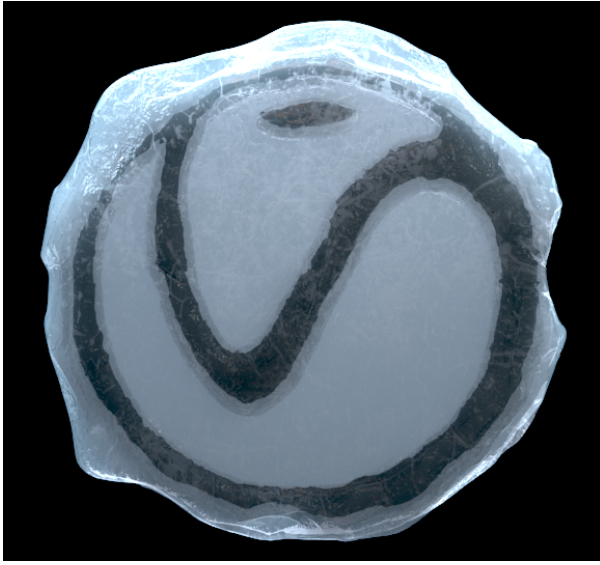# V-Ray Scatter Volume

This page provides information on the V-Ray Scatter Volume Material.

Overview

The V-Ray Scatter Volume material is designed solely as a brute force option for SSS to produce an unbiased result. When used as a base material in a Blend material it can create complex materials with a subsurface scattering base.

Parameters

Mode – Determines which method is used to control the sub-surface scattering effect.

> **Sub-Surface Color + Radius** – The subsurface effect is controlled with the help of the sub-surface **scatter color** parameters.
> **Scatter Coefficient + Fog Color** – The subsurface effect is controlled with the help of the **scatter coefficient** and **fog color** parameters.

Color – Controls the surface coloration for the material.

Scatter Color – Specifies the internal scattering color for the material. Brighter colors cause the material to scatter more light and to appear more translucent; darker colors cause the material to look more diffuse-like.

Overall Color – Controls the surface coloration for the material.

Radius (cm) – Controls the amount of light scattering in the material. Smaller values cause the material to scatter less light and to appear more diffuse-like; higher values make the material more translucent. Note that this value is specified always in centimeters (cm); the material automatically converts it into scene units based on the currently selected system units.

Radius Mult. – A multiplication control for the radius.

Phase Function – A value between -1.0 and 1.0 that determines the general way light scatters inside the material. Its effect can be somewhat likened to the difference between diffuse and glossy reflections from a surface, however the phase function controls the reflection and transmittance of a volume. A value of 0.0 means that light scatters uniformly in all directions (isotropic scattering); positive values mean that light scatters predominantly forward in the same direction as it comes from; negative values mean that light scatters mostly backward. Most water-based materials (e.g. skin, milk) exhibit strong forward scattering, while hard materials like marble exhibit backward scattering. This parameter affects most strongly the single scattering component of the material. Positive values reduce the visible effect of single scattering component, while negative values make the single scattering component generally more prominent. *For more information, see the Phase Function example below.*

Bounces – Controls the number of bounces a ray of light makes inside the volume.

Subdivs – Controls the quality of the sub-surface scattering. Lower values produce a faster but noisier result. Higher values reduce the noise but increase the render times.

Light Mult. – Multiplier for the direct lighting on the volume. A value of 1.0 is physically accurate. Larger values may be used to make the volume appear brighter.
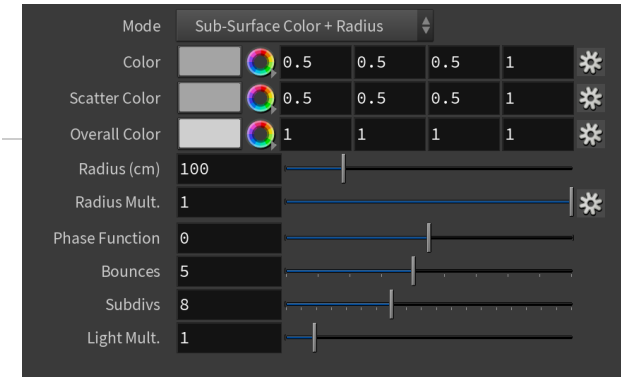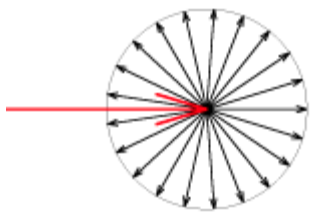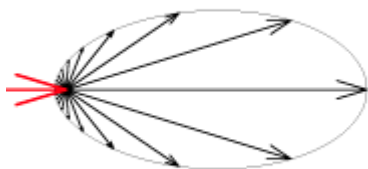

ase Function

These images represent how different values of the **phase function** parameter affect the raytracing inside the volume. The red arrow represents a ray of light going through the volume; the black arrows represent possible scattering directions for the ray.

phase function = -0.5 (Backward Scattering)

phase function = 0 (Isotropic Scattering)

phase function = 0.5 (Forward Scattering)

Usage Notes

Normally, V-Ray Scatter Volume is a base material of a Blend material and the coat material is a transparent or refractive V-Ray Material. You will get best results if the coat V-Ray Material has its **Affect Shadows** option enabled so that it lets light through more easily:

Sample Usage

The ice chunk shown on the right is created as a dense mesh with a rough surface. Strong lights are placed to point at the object, both above and below it.

A single V-Ray Blend is applied to the entire object. The material setup consists of the following:

- V-Ray Blend:
  - Layer 1 (base layer): V-Ray Scatter Volume
  - Layer 2 (coat layer): V-Ray Material named Scatter_Ice_Coat
  - Blend amount: Pure white (255,255,255), *see Notes below*
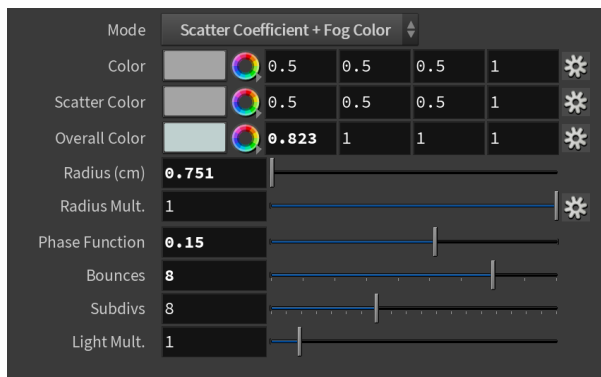
V-Ray Scatter Volume Details
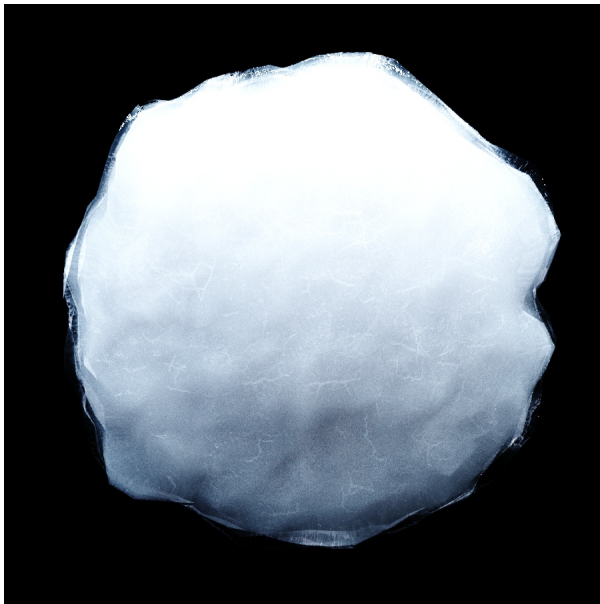
Note that the
Phase Function value is a small positive number to create slight forward scattering.

V-Ray Material Details

The V-Ray Material creates the icy "coat" around the object. Settings include:

- Reflection, Refraction, Fog Colors: White
- Bump, Reflection Glossiness, and Refraction Glossiness
  maps: Color Correction maps that adjust brightness and contrast of
  an ice bitmap.

Notes

- When using Blend with V-Ray Scatter Volume as base and a refractive V-Ray Material as coat, it is strongly recommended to assign pure white as the blend amount, otherwise the result will not be physically accurate and it will lead to longer render times.