

8-Bit vs 10-Bit Encoding — Decision Cheat Sheet

When 10-bit pays off, when 8-bit is fine. Updated for 2026.

Default in 2026: 10-bit.

5–12% smaller files at the same perceptual quality; banding on smooth gradients goes away.

When 10-bit is the right call

- HDR delivery (HDR10, HDR10+, Dolby Vision, HLG) — spec-mandated.
- SDR streaming where you own the pipeline (OTT, AVOD, SVOD, e-learning).
- Surveillance, telemedicine, and AR/VR — banding hides diagnostic detail.
- Premium AV1 tier (matches Netflix's choice — AV1 10-bit on SDR since 2020).
- Any catalogue large enough that 5–12% CDN savings cover the encode budget.

When 8-bit is fine (or required)

- YouTube SDR uploads — platform truncates 10-bit on ingest to 8-bit BT.709.
- WebRTC real-time / low-latency, where 10-bit HW profiles are still thin.
- Sub-500 kbps ladders — per-pixel overhead may eat the precision win.
- Legacy device tail that lacks 10-bit HEVC / AV1 Main 10 decode in HW.

Encoder flags (10-bit pipeline)

Encoder	10-bit flag	Notes
x264	<code>--profile high10 --output-csp i420</code>	Use 10-bit build
x265	<code>--profile main10 --output-depth 10</code>	Internal math is 10-bit either way
SVT-AV1	<code>--input-depth 10 --profile 0</code>	Native 10-bit ladder
libvpx-vp9	<code>--profile=2 --bit-depth=10</code>	VP9 Profile 2
VideoToolbox	<code>kVTPProfileLevel_HEVC_Main10_AutoLevel</code>	Apple Silicon, full HW
NVENC	<code>-preset p5 -pix_fmt p010le -profile main10</code>	10-bit; 30–50% throughput dip on older silicon
QuickSync	<code>-pix_fmt p010le -profile:v main10</code>	Gen11+; Arc class supports AV1 10-bit

2026 device-support floor (10-bit HW decode)

- HEVC Main10: broad — Apple A12+/M-series, Android flagships since 2018, smart TVs since ~2017.
- AV1 Main 10: Apple A17/M3+ (universal in 2025 line), Android flagships since 2021, mid-range from 2023.
- VP9 Profile 2: legacy, broad on Android/ChromeOS; new pipelines should prefer AV1 instead.
- Long-tail share without 10-bit decode in 2026: 3–7% globally; keep an 8-bit fallback ladder.

Rule of thumb

Default 10-bit. Ship an 8-bit fallback for legacy. Skip 10-bit only if the platform truncates or HW penalty > 30%.