

SETUP

STEP 1 Keep download files in their original folder.

The download is most likely a zip file. This zip file contains a scene folder enclosing all necessary scene files. Place this folder in a directory of your choice and keep all its contents in tact (no need to move the textures in other locations).

STEP 2 Test the scene to ensure it renders properly and all file paths are set correctly.

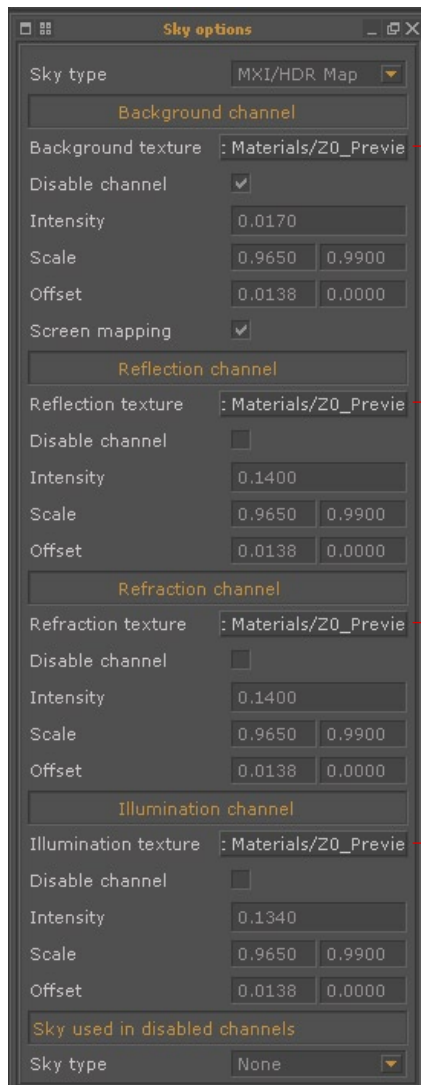
Open the mxi file within Studio and press render.
If the result looks like figure 1 then all is good.
If the result looks like in figure 2 then there is a problem.

STEP 3: If the render did not come up as in figure 1, then:

Go to the sky-options and re assign the texture paths in all channels to the file "SphericalPanorama.mxi" (found in the downloaded folder).

STEP 4: If for some reason the MXI texture is still not showing up in the reflections then:

Go to the objects list. Expand the group named "Environment" and unhide all the walls.



Set all to "SphericalPanorama.mxi"

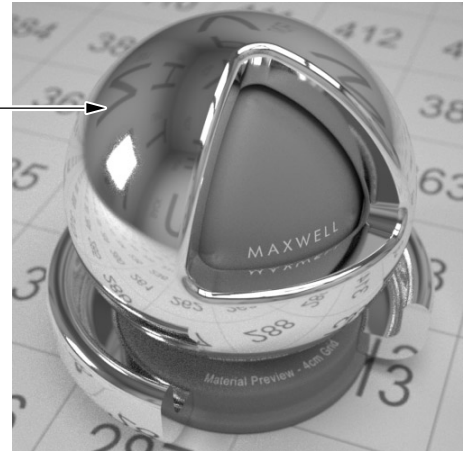


FIGURE 1

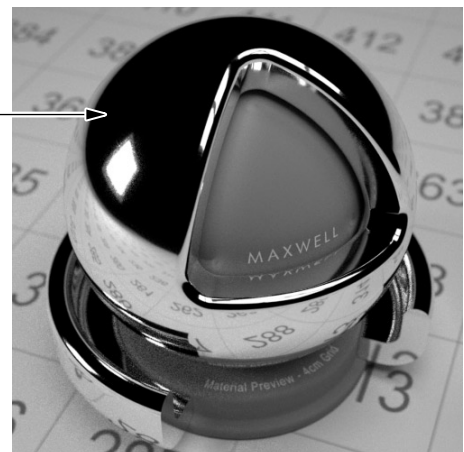
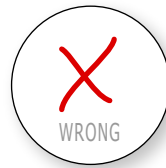


FIGURE 2: MXI environment is not properly set.



REQUIRED MXI ENVIRONMENT: This image must be loaded into the sky options in all channels

BACKGROUND

OBJECTIVE

The idea is to provide a material presentation scene as an attempt for uniformity providing standard illumination and scale. A common ground (common environment and lighting) as a way to get an idea of how a material would look like under calibrated exposure settings and in a neutral environment.

BACKGROUND

Materials are a very critical area for Maxwell (or any render engine). When materials are authored arbitrarily by several people, each chooses different illumination settings, scale, and environments. Such variability can cause difficulties in judging one material against another and how a material would look under simple (neutral, non-stylized) lighting conditions.

TECHNICAL SUMMARY

Scene is housed within a 100.0cm cube (the "light box"). Ground surface is lined with a 25x25 grid. Each square of the grid is 4cm and contains a unique number from 000 to 625. Each wall and the ceiling contains 4 unique letters (symbols). The uniqueness of such surface indicia helps to identify the source of reflections on the surfaces of the test object. The test object itself has a carefully devised shape so as to provide a variety of metrics (or evaluation checkpoints) and is placed at the center of the floor (above numeral 312). The scene contains two emitters. One emitter is a large overhead at 80watts @ 12.5 lm/W efficacy and provides the ambient illumination for the scene. The other emitter is smaller at 20watts @ 12.5 lm/W efficacy and provides a source for caustics (in case of reflective objects). Both emitters are at RGB[255,255,255] deliberately so that they do not impart color bias to the test object.

TECHNICAL DETAILS:



Calibration card

Black@[0,0,0]

Gray@[191,191,191]

Scene Exposure Calibration

The scene is already pre-calibrated (no need for further adjustments). A calibration card was placed on the ground position at numeral 312 (the exposure of the scene was adjusted for that very position). The card contains a texture of colored squares with specific RGB values. The Maxwell exposure settings were adjusted (while probing with an 5x5 eyedropper tool) to ensure that the output gray colors of the card are as true as possible to the input colors. So, the eyedropper should read gray at exactly RGB 220 for the top square, gray at approximately RGB 130 +/- 1 for the second from top and so on until gray 0 for bottom.

The calibrated exposure settings are ISO400, Shutter4.5, F12.0, Burn0.8 and Gamma2.2 (please do not adjust these settings while rendering material tests. If a material doesn't look good under these conditions then the color of the material, or other attributes of the material itself need to be adjusted instead).

After the exposure calibration was complete then a spherical panorama of the cube interior was constructed. The resulting image was used as an MXI environment (sky-options) in place of the walls. The walls themselves were deleted. This step (of removing the walls and replacing them with a "baked" image of themselves speeds up the rendering substantially. It is very important that no adjustments are made to the emitters of the scene...such an action would entirely throw off the scene calibration and would cause the MXI image to be out of-sync in terms of illumination.

Preview Material

Second reflective caustic area

Triangular cutout (providing flat surface areas)

Shell thickness @ 9.7mm

Gray core at 50% (providing a neutral visual reference point for colors)

Preview Material

Rim (6mm thickness)
Emulating a drinking glass rim for testing attenuation on glass /transparent materials

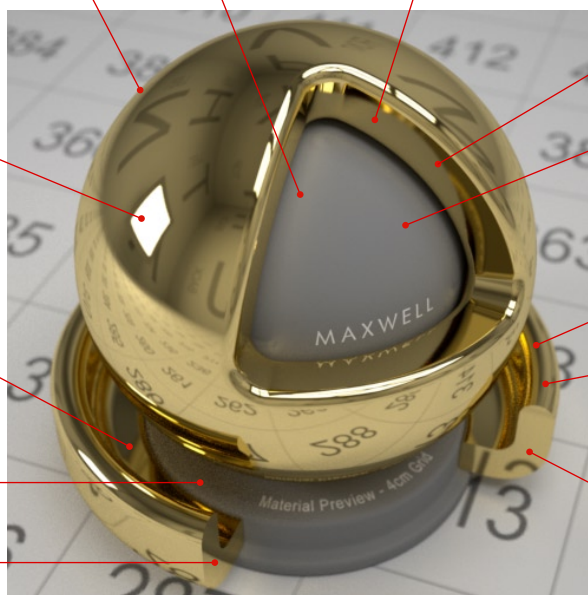
Fresnel checkpoint (45° reflectance)

Emitter reflection (for judging object specularity, material roughness parameters)

Mirror in mirror ray entrapment zone

First reflective caustic area

Fresnel checkpoint (63° reflectance)



TEST OBJECT:

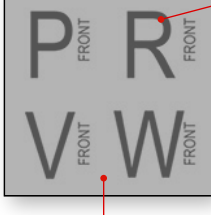
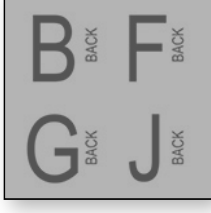
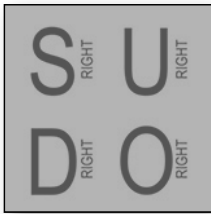
Modeled to feature an assortment of (typical) surface morphology.

Object Size:
(Ø7.46cm sphere, 9.7mm thickness
Ø8.85cm rim, 6mm thickness)

Object Design Features:

- Flat surfaces
- Spherical surfaces
- Cylindrical surfaces
- Rim (for glass material evaluation)
- Mirror-in-mirror ray entrapment area
- Gray@50% (reference color area)

BOX SURFACE INDICIA



Internal Core portion

The gray core is split in three: a) The bulb (emitter) portion, b) the ribbon (emitter) portion, and c) the exposed gray portion (with the Maxwell letters). The ribbon and bulb emitters are two-layer materials with one layer being gray diffuse and the other layer being emissive. The emissive layer is turned-off by default (emitter color set to 0). The emitter can be turned-on (by switching its color to 255) to showcase materials with SSS properties or the like.

Emitter Status indicator

- Ribbon emitter is ON
- Bulb emitter is ON
- ⦿ Both ribbon and bulb emitters are ON

SubSurface object 1

Reflection

Refraction

Attenuation indication;
(representing the rim
appearance of a drinking
glass)

Air Bubbles

Refractive Caustic

SubSurface object 2

Exposed core portion
(gray at 50%)

Internal cavity with
2mm wall thickness

Each square of the grid
is 4cm and contains a
unique number from 000
to 625.



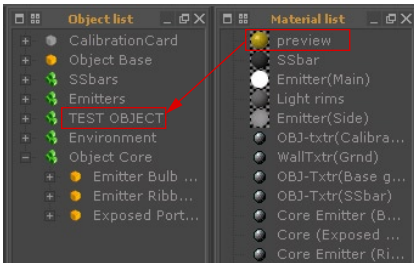
TEST OBJECT: SUB-Surface and attenuation Elements

The benefit of the air-bubbles is that they can help distinguish whether what we are looking is an internal reflection, or a surface reflection, or refraction. For example, if we look near the base (above the letters) we see the reflection of the ground surface and we also see some bubbles on top of it. This implies that those are not surface reflections, but instead they are coming from the internal face of the glass (this is something that would be hard to tell without those bubbles).

RGB(128,128,128)

RGB(180,180,180)

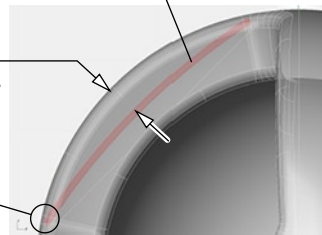
All reflections in the scene
originate from the above indicia



SubSurface bar object

Variable material
thickness above SSbar

Shallow region



SIDE VIEW of triangular cutout area

The subsurface bar would serve to evaluate SSS properties of a material. Due to the variable thickness of material covering the SSbar ... only the tips (the shallow region) of the bar will start becoming discernible at low SSS settings. As the SSS becomes stronger more of the bar will be seen through the object.

SCENE INSTALLATION.

Please treat this scene as a regular scene, placing it in a folder of its own with all textures. The first time you open it in Studio, please make sure that all materials are pointing to the right textures (and save again if necessary). Some users might opt to use this scene as a preview scene for MXED (material editor) ... this is possible ... but it is *not* the primary purpose of this scene.

USAGE PROCEDURE:

1. Launch Studio
2. Open "StandardMatTest.mxs" file
3. Adjust material named "preview" ... or ... Create one new material and assign it to object group named "TEST MATERIAL".
4. Render scene.
(please do not adjust illumination, camera position, or any other settings during this whole process).

CAUTION: The group labeled as "TEST OBJECT" is the only thing to be assigned custom/test materials. Also, the material named "Preview" and the object-core emitters are, the only items that are user defined. All other aspects of the scene must remain untouched (including exposure settings) for all renders. (Projector adjustment for texture placement is allowed).