Bit Depth Decision Checklist

Pick 8 / 10 / 12 bit by content type, target devices, and pipeline cost. Version 1.0 - May 2026

1 - CONTENT TYPE

- [ ] Content includes smooth skies, sunsets, or underwater scenes — *banding shows up here first*
- [ ] Content has dark scenes with shadow detail (cinema, drama, thriller) — *8-bit produces visible banding in shadows*
- [ ] Content has slow fades, dissolves, or long colour transitions — *fades band noticeably at 8-bit*
- [ ] Content is HDR (Dolby Vision, HDR10, HDR10+, HLG) — *10-bit is mandatory*
- [ ] Content is mostly talking heads, indoor surveillance, or screen-share — *8-bit is sufficient*

2 - SOURCE MATERIAL

- [ ] Source recorded in 10-bit or higher (ARRI, Sony Venice, recent iPhone ProRes) — *preserve 10-bit through pipeline*
- [ ] Source is 8-bit (most consumer phones, older cameras) — *10-bit transcode adds little quality*
- [ ] Source colour space is BT.2020 or DCI-P3 — *wider gamuts need 10-bit minimum*

3 - CODEC CHOICE

- [ ] Using HEVC Main10 for 10-bit delivery — *the workhorse for HDR streaming*
- [ ] Using AV1 Main 10-bit for newer pipelines — *Netflix primary HDR codec 2026*
- [ ] NOT using H.264 High10 for delivery — *no consumer hardware decoder*
- [ ] Using VP9 Profile 2 only if YouTube is the platform — *limited device coverage elsewhere*

4 - TARGET DEVICES

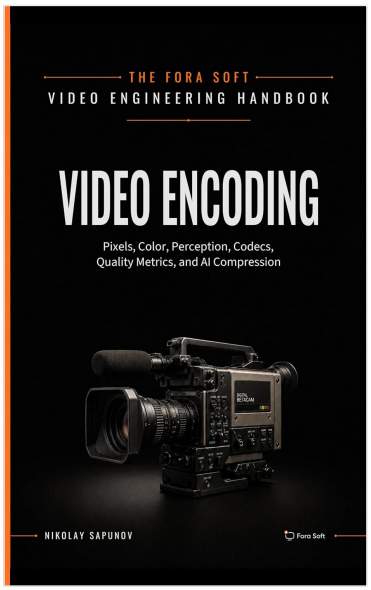
- [ ] Target devices have hardware decoder for chosen codec — *verify on real devices, not specs*
- [ ] Tested on 2019+ iPhone, recent Android flagship, 2020+ smart TV — *10-bit overhead invisible on modern silicon*
- [ ] Avoided 10-bit on older mobile hardware — *battery drain and thermal throttling risk*
- [ ] Display claims 10-bit (or 8-bit + FRC) for HDR content — *most consumer panels are 8-bit + dither*

5 - PIPELINE COST

- [ ] Encoder benchmark shows ≤ 15% bitrate overhead for 10-bit — *if higher, encoder settings need tuning*
- [ ] Storage budget can absorb 25% raw size increase if uncompressed — *raw scaling is linear in bits*
- [ ] Decoder CPU / battery impact tested on the lowest-tier target device — *where 10-bit will hurt first*

MOST COMMON BIT-DEPTH MISTAKES IN PRODUCTION

* Shipping HDR in 8-bit by mistake - guaranteed banding in shadows and skies. Always verify codec profile.
* Using H.264 High10 for delivery - works on encoder, fails on consumer hardware decode. Switch to HEVC Main10.
* Down-converting 10-bit source to 8-bit mid-pipeline, then back up - all the headroom is gone. Stay 10-bit end-to-end.



GO DEEPER · VOLUME 1 OF 7

Video Encoding: A Complete Guide to Video Compression

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This checklist helps you choose 8, 10 or 12 bit per title, device and pipeline cost. Volume 1 explains the signal behind the choice: sample precision and banding, colour spaces and HDR, 10-bit profiles in HEVC, AV1 and VP9, and the metrics that catch banding before viewers do.

WHAT YOU WILL FIND INSIDE

- Bit depth, quantization noise and banding
- Main 10 profiles in HEVC, AV1 and VP9
- BT.709, BT.2020 and HDR signalling
- Measuring banding with quality metrics

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