



National Association of Theatre Owners™

## **HDR - High Dynamic Range**

Prepared by NATO Technology Committee

### **Introduction**

NATO's Technology Committees have a mission of encouraging new technologies that may benefit the entire industry. To that end, we believe new image presentation systems have the potential to bring new experiences to our patrons. At this time NATO is not endorsing High Dynamic Range (HDR) or Laser systems, but we believe it is important for NATO to identify requirements necessary to bring these new technologies into our theaters. We hope to work with studios, service providers, and equipment manufacturers in understanding and refining our requirements.

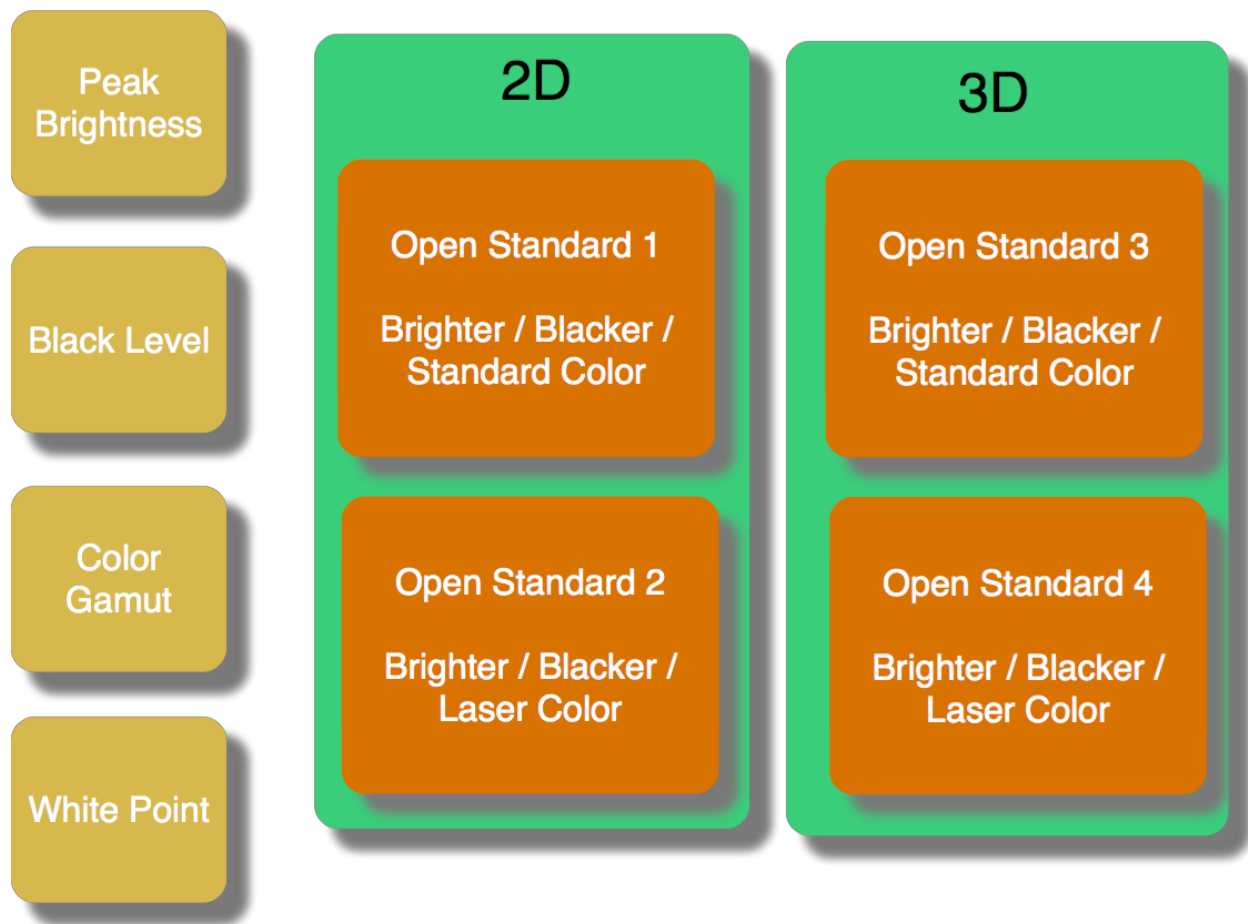
### **Requirements**

It is critical that there not be multiple proprietary solutions for theaters. It is essential that a theater that selects one class of HDR or Lasers be able to play all movies that are released in this class of new technologies. We also recognize the complexities of mastering to multiple target systems and the added complexity of distribution of multiple masters. We also believe it is time to define standards for new 2D and 3D projectors. With this in mind, and considering the difficulties of achieving high brightness particularly on low gain screens, there should be an acceptable tolerance either side in achieving these defined open standards. There also needs to be consideration of the illumination fall off with age of laser-based projectors.

Based on the work in Intersociety and ISDCF with participation from all sectors, NATO believes that there should be no more than four open standards for HDR defined - two for HDR-2D and two for HDR-3D for new HDR/Laser experiences. We are not proposing the numerical standards for the standards. We believe the creative and technical groups should define the detailed values. We believe defining an open standard is the most effective way of helping guide the industry without constraining creativity.

The open standards for HDR should be:

1. 2D-HDR - Defined maximum brightness (to be defined, between 14ftL and 30ftL), defined black levels and white point, standard P3 color space
2. 3D-HDR - Defined maximum brightness (to be defined, between 10ftL and 14ftL), defined black levels and white point, standard P3 color space
3. 2D-HDR - Defined maximum brightness (to be defined, between 14ftL and 30ftL), defined black levels and white point, Extended laser-based color space
4. 3D-HDR - Defined maximum brightness (to be defined, between 10ftL and 14ftL), defined black levels and white point, Extended laser-based color space



### **Suggested Approach**

NATO believes that the industry needs to conduct tests and demonstrations for the proposed detailed specifications of these open standards, also taking into account maintenance requirements and light diminishment over time. Working groups in SMPTE may provide a forum to standardize specific values and measurement procedures. By making these defined open standards it will allow exhibition to embrace new technologies with an understanding of the availability of studio approved masters.