AUTODESK®
VRED™ PROFESSIONAL 2015

Autodesk VRED Hands-On

AUTODESK

General information

To be able to follow the instructions of this manual, you need the files of the VRED Tutorial. Download files.

The structure is as follows:

1. IGES-data: This directory contains the necessary CAD files for import.

Filename: **.igs*.

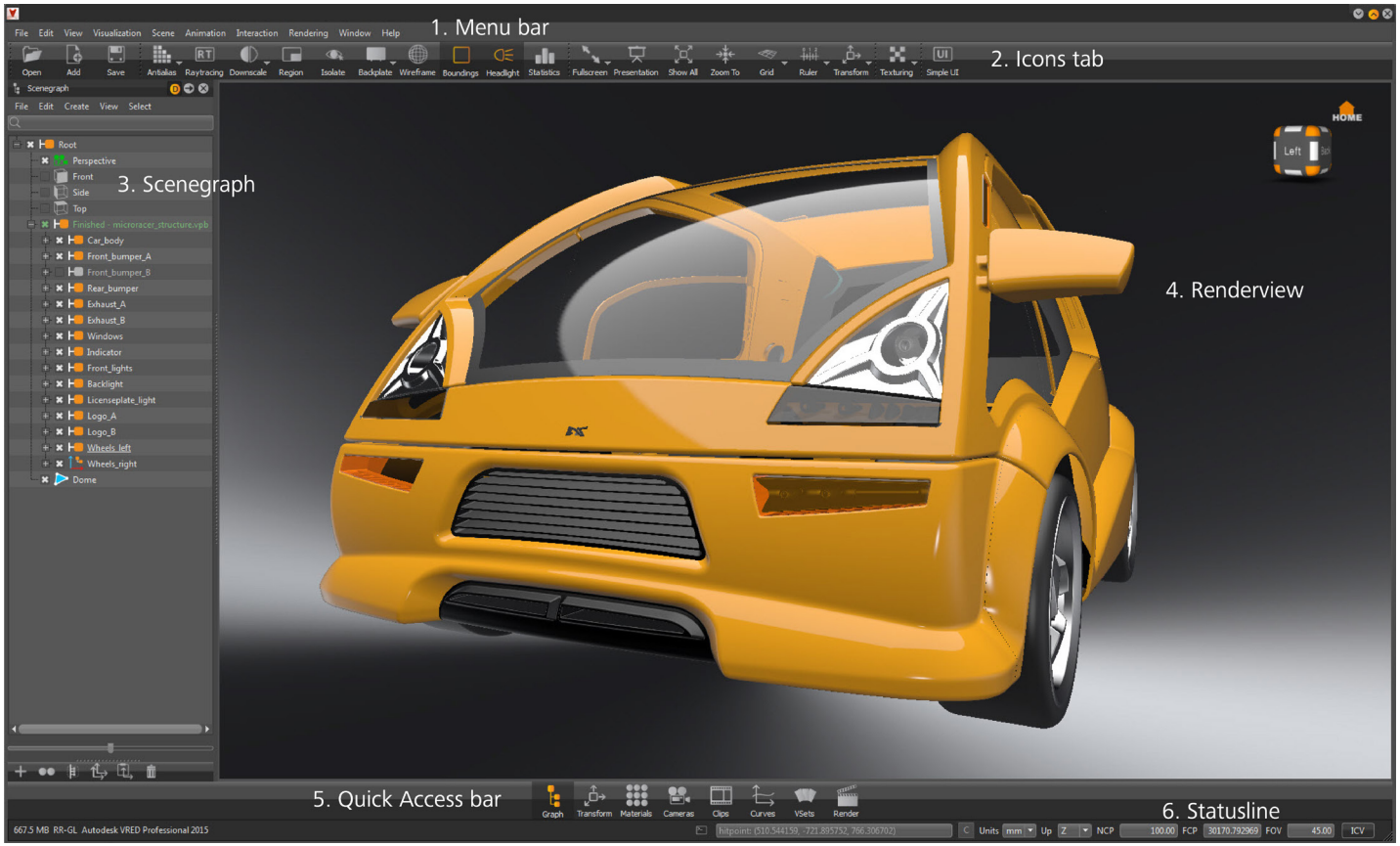
2. Textures_and_environment: This directory contains all needed textures, HDRI's, and the environment geometry. Filenames:

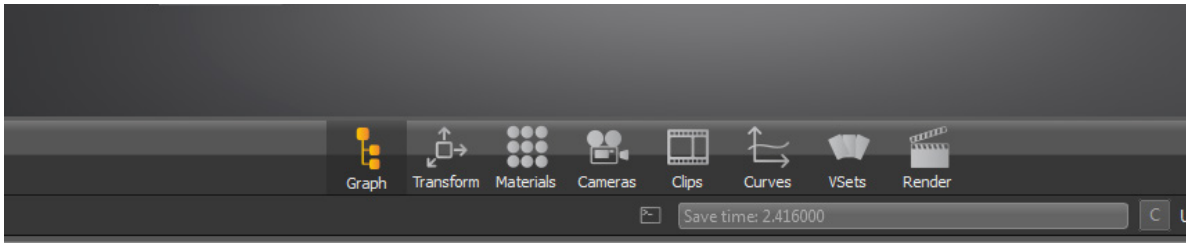
- *Environment.vpb* (Environment geometry)
- *perfectStudio.hdr* (Studio HDRI)
- *forest.mtd* (Forest HDRI)
- *nummerntafel_8.gif* (number plate texture)
- *tire_marking_bump.jpg* (Tire texture 1)
- *tire_profile_bump.jpg* (Tire texture 2)

3. VRED data: This directory contains the starting point file (if you want to import the CAD files, the IGES files are located in the IGES-data folder) and the final data, which shows what the final scene should look like after going through this tutorial. Filenames:

- *microracer_start.vpb* (Starting point file after CAD import)
- *microracer_final.vpb* (Final file)

Using VRED: Interface





This chapter provides general information regarding interface, navigation, selection, manipulating objects, and setting up preferences.

This tutorial is designed to work with the standard user interface. Make sure the Simple UI icon is not selected.

1. **Menu bar:** The Menu bar provides features for creating and editing content.

2. **Icons tab:** The Icons tab provides shortcuts to access commonly used features, such as render options or the wireframe function.

3. **Scenegraph:** The Scenegraph contains a tree of all objects used in a scene and enables you to directly select and modify them.

4. **Renderview:** The renderview displays the whole scene and enables you change views and to directly select and modify objects.

5. **Quick Access bar:** The Quick Access bar provides easy and fast access to main functions such as the Material Editor, the Clip Maker, or the Variants.

6. **Statusline:** The Statusline provides information about memory usage. It allows users to change the up vector, the near and far Clip Planes and the field of view. The Statusline is integrated with the Terminal.

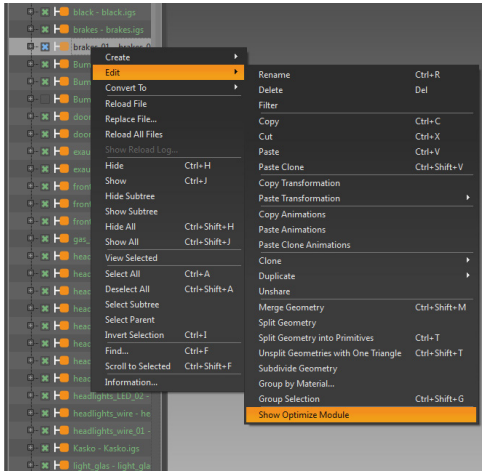
Optimize scene

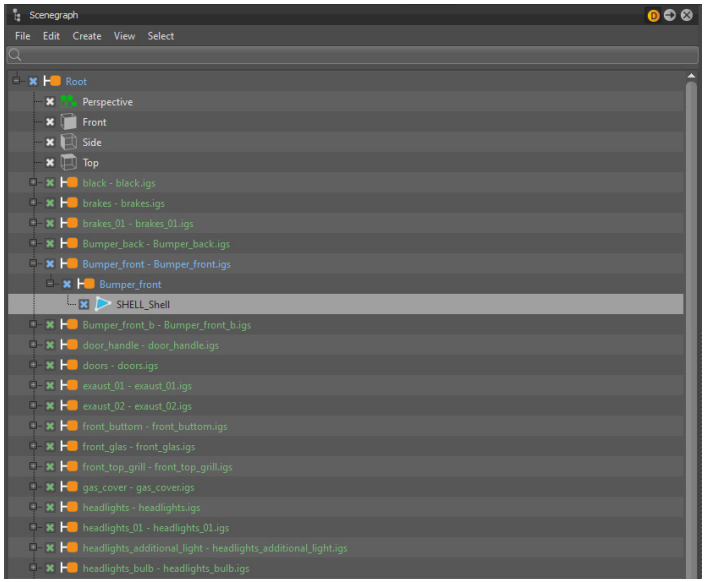
Autodesk® VRED is an interactive 3D visualization software. Before starting to prepare a VRED render file, CAD data must be loaded or imported.

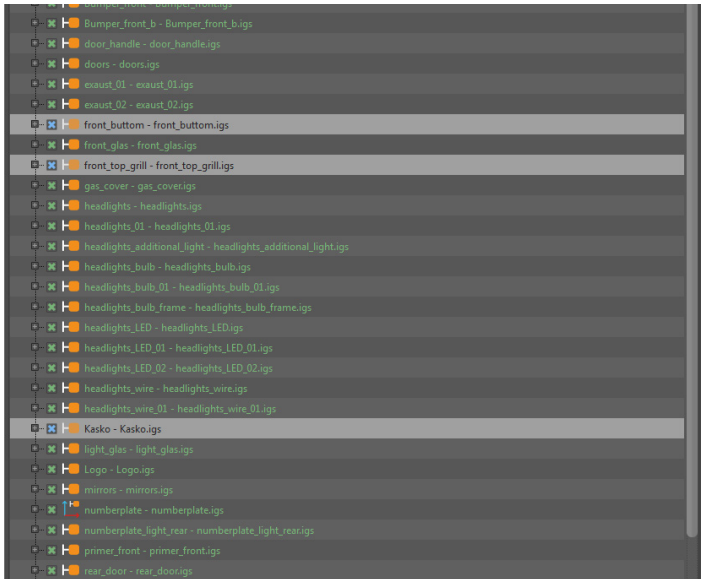
- The CAD file still has to be optimized. First, the import options have to be set.
- Select File > Open in the Menu bar. Select all Microracer IGES files and press Open.
- Choose a Tessellation quality (if you want to render your NURBS data directly, uncheck Tessellation).

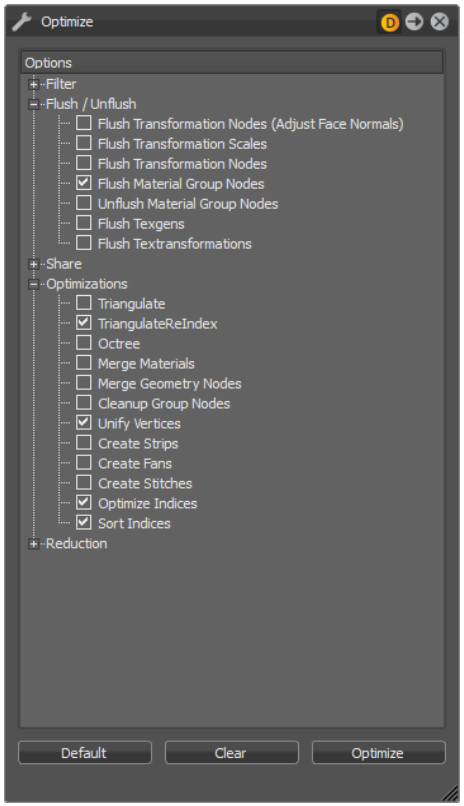
After importing data, the scene needs to be optimized.

- Select all imported groups. They are indicated in a green font.
- Right-click on any group node and select Edit > Show Optimize Module.
- Click the default button in the Optimize module.
- Check both Flush Transformation Nodes check boxes. This ensures that all transformations will be set to 0 and all scale operations will be set to 1.
- Check the Cleanup Group Nodes check box. This function removes all groups containing fewer than two child nodes.
- Press Optimize to execute the optimization process.









Optimize scene

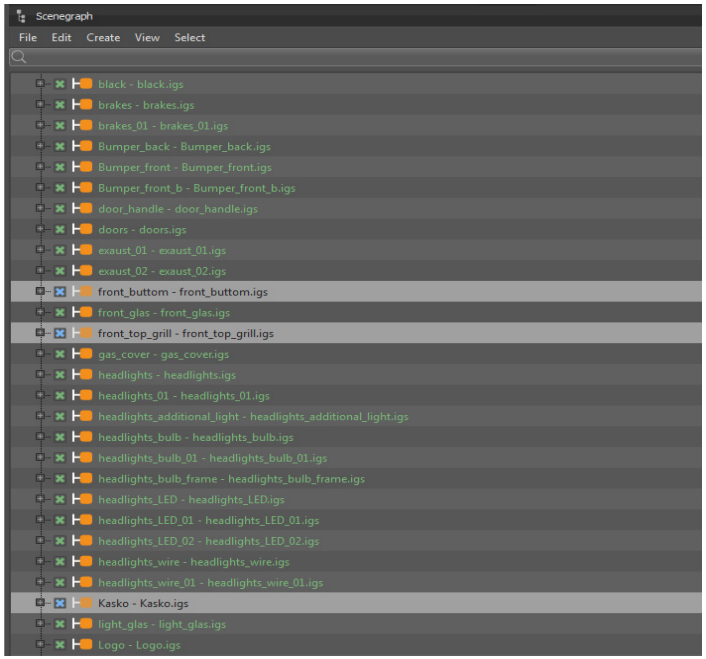
Now execute the Material Editor optimization

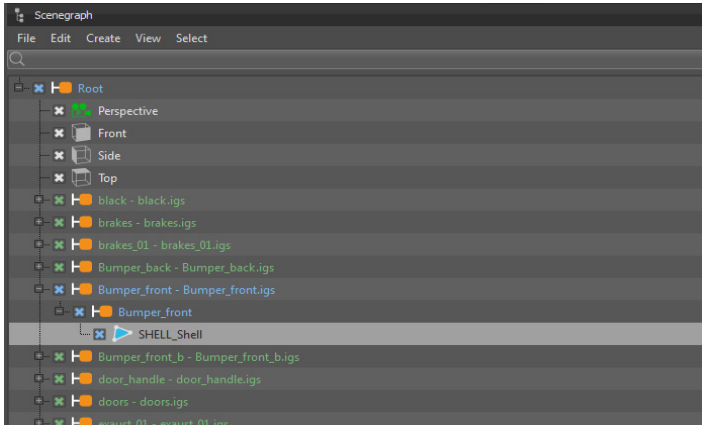
- This step is only necessary if you chose to open the IGES files. The microracer_start file materials have already been optimized.
- In the Material Editor click Edit.
- In the dialog box menu select Edit > Optimize Materials.
- Multiple identical materials will be replaced by a single material.

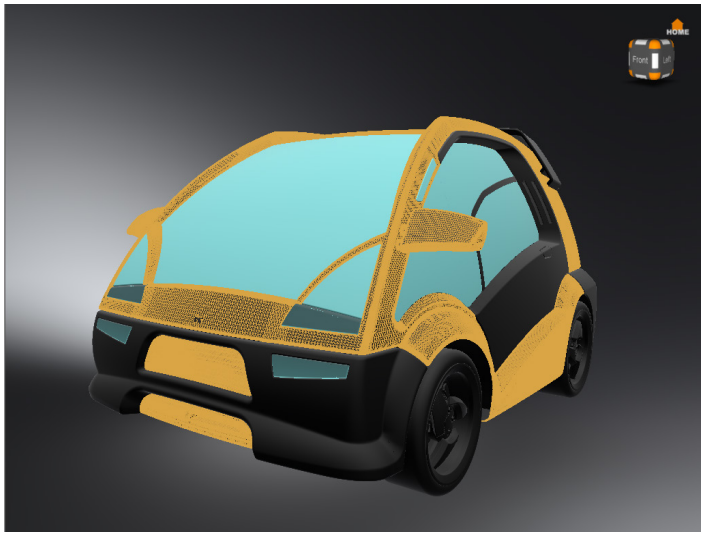
The imported data is split into separate patches, which still need to be merged to a connected part on an object basis. The optimization process merges all meshes with identical materials that are located in the same group, to a single object.

After importing data, the scene needs to be optimized.

- Select File > Optimize Scene in the Menu bar.
- Select Optimize Geometries in the drop-down box.
- Execute by clicking OK.



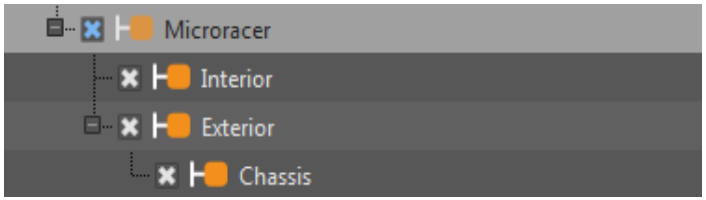


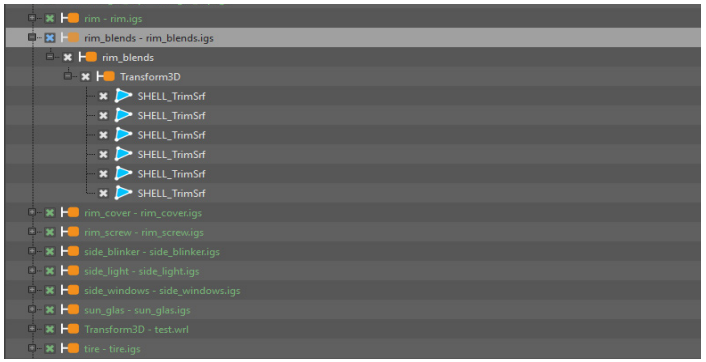


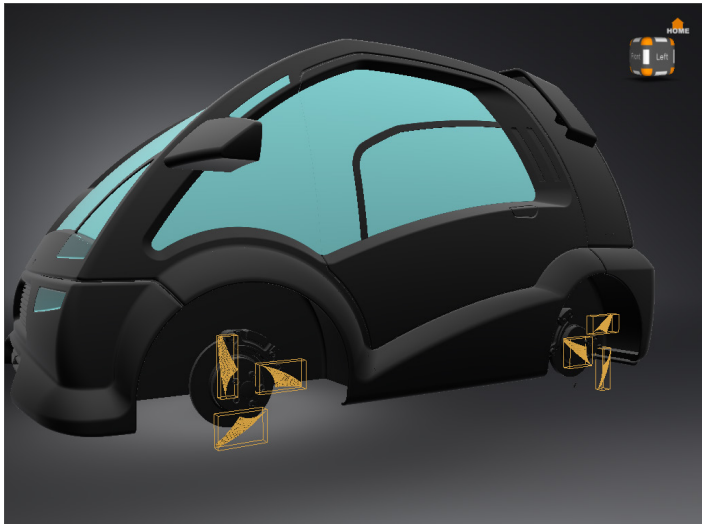
Rearranging the Scenegraph

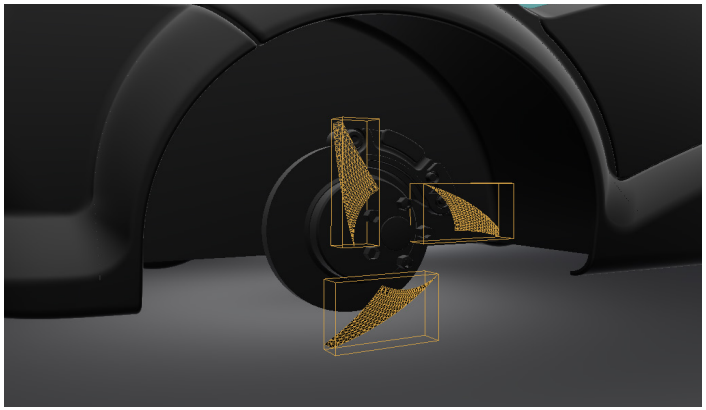
To obtain a better overview of the objects in the scene, we recommend that you prepare and restructure the Scenegraph.

- Right-click on any node in the Scenegraph and select Create > Group to create a group node. Any new group node will be created as a child of the selected node.
- Right-click on the root node and create a new group. Enter the name Microracer.
- Right-click on the Microracer group and create two other groups as children. Name them Interior and Exterior.
- Create another group called Chassis as child of the group Exterior.
- Move the *Kasko.igs* group node into the Chassis group, either by doing a cut and paste operation in the Scenegraph, or simply by using the drag and drop functionality.
- To use the cut and paste function, select the group node to be repositioned and press CTRL+X. Then select the designated parent group node and press CTRL+V.
- To use the drag and drop function, select the group to be repositioned, click and hold the left mouse button, drag it to the designated parent group, and drop. The moved group will be placed between the gray indicator lines that appear between two nodes. If the node turns blue, the group will be placed into the framed node.









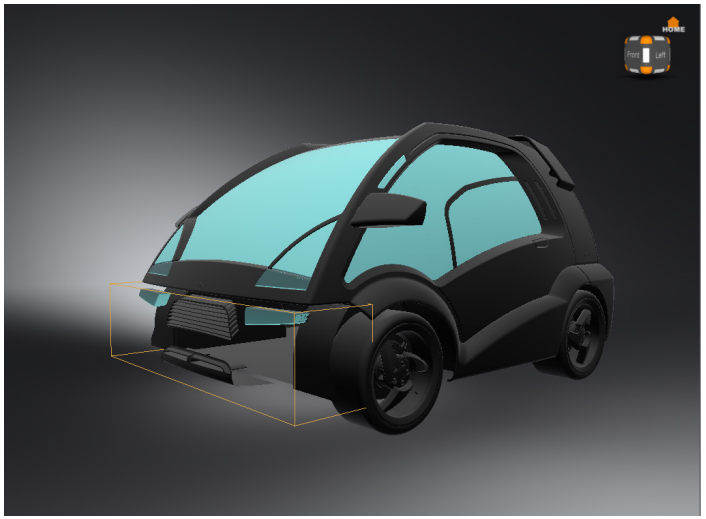
Create further groups and reposition all nodes to achieve a logical Scenegraph structure.

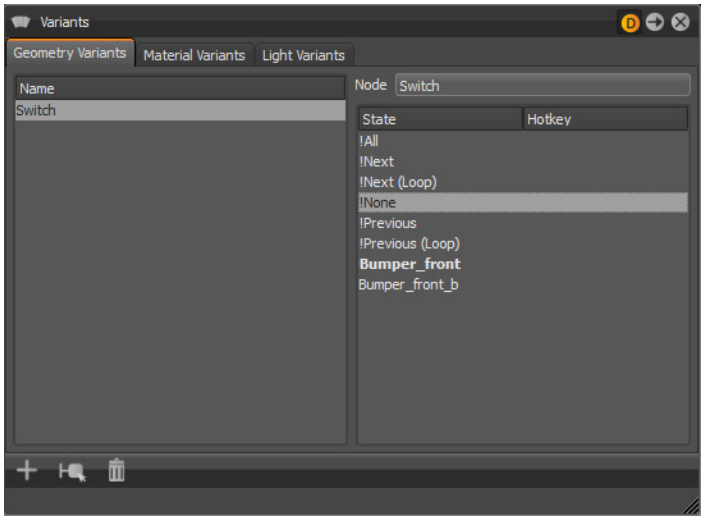
- Right-click on the rim_blends.igs group node in the Scenegraph and create two new group nodes called rim_blend_front and rim_blend_back.
- Select Front Shells in the Scenegraph and move them into the “rim_blend_front” Group.
- Select Back Shells in the Scenegraph and move them into the “rim_blend_back” Group.

Creating geometry switches

A geometry switch node offers the possibility of making one of a series of objects visible. There are two front bumper versions in this file. Add both front bumpers to a geometry switch node.

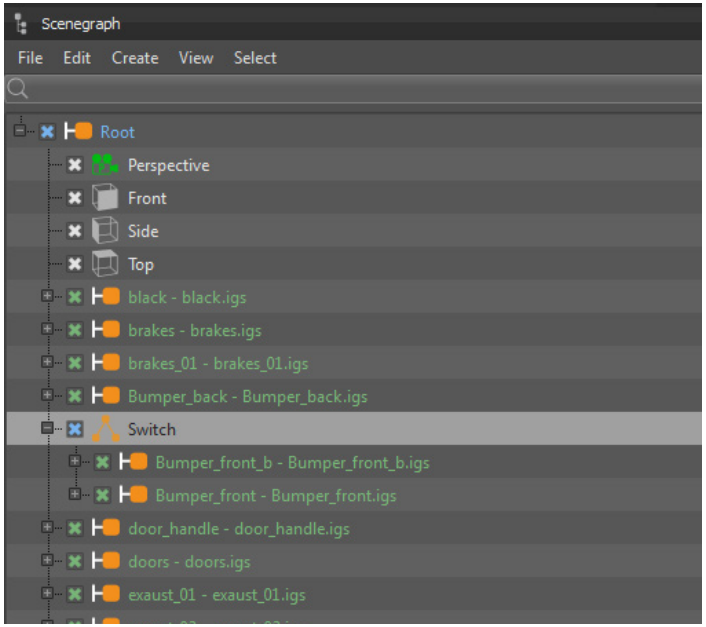
- In the Scenegraph, select Create > Switch. Drag the Switch below Bumper_back.
- Cut and paste both front bumper group nodes into the switch node.
- Both geometries are invisible because the initial state of a switch node is set to “None” by default, which means that no child is shown.
- Open Scene in the Menu Bar and click Variants.
- Right Click in the Variants module and “Create All”.
- Now the created Switch can be seen.
- Select the Switch and set the State from “!None” to “!Next” and assign a hotkey to it.
- Now you can switch between the two bumpers by clicking the hotkey.





This is what the Scenegraph should look like with the bumper switch:

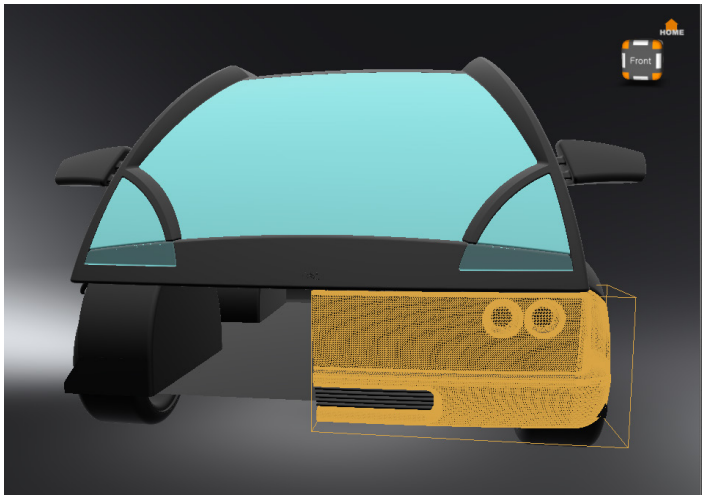
- Continue rearranging the Scenegraph by moving the door and bumper nodes to the Chassis group.



Duplicate & mirror

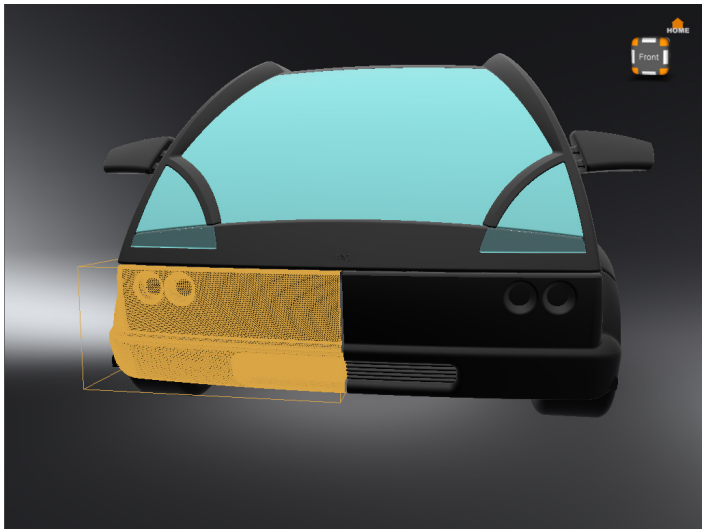
After rearranging the Scenegraph, it becomes apparent that some parts are only partially modeled. In this case, they can simply be duplicated and mirrored (i.e., for the co-driver's side).

- Right click on the group node Bumper_front_b.igs and select Edit > Duplicate > Mirror X.
- A new node named Bumper_front_b_mirrored has been created and is at the bottom of the scenegraph.
- Drag and drop Bumper_front_b_mirrored into Bumper_front_b.igs.
- Now you have created the missing part of the bumper.



Duplicate and mirror all missing parts, rename them, and place them adequately in the Scenegraph:

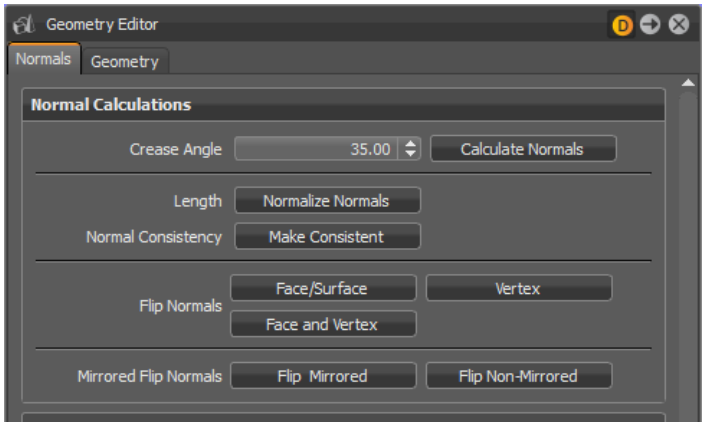
- Headlight interior parts
- Rims and tires
- Rear light interior parts

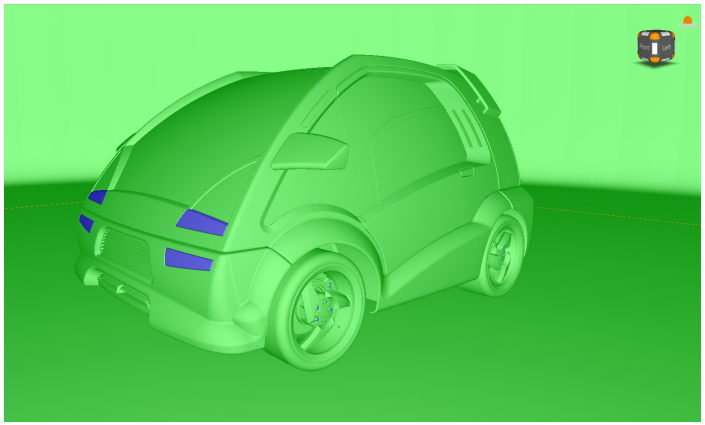


Surface direction and normals

The surface normals define the direction, a surface is pointing. To see the surface directions, switch to Vertex/Face normal rendering render mode.

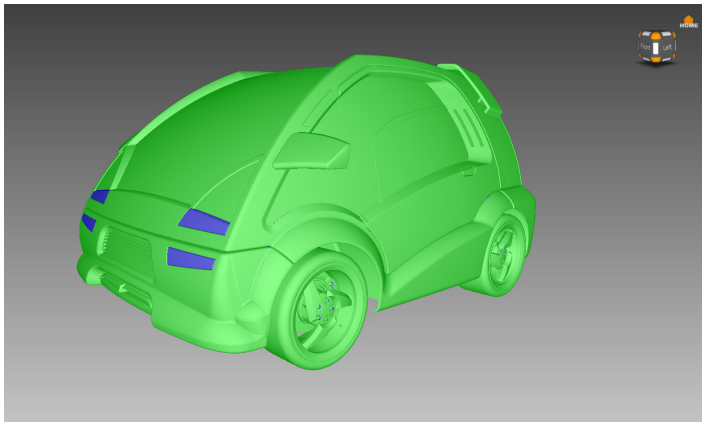
- Press F5 or in the Visualization menu turn on Vertex/Face Normal Rendering.
- Each surface has a green and a blue drawn side. To receive proper shading and ambient occlusion rendering results, all surfaces viewed from the outside should appear green. Green means the vertex and surface normals point towards the camera. Blue means the vertex and surface normals point away from the camera.
- To adjust the surface normals open the Scene > Geometry Editor > Normals module.
- Select any geometry part appearing blue. Press the Face and Vertex button in the Normals tab. All normals of the selected object will be flipped.

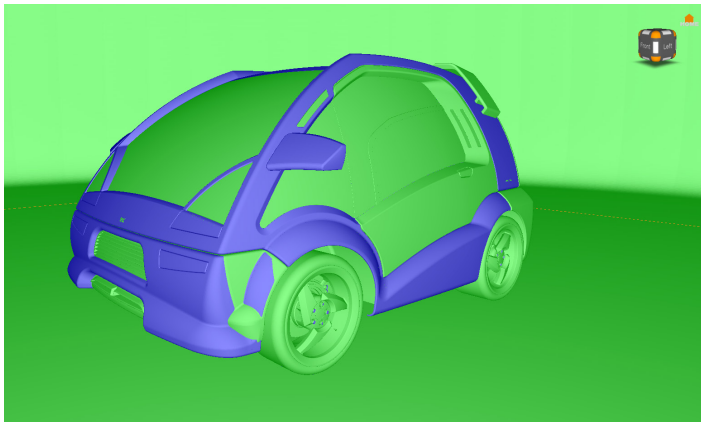




Sometimes only part of the selected object's normals have to be flipped:

- Press and hold ALT + click right mouse button on the blue parts of the surface. Only the adjacent blue faces will be flipped. The adjacency crease angle can be set in the Scene > Geometry Editor > Normals.
- Adjust the normals direction for the car's frame, brakes, headlight interiors, rear window, and others.
- Press F3 to change the render mode to "Realistic High Quality" rendering.

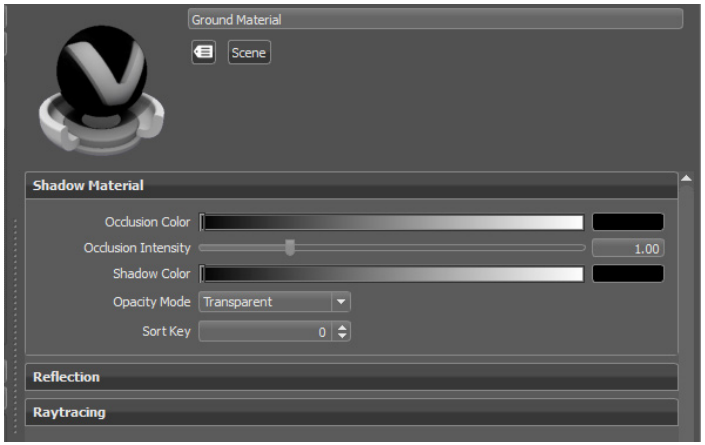


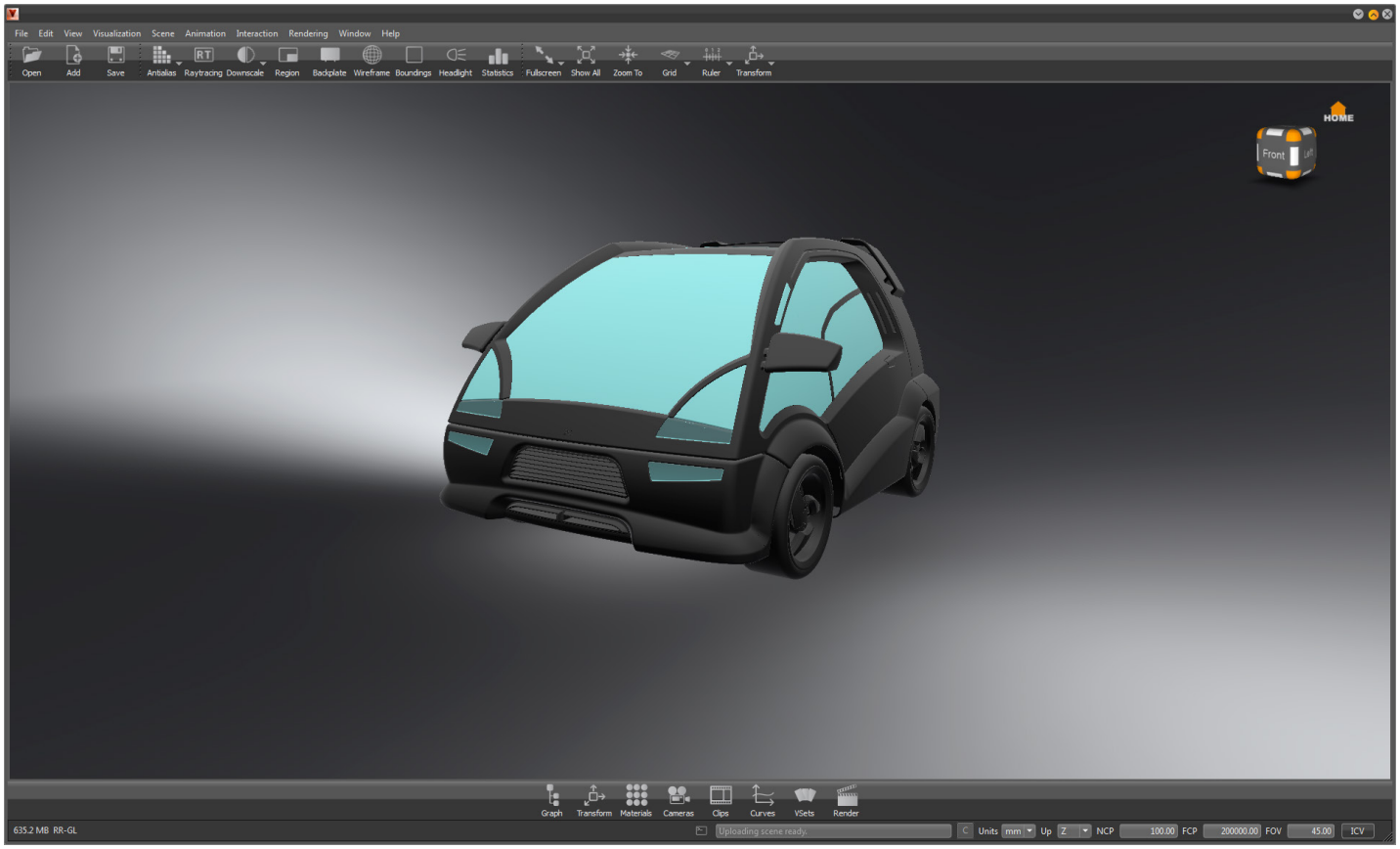


Material: Shadow Material

Use and assign materials.

The Shadow Material is a special material for ground surfaces. It is a transparent material that is opaque only where ambient occlusion is calculated or where shadows cast by light sources or EnvironmenSphereMaterials (only raytracing mode) hit the ground.

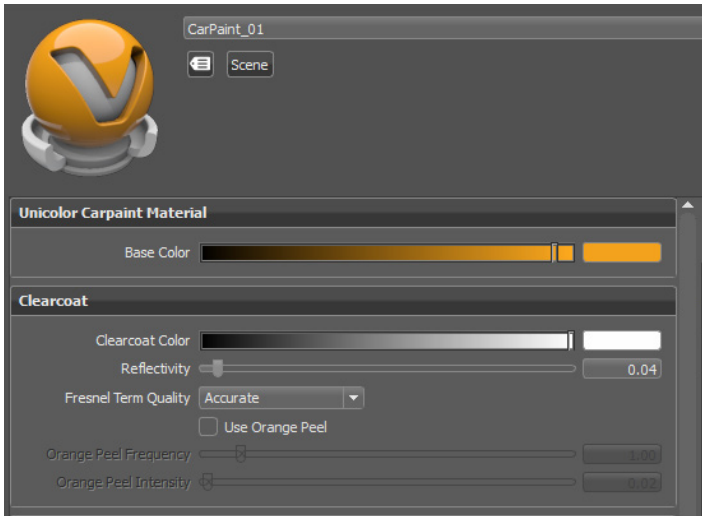




Material: Carpaint Material & Plastic Material

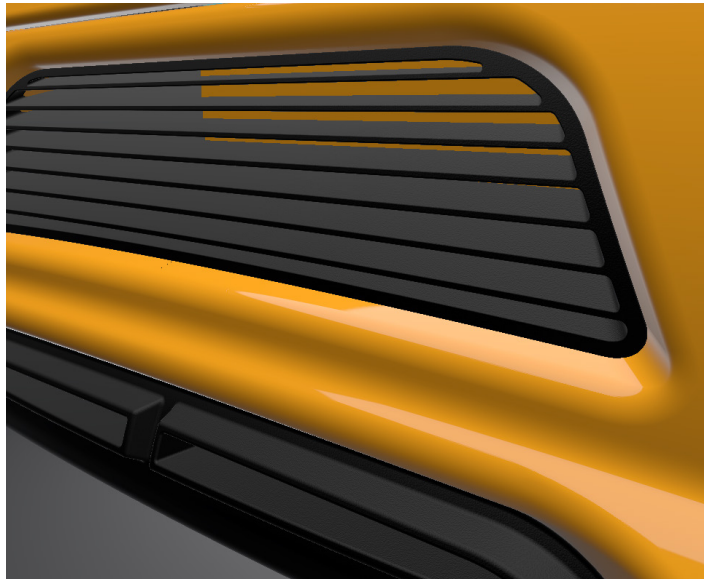
Create a Unicolor Paint Material for the car's chassis.

- Right-click in the Materials tab and select Create Material > Unicolor Carpaint.
- Rename the Unicolor Carpaint material to CarPaint_01.
- Set the car paint base color to orange using the color chooser.
- Set the car paint clearcoat color to white.
- Assign CarPaint_01 to all body parts of the car.
- Select all body parts in the Renderview with SHIFT+CTRL+left-click.
- In the Materials tab, right-click on the CarPaint_01 material and select Apply to Selected Nodes.



Create a Plastic Material for the car's plastic parts.

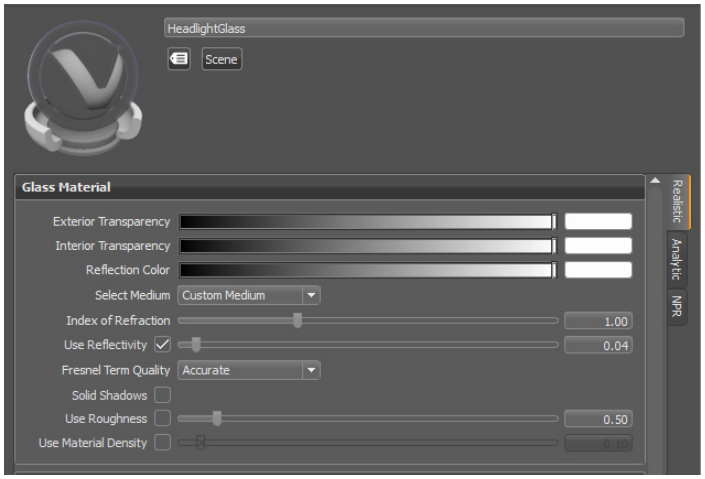
- Right-click in the Materials tab and select Create Material > Plastic.
- Rename Plastic Material1 to "BlackPlasticGrill".
- Assign the BlackPlasticGrill material to the two front grills. This time, assign the material by dragging it from the Material Editor and dropping it on the grill in the Renderview.
- Set the BlackPlasticGrill material's Diffuse Color to black.
- Set the Glossy Color to mid-gray.
- Set the Roughness to 2.
- Enable the Use Structure check box in the Bump Texture menu.
- Set the Bump Intensity value to 2.
- Set the Structure Size to 0.3.



Material: Glass Material

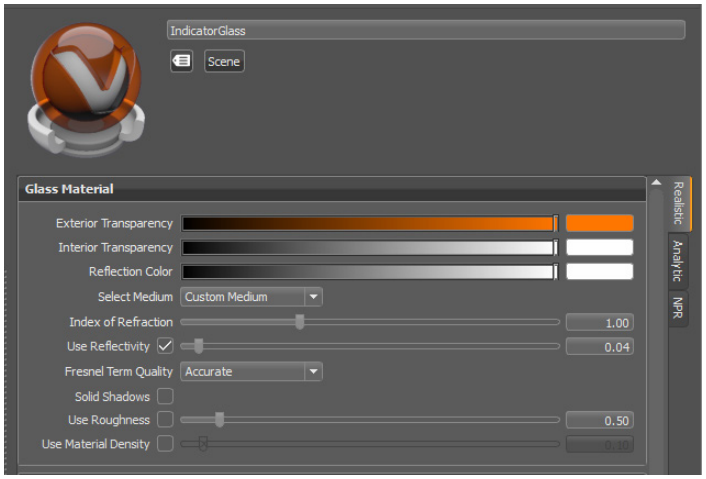
Create a Glass Material for the car's headlight glasses.

- Right-click in the Materials tab and select Create Material > Glass.
- Rename the Glass material to HeadlightGlass and assign it to the headlight glass parts.



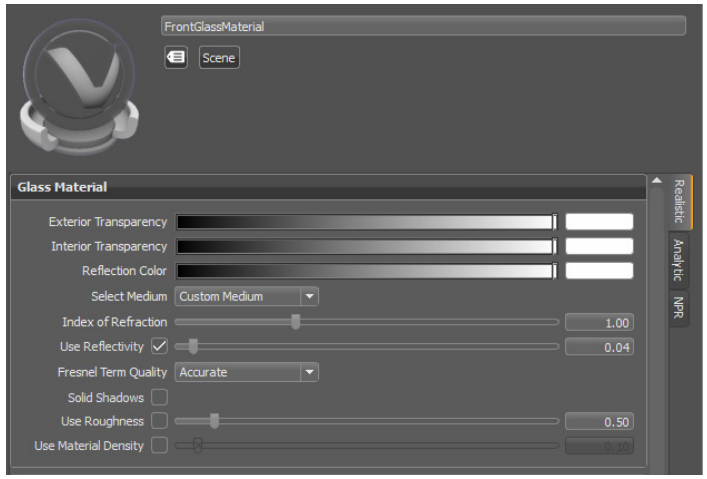
Create a GlassMaterial for the car's indicators.

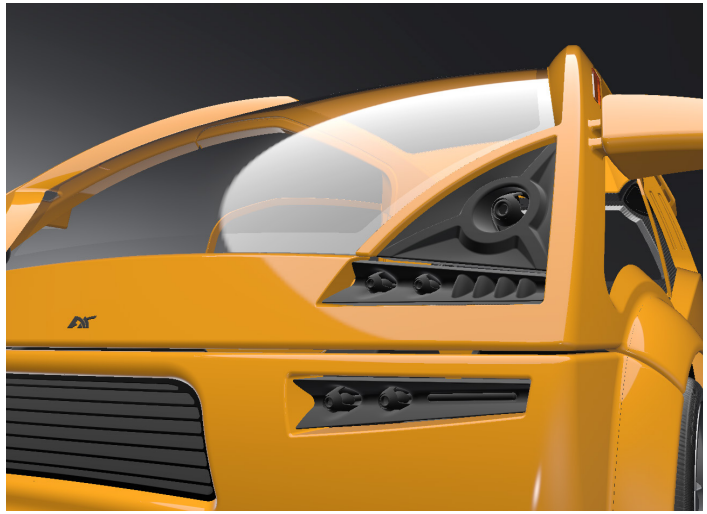
- Right-click in the Materials tab and select Create Material > Glass.
- Rename Glass material to IndicatorGlass and assign it to the indicator glass parts.
- Set the Exterior Transparency color to a strong orange color.



Create a Glass Material for the car's frontglass.

- Right-click in the Materials tab and select Create Material > Glass.
- Rename the Glass material to FrontGlass and assign it to the headlight glass parts.

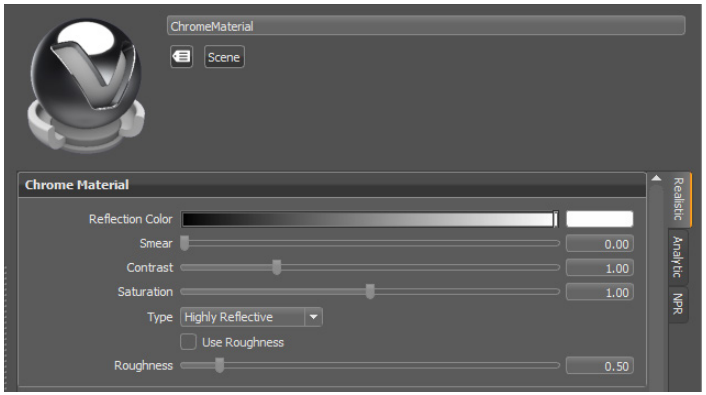




Material: Chrome & brushed metal

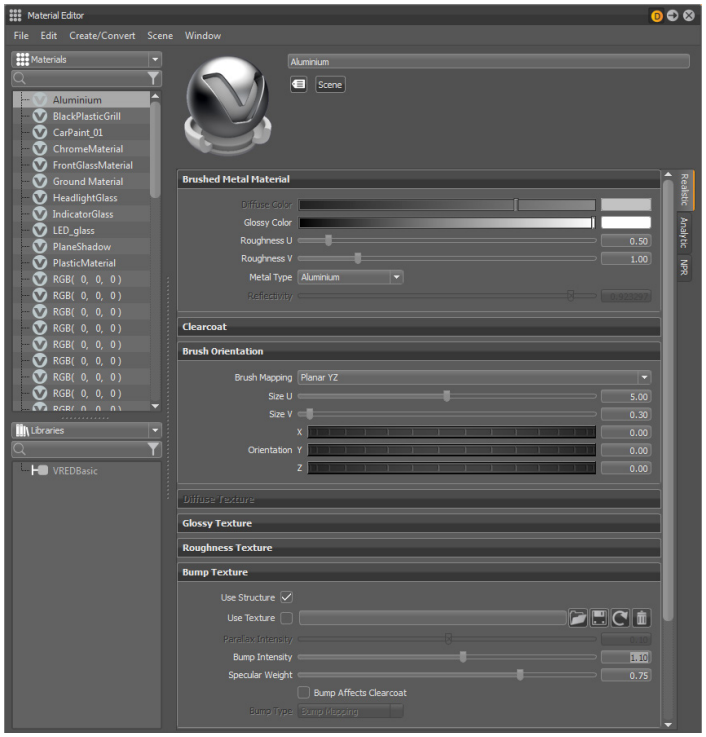
Create a Chrome Material for the car's chrome parts.

- Right-click in the Materials tab and select Create Material > Chrome.
- Assign the Chrome material to the chrome parts in the headlights.



Create a Brushed Metal Material for the car's brushed aluminum parts.

- Right-click in Materials tab and select Create > Brushed Metal.
- Rename the Brushed Metal material to "Aluminium".
- Assign the Aluminium material to the brushed_aluminum parts of the headlights.
- Set the Glossy Color to a light gray color with a value of 0.8.
- Set the Roughness U value to 0.5 and the Roughness V value to 1.
- Set the Metal Type to Aluminium.
- Brush Orientation > Set the Brush Mapping to planar YZ.
- Set the Size U value to 5 and the Size V value to 0.3
- Bump Texture > Use structure.
- Set the Bump Intensity to 1.1.
- Set the Specular Weight to 0.75.



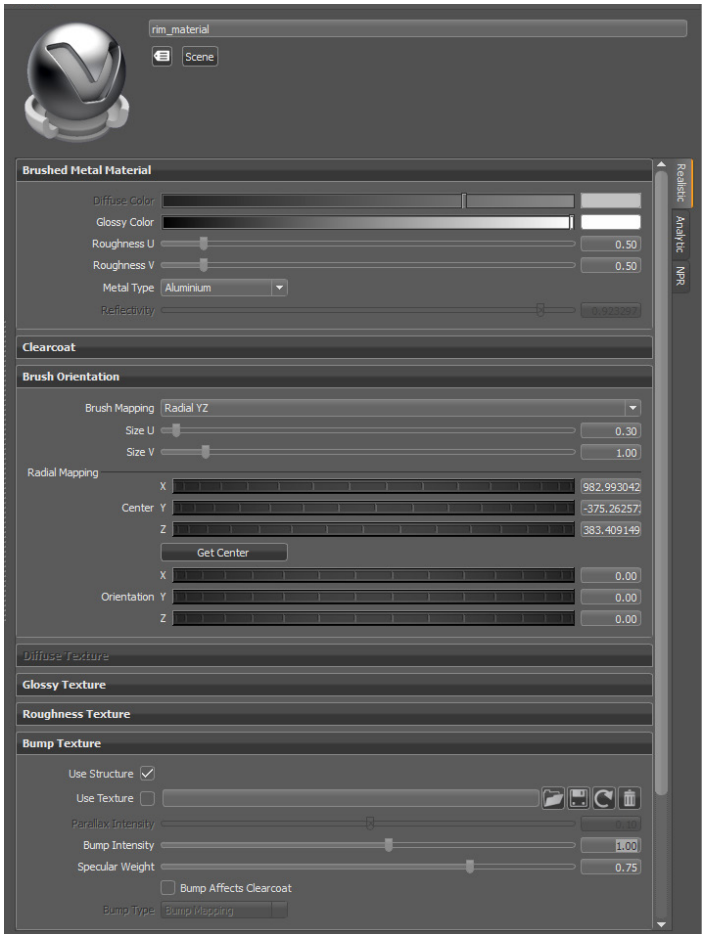
Material: Brushed metal

Create a BrushedMetalMaterial for the rims.

- Right-click in Materials tab and select Create > Brushed Metal.
- Rename the Brushed Metal to Rim Material.
- Assign the Rim Material material to the front left and front right rim.
- Set the metal type to Aluminium.
- In the Brush Orientation section, set the Brush Mapping orientation to Radial YZ.
- Set the Size U and V value to 0.3.
- Select the front left rim and press Get Center in the material's Radial
- Mapping section.
- Enable the Use Structure check box in the Bump Texture section.
- Set the Bump Intensity value to 1.

Duplicate the Rim Material and assign the duplicated material to the rear rims.

- Right-click on the Rim Material in the Material Editor > Material tab. Select Edit > Duplicate.
- Rename the duplicated material to Rim Material_back.
- Assign the Rim Material_back material to the rear rims.
- Select the left rear rim and press the Get Center button in the material's Radial Mapping section.



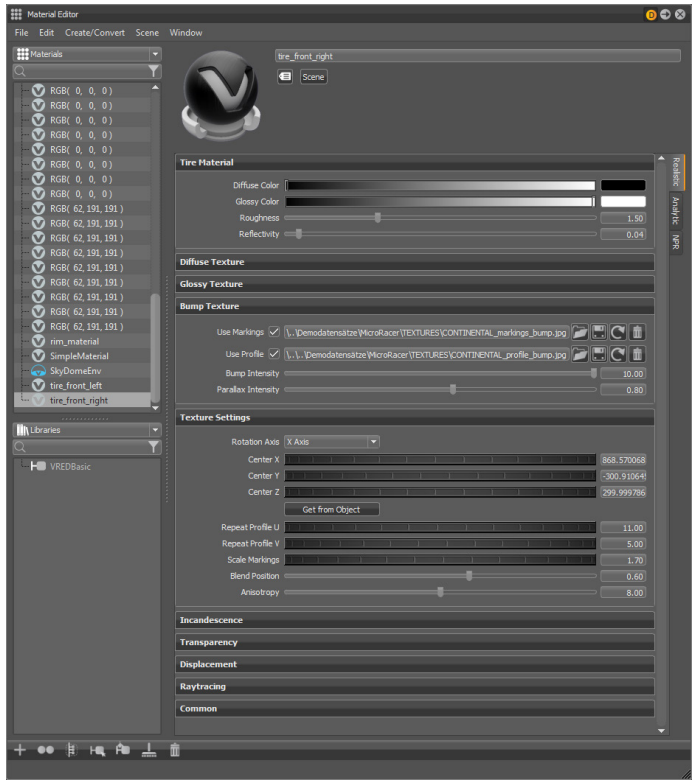
Material: Tire Material

Create a Tire Material for the car's tires.

- Right-click in the Materials tab and select Create Material > Tire.
- Rename the Tire to tire_front_left.
- Assign the tire_front_left material to the left front tire.
- Set the Diffuse Color to black.
- Set the Glossy Color to white.
- Set the Roughness value to 1.5.
- Load the file tire_marking_bump.jpg as the Diffuse marking texture.
- Load the tire_profile_bump.jpg as the Diffuse profile texture.
- Load the file tire_marking_bump.jpg as the Bump marking texture.
- Load the tire_profile_bump.jpg as the Bump profile texture.
- Set the Bump Intensity to 10.
- Set the Parallax Intensity to 0.8
- Select the front tire and press the Get Values from Object button in the Texture Settings section located in the materials attributes.
- Set the texture Repeat Profile U value to 11 and the Repeat Profile V value to 5. These values define the repeat behavior of the profile area of the tire.
- Set the Scale Markings value to 1.7. This value defines position and size of the markings.

Duplicate the tire_front_left material and rename the new material to tire_front_right.

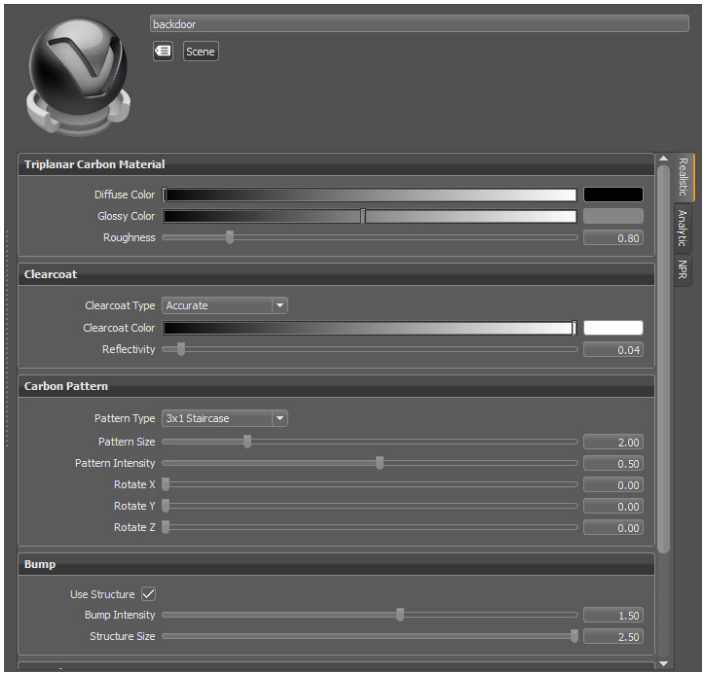
- Assign the tire_front_right material to the front right tire. Caution: The profile will not be placed correctly.
- To update the profile placement, select the front right tire and press the "Get Value from Object" button in the Texture Settings section located in the material attributes of the tire_front_right material.
- Repeat the same procedure for the two rear tires.

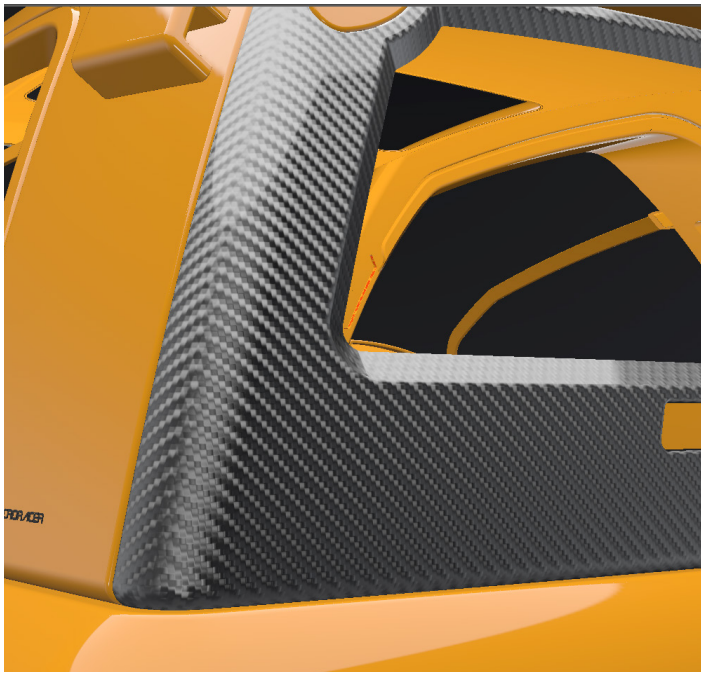


Material: Carbon Material

Create a Carbon Material for the car's back door.

- Right-click in the Materials tab and select Create Material > Carbon.
- Rename the Carbon material to rear door.
- Assign the rear door material to the rear door.
- Set the Carbon Pattern Type in the Carbon Pattern section to 3x1 Staircase.
- Set the Pattern Size to 2.
- Enable the Use Structure check box in the Bump section.
- Set the Bump Intensity to 1.5.
- Set the Structure Size to 2.5.





Now go through the following steps:

- Create a black Reflective Plastic material for the door handles and name it door_handle.
- Create a black Plastic material for the car's chassis blackout and name it black.
- Create a Chrome material for the car's exhaust and call it exhaust.
- Create a Chrome material for all Logos and types named Logo.
- Create another Chrome material called cover for the gas cover and increase the Roughness value.
- Create a red Glass material for the rearlights called rear_glass.
- Adjust the windshield's glass material transparency. Set the Exterior Transparency color to black.
- Assign the IndicatorGlass material to the side blinker`s internal light geometry.
- Create a Brushed Metal Material and name it dark_metal using the metal type Tungsten.
- Assign it to the brake calipers, lug nuts, ventiles and the center caps.
- Create a Brushed Metal material called brake disc and apply to the brake discs.

Ambient Occlusion

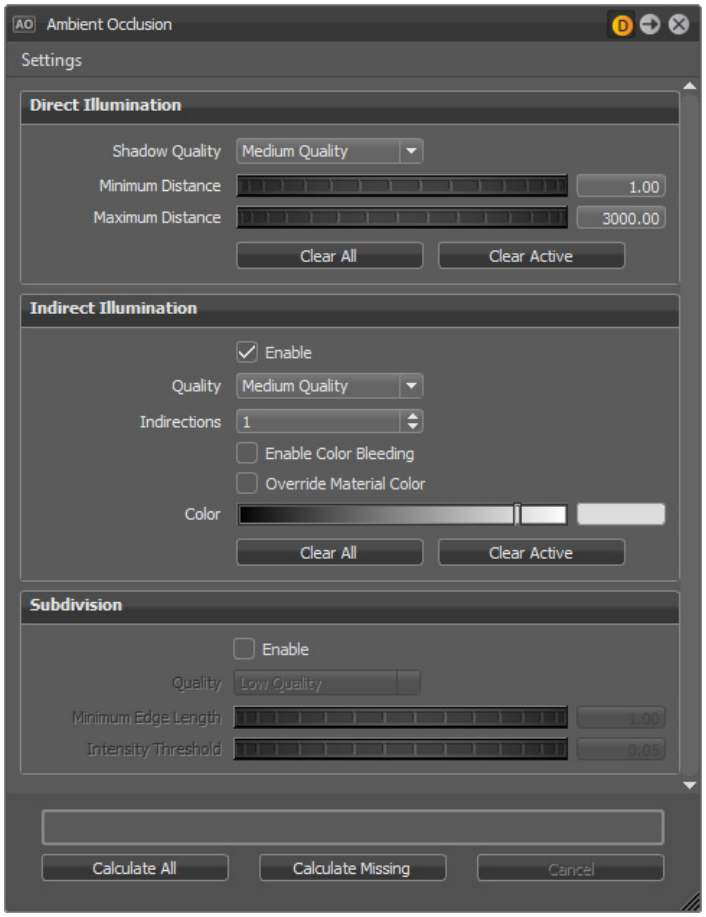
Precalculated Ambient Occlusion is a Render mode. In raytracing mode, ambient occlusion settings take effect only on surfaces that have TruelightShaders assigned and when selecting a Pre-computed Illumination render mode. In Raytracing GI rendering mode the pre-calculated ambient occlusion will be ignored. All information will be rendered at runtimes.

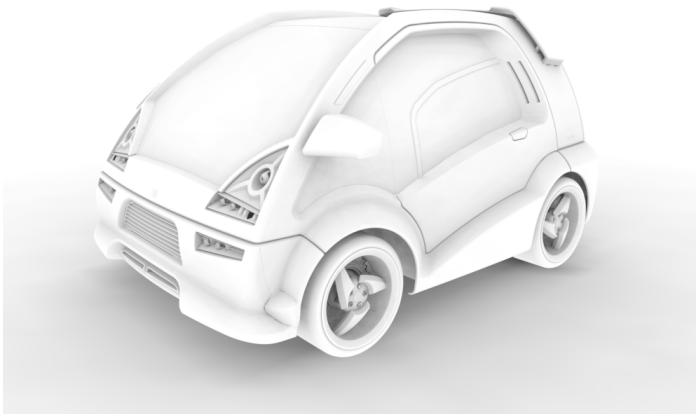
To calculate the ambient occlusion, you must to create a ground plane, which visualizes the occlusion information at the car's bottom side. This was completed in the Material: Shadow Material section.

Select the Microracer group node in the Scenegraph. Hold the CTRL key and select the ShadowPlane contained in the Environment node in the Scenegraph.

- Scene > Ambient Occlusion.
- Set the Shadow Quality to Medium Quality.
- Press Calculate All. Ambient Occlusion is a complex calculation and may take considerable time to complete.
- Press F7 to switch to Ambient Occlusion Rendering render mode.

The ambient occlusion calculation is vertex-based. To achieve a completely smooth result, it may be necessary to recalculate some parts, which do not have a mesh fine enough to offer smooth transitions from dark to bright. VRED adds further subdivisions to these parts if necessary. Subdivisions will be added to all.





Ambient Occlusion

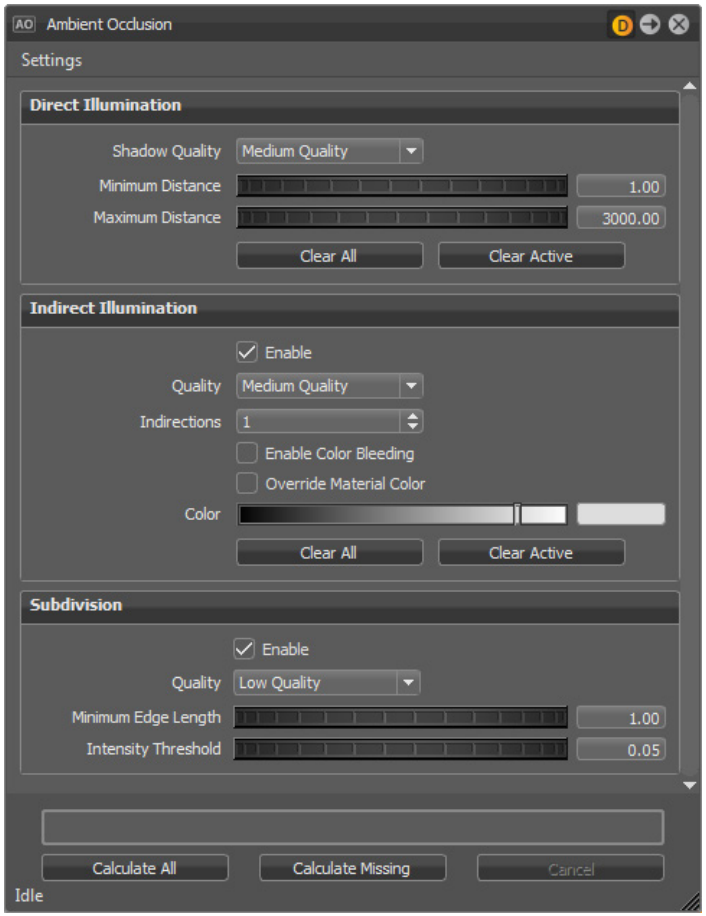
The surface normals define the direction at which surface is pointing. To see the surface directions switch to "Vertex/Face normal rendering" render mode.

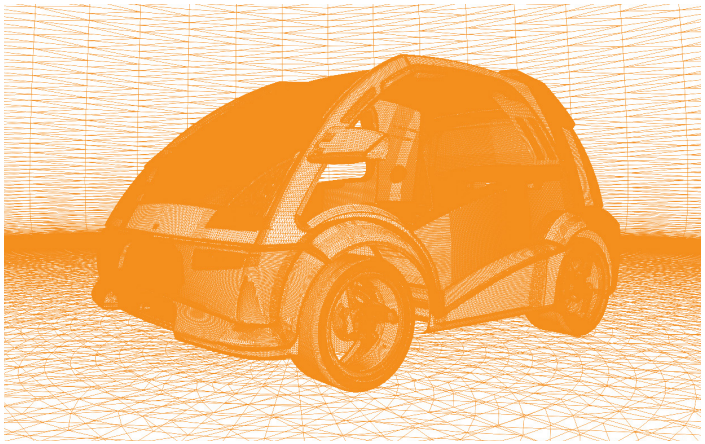
- Select the Ground Plane and all glass objects.
- In the Ambient Occlusion Module, enable the subdivision checkbox.
- Set the Subdivision Quality to High Quality.
- Set the Minimum Edge Length to 1 and press Calculate All.
- All selected parts will be rerendered, taking into account all visible parts.

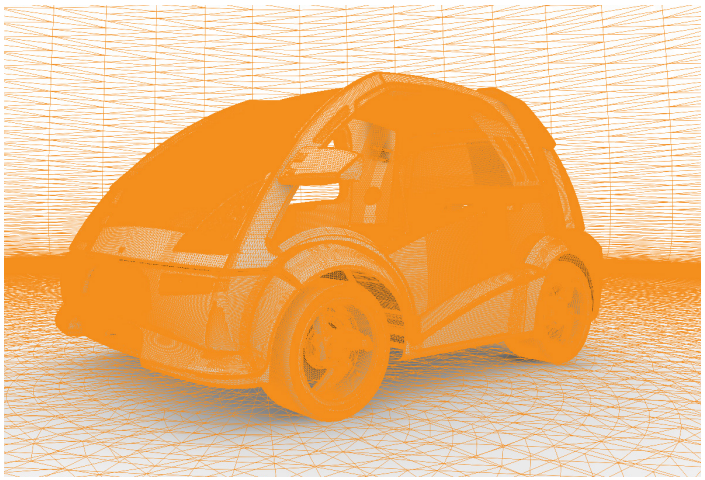
Sometimes only part of the selected object's normals have to be flipped:

- Select the headlight glass. Right-click on the headlight glass node in the Scenegraph and hide it.
- Geometries behind the glass are black because the headlight glass was not recognized as a transparent object during occlusion rendering. To define objects as transparent for ambient occlusion rendering, assign a transparent material.
- Unhide the headlight glass.

- Press F3 to switch to Realistic High Quality render mode.
- In the MaterialEditor > Materials tab: Right-click on the material assigned to the glass objects and select Convert > ToTruelightMaterial > Glass.
- Switch back to ambient occlusion render mode (F7) and recalculate the whole car and the ground.
- Set the shadow quality to Medium Quality.
- Deactivate the Subdivision check box in the Ambient Occlusion module before recalculating and press Calculate.
- Press F3 to switch to Realistic High Quality render mode.







Material: Intermediary result

This is how your picture should look now:

Creating environments

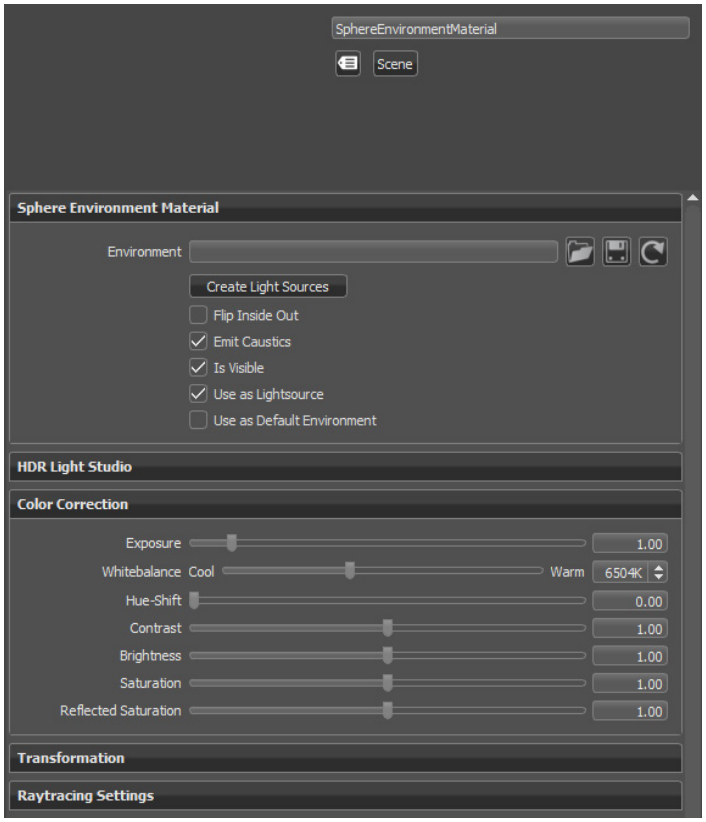
HDR images can be used as spherical environments. They surround all objects of the scene. An HDR image can also be used to define the lighting of a scene. VRED provides a default HDR image that is connected to all TruelightMaterials and is used to light the scene.

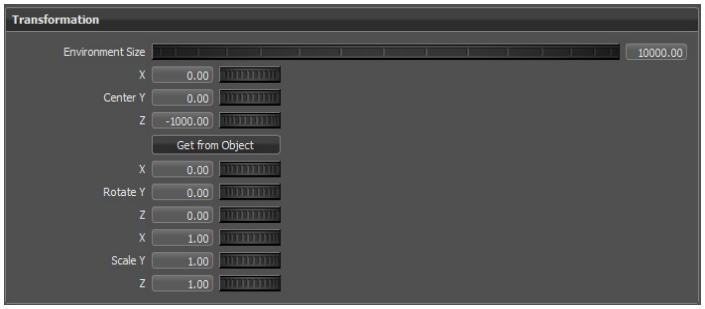
- At the bottom of each material's attributes list (except for the ShadowMaterial) is an Environment section under the Common tab.
- The environment value is set to SkyDomeEnv, which indicates that the default HDR image is in use.
- To use an individual HDR image as environment, a SphereEnvironmentMaterial is needed.

- In Material editor right click in the Materials pane. Select Create Environment > Sphere Environment.
- Navigate to the forest.mtd image and select.
- The envirognment will be loaded and named.

Assign the new environment to all TrueLightMaterials.

- Drag&Drop the "forest" Material on the Dome Geometry
- Right Mouse click on forest and select "Apply Environment to All Materials".
- The previous lighting information will be replaced by the lighting of the new forest material.
- In the forest material's attributes, set the Reflected Saturation value to 0.65.
- Save the project file.



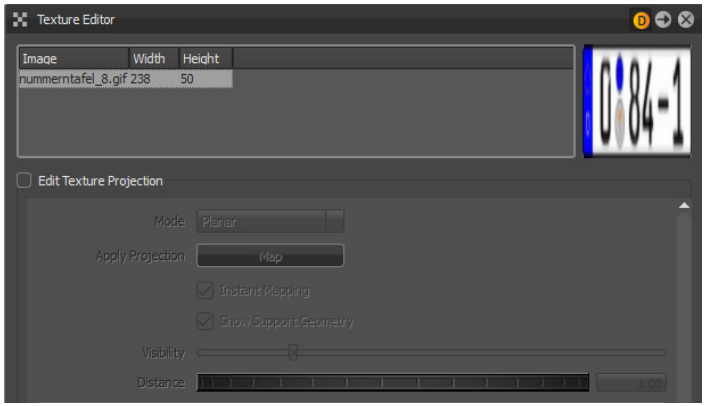


Projected textures

Create projected textures.

Create a Reflective Plastic Material for the numberplate.

- Right-click in the Materials tab and select: Create Material > Reflective Plastic and assign to the License plate geometry.
- Rename the Reflective Plastic Material to licenseplate.
- Set the material's environment value to forest in the Common section of the numberplate material.
- In the Diffuse Texture section, assign the licenseplate material to the license plate.
- Enable the Use Texture check box and select the texture nummerntafel_8.gif.
- With the licenseplate geometry node selected, select Scene > Textures Editor.
- Select Edit Texture Projection.
- Move the Visibility slider to max.
- In the Place Texture 2D section, rotate the texture by 180 degrees.

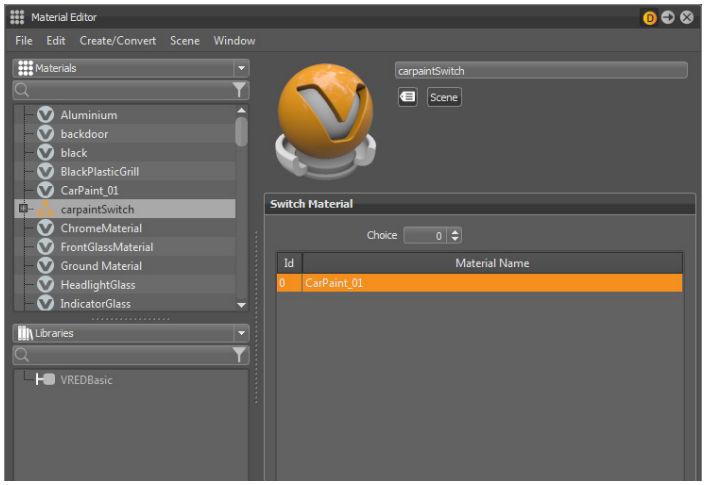


Material switches

Create material switches.

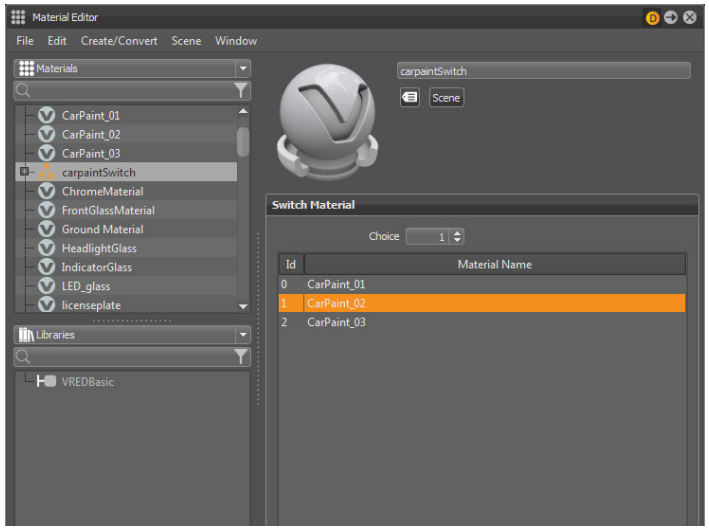
A Switch Material is a material node that enables the assignment of different materials. In other words, it can be used to switch between the different color variations. Create a Switch Material as a bucket for different car paints.

- Right-click in the Materials tab and select Create Material > Switch.
- Rename the Switch to carpaint.
- Right mouse click on the CarPaint_01 material in the Material Editor Scenegraph and select Select nodes. All objects with the CarPaint_01 material assigned will be selected.
- Right-click on the Switch Material carpaintSwitch and select Apply to selected nodes.



All chassis parts will turn black, since there is still no shading added to the carpaintSwitch node yet.

- Right-click the CarPaint_01 material and select Edit > Copy.
- Select the carpaintSwitch node and Edit > Paste the CarPaint_01 material into the context box of the carpaintSwitch node.
- Edit > Duplicate the CarPaint_01 material. Rename the new CarPaint_
- material to CarPaint_02.
- Add the CarPaint_02 material to the carpaintSwitch node.
- Set the CarPaint_02 material's color to gray.
- Create a Metallic Carpaint Material.
- Right-click in the Materials tab and select Create > Metallic Carpaint
- Rename the MetallicPaintMaterial to CarPaint_03.
- Set the CarPaint_03 material's Environment parameter to forest in the Common section.
- Add the new material to the carpaintSwitch material node.
- Now the Chassis color can be quickly changed by choosing different materials in the carpaint switch.

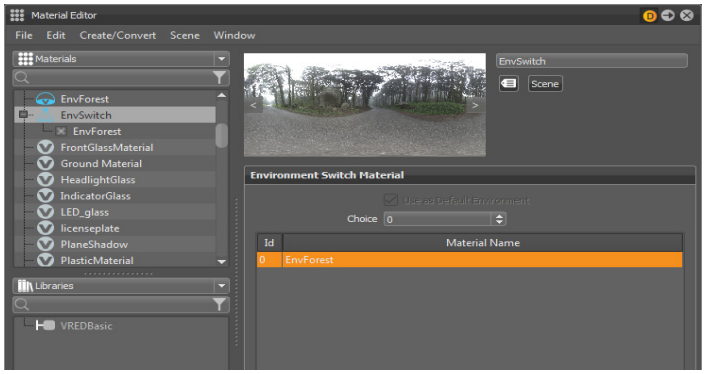


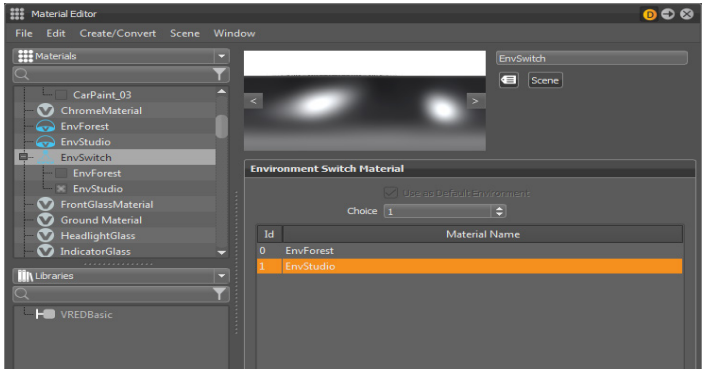
Environment Material switch

Create environment material switches.

An Environment Switch Material is a material node that enables instant assignment of different HDR surroundings to all shaders. The lighting situation can be switched immediately, based on the used HDR image.

- Right-click in the Materials tab and select Create Environment > Environment Switch.
- Rename the Environment Switch Material to EnvSwitch.
- Right-click in the EnvSwitch content box and select Add Environment > forest.
- Create a new Sphere Environment Material called EnvStudio.
- Load the HDR image called perfectStudio.mtd.
- Add the EnvStudio material to the EnvSwitch.
- Add the SkyDomeEnv material to the EnvSwitch.
- Apply the EnvSwitch material to the Dome geometry node.
- Right-click on the EnvSwitch material and select Apply Environment to All Materials. Leave the dialog box empty. All Truelight Material's forest values in the environment parameter will be replaced by the EnvSwitch value.
- Select the desired HDR Image in the EnvSwitch Choice parameter.





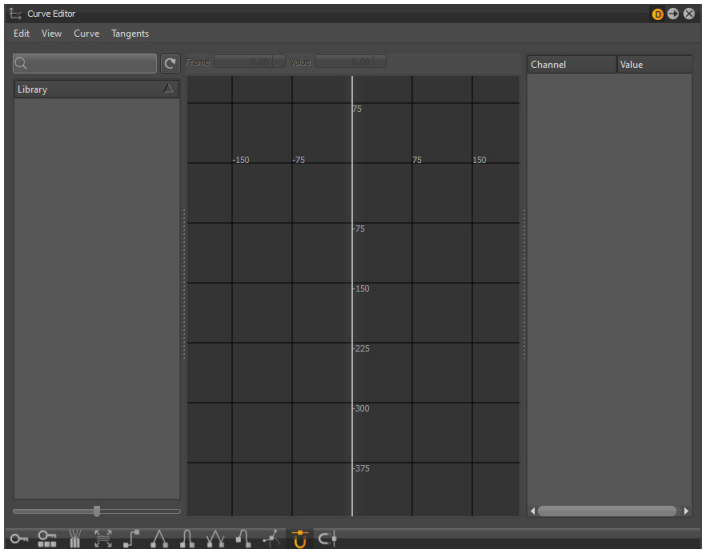
Object animations

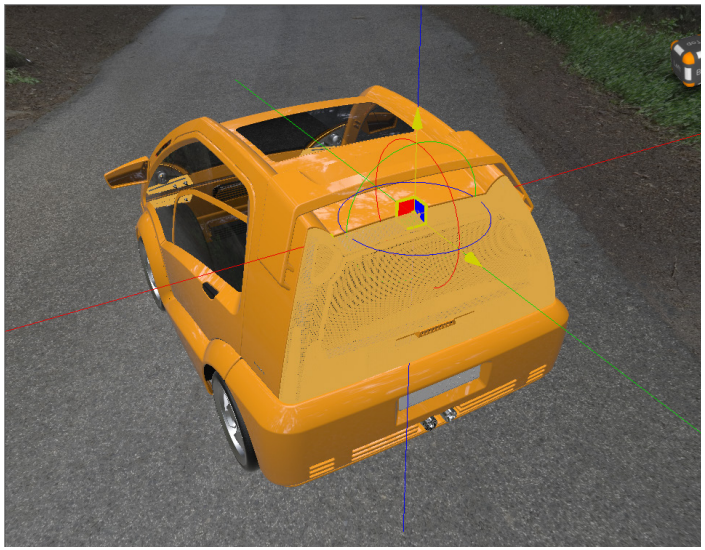
Position the pivot and create object animations.

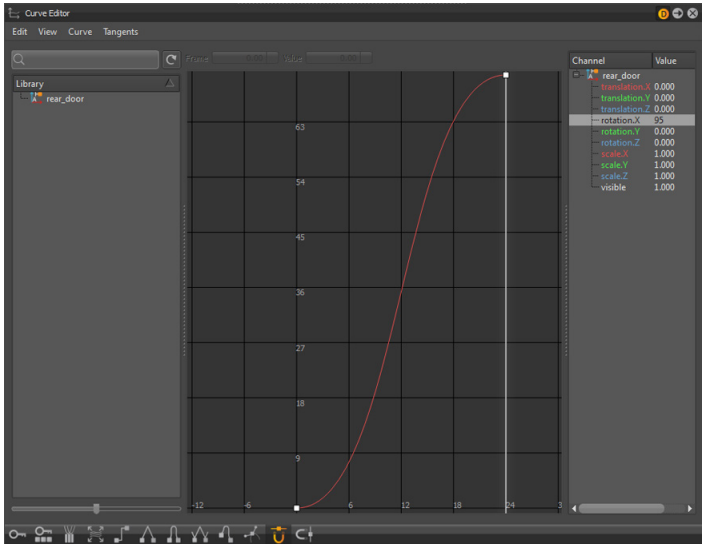
Animations can be created in the Curve Editor module. VRED supports the creation of keyframe animations. Keyframe animations can be rearranged and retimed in the Clip Maker module.

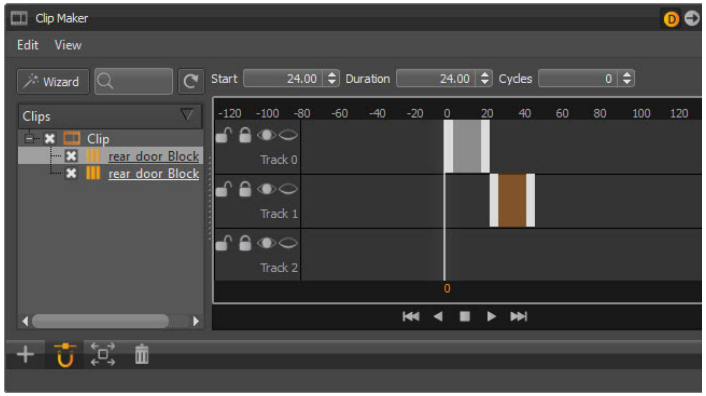
How to create a back door animation:

- Select the rear_door group node in the VRED Scenegraph. Activate the Transform Tool in the Icons tab.
- Press Shift + Q to activate the Pivot-Transform Tool.
- Hold shift to position the pivot (yellow arrows) at the top edge of the backdoor.
- Press Shift + E to activate the Rotate Tool.
- An object can be rotated by holding Shift + left clicking on the circles
- Open Animation > CurveEditor module.
- The rear_door transform parameters will be listed in the CurveEditor's Scenegraph. Press the Key All Channels button in the CurveEditor to key the initial rear_door position at frame 0. Keyed parameters appear colored.
- Go to Animation > Timeline to display the timeline at the bottom of the Renderview and move to frame 24. Rotate the x-axis of the Back_door geometry 95 degrees. Press the Key All Channels button again.
- Press "f" to frame all created keyframes in the CurveEditor's Graph.
- Hold SHIFT + click left mouse button and drag to create a frame selection around all keyframes. Press the "Flat tangents" button to define a flat tangent in all keyframes.
- Scrub through the timeline to view the animation. To store the animation, press the Create an animation block element button in the CurveEditor. An animation Block called "rear_door_Block"will be created and added to the CurveEditor's Scenegraph. It lists all animated parameters. When selecting the rear_door_Block parameter, the stored animation can be accessed and played.
- Go to Animation > Clip Maker and create a clip by clicking on the plus sign icon and selecting Clip.
- Drag&Drop the rear_door_Block onto the new clip.
- Right click on the rear_door_Block parameter in the Clipmaker and select "Duplicate flipped".
- Left mouse button drag the duplicate to the end of rear_door block.
- Now press the Play Button, in the Clip Maker, and view the reverse animation.
- In the Curve Editor the Back_door parameters are now free for further keyframe animations. An unlimited number of Animation Blocks can be created.





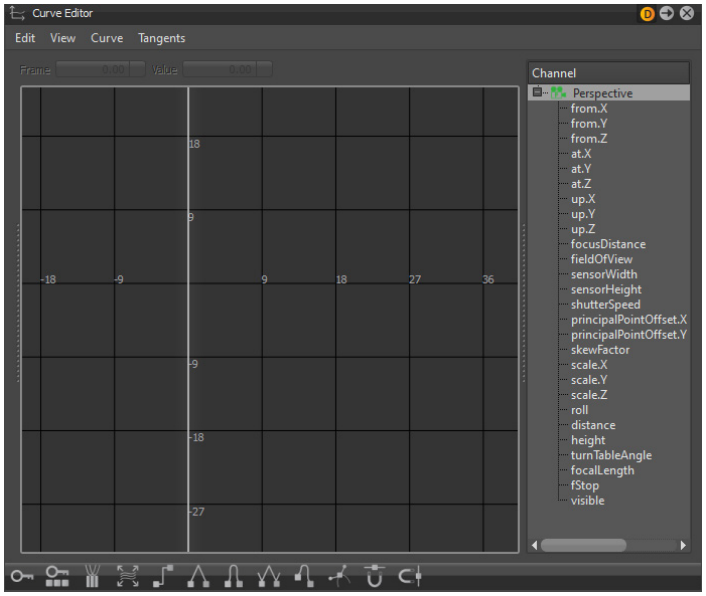


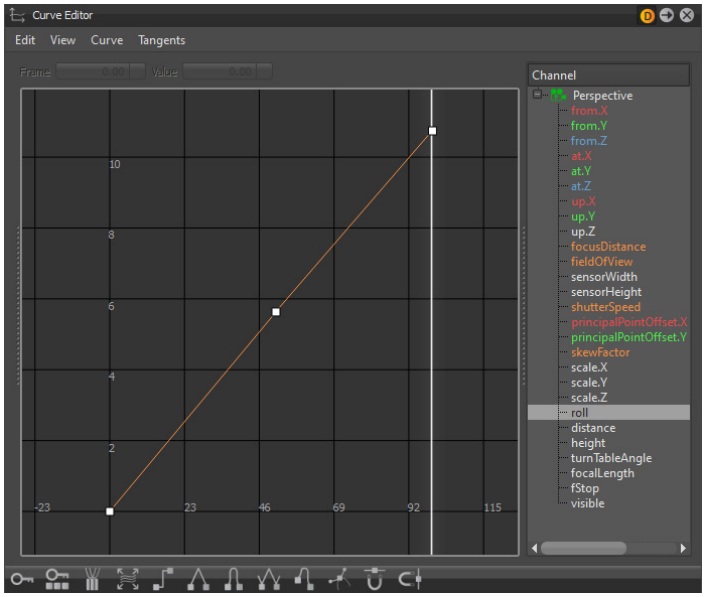


Camera animations

Camera animations can also be created using the CurveEditor module.

- Select the Microracer group node in the VRED Scenegraph and press right view on the Navigation Cube in the Renderview.
- Open the Animation > Curve Editor module.
- In the Time Line set the end frame value to 100 and move to frame 0.
- In the Scenegraph, select Perspective Camera in the root node.
- Press the Key all channels button in the Curve Editor.
- Move to frame 50 in the Time Line.
- Select the Microracer group node in the VRED Scenegraph and press front view on the Navigation Cube in the Renderview.
- In the Scenegraph, select Perspective Camera in the root node.
- Press the Key all channels button in the Curve Editor.
- Move to frame 100 and in the Time Line.
- Select the Microracer group node in the VRED Scenegraph and press left view on the Navigation Cube in the Renderview.
- In the Scenegraph, select Perspective Camera in the root node.
- Press the Key all channels button in the Curve Editor.
- Select Create an animation block element, in the Curve Editor, to store the animation. A camera block will be created.





Rendering

VRED supports two different rendering modes: OpenGL rendering and raytraced rendering-.

- Switching between both render modes does not require particular preparation. To activate raytracing rendering press the Raytracing button in the Icons bar.
- To improve the interactive performance in the Renderview press “Downscale” in the Icons Bar. Press and hold the left Mouse button on the Downscale button. Four modes are available.
- In case no antialiasing calculations take place select Antialias in the Icons bar. Alternatively, press the spacebar.
- Caution: In OpenGL Mode all reflections are approximated. A correct result will only be received in raytracing mode, as this mode calculates light beams physically. Nevertheless, all color variations, geometry switches, environment switches, and animations are available in both modes in the same way.

Raytracing rendering

Creating area lights in raytracing rendering

- In the Material Editor, switch to the default environment and change the carpaint switch to metallic carpaint.

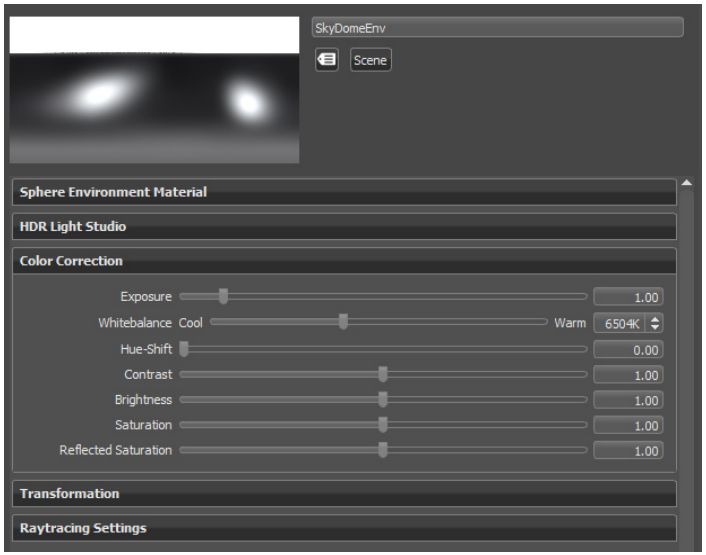
Raytracing rendering

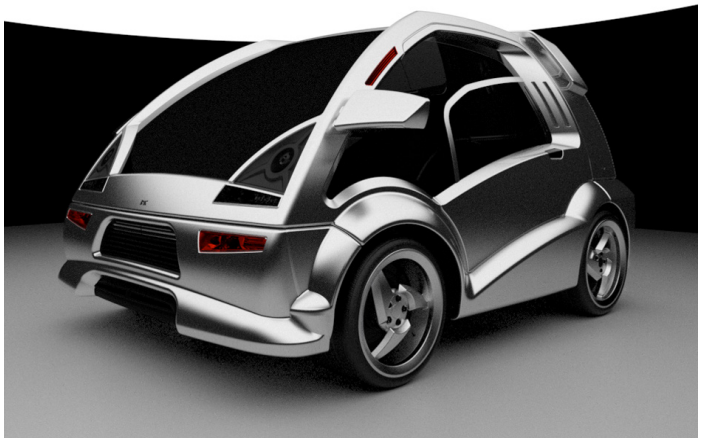
Direct light sources can be converted to area light sources.

- Activate Downscale and Raytracing in the Menu bar.
- Create a PlasticMaterial. Rename it ground_plastic and assign it to the Shadowplane.
- Change the EnvSwitch material to SkyDomeEnv.
- Go to Scene > Light Editor.
- Right click in the Light Editor Scenegraph and select Create > Disk Light.
- Set the light intensity to 2.
- Enable the Visible in Reflections check box.
- Select Transform from the Icons Bar, to move and scale the Disk Light.
- Shift drag the move manipulator and place the Disk Light above the Microracer.
- Shift R to change to the scale manipulator.
- Shift drag the yellow cube to scale uniformly. Scale toapproximately 400.
- Adjust the height of the Disk Light if necessary (shift W).
- Activate Antialias in the Menu bar.

Create area lights in raytracing rendering.

- The whole scene is still being lit by the HDR image and the DiskLight. To use only the DiskLight's lighting, set the SkyDomeEnv Exposure value to 0.

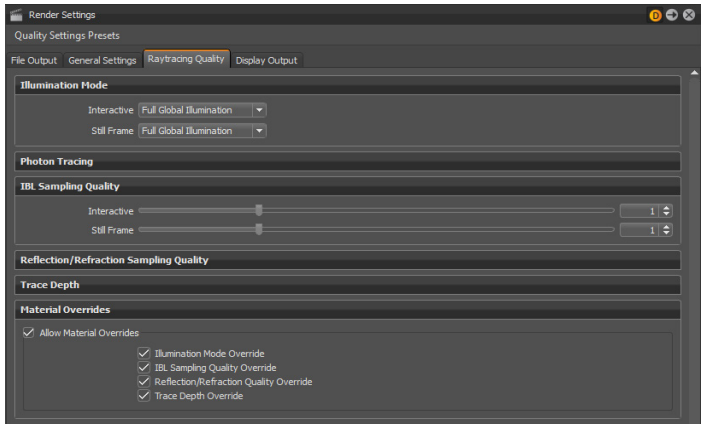




Global illumination

Raytracing rendering mode supports full global illumination. When you activate this function, more than one light reflection bounce will be calculated. All shadows will be calculated on the fly.

- Adjust the ground_plastic material.
- Set the Roughness value to 0.02.
- Set the Reflectivity value to 0.5.
- Open Rendering > Render Settings. In the Raytracing Quality set the Illumination Mode in Still Frame to Full Global Illumination.
- In the Reflection/Refraction Sampling Quality tab, change the Still Frame value to 3.
- In the Trace Depth tab, change the value for Still Frame to 32.



Interface: Iconstab

The Icons tab provides shortcuts to access commonly used features, such as the render options or the wireframe function.

File Open: File > Open

Add File: File > Add

Save File: File > Save

Antialiasing: Turns on/off antialiasing.

Raytracing: Activates raytracing. When deactivated OpenGL mode.

Downscale: Activates/deactivates downscaling. Offers a total of four downscaling options to accelerate the work process.

Region: Defines a render region.

Isolate: Shows only the selected nodes in the Renderview.

Backplate: Sets the backplate to visible / invisible.

Wireframe: Renders the geometry in wireframe.

Bounding Box: Draws the maximum cubic extension of selected object.

Headlight: Activates the Headlight. Its position is identical to the camera's position. It points in the same direction as the camera's view.

Statistics: Activates the scene's statistics. They are drawn at the top left corner of the Renderview.

Full Screen: Activates Full Screen render mode. Pressing Escape deactivates Full Screen render mode.

Presentation: Disables all VRED internal hotkeys except user defined hotkeys from the Variants module.

Show all: Shows all objects in the scene.

Zoom: Frames selected objects.

Grid: Shows the Grid. In default mode it is the XY Grid.

Ruler: Activates the Ruler check box. The ruler axis adapts according to the view axis.

Transform: Activates the Transform tool to interactively transform objects in Renderview.

- Press any arrow to move selected object along the selected transform axis.
- Press any cube to scale selected object along the selected scale axis.
- Press any sphere to rotate selected object along the selected rotation axis.

  red > X-axis

  green > Y-axis

  blue > Z-axis

- Press the yellow cube to scale the selected object along all scale axes uniformly.
- Press the green, red, or blue plane to move selected object along selected plane axis.

Texturing: The new Texture editing mode allows the user to interactively place and modify textures without opening the Material Editor.

Simple UI: Enables a user to create image content very quickly. Reduces functionality to a minimum viable amount.

Connect: Using the connector, VRED instances can be synchronized for navigation, even on independent computers. This mode can be useful to compare variants, for example. Besides navigation, python commands are synchronized.

Cluster: Opens the Cluster module. The Cluster module provides access to all settings for setting up the different clustering modes VRED offers.

Tracking: The tracking module is responsible for connecting an external tracking system to VRED by communicating to one or more VRPN (Virtual Reality Peripheral Network) servers.

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