**3GPP TSG SA WG4 #112 *S4-210105***

**1st – 10th February 2021**

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| *CR-Form-v12.0* | | | | | | | | |
| **Pseudo CHANGE REQUEST** | | | | | | | | |
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|  | **26.955** | **CR** | **<CR#>** | **rev** |  | **Current version:** | **0.4.7** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

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| ***Title:*** | [FS\_5GVideo] pCR26.955: Updated EVC verification test results | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Qualcomm Incorporated, Samsung Electronics | | | | | | | | | |
| ***Source to TSG:*** | SA4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | FS\_5GVideo | | | | |  | ***Date:*** | | | 2021-01-27 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) Rel-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
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| ***Reason for change:*** | | The essential video coding verification results are updated based on the official EVC verification test results for SDR content released by MPEG | | | | | | | | |
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| ***Summary of change:*** | | Addition and deletion of references  Updated information regarding EVC verification test results | | | | | | | | |
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| ***Consequences if not approved:*** | | Information regarding EVC verification test results will be incomplete in the study item description | | | | | | | | |
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| ***Clauses affected:*** | |  | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
| ***56*** | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**===== CHANGE =====**

## 2 References

~~[52] ISO/IEC JTC 1/SC 29/WG 04 output document N0027, "Updated Verification Test Plan for Essential Video Coding for SDR Content", Online meeting, Oct. 2020.~~

[52] ISO/IEC JTC 1/SC 29/WG 04 output document N0047, " Report on Essential Video Coding compression performance verification testing for SDR Content", Online meeting, Jan. 2021. http://www.mpegstandards.org/wp-content/uploads/mpeg\_meetings/133\_OnLine/w20000.zip

[53] ISO/IEC JTC 1/SC 29/WG 04 output document N0030, "Report on Essential Video Coding compression performance verification testing for HDR/WCG content", Online meeting, Oct. 2020. <https://www.mpegstandards.org/wp-content/uploads/mpeg_meetings/132_OnLine/w19832.zip>

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## 8.3 Essential Video Coding (EVC)

### 8.3.1 Overview

The development of the MPEG-5 Essential Video Coding (EVC) standard is completed and its specification has been published in October 2020 as ISO/IEC 23094-1 [50].

The main goal of the EVC standard is to provide significantly improved compression capability over previous generation of video coding standards with timely publication of commercial terms. The EVC standard has been developed to provide a video codec for emerging delivery protocols and networks, such as 5G, enabling the delivery of high-quality video services to an ever-growing audience by providing improved coding performance.

The MPEG-5 EVC defines two important profiles, "Baseline" profile and "Main" profile. It was the design objective that the "Baseline" profile contains only technologies that are older than 20 years. The "Main" profile includes additional tools, each of which can be either cleanly disabled or switched to the corresponding baseline tool on an individual basis. Additionally, for still image coding, "Main Still Picture" and "Baseline Still Picture" profiles, which employ the same coding tools as in the corresponding video profiles, are defined.

~~MPEG is currently conducting verification tests [52] with formal subjective testing to confirm that the EVC Main profile achieves significant bit-rate reductions vs. HEVC for equal subjective video quality for SDR content and that the EVC Baseline profile achieves similar bit-rate reductions vs. AVC for equal subjective video quality for SDR content. The verification tests have been completed for HDR content and the results are reported in [53]. They show that the EVC Main profile provides around 36% of bitrate reduction for HDR content at UHD resolution and 35% for HDR content at HD resolution for equal subjective quality.~~

~~Editors’note: This will be updated when full subjective test results are released by MPEG and will be documented as external reference.~~

MPEG has completed the EVC verification tests for HDR and SDR content with formal subjective testing showing that for equal subjective video quality, the EVC reference encoder using the EVC Main profile can achieve significant bit-rate reduction compared to the HEVC reference encoder using the HEVC Main 10 profile. These tests also demonstrated that the EVC reference encoder using the EVC Baseline profile can achieve similar bit-rate reduction compared to AVC reference encoder using the AVC Progressive High 10 profile. Such analysis was performed using MOS BD-rate calculations.

The verification test conditions and results for SDR content are reported in [52]. The average bitrate savings for the EVC reference encoder using the EVC Main profile compared to the HEVC reference encoder using the HEVC Main 10 profile are approximately 39% for UHD SDR content encoded using the random access configuration, and approximately 41% for HD SDR content, encoded using the low delay configuration. The average bit rate savings for the EVC reference encoder using the EVC Baseline profile compared to the AVC reference encoder using the AVC Progressive High 10 profile are approximately 39% for the UHD SDR content encoded using the random access configuration, and approximately 34% for HD SDR content encoded using the low delay configuration.

The verification test conditions and results for HDR content are reported in [53]. For random access configuration, the EVC reference encoder using the EVC Main profile provides around 36% bitrate reduction for HDR content at UHD resolution and 35% bitrate reduction for HDR content at HD resolution compared to the HEVC reference encoder, with HDR/WCG encoder optimizations enabled, using the HEVC Main 10 profile, for equal subjective video quality.

Application areas especially targeted for the use of EVC include ultra-high definition 4K and 8K video, video with a high dynamic range and wide colour gamut, and video for immersive media applications such as 360° omnidirectional video, as well as conventional standard-definition and high-definition video content.