CAD PROJEKT K&A

Operation manual

Visualisation
Object properties

CAD Kitchens 8.0, CAD Decor 4.0, CAD Decor PRO 4.0

www.en.cadprojekt.com.pl

INTRODUCTION

Instructions describe how to start working in the Visualization module related to assigning properties to objects.

We wish you a pleasant and fruitful work with our software!

CAD Projekt K&A team

The manual provides instructions and keyboard shortcuts for the previous 32-bit version of the program environment. The program now runs in a 64-bit environment. The commands and keyboard shortcuts may have changed as a result. Additionally, the program's interface has been updated.

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Visualisation – Defining object properties

1. Preliminary notes

In the visualization module, in addition to applying textures, other operations that are very important for the final appearance of the interior are carried out - such as assigning and modifying the properties of individual objects and surfaces. Each decor element can be assigned specific effects: gloss, transparency (e.g. for glass), reflections (e.g. for metal and mirrors), roughness, emission (emitting) of its own light in any color, backlighting (imitation of glowing with an intense glow) and mapping of texture irregularities, presenting convexity and concavity of patterns (e.g. on structural plaster, patterned wallpaper, leather upholstery, etc.).

Illustration 1 Example of the use of glass and metal effect

Proper use of the available functions guarantees a natural and photorealistic appearance of the arranged room and the equipment and decorations used in it. An example of using the transparency effect and the **Ray tracing algorithm** is shown in the illustration above (Illustration 1).

2. Editing functions in the "Material Properties" tab on the right menu

Once an object is selected (by double-clicking with the left mouse button or using the **"Select Item"** icon), editing options, divided into panels, become available in the right menu. The available functions are shown in the following tables.

2.1. Basic texture editing functions

In the following tables, we present the options available in each sub-tab of the **"Material Properties"** tab in the right panel.

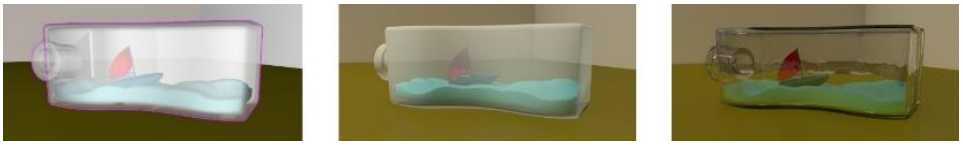
Function	Tab „Filling type”
Button „Colour”	- switches the user to the palette and color selection options, described in the next table;
Button „Texture”	- takes the user to the options for editing the texture with which the selected object is covered (we will present them in the next table).

Function	Tab „Colour”
Palette	- allows you to select any shade to use on the selected object; - the vertical bar allows you to select a hue (moving the cursor changes the hue in the preview bar above the palette, as well as the RGB value and settings of the **"Colour"** slider under the palette; - a rectangular area allows you to indicate with the cursor what saturation and brightness you want the selected hue to have moving the cursor changes the hue in the preview bar and the settings of the **"Brightness"** and **"Saturation"** sliders below the palette; - the cursor on the palette (circle) can be moved using drag-and-drop (by clicking on it with the left mouse button and holding the button down while moving the mouse) or by simply clicking on the desired point.
RGB values	- in these fields, you can set any numeric values in the range from 0 to 255, which allows you to get the exact color you are looking for (as long as you know its RGB value); - values can be set by left-clicking on the bar, moving the range of the slider using drag-and-drop, or typing the value from the keyboard (after first right-clicking on the digit);

Colour	- this slider allows you to change the color (e.g., red, yellow) - the hue thus indicated will have maximum saturation and brightness set to 50%.
Saturation	-with the help of this slider you can select the intensity of the color (from gray to the maximum saturation of the selected colur).
Brightness	-moving this slider lightens or darkens the selected color - the minimum setting is black, and the maximum setting is white.

Function	Tab „Texture”
Move	- allows you to move a texture on an object in the X or Y axis; - after clicking on it, the appearance of the texture preview changes - a vertical and horizontal slider appears, used to move the image;
Restore	- returns the texture to its original position, resetting the offset of the;
Name	- the name of the selected texture is displayed here;
Group	- the name of the group to which the texture belongs is given here, e.g. suede, brick;
Manufacturer	- if the texture comes from the manufacturer's database, its name will be displayed here;
Size	- In this panel, you can resize the texture (fit it to the surface of the object, stretch the pattern vertically and horizontally) using the following functions;
Adjust	- selecting this option stretches the texture to the dimensions of the object on which it is applied;
Grout width/ Height,	- having first subjected it to editing by double-clicking with the left mouse button; - after entering a value that exceeds the maximum (100000 mm), the program will set the maximum value; - the minimum value is 10 mm; - value can be changed using the buttons ⊖ and ⊕ or by typing in a value from the keyboard;
Angle of rotation	- value can be changed using the buttons ⊖ and ⊕ or by typing the value from the keyboard, after double-clicking with the left mouse button; - if the user enters a value that exceeds the maximum, the program sets 360°..

2.2. Defining material properties

Function	Tab „Material properties”
Gloss	- effect used for polished, smooth surfaces such as plastic, wood, polish, ceramic or objects coated with enamel or varnish; - results in a reflection of light from the item similar to that achieved on porous plastic;
Transparency	- at the maximum setting of this effect, the element becomes invisible until the lights come on; - the transparency effect alone can be used, for example, on curtains (just set the slider to 1%), while glass objects should additionally be given the effect of reflections; - at lower transparency intensities, objects mimic milky, tinted or frosted glass or clear plastic or plexiglass (Illustration 2); - In order for glass objects to look good in visualization, that is, to naturally refract and reflect light, use **Ray tracing** or **Path tracing** (Illustration 2).  *Illustration 2 Left: object with transparency given (50%), center: view after Path tracing calculations, right: 20% reflections added (glass effect)*
Reflecions	- the effect of reflections (from subtle to mirror-like) is used to present metal objects and mirrors; - to get the right look of reflections, you need to correctly define their type: general or planar (flat); - given reflections will be visible when the lights are on provided that the option **"Mirror"** or **"Metal Effect"** in the **"Scene”** tab is checked.

Roughness

- this parameter is closely related to reflections (to be visible when the lights are on, you must also set reflections)
- has a significant impact on the appearance of the rendered scene, as it produces more realistic, blurred reflections;
- in real life, almost all materials reflect light to some extent (the only exception is some textiles), so in order to make visualizations look completely natural, it is useful to give the effect of reflections and roughness also, for example, leaves of potted plants,
- light on rough surfaces reflects in a diffuse, inaccurate way - and the **"Roughness"** function mimics this very well (Illustration 3);
- in addition, applied on the surface with given mirror reflections will give the effect of "fogged mirror";

Illustration 3 – An example of a fogged mirror (using the "Roughness" option)

Reflection type:
-General
-Planar

- having given the effect of reflections to the object, indicate whether they are to be general (omnidirectional) or planar (flat) reflections - this affects the way the scene is displayed in the basic render);
- General reflections apply to items simulating metal with irregular or circular shapes, such as faucets, chrome furniture pieces, tableware, lamps, decorations, door handles, etc..);
- Planar reflection, that is, planar (which used to be further divided into vertical and horizontal) should be set for objects that are flat and rectangular, especially large planes, such as mirrors, lacquered floors, window panes, furniture fronts, ceramic tiles;
- selection of the type of reflections is not necessary when using the Path tracing algorithm - the way this computational method works, reflections are always properly displayed, without the need for user intervention.
- In the case of the basic renderer and the Raytracing algorithm, in order for the effects of reflections to be visible, two options must be checked in the **"Render"** tab: **"Mirrors effect"** and **"Metal effect"**(the former is responsible for displaying planar reflections, and the latter for general) (Illustration 4).

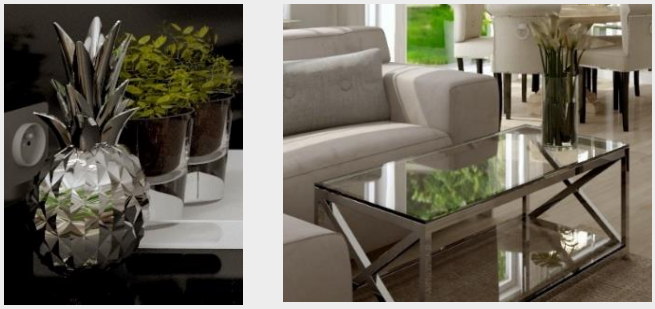


Illustration 4 Examples of objects with general (left) and planar (right) reflections (illustrations obtained using the Path tracing algorithm)

2.3. Emission properties

Function	Tab „Emission”
Emiission	- effect of emitting its own light; - the object will actually emit light into the environment, which will have a real impact on the lighting distribution in the scene; - changing the properties of emitting materials (intensity of emitted light and its color) is possible during **Radiosity** and **Path tracing** calculations; - to do this, select the object by double-clicking the left mouse button, and then on the right menu, in the **"Emission"** tab, move the **"Emission"** slider to the desired value (the **"Glow"** slider will automatically set itself to the same value; description of its operation can be found below);
Glow	- the effect of imitating the emission of a glow, glowing with white light; - at the maximum setting of this effect, the selected elements become strongly brightened and appear as if they emit intense light, which, however, has no real effect on the distribution of lighting in the scene (it is an apparent glow); - to properly show this effect, check the "Emission presentation" option in the "Render" tab”; - the backlighting effect can be assigned to any elements - it is most often used for halogen grommets, window frames, ceiling skylights and other objects that emit or transmit light in real life;
Emission colour	- by default, the emitted light is white - to give it any other color, click on the hue preview in the "Emission color" field - this will open a palette where you can indicate any shade; - to confirm the selection, click the **"Ok**" button;
Use emission colour	- the visibility of the newly assigned emission color can be controlled by checking or unchecking the **"Use emission color"** option - the new light color will become visible in the scene after the next view refresh.

2.4. Defining bump mapping

Function	Tab„Bump mapping”
Bump mapping	- bump mapping, is a method of texturing spatial objects by imitating the irregularities of their surfaces to achieve a natural shadow distribution effect on their surface; - this technique perfectly reproduces irregularities, porosity, bulges, convex and concave patterns on the surface of objects; - when the **"Bump mapping"** option is selected, the darker parts of the texture will be treated as concave elements and presented as such; - the greater the movement of the slider, the greater the impression of the three-dimensional surface of the object;
Reversed effect	- when this option is selected, the pattern will be displayed in reverse - indentations and highlights will be distributed inversely to the situation described above.

2.5. Layer management

When editing design elements in the visualization, the user can easily and conveniently manage its layers. Two tabs at the bottom of the right menu are used for this: **"Layer"** and **"Selected"** (Illustration 5), whose functions we describe in the following tables.

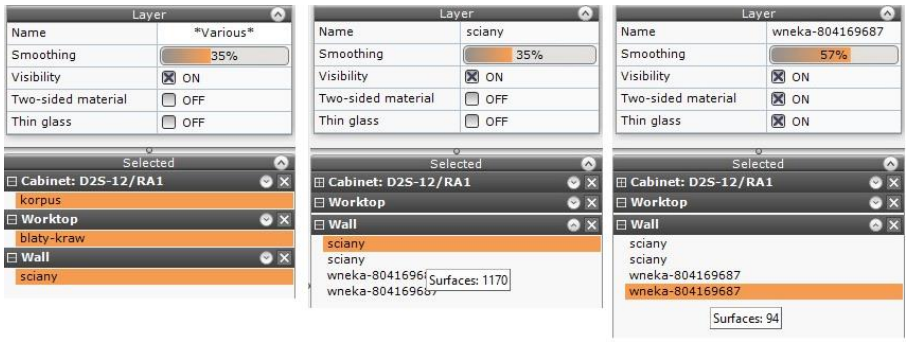


Illustration 5 "Layer" and "Selected" tabs on the right menu

Function	Tab „Layer”
Name	- this field displays the name of the object layer currently being edited;
Smoothing	- allows additional processing of models with rounded shapes that were drawn in a way that does not guarantee a satisfactory level of edge smoothing, or were over-simplified in this respect after the conversion was carried out; - allows to level the edges and sharp corners in places that should be smooth and rounded (Illustration 6);  *Illustration 6 Example of an element with curved shapes without smoothing (left) and with smoothing (right))*
Visibility	- allows you to turn on and off the visibility of the edited layer;
Two-sided material	- for elements that are made up of single surfaces and are to show the same properties on both sides (e.g., on top and underneath or on the right and left), check this function; - a good example illustrating the usefulness of this function is a blind - each sheet is drawn in this case using a single surface (face) - in order for the light to spread properly, both sides of the sheet must be treated by the program as two separate surfaces; - this function is also useful for models that have been drawn incorrectly and cannot be repaired using the scene repair function turning it on also in this case will result in the correct distribution of light on the object and the environment(Illustration 7).  *Illustration 7 – object without the given property "Two-sided material" and with the given property (on the right) - visible effect of this function on the lighting distribution*

Function	Tab „Selected”
List of layers	- all layers of the selected object are displayed here (when a single item is edited - the second and third parts of Illustration 5) or the selected layers of all edited objects (the first part of the Illustration 5); - after pointing the cursor (without clicking) to the selected layer, the number of surfaces that lie on it will be displayed (the second and third parts of the Illustration 5).

Additional information

1. Instructional videos

- Playlist, Visualization | Render"
- Bulge effect on texture
- Material property settings - fronts
- Material property settings - wood flooring
- Material property settings - glass | ceramic | metal

2. Shortcuts and commands

The document compares keyboard shortcuts in the .4CAD and visualization environments and lists the most frequently used commands in versions up to 3.Xi/7.X and version 4.X/8.X (both 34 and 64 bit versions of the environment). Find the document at: https://www.cadprojekt.com.pl/zasoby/pdf/opisy-techniczne/shortcuts-4-0-8-0-eng.pdf

This document provides an overview of keyboard shortcuts and commonly used commands in the .4CAD environment for visualization. The shortcuts and commands can be issued using either the mouse or keyboard. It can be accessed at: https://www.cadprojekt.com.pl/zasoby/pdf/opisy-techniczne/shortcuts-4-0-8-0-64bit-eng.pdf

In the above list, LPM and RMB stand for left and right mouse buttons, respectively. A command notation with a + sign (e.g. [Ctrl] + [Z]) indicates that both keys should be pressed simultaneously, while a notation with a >> symbol (e.g. [E] >> [Enter] or [Space]) means that you should first type E and then press [Enter] or the space bar.

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