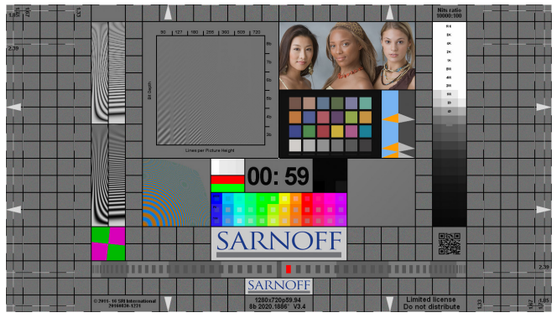

Identify the quality issues that matter most to you. Inside is a quick reference guide detailing the pattern's specific test parameters.

Standard Formats

- SD (576i, 486p, 486i)
- HD (720p, 1080i, 1080p)
- 2k (2048 x 1080)
- UHD (3840 x 2160)
- 4k (4096 x 2160)
- Custom formats: any resolution, frame rate, and color space

Media File Formats

- Y'UV 10-bit 4:2:2 in 'v210' files
- R'G'B' 4:4:4 in 10-bit DPX or 16-bit TIFF files
- R'G'B' or XYZ OpenEXR files
- Rec. 709, PQ[1]/2020[2], HLG[3]/2020[2], ACESproxy, S-Log3 or Log-C
- Uncompressed Y'UV 4:2:2, in media wrapper
- Compressed MPEG-2, H.264 or HEVC Transport Streams

[1] SMPTE ST-2084, [2] ITU-R BT-2020, [3] ITU-R BT.2100

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STAY CONNECTED

Visualizer™ SDR/HDR+WCG Digital Video Test Pattern

The Visualizer™ test pattern offers a comprehensive way to evaluate more than 20 key parameters of video quality from a single screen. It enables you to easily identify processing and transmission errors throughout the digital signal chain.

End-to-End Digital Video Diagnostics

The Visualizer™ test tool is an easy-to-interpret, visual pattern that enables accurate evaluation and calibration of a wide range of digital video systems. From simplifying equipment configuration to measuring compression performance, the Visualizer pattern takes the guesswork out of digital video quality control.

The pattern is available as an uncompressed or compressed video sequence. In streaming form—as HEVC/H.265, H.264/MPEG-4 AVC and MPEG-2 video—it is suitable for testing both file-based and streaming systems. The sequence has been carefully compressed using custom SRI encoders, ensuring that compression-sensitive features remain intact.

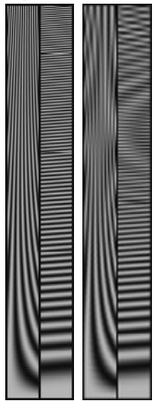
- Quantifies compression fidelity
- Identifies color matrix mismatch
- Determines bit depth and chroma subsampling
- Reveals skipped frames
- Quantifies lip sync errors
- Provides 18 additional tests

HDR+WCG Version

- Reveals tone mapping and clipping
- Shows color gamut mismatch
- Indicates gamut mapping

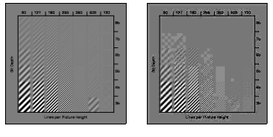
Scan with your smartphone for narrated video demonstrations

1 Frequency Response



At the left, H and V linear frequency sweeps from zero to the Nyquist limit. At right, after conversion from 1920x1080 to 1280x720 and back. Note the aliasing at the top that should have been filtered away to gray. Note the strong Moiré pattern 2/3 the way up. 2/3 = 720/1080. Use pattern's 12-unit grid scale to measure frequency ratios (8/12 = 720/1080).

2 Compression Fidelity



Right: Some regions have missing detail. At each frequency, note the highest bit depth with visible signal. Left: Uncompressed shows visible signal from bottom to top in every frequency burst. (Contrast exaggerated.)

3 Reference Image

Check skin tones, detail in hair and jewelry; check for highlight clipping, black clipping. The image is color-managed for gamma and RGB primaries.

4 Jacob's Ladder

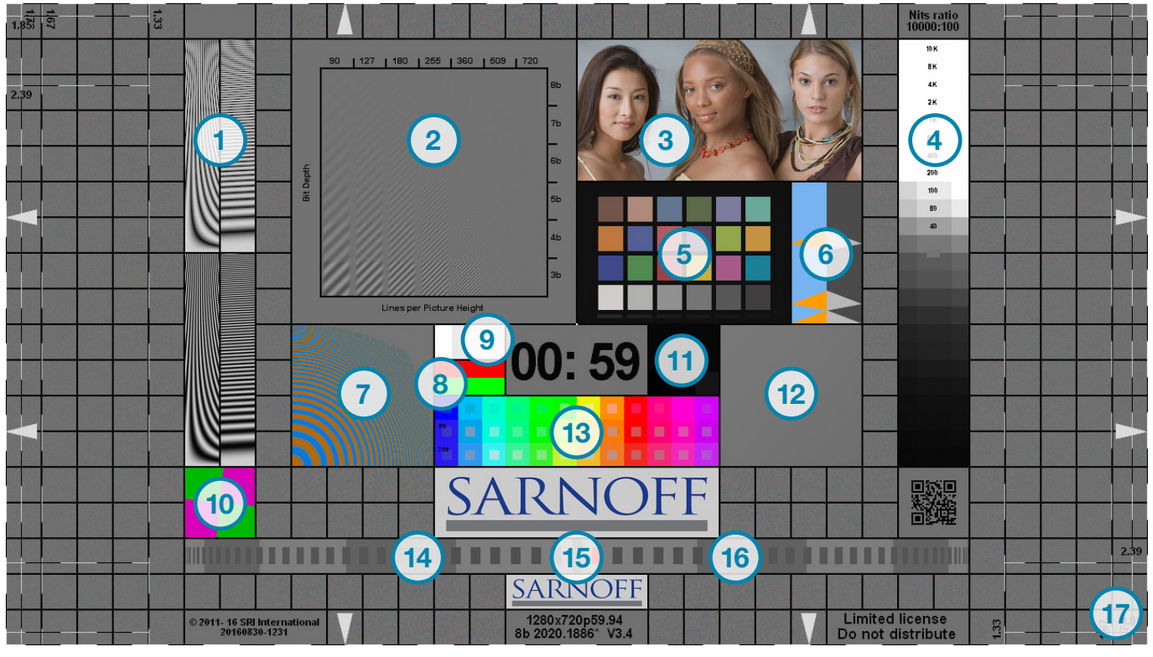
Calibrated linear light stairstep from 100% (10,000 nits) down 6 decades in 24 steps, with +/- 1/3 stop deltas. Check monitor tone mapping and clipping, and darkest visible light level.

5 ST-303M

See User Guide Appendix for RGB values for each chip. Note six dim blocks in the fifth row. They are 1/200, 1/400, 1/800, 1/1600, 1/3200, 1/6400 of the linear light range.

6 Lava Lamp

Right half: luma only. Left half: chroma only. Look for jumps or stutter indicating dropped or repeated frames. 1/4 way up, speed is 1 line per frame or field: look for jaggies there. Look for differences between luma and chroma resolution and motion smoothness.



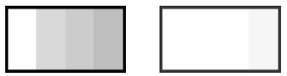
7 Chroma Downsampling

Chroma 4:4:4 *Chroma 4:2:2* *Chroma 4:2:0p* *Chroma 4:2:0i*

8 Color Matrix

Correct *Rec.709 YUV decoded as Rec. 601* *Rec.2020 decoded as Rec.709*

9 White Pluge



Correct *Blown out*

1002, 940, 932, 914 (107%, 100, 99, 97). Headroom is clipped if you can't see the difference between 107 and 100. You should see a difference between 100 and 99 (adjust monitor contrast down).

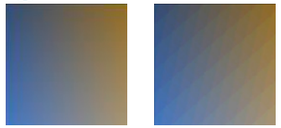
10 Chroma Upsampling Back to 4:4:4

4:4:4 *4:2:2 to 4:4:4* *4:2:0p to 4:4:4* *4:2:0i to 4:4:4*

11 Pluge

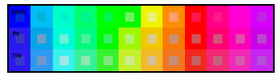
± 4, 2, 1%. Left image: monitor brightness too high. Adjust down until 1st and 2nd columns merge (middle image). All 3rd column chips are different than 2nd column. Right: monitor brightness too high, but column 1 (super black) has been clipped off upstream or in the monitor.

12 Bit Depth



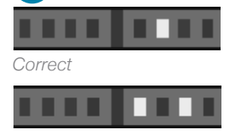
Left: 10-bit shows no contour lines. Dithered 8-bit may look almost as smooth. Right: 8-bit video has rotating contour lines. Compression artifacts may also appear. (Contrast exaggerated.)

13 Gamut Bars



12 color points around each gamut, with small chips desaturated by 5 delta-E. Reveals gamut mapping.

14 Field Dominance



Correct

Reversed

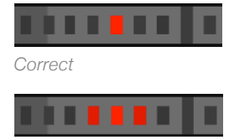
15 Lip Sync

Correct: Tick is heard when center mark flashes.

Incorrect: Audio is 3 frames/fields early

16 Chroma Motion Error

Demonstrates incorrect processing of Chroma in interlaced 4:2:0 systems



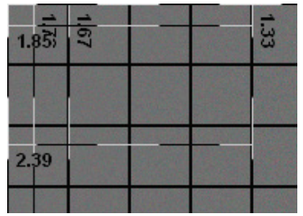
Correct

Incorrect

17 Border Marquee & Crop Lines

Correct: Top white dashed line is showing

Top line is missing



When center-cropped to the indicated aspect ratio, the associated dashed lines will be the edge pixels of the new image.