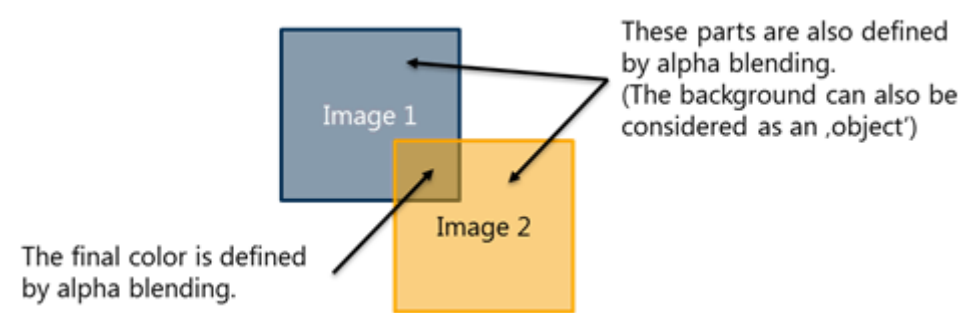


Blending

Alpha Blending is the process of combining the pixel data of multiple overlapping objects to a single pixel with a final color and alpha value.



Blend Factor

Here is an example on the different blend factors using alpha blending:

RGB	* One =	
RGB	* Zero =	
RGB α	* Src Alpha =	
RGB α	* Src Alpha =	
RGB α	* Src Alpha =	
RGB α	* Inv-Src Alpha =	
RGB α	* Inv-Src Alpha =	
RGB α	* Inv-Src Alpha =	

Alpha is 1.0 (white) for non-transparent pixels and 0.0 (black) for transparent pixels.

Blend Operation

The blend operation specifies how the destination and source pixel values are combined. Here is an example blending 50% red on opaque blue:

Destination: **B = 1.0** **α = 1.0**

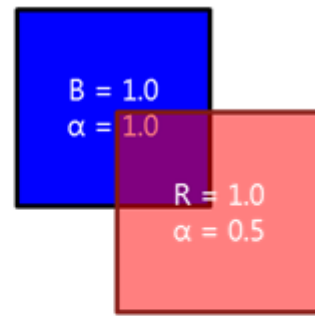
Source Blend Factor: Source Alpha

Source: **R = 1.0** **α = 0.5**

Destination Blend Factor: Inverse Source Alpha

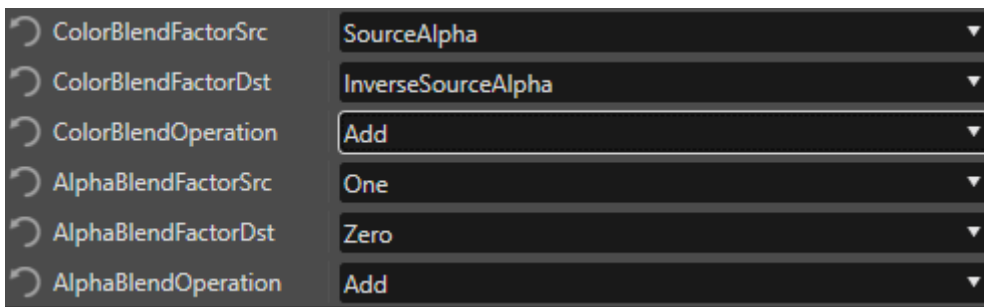
Blend Operation: Add

```
result = valuesrc * <src_blend_factor> <op> valuedst * <dst_blend_factor> =  
= ((1, 0, 0) * 0.5) + ((0, 0, 1) * (1 - 0.5)) =  
= ((1, 0, 0) * 0.5) + ((0, 0, 1) * 0.5) =  
= (0.5, 0, 0) + ((0, 0, 0.5)) = (0.5, 0, 0.5)
```



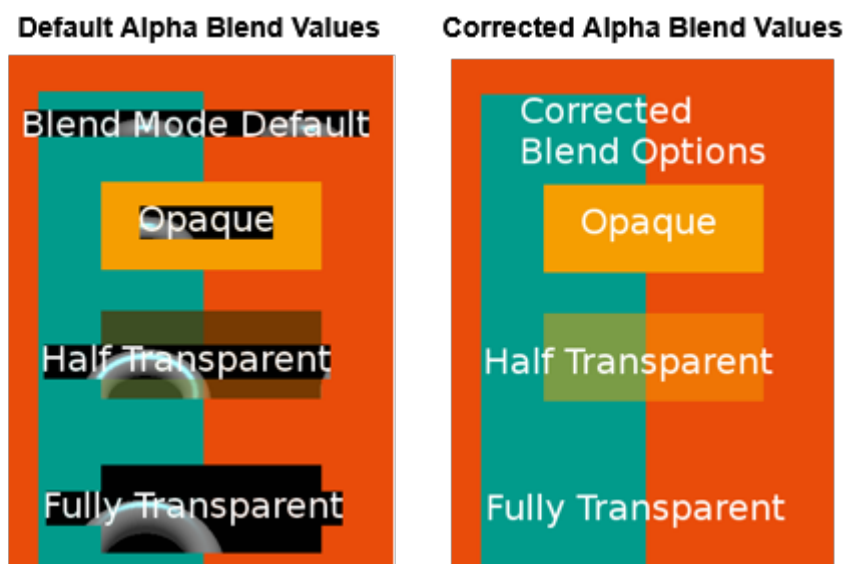
Blend Problems

The default values used for blending are set to the following configuration:



The default values ensure maximum performance when no layer blending is needed or no objects with transparency on the same layer are overlapping. The reason is that the Destination Alpha is multiplied with 0 (ignored) and the Source Alpha is used instead. This means the transparency of the last drawn item is used. The default Color Blend Values are fine for all common cases.

In the following example, a partially transparent 2D scene on one layer is rendered over a 3D scene of another layer.



	Default Alpha Blend Values	Corrected Alpha Blend Values
Configuration		
Alpha Blend Factor Src	One	InverseDestAlpha
Alpha Blend Factor Dst	Zero	One
Alpha Blend Operation	Addd	Add
Problem caused by	- Scene using layers - Overlapping objects with transparency	
Reason	Destination Alpha is multiplied with 0 (ignored), and the source Alpha is used instead. Therefore, the transparency of the last drawn item is used and the background layer with the 3D scene is partially visible.	With the corrected Alpha Blend vales, the transparency of the SolidColorNodes is applied as intended and the background layer is not visible.

Alpha blending is disabled by default. Blending should not be enabled unless really necessary. Unnecessarily enabling blending will lead to a performance loss. When using images with alpha information, blending can be enabled in the Solutions Options dialog: “File – Solution Options... - Default Render Mode – Enable Blending”