Encoder Selection Cheat Sheet

Seven open-source video encoders for 2026: when to use, when to skip

Companion to article 5.7 of Block 5. Print on A4 or US Letter. May 2026

Seven encoders at a glance

Encoder	Codec	Year	License	Default preset	Use when
x264	H.264	2003	GPLv2 + comm.	slow / medium	Universal baseline, live, real-time
x265	H.265 / HEVC	2013	GPLv2 + comm.	slow	4K HDR VOD, broadcast contribution
libvpx VP9	VP9	2013	BSD	cpu-used 1-2	Legacy VP9 catalogue maintenance
libvpx VP8	VP8	2010	BSD	realtime	WebRTC fallback (still default)
SVT-AV1	AV1	2018	BSD-3	preset 5 / 6	Default AV1 encoder for 95% of cases
rav1e	AV1	2018	BSD-2	speed 6	Rust pipelines, memory safety, embedded
libaom	AV1	2018	BSD-2	cpu-used 4	Premium VOD if compute amortizes
vvenc	H.266 / VVC	2021	BSD-3-Clear	medium	Early-adopter; ready by 2027-2028

FFmpeg recipes you will actually use

x264, 1080p VOD, CRF 21, slow preset:

```
ffmpeg -i in.mov -c:v libx264 -preset slow -crf 21 -pix_fmt yuv420p out.mp4
```

x265, 4K HDR10, Main 10, Level 5.1:

```
ffmpeg -i in.mxf -c:v libx265 -preset slower -profile:v main10 \
  -pix_fmt yuv420p10le -x265-params level=5.1:tier=high -tag:v hvc1 out.mp4
```

SVT-AV1, 1080p VOD, preset 5, CRF 30:

```
ffmpeg -i in.mov -c:v libsvtav1 -preset 5 -crf 30 -pix_fmt yuv420p10le out.mp4
```

libaom-av1, premium VOD, cpu-used 4, 2-pass:

```
ffmpeg -i in.mov -c:v libaom-av1 -cpu-used 4 -crf 28 -b:v 0 -row-mt 1 out.mkv
```

vvenc, 1080p early-adopter VOD, medium preset:

```
vvencFFapp -i in.yuv -s 1920x1080 -r 24 --preset medium -q 32 -o out.266
```

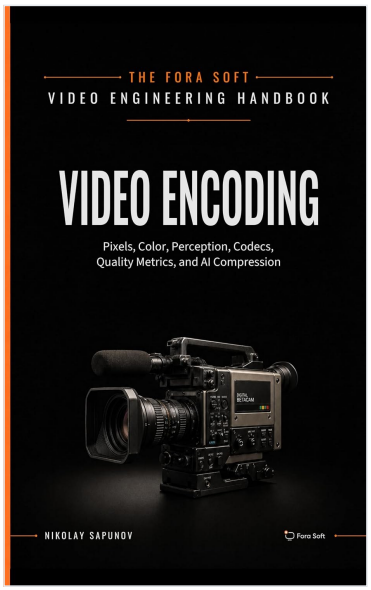
Three pitfalls to avoid

1. **Picking by codec, deploying by encoder.** "Use AV1" can mean SVT-AV1 (fast) or libaom (30x slower). Always specify codec AND encoder AND preset in design docs.
2. **Trusting old benchmarks.** SVT-AV1 ships every 6 months; benchmarks older than 12 months are stale. Re-run on the encoder version you actually ship.
3. **Ignoring licensing in CI/CD.** x264 / x265 are GPLv2 by default. Closed-source product? Purchase a commercial license from x264 LLC / MulticoreWare, or use a BSD encoder (SVT-AV1, etc.).

Cost formula to run before picking

```
total_cost_per_stream = (encode_CPU_cost / views) + (bandwidth_cost * views)
```

- Many views per encode (Netflix, YouTube): bandwidth dominates -> libaom / vvenc worth the cost.
- Few views per encode (corporate training, internal): CPU dominates -> x264 stays correct.



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This sheet matches seven open-source encoders to the jobs they do best and gives you working FFmpeg recipes. Volume 1 explains why the encoders differ: the codecs they implement, presets and the speed-efficiency trade-off, rate control modes, and how to benchmark encoders fairly on your own content.

WHAT YOU WILL FIND INSIDE

- x264, x265, SVT-AV1 and libaom: what the presets change
- Encode cost against bandwidth savings
- Rate control: CRF, two-pass and constant bitrate
- Fair encoder benchmarks with VMAF and BD-rate

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