

Browser SVG Pattern Rendering Reference

How browsers paint SVG backgrounds and what to avoid

Rendering pipeline

Parse CSS > Build render tree > Layout > Paint > Composite. SVG backgrounds are painted in the Paint step.

Compositor-thread animations

Only opacity and transform run on compositor thread. background-position and background-size trigger repaint.

Filter cost

feGaussianBlur: $O(n^2)$ for large stdDeviation. feTurbulence: CPU-heavy, avoid on mobile. feColorMatrix: cheap.

Repeat performance

background-repeat: repeat is GPU-native tile operation -- very fast. No-repeat on large element = one paint.

will-change

will-change: transform promotes element to compositor layer. Useful for animated patterns; increases GPU memory.

content-visibility: auto

Skips off-screen rendering. Use on sections with complex pattern backgrounds for 30-40% faster load.

Chrome vs Firefox

Chrome (Blink): patterns in GPU raster. Firefox (Gecko): CPU raster for complex SVG. Safari (WebKit): similar to Chrome.