

# Working with sun caustics



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## Why this tutorial ?

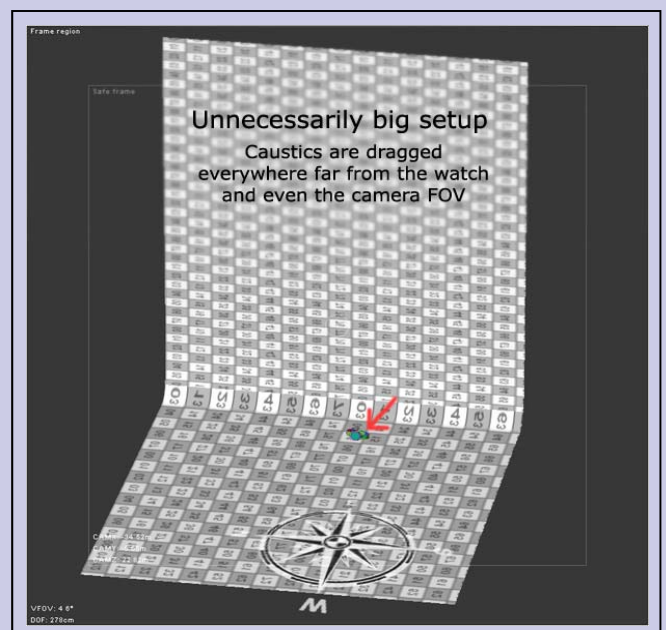


Because it's important to always have the fastest render time possible. The case of an object lying on a floor under the sun is probably one that everyone will have to deal with sooner or later. Let's discuss the does & don'ts to make fry render it efficiently.

When using a large ground plane, 2 options are possible : the ground is lambertian and thus does not produce any caustics (it only receives them) or it's a caustics generator. Either way, the smaller the floor is, the faster the noise will clean up.

This is particularly true for non-lambertian materials, but even if less noticeable, it is for lambertians too.

So in any case, try to avoid the use of unnecessarily big grounds.



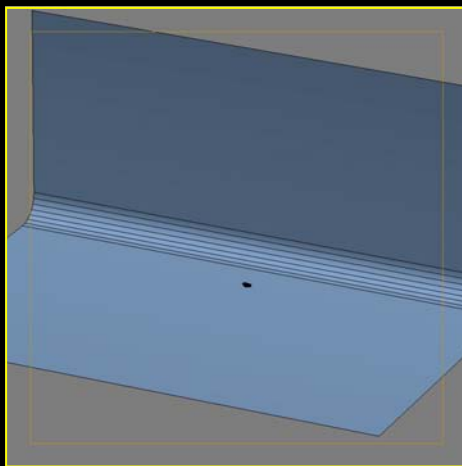


Let's take a look at some rendered examples :



This case is the most obvious one : the huge floor is very noisy even after 3 hours of rendering. This is because the floor is highly reflective, so the engine needs to integrate caustic light paths all over a humongous surface. Even for parts of the scene that are not visible by the camera !

➔ Scene setup :



➔ Blow-up :

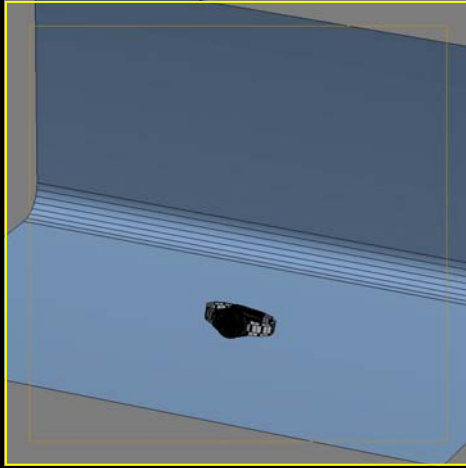


As you can see, the caustic and the reflection on the ground plane are VERY noisy after 3 hours of rendering. This is because the engine has to shoot lots of rays that the camera won't even see. The camera can only see a small part of the scene here, and 90% of the surface of the floor is not only pointless, but a performance killer.



Here we have reduced the ground plane so it's not much bigger than what camera sees. And this makes quite a difference ! Caustics integrate faster and the scene is much cleaner in less time. This is the right way to model this kind of open daylight scenes in order to get the best efficiency out of fry.

...> Scene setup :



...> Blow-up :



As you can see, the caustic and the reflection on the ground plane look much cleaner and the render time is cut by 1 hour. This is because the engine can shoot many more rays per pixel in the same amount of time.

...> Renders :

15 minutes (Dual Xeon Dual Core)

(Roughness 85)



fryrender  
physically-based render engine

1h30 min - dual xeon quad 1.6 ghz

dual layered floor



fryrender  
physically-based render engine

As you can see here the ground with a dual-layered material renders much more slowly than the one with a high roughness. This is a general sampling rule for fryrender: the higher the roughness, the easier for the caustics to compute. And also, the higher the number of layers for a material, the higher the number of passes necessary for it to clean up.

