# NETFLIX

Netflix, Inc.

# Netflix Originals:
# <u>Features and Series</u>
# Production and Post-Production Requirements
# v2.0

## Scope

Provide a set of technical requirements for production and post-production workflows to ensure that a high level of quality is maintained throughout the lifecycle of a project from capture to archival. This serves the purpose of future-proofing the content as the Netflix platform and viewing experience continues to evolve.

## Camera Requirements

### 4K Resolution:
- Camera must have a true 4K sensor (equal to or greater than 4096 photosites wide).

### Recording Format:
- Must be set to the camera's RAW (unprocessed, pre-debayer) format.
  - Minimum of 12-bit log (or 16-bit linear)
  - Maximum compression ratio of 6:1
- Must be set to the camera's wide or native color gamut.
- No looks or color corrections should be baked into the camera RAW files.
- Files must maintain all metadata (i.e. Tape Name, Timecode, Frame Rate, ISO, WB, etc.)

### Aspect Ratio / Framing:
- Aspect ratios greater than 2.00:1 must be evaluated and discussed with Netflix for approval.
- Framing chart must be shot before principal photography begins, and processed through the dailies pipeline which will be shared with editorial, post-production, and VFX.

### Secondary Cameras:
- Any cameras other than the primary camera (crash, POV, drone, underwater, etc.) must be approved by Netflix.
- Test footage should be shot and provided to dailies and post-production to ensure compatibility with primary camera.

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## Approved Cameras:

| | | Effective Pixels | Recording Format |
|---|---|---|---|
| Canon C300 Mk II | | 4K: 4096 x 2160 | Canon RAW |
| Canon C500 | | 4K: 4096 x 2160 | Canon RAW |
| Panasonic VariCam 35 | | 4K: 4096 x 2160 | V-RAW |
| Panasonic VariCam LT | | 4K: 4096 x 2160 | V-RAW |
| RED Dragon | | 6K: 6144 x 3160 | REDCODE RAW (up to 6:1) |
| RED Weapon | | 8K: 8192 x 4320 | REDCODE RAW (up to 6:1) |
| Sony F55 | | 4K: 4096 x 2160 | F55RAW |
| Sony F65 | | 4K: 4096 x 2160 | F65RAW F65RAW-LITE |
| Blackmagic Design URSA Mini 4.6K | | 4.6K: 4608 x 2592 | CinemaDNG RAW (up to 4:1) |
| Blackmagic Design URSA 4.6K | | 4.6K: 4608 x 2592 | CinemaDNG RAW (up to 4:1) |

## Color Pipeline Requirements
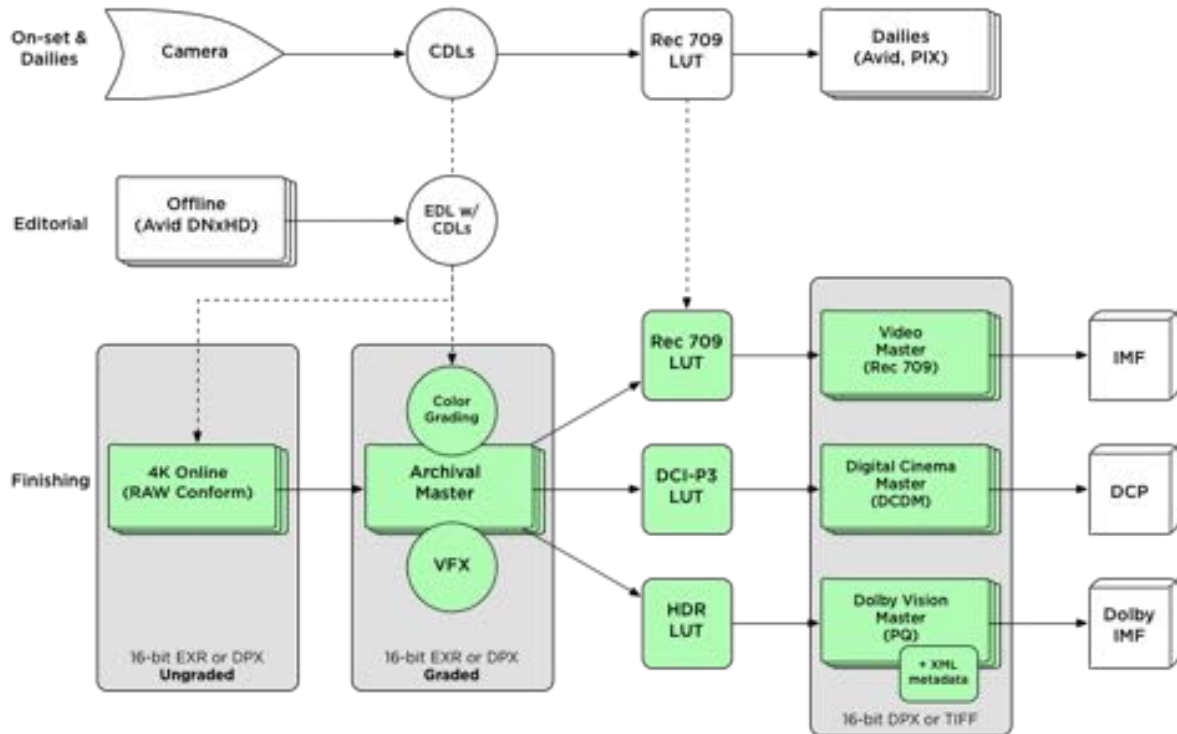


### For Non-ACES Pipelines (Camera Native + Viewing LUT):
- Color space of camera video tap must be defined and communicated to all departments.
  - Examples: *Sony SLog3-SGamut3.CINE, REDLogFilm-DragonColor, Panasonic V-Log-V-Gamut, CanonLog2-CinemaGamut*
- Viewing LUT / Show LUT must be defined and shared between all departments.

### For ACES Pipelines:
- ACES version should be defined and shared between all departments.
- Camera video tap should be set to ACESproxy (if supported by camera) and scaled from legal-range to full-range for CDL application.

### On-Set & Dailies Color:
- CDLs only
  - No secondaries, keys, or power windows to ensure compatibility in post
- On-set monitor must be calibrated to the Rec. 709 / BT.1886 standard, or equivalent HDR standard (i.e. SMPTE ST.2084)

*Color pipeline document must be shared with production and post-production.*

# Dailies Requirements

On-set or near-set dailies services are required in order to provide efficiency for downstream processes (i.e. FotoKem nextLAB, Technicolor OnLocation, Deluxe EC3/Mobilabs, Light Iron Outpost, MTI Cortex, or others which can handle all of the below requirements).

## Back-up / Data Verification:

- Two or more back-up copies with MD5 checksums must be generated of all original camera footage and audio.
- Footage must be QC'd for possible issues while referencing camera report with scene/take information.

## Color & Sync:

- Production sound must be synced to camera footage for editorial media.
- Color should be applied, following the color pipeline defined above.
    - If CDLs exist, they must be applied before the LUT in a common camera space.
    - No secondaries, power windows, or keys in dailies.
- Grading monitor must be calibrated to REC.709 / BT.1886 standard, or equivalent HDR standard (i.e. SMPTE ST.2084)

## Deliverables:

- Editorial media and proxy deliverables must be generated from original camera RAW files, not from a secondary proxy recording.
- ALEs / BINs should be generated with all common scene, take, timecode metadata as well as shot-specific CDLs and LUT names.
- Archival of camera RAW footage, audio, and color information should maintain original directory structure, filenames, and metadata that were created by the cameras, audio recording devices, and dailies software to one or more of the following:
    - LTO-5, LTO-6 or LTO-7 tape in LTFS format
    - Netflix's cloud-based Archive
    - High-speed external hard-drive
- Once multiple backups are complete and verified at another location, the camera magazines / recording media may be cleared.

# Post-Production Requirements

## Conform & VFX

- Framing chart must be placed at the head of all timelines (per episode / reel).
- Conform and VFX pulls must be:
  - Minimum resolution of 4K.
  - One of the following file formats:
    - 16-bit EXR (.exr) in ACES or camera's Scene Linear color space
    - 16-bit DPX (.dpx) in the camera's Log color space
- VFX pulls should include CDLs, LUT, and color reference.
  - Round-trip tests should be run to verify dailies color match between VFX and editorial.
- EDLs, XMLs, AAFs should be used to reference back to the original 4K files for the online conform.
- Proxy files should only be used for reference during editing, previews, and/or audio-dub/timed-text generation

## IMF Master

- IMF must be generated from a final uncompressed Video Master (i.e. DPX, EXR, or TIFF)  and not from a compressed file (i.e. ProRes, DNX).
- Resolution:
  - 4K: 4096x2160 resolution (if aspect ratio is greater than or equal to 1.89:1)
  - UHD: 3840x2160 resolution (if aspect ratio is less than 1.89:1)
- See our Full Technical Specifications document for full IMF specifications.

## Archive Elements

- Framing chart must be placed at the head of all archival masters (per episode / reel).
- Picture:
  - NAM - Non-graded Archival Master
    - Ungraded in Working Color Space, 16-bit DPX or EXR
  - GAM - Graded Archival Master
    - Graded in Working Color Space, 16-bit DPX or EXR
    - LUTs or ACES Version must be included in archive
  - VDM - Video Display Master
    - Rec.709, 16-bit DPX (for SDR)
    - PQ P3 D65, 16-bit TIFF (for HDR)
- Audio:
  - All final sound mixes (near-field 5.1 and 2.0), Stems, M&Es, etc
- Editorial projects (Avid bins, .aaf/.ale, Final Cut Pro .fcp/.fcpx, Premiere Pro .prproj, etc.)
  - Editor's assembly
  - Director's cut
  - Any preview cuts
  - Final cut
- Audio mixing/mastering projects (Pro Tools sessions).
- Color mastering projects (Resolve, Baselight, Rio, Nucoda, etc.).
  - *See Delivery Requirements and Archive Delivery Specifications for more information*