

COLOR NEWS 1/2020

HDR demystified

HDR

HDR (High Dynamic Range) means better image quality with deeper blacks, brighter whites, more vibrant colors and details. Basically you have much larger range of possibilities regarding the look of the footage

Dolby Vision (DV)

DV is the main standard for HDR. We are grading in HDR and in the 2nd step **every shot** gets a trim pass to SDR (REC. 709), which is called **Dynamic Metadata**. Modern viewing devices recognise the DV and are mapping the stream to the optimal viewing condition. So if you watch it on an iPhone 11 you get (\approx) 640 Nits. On a LG C9 TV (\approx) 700 Nits. If you don't have a HDR DV device you will see the normal SDR video with 100 Nits.

Nits

A nit is a measurement of received brightness. SDR TVs have around 100 Nits. HDR screens start from 600 to 1000 nits and the aim is 4000 Nits one day. Important: To maintain a pleasing viewing experience we reserve the maximum Nits only for the 10% peak highlights.

It took HDR a while to arrive, but there is no doubt, that it is here to stay. In my opinion the main development has been done and the main workflows have been established.

All productions for Netflix and Amazon (and more platforms to come) from 2020/21 will be in HDR Dolby Vision. The HDR adoption is happening 60% faster than it took from SD to HD. Almost every new mobile device is HDR ready. Reason enough to summarise a few facts about HDR.



Which cameras can shoot HDR?

Every camera with a dynamic range of **12 stops and above** is considered HDR. For instance, Arri took footage from the first Alexa cameras ever and mastered it years later in HDR and it looked stunning. Today's digital film cameras are considered 15 stops and above.

HDR is just soooo bright!

Not if you do it right in post. We all know the sunburn kind of images on TVs in the electronics market. But that is **NOT!** how HDR should be seen ever. In fact you should not feel the HDR if it is mastered correctly. The image should just have this **little extra touch of brilliance**. More details in blacks and highlights and a wider color gamut. That's it. The peak highlights (specular reflections, light bulbs) should cover a max. of 10-15% of the image.

How to light for HDR!

I don't think there is a major change in the traditional lighting. But keep in mind that peak highlights will be up to 10x brighter in HDR, meaning they take more attention. And this can affect the storytelling e.g. bright practical lights and windows.

I suggest to control the peak highlights at a max of 30% above the brightness of the actors faces.

ACES

The Academy Color Encoding System (ACES) is a new standard which gives us the widest color gamut possible (more than the human eye) and up to (\approx) 32 stops of dynamic range. It works also as an interchange format e.g. between grading and VFX without quality loss and as archival format.

Aces is designed "to look" like film and in grading gives us deeper and more cinematic looks. Aces is perfect for HDR.

REC.2020 and PQ

Rec.2020 defines aspects of UHD like the resolution for 4K (3840x2160), 8K and the color space primaries

Dolby's PQ transfer function is used within the REC.2020 colorspace to display HDR video levels.

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What to avoid in HDR!

Again we have to talk about the highlights. I would try to avoid overexposed highlights at any cost. Once gone, in HDR they will appear like white patches. In grading we can still blur/flair them out easily, but it is always better to control them at shooting stage.

Do I need an HDR monitor on set!

Not necessarily, but it helps for sure to judge the highlight and shadow details.

At Futureworks we suggest a portable solution and if wanted, the option for live color grading.

Is there any specific workflow to follow?

The workflow for on set is the same as for SDR. Any RAW/log footage is automatically HDR ready (if above 12 stops). In postproduction we follow a strict **ACES workflow** for grading and VFX to maintain the maximum dynamic range and color gamut.

Is RED HDR-X and HDR the same?

Two very different things.

Red has developed a technique to record and combine two different exposures.

In SDR it is "squeezed" in an 8 bit environment/monitor with 100 nits.

HDR means a viewing device in 10/12 bit and 1000 nits peak brightness.

Cinema, HDR, SDR.

How many gradings do we need?

Because of our **scene referred workflow** at Futureworks we can switch almost seamlessly between the various deliverables. Once graded in one colorspace it just needs a minor trim pass to finalise in another.

I hope you enjoyed my first newsletter in 2020 and have fun with your upcoming HDR projects.

Yours sincerely,
Andreas Brueckl

