



# Product Brochure

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Comprehensive solutions for  
image quality testing

# About Imatest

Imatest is a leader in image quality testing. Our services provide independent, impartial image quality solutions for design and manufacturing sectors. Our team members are experts with 150 years of combined professional experience. This allows businesses to focus resources on creating great products rather than writing software or building lab hardware.



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## Global Partner and Reseller Network

Imatest has a global network of trusted resellers and equipment partners that offer local support and value-added products.



 [imatest.com/resellers](https://imatest.com/resellers)

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# Imatest Master

*Image quality analysis software*

## Why Choose Imatest Master?

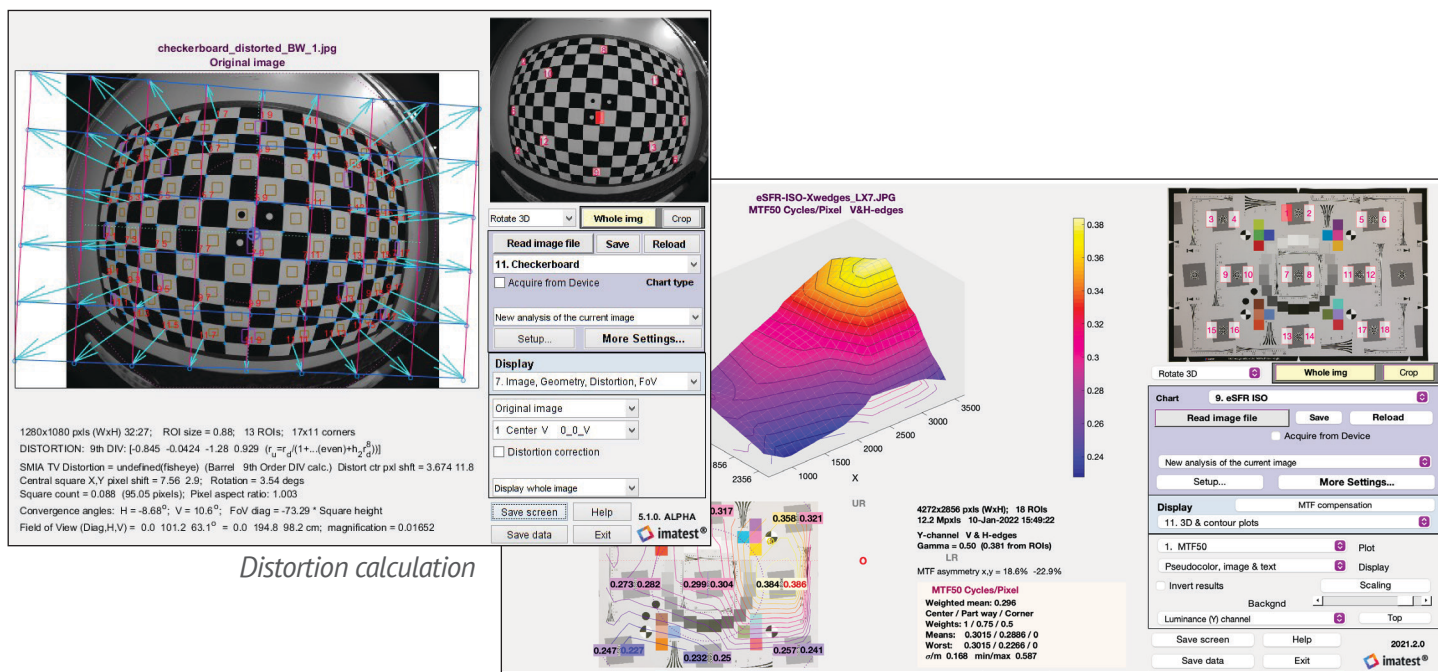
In today's imaging industry, companies are pressured to produce high-quality cameras with the newest features. Yet, new features also mean the necessity for regular updates so industry standards are always met. Imatest Master streamlines this challenging process by providing state-of-the-art software that is regularly reengineered to meet customer requirements. In addition, Imatest Master can test nearly any conceivable type of camera for over a dozen image quality factors, including sharpness, noise, dynamic range, and color accuracy.

“

*We decided to leverage Imatest, a de facto industry standard, instead of developing our own image quality testing metrics.*

”

*Signal Processing Software Manager  
at a Leading Semiconductor Firm*



*eSFR ISO 3D Plot*





## Highlighted Features

- ✓ **eSFR ISO** tests numerous image quality factors with a single multifeature test chart.
- ✓ **Arbitrary Charts** can automatically test your own custom chart.
- ✓ **Image Acquisition** acquires images in real time from various sensors and cameras.
- ✓ **Test Manager** organizes a set of modules to run with user-defined test plans and stores results in a database.
- ✓ **Reports** feature creates custom interactive reports with the results you define.
- ✓ **Compatibility** with both the Imatest Light Box and Imatest Light Panel.

## Benefits of Imatest Master

- ✓ Imatest Master is the industry standard for communicating image quality results and is more reliable and cost-effective than creating in-house software.
- ✓ Automatic recognition of common chart features like those found in the SFRplus and eSFR ISO 12233:2017 charts greatly reduce the amount of time needed to measure many image quality factors.
- ✓ Test Manager, Database, and Reports features allow companies to set up repeatable comprehensive test plans and communicate relevant results.



# Imatest IT

## Industrial testing

### Why Choose IT?

Imatest Industrial Testing (IT) software integrates key Imatest Master modules as software components into an existing testing program. With Imatest IT, test results are consistent throughout the manufacturing process. Imatest IT also resolves potentially biased results generated by a supplier's in-house testing system by integrating the same specifications set during the design process.

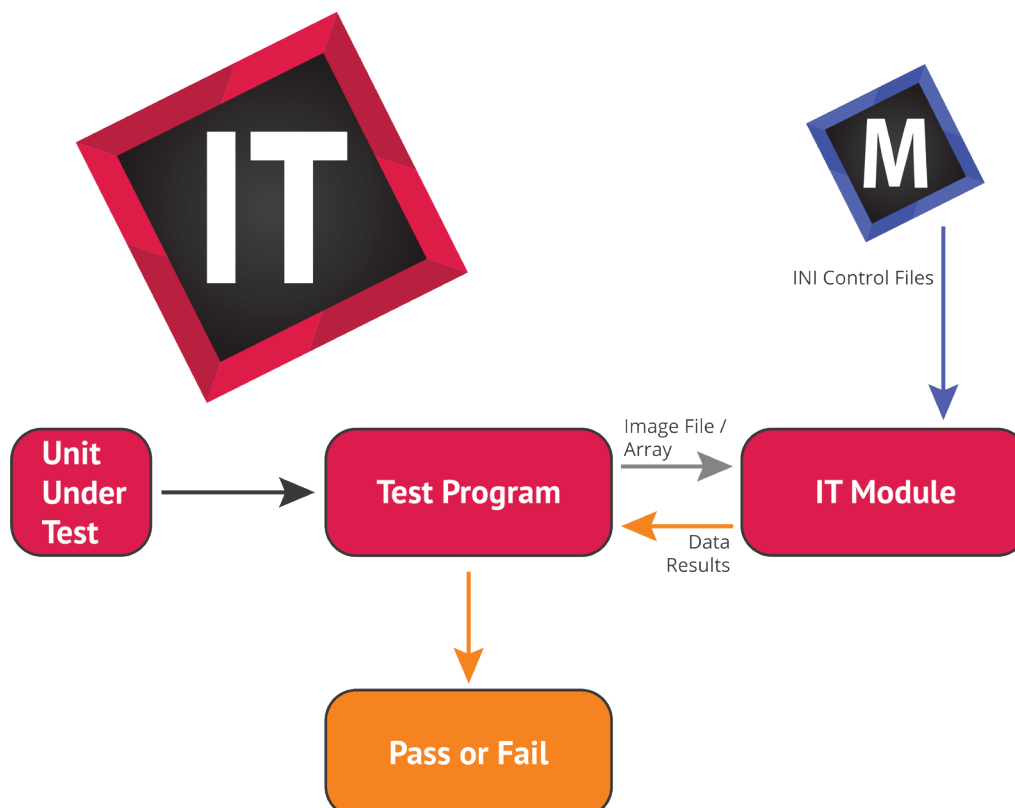
“

*Imatest IT provides us with a gaugeable test platform from start to RMA [Return Merchandise Authorization]. We found that of all our camera module suppliers, those who follow our recommendation to use Imatest throughout their manufacturing process are the ones that perform the best.*

”

*Camera Engineering Lead  
Fortune 100 mobile device manufacturer*

### IT Testing Workflow





## Highlighted Features

- ✓ Pass/Fail Specification lets you define required quality levels for a camera.
- ✓ SFRplus chart analysis allows for a complete map of sharpness nonuniformity, unlike many manufacturing tests that limit sharpness checks to the center and corners of an image.
- ✓ Even Field Test detects blemishes on the sensor, measures color and illumination non-uniformity, and identifies defective pixels.
- ✓ Calibrate signal processing with the results of color and illumination uniformity tests on each module and correct for the uniqueness in each camera.
- ✓ Maximize efficiency by completing camera quality-assurance tests with just three images: SFRplus chart, light even field, and dark even field.

## Benefits of Imatest IT

- ✓ Detects problems early in the manufacturing process and prevents costly yield losses down the line by inspecting the sensor and lenses before completing the camera module and final device assembly.
- ✓ Allows your business to safely balance fast production and product quality by automating processes that were performed manually.
- ✓ Eliminates potentially biased results generated by a supplier's in-house testing system.
- ✓ Prevents the need for correlation of supplier test results by using the same Imatest algorithm and charts in production as in R&D.



*Integrates with production machines*

# Imatest Ultimate

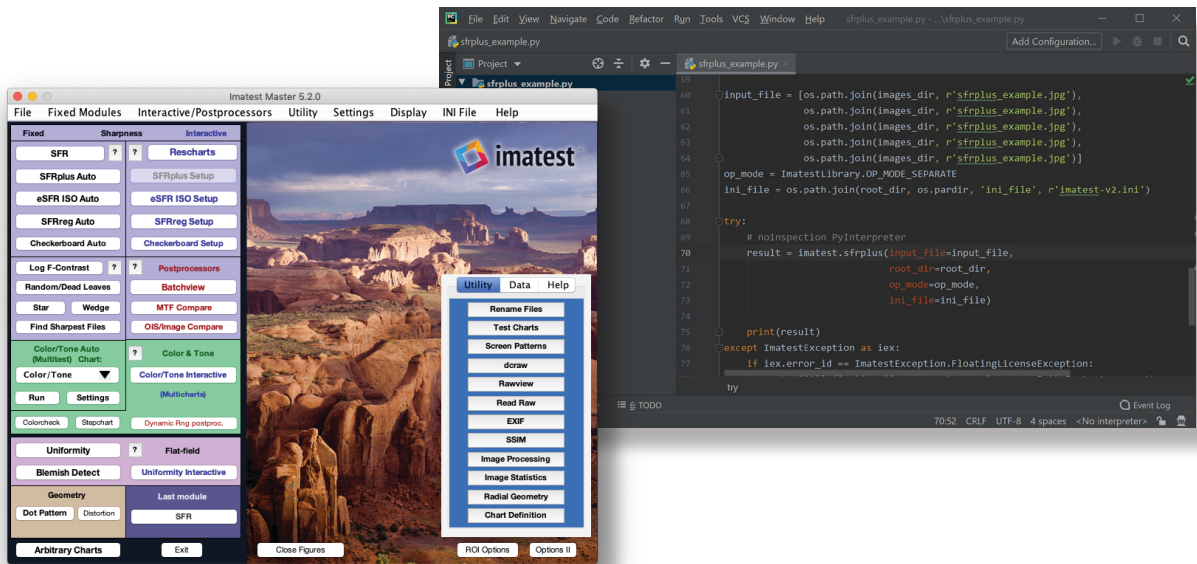
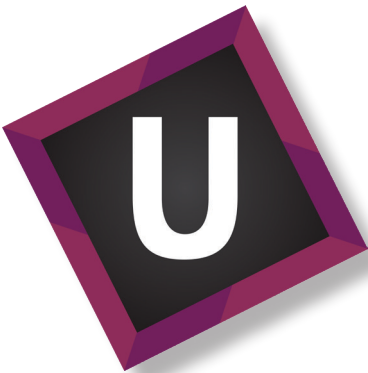
*Activating Imatest IT along with Imatest Master*



## Why Choose Ultimate?

Imatest Ultimate combines the analysis suite of Imatest Master and the automated testing of Imatest IT. This combination enables engineers to refine settings while integrating Imatest’s software library with their factory or lab control systems without managing multiple licenses or computers. Imatest Ultimate offers our complete software capabilities within a single license.

Contact [sales@imatest.com](mailto:sales@imatest.com) for more information.



Imatest Software	User Interface	Image Acquisition	Automation Library	Parallel Processing
Master	✓	✓		✓
IT		✓	✓	✓
Ultimate	✓	✓	✓	✓

# Imatest License Information

*Find the right tools for image quality testing*



## **Subscription License**

Subscription licenses offer many benefits including access to all updates during the subscription period, access to our technical support team, unlimited access to the Imatest training curriculum, and exclusive discount opportunities.

## **Perpetual License**

New perpetual licenses include one year of Support. Maintaining current support allows you access to all upgrades and updates during the Support period, as well as access to our technical support team.

## **Node-Locked License**

A node-locked license can be installed on multiple computers, but activated on just one computer at a time. A user must deactivate the license before it can be reactivated on a different computer. Note that a node-locked license can be upgraded to a floating license.

## **Floating License**

A floating license is a flexible option offered with all Imatest license types. A floating license allows a set number of user “seats” to share the software across a number of computers. For example, a license purchased to allow four simultaneous activations can be installed on more than four computers, and it allows for easy transition of the four active users among installations.

## **Volume Discounts**

We offer volume discounts to organizations that purchase five or more licenses in one order. Contact [sales@imatest.com](mailto:sales@imatest.com) for details.

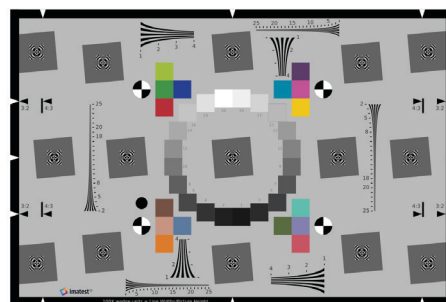
# eSFR ISO Test Chart

*Perform highly automated measurements with the eSFR ISO Test Chart*

## Why Choose the Imatest eSFR ISO Test Chart?

Imatest eSFR ISO charts are fully compliant with ISO 2233:2017.

The multifeature chart design allows for the measurement of several key image quality factors, including sharpness, chromatic aberration, distortion, noise, tonal response, color accuracy, ISO sensitivity, and limiting resolution. When used with Imatest software, the system can automatically locate

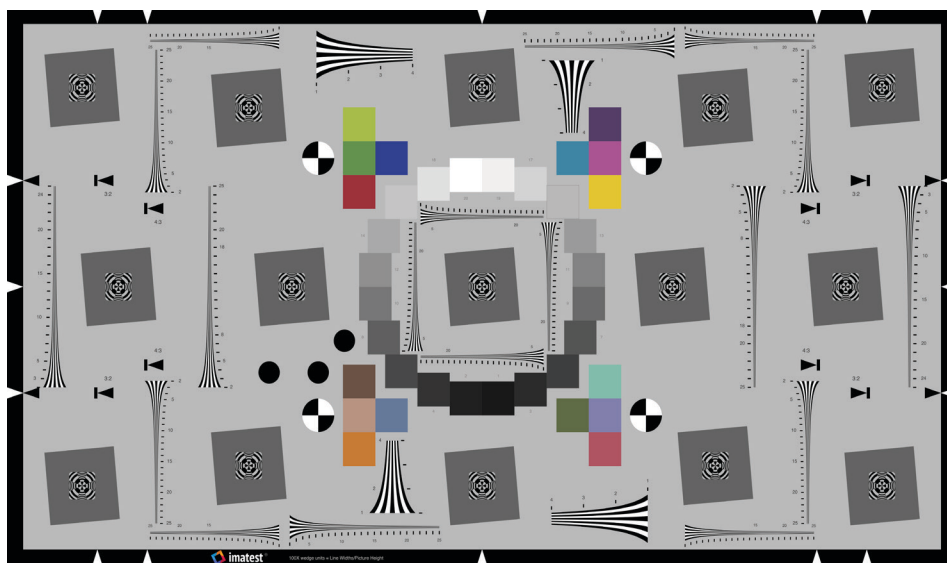


*Enhanced eSFR ISO chart*

and analyze all chart features, such as slanted-edges, grayscale optoelectronic conversion function (OECF) patches, color patches, and wedges. Versions of the eSFR ISO chart are available with hyperbolic edges up to 2500 or 4000 LW/PH as well as extended and enhanced features.

## Sizes

Our eSFR ISO charts can be printed in a variety of sizes to suit your testing needs. Custom charts are available with extended aspect ratios. Contact us if you need a custom-size solution.



*Extended eSFR ISO chart with extra wedges*





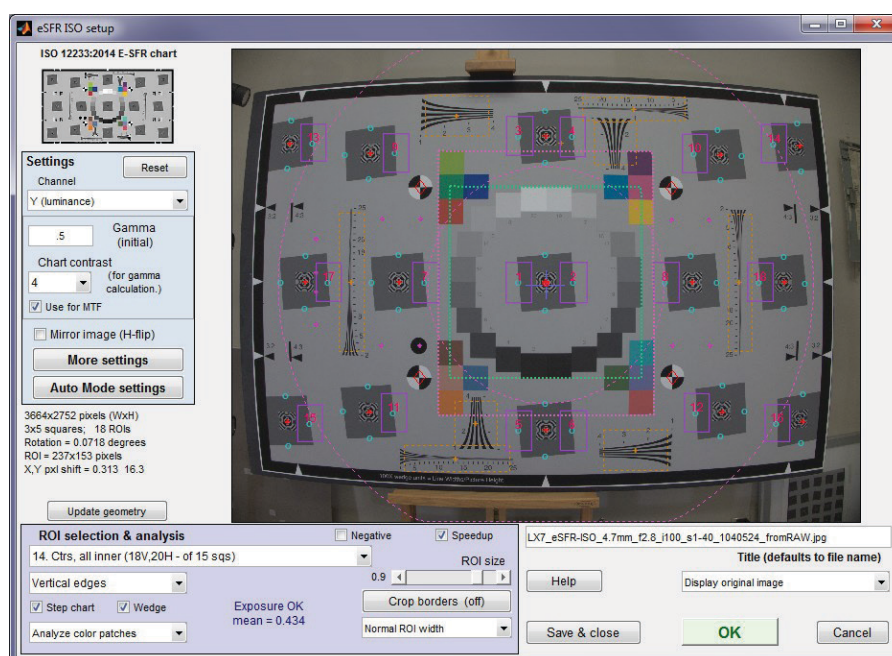
Size	Enhanced	Extended	MP Suitability	5.1 MTF Compensation*
1x	319.2mm x 212.8mm (12.6" x 8.4")	382.9mm x 215.3mm (15.1" x 8.5")	Inkjet: 1.6MP Photographic: 3.4MP	Inkjet: 3.2MP Photographic: 6.8MP
2x	638.3mm x 425.5mm (25.1" x 16.8" )	765.4mm x 430.4mm (30.1" x 16.9" )	Inkjet: 6.2MP Photographic: 13MP	Inkjet: 12.4MP Photographic: 26MP
4x	1276.6mm x 851.1mm (50.3" x 33.5")	1513mm x 850.8mm (59.6" x 33.5")	Inkjet: 24.9MP Photographic: 54MP	Inkjet: 49.8MP Photographic: 108MP

Measured to the outside of the black border.

\* Megapixel Suitability with 5.1 MTF Compensation

## Substrates

The ImaTest eSFR ISO chart can be produced on a variety of substrates, including reflective inkjet (matte or semigloss), high-precision reflective photographic print, backlit photographic film, and chrome on glass.



eSFR ISO setup window

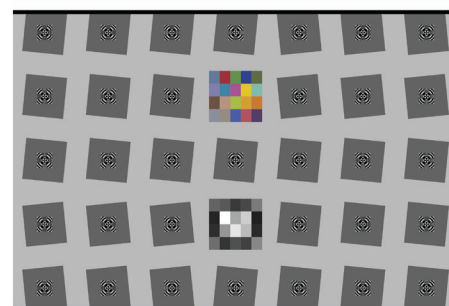


# SFRplus Test Chart

*Imatest's efficient slanted-edge test charts*

## Why Choose the Imatest SFRplus Test Chart?

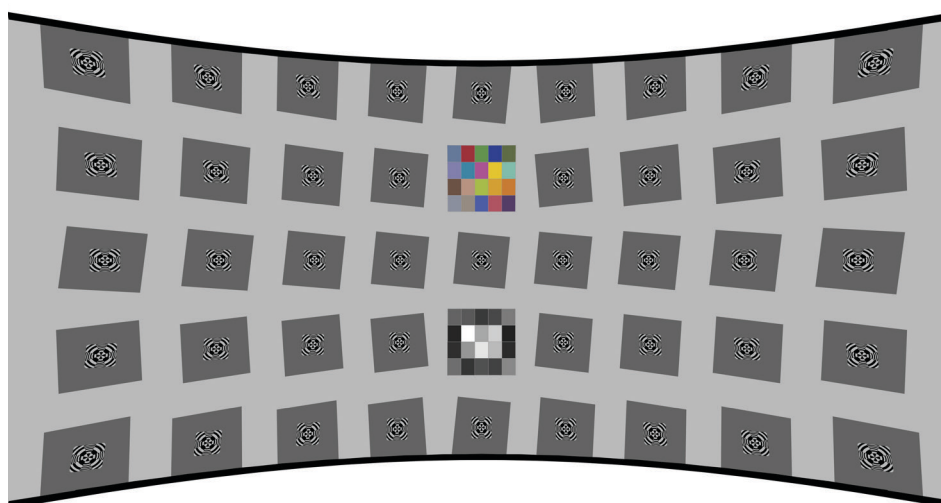
The Imatest SFRplus chart provides a highly detailed and comprehensive map of sharpness over an imaging system's field of view. SFRplus can be used for a wide range of testing scenarios, including systems with fish eye lenses such as automotive imaging systems. SFRplus is available in standard planar, predistorted, and microscopic sizes. The chart is offered in multiple contrast ratios: 4:1 that meet the ISO 12333:2017+ standard, 10:1, and two-toned 10:1 and 2:1.



*SFRplus Test Chart (5 x 7)  
with 4:1 contrast*

## Sizes and Substrates

We offer SFRplus charts on a variety of substrates and in a range of sizes. Contact **charts@imatest.com** for customization or assistance selecting a chart for your testing needs.

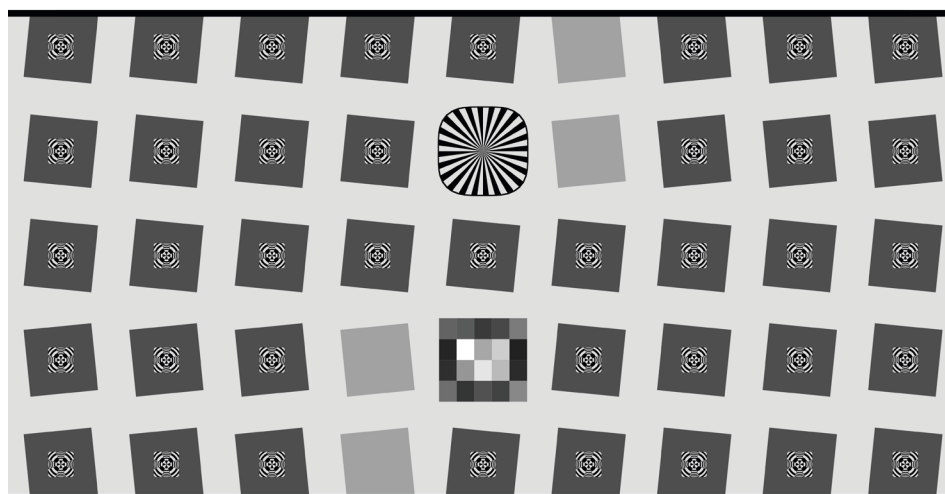


*Predistorted SFRplus test chart (5 x 9) with 4:1 contrast*



Substrate	Active Area (5 x 7 squares)	Active Area (5 x 9 squares)
<b>Inkjet (XS)</b>	16.33cm x 22.86cm (6.429" x 9")	19.76cm x 35.56cm (7.778" x 14")
<b>Inkjet (S)</b>	34.47cm x 48.26cm (13.571" x 19" )	32.46cm x 58.42cm (12.778" x 23")
<b>Inkjet (M)</b>	59.87cm x 83.82cm (23.571" x 33")	55.03cm x 99.06cm (21.667" x 39")
<b>Inkjet (L)</b>	107.04cm x 149.86cm (42.143" x 59")	83.26cm x 149.86cm (32.778" x 59")
<b>Inkjet (XL)</b>	110.74cm x 160.02cm (43.6" x 63")	103.01cm x 185.42cm (40.556" x 73")
<b>Color LVT Film</b>	Small - 160mm x 114.3mm (6.3" x 4.5") Medium - 229mm x 163.2mm (9.016" x 6.425") Multi - 235mm x 131mm (9.25" x 5.139")	235mm x 131mm (9.25" x 5.139") Multisize*
<b>Black and White LVT Film</b>	48.3cm x 34.13cm (19" x 13.44")	48.3cm x 26.81cm (19" x 10.56")
<b>Chrome on Glass (1.97")</b>	3cm x 4.2cm (1.18" x 1.65")	2cm x 3.6cm (.79" x 1.42")
<b>Chrome on Glass (3.94")</b>	6.5cm x 9cm (2.56" x 3.54")	4cm x 7.2cm (1.58" x 2.83")
<b>Chrome on Glass (slide)</b>	Various active areas per slide	2.54cm x 7.62cm (1" x 3") Multislide (Includes five patterns)

\*Smaller multisize charts available.



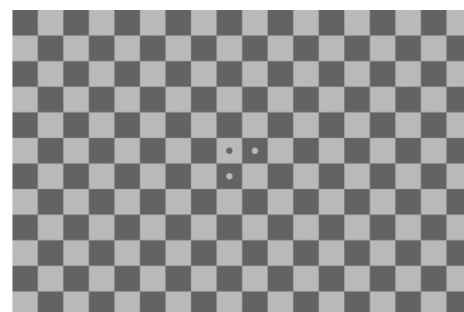
SFRplus test chart (5 x 9) with 10:1 and 2:1 contrast

# Checkerboard Test Chart

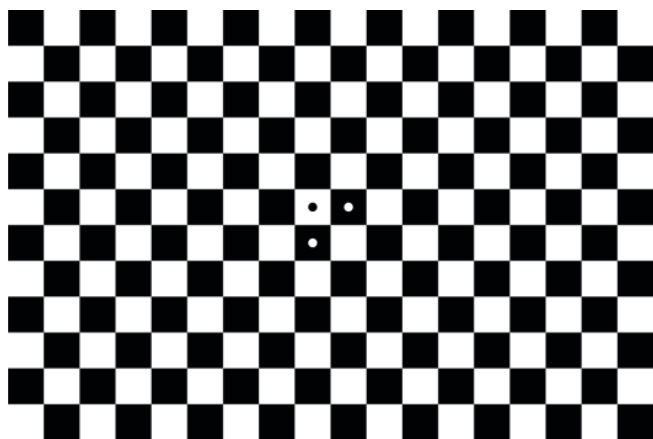
*Imatest's recommended chart for measuring distortion*

## Why Choose Imatest Checkerboard Test Chart?

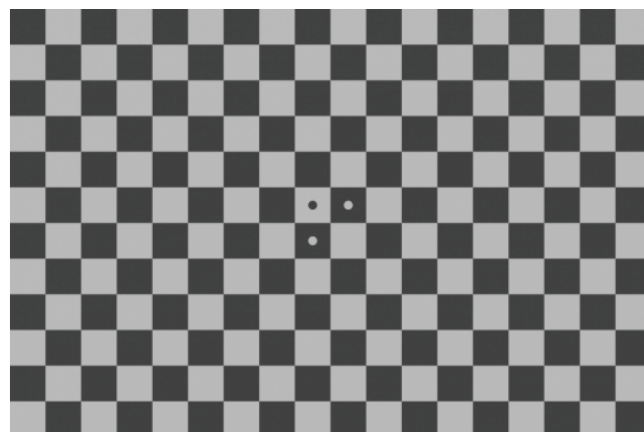
Imatest's Checkerboard chart works over a wide range of testing distances. It is available in various substrates, including reflective, transmissive, high-precision, and NIR-capable. The checkerboard design offers high-density SFR measurements as well as high-accuracy distortion characterization of any system. Select sizes range from microscopic to over 1 meter or have us create a custom size tailored to your needs.



*4:1 Contrast Ratio  
(ISO 12233 Standard Contrast)*



*45:1 Contrast Ratio*



*10:1 Contrast Ratio*



## Sizes & Substrates

### Inkjet

Size	Active Area	Megapixel Suitability	MTF Compensation
X-Small	20.07cm x 30.1cm (7.9" x 11.85")	3.1	6.2
Small	39.12cm x 58.67cm (15.4" x 23.1")	5.9	11.8
Medium	59.44cm x 89.15cm (23.4" x 35.1")	14.3	28.6
Large	110.24cm x 165.35cm (43.4" x 65.1")	28.1	56.2

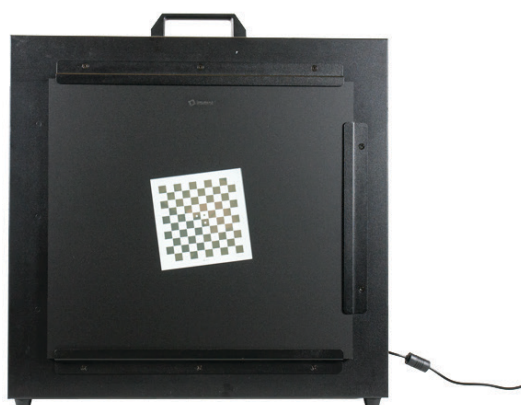
### Reflective Photographic

Size	Active Area	Megapixel Suitability	MTF Compensation
Small	39.12cm x 58.67cm (15.4" x 23.1")	11.8	23.6
Medium	59.44cm x 89.15cm (23.4" x 35.1")	28.6	57.2
Large	89.92cm x 150.11cm (35.4" x 59.1")	69.4	138.8

### Chrome on Glass

Plate Size	Square Layout	Megapixel Suitability	MTF Compensation
50.8mm x 58mm (2" x 2")	30 x 30, 15 x 15, or 7 x 7	25+	12
101.6mm x 101.6mm (4" x 4")	20 x 20 or 10 x 10	50+	52
25.4mm x 76.2mm (1" x 3")	40 x 40, 20 x 20, or 10 x 20	10+	Not necessary

Contact [charts@imatest.com](mailto:charts@imatest.com) to learn more about custom chart options.



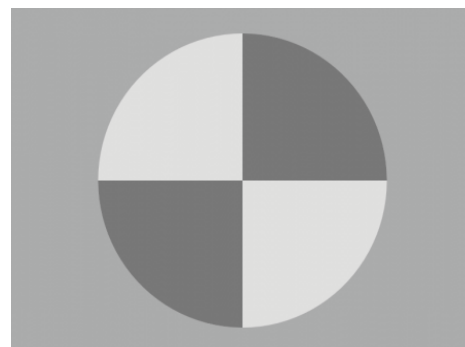
*4" x 4" Chrome on Glass  
Imatest LED Lightbox, Size B*

# SFRreg Test Chart

*Accurately measure MTF and lateral chromatic aberration*

## Why Choose the Imatest SFRreg Test Chart?

SFRreg charts provide slanted edges for sharpness and lateral chromatic aberration measurements. Place SFRreg charts at arbitrary positions and angles to accommodate a wide variety of test cases, including long distance and ultrawide field of view (FoV). Where a large planar target cannot practically fill the FoV, multiple SFRreg charts can be placed throughout the field to test focus with a single image.



*SFRreg test chart*

## Sizes and Substrates

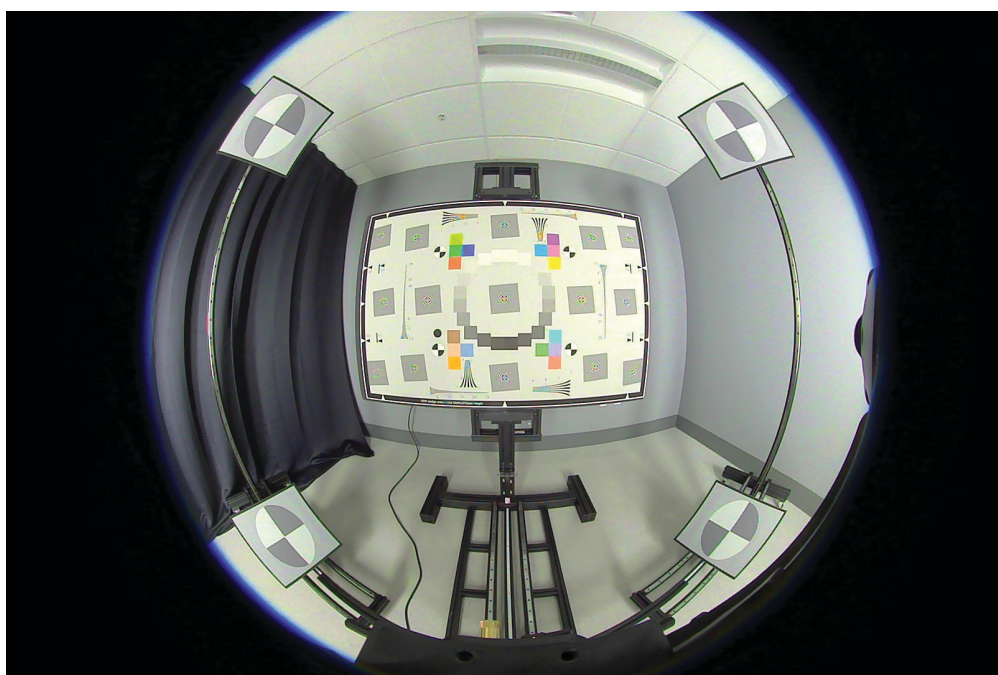
We offer a range of sizes to suit your testing needs. Charts can be rotated to the ISO standard 5° tilt angle or to align with sagittal and tangential directions in a radial field. Several contrast ratios are available including 4:1 (ISO Standard) and 10:1. Available substrates include reflective, transmissive, and high-precision film targets. Circular versions of the target can be installed in target projection collimators to simulate long distance. Contact us for assistance to determine the chart that will work best for your test setup.



*Modular Test Stand with Wide Field of View Module*



Size	Substrate	Reg Mark Diameter	Active Area
.5x	Inkjet	100mm (3.94")	125mm x 165mm (4.92" x 6.50")
1x	Inkjet	200mm (7.87")	250mm x 330mm (9.84" x 12.99")
1.5x	Inkjet	300mm (11.81")	375mm x 500mm (14.76" x 19.69")
2x	Inkjet	400mm (15.75")	500mm x 665mm (19.69" x 26.18")
3x	Inkjet	600mm (23.62")	750mm x 1000mm (29.53" x 39.44")
4x	Inkjet	800mm (31.50")	1000mm x 1330mm (39.37" x 52.36")
5x	Inkjet	1000mm (39.37")	1105mm x 1665mm (43.50" x 65.55")
1 Reg Mark	Film	157.88mm (6.22")	196.85mm x 234.95mm (7.75" x 9.25")
2 Reg Marks	Film	93.84mm (3.69")	117.0mm x 156.0mm (4.61" x 6.14")
4 Reg Marks	Film	70.66mm (2.78")	88.11mm x 117.48mm (3.47" x 4.63")
6 Reg Marks	Film	59.20mm (2.33")	73.82mm x 98.43mm (2.91" x 3.88")
12 Reg Marks	Film	39.34mm (1.55")	49.06mm x 65.41mm (1.93" x 2.58")



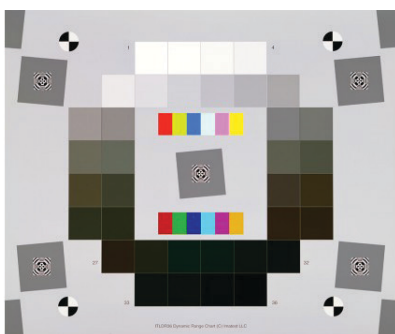
*Example of SFRreg Test Chart arrangement for wide field of view*

# Dynamic Range Charts

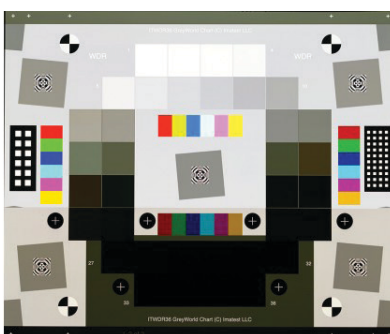
*Charts for testing tonal response, noise, and dynamic range*

## Why Choose Imatest Dynamic Range Charts?

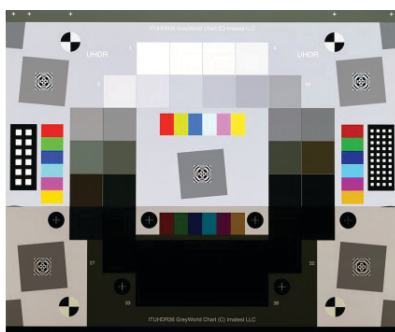
The Imatest Dynamic Range chart is available in three density ranges. This chart allows you to measure tonal response, noise, and dynamic range of various imaging systems with a single image instead of a series of images at different exposures. Each chart includes a middle-gray background that enables proper exposure in auto-exposure cameras. The Imatest DarkWorld mask creates a version of the target with less flare light that can be challenging for auto-exposure, but leads to higher dynamic range numbers by creating a scene that resembles night. (The Dynamic Range chart with a black background tends to overexpose the brighter patches in auto-exposure cameras.)



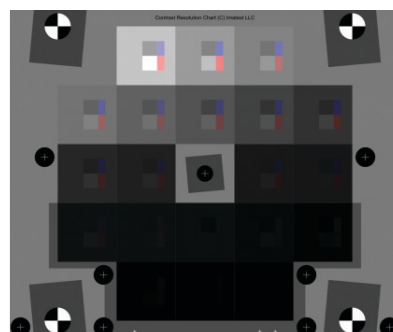
*Low Dynamic Range  
(ITLDR)*



*Wide Dynamic Range  
(ITWDR)*



*Ultra-High Dynamic Range  
(ITUHDR)*



*Contrast Resolution Chart  
(ITCRC)*





Charts	Density	Aspect Ratio	Camera Types
<b>Low Dynamic Range (ITLDR36)</b>	50dB	4:5, 16:9	Small pixel cameras like camera phones or tablets
<b>Wide Dynamic Range (ITWDR36)</b>	100dB	4:5	High-quality cameras like DSLRs and non-HDR devices
<b>Ultra-High Dynamic Range (ITUHDR36)</b>	150dB	4:5	High Dynamic Range (HDR) cameras
<b>Contrast Resolution Chart (ITCRC)</b>	100dB	4:5	Black box cameras with tone mapping and noise reduction

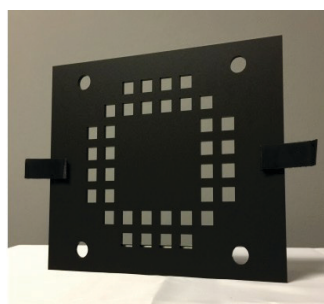
Imatest recommends using Dynamic Range charts with a high-illuminance light source (10,000 to 100,000 lux) to provide sufficient light when testing image sensors over their range of sensitivity. These test charts are well suited for measuring both camera and sensor dynamic range, which are fundamentally different.

## Standard Compliance

The Ultra-High Dynamic Range (ITUHDR) chart used with the ImaTest DarkWorld Mask illuminated by a 100,000 lux LED Light Box is compliant with the target definitions in the IEC 62676-5 standard.



*10,000 to 100,000 max lux LED Lightbox*



*Imatest DarkWorld Mask*

# Imatest LED Light Panel

*A versatile, low-profile, uniform light source*

## Why Choose Imatest LED Light Panel?

The Imatest LED Light Panel provides a versatile, low-profile and lightweight light source with 90% uniformity, dimmability, wireless controls, and easy integration with our hardware and charts.

Choose from a variety of color temperatures as well as near-infrared channels with illuminance levels ranging from Visible: 100 ~ 1,000 lux.

The LED Light Panel is ideal for testing many image quality factors with a range of transmissive test charts.



*Light Panel with eSFR ISO Chart*

## The light panels are offered in seven standard sizes with:

- ✓ Chart alignment rails to align charts for the most reliable results.
- ✓ A single channel. Choose from four visible and two NIR illuminant options.
- ✓ Illuminance levels range from Visible: 100 ~ 1,000 lux, NIR: 2 ~ 20 W/m<sup>2</sup>.
- ✓ 90% uniformity standard.



*Low-Profile*



*Wireless Control Box*



Size	Diffuser Panel Size/ External Dimensions	Intensity (min to max)	Light Temperature Options	Uniformity	Channels
A	229mm x 152mm (9" x 6") 299mm x 222mm x 40 mm (11.8" x 8.7" x 1.6")	Visible: 100 ~ 1,000 lux  NIR: 2 ~ 20 W/m²	3100K 4100K 5100K 6500K NIR 850nm NIR 940nm	90%	Single
B	260mm x 220mm (10.24" x 8.66") 384mm x 334mm x 60mm (15.1" x 13.1" x 2.4")				
C	432mm x 305mm (17" x 12") 512mm x 385mm x 60mm (20.2" x 15.2" x 2.4")				
D	610mm x 432mm (24" x 17") 690mm x 512mm x 60mm (27.2" x 20.2" x 2.4")				
E	907mm x 540mm (35.7" x 21.3") 987mm x 620mm x 70mm (38.9" x 24.4" x 2.8")	Visible: 30 ~ 1,000 lux  NIR: 2 ~ 20 W/m²			
F	907mm x 680mm (35.7" x 26.8") 987mm x 760mm x 70mm (38.9" x 29.9" x 2.8")				
G	1225mm x 680mm (48.2" x 26.8") 1305mm x 760mm x 70mm (51.4" x 29.9" x 2.8")				

## Power Controls

- ✓ 20W
- ✓ 110V
- ✓ 220V
- ✓ Manual
- ✓ USB
- ✓ WiFi



Control Box & Sizes A-D

# Imatest LED Lightbox

*Designed for dynamic range and high resolution testing*

## Why Choose the Imatest LED Lightbox?

The Imatest LED Lightbox is a highly uniform light source for transmissive charts that are designed for dynamic range and ultrahigh resolution testing. With the Lightbox, you can align charts precisely with mounting rails, integrate with test fixtures using universal mounting points, and control light with wireless controls. Choose from a continuous range of color temperatures, including near-infrared channels and intensity levels between Visible: 30 ~ 10,000 lux.

## Lightboxes are available in two standard sizes with:

- ✓ Multi (dual) channel with mixed mode.
- ✓ Standard intensity levels between Visible: 30 ~ 10,000 lux or ~100,000 lux, NIR: 2 ~ 20 W/m<sup>2</sup>.
- ✓ 95% and 93% uniformity (90% for NIR options).





Size	Diffuser Panel Size/ External Dimensions	Intensity (min to max)	Light Temperature Options	Uniformity	Channel**
B	260mm x 220mm (10.24" x 8.66") 400mm x 380mm x 150mm (15.7" x 15" x 7.9")	Visible: 30 ~ 10,000 lux 30 ~ 100,000 lux NIR: 2 ~ 20 W/m <sup>2</sup>	3100K & 6500K *  5100K & 850nm	95% (90% in NIR)	Multi (dual) channel with mixed mode
C	432mm x 305mm (17" x 12") 600mm x 490mm x 150mm (23.6" x 19.3" x 7.9")	Visible: 30 ~ 10,000 lux NIR: 2 ~ 20 W/m <sup>2</sup>	850nm & 940 nm  5100K & 940nm	93% (90% in NIR)	

\* Mixed mode allows you to achieve desired color temperature within that range.

\*\* In mixed mode, minimum lux increases to 200.

**Power**

**Controls**

- ✓ 20W

✓ 110V

✓ 220V
- ✓ Manual

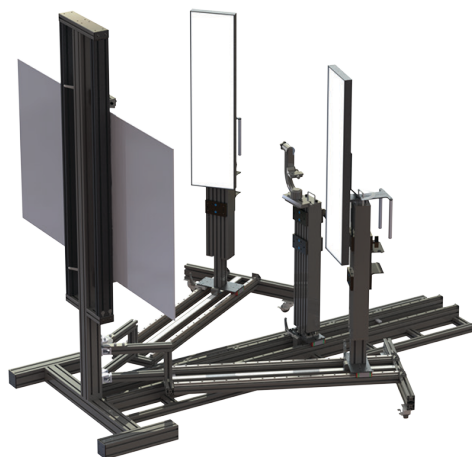
✓ USB


✓ WiFi



# Reflective Lighting

*Uniform lighting for reflective test charts*



	Kino Flo Freestyle 31 LED	Metaphase NIR ExoLight	T
<b>Color temperature/ wavelength range</b>	CCT: 2700K-6500K Extended Color Range: 2500K-9900K	850nm or 940nm	
<b>Spectral tunability</b>	n/a	n/a	
<b>Illuminant type</b>	LED	LED	
<b>Dimensions</b>	Two 102x28x9cm panels, can be mounted on 76cm stands or the Modular Test Stand- Reflective Module	Two 94 x 8 x 7cm bars	
<b>Control options</b>	External control box or USB DMX controller	External control box or USB connection	
 <b>Lighting control compatibility</b>	yes	no	



Thouslite LEDCube	IQL SpectriWave Lighting System
CCT: 2000~20000K	Daylight: D75/D65/D50 Cool White Fluorescent (CWF) TL-84/83; SPX35; Inc. "A"/Horizon; 10,000K
350-700nm	n/a
LED	3 Fluorescent Light Sources: D65, D50, CWF/TL-84 Incandescent "A", and Horizon
30x30x21cm cubes mounted (optional) on 62 x 50 x 187cm fixtures (up to 3 cubes per fixture)	Two 133x76x86cm illuminant banks mounted on 72cm stands
Wired/wireless control via LED Navigator software, touch screen control box, or USB cable.	Optional wired/wireless remote control via PC tablet. Rotary dial or digitally individual lamp control, multi-source option for creating mixed lighting conditions.
no	no



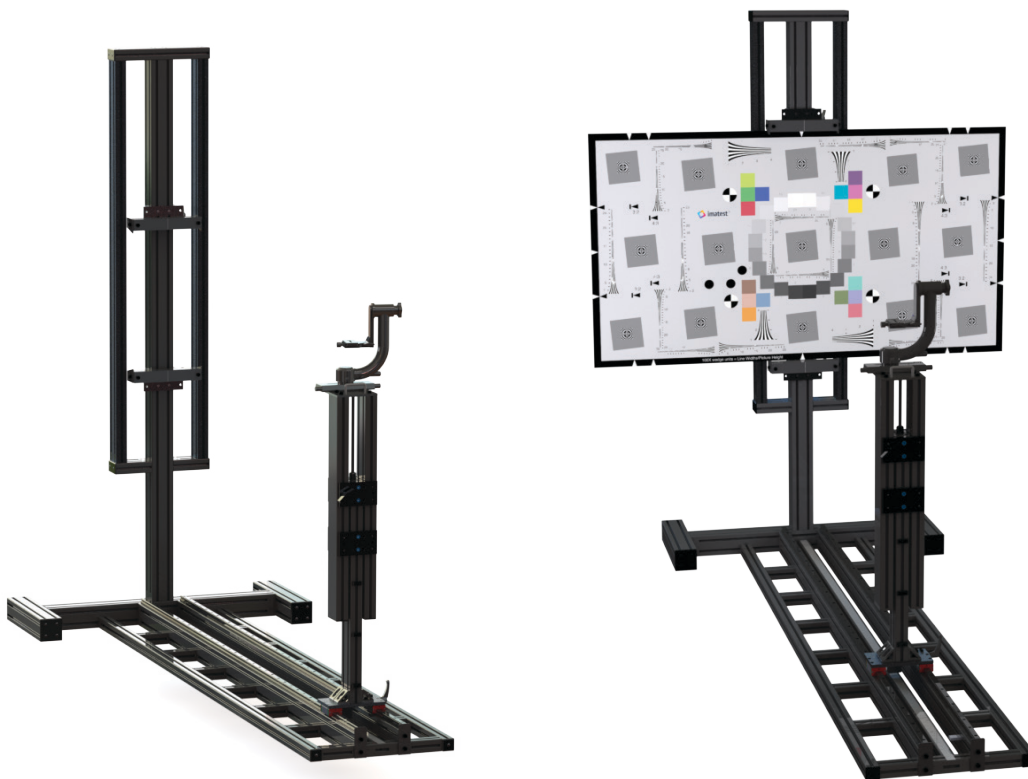
# Imatest Modular Test Stand

*Easy-to-use platform for consistent imaging tests*

The Modular Test Stand (MTS) facilitates precise setup and repeatable camera positioning for consistent imaging tests. The MTS enables you to produce superior cameras while significantly reducing time spent in the lab. The MTS is configurable to accommodate your camera system. Optional add-on modules include reflective lighting and wide field-of-view options.

## Included with the Fixture:

- ✓ Custom rail system for easy positioning.
- ✓ Ruler and laser rangefinder for precise test distance measurements.
- ✓ Reliable camera mount (tripod head or gimbal head).
- ✓ Adjustable chart holder that conforms to a variety of test targets.
- ✓ Controlled alignment that enables tilt and rotation measurements.





Specifications	Details
Weight - default option (2m rail)	102kg
Total shipping weight with crate (2m rail)	159kg
Shipping crate dimensions	2.34m x 0.66m x 0.53m
Overall dimensions (2m rail)	1000mm x 2050mm x 2020mm
Camera tilt ( $R_z$ )	Geared Tripod Head: $-90^\circ$ / $+30^\circ$ Gimbal Head: $0^\circ$
Camera pitch ( $R_x$ )	Geared Tripod Head: $-10^\circ$ / $+90^\circ$ Gimbal Head: $360^\circ$
Camera rotation ( $R_y$ )	Tripod Head: $360^\circ$ Gimbal Head: $300^\circ$
X-axis translation	120mm
Reflective chart size range	Min: 21.58cm x 27.94cm (8.50" x 11"), Max: 110cm x 144cm (3.94" x 56.69")
Transmissive chart size range	Imatest LED Light Panel C, D, E, F, and G
Rail length options	1m, 2m, 3.5m (39.37", 78.74", 137.79"); custom lengths available
Material	6105-T5 Aluminum - Black Anodized

Custom configurations available. Contact [testing@imatest.com](mailto:testing@imatest.com).

### Light Panel Dimensions (Active Area):

Light Panel	Diffuser Panel Size	Illumination
C	432mm x 305mm (17.01" x 12.01")	<b>Visible</b> 100 - 1000 lux 3100K, 4100K, 5100K, 6500K  <b>NIR</b> 2 ~ 20 W/m <sup>2</sup> 850nm or 940nm
D	610mm x 432mm (24.02" x 17.01")	
E	907mm x 540mm (35.71" x 21.26")	
F	907mm x 680mm (35.71" x 25.59")	
G	1225mm x 680mm (48.23" x 25.59")	

# Imatest Motorized Test Stand

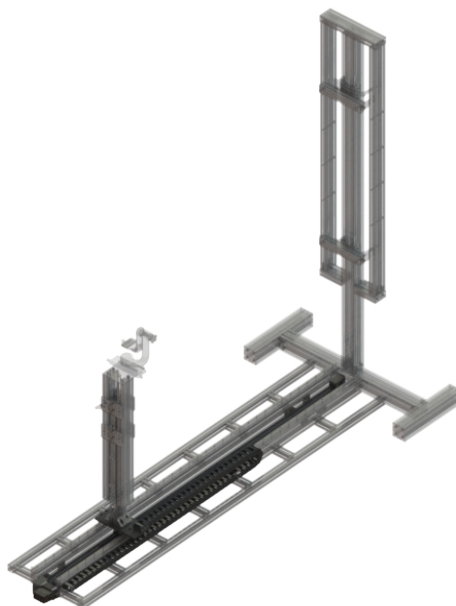
*Add-on to the Imatest Modular Test Stand*

## Why Choose the Imatest Motorized Test Stand?

This add-on module to the IMTS-2m allows for automated positioning of the Camera Post. Create automated test plans with many camera-to-chart test distances. Perform live depth of field tests using a computer controlled stage with precise linear movements.

## MTS Reflective Module Features

- ✓ Easily upgrade your existing Modular Test Stand
- ✓ Includes linear stage, dragchain, and adapter kit
- ✓ Includes a recirculating ball bearing carriage which provides high load and long lifetime
- ✓ Easily connect using USB 2.0 or serial communication ports, send commands over RS-232
- ✓ Zaber's Console software makes it easy to control the speed and position of the camera, change the device settings, and write custom scripts.
- ✓ The linear stage system includes an indexed knob which provides manual control
- ✓ Travel: 1850mm
- ✓ Maximum Speed: 3000 mm/s
- ✓ Control Interfaces: USB Serial, Zaber Console Software, Python 3 - Zaber Motion Library





# Imatest Motorized Test Stand Specifications

Specifications	Details
Add-On Kit Weight	10.98 Kg (24lbs)
Motorized Carriage Dimensions	2237mm x 134mm x 76mm
IMTS-2m Dimensions (w/ Motor)	2550mm x 1000mm x 2020mm
Linear Motion	Travel: 1850mm   Maximum Speed: 3000mm/s
Microstep Size (Default Resolution)	7.03125 $\mu$ m
Motor Precision	Accuracy (unidirectional): 1,600 $\mu$ m   Repeatability: < 20 $\mu$ m
Motor Backlash	< 250 $\mu$ m
Motor Power	Peak Thrust: 90N   Maximum Torque: 180 N•cm
Operating Temperature Range	0 to 50 °C
Maximum DUT Weight	100 lbs
Electrical	Standard 120V   Maximum Current Draw: 3500 mA



# Imatest MTS Reflective Module

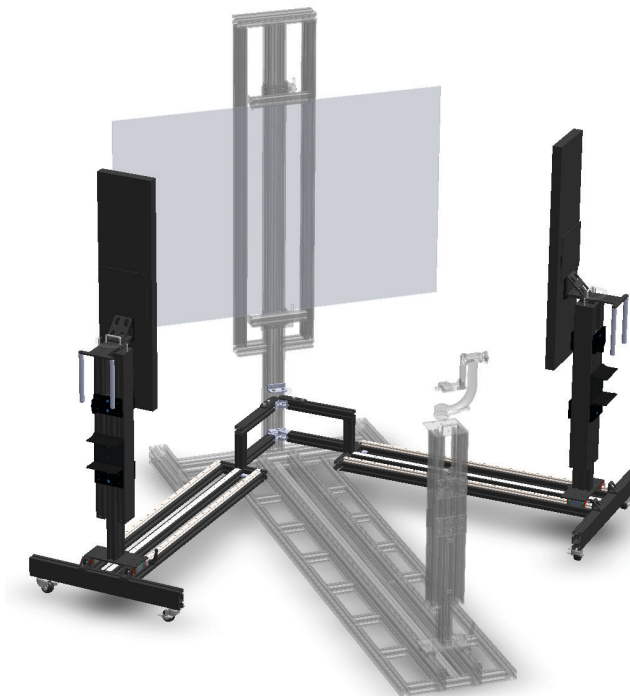
*Add-on to the Imatest Modular Test Stand*

## Why Choose the MTS Reflective Module?

The Imatest Reflective Module is an add-on to the Imatest Modular Test Stand. The easy-to-use Module is designed to work with Kino Flo Freestyle 31 lights, Metaphase NIR ExoLights, and reflective charts. High-quality hardware allows you to effortlessly position lights, while angle and position markers indicate light bank locations for repeatable lighting configurations. The Base Module, target, and lights are sold separately. For custom configurations, contact [testing@imatest.com](mailto:testing@imatest.com).

## MTS Reflective Module Features

- ✓ Physical indicators to mark positions.
- ✓ Angle indicators to determine incident light angles.
- ✓ Easy and dampened height adjustment.
- ✓ Designed to work with Kino Flo Freestyle 31 lighting system or Metaphase NIR ExoLight (850nm or 940nm) or both with Dual setup.





# MTS Reflective Module Specifications

Specifications	Details
Weight	54kg
Shipping crate dimensions	1.4m x 0.66m x 0.65m
Total shipping weight with crate	92kg
Width when fully extended	3100mm (122.03")
Travel distance of light*	A. Height adjustment: 300mm (11.81") B. Distance from chart: 250mm (39.37") – 1250mm (49.21") C. Incident angle: 22° – 90°

*\*lights sold separately.*



# Imatest Wide Field-of-View Module

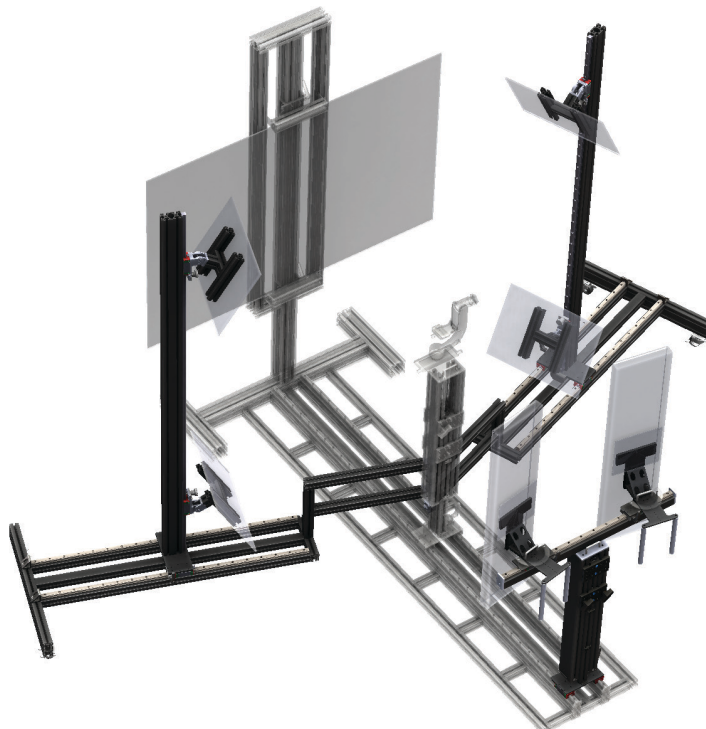
*Add-on to the Imatest Modular Test Stand*

## Why Choose the WFOV Module?

The Imatest Wide Field of View (WFOV) Module integrates with Imatest's Modular Test Stand base module and provides an easy to use platform for testing sharpness of cameras with FOV up to 200°. The fixture includes three rail systems for easy mounting and positioning of camera devices, peripheral test targets, and Kino Flo LED lights (sold separately). The main chart holder and peripheral target holders can accommodate a variety of different sizes.

## WFOV Module Features

- ✓ Polar-coordinate system for four reflective SFRReg targets whose distance, angle, and height are easily adjusted.
- ✓ Sliding light post for mounting Kino Flo LED panels that provide uniform illumination of all test charts.
- ✓ Mounting points for Isolight Pucks that measure lighting brightness and color uniformity.
- ✓ Includes one Isolight Puck (option to add four additional Pucks).







# MTS-RWFOV Module Specifications

Specifications	Details
Fixture Weight	78.5kg (173lbs)
Shipping crate dimensions	2.03m x 0.61m x 0.53m (80" x 24" x 21")
Total Shipping weight with crate	149kg (328lbs)
Testing distance range	0.5m - 1.5m (19.69" - 59.06") @ 3:2 or 16:9 camera aspect ratio
Testing Field of View	Recommended camera diagonal FOV: 140° - 200°
Recommended Test Charts	Test Distances < 1m (39.37"), FOV < 160°: 4 Outer targets: SFRreg - Size 0.5x, 1 Center Target: eSFR ISO - Size 2x  Test Distances < 1m (39.37"), FOV >160°: 4 Outer targets: SFRreg - Size 1x, 1 Center Target: eSFR ISO - Size 2x  Test Distances > 1m (39.37"): 4 Outer targets: SFRreg - Size 1.5x, 1 Center Target: eSFR ISO - Size 4x
Material	Black anodized 6105 T5 Aluminum



# Imatest Linear Motion Blur Module

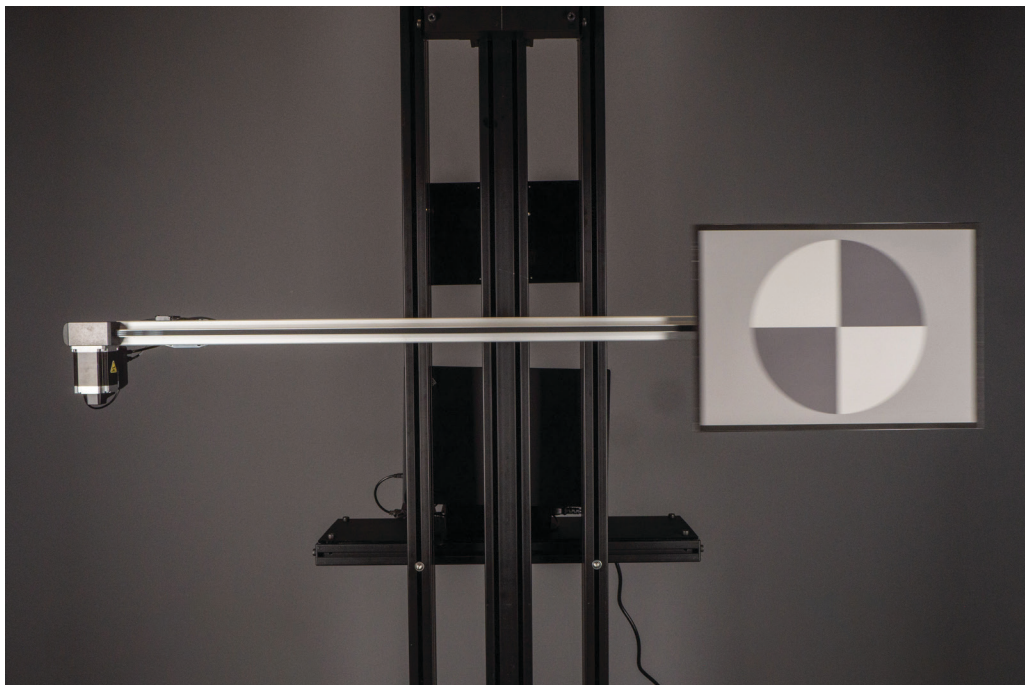
*Add-on to the Imatest Modular Test Stand*

## Why Choose the Imatest Linear Motion Blur Module?

Test the effects of moving objects using a computer controlled stage with precise linear movements. Simulate scene motion. This add-on module to the Imatest Modular Test Stand allows you to test motion blur.

## MTS Reflective Module Features

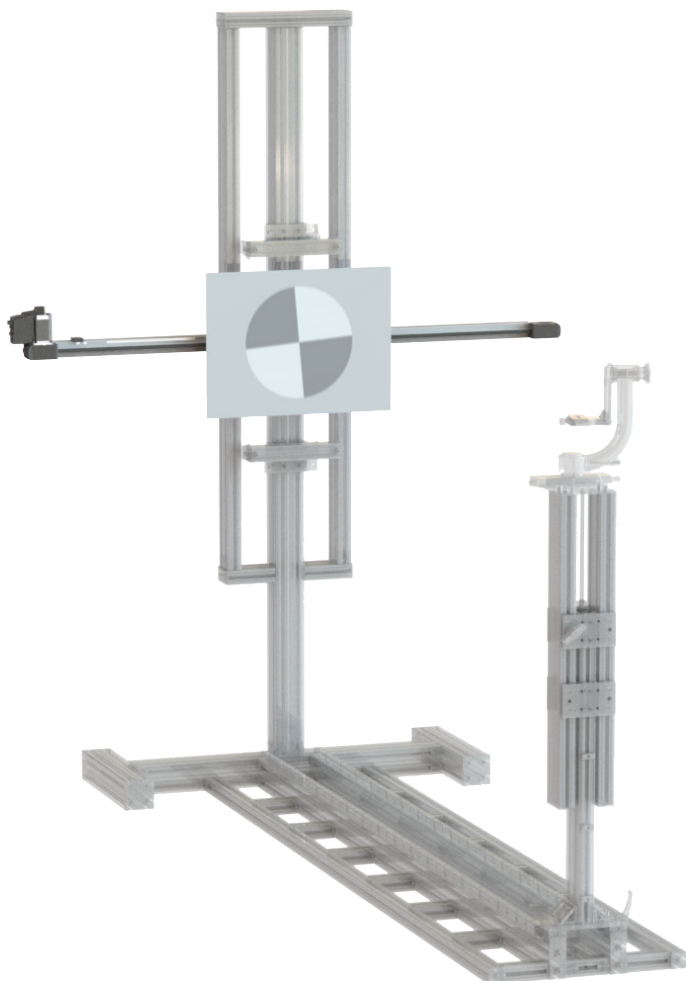
- ✓ Includes a recirculating ball bearing carriage which provides high load and lifetime
- ✓ Easily connect using USB 2.0 or serial communication ports
- ✓ Send commands over RS-232
- ✓ Zaber's Console software makes it easy to control the speed and position of the target, change the device settings, and write custom scripts.
- ✓ The linear stage system includes an indexed knob which provides manual control
- ✓ Travel: 1150mm
- ✓ Maximum Speed: 3000 mm/s
- ✓ Control Interface: USB Serial, Zaber Console Software, Python 3 - Zaber Motion Library





# Imatest Linear Motion Blur Specifications

Specifications	Details
Weight	7.71 Kg (17lbs)
Slider Dimensions	1489.7mm x 134mm x 76mm
MTS-2m Dimensions (w/ slider)	1489.7mm x 2395mm x 2020mm
Linear Motion	Travel: 1150mm   Maximum Speed: 3000 m/s
Microstep Size (Default Resolution)	7.03125 $\mu$ m
Precision	Accuracy (unidirectional): 1,037.5 $\mu$ m   Repeatability: < 20 $\mu$ m
Backlash	< 250 $\mu$ m
Motor Power	Peak Thrust: 90N   Maximum Torque: 180 N•cm
Operating Temperature Range	0 to 50 °C
Maximum Load	Maximum Centered Load: 500 N   Maximum Cantilever Load: 5 N•m
Electrical	Maximum Current Draw: 3500 mA



# Imatest Collimator Fixture

*Relay lens system for simulating long test distances*

## Why the Imatest Collimator Fixture?

Cameras with long-focus distances can be difficult to test in a compact space. Testing your imaging system at distances up to infinity can be achieved using relay optics. The Collimator Fixture is configurable to your working distances and fields of view with an adjustable lens-to-chart distance, interchangeable collimating lenses, and charts.



*Size: 951mm (37.44") length x 1300mm (51.18") width x 797mm (31.38") height (depending on required light panel size)*

## Included with the Fixture

- ✓ Joystick and computer-control interface for automatic positioning using four motorized stages.
- ✓ Storage and recall of device positions.

## Requirements

- ✓ Entrance pupil diameter of device under test must be less than or equal to the exit pupil size of the collimating lens.
- ✓ Camera needs to be aligned precisely with the optical axis of the collimator.



## Available Collimator Lenses

Lens	Wavelength	FOV	Exit Pupil Size	Virtual Object Distance
<b>CL736i</b>	Visible	70°	15.0mm	400mm - Infinity
<b>CL921e</b>	Visible	90°	4.5mm	400mm - Infinity
<b>CL1021i</b>	Visible	100°	4.5mm	400mm - Infinity
<b>CL1223i</b>	Visible	120°	4.5mm	350mm - Infinity
<b>CL825I</b>	IR (850nm, 940nm)	80°	4.0mm	400mm - Infinity
<b>CL921IR</b>	IR (850nm, 940nm)	90°	4.5mm	400mm - Infinity



*70° Medium Field of View  
Collimator Lens*



*90° Field of View  
Collimator Lens for Mobile*



*120° Wide Field of View  
Collimator Lens*

Light Panel	Size	Illumination
<b>C</b>	432mm x 305mm	<b>Visible</b> 100 - 1000 lux 3100K, 4100K, 5100K, 6500K  <b>NIR</b> 2 ~ 20 W/m <sup>2</sup> 850nm or 940nm
<b>D</b>	610mm x 432mm (24.02" x 17.01")	
<b>E</b>	907mm x 540mm (35.71" x 21.26")	
<b>F</b>	907mm x 680mm (35.71" x 26.77")	
<b>G</b>	1225mm x 680mm (48.23" x 26.77")	

### Adjustable long-distance testing for confined spaces

The CM10120 system allows users to simulate a test distance from 1m - infinity. This is useful for testing camera systems that have long focus distances since lab space and production line space are usually limited. The simulated distance is manually adjustable across the entire range. Multiple units can be configured to project multiple targets into a camera if simultaneous multi-region testing is required.

- ✓ Manually adjustable diopter barrel for changing simulated distance
- ✓ High-resolution B&W film target reticle
- ✓ Manually controlled 6000K or NIR LED light source
- ✓ 10° inspectable FOV

- ✓ Manual adjustment of light levels
- ✓ Independent channel control; each channel can drive a single CM10120 unit
- ✓ Default Configurations: 4 channel, 8 channel, and 13 channel
- ✓ Works for both VIS and NIR configurations





## CM10120 Specifications

Specifications	Details
Weight	0.87kg
Shipping weight	2.08kg (Net weight: 1.08kg)
Overall dimensions	376.5mm x 77.4mm (L x diameter)
Inspectable FOV	10°
Effective focal length	323.9mm
Exit pupil size	ø4.5mm
VIS LED color temperature	6000K ± 500K
NIR LED wavelengths	850nm or 940nm
Target reticle diameter	60.2mm

## LED Controller Specifications

Specifications	OSLED-4CH	OSLED-8CH	OSLED-13CH
Weight	4.55kg	5.95kg	6.42kg
Shipping weight	5.55kg	7.1kg	7.42kg
Shipping dimensions	47cm X 35cm X 34cm	47cm X 35cm X 34cm	47cm X 35cm X 34cm
Overall dimensions	200mm X 170mm X 340mm	200mm X 170mm X 340mm	200mm X 170mm X 340mm
Input Voltage	AC110~220V(50Hz/60Hz)	AC110~220V(50Hz/60Hz)	AC110~220V(50Hz/60Hz)



# Imatest Thouslite LEDCube & Fixture

*Tunable LED light sources with adjustable stands*

## Why Choose the Imatest Thouslite LEDCube & Fixture?

The Thouslite LEDCube and Imatest Fixture allow you to integrate this highly tunable reflective light source into your test lab. Reproduce any phase of daylight with the highest quality Color Rendering Index (CRI: 99) and Metamerism Index (MI: Grade A). Simulate various lighting environments to evaluate the performance of your camera or sensors, including tests for auto white balance, color rendering, auto exposure, etc.

## Imatest Thouslite LEDCube & Fixture Features

- ✓ Reproduce high quality blackbody & daylight illuminants including tungsten and daylight
- ✓ Correlated Color Temperature (CCT) from 2700K to 6500K with CCT accuracy  $\leq \pm 50\text{K}$
- ✓ Luminance adjustable with no warm up time
- ✓ High uniformity ( $< 96\%$ ) with flicker free light output
- ✓ Optimized heat management and driver board design for excellent long term stability
- ✓ LEDCube hardware can save up to 80 light source presets programmable via software
- ✓ Fast & accurate calibration - compatible with spectrometer and LEDNavigator software
- ✓ Dynamic lighting - Programmable light sequences and intervals
- ✓ LED channel wavelength selection
  - service includes UV, Visible, and
  - NIR wavelengths
- ✓ Place up to 3 LEDCubes on each





# Imatest Thouslite LEDCube & Fixture Specifications

Specifications	Details
Weight	LEDCube-C15: 7 kg (15.5 lbs)   LEDStand (pair): 27.2 kg (60 lbs)
LEDCube Dimensions	300 x 300 x 210 mm   Emitter Dimensions: 270 x 270 mm
Fixture Dimensions	620 x 500 x 1873 mm (24.41" x 19.69" x 73.74")
Crate Dimensions	1816.1 x 622.3 x 482.6 mm (71.5" x 24.5" x 19")
Total Shipping Weight	91 kg (200 lbs)
LED Channels	15 Channels
Spectral Range	350-700nm
LED Lifetime	>10,000 Hours
Predefined Illuminants	Standard daylight D65, 050 CIE Ra: 33.85< Grade A (<0.25)
Tunable Range	CCT: 2000~20000K, CIE Ra: 0~100, Duv: -0.02~+0.02
Maximum Illuminance @ 1 m	D50: 1250 lux   D65: 850 lux
Short-term Stability	D65< ±10K, D50<±5K; Luminance <0.5%
Long-term Stability	D65< ±25K, D50<±15K; Luminance <0.5%
Electrical	110/230V, 50/60HZ, 180W



# Imatest Puck Plate

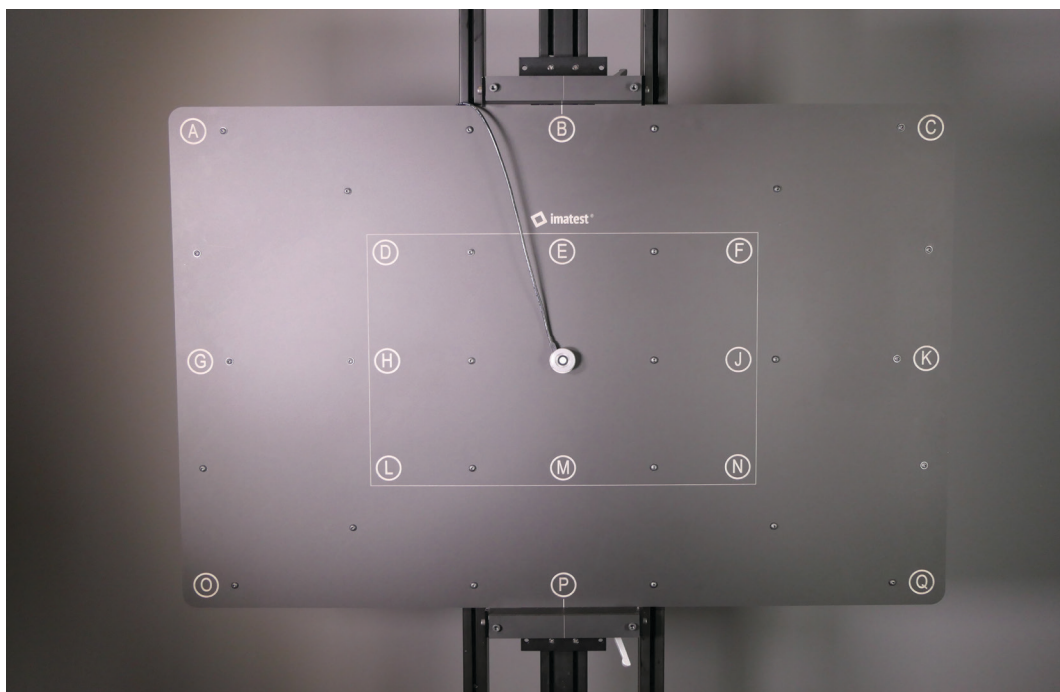
## *Isolight Puck Plate for Measuring Reflective Uniformity*

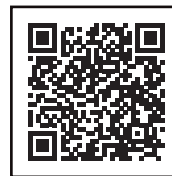
### Why Choose the Imatest Puck Plate?

The Isolight Puck light and color sensor is an ideal companion for image quality testing or camera calibration. Quickly set and verify your lighting color and light level. The Puck plate features embedded magnets on a 3x3 grid for measuring uniformity across the surface of size 2x or 4x reflective test charts with a single Isolight Puck.

### Imatest Puck Plate Features

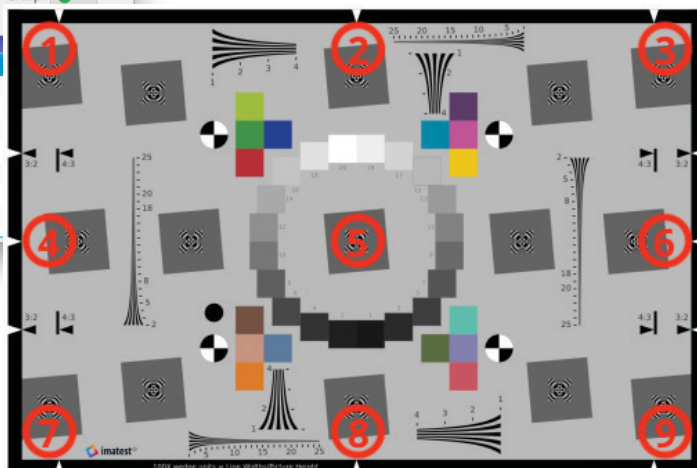
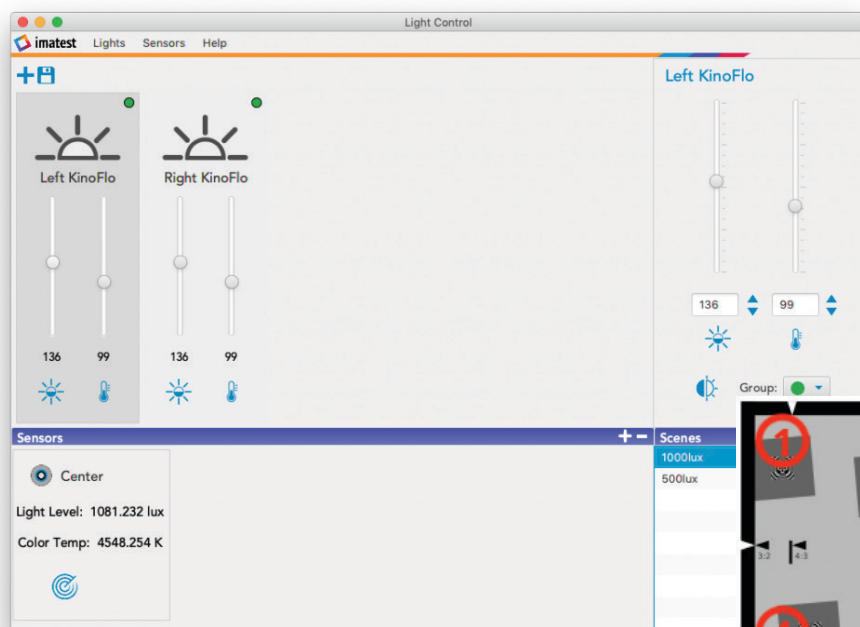
- ✓ Embedded magnets for quick, repeatable positioning of Isolight Pucks
- ✓ Measure uniformity across the surface of your test chart with a single Isolight Puck
- ✓ Includes a 3x3 grid for both size 2x and 4x reflective test charts
- ✓ Measure lighting intensity and color temperature
- ✓ Serial-over-USB interface is compatible with Windows, Mac, Linux, and Android devices
- ✓ Angular response is cosine fourth function
- ✓ The full-color RGB LED ring can be programmed to alert you to any lighting condition





# Imatest Puck Plate Specifications

Specifications	Details
Weight	11Kg (24lbs)
Dimensions	1277mm x 851mm x 14mm
Supported Chart Sizes	eSFR ISO 2x (610mm x 400mm)   eSFR ISO 4x (1220mm x 800mm)
Shipping Weight	23Kg (51lbs)
Shipping Dimmensions	1111.25mm x 1409.7mm x 114.3mm
Isolight Puck LUX Value Range	0.1 lux to 1.0 Mlux
Isolight Puck LUX Value Accuracy	Greater of 2 lux or +/-5% of reading
Isolight Puck Color Response	Full Color Response in CIE-x, or CIE-y coordiantes, Color temperature (K)
Isolight Puck Color Temp Accuracy	+/-100K at 2856K
Isolight Puck Chromaticity	+/-0.005 in CIE xy chromaticity space within 0.05 delta uv from the Blackbody locus
Isolight Puck Power Requirements	200mA, USB 2.0 mini-B connector
Isolight Puck Dimmensions	40mm x 40mm x 21mm



# Jeti Specbos Broadband Spectroradiometer

*Miniaturized, fast, and versatile broadband spectroradiometer*

## Why Choose the Jeti Specbos 1211-2 Broadband Spectroradiometer?

The Jeti specbos 1211-2 is a miniaturized and fast broadband spectroradiometer covering the wavelength range from 350 ~ 1000nm. It can be used for various applications both in lab as well as in production and can measure in Radiance and in Irradiance mode based on its NIST traceable calibration. Includes 90° diffusor to allow Irradiance measurements perpendicular to the instrument.

## Jeti Specbos 1211-2 Broadband Spectroradiometer Features:

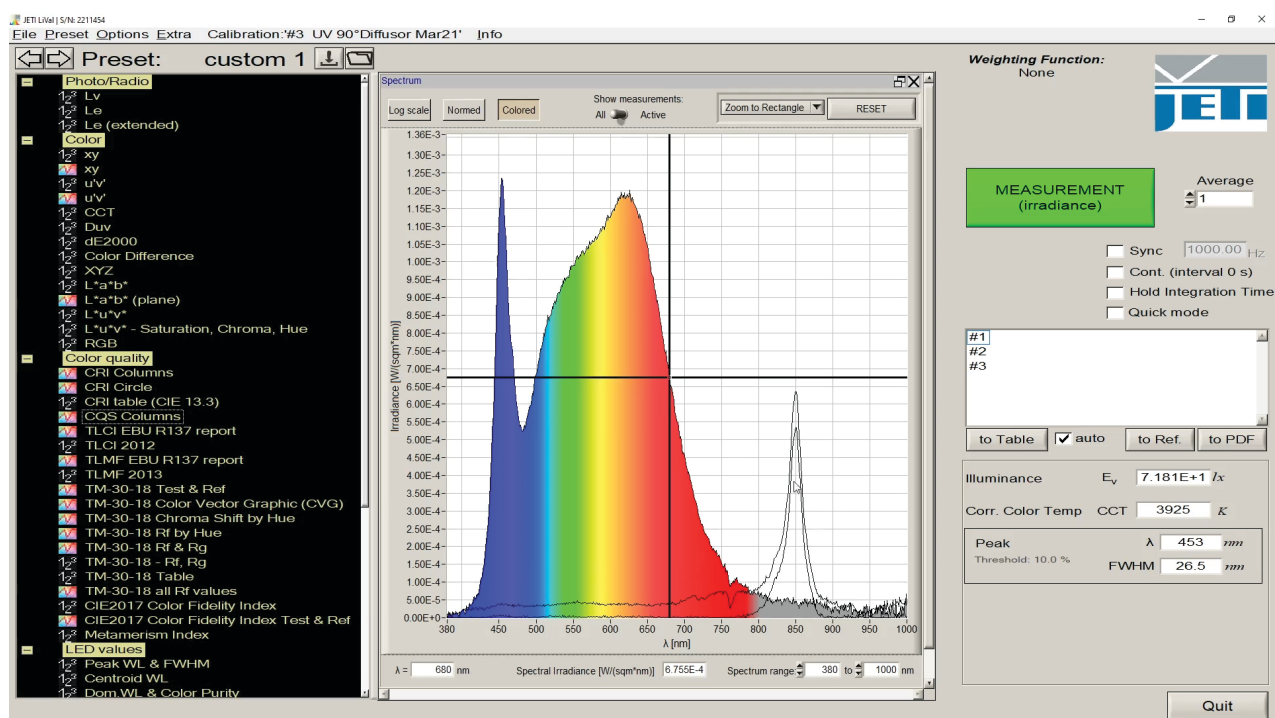
- ✓ Wavelength range from VIS to NIR (300nm to 1000nm)
- ✓ Radiometric software JETI LiVal included, as well as a 90° diffusor to allow irradiance measurements to the instrument
- ✓ Measure luminance, radiance, illuminance, irradiance, xy and u'v' coordinates, CCT, color rendering index, and more
- ✓ Spectral calculations, saving of reference spectra, and data export in csv and xls files
- ✓ Measurement also possible with DLLs or SCPI compatible commands
- ✓ Small and easy to use, yet highly sensitive
- ✓ NIST traceable calibration
- ✓ Mechanical shutter for dark signal compensation





# Jeti Specbos Broadband Spectroradiometer Specifications

Specifications	Details
Weight	450g
Dimensions	180mm x 82mm x 53mm
Operating conditions:	10°-40° C   Humidity < 85%   relative humidity at 35°C
Optical bandwidth	4.5nm
Measuring range	Luminance 0.2 ... 100 000 cd/m2 Illuminance 1 ... 500 000 lux
Wavelength resolution	1nm
Digital electronic resolution	15 bit ADC
Viewing angle	1.8° (luminance mode)
Measuring distance/diameter	20cm - Ø 6mm; 100cm - Ø 31mm (luminance mode)
Accessories included:	PC software JETI LiVal for Windows 8.1/ 10, operating instructions and software development kit on BT stick, USB cable, battery charger and trigger connector, tripod, carrying case, protection cap





# Training

*Increase your knowledge of image quality testing*



## How Our Training Courses Work

You'll gain access to our recorded two-day training courses for three weeks. Our courses cover the factors contributing to image quality, how to select appropriate test charts, and how to use Imatest. Contact [training@imatest.com](mailto:training@imatest.com) for pricing on customized in-house training.

## You will learn how to:

- ✓ Assess overall image quality.
- ✓ Measure key image quality factors using Imatest.
- ✓ Understand and interpret Imatest output.
- ✓ Avoid common mistakes in applying Imatest.
- ✓ Set up and tailor your test lab for accurate measurements.
- ✓ Select the appropriate test charts.
- ✓ Configure options to achieve particular testing objectives.
- ✓ Balance the tradeoff between yield and end-user satisfaction.
- ✓ Automate tests for manufacturing quality control.





# Consulting & Services

*Get customized support for all of your imaging needs*



## How Can Our Experts Help You?

Imatest offers innovative solutions to address key issues in the design, development, and testing of imaging applications. We can adapt our algorithms to the characterization of unconventional imaging systems and optimize the efficiency of your testing procedures by maximizing the number of quality factors obtained from each test image. Imatest can also offer test lab services to test your device in our own world-class test lab.

*For a major medical device company, Imatest developed software to remove honeycomb patterns introduced by fiberscopes and developed blemish detection algorithms and software.*

*Developed custom test charts and procedures to assess the image quality of a revolutionary new imaging system for a major medical device company.*

## Experts Available in the Following:

- ✓ Imaging and color science.
- ✓ Camera image quality/system characterization.
- ✓ Digital signal processing/image enhancement pipeline.
- ✓ Computer science.
- ✓ Electrical engineering.
- ✓ Physics.
- ✓ Biomedical photography.
- ✓ Camera calibration.
- ✓ Remote sensing.

*Integrated direct acquisition from development kits included in Imatest software for several image sensor manufacturers.*

*Imatest generated innovative infrared test charts designed to work in harsh physical environments for the US military.*

*Constructed test methods and software to support quality control of night vision scopes for a supplier to the US military.*



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