Sub-Surface Scattering (SSS) simulates the effect of light entering an object and scattering beneath its surface. Not all light reflects from a surface. Some of it will penetrate below the surface of an illuminated object. There it will be absorbed by the material and scattered internally. Some of this scattered light will make its way back out of the surface and become visible to the camera. This is known as 'sub-surface scattering' or 'SSS'. SSS is necessary for the realistic rendering of materials such as marble, skin, leaves, wax, and milk. The SSS component in this shader is calculated using a brute-force raytracing method.

You must ensure that the geometry normals are pointing in the correct direction, otherwise, SSS will not render correctly.
SSS is important when replicating realistic materials such as plastics, for example:

![SSS disabled](SSS_disabled.png)  ![SSS enabled](SSS_enabled.png)

**Color**

The color used to determine the sub-surface scattering effect. For example, replicating a skin material, would mean setting this to a fleshy color.

**Weight**

The amount of sub-surface scattering. Multiplies the SSS Color. Below you can see the effect of adding SSS Weight:

![0](weight_0.png)  ![0.5](weight_0.5.png)  ![1](weight_1.png)

**Radius**
The radius of the area each sample affects. Higher values will smooth the appearance of the sub-surface scattering. Results will vary depending on the scale of the object in your scene. Arnold will take into account the shape and thickness of the object being lit. If it is thin enough, the object will often see light scattering out the back side, depending on the radius value (see example images below):

The lighter the color, the more light is scattered. A value of 0 will produce no scattering effect:

Increasing the radius value can radically change the appearance of the material, from looking like leather to marble.
Instead of distributing all of the colors with the same amount, you can also choose different radius values for each of the RGB colors. For example, a material like clay or skin should have a higher red radius than green and blue.

The images below show the effect when increasing the red color of the radius. Notice the colored ‘fringing’ effect around the edges of the circles. The same effect occurs when gaussian blurring the red channel of the source image in a compositing package.
Diffusion Profile

Choose between empirical or cubic (default). If set to empirical, Arnold uses a more physically accurate subsurface scattering profile, that, with a single layer, can capture both surface detail and deep scattering.

SSS Between Objects

It is possible to tag multiple objects as belonging to the same SSS 'set' so that illumination will blur across object boundaries. A common use case might be blurring between teeth and gum geometry. It is enabled by adding the constant STRING userdata sss_setname to the same value on the objects in the set.
As well as the SSS component of the Standard shader there is also a specific Skin shader.

Add 'share_sss' to the 'SSS Set Name' text field of the objects that you wish to share SSS.