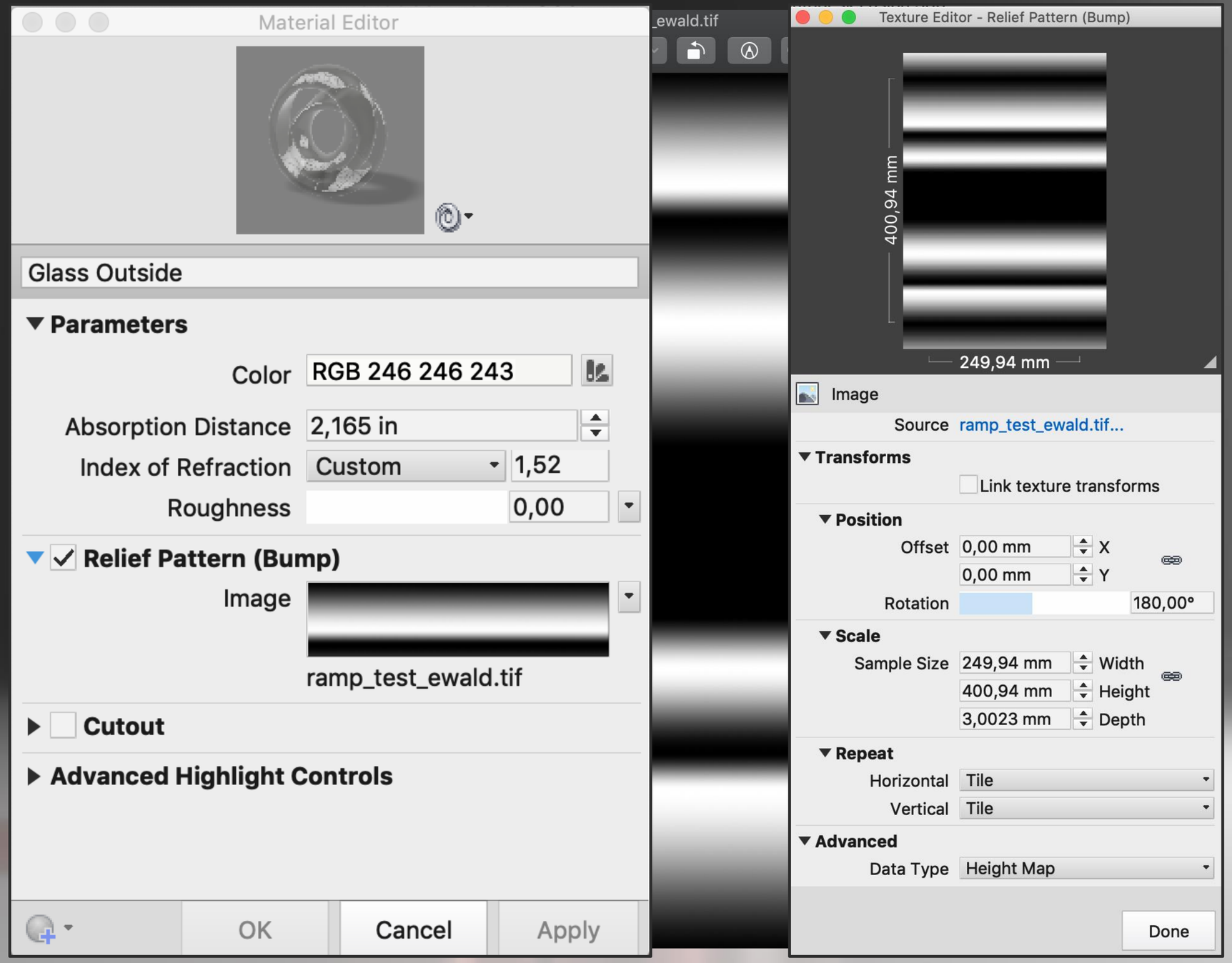
DIELECTRIC CONTROL

Nested Dielectrics

Define dielectric priorities for shader

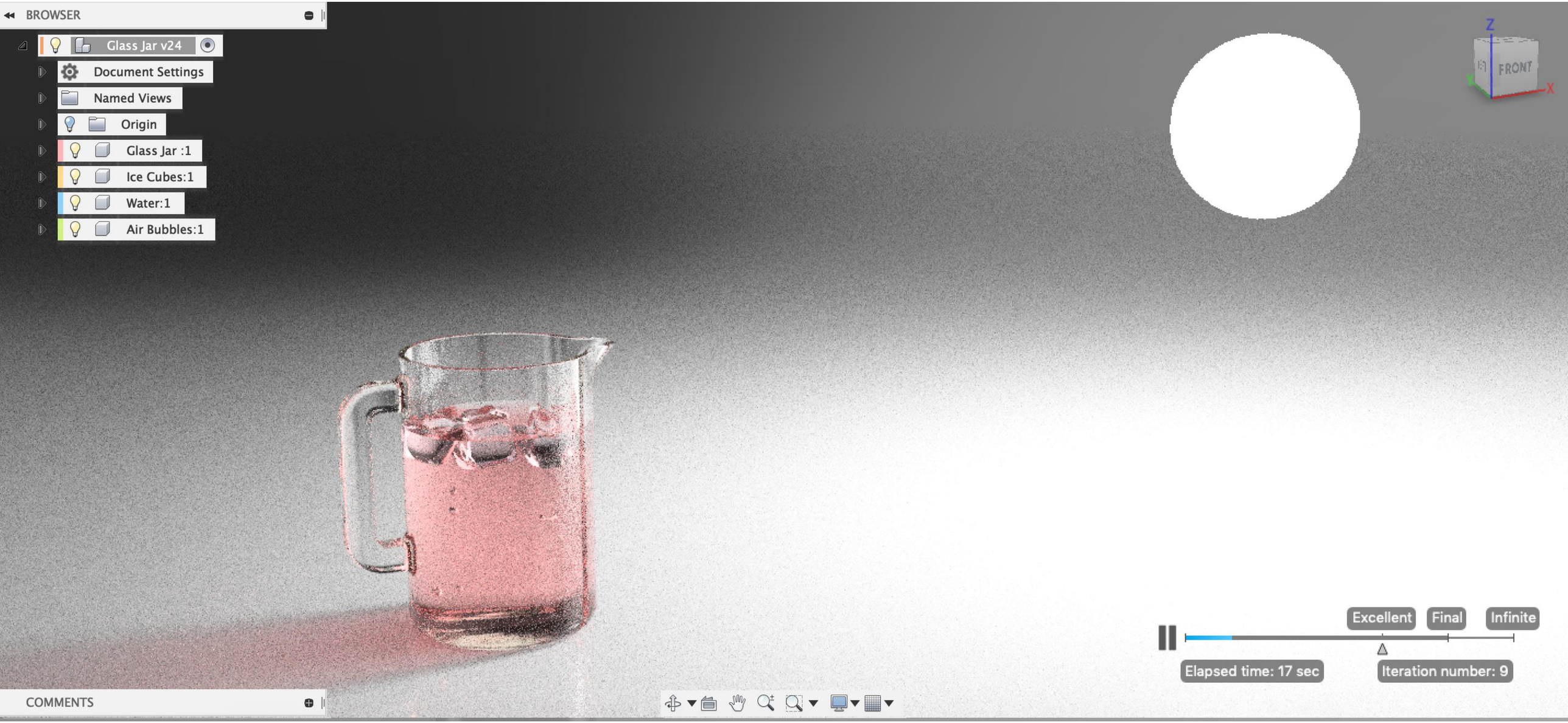





Material Editor
Glass Outside
Parameters
Color
RGB 246 246 243
Absorption Distance
2,165 in
Index of Refraction
Custom
1,52
Roughness
0,00
Relief Pattern (Bump)
Image
ramp_test_ewald.tif
Cutout
Advanced Highlight Controls
OK
Cancel
Apply
_ewald.tif
Texture Editor - Relief Pattern (Bump)
400,94 mm
249,94 mm
Image
Source
ramp_test_ewald.tif...
Transforms
Link texture transforms
Position
Offset
0,00 mm
X
0,00 mm
Y
Rotation
180,00°
Scale
Sample Size
249,94 mm
Width
400,94 mm
Height
3,0023 mm
Depth
Repeat
Horizontal
Tile
Vertical
Tile
Advanced
Data Type
Height Map
Done

Tips & Tricks

External Light Sources



Depth of Field

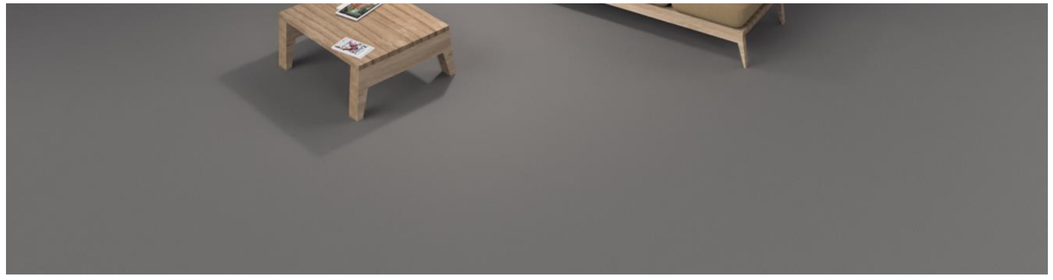
Add objects as external depth of field

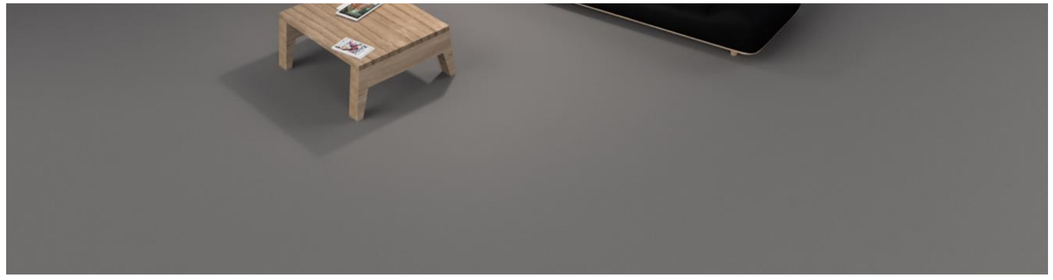
Named Views

RENDERING GALLERY

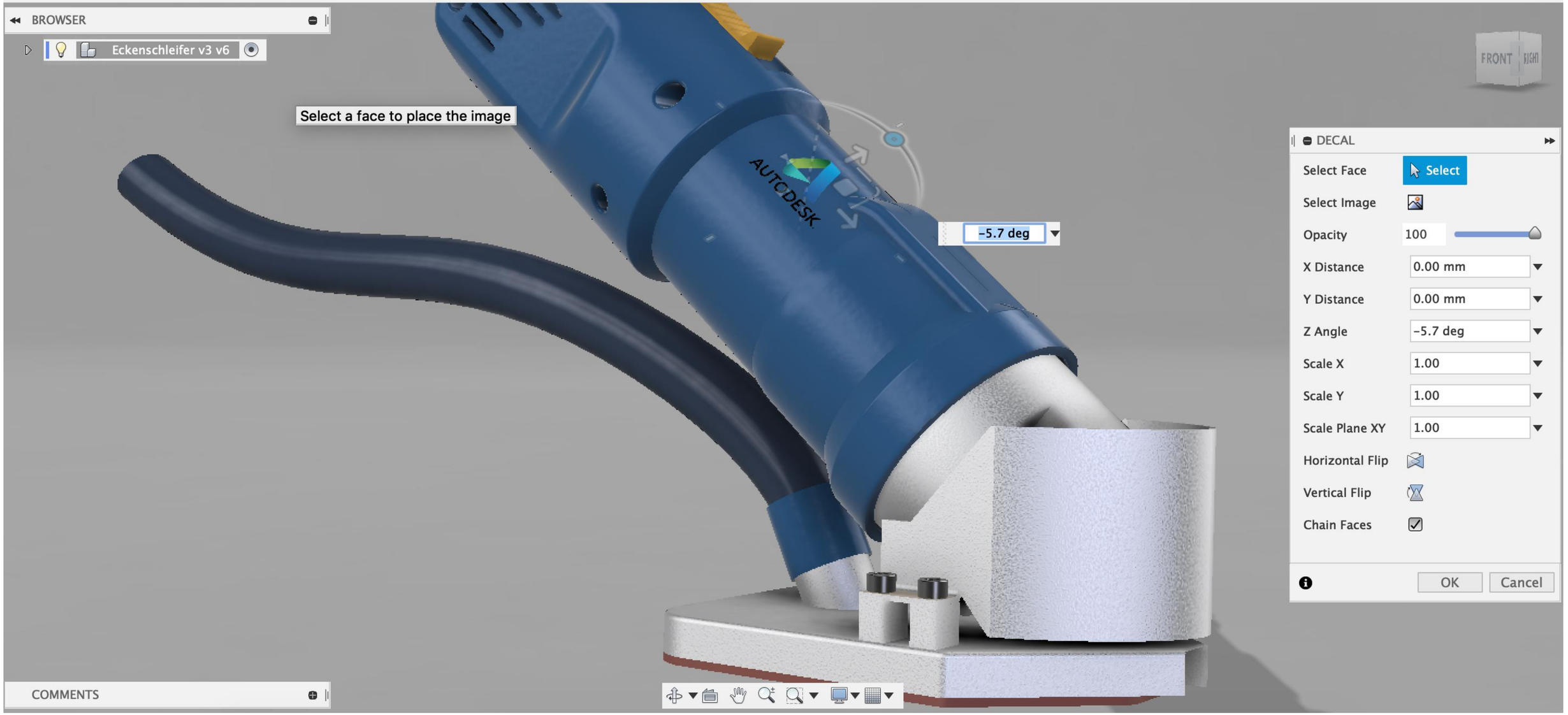
RENDER ON SAVE

Drag and drop views here to enable rendering on save for future versions



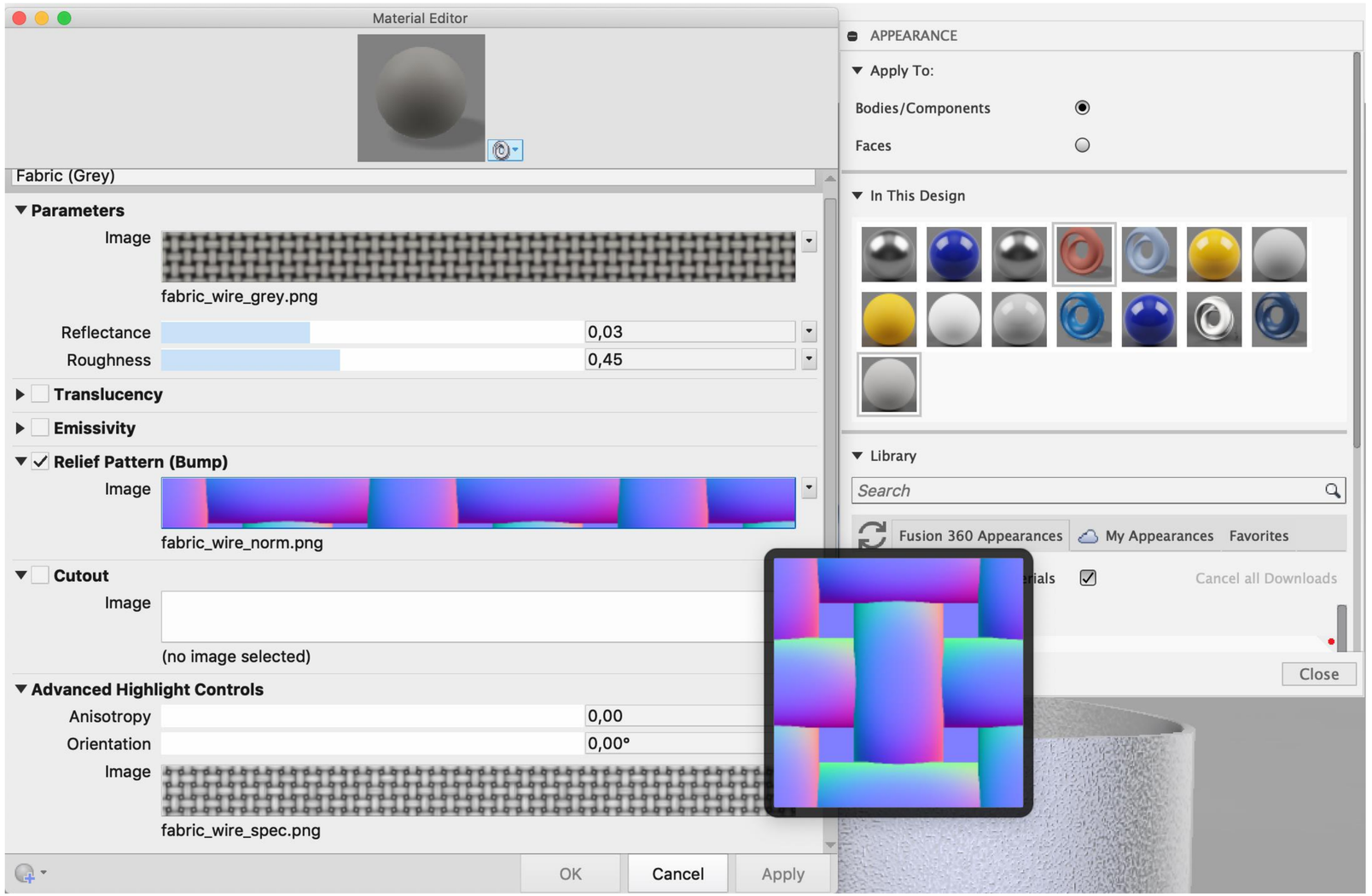


Decals

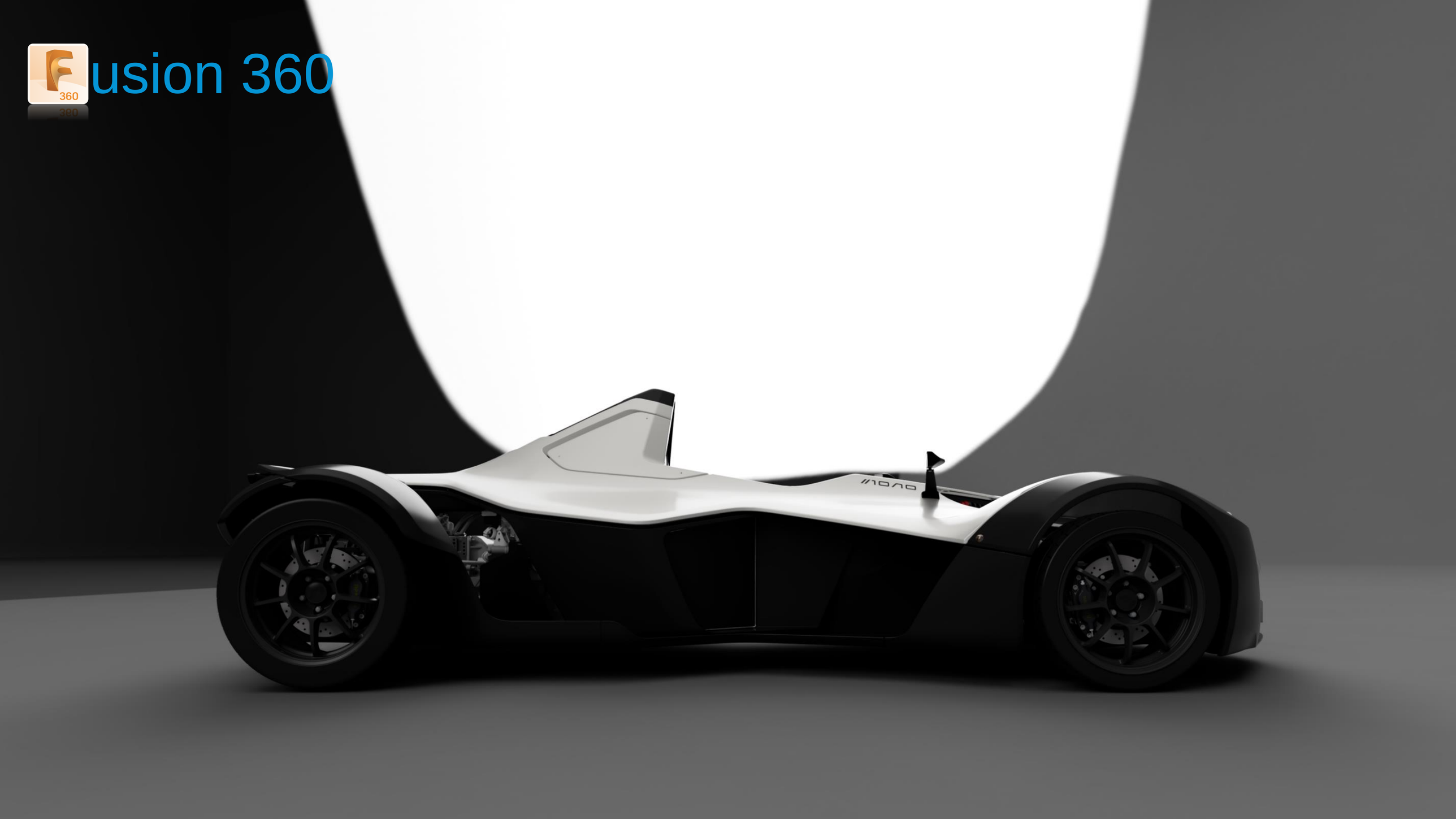

BROWSER
Eckenschleifer v3 v6
Select a face to place the image
AUTODESK
-5.7 deg
FRONT
RIGHT
DECAL
Select Face
Select
Select Image
Opacity
100
X Distance
0.00 mm
Y Distance
0.00 mm
Z Angle
-5.7 deg
Scale X
1.00
Scale Y
1.00
Scale Plane XY
1.00
Horizontal Flip
Vertical Flip
Chain Faces
OK
Cancel
COMMENTS

Advanced Material Specs

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



Fusion 360



VRED

VRED Design

Widely used within Automotive


VRED Design
And other cool things …

VRED Design

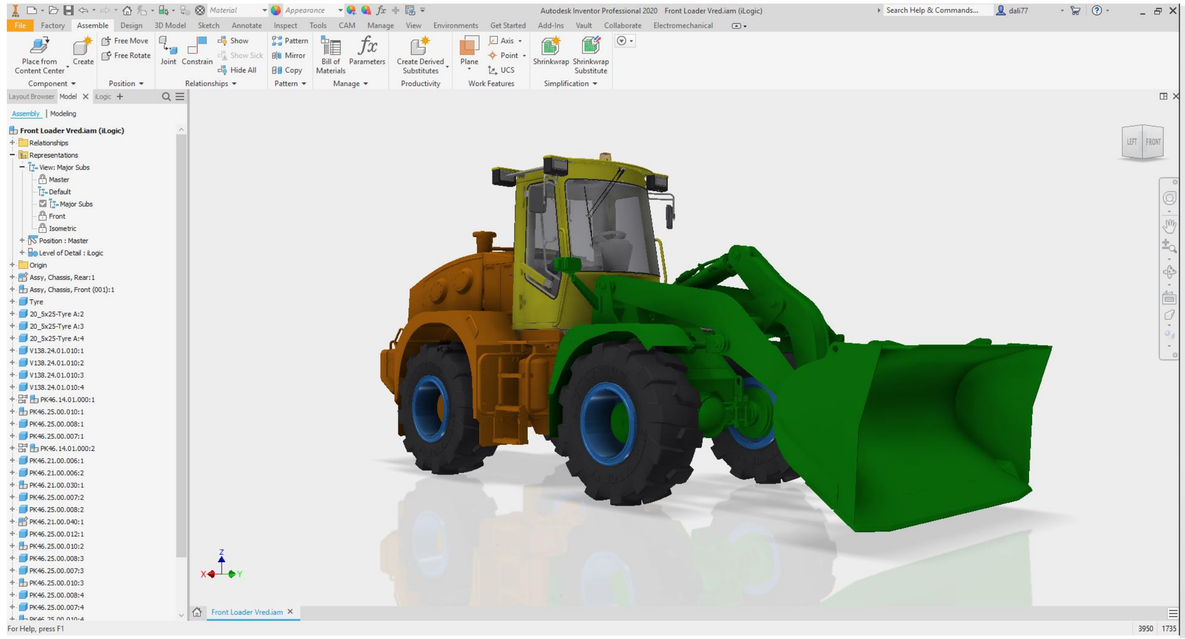
VRED offers **product designers** a high end visualisation tool and allows product configuration with quick and effective rendering and VR when needed

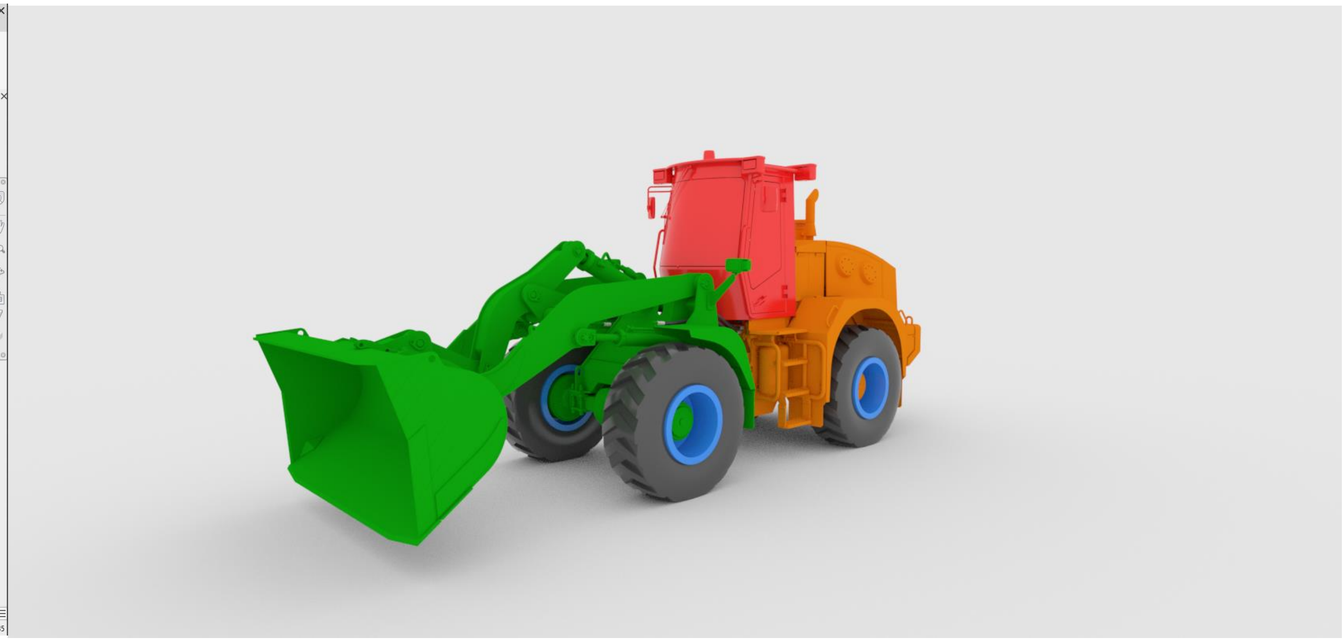
Image courtesy of Astro Studios

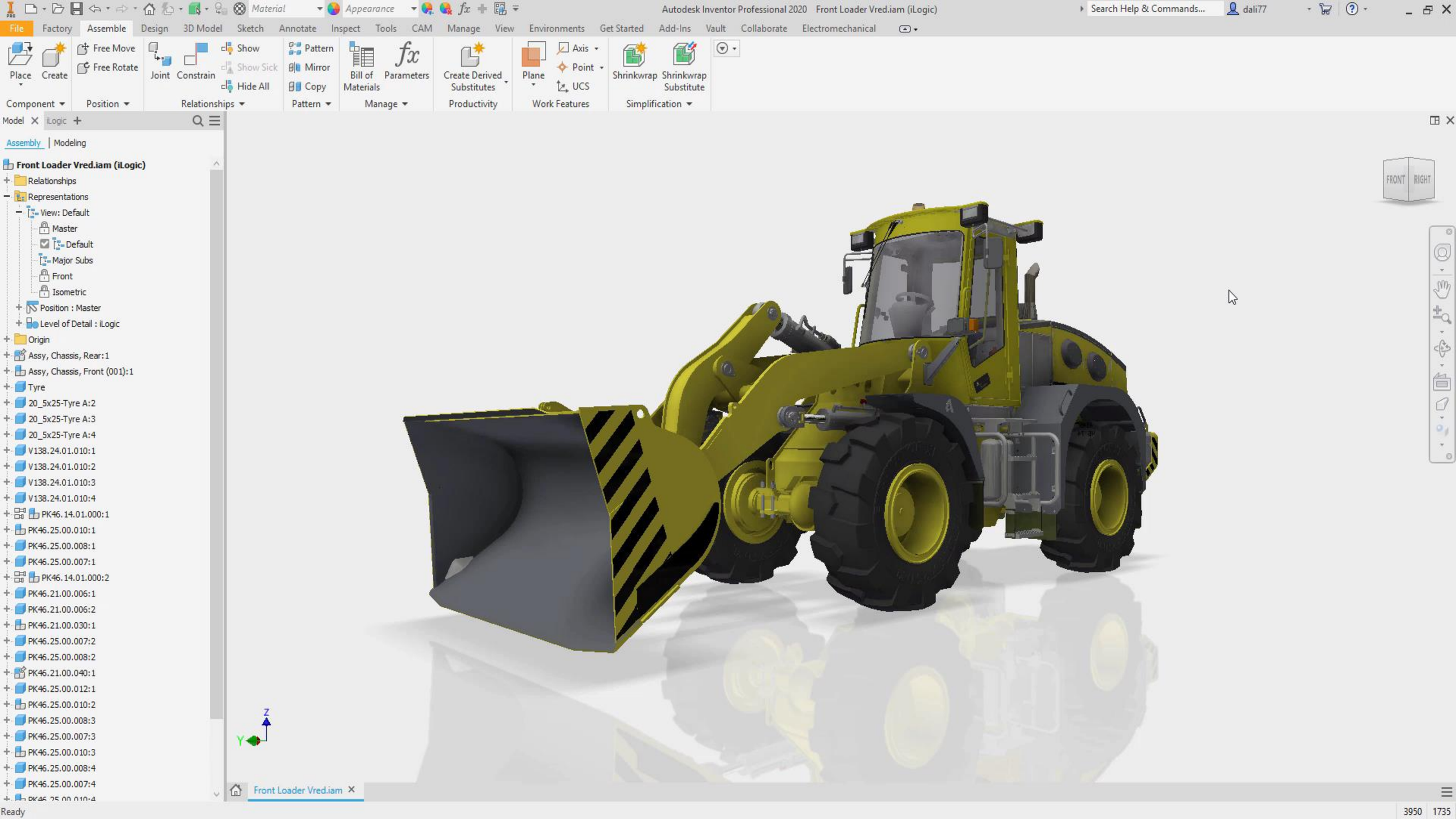
VRED Design

Engineering Design Review

VRED’s ability to handle large amounts of data with quick and efficient workflow makes it ideal for complex models.






Autodesk Inventor Professional 2020 Front Loader Vred.iam (iLogic)
Search Help & Commands...
dali77
File Factory Assemble Design 3D Model Sketch Annotate Inspect Tools CAM Manage View Environments Get Started Add-Ins Vault Collaborate Electromechanical
Place Create Free Move Free Rotate Joint Constrain Show Show Sick Hide All Pattern Mirror Copy Bill of Materials Parameters Create Derived Substitutes Plane Axis Point UCS Shrinkwrap Shrinkwrap Substitute
Component Position Relationships Pattern Manage Productivity Work Features Simplification
Model iLogic
Assembly Modeling
Front Loader Vred.iam (iLogic)
Relationships
Representations
View: Default
Master
Default
Major Subs
Front
Isometric
Position : Master
Level of Detail : iLogic
Origin
Assy, Chassis, Rear:1
Assy, Chassis, Front (001):1
Tyre
20_5x25-Tyre A:2
20_5x25-Tyre A:3
20_5x25-Tyre A:4
V138.24.01.010:1
V138.24.01.010:2
V138.24.01.010:3
V138.24.01.010:4
PK46.14.01.000:1
PK46.25.00.010:1
PK46.25.00.008:1
PK46.25.00.007:1
PK46.14.01.000:2
PK46.21.00.006:1
PK46.21.00.006:2
PK46.21.00.030:1
PK46.25.00.007:2
PK46.25.00.008:2
PK46.21.00.040:1
PK46.25.00.012:1
PK46.25.00.010:2
PK46.25.00.008:3
PK46.25.00.007:3
PK46.25.00.010:3
PK46.25.00.008:4
PK46.25.00.007:4
FRONT RIGHT
Z
Y
Front Loader Vred.iam
Ready
3950 1735


D:/Datasets/FY2020 Front Loader/VRED/2020 Front Loader-FINAL.vpb - Autodesk VRED Design 2020.1
File Edit View Visualization Scene Animation Interaction Rendering Window Help
New Open Import Save Antialias Raytracing Downscale Region Isolate Sceneplates Wireframe Boundings Headlight Statistics Fullscreen Presentation Show All Zoom To Grid Ruler Transform Selection Texturing Simple UI
dali77
HOME
Front
Graph Transform Materials Cameras Clips Curves VSets Render
FPS: 2.4 3596.9 MB RR-GL
Save time: 3.372258
Units mm Up Z NCP 28.00 FCP 339949.00 FOV 45.00 ICV

VRED Design

Design Review and VR

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

D:/Datasets/FY2020 Front Loader/VRED/2020 Front Loader-FINAL.vpb * - Autodesk VRED Design 2020.2

File Edit View Visualization Scene Animation Interaction Rendering Window Help

New Open Import Save Antialias Raytracing Downscale Region Isolate Sceneplates Wireframe Boundings Headlight Statistics Fullscreen Presentation Show All Zoom To Grid Ruler Transform Selection Texturing Simple UI

dali77

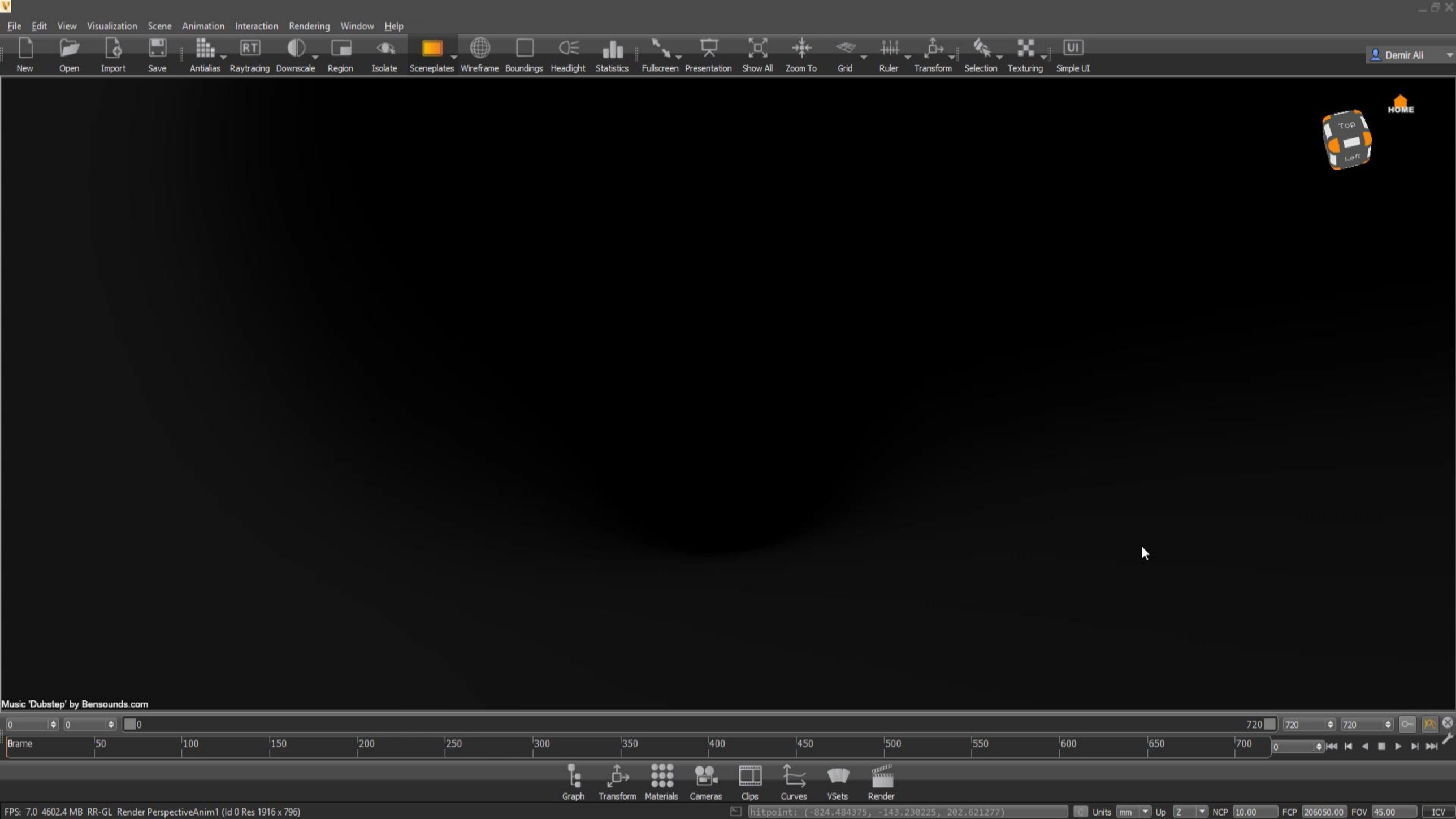
Graph Transform Materials Cameras Clips Curves VSets Render

FPS: 15.1 3677.0 MB RR-GL

Uploading scene ready.

Units mm Up Z NCP 28.00 FCP 339949.00 FOV 45.00 ICV


Christoph


File Edit View Visualization Scene Animation Interaction Rendering Window Help
New Open Import Save Antialias Raytracing Downscale Region Isolate Sceneplates Wireframe Boundings Headlight Statistics Fullscreen Presentation Show All Zoom To Grid Ruler Transform Selection Texturing Simple UI
Demir Ali
HOME
Top
Left
Music 'Dubstep' by Bensounds.com
0
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700
Graph Transform Materials Cameras Clips Curves VSets Render
FPS: 7.0 4602.4 MB RR-GL Render PerspectiveAnim1 (Id 0 Res 1916 x 796)
hitpoint: (-824.484375, -143.230225, 202.621277)
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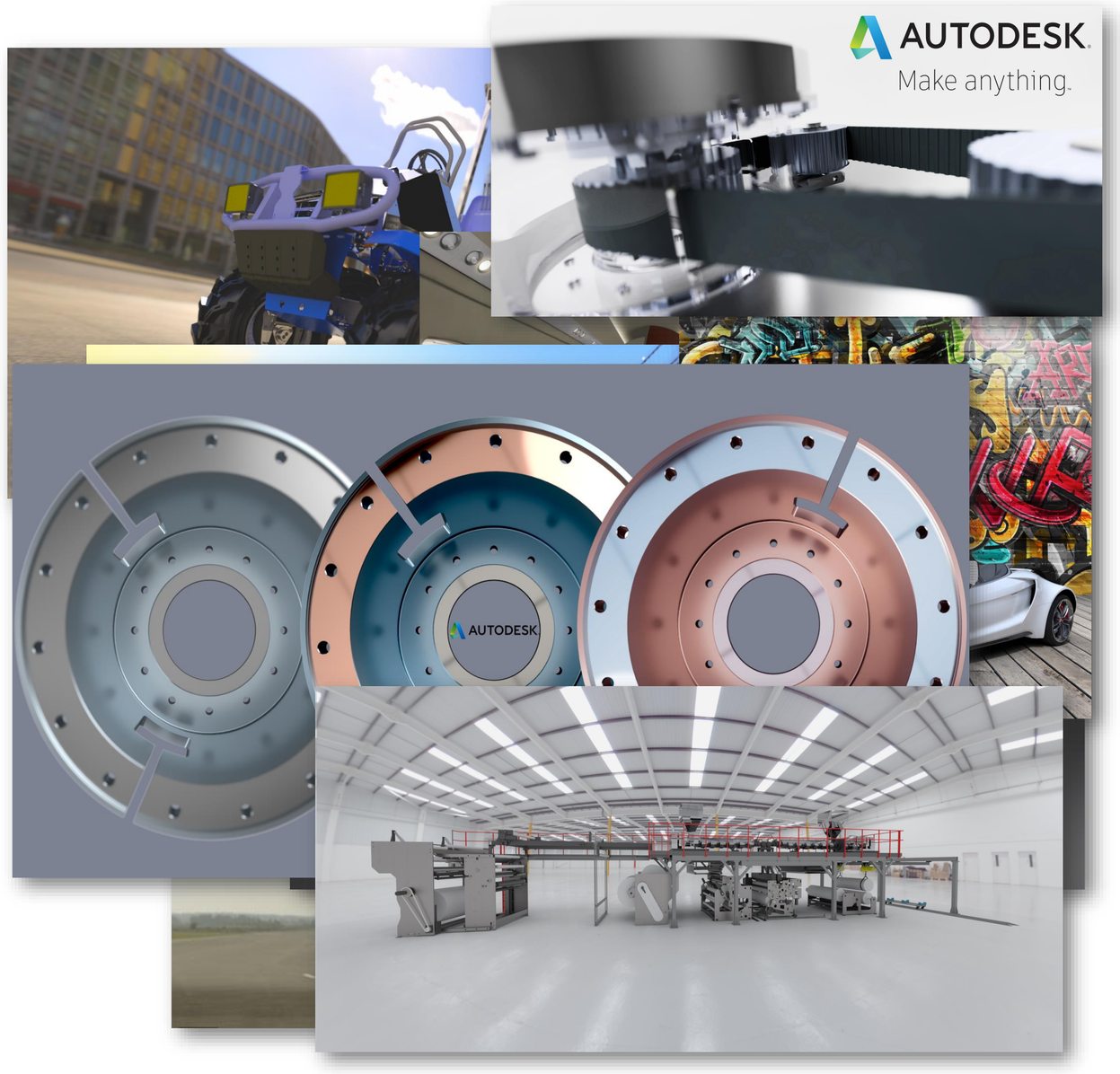
What are we going to cover

Design Visualisation

Product Visualisation

Immersive Design Review

Cloud Rendering



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