Response from Google AI search: provide a comparison table of jpg vs jpg xl (jxl) vs AVIF vs png

JPG vs JXL (JPEG XL) vs AVIF vs PNG: A comparison table

Here's a comparison of these image formats, highlighting their key features and suitability for different uses:

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| --- | --- | --- | --- | --- |
| Feature | JPG (Joint Photographic Experts Group) | JXL (JPEG XL) | AVIF (AV1 Image File Format) | PNG (Portable Network Graphics) |
| Compression | Lossy | Lossy and Lossless | Lossy and Lossless | Lossless |
| Transparency | No support | Yes, supports alpha channels | Yes, supports alpha channels | Yes, supports alpha channels and variable transparency |
| Color Depth | 24-bit color (millions of colors) | Up to 32 bits per channel, supports HDR | Up to 12 bits per channel, supports HDR | Up to 48-bit truecolor or 16-bit grayscale |
| File Size | Generally smaller due to lossy compression | Often significantly smaller than JPG/PNG with similar quality; excellent lossless compression for photos | Can be significantly smaller than JPG/WebP at similar quality | Larger than JPG due to lossless compression; smaller for text images than other formats with lossless compression |
| Use Cases | Web images, social media, casual printing, photography where file size is critical and minor quality loss is acceptable | Ideal for web delivery (fast loading, progressive decoding), professional photography, high-fidelity images, and backward compatibility with JPEG | Web images (speeding up page load), streaming services, HDR photos, animations | Web graphics, logos, charts, illustrations, text-based images, images needing transparent backgrounds |
| Browser Support | Universal support | Limited support | Widely supported in major browsers (Chrome, Firefox, Safari) | Wide support |
| Progressive Rendering | Yes (progressive JPEGs) | Yes, advanced progressive decoding options | No, requires full image loading before display | Yes (interlacing) |
| Lossless JPEG Transcoding | Not applicable | Yes, can losslessly recompress existing JPEG images (reduces file size by ~20%) | Not applicable | Not applicable |
| Animation | No | Yes, but video codecs are more efficient for realistic moving content | Yes | No, unless using unofficial extensions or MNG |
| Royalty-free | Yes (patents expired) | Yes | Yes | Yes |

Explanation and key takeaways

* JPG: The oldest and most widely supported, but uses lossy compression, meaning some data is permanently discarded to achieve smaller file sizes. Not suitable for images requiring transparency. Best for photographs and web images where a balance between quality and file size is needed.
* PNG: Uses lossless compression, retaining all image data, making it ideal for images where quality is paramount (e.g., logos, images with text). Supports transparency, but results in larger file sizes compared to JPG and AVIF.
* JXL (JPEG XL): A newer format aiming to replace existing formats by offering both lossy and lossless compression, superior quality and compression ratios at high fidelity, and features like HDR, transparency, and progressive decoding. One significant advantage is its ability to losslessly transcode existing JPEG files, reducing their size by roughly 20%. It's designed for efficiency and is royalty-free. Its main drawback is currently limited browser and software support.
* AVIF: Another modern format utilizing the efficient AV1 video codec for image compression. Offers very efficient lossy and lossless compression, potentially leading to significantly smaller file sizes than JPG, WebP, or even lossless PNG. Supports HDR, transparency, animations, and other features. It is royalty-free. While widely supported by major browsers, it lacks progressive rendering.