

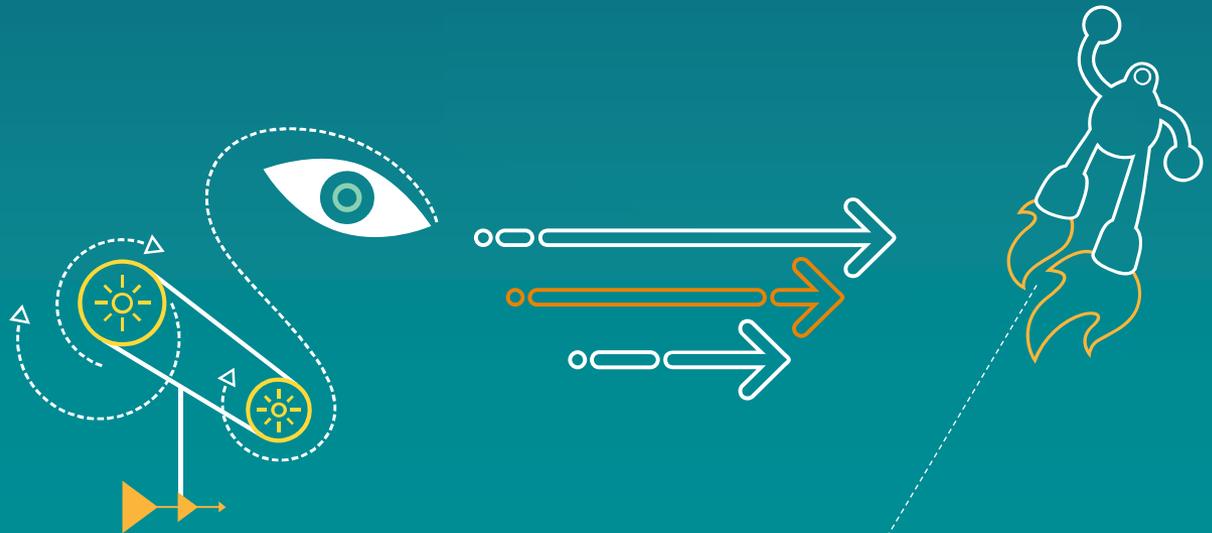
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**JCTVC-R0175**

**Non-SCCE3: Additional results for subtest C.4**

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## C.4 with improved encoder

- C.4 encoder is replaced by C.2 encoder with the following modification
  - Palette entries with single occurrence are removed from the palette if they can't be predicted using the palette predictor for lossy conditions
- No normative changes compared with C.4.

# BD-rate results with respect to SCCE3 AHG

	All Intra			All Intra		
	G/Y	B/U	R/V	G/Y	B/U	R/V
RGB, text & graphics with motion, 1080p	-11.4%	-11.1%	-10.9%	-13.4%	-13.0%	-12.8%
RGB, text & graphics with motion,720p	-9.6%	-8.4%	-8.6%	-11.6%	-10.3%	-10.6%
RGB, mixed content, 1440p	-5.3%	-4.3%	-4.4%	-6.9%	-5.8%	-6.0%
RGB, mixed content, 1080p	-5.2%	-4.9%	-4.9%	-7.6%	-7.1%	-7.2%
RGB, Animation, 720p	-0.2%	-0.6%	-0.7%	-0.3%	-0.6%	-0.7%
RGB, camera captured, 1080p	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%
YUV, text & graphics with motion, 1080p	-11.5%	-13.0%	-12.7%	-13.7%	-15.1%	-14.9%
YUV, text & graphics with motion,720p	-6.4%	-9.3%	-11.3%	-8.4%	-11.2%	-13.1%
YUV, mixed content, 1440p	-4.1%	-8.8%	-9.2%	-5.8%	-10.7%	-11.0%
YUV, mixed content, 1080p	-4.8%	-9.3%	-9.3%	-7.3%	-12.2%	-12.2%
YUV, Animation, 720p	0.1%	-1.4%	-1.3%	0.1%	-1.4%	-1.3%
YUV, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Enc Time[%]	105%			101%		
Dec Time[%]	98%			95%		

Full-frame IBC

Two CTU IBC

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## C.4 with improved encoder and a subset of tools

- The following tools are removed from C.4
  - Escape coded as a flag
  - Redundancy removal from B.12
- Remaining tools
  - Palette stuffing
  - Grouping to signal palette predictor
  - Truncated binary coding of indices
  - CU level escape flag
  - Redundancy removal
  - No palette reset at the beginning of CTB rows

# BD-rate results for C.4 with improved encoder and a subset of tools (SCCE3 AHG)

	All Intra			All Intra		
	G/Y	B/U	R/V	G/Y	B/U	R/V
RGB, text & graphics with motion, 1080p	-10.8%	-10.5%	-10.3%	-12.5%	-12.2%	-12.0%
RGB, text & graphics with motion,720p	-9.4%	-8.1%	-8.3%	-11.2%	-10.0%	-10.3%
RGB, mixed content, 1440p	-5.1%	-4.1%	-4.2%	-6.6%	-5.6%	-5.7%
RGB, mixed content, 1080p	-5.0%	-4.7%	-4.7%	-7.2%	-6.8%	-6.9%
RGB, Animation, 720p	-0.2%	-0.6%	-0.7%	-0.2%	-0.6%	-0.7%
RGB, camera captured, 1080p	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
YUV, text & graphics with motion, 1080p	-11.0%	-12.5%	-12.2%	-12.9%	-14.4%	-14.2%
YUV, text & graphics with motion,720p	-6.2%	-8.9%	-11.0%	-8.1%	-10.8%	-12.7%
YUV, mixed content, 1440p	-4.0%	-8.6%	-8.9%	-5.6%	-10.5%	-10.8%
YUV, mixed content, 1080p	-4.6%	-9.1%	-9.1%	-7.0%	-11.8%	-11.8%
YUV, Animation, 720p	0.1%	-1.3%	-1.2%	0.1%	-1.3%	-1.1%
YUV, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Enc Time[%]	103%			104%		
Dec Time[%]	99%			101%		

Full-frame IBC

Two CTU IBC

# Synergies between different tools in C.4

- Performance of C.4 is better than sum of individual tools on top of AHG

full-frame IBC	A.7	A.8	B.12	B.13	A.7 + A.8 + B.12 + B.13	C4
RGB, text & graphics with motion, 1080p	-2.4%	-3.3%	-1.6%	-0.5%	-7.8%	-9.3%
RGB, text & graphics with motion,720p	-1.6%	-3.1%	-1.1%	-0.1%	-6.0%	-7.2%
RGB, mixed content, 1440p	-1.3%	-0.2%	-0.2%	-0.1%	-1.8%	-2.7%
RGB, mixed content, 1080p	-1.3%	-0.3%	-0.3%	-0.1%	-2.0%	-3.0%
RGB, Animation, 720p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
RGB, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
YUV, text & graphics with motion, 1080p	-2.4%	-3.4%	-2.1%	-0.5%	-8.5%	-9.4%
YUV, text & graphics with motion,720p	-0.8%	-2.3%	-0.8%	0.0%	-3.9%	-4.9%
YUV, mixed content, 1440p	-0.9%	-0.2%	-0.2%	0.0%	-1.3%	-1.9%
YUV, mixed content, 1080p	-1.1%	-0.5%	-0.5%	-0.1%	-2.3%	-2.7%
YUV, Animation, 720p	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
YUV, camera captured, 1080p	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

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# Conclusions

- C.4 with improved encoder achieves higher performance compared with C.4 without normative changes.
- C.4 with improved encoder and a subset of tools
  - A minimal set of tools to achieve comparable performance with other C.x tests
- C.4 achieves better performance than the sum of individual BD-rate gains with respect to SCCE3 AHG