As an example, let's look at CMYK (0.9, 0.1, 0.1, 0). In your device specific CMYK color space, it looks like this: Let's ask LaTeX to convert it to RGB:

Since both colors are device specific, I can't know how similar these look on your system. But on most system, they aren't a good fit.

Since device specific color are hard to reason about and conversion between them is ill-defined, let's switch to ICC profile based colors instead. For CMYK I'll use a FOGRA39 Coated profile which represents common conditions for offset printing in Europe. It prints our example color as . For RGB I'll use the very common sRGB standard. It shows the automatic conversion from above as .

Now I know for certain that these two color look quite different, so we want to do better. If we convert between these two colorspaces while taking the profile into account, we get .

To make these more comparable, we can look at all the color next to one another.

Colorspace	Device RGB	sRGB	sRGB	Fogra 39	Device CMYK
Conversion	LaTeX	LaTeX	luaicc	n/a	n/a

(Of course, the similarity of the sRGB conversion by luaicc and the Fogra 39 color can appear better than it is since your system has to convert the color too in order to display it, using probably quite similar rules. So to really judge the quality, you need a calibrated screen with a color gamut bigger than both colorspaces.)

An example in the opposite direction is this conversion of RGB $(0.5, 0.5, 0)$:

Colorspace	Device RGB	sRGB	Fogra 39	Fogra 39	Device CMYK
Conversion	n/a	n/a	luaicc	LaTeX	LaTeX

Of course, converting colors only works reliably if the color is in the target colorspace's gamut. Otherwise it can't be represented. Take for example the conversion of $RGB(1, 1, 0)$:

Colorspace	Device RGB	sRGB	Fogra 39	Fogra 39	Device CMYK
Conversion	n/a	n/a	luaicc	LaTeX	LaTeX

luaicc does have support to identify such cases, such that the user can be warned or some indication added to the colored segment.