

## Compression Software Comparison - Mac mini (2018)

Movie	Compression Setting	Apple Compressor	Adobe Media Encoder	ffWorks	% Mac mini is faster than iMac
<b>XDCAM EX 720p/60.8:59 Duration</b>					
	XDCAM EX to ProRes 422	01:24	03:32	01:46	41%
	XDCAM EX to H.264 (YouTube 720p)	02:51	02:22	02:39	45%
	XDCAM EX to HEVC 8-bit (HW)	01:27	02:12	04:19	47%
	XDCAM EX to HEVC 10-bit (SW)	56:27	09:43	05:49	-7%
	XDCAM EX to MXF OP1a XDCAM HD	04:07	02:48	00:50	47%
<b>ProRes 422 HQ 1080p/30 4:45 Duration</b>					
	ProRes 422 HQ to H.264 (YouTube 1080p)	02:32	02:23	03:24	33%
	ProRes 422 to HEVC 8-bit (HW)	01:34	02:22	04:51	43%
	ProRes 422 to HEVC 10-bit (SW)	54:28	08:37	06:34	0%
	ProRes 422 HQ to MXF XDCAM HD 720p/60	03:55	05:50	01:37	-53%
<b>ProRes 4444 720p/30 43:02 Duration</b>					
	ProRes 4444 to H.264 (YouTube 720p)	07:25	06:51	05:03	36%
	ProRes 4444 to HEVC 8-bit (HW)	04:56	06:53	08:17	51%
	ProRes 4444 to HEVC 10-bit (SW)	FAIL	19:24	11:35	29%
	ProRes 4444 to MXF OP1a	19:43	16:04	03:55	-11%
				<i>Average Speed Boost</i>	23%

## Compression Software Comparison - iMac (2017)

Movie	Compression Setting	Apple Compressor	Adobe Media Encoder	ffWorks	% iMac is faster than Mac mini
<b>XDCAM EX 720p/60.8:59 Duration</b>					
	XDCAM EX to ProRes 422	02:43	05:27	03:17	-41%
	XDCAM EX to H.264 (YouTube 720p)	06:50	02:50	04:35	-45%
	XDCAM EX to HEVC 8-bit (HW)	03:52	05:32	05:43	-47%
	XDCAM EX to HEVC 10-bit (SW)	43:55	15:24	08:14	7%
	XDCAM EX to MXF OP1a XDCAM HD	04:06	08:58	01:32	-47%
<b>ProRes 422 HQ 1080p/30 4:45 Duration</b>					
	ProRes 422 HQ to H.264 (YouTube 1080p)	03:21	03:11	05:58	-33%
	ProRes 422 to HEVC 8-bit (HW)	02:58	05:07	07:27	-43%
	ProRes 422 to HEVC 10-bit (SW)	45:49	13:24	10:17	0%
	ProRes 422 HQ to MXF XDCAM HD 720p/60	02:44	02:52	01:51	53%
<b>ProRes 4444 720p/30 43:02 Duration</b>					
	ProRes 4444 to H.264 (YouTube 720p)	09:39	12:07	08:25	-36%
	ProRes 4444 to HEVC 8-bit (HW)	13:50	14:32	12:59	-51%
	ProRes 4444 to HEVC 10-bit (SW)	FAIL	25:43	17:57	
	ProRes 4444 to MXF OP1a	15:07	13:57	06:44	11%
				<i>Average Speed Boost</i>	-23%

## Apple Compressor (v. 4.4.2) Hardware Comparison Speed Test

Movie	Compression Setting	2017 iMac	2018 Mac mini	Winner	Mac mini % Faster	X Faster than Real Time	Source Duration
<b>XDCAM EX 720p/60.8:59 Duration</b>							
	XDCAM EX to ProRes 422	02:43	01:24	Mac Mini	48%	6.4	08:59
	XDCAM EX to H.264 (YouTube 720p)	06:50	02:51	Mac Mini	58%	3.2	08:59
	XDCAM EX to HEVC 8-bit (HW)	03:52	01:27	Mac Mini	63%	6.2	08:59
	XDCAM EX to HEVC 10-bit (SW)	43:55	56:27	iMac	-29%	0.2	08:59
	XDCAM EX to MXF	04:06	04:07	Tie	0%	2.2	08:59
<b>ProRes 422 HQ 1080p/30 4:45 Duration</b>							
	ProRes 422 HQ to H.264 (YouTube 1080p)	03:21	02:32	Mac Mini	24%	1.9	04:45
	ProRes 422 to HEVC 8-bit (HW)	02:58	01:34	Mac Mini	47%	3.0	04:45
	ProRes 422 to HEVC 10-bit (SW)	45:49	54:28	iMac	-19%	0.1	04:45
	ProRes 422 HQ to MXF XDCAM HD 720p/60	02:44	03:55	iMac	-43%	1.7	04:45
<b>ProRes 4444 720p/30 43:02 Duration</b>							
	ProRes 4444 to H.264 (YouTube 720p)	09:39	07:25	Mac Mini	23%	5.1	37:35
	ProRes 4444 to HEVC 8-bit	13:50	04:56	Mac Mini	64%	7.6	37:35
	ProRes 4444 to HEVC 10-bit	FAIL	FAIL				
	ProRes 4444 to MXF	15:07	19:43	iMac	-30%	2.5	37:35
<b>NOTES</b>							
	Default settings between all three applications are not identical						
	Each file was compressed separately - no batch processing.						
	Compression Settings are all defaults						
	Convert XCAM to ProRes used ProRes > ProRes 422						
	Convert to H.264 used Video Sharing > HD 720p						
	Convert to HEVC 8-bit used Apple Devices > 4K HEVC 8 Bit - this supports hardware acceleration, but not HDR						
	Convert to HEVC 10-bit used Apple Devices > 4K HEVC 10 Bit - this is software-compression only, but required for HDR media						
	Convert to MXF using MXF > XDCAM HD 422						
	All images were compressed at source frame sizes - no scaling						
	ProRes 4444 to HEVC 10-bit failed three times, each after 2.5 hours, using two different files on the iMac						
	ProRes 4444 to HEVC 10-bit failed twice, each after 3.2 hours, on the Mac mini						

## Adobe Media Encoder (v.13.0.1.12) Hardware Comparison Speed Test

Movie	Compression Setting	2017 iMac	2018 Mac mini	Winner	Mac mini % Faster	X Faster than Real Time	Source Duration
<b>XDCAM EX 720p/60.8:59 Duration</b>							
	XDCAM EX to ProRes 422	05:27	03:32	Mac Mini	35%	2.5	08:59
	XDCAM EX to H.264 (YouTube 720p)	02:50	02:22	Mac Mini	16%	3.8	08:59
	XDCAM EX to HEVC 8-bit (HW)	05:32	02:12	Mac Mini	60%	4.1	08:59
	XDCAM EX to HEVC 10-bit (SW)	15:24	09:43	Mac Mini	37%	0.9	08:59
	XDCAM EX to MXF OP1a XDCAM HD	08:58	02:48	Mac Mini	69%	3.2	08:59
<b>ProRes 422 HQ 1080p/30 4:45 Duration</b>							
	ProRes 422 HQ to H.264 (YouTube 1080p)	03:11	02:23	Mac Mini	25%	2.0	04:45
	ProRes 422 to HEVC 8-bit (HW)	05:07	02:22	Mac Mini	54%	2.0	04:45
	ProRes 422 to HEVC 10-bit (SW)	13:24	08:37	Mac Mini	36%	0.6	04:45
	ProRes 422 HQ to MXF XDCAM HD 720p/60	02:52	05:50	iMac	-103%	1.7	04:45
<b>ProRes 4444 720p/30 43:02 Duration</b>							
	ProRes 4444 to H.264 (YouTube 720p)	12:07	06:51	Mac Mini	43%	6.3	43:02
	ProRes 4444 to HEVC 8-bit	14:32	06:53	Mac Mini	53%	6.3	43:02
	ProRes 4444 to HEVC 10-bit	25:43	19:24	Mac Mini	25%	2.2	43:02
	ProRes 4444 to MXF OP1a	13:57	16:04	iMac	-15%	3.1	43:02
<b>NOTES</b>							
	Default settings between all three applications are not identical						
	While AME supports parallel compression, each file was compressed individually						
	All images were compressed at source frame sizes - no scaling						
	Converting to ProRes used a custom setting to create ProRes 422						
	Converting to H.264 used Web > Social Media > YouTube - either 720 or 1080, depending upon the source file						
	Converting to HEVC 8-bit matched HEVC 10-bit, except switched to 8-bit with hardware encoding turned on						
	Converting to HEVC used a default HEVC setting, switched to 10-bit software encoding and matching frame size						
	Converting to MXF using MXF > XDCAM HD SO NTSC 720p60						
	FAR greater range of MXF and HEVC formats in AME						
	ProRes 4444 compressed to MXF, but with errors. The movie would still play, however.						

## ffWorks/ffmpeg (v. 1.1.9 Hardware Comparison Speed Test

Movie	Compression Setting	2017 iMac	2018 Mac mini	Winner	Mac mini % Faster	X Faster than Real Time	Source Duration
<b>XDCAM EX 720p/60.8:59 Duration</b>							
	XDCAM EX to ProRes 422	03:17	01:46	Mac Mini	46%	5.1	08:59
	XDCAM EX to H.264 (YouTube 720p)	04:35	02:39	Mac Mini	42%	3.4	08:59
	XDCAM EX to HEVC 8-bit (HW)	05:43	04:19	Mac Mini	24%	2.1	08:59
	XDCAM EX to HEVC 10-bit (SW)	08:14	05:49	Mac Mini	29%	1.5	08:59
	XDCAM EX to MXF OP1a XDCAM HD	01:32	00:50	Mac Mini	46%	10.8	08:59
<b>ProRes 422 HQ 1080p/30 4:45 Duration</b>							
	ProRes 422 HQ to H.264 (YouTube 1080p)	05:58	03:24	Mac Mini	43%	1.4	04:45
	ProRes 422 to HEVC 8-bit (HW)	07:27	04:51	Mac Mini	35%	1.0	04:45
	ProRes 422 to HEVC 10-bit (SW)	10:17	06:34	Mac Mini	36%	0.7	04:45
	ProRes 422 HQ to MXF XDCAM HD 720p/60	01:51	01:37	Mac Mini	13%	2.9	04:45
<b>ProRes 4444 720p/30 43:02 Duration</b>							
	ProRes 4444 to H.264 (YouTube 720p)	08:25	05:03	Mac Mini	40%	8.5	43:02
	ProRes 4444 to HEVC 8-bit	12:59	08:17	Mac Mini	36%	5.2	43:02
	ProRes 4444 to HEVC 10-bit	17:57	11:35	Mac Mini	35%	3.7	43:02
	ProRes 4444 to MXF OP1a	06:44	03:55	Mac Mini	42%	11.0	43:02
<b>NOTES</b>							
	Default settings between all three applications are not identical						
	While ffWorks supports parallel compression, each file was compressed individually						
	All images were compressed at source frame sizes - no scaling						
	MXF OP1a settings are not necessarily comparable between software						
	Converting to ProRes used ProRes Standard Profile						
	Converting to H.264 used YouTube mp4 setting						
	Converting to HEVC 8-bit used H.265 Main Profile software encoding						
	Converting to HEVC 10-bit used H.265 Main Profile 10-bit software encoding						
	Converting to MXF using MXF default setting adjusted to match frame size and frame rate						

## 27" iMac Compressed File Size - in MB

Movie	Compression Setting	Compressor	AME	ffWorks
<b>XDCAM EX 720p/60.8:59 Duration</b>				
	XDCAM EX to H.264 (YouTube 720p)	683.6	1060	263.3
	<i>Default Compressed Bit Rate</i>	9765	16384	5308
	XDCAM EX to HEVC 8-bit (HW)	353.1	274.4	55.8
	<i>Default Compressed Bit Rate</i>	15000 kbps	4096	2212
<b>ProRes 422 HQ 1080p/30 4:45 Duration</b>				
	XDCAM EX to H.264 (YouTube 1080p)	539.9	577.8	181.1
	<i>Default Compressed Bit Rate</i>	14648	16384	23489.74
	ProRes 422 to HEVC 8-bit (HW)	269.1	148.2	31.8
	<i>Default Compressed Bit Rate</i>	15000 kbps	4096	9787
<b>ProRes 4444 720p/30 43:02 Duration</b>				
	XDCAM EX to H.264 (YouTube 720p)	987.7	746.3	326.6
	<i>Default Compressed Bit Rate</i>	9765	16384	5308
	ProRes 4444 to HEVC 8-bit	808.6	569.3	150.4
	<i>Default Compressed Bit Rate</i>	15000	4096	2212
<b>NOTES</b>				
	File size is dependent upon compression bit rate - but look at the differences in defaults!			
	Actual data rates vary based upon frame size and pixel movement between frames			
	Doubling the frame size roughly doubled the compression time.			