VISUAL DISPLAYS

Winter 2021 Webinar Programme

8 Essentials in Specifying Screens and Displays
All you need to know to specify, sell and sign off displays of all sizes and technologies

DISPLAYS, LIGHT & ENVIRONMENTAL EXPERTISE

PRODUCTS, SERVICES, SPECIALIST CONSULTANCY

Presenter – Greg Jeffreys

VISUAL DISPLAYS

- Managing Director of Visual Displays (formerly Paradigm AV)
- Current chair, AVIXA Standards Steering Committee
  - Lead writer, PISCR image contrast standard – and new ISCR standard task group
  - Task group chair ANSI/AVIXA DISCAS standard – image size, resolution, viewing positions/angles, content size guidance
  - Task group working on AVIXA's new UX for AV Design standard
  - President of InfoComm/AVIXA 2012, board member 2008-13
- Specialist consultant in standards, displays, light & lighting, VC lighting, teaching space & meeting room design
- Outstanding Contribution Award – AV Technology Awards 2020

Let me have your questions and comments during the session please!

PLEASE KEEP QUESTIONS COMING DURING THE WEBINAR!

Displays in 2021?

▶ Gradual return to building occupation

▶ Indefinite change to space usage

▶ Larger spaces preferred, being repurposed

▶ Recognised need before meetings and group gatherings

  ▶ Focus: do what's needed then disperse

  ▶ (Might be long term blessing – why do meetings have to last for an hour?!)

▶ Delivering content correctly is vital

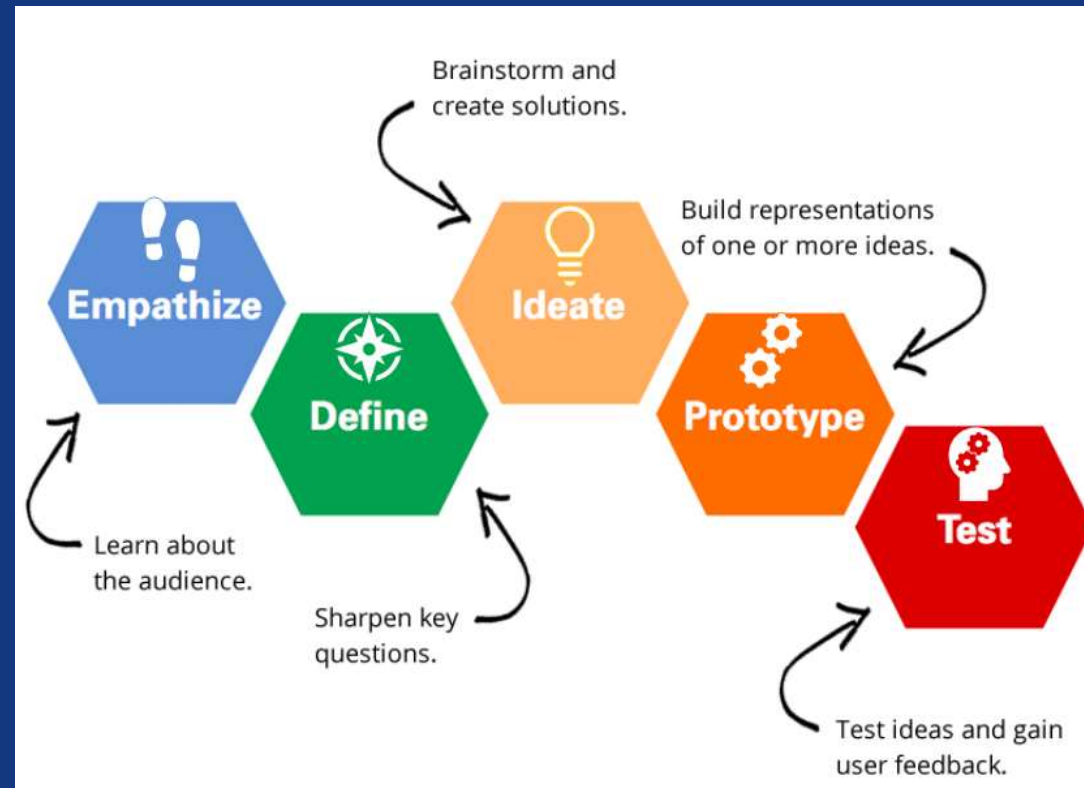 ▶ Viewers need to engage with content throughout the entire space

1 – Knowledge is key
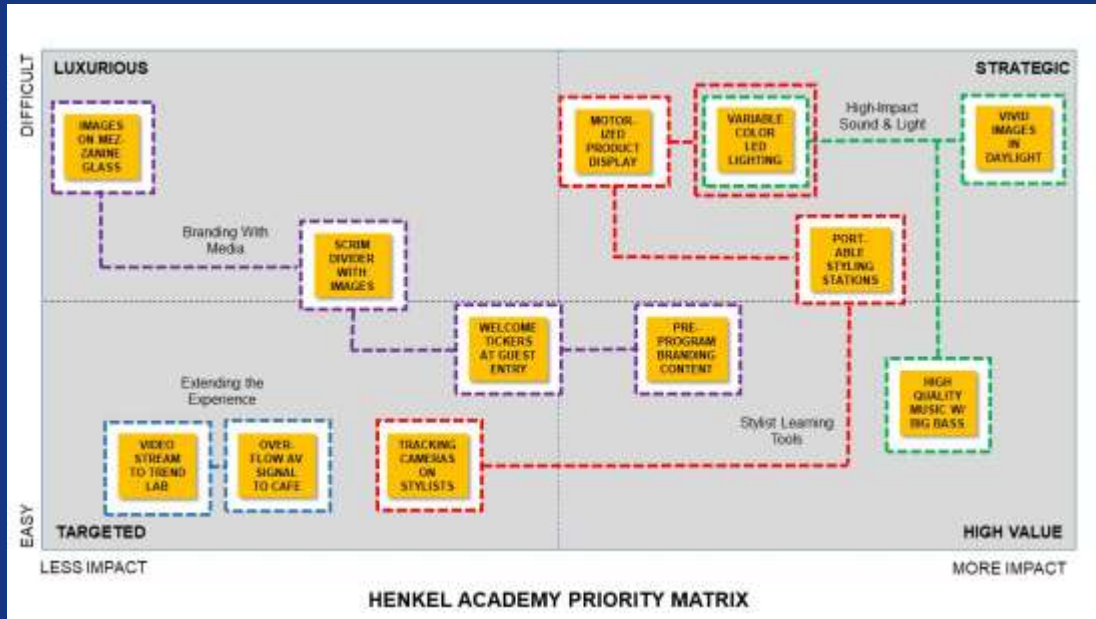## Understand user needs and content

How to create exceptional user experiences?

AVIXA's new UX design standard is based on Human-Centred Design

Brainstorm and create solutions.

Build representations of one or more ideas.

Empathize

Define

Ideate

Prototype

Test

Learn about the audience.

Sharpen key questions.

Test ideas and gain user feedback.

It's all about talking to the users – yes the users, not buyers!

UX processes and techniques to establish user needs

VISUAL DISPLAYS

HENKEL ACADEMY PRIORITY MATRIX

DIFFICULT

LUXURIOUS | STRATEGIC

IMAGES ON MEZZANINE GLASS

MOTORIZED PRODUCT DISPLAY

VARIABLE COLOR LED LIGHTING

High-Impact Sound & Light

VIVID IMAGES IN DAYLIGHT

Branding With Media

SCRIM DIVIDER WITH IMAGES

PORTABLE STYLING STATIONS

WELCOME TICKERS AT GUEST ENTRY

PRE-PROGRAM BRANDING CONTENT

HIGH QUALITY MUSIC W/ BIG BASS

Extending the Experience

Stylist Learning Tools

VIDEO STREAM TO TREND LAB

OVER-FLOW AV SIGNAL TO CAFE

TRACKING CAMERAS ON STYLISTS

TARGETED | HIGH VALUE

LESS IMPACT | MORE IMPACT

EASY

| CUE MUSIC & BRANDING SIGNAGE | GREET STYLISTS BY NAME IN LOBBY | ESCORT STYLISTS TO COFFEE/TEAPOINT | MOVE TO ACADEMY FOR WELCOME |
| DEMONSTRATE BRANDED PRODUCT | MOVE TO STYLING STATIONS | STREAM STYLISTS USING PRODUCT | CELEBRATE WITH DRINKS AND SNACKS |

Let us help you with our comprehensive services

UX and use case
…knowledge is the key

VISUAL DISPLAYS

▶ Talk to the users!

▶ Don't be afraid of the work 'protype' here – it's your friend!

▶ Start with the end in mind

▶ Forget technology until key basic issues are 100% scoped

▶ Objective: create measurable performance metrics

Watch out for public review of new *User Experience Design for AV* standard!

Article in AV Magazine here - *https://www.avinteractive.com/features/its-all-about-the-experience-27-08-2020/*

2 – Image size
Is it big enough? …for social distancing?

And now size REALLY matters

▶ Post COVID-19 lock-down, social distancing will have radical impact on space occupancy

▶ Imperial College Uni expects <16% possible occupancy

    ▶ *Other estimates start at 9%*

▶ ***People will need to be at – and see from – the back of the room***
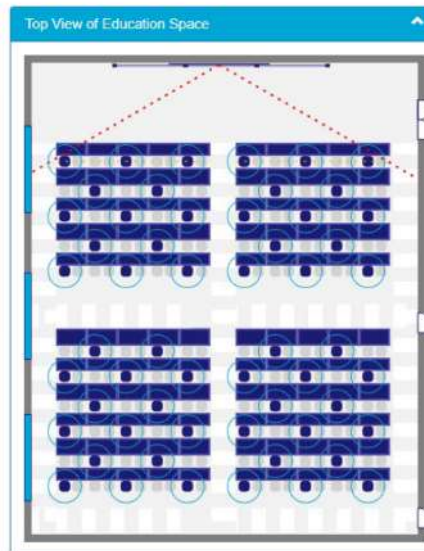
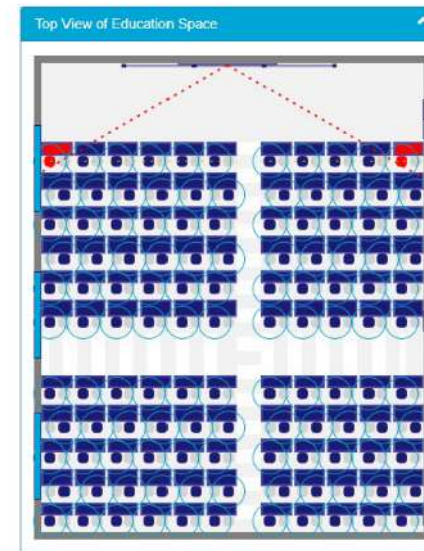   ▶ *They won't want to spend a fortune achieving this…*

Image © Courtesy of **The Education Space Consultancy**
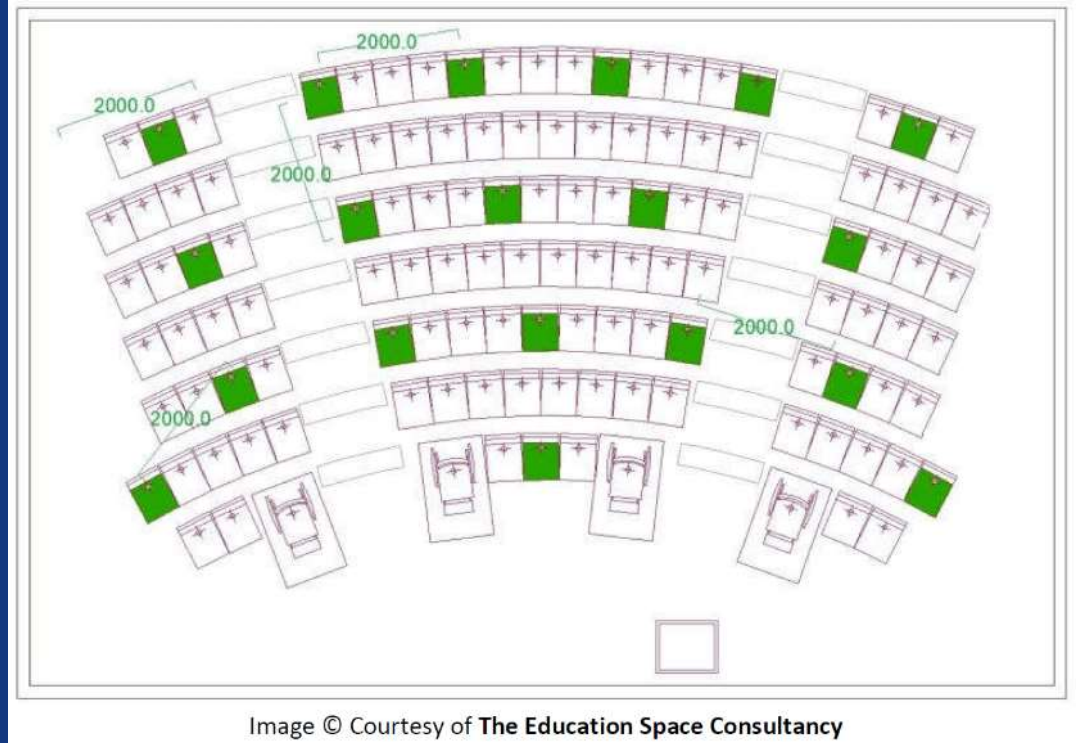
Social distancing space configurator
Complete space configuration and management
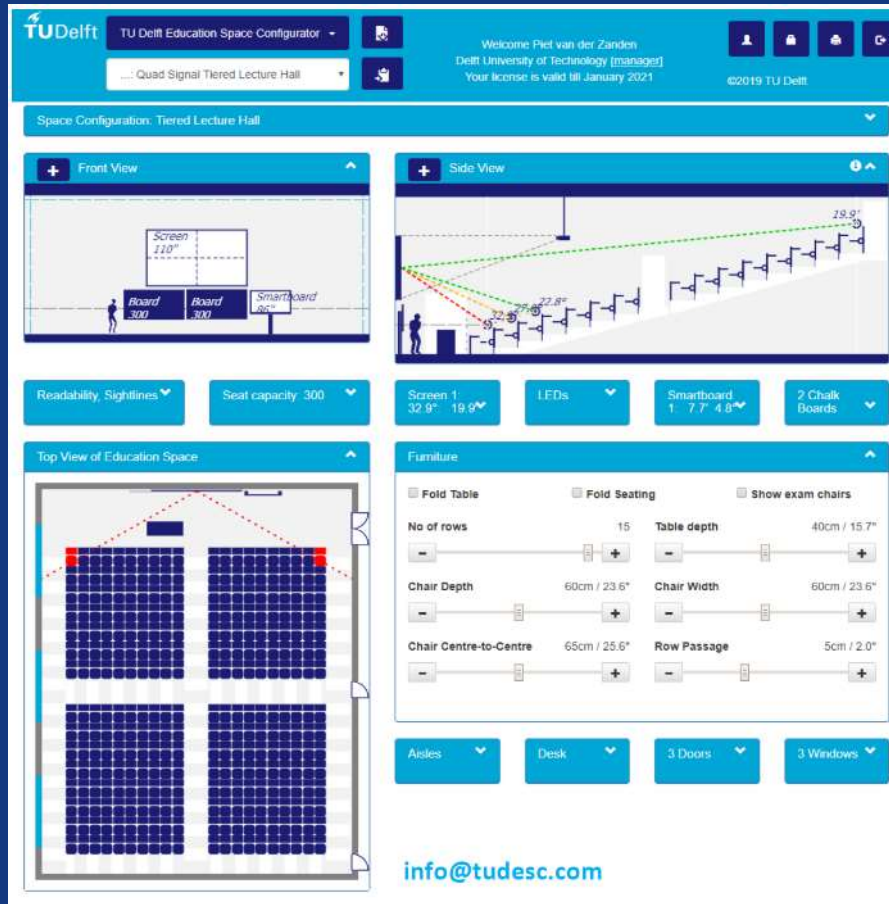
Social Distance with normally generated Seat Capacity (56)

Social Distance with optimized Seat Capacity (121)

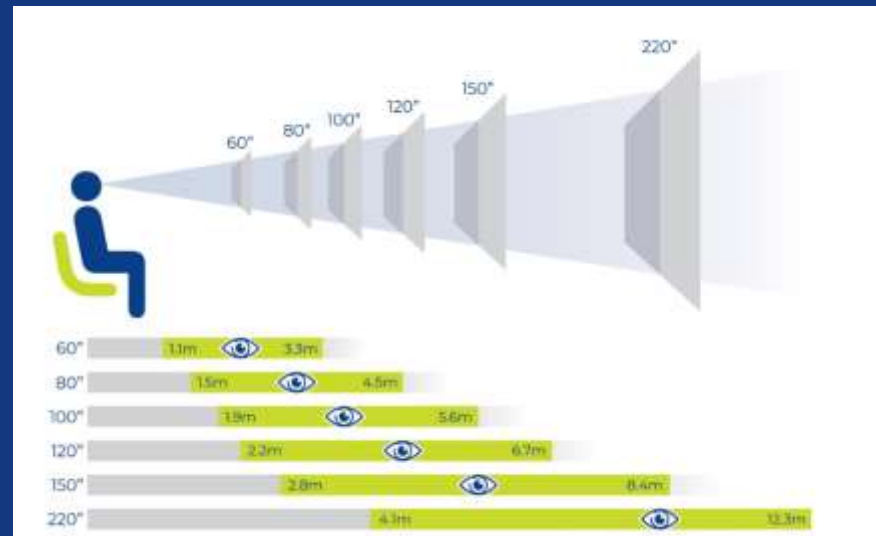Printed detailed Floorplan for facility instructions
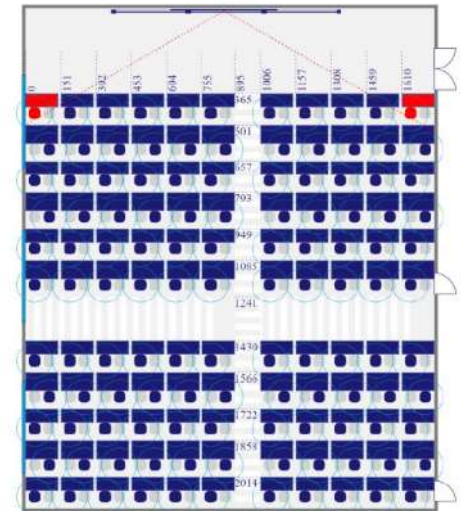
▶ Available for HE & FE now

▶ Office/organisation version later in 2021

Use DISCAS!
Take our 1hr webinar (1 CTS Renewal Unit)

▶ Use 6:1 rule as baseline metric (relates to 3%ElementHeight in DISCAS)

▶ …but DISCAS is too easy to use not to use it!
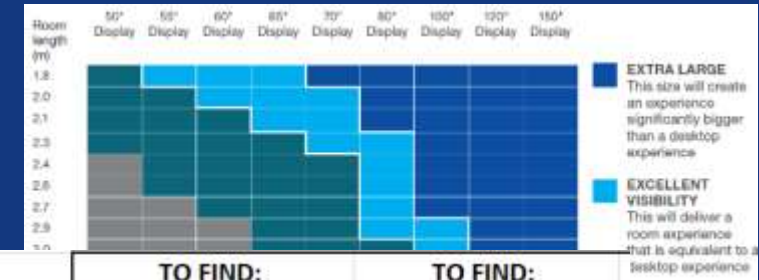
▶ There are good quick reference guidelines too…

Start with 6 : 1
…because size matters

- The DISCAS image size standard is globally recognised

- Content (font size/height) is the 'big new thing'

- Easy-to-use calculator

- Recommended starting point = 3%EH
  - which means…

- The maximum viewing distance should be no more than 6x the image height

- Download calculator here - https://visualdisplaysltd.com/resources/useful-calculator-tools

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	50° Display	55° Display	60° Display	65° Display	70° Display	80° Display	100° Display	120° Display	150° Display
Room length (m)									

EXTRA LARGE
This size will create an experience significantly bigger than a desktop experience

EXCELLENT VISIBILITY
This will deliver a room experience that is equivalent to a desktop experience

ACCEPTABLE
This meets minimum standards, but is not equivalent to a desktop experience

NOT RECOMMENDED
This is a poor experience that does not meet any standards

Do not add measurement labels (", mm)	TO FIND: Farthest Viewer	TO FIND: Minimum Image Height
Image Height	1000	1000
Distance from floor to bottom of image	1220	1220
Image Offset	0	0
Image Width	1780	1780
Farthest Viewer	6000	6000
Viewing Ratio	6.00	6.00
Minimum %Element	3.00%	3.00%

| TO FIND CLOSEST VIEWER	Farthest Viewer	Minimum Image Height
Vertical Viewing Factor	1000	1000
Closest Viewer	1732.0	1732.0
Viewing Ratio	1.73	1.73
Nominal Viewing Depth	4268.0	4268.0
Max. Length of CV Plane	4220	4220

3 – Resolution

4K can be false friend

Useful fact

In practice 4K and UHD are interchangeably used terms. The strict definition is that 4K resolution is 4096 x 2160 and UHD is 3840 x 2160. UHD is exactly 4 times the resolution of HD - twice the width of HD (1920 x 2 = 3840 pixels wide) and twice the height (1080 x 2 = 2160 pixels high). So UHD is usually what's needed in our ProAV world.

HD
1920 pixels wide
1080 pixels high

UHD
3840 pixels wide
2160 pixels high
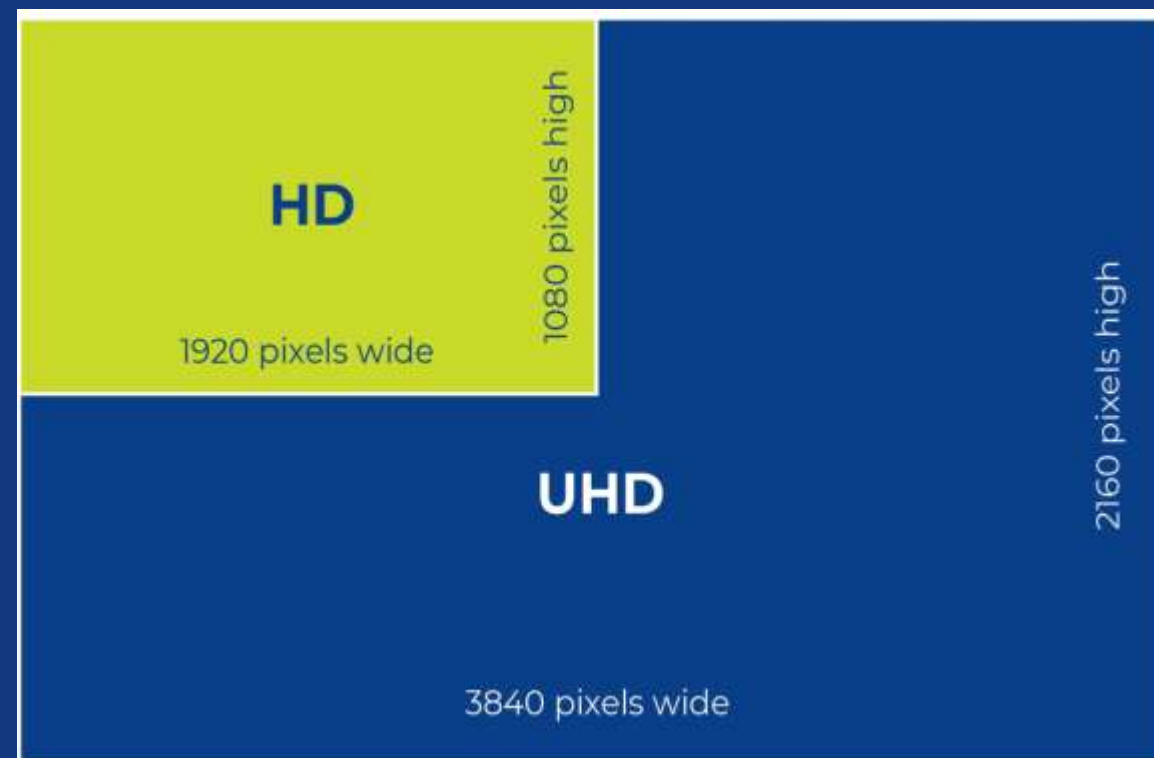
4 – Contrast

Contrast is key driver
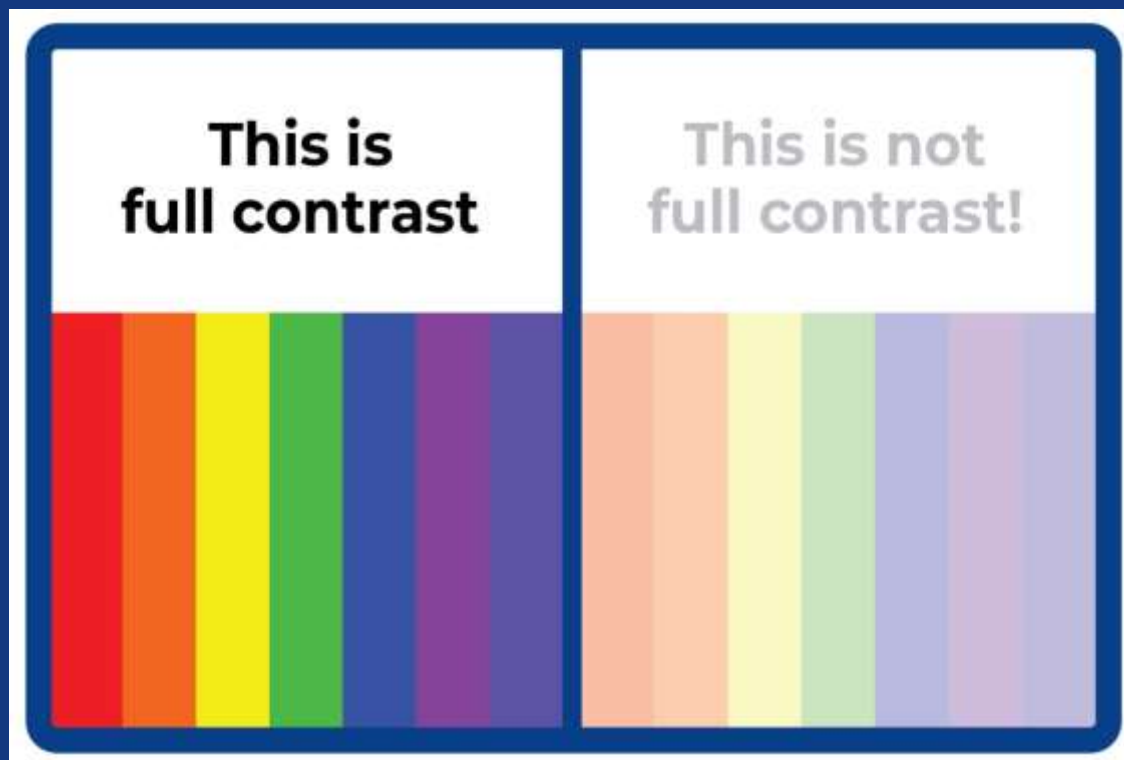
Low contrast even damages perceived resolution.

15:1 contrast ratio PISCR

▶ In standard installations 15:1 is almost always impossible to achieve

▶ *Use ALR (ambient light rejecting) projection screens*
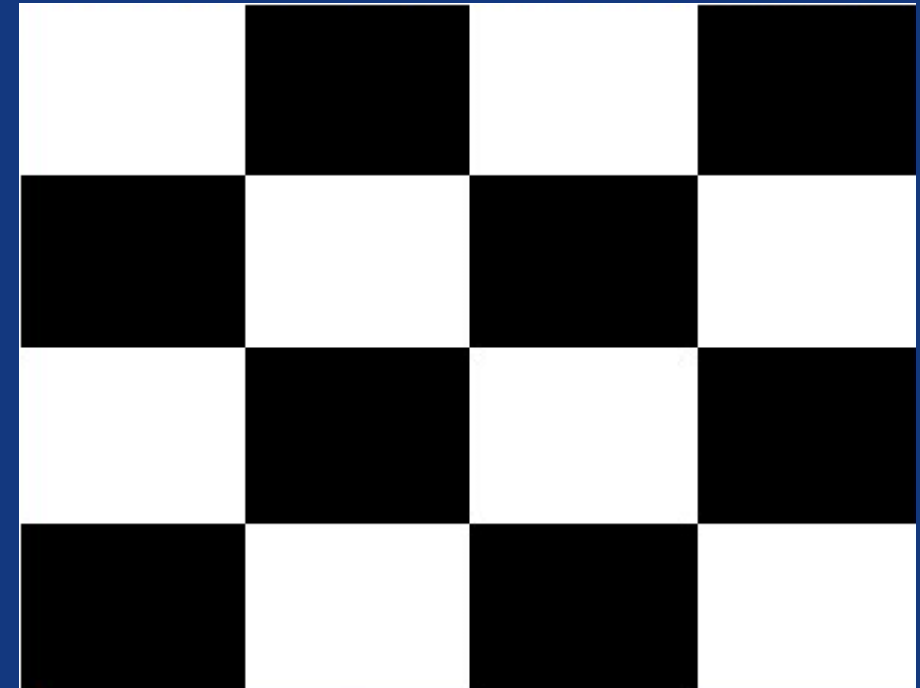
The white squares' average luminance (brightness) must be 15 x more than the black squares.
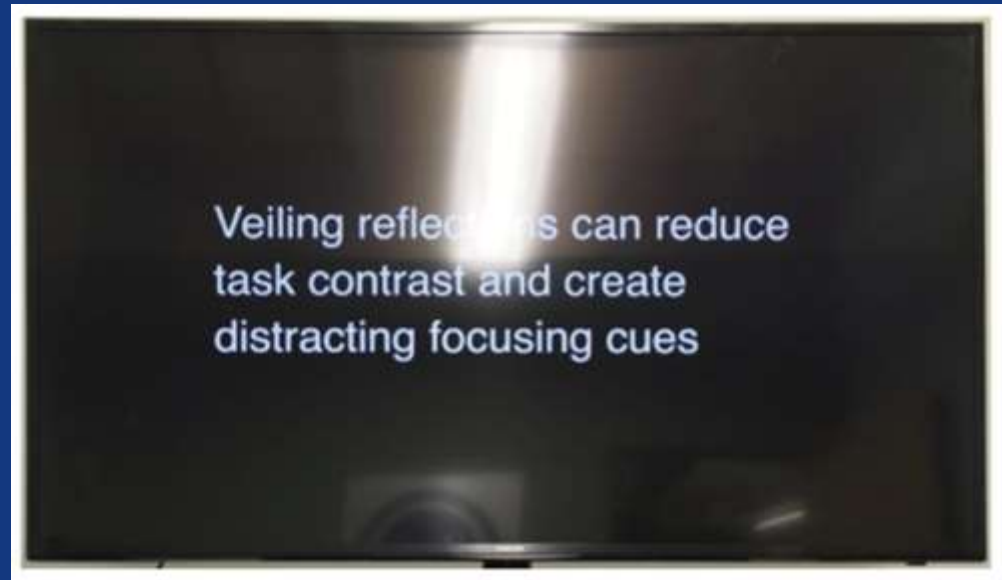*ONSCREEN – NOT FROM PROJECTOR*

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DISCAS / ISCR viewer categories

▶ 2 of 4 are applicable:

▶ Basic Decision Making (BDM)

- ▶ Viewers can make decisions and have learning engagement with the content

▶ Analytical Decision Making (ADM)

- ▶ Viewers can make decision and have learning engagement with the finest detail of r

Real life contrast is driven 100% by ambient light

▶ Projector contrast can't be perceived until you're in a darkened room

▶ Use our calculators

▶ If you can't control the light, you need screen technology that can…

FPD/LFD display contrast also driven by ambient light

▶ Ambient light affects LFD (large format displays) too

Veiling reflections can reduce task contrast and create distracting focusing cues

ALR projection screens are matt and do not suffer from these issues

PISCR being replaced by ISCR

▶ From 'Projected Image System Contrast Ratio' to just plain 'Image System Contrast Ratio

▶ All displays types assessed in a single unifying standard

▸ https://www.avixa.org/standards/image-system-contrast-ratio

▸ Related tools - https://visualdisplaysltd.com/resources/useful-calculator-tools

The split screen technology demonstration

dnp
Supernova
08-85

dnp
Supernova
20-25

Standard white
Da-Lite
gain 1

See full Gary
Kayye ISE
video here -
https://www.dnp-
screens.com/en/video/dn
p-ambient-light-rejecting-
screens-at-ise-2015/

The split screen technology demonstration

Play video here - https://www.youtube.com/watch?v=i82O9xYxRxk
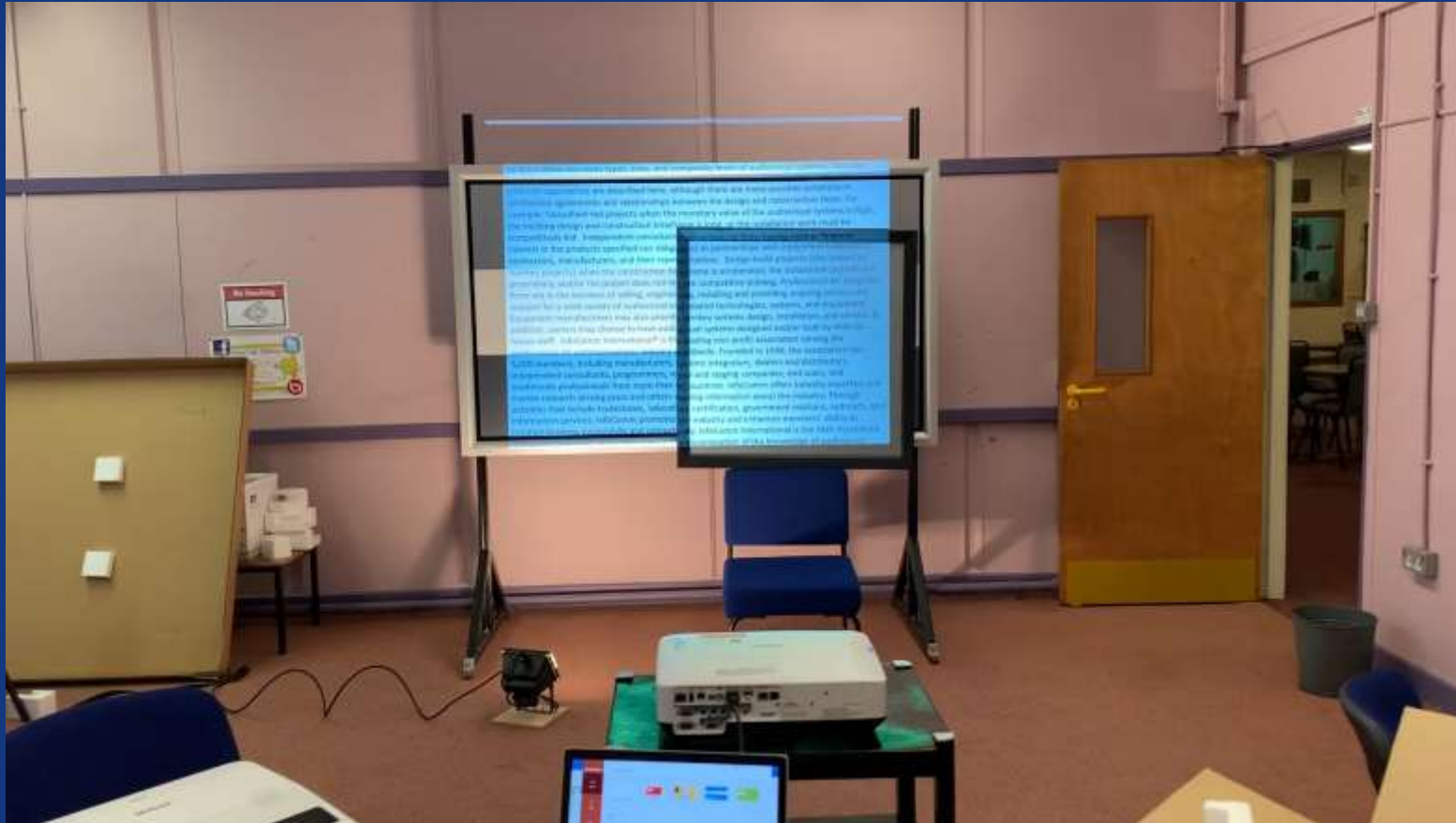
5 – Image luminance ('brightness')

▶ You need the 'Goldilocks Effect' – not too dark and DEFINITELY not too bright (FPD, dvLED etc)

Avoiding asthenopia is the key objective – don't design eyestrain into your spaces

Don't design in asthenopia ...avoiding eye strain

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▶ Task Luminance Ratio (max 3:1 for key tasks)

▶ Keep luminances of everything within prescribed range to avoid eye strain

	Ambient light in lux			
	300	**400**	**500**	*You should have 300-500 lux on a meeting room table*
Peak Gain of task (eg paper)	1	1	1	
TASK LUMINANCE =	*96*	*127*	*159*	cd/m^2 [nit]
Task luminance ratio	2.5	2.5	2.5	: 1
MAX DESIRED IMAGE LUMINANCE =	*239*	*318*	*398*	cd/m^2 [nit]
ISCR contrast ratio required	15	15	15	: 1
MAX PERMITTED BLACK LEVEL (relative to the max white level permitted on your image	*16*	*21*	*27*	cd/m^2 [nit]
MAX PERMITTED LUX ON SCREEN (ambient light must be at or below this level onscreen to achieve the 15:1 required for PISCR Basic Decision Making category	*50*	*67*	*83*	lux

The black level paradox

▶ Task Luminance Ratio (WELL, SLL, IES etc building codes) must fall within 3:1 ratio

  ▶ https://v2.wellcertified.com/v/en/light/feature/6

▶ *Focus on image black levels* to ensure display white levels are not too high
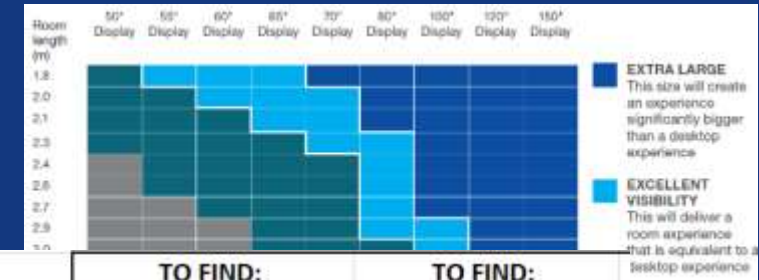
  ▶ Download essential calculators here - https://visualdisplaysltd.com/resources/useful-calculator-tools

6 – Viewing distances & locations

Start with 6 : 1
…because size matters

- The DISCAS image size standard is globally recognised

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- Easy-to-use calculator

- Recommended starting point = 3%EH
  - which means…

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- Download calculator here - https://visualdisplaysltd.com/resources/useful-calculator-tools

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Viewing Ratio	1.73	1.73
Nominal Viewing Depth	4268.0	4268.0
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Typical DISCAS plan
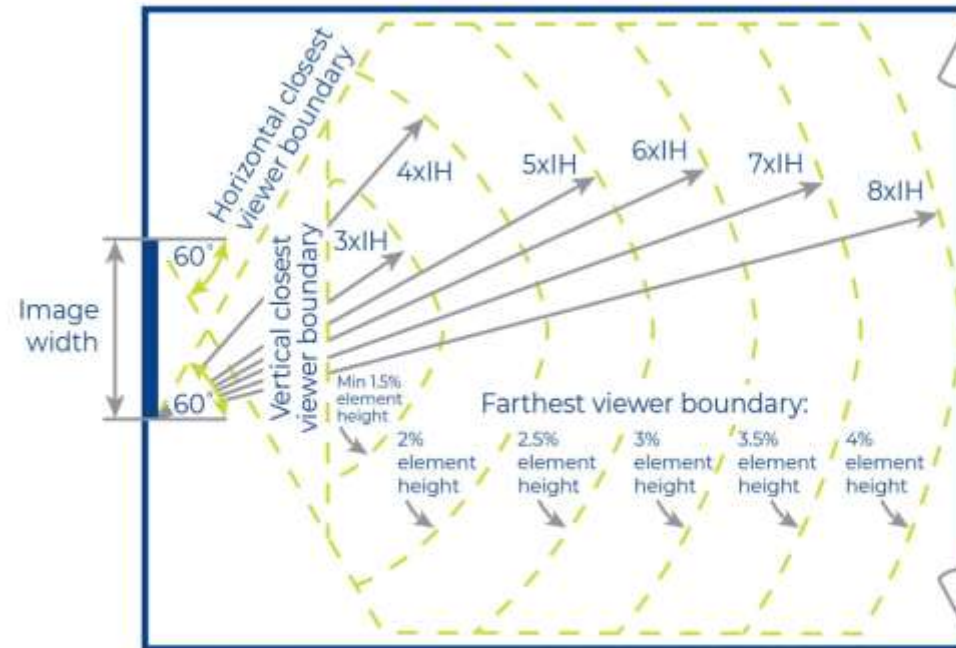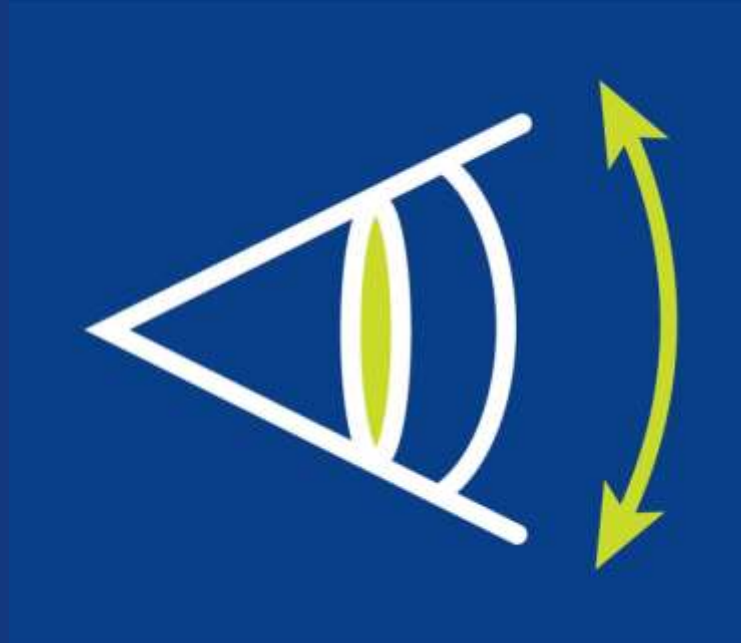
7 – Viewing Angles

Vertical viewing angles
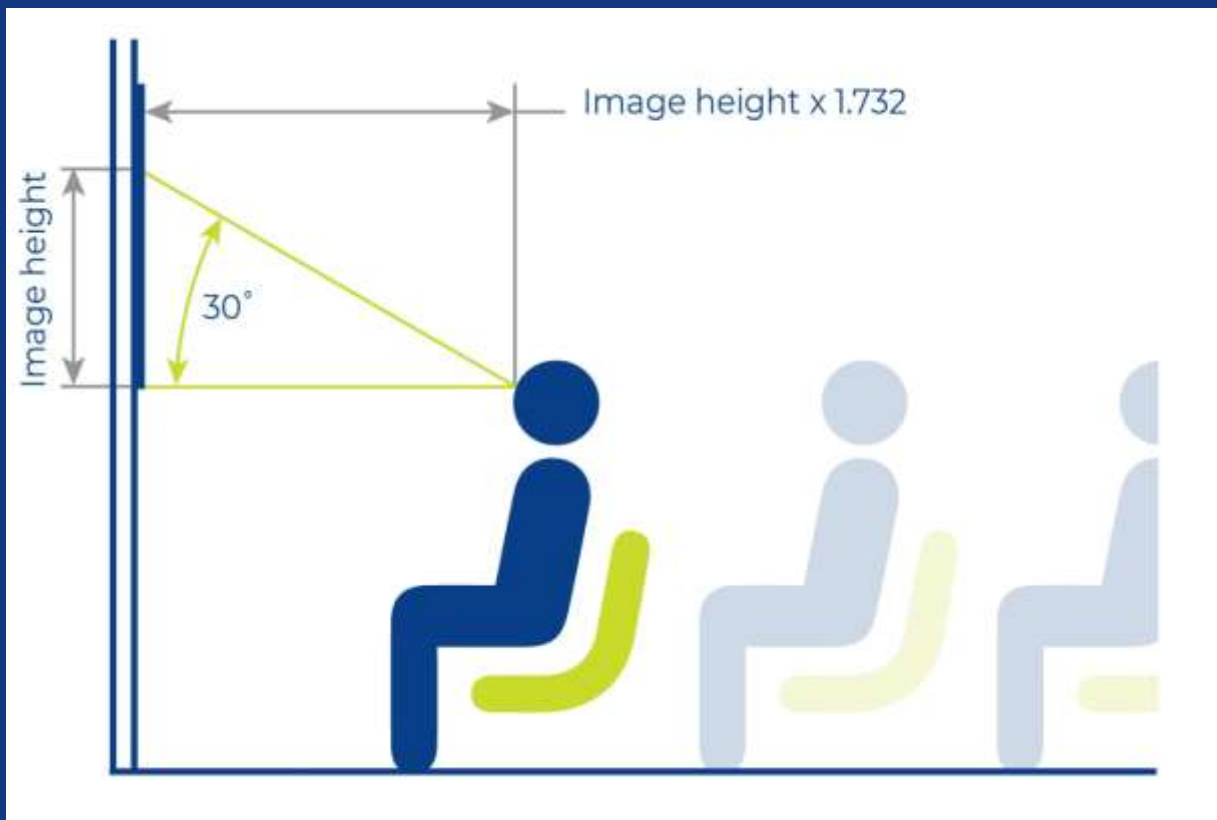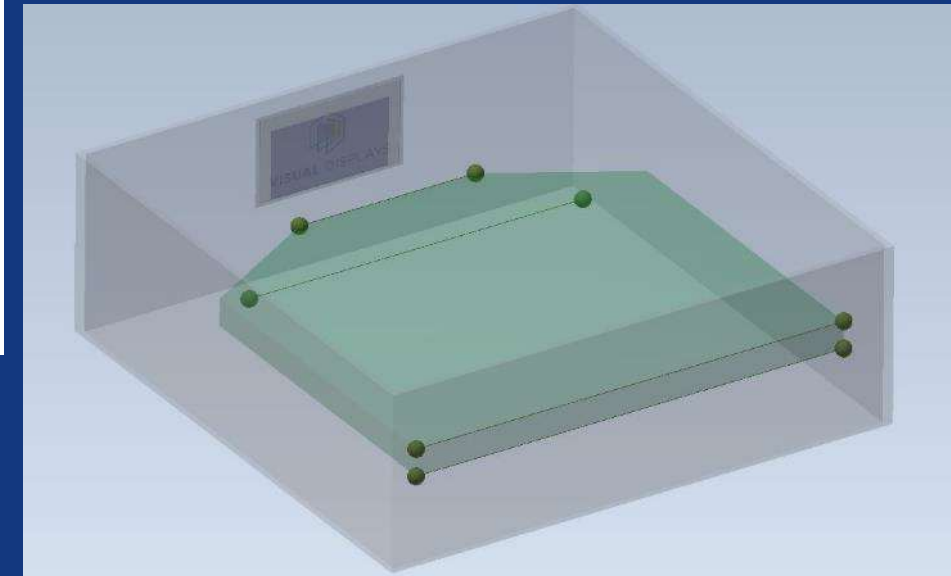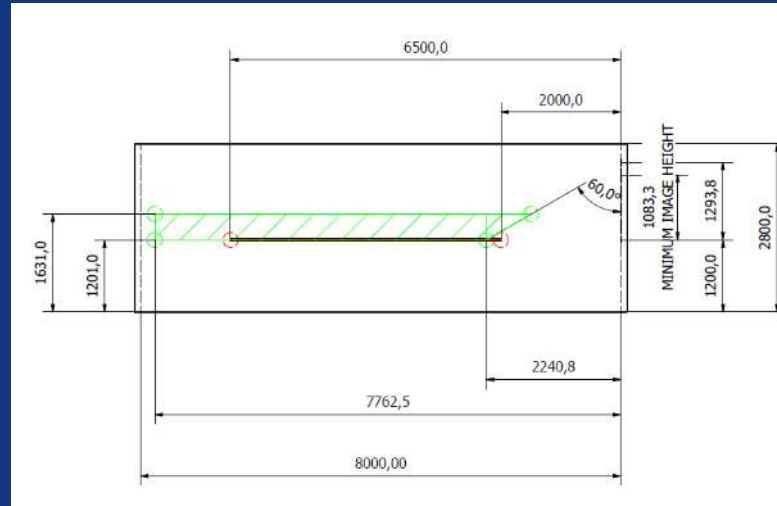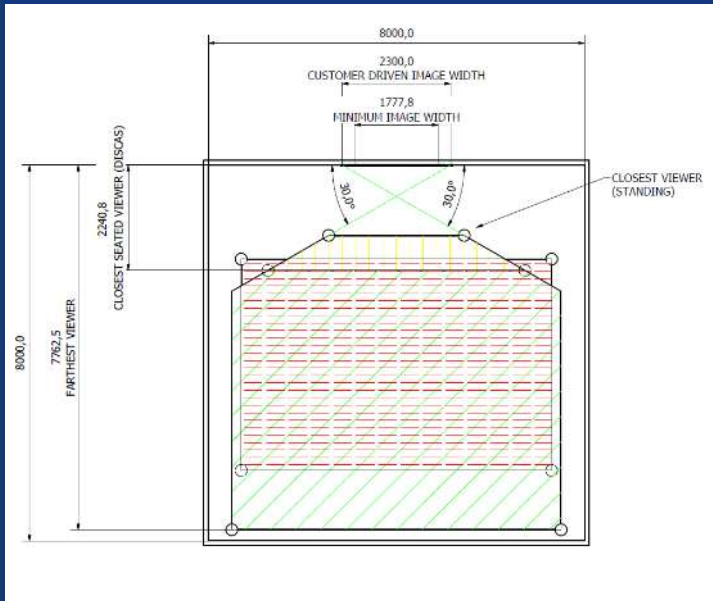
Horizontal viewing angles
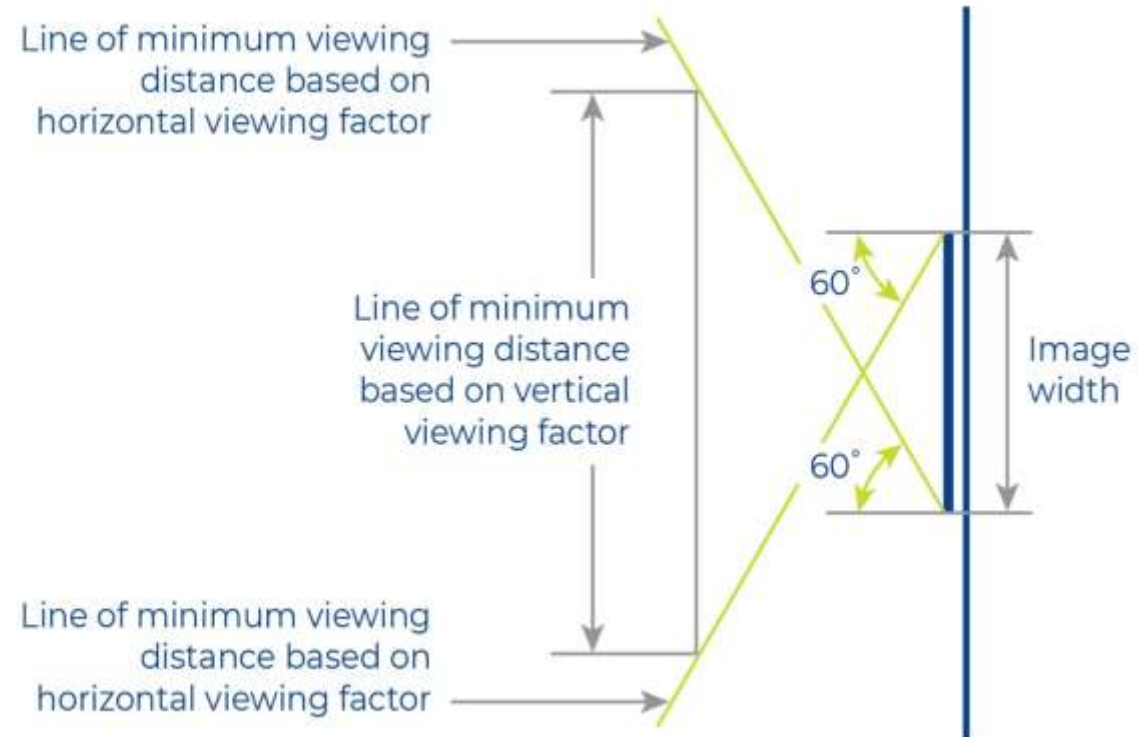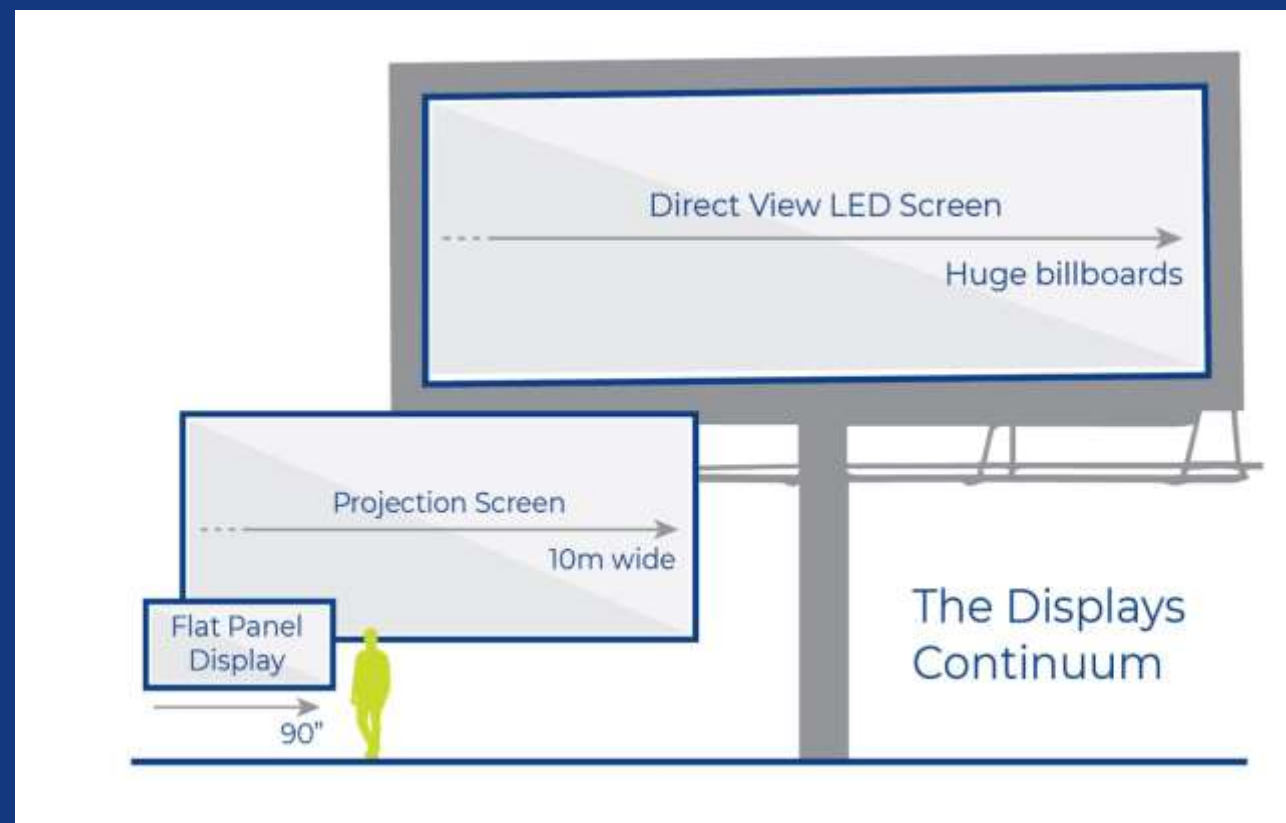
DISCAS CAD tools
## Formulae in parametric 3D CAD (+ renderings)

The displays continuum

- ▶ Up to 90" – flat panels (LFD, FPD)
- ▶ Above 90" – ALR projection
- ▶ Variable entry point for dvLED
  - ▶ Best used for signage

2021 is the year for projection

- ▶ Big enough
- ▶ Cheaper than large flat panels
- ▶ A fraction of the cost of dvLED

- ▶ BUT MUST BE DONE PROPERLY FOR SERIOUS CONTENT

- ▶ Done properly, can be better than flat panels or dvLED
- ▶ The washed out reality of most projection is completely avoidable
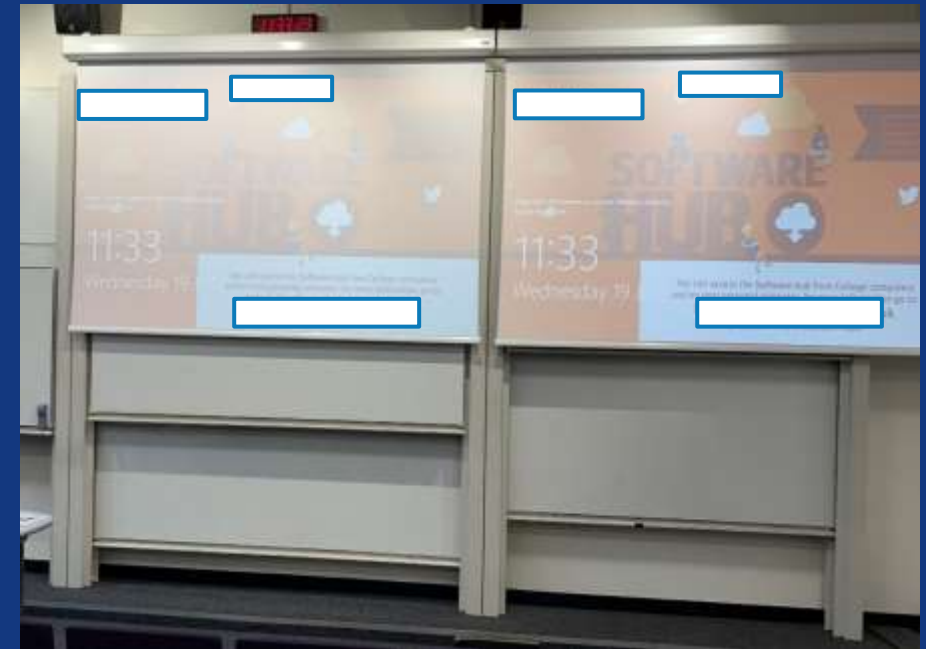
| Features	Comparative LED product	130" CLD XL Display	
	130" Branded LED Display	130" CLD XL Basic Display	130" CLD XL UST Display
Image size	2.88 x 1.62m	2.88 x 1.62m	2.88 x 1.62m
Price	£50,000 - £73,000 + VAT	£16,400 + VAT	£26,200 + VAT
Resolution	1920 x 1080 (HD)	3860 x 2160 (UHD 4K [pixel shift])	3860 x 2160 (UHD 4K [pixel shift])
Pixel pitch	1.5mm	0.75mm	0.75mm
Closet viewing distance	3.7m - 4.6m	2.2m	2.2m
Farthest viewing position	9.7m	9.7m	9.7m
Max brightness (luminance)	600 nit	383 nit	308 nit
Max brightness needed under 300-500 lux downlighting	190 - 320 nit	190 - 320 nit	190 - 320 nit
ANSI ISCR/PISCR Contrast (min required 15:1)	not stated	34	35
Max viewing angle	170 deg	170 deg	170 deg
Weight	105-125kg	17kg (projector) / 29kg (screen)	24kg (projector) / 55kg (screen)
Power	3000 W	416 W	626 W

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8 – Sign-off
Inspect what you expect!

Use the grey scale!
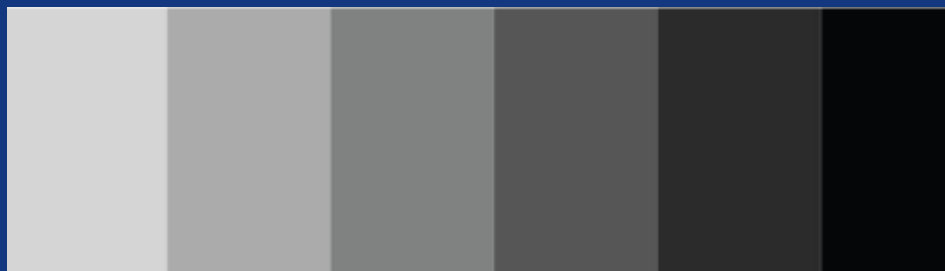
The more grey 'chips' you can render and see, the bigger the contrast, the better the image quality. It's that simple.

Attend our system auditing and certification webinar!

https://visualdisplaysltd.com/resources/webinars

WELL Building Standard v2™

https://v2.wellcertified.com/v/en/overview

AQAV – AV9000

- ▶ Obviating the snagging list
- ▶ Focus on good processes

Good reception from AV User Group

AQAV – Observational & meter testing modes

- ▶ Practical approaches:
  - ▶ Structured observational certification – or…
  - ▶ Formal measurement

C2.0 Commissioning Kit

The Association for Quality in Audio Visual Technology, Inc.
Commissioning Kit – C2.0 Standard Kit

Online version of this webinar

Trusted partners –
supporting AV resellers, integrators, consultants & specifiers

Visual Displays Ltd

Specialist manufacture, distribution & services

Working in partnership with & through the channel

▶ Products

    ▶ dnp Supernova ALR (ambient light-rejecting) projection screens

    ▶ Complete laser projection display bundles – from 100" to any size

    ▶ Comprehensive projection screens, materials

    ▶ Immersive displays

    ▶ Bespoke display & mounting solutions

    ▶ Bespoke interactive displays

    ▶ Daylight control (blinds)

▶ Services

    ▶ Display design and specification

    ▶ Parametric 3D CAD design

    ▶ Expert tender response support and consultant liaison

    ▶ Space redeployment design for social distancing

    ▶ System troubleshooting

    ▶ Room surveys and audits (using meters & reporting to standards)

    ▶ Proof of concept

    ▶ Specialist consultancy

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Complete
Laser Displays

- **Premium ALR laser projection displays - the ultimate all-in-one large screen display solution**
- **100" to any size**
- **Optimised viewing from everywhere in the room and in brightly lit conditions**

Specify and buy with single SKUs (order codes)

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Each CLD bundle includes

- **Epson laser projector** (with 5 year warranty)

- **dnp Supernova ALR (ambient light rejecting) screen**

- **Complete mounting solution**

Optional Extras:

- Free installation CAD drawings
- Site survey
- Installation
- 16:10 aspect ratio available
- Furniture
- Bespoke framework
- High-gain screen option (for limited field of view) no additional charge

▶ Hassle-free, single-SKU complete solution

▶ Multiple screen, projector and mount options to suit any space

▶ Large custom-size displays for optimised viewing from everywhere in the room

▶ Laser projection and ALR screen technology for flawless image quality at a fraction of the cost of FPD and dvLED

▶ Seamless single images - no visible joins (as with videowalls)

▶ Completely non-reflective screen - no 'cheap seats' created by distracting reflections from lighting and daylight

▶ High resolution HD video and graphics for detailed content viewing – exceeds AVIXA DISCAS resolution requirement

▶ Conforms to to AVIXA DISCAS image size standard for all room sizes

▶ Exceeds AVIXA ISCR image contrast requirement – for all viewers

▶ Optimised image brightness, designed for all-day viewing without eye strain
(in conformance with the new WELL v2 Building Standard)

▶ Lightweight – can mount on any wall, even the largest sizes

▶ Reliable & easy to use

▶ Maintenance free

Ambient light rejecting screens
...best known for dnp Supernova

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dnp
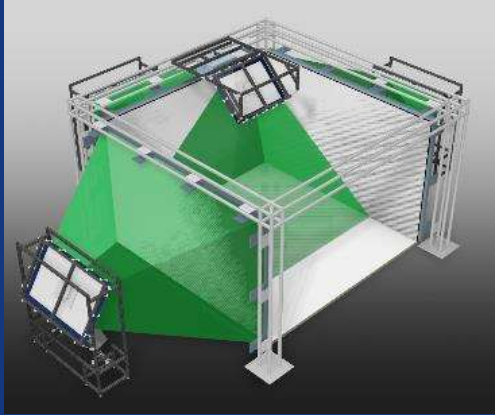Supernova
08-85

dnp
Supernova
20-25

Standard white
Da-Lite
gain 1

See full Gary
Kayye ISE
video here -
https://www.dnp-
screens.com/en/video/dn
p-ambient-light-rejecting-
screens-at-ise-2015/

https://www.dnp-screens.com/

We do some really cool things with projectors

VISUAL DISPLAYS

CAVES

RETAIL & SIGNAGE

CURVED SCREENS

MULTI-PROJECTION

INTERACTIVE DISPLAYS, FLOORS – ANYTHING!

AIR TRAFFIC CONTROL

We do some really cool things with projectors

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MIRROR RIGS,
FLOOR PROJECTION

PEPPER'S GHOST

CURVED REAR PROJECTION

TV STUDIOS

SHOPPING
MALLS

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Example projects

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Kings Cross – 5.5m w dnp
Supernova (10K lumen projector)

Home cinema

Universities, Colleges, Schools

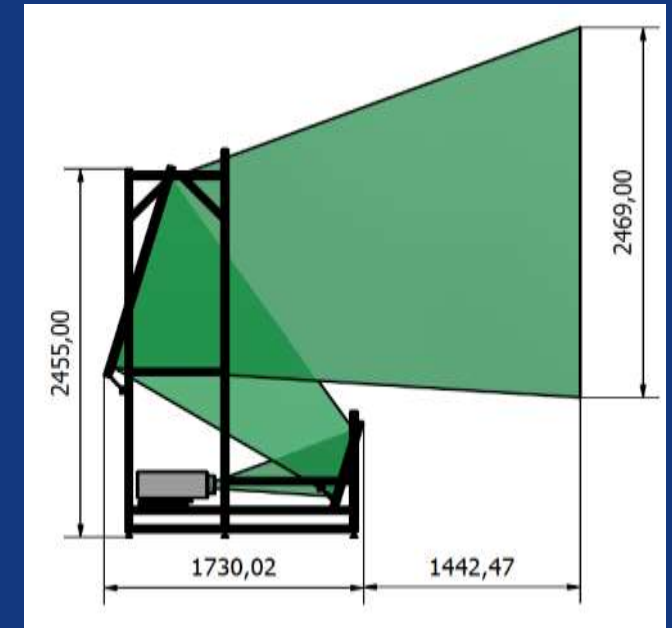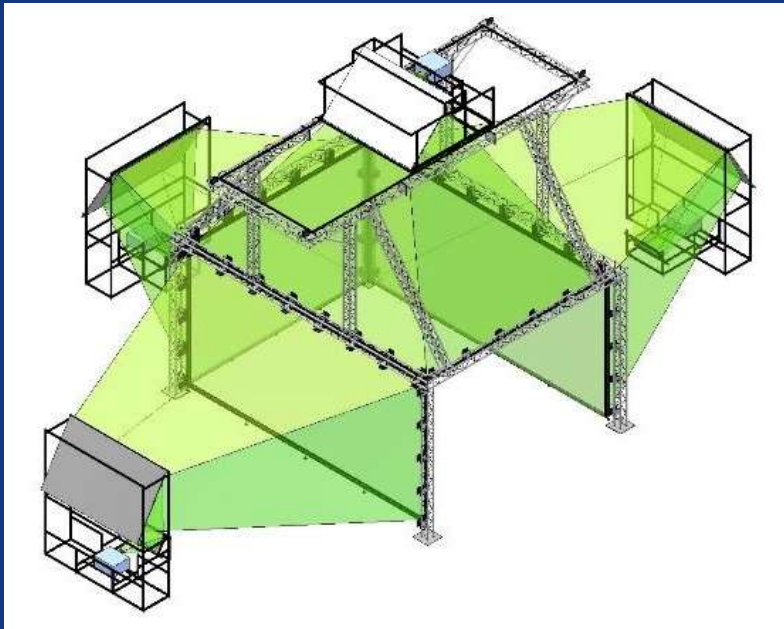Interactive floors, walls, windows – anything to any surface!

Corporate

www.visualdisplaysltd.com

Adding value to projectors with world-leading 3D CAD design and bespoke manufacture

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▶ We turn your opportunities into success stories

▶ You and your channel partners can offer expert and unique solutions

Our website is packed with essential info, tools & content

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▶ Case studies

    ▶ Corporate – https://visualdisplaysltd.com/case-studies/corporate

    ▶ Retail & signage – https://visualdisplaysltd.com/case-studies/retail-signage

    ▶ Education – https://visualdisplaysltd.com/case-studies/education

    ▶ Leisure – https://visualdisplaysltd.com/case-studies/leisure

▶ Displays expertise, advice and knowledge bank – https://visualdisplaysltd.com/resources/tools/specifying

▶ Tools, resource bank, essential easy-to-use calculators – https://visualdisplaysltd.com/resources

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VISUAL DISPLAYS

Visual Displays Ltd

sales@visualdisplaysltd.com

01234 581000

www.visualdisplaysltd.com