

PREPARED FOR DEMONSTRATION (NO CLIENT) · DELIVERY TO NETA FILE SUBMISSION  
REQUIREMENTS (2025)

# Tears of Steel – Demonstration master

Demonstration report – a test master built from the open film Tears of Steel ((CC) Blender Foundation | mango.blender.org, CC BY 3.0) with faults introduced on purpose; every value was measured by ClearedQC

|                                                                                                      |                                                           |                           |
|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|---------------------------|
| CLIENT<br>Demonstration (no client)                                                                  | SPECIFICATION<br>NETA File Submission Requirements (2025) | DATE<br>19 September 2026 |
| MASTER<br>TOS_DEMO_MASTER.mxf · 3,591,257,703 bytes · MD5<br>6f6cf8bb3ccd7e44b79ac5f6bf758860        |                                                           |                           |
| CAPTIONS<br>TOS_DEMO_MASTER_captions_v2.scc · 10,512 bytes · MD5<br>6335acee11570c7d646da992501a1163 |                                                           |                           |

**NOT YET CLEARED · QC STATUS: REJECTED**

## 41 of 57 items need attention

32 fail (grade 3), 8 warnings (grade 2), 1 not yet reviewed · 16 pass — see the items marked below

**How to read this report.** Each row sets the value measured in the file against the value required.**Pass** — meets the requirement.**FYI** — for information; no effect on compliance.**Grade 1** — minor, against a captioning convention; fixing is advised, not required.**Grade 2 · Warning** — borderline, or outside an engineering guideline (such as the PBS TOS) rather than a published requirement; fixing is recommended.**Grade 3 · Fail** — does not meet the distributor's published requirement; must be fixed before delivery.

Grades follow the 1–3 scale common in broadcast QC reports.

## Video

| REQUIREMENT | EXPECTED    | MEASURED    | STATUS |
|-------------|-------------|-------------|--------|
| Codec       | MPEG-2      | MPEG-2      | ✓ Pass |
| Resolution  | 1920 × 1080 | 1920 × 1080 | ✓ Pass |

| REQUIREMENT              | EXPECTED                         | MEASURED                                                           | STATUS            |
|--------------------------|----------------------------------|--------------------------------------------------------------------|-------------------|
| Field order              | Upper field first (TFF)          | Lower field first (BFF), coded top first                           | ✗ Fail<br>grade 3 |
| Frame rate               | 29.97 fps                        | 29.97 fps                                                          | ✓ Pass            |
| Bit rate                 | 50 Mb/s                          | 35 Mb/s                                                            | ✗ Fail<br>grade 3 |
| Colour range             | Limited (TV) range               | Limited (TV) range                                                 | ✓ Pass            |
| Colour matrix            | BT.709                           | BT.601 (625 lines)                                                 | ✗ Fail<br>grade 3 |
| Colour primaries         | BT.709                           | not signalled                                                      | ✗ Fail<br>grade 3 |
| Transfer characteristics | BT.709                           | not signalled                                                      | ✗ Fail<br>grade 3 |
| Chroma subsampling       | 4:2:2 (NETA 2025)                | 4:2:0                                                              | ✗ Fail<br>grade 3 |
| Aspect ratio             | 16:9, full-height active picture | 16:9, square pixels (1920 × 1080)                                  | ✓ Pass            |
| GOP structure            | Long GOP (NETA 2025)             | Long GOP, I-frame every 15 frames (varies), in the first 60 frames | ✓ Pass            |

## Image artefacts — encode integrity

| REQUIREMENT                      | EXPECTED                                               | MEASURED                                                                | STATUS |
|----------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------|--------|
| Decode integrity                 | decodes cleanly end to end                             | 0 decode errors                                                         | ✓ Pass |
| Compression artefacts (blocking) | a flat metric; high values checked on the picture      | median 1.663, p99 2.697, max 9.491; 2926 frames above 2.0               | FYI    |
| Frozen and duplicated frames     | no unintended freezes — holds on graphics are intended | 21 freeze events (0.4–20.0 s); 826 frames identical to the previous one | FYI    |

| REQUIREMENT                    | EXPECTED                                    | MEASURED                                                                                                                                                                    | STATUS                   |
|--------------------------------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <b>Field order and combing</b> | upper field first, no combing               | 60 s sample: 0 TFF / 1163 BFF / 335 progressive                                                                                                                             | ✗ <b>Fail</b><br>grade 3 |
| <b>Field cadence</b>           | no stray repeated fields on moving pictures | 60 s sample: repeated fields on 348 of 1029 moving frames – consistent with 2:3 pulldown (film-rate source); 9 detections on held frames, where there is no motion to judge | FYI                      |

Blocking measured on the programme picture from 01:00:27:01, after the leader, on the active picture (1920 × 800), without the letterbox bars, in 60-second blocks; plain black or flat frames are left out.

Freeze events, for review against the picture (holds on graphic cards and end tags are intended):

```

1  at 01:00:00:01  20.0 s long
2  at 01:00:20:01   5.0 s long
3  at 01:00:25:01   2.0 s long
4  at 01:00:27:01   1.5 s long
5  at 01:00:28:17   2.6 s long
6  at 01:00:31:05   1.1 s long
7  at 01:00:32:09   2.6 s long
8  at 01:00:34:29   1.0 s long
9  at 01:01:31:14   0.9 s long
10 at 01:01:33:19   0.4 s long
11 at 01:01:34:02   0.5 s long
12 at 01:01:34:17   0.6 s long
13 at 01:01:35:04   0.6 s long
14 at 01:01:35:22   0.7 s long
15 at 01:01:36:12   0.5 s long
... and 6 more

```

## Photosensitivity — Ofcom GN2 / ITU-R BT.1702

| REQUIREMENT            | EXPECTED                                                         | MEASURED                                 | STATUS                   |
|------------------------|------------------------------------------------------------------|------------------------------------------|--------------------------|
| <b>Luminance flash</b> | ≤ 3 flashes in any second, over 25% of the frame                 | worst 1-second window: 11 at 01:05:23:06 | ✗ <b>Fail</b><br>grade 3 |
| <b>Red flash</b>       | ≤ 3 flashes in any second, over 25% of the frame (saturated red) | worst 1-second window: 11 at 01:05:25:05 | ✗ <b>Fail</b><br>grade 3 |

Screened frame by frame against the Ofcom Guidance Note 2 / ITU-R BT.1702 thresholds. This is a screening, not a Harding FPA certification; the regular spatial pattern criterion is

not tested.

## Audio

| REQUIREMENT          | EXPECTED    | MEASURED    | STATUS |
|----------------------|-------------|-------------|--------|
| Audio tracks         | 2           | 2           | ✓ Pass |
| Codec                | PCM, 24-bit | PCM, 24-bit | ✓ Pass |
| Sample rate          | 48 kHz      | 48 kHz      | ✓ Pass |
| Bit rate per channel | 1,152 kb/s  | 1,152 kb/s  | ✓ Pass |

## Channel layout — 45 s window from 254 s

| REQUIREMENT                      | EXPECTED                                               | MEASURED                                                                             | STATUS               |
|----------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------------------|----------------------|
| Channels 1 and 2 carry programme | Yes                                                    | Yes                                                                                  | ✓ Pass               |
| Stereo image                     | Channels in phase (synthesis is checked by ear, below) | L/R correlation -0.4476 over the 45 s window – channels out of phase: check polarity | ⚠ Warning<br>grade 2 |

```
channel  peak dBFS  RMS dBFS  non-zero samples
1         -10.87   -31.98   2159996
2         -10.48   -31.79   2159992
NETA 2025, stereo without DVI or SAP: 1 = L, 2 = R
```

## Wrapper and timecode

| REQUIREMENT         | EXPECTED                                  | MEASURED    | STATUS            |
|---------------------|-------------------------------------------|-------------|-------------------|
| Operational pattern | OP1a                                      | OP1a        | ✓ Pass            |
| Start timecode      | 01:00:00;00 or<br>00:00:00;00 (NETA 2025) | 01:00:00:00 | ✗ Fail<br>grade 3 |
| Drop-frame flag     | Yes                                       | No          | ✗ Fail<br>grade 3 |

| REQUIREMENT         | EXPECTED                                                                              | MEASURED                                               | STATUS                      |
|---------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------|-----------------------------|
| <b>Leader</b>       | No slate, bars, tone or countdown: one frame of black, then the programme (NETA 2025) | Colour bars at 01:00:00:00; steady tone at 01:00:00:00 | <b>○ Warning</b><br>grade 2 |
| <b>Running time</b> | No longer than 12:30 (distributor)                                                    | 12:42:04                                               | <b>✗ Fail</b><br>grade 3    |

## First and last frame — NETA 2025

| REQUIREMENT                       | EXPECTED                     | MEASURED                                   | STATUS                      |
|-----------------------------------|------------------------------|--------------------------------------------|-----------------------------|
| <b>First frame</b>                | Black (0 IRE)                | Average 7.3 IRE; brightest 1% at 7.3 IRE   | <b>✗ Fail</b><br>grade 3    |
| <b>Last frame</b>                 | Black (0 IRE)                | Average 28.2 IRE; brightest 1% at 78.1 IRE | <b>✗ Fail</b><br>grade 3    |
| <b>Audio over the first frame</b> | silent under the black frame | peak -20.0 dBFS                            | <b>○ Warning</b><br>grade 2 |
| <b>Audio over the last frame</b>  | silent under the black frame | peak -34.7 dBFS                            | <b>○ Warning</b><br>grade 2 |

## Video levels — every frame scanned (0–100 IRE = Y 16–235)

| REQUIREMENT                         | EXPECTED | MEASURED                         | STATUS                   |
|-------------------------------------|----------|----------------------------------|--------------------------|
| <b>Frames over 1% out of range</b>  | 0        | 153 (5.1 s)                      | <b>✗ Fail</b><br>grade 3 |
| <b>Frames over 5% out of range</b>  | 0        | 153 (5.1 s)                      | <b>✗ Fail</b><br>grade 3 |
| <b>Frames over 10% out of range</b> | 0        | 134 (4.5 s)                      | <b>✗ Fail</b><br>grade 3 |
| <b>Frames over 50% out of range</b> | 0        | 0 (0.0 s)                        | <b>✓ Pass</b>            |
| <b>Worst frame</b>                  | —        | 50.00% at 01:05:28:23            | FYI                      |
| <b>Lowest / highest pixel value</b> | —        | -7.3 / 109.1 IRE (codes 0 / 255) | FYI                      |

Frames analysed: 22864

## RGB gamut and black level

| REQUIREMENT | EXPECTED                                                  | MEASURED                                                                                                                                                              | STATUS               |
|-------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| RGB gamut   | GBR held to 0–700 mV (PBS TOS §3.4.1), EBU R103 tolerance | 76 frames sampled every 10 s: median 0.10% of pixels outside 0–700 mV (mean 1.16%); 4 frames beyond the EBU R103 tolerance, worst 22.4% of the picture at 01:01:30:15 | ⚠ Warning<br>grade 2 |
| Black level | Black at 0 V, no setup (PBS TOS §3.4.3)                   | Black at code 32.0 – a 7.5 IRE setup sits at about 32                                                                                                                 | ⚠ Warning<br>grade 2 |

## Closed captions — embedded (SMPTE 436M ANC)

| REQUIREMENT                  | EXPECTED                                  | MEASURED | STATUS |
|------------------------------|-------------------------------------------|----------|--------|
| Embedded caption track (ANC) | None: captions travel in the .scc sidecar | None     | ✓ Pass |

Sidecar delivery: the .scc must carry exactly the same file name as the video and the same start timecode (NETA 2025).

## Closed captions — sidecar .scc

| REQUIREMENT                 | EXPECTED                           | MEASURED                                 | STATUS            |
|-----------------------------|------------------------------------|------------------------------------------|-------------------|
| File name matches the video | TOS_DEMO_MASTER.scc (NETA 2025)    | TOS_DEMO_MASTER_captions_v2.scc          | ✗ Fail<br>grade 3 |
| Lines over 32 characters    | 0 — the CEA-608 grid is 32 columns | 1 lines over 32 characters               | ✗ Fail<br>grade 3 |
| Lines on screen             | 1–3 lines, 2 preferred (NETA 2025) | 1 caption with more than 3 lines (max 4) | ✗ Fail<br>grade 3 |
| Captions too short to read  | none under 0.90 s on screen        | 1 under 0.90 s                           | ✗ Fail<br>grade 3 |

| REQUIREMENT                           | EXPECTED                                           | MEASURED                                         | STATUS            |
|---------------------------------------|----------------------------------------------------|--------------------------------------------------|-------------------|
| <b>Reading speed</b>                  | convention, for reference                          | 4 above 25 characters per second (convention)    | Grade 1           |
| <b>Gap between captions</b>           | convention, for reference — not a NETA requirement | 23 with no blank frame between them (convention) | Grade 1           |
| <b>Bytes with wrong parity</b>        | 0 — CEA-608 requires odd parity                    | 6 bytes with even parity                         | ✗ Fail<br>grade 3 |
| <b>Captions outside the programme</b> | 0 — all inside the programme                       | 2 outside the programme                          | ✗ Fail<br>grade 3 |
| <b>Clear pulse (EDM) at the head</b>  | at the head of the programme (PBS TOS 8.6)         | frame 1891 of the programme                      | ✗ Fail<br>grade 3 |

608 byte pairs read: 1699    captions decoded: 78  
 first at 01:00:50:01    last at 01:12:48:06

### Timecoded correction list

Lines over 32 characters

01:00:52:01 43 chars: Look Celia, we have to follow our passions;

Captions over 2 rows — NETA 2025 allows up to 3 lines; only captions with more than 3 must change

01:00:54:01 3 rows

01:00:57:25 4 rows

01:01:05:25 3 rows

01:06:14:01 3 rows

Captions too short to read

01:01:04:01 0.40 s

Gap between captions — convention, for reference; not a required fix

01:00:52:01 0 frame(s)

01:00:54:01 0 frame(s)

01:00:57:25 0 frame(s)

01:01:01:16 0 frame(s)

01:01:08:01 0 frame(s)

01:01:09:07 0 frame(s)

01:03:40:01 0 frame(s)

01:03:48:16 0 frame(s)

01:03:50:16 0 frame(s)

01:04:11:16 0 frame(s)

01:04:13:01 0 frame(s)

01:04:28:16 0 frame(s)

01:04:32:01 0 frame(s)

```

01:06:14:01  0 frame(s)
01:06:28:01  0 frame(s)
01:06:33:16  0 frame(s)
01:06:41:01  0 frame(s)
01:06:50:01  0 frame(s)
01:06:54:01  0 frame(s)
01:06:56:01  0 frame(s)
01:06:57:16  0 frame(s)
01:07:37:01  0 frame(s)
01:08:51:01  0 frame(s)

```

Bytes with wrong parity

```

line 27  word 526f  byte 0x6F
line 27  word 626f  byte 0x6F
line 27  word 74a7  byte 0x74
line 31  word 6973  byte 0x69
line 31  word 2069  byte 0x69
line 31  word 7072  byte 0x72

```

Captions outside the programme

```

01:12:45:06
01:12:48:06

```

Clear pulse (EDM) at the head

Reading speed — convention, for reference; not a required fix

```

01:01:04:01  42.5 chars/s
01:01:05:25  26.8 chars/s
01:01:08:01  35.8 chars/s
01:09:25:01  26.0 chars/s

```

## Loudness, peaks and dialogue — ITU-R BS.1770, channels 1 and 2

| REQUIREMENT                 | EXPECTED                                   | MEASURED                                                                                                                                                                        | STATUS                      |
|-----------------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| <b>Integrated loudness</b>  | -24 LKFS ± 2                               | -17.7 LKFS                                                                                                                                                                      | <b>✗ Fail</b><br>grade 3    |
| <b>True peak</b>            | ≤ -2 dBTP                                  | 1.4 dBTP                                                                                                                                                                        | <b>✗ Fail</b><br>grade 3    |
| <b>Peak programme level</b> | -12 to -8 dBFS,<br>nominal -10 (NETA 2025) | Sample peak -0.0 dBFS; above -8 dBFS in 238 seconds<br>(first: 01:00:35:29, 01:00:36:29, 01:00:37:29) —<br>NETA allows peaks to -2 dBTP for moments of dramatic impact: confirm | <b>○ Warning</b><br>grade 2 |

| REQUIREMENT                 | EXPECTED                                                      | MEASURED                                                                                                                          | STATUS                      |
|-----------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| <b>Clipping</b>             | Free of clipping (NETA 2025); distortion is a listening check | Flat-topped samples at full scale in 4 seconds (first: 01:07:06:17, 01:07:07:17, 01:07:08:17)                                     | ✗ <b>Fail</b><br>grade 3    |
| <b>Average audio level</b>  | around -20 dBFS (NETA 2025, reference)                        | -21.1 dBFS RMS over the whole programme, quiet passages included                                                                  | FYI                         |
| <b>Dialog level</b>         | Average dialogue at -24 LKFS ± 2 (NETA 2025)                  | -18.4 LKFS over the caption periods (speech located from the caption file); spread across six equal parts of the programme 7.5 LU | ○ <b>Warning</b><br>grade 2 |
| <b>Loudness range (LRA)</b> | —                                                             | 20.9 LU                                                                                                                           | FYI                         |

### Checked on the picture and by ear

| REQUIREMENT                | EXPECTED                                                                                             | MEASURED                                                                                                                    | STATUS                   |
|----------------------------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <b>Lip sync</b>            | Audio may not lead or lag video by more than ½ frame (NETA 2025)                                     | Sound runs 4 frames (133 ms) late throughout: first seen on the close-ups from 01:00:50:00 (planted for this demonstration) | ✗ <b>Fail</b><br>grade 3 |
| <b>Audio distortion</b>    | Free of distortion (NETA 2025) — by ear; clipping is measured above                                  | The passage at 01:07:06:19 is hard-clipped for 3 s: audible distortion (planted)                                            | ✗ <b>Fail</b><br>grade 3 |
| <b>No stereo synthesis</b> | Stereo synthesizing is not allowed (NETA 2025) — confirmed from the mix; correlation cannot prove it | A genuine stereo mix; the polarity problem is reported above                                                                | ✓ <b>Pass</b>            |
| <b>Caption timing</b>      | Within ±1 second of the spoken word (NETA 2025)                                                      | Captions from 01:05:21:01 to 01:05:31:16 appear about 2 s after the line is spoken (planted); the rest follow the dialogue  | ✗ <b>Fail</b><br>grade 3 |

| REQUIREMENT              | EXPECTED                                                                   | MEASURED                                                                                                                                                                                                                                                                                                                                      | STATUS                        |
|--------------------------|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>Caption placement</b> | Clear of name keys, on-screen text, faces and important action (NETA 2025) | Not yet reviewed – human check required. Automatic pre-check: 76 captions, 0 of them raised above the bottom rows; positions follow the standard CEA-608 grid, where a television may draw them 20–60 px higher than an editing system's monitor; graphics in the edit not checked; on-screen text and faces under the captions: 10 to check. | <b>⚠ Warning</b><br>to review |
| <b>Funding credits</b>   | Opening and closing credits as the distributor requires                    | Not required by this distributor; No funders in this programme                                                                                                                                                                                                                                                                                | FYI                           |
| <b>Distributor tag</b>   | Present and complete as the distributor requires                           | No distributor tag at the end: the programme ends on the credit roll                                                                                                                                                                                                                                                                          | <b>✗ Fail</b><br>grade 3      |
| <b>Rating icon</b>       | Inserted and placed as the distributor requires                            | No TV rating icon anywhere in the programme                                                                                                                                                                                                                                                                                                   | <b>✗ Fail</b><br>grade 3      |

Judgement, not measurement: each note says where the reviewer looked or listened.  
Caption placement – captions to look at (the pre-check narrows the search; it does not replace watching every caption):

01:01:17:01 "Robot's memory synced and" – on-screen text  
 01:01:28:01 "This is pretty freaky." – on-screen text  
 01:03:40:01 "Of course you're ready, you're a" – on-screen text  
 01:03:46:01 "We should have about ten" – on-screen text  
 01:03:48:16 "Well that's perfect." – on-screen text  
 01:05:52:01 "...and I just want to be awesome" – face  
 01:06:06:01 "Okay, they're coming. Two" – on-screen text  
 01:06:12:01 "Vivacissimo!" – face  
 01:06:28:01 "But that's no reason to" – face  
 01:06:33:16 "We already tried that one!" – face

## Notes and recommended actions

About this report. This is a demonstration: a test master built from the open film Tears of Steel ((CC) Blender Foundation | [mango.blender.org](https://mango.blender.org), CC BY 3.0), with faults introduced on purpose so the report shows what a failing master looks like. Every value above was measured by ClearedQC; the picture- and-ear notes record faults that were planted and then checked on the picture.

What each fix takes - export settings (one re-export, about an hour): XDCAM HD422 at 50 Mb/s (4:2:2), upper field first, drop-frame timecode starting 01:00:00;00, BT.709 signalled; no bars, tone or slate; one frame of black at the head and at the tail.

What each fix takes - picture (in the grade): remove the 7.5 IRE setup; bring the bright scene from 01:01:26:29 and the saturated scene from 01:02:26:27 back inside 0-100 IRE and the RGB gamut; rework the strobe effect at 01:05:26:22 so it stays under three flashes in any second.

What each fix takes - sound (in the mix, not the master): normalise to -24 LKFS with a true-peak limiter at -2 dBTP; replace the clipped passage at 01:07:06:19 from the session (clipping cannot be repaired in the master); flip the polarity of the right channel; move the sound 4 frames earlier.

What each fix takes - captions (in the caption software, then re-export): name the .scc exactly like the video; rewrap to 32 characters and no more than 3 lines; retime the short caption and the late block; remove the two captions after the programme; start the file with a clear pulse. The timecoded list above gives every place to change.

What each fix takes - delivery elements: add the distributor tag and the TV rating icon, and bring the running time inside the maximum.

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**How these figures were taken.** Stream and signal analysis of the file itself: container and codec metadata, per-channel audio statistics, ITU-R BS.1770 loudness, frame-level video analysis and caption decoding. Loudness and true-peak measurement verified against the EBU Tech 3341/3342 test set (31 of 31 applicable cases). Expected values follow the distributor's published delivery requirements (NETA File Submission Requirements (2025)).

This report describes the file as received. It does not certify caption accuracy under 47 CFR §79.1, which rests with whoever authored the captions.

Technical evaluation by Cleared for Air with ClearedQC 2026.09.1 (NETA 2025 test plan) · 19 September 2026 · report CFA-20260919-DEMO

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