

A COLR version 1 colour font

COLR version 0, which example 2.14 draws, describes a colour glyph as a flat list of outlines each filled with one solid colour. VERSION 1 replaces that list with a graph: the leaves are solid colours and linear, radial and sweep gradients, and the branches clip, transform and composite what hangs below them. Every emoji face made since about 2021 is built that way, and so is every display face that draws its letters in gradients.

The call does not change. [colorFont] reads whichever version the face carries - a face may use version 1 for some glyphs and version 0 for others, which the standard allows - and what comes out is a Type 3 font either way: a family like any other.



solid, linear, radial, sweep, layers, rotated, soft-light, source-in, faded, re-used - and the last one is a version 0 glyph in the same table

One row per paint kind

Each mark below is one badge at 16 pt with the paint record it is made of beside it. Nothing here is drawn on the page: it is all inside the glyph, which is why the marks scale, move and measure like letters.

-  PaintSolid - a shape and one palette colour, all version 0 could do
-  PaintLinearGradient - three points, the third one a rotation
-  PaintRadialGradient - two circles, PDF's type 3 shading exactly
-  PaintSweepGradient - by angle, and PDF has no such shading at all
-  PaintColrLayers - a slice of the layer list, bottom first
-  PaintRotateAroundCenter - the sub-graph turns, gradient and all
-  PaintComposite, Soft Light - a PDF blend mode in a group
-  PaintComposite, Source In - a gradient poured into a shape
-  a colour line that fades - one shading in bands of constant alpha
-  PaintColrGlyph - another glyph's graph, incorporated here
-  a version 0 record in the same table, read by the older road

It is a font, gradients and all

The same four badges at five sizes. Nothing is scaled by hand and no gradient is re-computed: the shadings are written in FONT UNITS inside the glyph streams, and the /FontMatrix carries the em. A gradient painted through a shading PATTERN could not do this - a pattern is anchored to the page and would stay put while the glyph moved - which is why every gradient here is a clipping path with an "sh" inside it.



A glyph the table says nothing about

A colour face carries ordinary glyphs beside its coloured ones, and the answer for one of those is its own outline in the colour of the text - like a letter. The arrow below is such a glyph: it has no entry in either half of the COLR table, so it follows -color while the badge beside it does not.



black, orange, green, violet - and the badge keeps its gradient

In the running text

One string, one call, two faces: -fallback names the faces that may set what -family cannot, so the package decides per character where each glyph comes from. A gradient badge breaks with the paragraph like any other character.

● Delivery 2026-0414 has left the warehouse. ✖ Two of the four pallets were refused at the door ● and are on their way back; the remaining two were accepted ✔ and signed for at 14:20. Please tell us what to do with the returns. ⚠

What is refused rather than drawn wrongly

Two things in COLR version 1 have no PDF spelling at all, and both are refused by name instead of coming out as something the font never asked for. The Plus composite mode ADDS the two colours and clamps the sum; PDF has fifteen blend modes and no additive one. And a colour STOP whose palette index is the 0xFFFF sentinel means "whatever colour the text has" - which is decided when the glyph is drawn, while a shading's colours stand in the file.

The message, caught from this very page: tclpdf: a PaintComposite table of font "broken" asks for the Plus composite mode, which adds the two colours and clamps the sum. PDF has fifteen blend modes (ISO 32000-2, 11.3.5) and no additive one, and none of the fifteen can be combined into it - so the glyph would come out darker than the font says with nothing reporting it

Check it yourself

The first command shows the Type 3 font: no font file anywhere, a /CharProcs entry per badge, and the font's own /Resources carrying the shadings and the graphics states the glyphs need. The second prints a glyph stream - a clip, an "sh" and the brackets around them. The third counts the shadings in the file, and the fourth is the one that matters for a reader.

```
qpdf --qdf --object-streams=disable 02.17-colour-font-v1.pdf - | grep -A24 Type3
qpdf --qdf --object-streams=disable 02.17-colour-font-v1.pdf - | grep -B2 -A30 ' d0'
qpdf --qdf --object-streams=disable 02.17-colour-font-v1.pdf - | grep -c ShadingType
pdftotext 02.17-colour-font-v1.pdf - | head -20
```