

File Size and Checksums

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DPX

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What is inside my DPX?

- log neg encoding
- log RGB encoding or quasi-log encoding
- gamma encoding or power function encoding
- scene-linear encoding

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DPX Content (1)

- **log neg encoding**

Cineon Printing Density (CPD/DPX), ARRI log C

- **log RGB encoding or quasi-log encoding**

FilmStream (log₆₀), SI-log (Silicon Imaging, log₉₀), ARRI log F, Panalog, S-log (Sony), REDLOG

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DPX Content (2)

- **gamma encoding or power function encoding**

sRGB, CineGamma, "film rec", hyper-gamma

- **scene-linear encoding**

ACES

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File Size

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Source

- **3K (3072 × 2048 pixels, i.e. 3:2 aspect ratio)**
- **192 frames, i.e. 8 seconds (at 24 frames/second)**

Note: 4:3 in 2K is half of the size of 3:2 in 3K.

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Single Images Archive File

4.83 GB	Cineon, 10-bit	.cin
7.25 GB	TIFF, RGB, 16-bit	.tif
6.51 GB	PNG, RGB, 16-bit	.png
4.83 GB	DPX, R'G'B', 10-bit	.dpx
5.44 GB	DPX, R'G'B', 12-bit	.dpx
7.25 GB	DPX, R'G'B', 16-bit	.dpx
7.25 GB	OpenEXR, R'G'B', 16-bit	.exr
14.50 GB	OpenEXR, R'G'B', 32-bit	.exr

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Stream Archive File

562.8 MB	ProRes 422 HQ, 10-bit	.mov
531.3 MB	DNxHR HQX, 10-bit	.mxf
1.08 GB	ProRes 4444 XQ, 12-bit	.mov
1.06 GB	DNxHR 444, 12-bit	.xmf
3.23 GB	raw, Y'CbCr 4:2:2, 10-bit	.avi
3.22 GB	raw, Y'CbCr 4:2:2, 10-bit	.mov
939.7 MB	FFV1, Y'CbCr 4:2:2, 10-bit	.mkv

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Access Files

DaVinci Resolve 19.1.3

36.1 MB	3K, H.264	.mkv
18.9 MB	3K, H.265	.mkv

-c:v libx264 -profile veryslow -crf 21

20.4 MB	3K, H.264	.mp4
5.5 MB	HD, H.264	.mp4

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Checksums

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Checksums

cryptographic

- MD5
- SHA-1
- SHA-256
- SHA-512

non-cryptographic

- CRC-32
- xxHash 32
- xxHash 64
- xxHash 128

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Checksum Benchmarking

```
1 #!/usr/bin/env bash
2
3 # This script uses the 'make_manifest' from our open-source set
4 # 'Bash Scripts for Audio-Visual Preservation', available at:
5 # https://avpres.net/Bash_AVpres/
6
7 declare -a list=(md5 sha1 sha256 sha512 crc32 xxh32 xxh64 xxh128)
8
9 for algorithm in "${list[@]"; do
10     echo
11     echo "${algorithm}"
12     date +%T'
13     make_manifest -i ~/Desktop/FFmpeg_TEST --algorithm=${algorithm}
14     date +%T'
15 done
16
```

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Results

MD5

01:55 = 100 %

SHA-1

00:43 = 37 %

SHA-256

00:43 = 37 %

SHA-512

01:02 = 54 %

CRC-32

00:17 = 15 %

xxHash 32

00:26 = 23 %

xxHash 64

00:15 = 13 %

xxHash 128

00:15 = 13 %

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RAWcooked

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Disclaimer (1)

AV Preservation by reto.ch sponsored
MediaArea.org for the design and programming
of the RAWcooked tool:

- EUR 10 000 in 2018 to allow the core development and the release of the starting version 18.10
- EUR 1000 in 2023 for the upgrade to version 23.03

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Disclaimer (2)

AV Preservation by reto.ch sponsored
MediaArea.org for the organisation of the “No
Time to Wait” conferences:

- EUR 2000 in 2017, 2018 and 2019, in 2021 and 2022
- EUR 1000 in 2023, 2024 and 2025

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No Time to Wait

- Berlin 2016
- Wien 2017
- London 2018
- Budapest 2019
- [Hilversum] 2021
- Den Haag 2022
- Praha 2023
- Karlsruhe 2024
- Dublin 2025

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A Bridge

RAWcooked (command-line interface)

→ mediaarea.net/RAWcooked

```
# encode
rawcooked input_path_of_folder

# decode
rawcooked rawcooked_input_file.mkv

# get help
rawcooked -h
man rawcooked
```

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RAWcooked

- encoding into Matroska container using FFV1 video codec and FLAC audio codec
- significantly fewer files
- all metadata preserved
- decoding with bit-by-bit reversibility
- possibility to embed sidecar files such as checksum manifest, LUT, XML and PDF
- compatibility with media players

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```
-bash
Licensed DPX flavors:
Yes DPX/Raw/RGB/8bit/U/LE
Yes DPX/Raw/RGB/10bit/U/LE/FilledA
Yes DPX/Raw/RGB/10bit/U/BE/FilledA
Yes DPX/Raw/RGB/12bit/U/LE/FilledA
Yes DPX/Raw/RGB/12bit/U/BE/Packed
Yes DPX/Raw/RGB/12bit/U/BE/FilledA
Yes DPX/Raw/RGB/16bit/U/LE
Yes DPX/Raw/RGB/16bit/U/BE
Yes DPX/Raw/RGBA/8bit/U/LE
Yes DPX/Raw/RGBA/10bit/U/LE/FilledA
Yes DPX/Raw/RGBA/10bit/U/BE/FilledA
Yes DPX/Raw/RGBA/12bit/U/LE/FilledA
Yes DPX/Raw/RGBA/12bit/U/BE/Packed
Yes DPX/Raw/RGBA/12bit/U/BE/FilledA
Yes DPX/Raw/RGBA/16bit/U/LE
Yes DPX/Raw/RGBA/16bit/U/BE
Yes DPX/Raw/Y/8bit/U/LE
Yes DPX/Raw/Y/10bit/U/BE/FilledA
Yes DPX/Raw/Y/10bit/U/BE/FilledB
Yes DPX/Raw/Y/12bit/U/BE/Packed
Yes DPX/Raw/Y/16bit/U/LE
Yes DPX/Raw/Y/16bit/U/BE

Licensed TIFF flavors:
```

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Demo

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