



TECHNICAL SPECIFICATIONS

FOR THE DELIVERY OF
DOLBY VISION

2022-08-31

V 1.0

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1. GENERAL NOTES

The specifications outlined in this document are applicable to all commissioned and in-house HDR Dolby Vision productions.

Any delivery in a format or specification not explicitly listed in this document will require prior written approval by Red Bull Media House Quality Management.

1.1 QUALITY REQUIREMENTS FOR GLOBAL DISTRIBUTION

Red Bull Media House is a global content producer and distributor, delivering highly compelling programming to broadcast and online audiences all over the world. As a result, all programming produced for and delivered to Red Bull Media House from anywhere in the world must meet the highest technical quality standards, both in its original delivery format, as well as after being converted or conformed to other standards and frame rates used in other regions of the world.

This means that even minor imperfections, which might sometimes be acceptable for broadcast and/or distribution in your region, cannot be accepted by Red Bull Media House since these minor imperfections are likely to turn into bigger quality problems after frame rate conversions for other regions, making the converted program unsuitable for broadcast and distribution.

1.2 PRODUCER RESPONSIBILITY

It is the responsibility of the producer (i.e. "Production Partner" or "Production Company") to ensure that all delivered assets comply with all Red Bull Media House quality standards and requirements. Acquisition frame rate and scan type, and delivery frame rate, frame size and scan type must be approved in writing by Red Bull Media House Quality Management prior to the start of filming. Any later adjustment(s) of acquisition frame rate and/or scan type, and/or delivery frame rate, frame size and/or scan type can only be made with the prior written approval by Red Bull Media House Quality Management. Any video assets shot, edited and/or delivered in frame rates not pre-approved in writing by Red Bull Media House Quality Management may be subject to rejection. Producer acknowledges that it is the producer's responsibility to communicate regularly with Red Bull Media House Quality Management. Red Bull Media House reserves the right to refuse delivery of otherwise finished video assets in cases where dropped and/or duplicated frames (freeze frames) and/or other serious deficiencies are found even if deficiencies originate in sources obtained from Red Bull Media House. Red Bull Media House may require the producer to bear any costs resulting from the producer's failure to comply with the timely instructions of Red Bull Media House Quality Management.

Deficient programs that fail the Red Bull Media House quality control process may be considered 'not delivered.'

1. GENERAL NOTES

1.3 TECHNICAL SUPPORT RESSOURCES

The quality requirements of Red Bull Media House will be described in detail in the course of the quality assurance process, during which additional documentation will be provided. In addition to the standard Red Bull Media House quality control, Production Partners **are required to actively participate** in the Red Bull Media House quality assurance process prior **to final delivery**.

1.4 PRE-APPROVAL OF FILMING AND DELIVERY FRAME RATE

Acquisition frame rate and scan type, and delivery frame rate, frame size and scan type **must be approved in writing prior to the start of filming** by Red Bull Media House Quality Management. Any footage or programs shot, edited and/or delivered in frame rates not pre-approved in writing by Red Bull Media House Quality Management may be subject to rejection by Red Bull Media House, and no funds provided by Red Bull Media House may be used to cover the cost of unauthorized filming, editing and/or delivery.

1.5 RESTRICTIONS ON FRAME RATE MIXING

The mixing of shooting frame rates (shooting in 25 and 29.97 fps for the same program, for example) is generally not acceptable, and we also strongly caution against the mixing of frame rates in post-production. Especially if you are planning to use pre-existing footage, it is mandatory that you document in as much detail as possible the format(s) and frame rate(s) and legal clearance potential of the pre-existing footage **prior to the start of shooting** in order to assist to the best of your ability the Red Bull Media House Quality Management in determining the shooting and delivery format that will best suit your program.

Any later adjustment(s) of acquisition frame rate and/or scan type, and/or delivery frame rate, frame size and/or scan type can only be made with the **prior written approval** by Red Bull Media House Quality Management.

2. DELIVERY

This chapter outlines the required deliverables for an HDR Dolby Vision delivery. The specific deliverables which are required for your production will be determined during the briefing process.

2.1 DELIVERABLES OVERVIEW

This section provides a high-level checklist of all audio and video deliverables that must be provided for HDR Dolby Vision productions:

- JPEG 2000 DOLBY VISION MXF Dirty
- JPEG 2000 DOLBY VISION MXF Dirty without subtitles (only if program contains any burned-in subtitles)
- JPEG 2000 DOLBY VISION MXF Clean
- Stereo Full Mix WAV (1 File)
- Stereo Stems: multiple separate Stereo WAV Files (undipped)
- Dolby Atmos Full Mix as ADM WAV (1 File) (if Dolby Atmos is part of the production)
- Dolby Atmos Full Mix without VO as ADM WAV (1 File) (if Dolby Atmos is part of the production)

Other additional deliverables (like e.g. music cue sheets, transcripts and shot lists) will be requested by Red Bull Media House Content Management.

2.2 VIDEO DELIVERABLES

Naming convention video:

VIN_ProjectName_HDRformat_Clean/Dirty_Version.mxf

Please make sure to follow this naming convention exactly. Also do not use any special characters in the file name.

VERSION	DESCRIPTION / NOTES	FILE NAME EXAMPLE
Master #1 dirty	including all graphics and text (final program master)	MI202204260432_TheLongestWave_DolbyVision_Dirty_V2.mxf
Master #2 dirty w/o subtitles	same as "Master #1 dirty" but without subtitles (only required if program contains any burned-in subtitles)	MI202204260432_TheLongestWave_DolbyVision_DirtyWOSubtitles_V2.mxf
Master #3 clean	without overlay graphics and text; time code and duration identical to dirty version; a detailed definition of "clean" can be found in "Annex: Clean Version"	MI202204260432_TheLongestWave_DolbyVision_Clean_V2.mxf

2. DELIVERY

VIDEO SPECIFICATIONS

The Program Master delivery format that applies to your production will be determined in your production agreement and during the briefing process.

The following table lists all acceptable resolution / frame rate combinations and all specific properties an HDR Dolby Vision file must have:

SPECIFICATION	NOTES
FILE FORMAT	MXF J2K
TRANSFER FUNCTION / EOTF	PQ (ST 2084)
MASTERING LUMINANCE	1000 nits
PIXEL BIT DEPTH	12 bit
COLOR ENCODING	RGB 4:4:4 Full Range
JPEG 2000 PROFILE	<p>UHD</p> <ul style="list-style-type: none"> up to 29.97 fps: Mainlevel 6 Sublevel 3 (max 800 Mbit/s) over 29.97 fps: Mainlevel 7 Sublevel 4 (max 1600 Mbit/s) <p>Always use "IMF Single Tile Lossy Profile"</p>

JPEG 2000 PROFILE	<p>HD</p> <ul style="list-style-type: none"> up to 29.97 fps: Mainlevel 4 Sublevel 2 (max 400 Mbit/s) over 29.97 fps: Mainlevel 5 Sublevel 3 (max 800 Mbit/s) 	Always use "IMF Single Tile Lossy Profile"
COLOR GAMUT / SPACE	P3-D65	<p>The color encoding field in the Dolby Vision XML must match the specifications and format of the rendered image sequence.</p> <p>See section 4.2 for mastering display properties.</p>
IMAGE RESOLUTION	3840 × 2160 (UHD) or 1920 × 1080 (HD)	UHD (3840 × 2160) strongly preferred
ASPECT RATIO	Full Frame Height	<p>No padding is strongly preferred (no letterboxing or pillarboxing). If letterboxing or pillarboxing are used they must be properly described in the Dolby Vision XML metadata (Canvas aspect ratio and image aspect ratio have to be set in level 5 metadata)</p>
FRAME RATE	23.976 / 25 / 29.97 / 50 / 59.94	50 fps or 59.94 fps preferred
SCAN TYPE	Progressive	
MAXFALL & MAXCLL	optional	can be included but not mandatory
DOLBY VISION XML	v4.0.2 Dolby Vision XML	Interleaved and must have HDR10 Static Metadata included as L6
LEVEL 254 CM VERSION IN DOLBY VISION XML	4.1	Indicates the latest backwards compatible algorithm has been applied for older CM 2.9 TV's and devices to ensure creative intent.

2. DELIVERY

2.3 AUDIO DELIVERABLES

Naming convention audio:

VIN_ProjectName_Language_ChannelName_ChannelType_Version.wav

Please make sure to follow this naming convention exactly.
Also do not use any special characters in the file name.

The language of the Full Mix is used in all file names to clarify that the stems belong to that Full Mix. So even if an audio channel doesn't contain any spoken language (e.g. GFX or Music) it is still labelled with the language of the Full Mix it belongs to. This is done to clearly separate stem packages for different language versions.

For further explanations on audio channel naming and content please refer to the section "[Audio Glossary](#)" at the end of this document.

STEREO SPECIFICATIONS

- PCM WAV
- 48 kHz, 24 bit
- Audio levels of each Full Mix must be compliant with the specifications listed in the section "[Audio Levels](#)" (-23 LUFS, -8dBTP)

STEREO

CHANNEL NAME	CHANNEL TYPE	FILE NAME EXAMPLE
Full Mix	Stereo	MI2022O426O432_TheLongestWave_English_FullMix_Stereo_V2.wav
Full Mix excl. Voice Over	Stereo (undipped) ¹	MI2022O426O432_TheLongestWave_English_MixMinus_Stereo_V2.wav
Effects / NAT	Stereo (undipped) ²	MI2022O426O432_TheLongestWave_English_Effects_Stereo_V2.wav
GFX	Stereo (undipped) ²	MI2022O426O432_TheLongestWave_English_GFX_Stereo_V2.wav
Music	Stereo (undipped) ²	MI2022O426O432_TheLongestWave_English_Music_Stereo_V2.wav
Voice Over	Stereo	MI2022O426O432_TheLongestWave_English_VO_Stereo_V2.wav
Interviews / OT	Stereo	MI2022O426O432_TheLongestWave_English_Interviews_Stereo_V2.wav

¹ Undipped:

For "Full Mix excluding Voice Over" only adjustments made to accommodate Voice Over should be removed but adjustments for Interviews / OT should remain unchanged.

² Undipped:

Any adjustments made to accommodate Voice Over or Interviews / OT should be removed, but cross-fades between different sources as well as any EQ effects should be preserved.

2. DELIVERY

DOLBY ATMOS

CHANNEL NAME	CHANNEL TYPE	FILE NAME EXAMPLE
Full Mix	Dolby Atmos	MI20220426O432_TheLongestWave_English_FullMix_DolbyAtmos_V2.wav
Full Mix excl. Voice Over	Dolby Atmos	MI20220426O432_TheLongestWave_English_MixMinus_DolbyAtmos_V2.wav

DOLBY ATMOS SPECIFICATIONS

- Dolby Atmos BWA V ADM File
- 48 kHz, 24 bit
- For further details see section "[Audio Specifics](#)"

3. AUDIO SPECIFICS

3.1 AUDIO LEVELS

FULL MIX IN STEREO

- Program audio levels of each Full Mix must not exceed -8 dBTP (True Peak)
- Integrated Program Loudness of -23 LUFS
- Loudness Range (LRA) of 15 LU or less. Upon written approval, we also accept LRA higher than 15 LU.
- All measurements must be determined in compliance with the recommendations of EBU R128 (but with maximum true peak levels of -8 dBTP).

FULL MIX IN DOLBY ATMOS

- Program audio levels must not exceed -1 dBTP (True Peak)
- All other parameters match Stereo Full Mix properties above

3.2 DOLBY ATMOS

A Dolby Atmos Home Theater Master must be delivered as a separate BWAV ADM file with the following specs:

- Dolby Atmos BWAV ADM File
- 48 kHz, 24 bit
- Single or multiple bed(s) are acceptable
- Tracks 1-128 may be used for objects or beds
- Loudness measurement must be performed on a 5.1 re-render
- FFOA must not be set

A Dolby Atmos for Home Studio certification is required for all Home Atmos mix rooms. The mix must be a dedicated nearfield mix. Timecode and duration of the Dolby Atmos Master must match final picture length exactly.

4. VIDEO SPECIFICS

4.1 VIDEO LEVELS & COLOR SPACE

Video files have to be delivered in P3-D65 color space with full range levels (not "studio range" levels).

Max allowed luminance level (MaxCLL) = 1000 nits.
Make sure to limit your output to this level.

4.2 HDR MASTERING MONITOR

Minimums requirements for mastering display:

- 1,000 Nit Peak Luminance
- EOTF: SMPTE 2084 (PQ)
- 100% support of P3 Color Gamut (with D65 white point)
- Measured Contrast Ratio: 200,000:1
- Black Level: 0.005 nits

Dolby Vision XML Mastering Display ID must match actual monitor used.
i.e. "1000-nit, P3, D65, ST.2084, Full" monitor equals Mastering Monitor ID=21 in XML.

4.3 ASPECT RATIO, LETTERBOXES & PILLARBOXES

If letterbox or pillarbox are used they must be properly described in the Dolby Vision XML metadata (canvas aspect ratio and image aspect ratio have to be set in level 5 metadata).

ASPECT RATIO	ACTIVE PICTURE WIDTH FOR HD IN PX	ACTIVE PICTURE HEIGHT FOR HD IN PX	LETTERBOX HEIGHT FOR HD IN PX
Full Frame (1.78)	1920	1080	0
Letterbox (1.85)	1920	1038	21
Letterbox (2.0)	1920	960	60
Letterbox (2.35)	1920	818	131
Letterbox (2.39)	1920	804	138
Letterbox (2.40)	1920	800	140
Pillarbox (1.33)	1440	1080	240*

* Pillarbox width instead of letterbox height

4. VIDEO SPECIFICS

ASPECT RATIO	ACTIVE PICTURE WIDTH FOR UHD IN PX	ACTIVE PICTURE HEIGHT FOR UHD IN PX	LETTERBOX HEIGHT FOR UHD IN PX
Full Frame (1.78)	3840	2160	0
Letterbox (1.85)	3840	2076	42
Letterbox (2.0)	3840	1920	120
Letterbox (2.35)	3840	1636	262
Letterbox (2.39)	3840	1608	276
Letterbox (2.40)	3840	1600	280
Pillarbox (1.33)	2880	2160	480*

* Pillarbox width instead of letterbox height

4.4 SAFE AREAS

All graphics must fall within the revised high definition 16:9 title safe areas as specified in SMPTE ST 2046-1-2009, with protection of 90% area / 5% margins for titles and 93% area / 3.5% margins for action.

For productions in North America, additional title safe requirements may apply.

4.5 TIME CODE / PROGRAM START AND END

Start Time Code: 00:00:00:00

Continuous time code

(drop frame time code is required in the case of 29.97 fps-based deliveries)

If program starts in black, audio signal must be present. If program fades to black, last frame must be completely black. Slates, additional black frames or color bars prior to the first frame of action or following the last frame of action are **not permitted**.

4.6 DOLBY VISION METADATA

Dolby Vision Metadata will be validated with Dolby Metafier.

Therefore please make sure to validate all delivered Dolby Vision files with Dolby Metafier before delivery.

Metadata for Letterboxes and Pillarboxes must be properly described in the Dolby Vision XML (see section "Aspect Ratio, Letterboxes & Pillarboxes").

5. CLOSED CAPTIONS AND SUBTITLES

Target luminance for burned-in subtitles is **300 nits**.

Text brightness should be adapted to the background image (readability must always be guaranteed). A range from 150–400 nits is acceptable depending on scene brightness.

Under no circumstances should burned in subtitles be peak-white!

Production Partners are only required to deliver a separate closed caption file if explicitly asked to do so!

ANNEX: CLEAN VERSION

Important:

Time code and duration of the Clean version must be identical to the Dirty version.

Color Grading:

Footage in the Clean version must have the same color grading as in the Dirty version.

Steps to create a "Clean" version:

1. Remove all text overlaying footage (e.g. subtitles, credit rolls, etc).
2. Remove all graphics overlaying footage (e.g. packaging graphics, show open, lower third backgrounds, corner bugs, bumpers, etc).
3. Keep full frame graphics that are hard cut.
4. Replace any non-hard cut transitions on full frame graphics with hard cuts.

An additional graphics package will be requested for any productions intending to create localized versions.

If you are uncertain whether certain elements should be kept or removed please consult Red Bull Media House Quality Management for clarification.

ANNEX: AUDIO GLOSSARY

This section provides further explanations and synonyms for our audio channel terminology.

CHANNEL NAME	EXPLANATION / SYNONYMS
Full Mix	The final mix of the program that includes all audio channels incl. Voice Over / Narration.
Full Mix excl. Voice Over	Also known as 'Mix Minus' or 'IT'
Effects / NAT	Atmosphere or Ambient sound as recorded on set; also known as Production Sound, Natural Sound (NAT), Original Sound or On-location Sound. Additionally includes effects intended to be indistinguishable from NATs. e.g., artificial ambient sounds, Foley and background sound effects; no GFX, no Music, no Voice Over / Narration, no Interviews.
Music	Any and all music contained in the program, including pre-mixed, recurring elements in a series, e.g. open, close.
GFX	Graphical Sound Effects are sound effects that complement graphic overlays, graphical transitions or animations. Not to be confused with "Effects / NAT"!
Interviews / OT	Also known as Dialog.
Voice Over	Also known as Commentary or Narration; abbreviation: VO

undipped	any adjustments made to accommodate Voice Over or Interviews / OT should be removed, but cross-fades between different sources as well as any EQ effects should be preserved; For Full Mix excluding Voice Over only adjustments made to accommodate Voice Over should be removed but adjustments for Interviews / OT should remain unchanged.
dipped	dipped stems must constitute the full final mix when combined at unity gain

ANNEX: CHANGELOG

VERSION	DATE	CHANGES
1.0	2022-08-31	<ul style="list-style-type: none">Initial Release