



D-cinema Concerns for cinematographers

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D-cinema Concerns for cinematographers

- Low light levels for 3D projection
- Use of high gain screens and silver screens for 3D digital presentations
- Cropping of images during projection
- High Frame Rates for 3D

Kommer Kleijn SBC

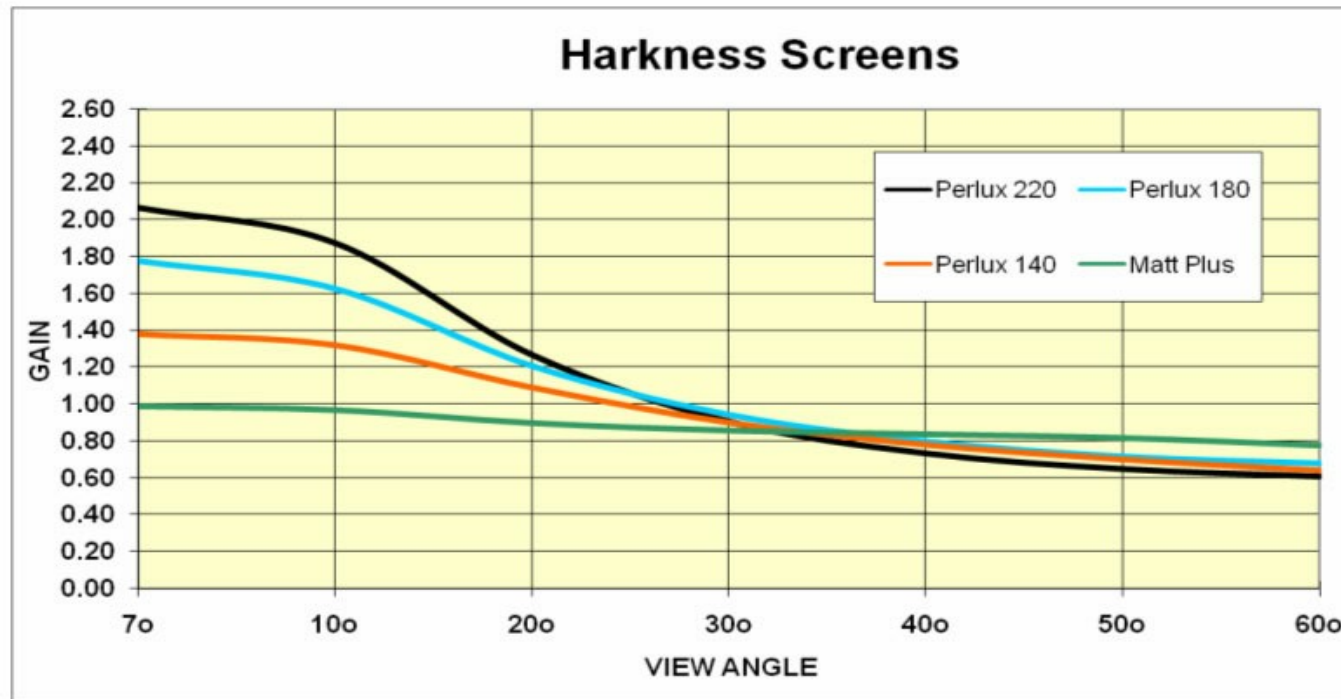
- Active Cinematographer and Stereographer
- IMAGO is the European Federation of cinematographers
- Chair of IMAGO Technical Committee
- IMAGO is a member of EDCF
- Kommer Kleijn represents IMAGO within EDCF
- Former Chair of the SMPTE 21DC Additional Frame Rates Ad Hoc Group

Low light levels for 3D projection

- Rec. light level for 2D projection = 14 fl
- All 3D systems have important light loss
- Light levels for 3D projection = 4 to 5 fl
- Lower levels than these are seen
- Significant reduction in contrast
- Inferior perception of shadow detail

Cinema Screen Gain

Gain screens : viewing angles



- Source: www.harkness-screens.com

Cinema Screen Gain

Gain screens : viewing angles

screen type	peak gain	half-gain angles
Perlux 140	1.4	50
Perlux 180	1.8	34
Perlux 220	2.2	26
Spectral 240	2.4	25

Cinema Screen Gain

Gain screens : theatre shape

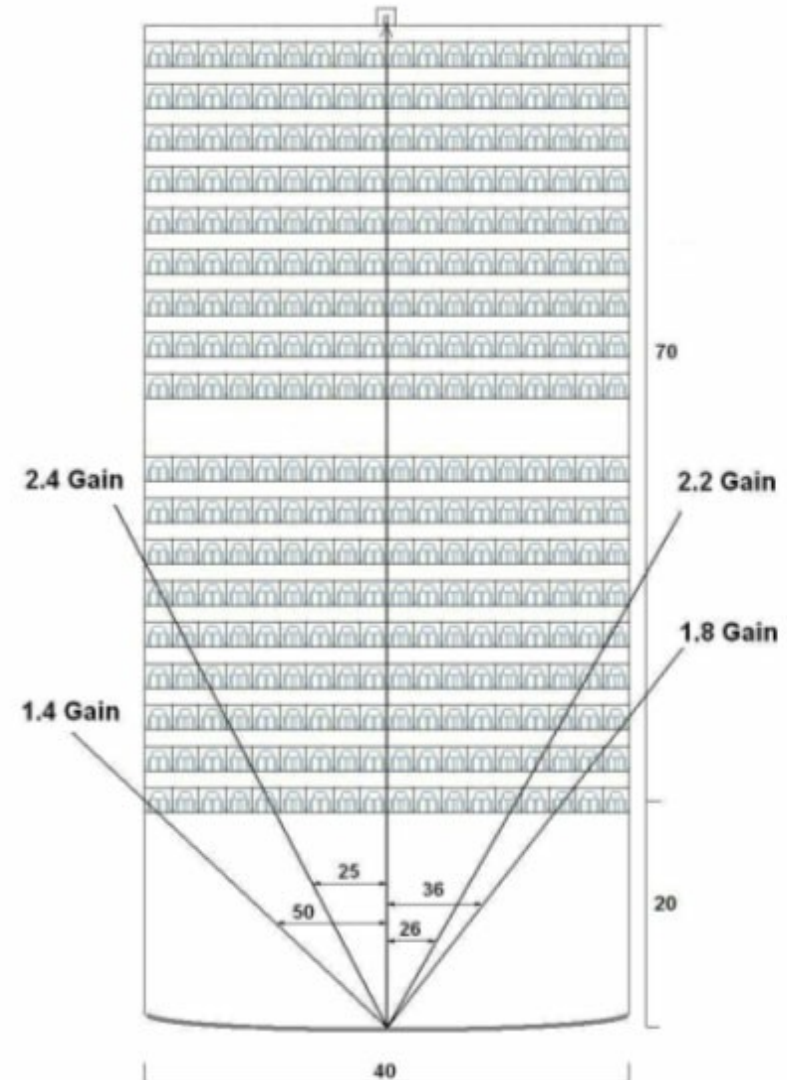
standard shape theatre

90' long

50' wide

40' screens

20' to front row



Cinema Screen Gain

Gain screens : theatre shape

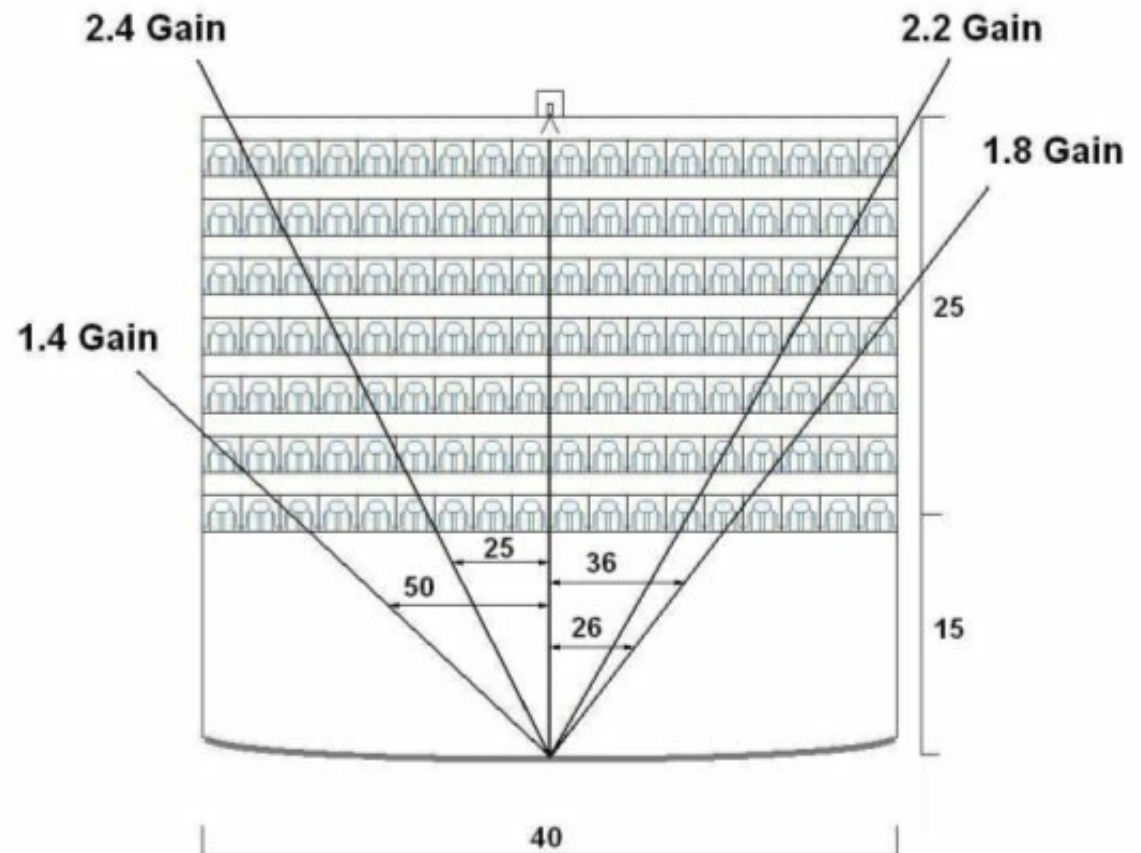
**very short theatre
(e.g. screening room)**

40' long

50' wide

40' screens

15' to front row






- Source: John Christian Rosenlund FNF, "People in the sun", C Maipo 2011, Screen: Cinema: Klingenberg Kino Oslo



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Silver Screen for 3D



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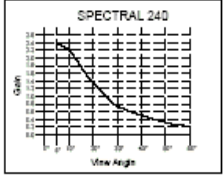
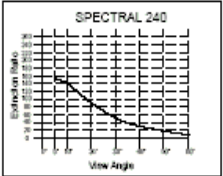
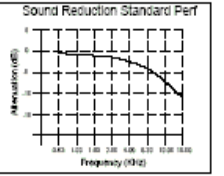
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**SPECTRAL™ 240 3D
FRONT PROJECTION SCREEN
DATA SHEET**

Document Ref DS-008 Issue 15 June 2010

Spectra™ 240 3D screens are considered by leading cinema exhibitors and special venue operators worldwide to be the optimum 3D projection surfaces. Silver aluminium flake based coating applied to a unique base material provides high gain characteristics, very low depolarisation level (extinction ratio) and excellent colour temperature. The surface type also supports conventional 2D pictures. *Noted for invisible seams under normal projection conditions.*

Application
Spectra™ 240 3D screens are recommended for face-in stretching to wrap-round (floating) or conventional style flat or curved frames. Harkness manufactured roller screens and Easy-Rect systems are other ideal applications. The surface cannot be folded for transit or storage, roll packing must always be used. Available in full screen perforated form where behind screen speakers are required (see attenuation curve). Mini-perforated and non-perforated options are also available.

<p>General Detail</p> <p>View Distance Minimum of 5mtr (15') recommended on perforated surfaces</p> <p>Maximum Size USA manufacture 23.77m x 12.19m (78' x 40') Europe manufacture 33m x 11m (108' 3" x 36' 1")</p> <p>Perforation Size Ø1.2mm (0.047")</p> <p>Perforation Density 4.5%</p> <p>Weight 0.52kg/m² (0.10lb/ft²)</p> <p>Eyelet Spacing 150mm (6") nominal (US) / 200mm (8") France</p> <p>Typical Packing Rolled in a cardboard tube; packed in a long wooden box when height is over 7m (23').</p> <p>Despatch/Storage Screens should normally be transported and stored at temperatures between 5°C and 30°C (40°F and 86°F), with relative humidity less than 80%. If screens are very cold (e.g. following air transport) then they must be allowed to warm up before unpacking, otherwise cold cracking may occur. Screens should be installed within a maximum of 2 months of shipping. Packages should be handled with care to avoid damage.</p> <p>Installation The following principles should be followed when installing Harkness Spectra™ 240 3D screen surfaces: <ul style="list-style-type: none"> • The auditorium should be clean with no building works taking place. • Installation should be at ambient temperature (20/24°C/68/75°F). • Care should be taken to avoid the screen coming into contact with sharp objects during installation. • Excessive loads should not be placed on any specific point of the screen. • Use of cotton gloves is recommended. • The viewing surface should not be touched (the rear of the screen is identified by the product label). • The surface should not be creased during installation. There are two principal methods to install the screen: <ul style="list-style-type: none"> • Flying the screen by attaching several tie lines to the top of the screen, passing these over the top of the frame and using them to pull the screen into place. • Unrolling the screen vertically across the front of the frame. Using one of these methods, the screen surface is loosely attached to the top of the frame. After this, the top of the screen is fully attached to the top lacing bar by working from the centre outwards using each eyelet. The lower edge of the screen should then be laced from the centre outwards, applying sufficient tension to pull the screen flat. Typically, the screen can be stretched up to 5% of its height at ambient temperature of 20/24°C/68/75°F using slack cord lacing. Slack lacing should be from the top down and sufficient to remove the folds. Excessive side tension should be avoided, particularly on a curved frame, as it will result in straightening of the screen across the curve (belly). Springs or elasticated ties are not recommended to install Harkness screen surfaces. The above method can be used for both face-in and for wrap-round frames. Normally, two people are sufficient to install a screen surface. </p> <p>Care and Maintenance The general environment where the screen is installed should be kept reasonably clean to avoid dirt and dust build-up. Screens can be periodically cleaned using a soft brush or cloth, doing this vertically with limited pressure. Screens can be cleaned using a damp cloth wetted with water and a mild detergent. Under no circumstances should screens be cleaned with abrasive materials or harsh chemicals such as acids, bleaches or solvents. Harkness Screens is not liable for damage caused to screens through the use of inappropriate cleaning methods or chemicals.</p> <p style="text-align: center; font-size: small;">In the interest of product enhancement, Harkness Screens reserves the right to introduce modifications or alterations without notice</p>	<p>Surface Finishing Options</p> <ul style="list-style-type: none"> • Web and eye (gronomat). Triple fold web integral with surface • Perforated pipe pocket any size on any side • Cloth web and fittings (straps) for press stud frames • Straight sides or shaped to special order • Cut square (unfinished edge) <p>Fire Retardancy Certification to the following standards: UK USA NFPA 701 France M2 Germany B1 Japan ST-30-050 (regulation requires certification by inspecting company) Korea (regulation requires certification by inspecting company) Australia</p>
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Silver Screen for 3D



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SPECTRAL™ 240 3D FRONT PROJECTION SCREEN DATA SHEET

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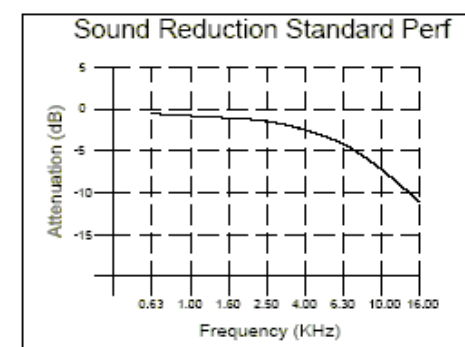
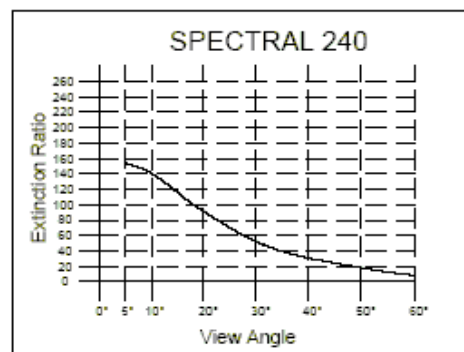
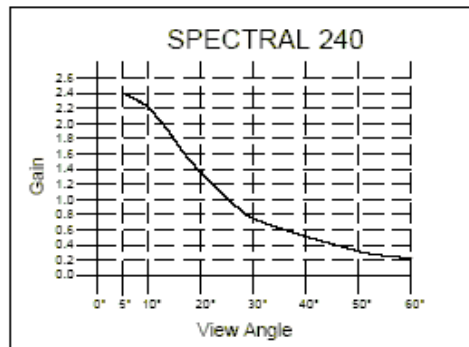
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General Detail

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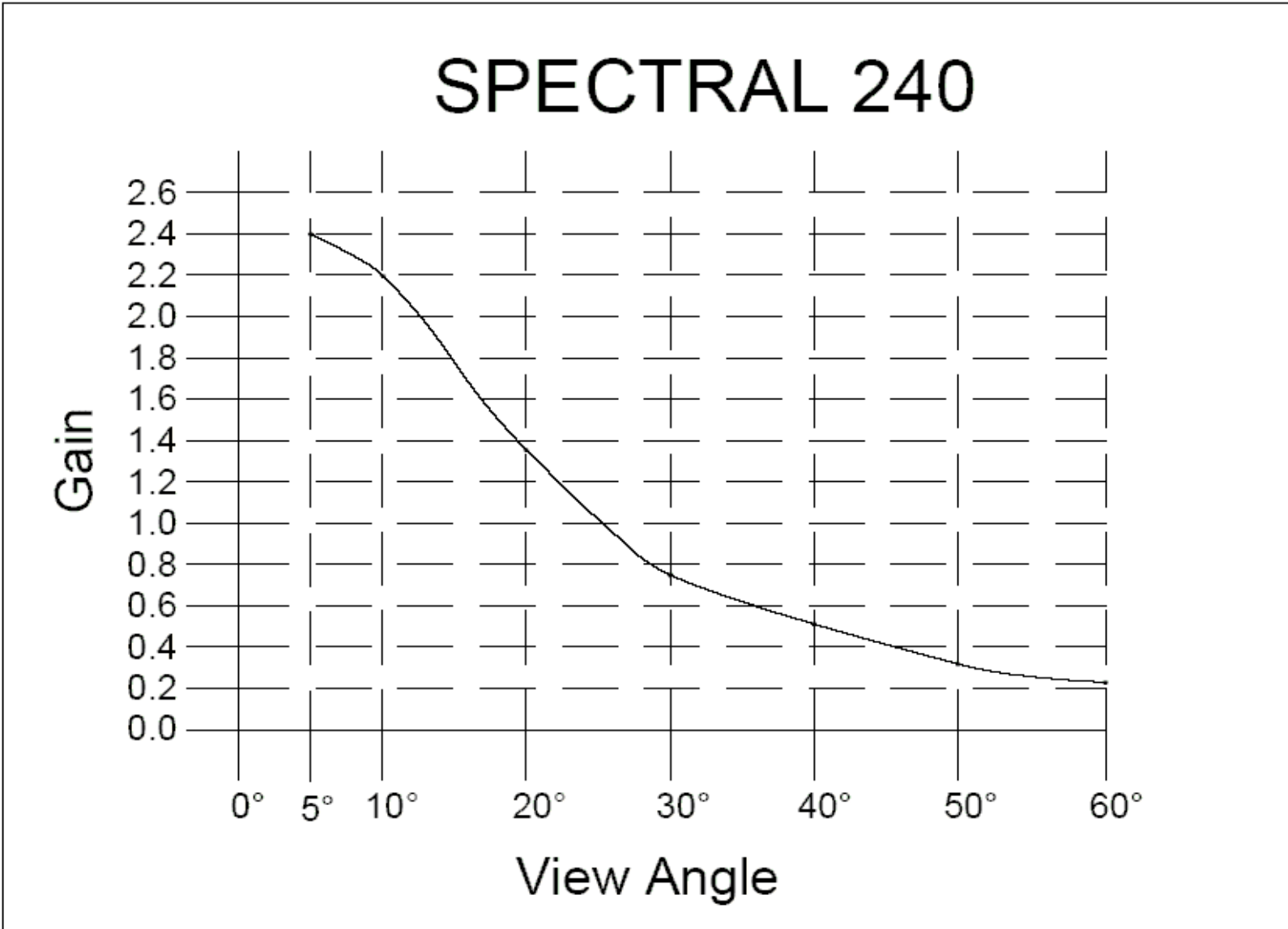
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Europe manufacture 33m x 11m (108' 3" x 36' 1")

Surface Edging Options

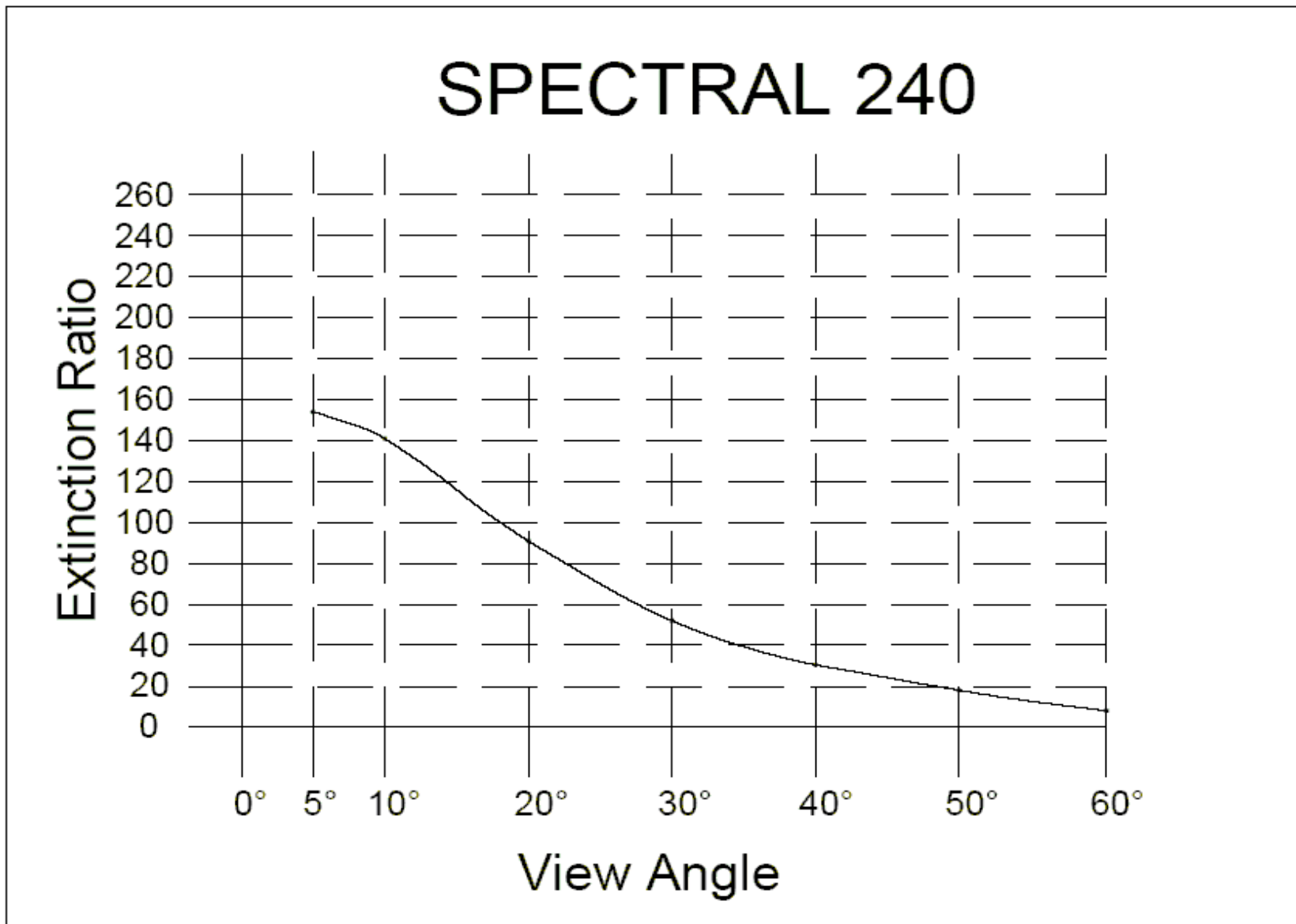
- Web and eye (grommet). Triple fold web integral with surface
- Preformed pipe pocket any size on any side
- Cloth web and fixings (snaps) for press stud frames
- Straight sides or shaped to special order
- Cut square (unfinished edge)

- Source: www.harkness-screens.com

Silver Screen for 3D



Extinction Ratio



Conclusions

- Cinematographers would like to recommend light distribution to stay within one stop (50%) like is the case with classic 1.4 screens
- Cinematographers would like to recommend in future 3D systems will allow for 14 fl projection
- Cinematographers prefer low gain screens
- In the mean time block front row corners when screen is high gain, especially if show is 3D
- Consider (automatically) removable (moving) 3D screens to preserve 2D presentation quality.

High Frame Rates

- The IMAGO Proposals first presented to EDCF in 2004. Work been done in EDCF-T
- 2006: Presentation of the proposals during Amsterdam SMPTE DC28 meeting: SMPTE AFR Study group was formed
- 2007: Study Group report finished, SMPTE Ad Hoc Group formed.
- 2009: Additional Frame Rates published by SMPTE
- 2010: Archival Frame Rates published by SMPTE

Additional Frame Rates

- 25 fps
- 30 fps
- 50 fps
- 60 fps

Archival Frame Rates

- In collaboration with the FIAF Technical Committee
- Goal: better access to archive content
- Goal is not to approach shooting speed, but to approach the projection speeds used at the time of first presentation of the movies.
- Agreement on acceptable error of 1 fps

Archival Frame Rates

- 16 fps
- 18 fps
- 20 fps
- 22 fps

What's New ?

Standardization

- High Frame Rates Study Group SMPTE 21DC starting soon (this week!) – please join
- Evaluate the possibilities for 3D presentation @ 48, 50 and 60 fps per eye (96, 100, 120 fps total)
- Evaluate the possibilities for 2D presentation @ 96, 100 and 120 fps total
- Proponents are EDCF, IMAGO, Warner Bros, Paramount and Doremi

What's New ?

Industry need for HFR

- Peter Jacksons' "Hobbits" shooting now in 3D @ 48 fps/eye sound speed.
- Eugenie Jansens' "Above my Head" shooting now @ 50 fps/eye sound speed.
- James Camerons' tests @ 48 and 60 f/eye.
- Lack of temporal resolution and Strobing more obvious in 3D than in 2D
- Detail perception much better in HFR
- Douglas Trumbull and Showscan Digital
- HFR before 4K ? 2D HFR available now



What's New ?

Hardware support for HFR

- New TI (4k) DLP engines do support 60 fps per eye stereo 3D ; Sony already did
- Both Barco and Christie announced support for this in their new lines of projectors.
- Many DC Servers now support 2D HFR but none (yet) support 3D HFR
- Probably a higher compressed data rate will be needed (more than 250 Mb/s)



Thank you

Thank you for your attention.
Please feel free to contact me on
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