

APPLIED IMAGE Inc.

Catalog

World leader for over 25 years of Imaging Calibration Standards and Electro-Optical Components

- Sinusoidal Arrays
- Bar Code Standards
- Resolution Test Targets
- Photo Mask Making Services
- Density Wedges - Gray Scales
- Rotary & Linear Encoders
- Image Analysis Standards
- Ronchi Rulings • Reticles
- Linear Calibration Standards
- N.I.S.T. Calibration Services

As our name clearly indicates, our business is IMAGING!

Established in 1978, **APPLIED IMAGE** has become a world leader in the field of opto-imaging components and standards. We achieved this distinction by manufacturing a wide variety of tight tolerance precision images to thousands of very discriminating companies like yours world wide. From precision reticles & microscopy vision standards to test targets & image analysis arrays, our customers look to **APPLIED IMAGE** for all of their opto-imaging needs. One special note of interest is that **APPLIED IMAGE** is the only supplier in the world of both sinusoidal test patterns (Sine Patterns) & certified bar code calibration standards - a distinction that we are proud of. In addition, **APPLIED IMAGE** excels in the manufacturing of custom optical encoders, masks & reticles, electro-optical components and metrology imaging standards specific to your requirements.



People & Systems

Not only does **APPLIED IMAGE** produce high quality images, but we can also assist you from conceptual design through prototype & evaluation, to final production, while keeping your specific requirements in mind. Let our years of experience provide for your specific product requirements assuring that you receive exactly what you need.

Our capable engineering team, using the most advanced technologies, will make sure that your product is made to specifications, on time, and within your budget.

We are **APPLIED IMAGE**, committed to you, our valued customer.



Quality Systems

The quality assurance / quality control process assumes considerable importance when you routinely operate in the micro tolerance region. At **APPLIED IMAGE**, quality is assured at each stage of the production process from design conception & engineering through final production. This commitment, combined with controlled environmental facilities, NIST traceable standards, and a highly qualified staff assures you that our products will meet or exceed your original specifications. And we've even gone the extra step, using ISO Certification guidelines and National Laboratory Calibration Standards, to assure that our systems are in compliance with today's demanding needs.



Standard Products or Custom Designs

Over the years, **APPLIED IMAGE** has created a wide assortment of STANDARD CALIBRATION products for the optical, imaging, microscopy, vision & robotics, bar code, medical imaging, scanning and photonics industries. In addition, we can modify and adopt our various standards to your specific needs, or design a completely new standard or component, in order to more closely meet your specific calibration or imaging requirements.

If a CUSTOM DESIGN is required, our expert staff will assist you in creating the exact opto-imaged component that you need. **APPLIED IMAGE**, *Your Single Source IMAGING Provider*.

Give us a call - **APPLIED IMAGE** - working very hard to earn and keep your business.

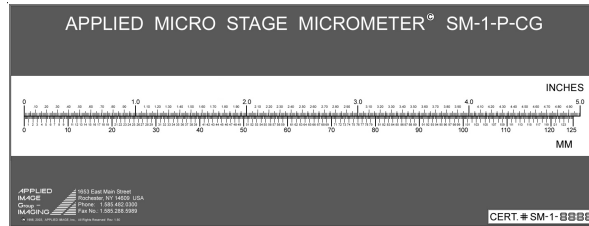
APPLIED IMAGE Inc.

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rev. 03-08

Stage Micrometers

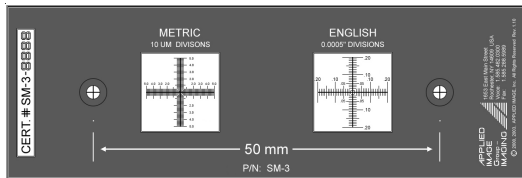
MICROSCOPY CALIBRATION STANDARDS



SM- 1 - **

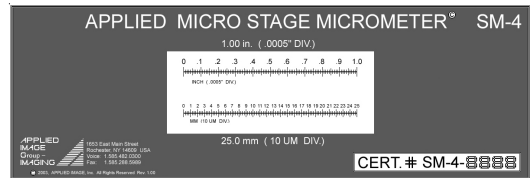
Glass Size: 2" x 5.25" (50mm x 132mm)
 Scale Length: 5 inch (English) X-axis only
 125mm (Metric) X-axis only

Divisions: English = 0.01" Metric = 100µm
 With numerical labeling every 1mm and 0.1 in.



SM- 3 - **

Glass Size: 1" x 3" (25mm x 75mm)
 Scale Length: 0.40 inch (English) X & Y Axis
 10.0 mm (Metric) X & Y axis
 Divisions: English = 0.0005" Metric = 10µm
 With numerical scale labeling every 0.1mm and 0.05 in.

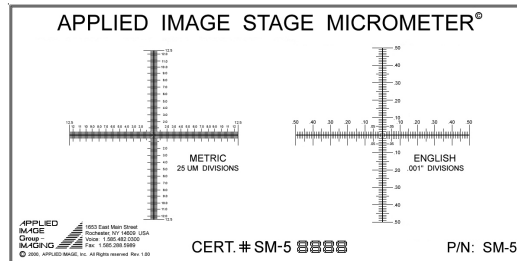


SM- 4 - **

Glass Size: 1" x 3" (25mm x 75mm)
 Scale Length: 1.0 inch (English) X-axis only
 25mm (Metric) X-axis only
 Divisions: English = 0.0005" Metric = 10µm
 With numerical scale labeling every 0.1mm and 0.05 in.

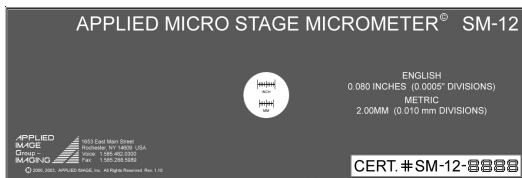
SM- 5 - **

1.5" x 3" (38mm x 75mm)
 1.0 inch (English) X & Y axis
 25mm (Metric) X & Y axis
 English = 0.001" Metric = 25µm
 With numerical scale labeling every 1mm and 0.1 in.



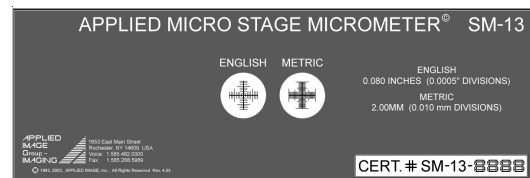
SM- 6 - **

1.5" x 3" (38mm x 75mm)
 1.0 inch (English) X & Y axis
 25mm (Metric) X & Y axis
 English = 0.0005" Metric = 10µm
 With numerical scale labeling every 0.1mm and 0.05 in.



SM- 12 - **

Glass Size: 1" x 3" (25mm x 75mm)
 Scale Length: 0.08 inch (English) X-axis only
 2.0mm (Metric) X-axis only
 Divisions: English = 0.001" Metric = 25µm
 no numerical scale labeling



SM- 13 - **

Glass Size: 1" x 3" (25mm x 75mm)
 Scale Length: 0.08 inch (English) X & Y Axis
 2.0mm (Metric) X & Y axis
 Divisions: English = 0.001" Metric = 25µm
 no numerical scale labeling

NOTE:

All **SM**, **IAM** and **Accu-CAL** SERIES Standards are available with Secondary or Direct NIST certification

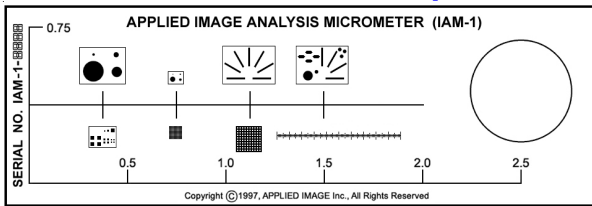
* * insert desired substrate material code = **CG** (Chrome on **G**lass) **or** **OP** (**OP**al glass)

Image Analysis

VISION CALIBRATION STANDARDS

APPLIED IMAGE is proud to introduce the *IAM Series*, the first complete and true line of **Image Analysis Microscopy Calibration Standards** specifically designed to address the complex needs of today's generation of image analysis and machine vision systems. These unique standards are designed to test multiple morphometric parameters to assure that your image analysis system is working properly, meeting the required calibration / certification requirements of your vision measurement system.

Morphometric Image Analysis Standard Part No. IAM-1 **

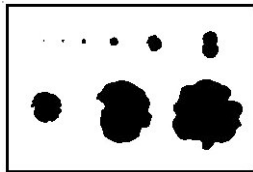


Ideally suited for morphological calibration where two dimensional shapes have to be measured with accuracy. Composed of eight test plates of various shapes, positions, angles and sizes. We even included a linear measurement scale for calibrating your imaging system.

Overall size: 1" x 3" **Image:** positive image / chrome

Plate	Frame Size	Description	Plate	Frame Size	Description
1	4600 x 3500 µm	CIRCLES - 2000, 1000, 500 & 250 µm dia.	5	1000 x 800 µm	SQUARES - 100, 40, 20 µm set of 2 ea.
2	1000 x 800 µm	CIRCLES - 500, 250, 125 & 62.5 µm dia.	6	2050 x 1650 µm	GRID PATTERNS - 50 µm open area and 50 µm line thickness
3	1000 x 800 µm	BARS - 200 x 20 µm at 30 degrees	7	4200 x 3400 µm	GRID PATTERNS - 200 µm open area and 200 µm line thickness
4	1000 x 800 µm	Various shapes, circles, bars and angular designs	8	10,000 µm long	Scale with 10 µm division

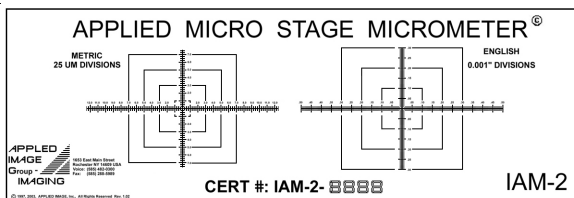
ASTM Grain Size / Nodularity Analysis Standard Part No. IAM-MET



Test Plate No. 4

Based on the Original IAM-1 Morphometric Image Analysis Standard above, the IAM-MET Grain / Nodularity standard is a multiple morphology calibration standard which was designed specifically for and by ASTM. The difference between the IAM-1 and IAM-MET is Plate No. 4. In the IAM-MET, test plate 4 has nine simulated images of irregular granular features most often found in metallurgical applications. In compliance with ASTM, the standard comes with Secondary Certification; Plate No. 8 (10,000 µm scale); and either Plate No. 1 (CIRCLES - 2000 µm, 1000 µm, 500 µm, & 250 µm diameters); **or** No. 2 (CIRCLES - 500 µm, 250 µm, 125 µm, & 62.5 µm dia.).

Linear (X & Y axis) Scale Part No. IAM-2 **



A dual axis linear micrometer that can accurately calibrate optical magnification, reticule scales and camera aspect ratio on a single standard for both axis without rotation. In addition, it can be used to calibrate and check linear stage motion or related auto measuring systems. Scales are in both English (inches) and Metric (millimeters) measurements.

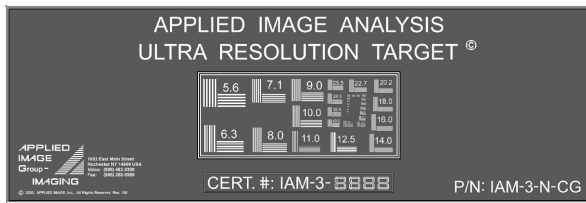
Overall size: 1" x 3" **Image:** negative image / chrome
Scale Image: X = 1" (25mm) Y = 0.60" (15mm)
Divisions: English = 0.001" Metric = 25 µm

IAM-1 thru IAM-8

The IAM series is available on either glass for transmitted illumination applications, or opal for reflective illumination. When ordering, complete the part number with the following material code;

** material code = **CG** (Chrome on Glass) or **OP** (Chrome on OPal glass)

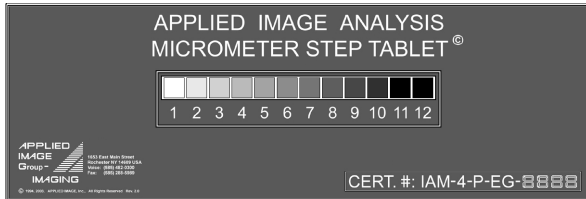
Ultra-High Resolution Target Part No. IAM-3 \ **



Based on the NIST/NBS 1010A and conforming to ANSI/ISO#2 standard, this target is ideal for verifying focus and resolution of high powered optical systems. With direct read information, the exact capabilities of the system will instantly be established. The values (in cycles per mm) are displayed next to 5 vertical and 5 horizontal evenly spaced bars, from 5.6 to 512 cycles per mm (89.2 μ m to 0.98 μ m bar sizes)

Overall size: 1" x 3" Image: negative image / chrome

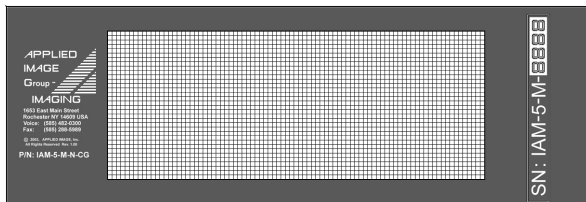
Neutral Density / Step Tablet Part No. IAM-4 \ **



Designed for illumination and detection calibration, which is needed for today's exacting imaging & vision systems. This tablet has 12 transmission steps, nominally ranging from 0 to 100% transmission. The neutral density step tablet is ideal for testing linearity of the sensing system.

Overall size: 1" x 3" Image: positive image / emulsion

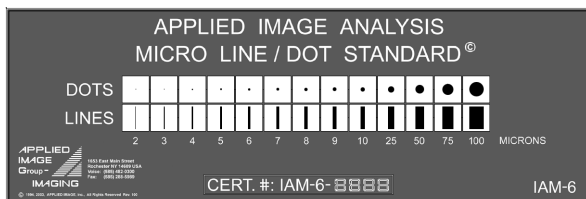
Stage Mapping / Grid Pattern Part No. IAM-5 \ **



The ideal standard for verifying / quantifying multiple image analysis parameters. Optical (barrel) distortion. Alignment between systems or optical paths. Cell areas for particle counting. The image area 20mm x 50mm. **Overall size:** 1" x 3"; image: negative image / chrome

Part No.	Clear Aperture	Opaque Lines	Pitch
IAM-5S	8.5 μ m sq.	1.5 μ m	10 microns
IAM-5M	180 μ m sq.	20 μ m	200 microns
IAM-5L	980 μ m sq.	20 μ m	1000 microns

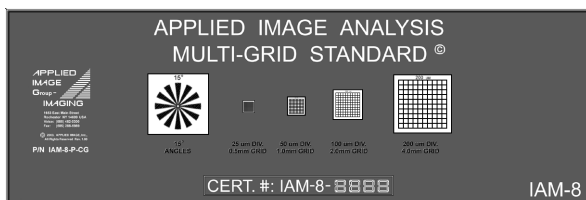
Micro Line / Dot Standard Part No. IAM-6 \ **



A standard specifically designed to calibrate CCD, CMOS devices and other geometric measuring imaging systems where CRITICAL MEASUREMENT (CD's) is important. Electronic sensors often have spurious resolution created by pixel dithering. The IAM-6 limits this calibration problem by providing known dot and line sizes (2 μ m, 3 μ m, 4 μ m, 5 μ m, 6 μ m, 7 μ m, 8 μ m, 9 μ m, 10 μ m, 25 μ m, 50 μ m, 75 μ m, 100 μ m) to test the sensor / optical capability.

Overall size: 1" x 3" Image: positive image / chrome

Multi-Grid Standard Part No. IAM-8 \ **



A uniquely designed standard with 4 different grid size patterns; 0.5 x 0.5mm grid with 25 μ m pitch; 1.0 x 1.0mm grid with 50 μ m pitch; 2.0 x 2.0mm grid with 100 μ m pitch; and 4.0 x 4.0mm grid with 200 μ m pitch. As well as a Star Target with 15 degree angle increments. This standard can be used to test not only the overall frame distortion issues but also linear distances for a wide variety of magnification ranges from 1x to 1000x power.

Overall size: 1" x 3" Image: positive image / chrome

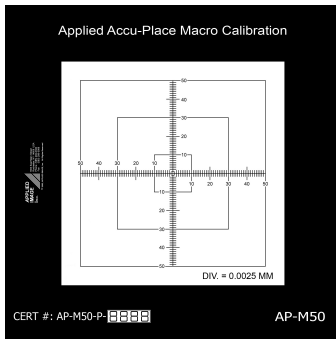
APPLIED Basic IAM Calibration Kit Part No. IAM-100-KIT / **

Composed of the three basic **APPLIED** Image Analysis standards needed for calibrating any system; the Morphometric (IAM-1); the Linear Scale (IAM-2); and the Neutral Density / Step Tablet (IAM-4). The ideal calibration standards for the full service / discriminating lab.

Robotic Vision

CALIBRATION STANDARDS

ACCU-PLACE™ Macro Calibration Standard



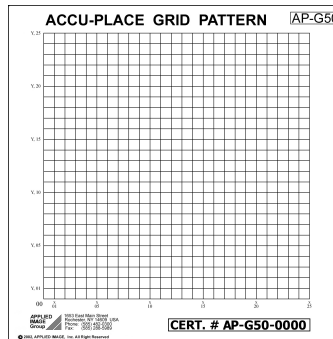
All *Accu-Place* Macro Calibration Standards have both X & Y axis metric scales. These dual axis standards are ideal for calibrating optical magnification, linear distance, stage motion as well as squareness of stage. In addition, with the larger area calibration scale, the calibration of low power optical systems over the longer distances can be easily carried out.

Part No.	AP-M50 / **	AP-M100 / **
Glass Size:	100mm x 100mm	125mm x 125mm
Scale (X&Y):	50mm x 50mm	100mm x 100mm
Divisions:	Metric = 25 µm	Metric = 50 µm

Part No.	AP-M200 / **	AP-M300 / **
Glass Size:	250mm x 200mm	350mm x 200mm
Scale (X&Y):	200mm x 150mm	300mm x 150mm
Divisions:	Metric = 100 µm	Metric = 200 µm

Pitch Accuracy: 2µm on Chrome on Glass or OPal glass

ACCU-PLACE™ Grid Indexing Patterns



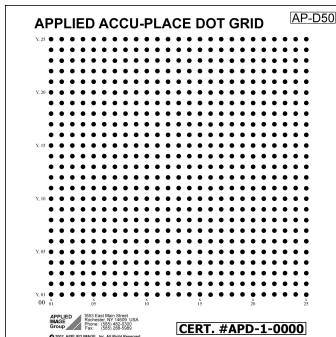
All *Accu-Place* Grid Indexing Pattern standards have number/letter indexed columns and rows for easy calibration of stage squareness, travel distance and motion. Ideally suited for image analysis as well as visual inspection systems where precise motion must be calibrated and measured.

Part No.	AP-G50 / **	AP-G100 / **
Part Size:	100mm x 100mm	125mm x 125mm
Grid (X&Y):	50mm x 50mm	100mm x 100mm
Pitch:	Metric = 1.0mm	Metric = 2.0mm

Part No.	AP-G200 / **	AP-G300 / **
Part Size:	250mm x 200mm	350mm x 200mm
Grid (X&Y):	200mm x 150mm	300mm x 150mm
Pitch:	Metric = 5.0mm	Metric = 10.0mm

Pitch Accuracy: 1µm on Chrome on Glass or OPal glass

ACCU-PLACE™ Dot Patterns



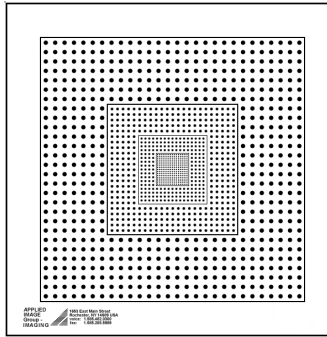
All *Accu-Place* Dot Pattern standards have indexed columns and rows for ease of use. Ideally suited for checking / verifying / quantifying optical (barrel) distortion; alignment between optical systems (or paths); as well as calibrating optical instruments that have both a vision and motion system.

Part No.	AP-D50 / **	AP-D100 / **
Part Size:	100mm x 100mm	125mm x 125mm
Grid (X&Y):	50mm x 50mm	100mm x 100mm
Pitch:	Metric = 1.0mm	Metric = 2.0mm
Dot Diameter:	0.1mm	0.2mm

Part No.	AP-D200 / **	AP-D300 / **
Part Size:	250mm x 200mm	350mm x 200mm
Grid (X&Y):	200mm x 150mm	300mm x 150mm
Pitch:	Metric = 5.0mm	Metric = 10.0mm
Dot Diameter:	0.5mm	1.0mm

Pitch Accuracy: 1µm on Chrome on Glass or OPal glass

ACCU-PLACE™ Dot Distortion Target



The *Accu-Place* Dot Distortion target is designed for measuring distortion in an optical system. The precise amount of distortion is determined from an array of precisely placed dots in a regular array. Such measurements can be used to correct for any distortion that occurs within the optical system.

	Dot Dia.	Dot Pitch	Grid Size
1st Zone:	2.00 mm	4.00 mm	100mm x 100mm
2nd Zone:	1.00 mm	2.00 mm	50mm x 50mm
3rd Zone:	0.50 mm	1.00 mm	24mm x 24mm
4th Zone:	0.20 mm	0.40 mm	11.6mm x 11.6mm

Part No.	AP-DD100 / **
Part Size:	152mm x 152mm

Pitch Accuracy: 1µm on Chrome on Glass or OPal glass

** insert desired substrate material code

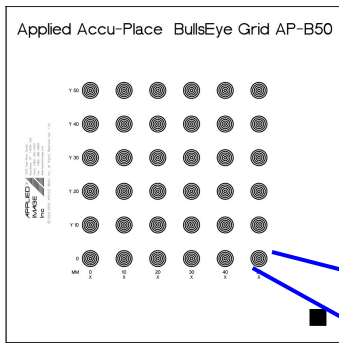
= **CG** (Chrome on Glass)

= **OP** (OPal glass)

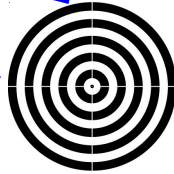
= **TM** (Transparent Material)

= **RM** (Reflective Material)

ACCU-PLACE™ BullsEye / Recognition Grid



The *Accu-Place Bulls Eye / Recognition Grid* is a unique concept in imaging calibration technology, designed with multiple series of circles within circles. This allows for multiple power magnification calibration as well as the testing of the system's ability to recognize and locate distinctive shapes within other shapes.



AP-B50 / **

100mm x 100mm
50mm x 50mm
Metric = 10mm
5mm

AP-B100 / *

125mm x 125mm
100mm x 100mm
Metric = 10mm
5mm

Part No.

AP-B200 / **

Part Size: 250mm x 200mm

Grid (X&Y): 200mm x 150mm

Pitch: Metric = 10mm

Circle Overall Size: 5mm

AP-B300 / **

Part Size: 350mm x 200mm

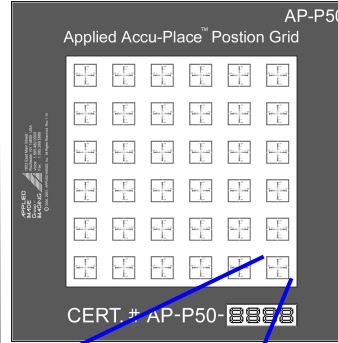
Grid (X&Y): 300mm x 150mm

Pitch: Metric = 10mm

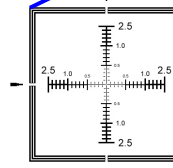
Circle Overall Size: 5mm

Pitch Accuracy: 1µm on Chrome on Glass or OPal glass

ACCU-PLACE™ Position Grid



The *Accu-Place - Position Grid* is a unique break through technology in testing POSITIONING and/or VISION recognition ability by having a matrix of small scales accurately positioned in a grid matrix format. The scales have a pitch accuracy of 1µm when produced on either Chrome on Glass or Chrome on Opal Glass.



AP-P50 / **

100mm x 100mm
50mm x 50mm
Metric = 10mm
5mm

AP-P100 / **

125mm x 125mm
100mm x 100mm
Metric = 10mm
5mm

Part No.

AP-P200 / **

Part Size: 250mm x 200mm

Grid (X&Y): 200mm x 150mm

Pitch: Metric = 10mm

Scale Overall Size: 5mm

AP-P300 / **

Part Size: 350mm x 200mm

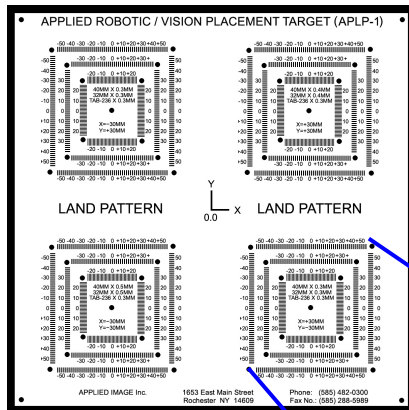
Grid (X&Y): 300mm x 150mm

Pitch: Metric = 10mm

Scale Overall Size: 5mm

Pitch Accuracy: 1µm on Chrome on Glass or OPal glass

Robotic ACCU-PLACE™ Pick and Place System



APPLIED IMAGE Group / IMAGING in conjunction with Hewlett Packard Corporation has developed a unique, and extremely accurate, **PICK & PLACE** target set designed to check for accuracy and repeatability of your robotic system, quick and easy.

The target set consists of a receiver grid (LAND PATTERN) and the parts to be picked (COMPONENTS). The component part is picked by the robotic system and placed onto the land pattern at which point Robotic / Vision position placement can be easily measured using the intergrated scales which are built into the target land pattern design.

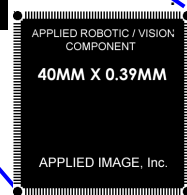
The **APPLIED ACCU - PLACE** Pick & Place Calibration System target addresses the important issues of the robotic "pick and place" testing in an inexpensive mode. The test set comes complete with full instructions.

The Land Pattern and all of the Test Components can be calibrated and certified to **N.I.S.T.** traceable standards. In addition, **APPLIED** offers Anti-Reflective coatings (AR) on all components.

The patterns can also be **customized for two sided systems** or on reflective materials where reflection images are a necessity (instead of transmission).

PLACEMENT ACCURACY

Direct Read to 5 microns
in the X, Y and theta positions



ACCU-PLACE Land Pattern Plate

APLP-1 Standard **ACCU-PLACE** Land Pattern plate consists of the following grids/scales:

40 mm x 0.5 mm pitch	32 mm x 0.5 mm pitch
40 mm x 0.4 mm pitch	32 mm x 0.4 mm pitch
40 mm x 0.3 mm pitch	32 mm x 0.3 mm pitch
TAB 236 x 0.3 mm (pitch)	

ACCU-PLACE Test Components

Available components sizes:

APTC-1 40mm x 0.5mm pitch	APTC-4 32mm x 0.5mm pitch
APTC-2 40mm x 0.4mm pitch	APTC-5 32mm x 0.4mm pitch
APTC-3 40mm x 0.3mm pitch	APTC-6 32mm x 0.3mm pitch
APTC-7 TAB 236 x 0.3mm pitch	

ACCU-PLACE Land Pattern Kit

APKIT-1 APPLIED IMAGE ACCU-PLACE Land Pattern Kit. Consisting of one each of the following:

APLP-1 Standard ACCU - PLACE Land pattern plate	APTC-1 40mm x 0.5mm pitch	APTC-2 40mm x 0.4mm pitch
APTC-3 40mm x 0.3mm pitch	APTC-4 32mm x 0.5mm pitch	APTC-5 32mm x 0.4mm pitch
APTC-6 32mm x 0.3mm pitch	APTC-7 TAB 236 x 0.3 mm pitch	

Sine Patterns

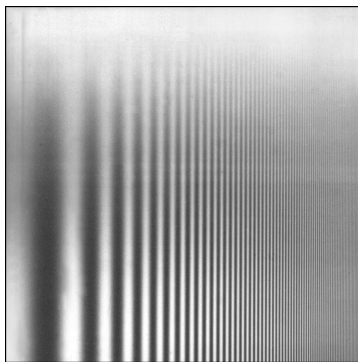
SINUSOIDAL ARRAYS

SINUSOIDAL TARGETS & ARRAYS

Over twenty years ago, Dr. Robert Lambert founded **SINE Patterns** on a single concept - to provide a new and better test array pattern for optical evaluations. After extensive research, Dr. Lambert developed the first *sinusoidal target array pattern*, for which he later received a US Patent. Since then, **SINE Patterns** has expanded its product line to provide *sinusoidal target arrays* for a variety of applications; from moiré contouring to *reliable* MTF evaluation of materials, lenses, cameras, and electro-optical systems.

Today, **SINE sinusoidal target arrays** are available exclusively from **APPLIED IMAGE** on transmission film or on reflective materials as well as in a variety of sizes and frequencies.

The reflection *sinusoidal pattern arrays* are made on reflective materials. They have proven to be very useful for MTF evaluation of various types of cameras and scanners. Because of the inherent limitations of reflective materials, the maximum spatial frequency of the reflective pattern arrays is limited to 20 cycles per mm.



SINUSOIDAL VISION DEMONSTRATION ARRAY

The *Sinusoidal Visual Demonstration Array* is designed to demonstrate the Modulation Transfer Function (MTF) of the human eye. Its transmittance varies sinusoidally and increases in spatial frequency from 0.2 to 20 c/mm, following a logarithmic scale. The modulation increases linearly from top to bottom. One can see, in the image, where the visual contrast contour disappears which is the MTF of the eye.

Ideally suited for teaching and demonstration - the **SINE Sinusoidal Visual Demonstration Array** is now available on either **RM - Reflective Material** (photo paper) or **TM Transmission Material** (film), mounted between glass or directly mounted in a glass 2" x 2" projection slide.

The SINE Reflective Sinusoidal Visual Demonstration Array on **Reflective Material** (photo paper);

Image size: 10 inch x 10 inch

Part No. **SINE LSR-1-RM**

The SINE Transmission Sinusoidal Visual Demonstration Array on **Transmission Material** (film)
mounted between glass;

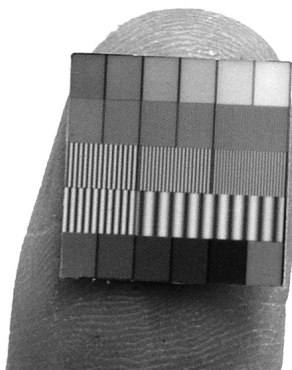
Image size: 2 inch x 2 inch

Part No. **SINE LSM-1-TM-G**

The SINE Transmission Sinusoidal Visual Demonstration Array on **Transmission Material** (film)
mounted into a 2 inch x 2 inch projection slide

Image size: 1.8 inch x 1.8 inch

Part No. **SINE LSM-1-TM-SL**



SINUSOIDAL ARRAY SINE M-13-60-S-RM for Fingerprint Conformance to IAFIS Requirements

The Newest **Sinusoidal Array**, **SINE M-13-60-S-RM**, was designed jointly by the Federal Bureau of Investigation, in Washington DC, and MITRE, of Bedford MA. The primary function of this new target is for computing Modulation Transfer Function (MTF) evaluation in live scanner fingerprint systems for conformance to Integrated Automated Fingerprint Identification Systems (IAFIS) image quality requirements. The array is on reflective material measuring 16mm by 16mm with sinusoidal arrays ranging in frequency from 1.0 to 10.0 cycles per mm; with nominal modulation of the sinusoidal areas at 60%. The top and bottom rows are density scales, from 0.20 to 1.20 densities.

The SINE Reflective Sinusoidal Array for Fingerprint Conformance to IADIS Requirements
on **Reflective Material** (photo paper);

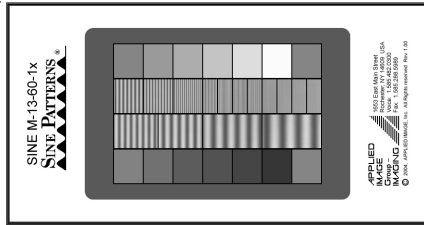
Image size: 16mm x 16mm

Part No. **SINE M13-60-S-RM**

Sine Patterns

SINUSOIDAL REFLECTIVE ARRAYS

SINUSOIDAL ARRAY SINE M-13-60



SINE M-13-60-1x

Density	0.7	0.6	0.5	0.4	0.3	0.2	0.7
Cycles per mm	0.75	1.0	1.5	2	3	4	5
Cycles per mm	0.5	0.375	0.25	0.1875			
Density	0.7	0.8	0.9	1.0	1.1	1.2	0.7

70 mm

48 mm

The *Sinusoidal Array* **SINE M-13-60** is designed to be used for evaluating systems that work in the reflective mode such as scanners, machine vision systems, and cameras. It is supplied in five different sizes. The map shown is the 1X version. The 1/2X and 1X slides incorporate the same spatial frequencies. Spatial frequencies for the 2X, 4X, and 8X versions are 1/2, 1/4 and 1/8 respectively.

The upper and lower rows, in each test pattern array, contain the gray scales and the numbers in the boxes indicate their approximate reflection density. The four corner areas are 0.7 density, all within 0.02 density, which are useful for checking uniformity of illumination. The inner rows contain the sinusoidal areas, having the indicated spatial frequencies noted on the map. Nominal modulation of the sinusoidal areas is 60%.

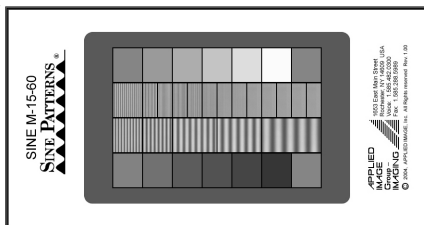
Each pattern array is supplied with a digital microdensitometer scan that lists the individual modulation values and density values of the gray scales. Modulation values are also given with compensation for the MTF of the microdensitometer.

The SINE M-13-60-1X pattern array is available in kit form with a 1.0 c/mm Ronchi Ruling standard as specified by the Federal Bureau of Investigation (FBI) specification for performance testing of fingerprint scanners. Software is available for use of this pattern to evaluate scanners. There is no charge for this software. (See also the FBI SIQT Scanner Test Chart).

Part No.	SINE M-13-60-1/2X-RM	SINE M-13-60-1X-RM	SINE M-13-60-2X-RM	SINE M-13-60-4X-RM	SINE M-13-60-8X-RM
Image Area	35mm x 23mm	70mm x 46mm	140mm x 92mm	280mm x 186mm	560mm x 372mm
Type	Reflective	Reflective	Reflective	Reflective	Reflective
Modulation	60%	60%	60%	60%	60%

- Catalog Numbering for Ordering Sinusoidal Array SINE M13-60:
SINE M-13 (basic array configuration) - **60** (percent modulation) - [**array magnification**]X - **RM** (Reflective Material)
- A digital microdensitometer scan is included with all Sinusoidal gratings.

SINUSOIDAL ARRAY SINE M-15-60



SINE M-15-60

Density	0.7	0.6	0.5	0.4	0.3	0.2	0.7
Cycles per mm	1.5	2	3	4	5	6	8
Cycles per mm	1.0	0.75	0.50	0.375	0.25		
Density	0.7	0.8	0.9	1.0	1.1	1.2	0.7

70 mm

48 mm

The reflective *Sinusoidal Array* **SINE M-15-60** is similar to the M-13-60 (1X version) except that the range of spatial frequencies begins with 0.2 cycles per mm and extends to 20 cycles per mm.

The outer two rows contain the gray scales and the numbers in the boxes in the diagram indicate their nominal density values. The two inner rows contain the sinusoidal areas and the numbers indicate the spatial frequencies in cycles per mm.

A digital microdensitometer scan is included with each pattern array. Modulation values are also given with compensation for the MTF of the microdensitometer.

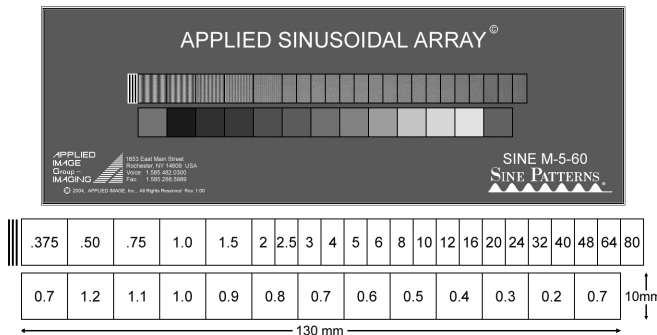
Part No.	SINE M-15-60-RM
Image Area	70mm x 48mm
Type	Reflective
Modulation	60%

Sine Patterns

SINUSOIDAL TRANSMISSION ARRAYS

The transmission *SINE Patterns sinusoidal target arrays* are made on extremely high resolution films. This makes it possible to achieve spatial frequencies as high as 256 cycles per mm. Most of *SINE sinusoidal target transmission array* patterns are available with modulation (contrast) values of 35%, 60% or 80%. Harmonic distortion the *sinusoidal target array* patterns are generally less than 3%.

SINUSOIDAL ARRAY SINE M-5



The *Sinusoidal Array SINE M-5* is made on a strip of 70mm film approximately 8.5 inches (215mm) in length.

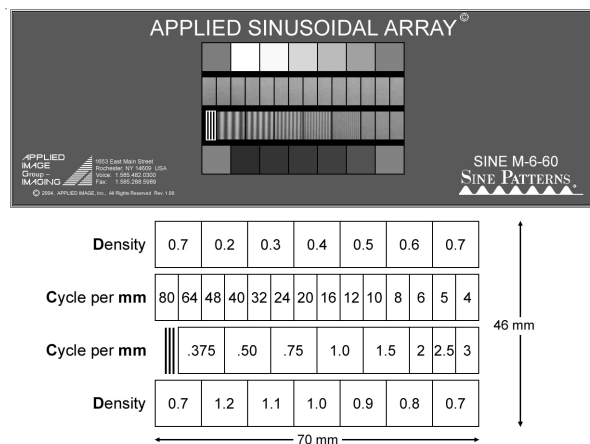
The upper row, as shown in the diagram, contains the sinusoidal areas with the spatial frequencies in cycles per mm. All sinusoidal areas are carefully oriented with respect to the others, and the lines at the left end of the array have been added for alignment purposes.

A gray scale is in the lower row and the numerals show the approximate density values. For the 80% modulation pattern the gray scale steps increase approximately 0.12% in size, in order that the scale exceeds the range of the sinusoidal areas.

A digital microdensitometer scan is included with each test target.

Part No.	Transmission Material		
	SINE M-5-35-TM	SINE M-5-60-TM	SINE M-5-80-TM
Image Area	130mm x 21mm	130mm x 21mm	130mm x 21mm
Type	Transmission	Transmission	Transmission
Modulation	35%	60%	80%

Transmission Material - Mounted between Glass		
SINE M-5-35-G	SINE M-5-60-G	SINE M-5-80-G
Image Area	130mm x 21mm	130mm x 21mm
Type	Transmission	Transmission
Modulation	35%	60%



SINUSOIDAL ARRAY SINE M-6

The *Sinusoidal Array SINE M-6* contains the same gray scales and sinusoidal areas as the M-5 but is arranged in a shorter and wider format, making it particularly useful when the complete array is to be imaged at one time.

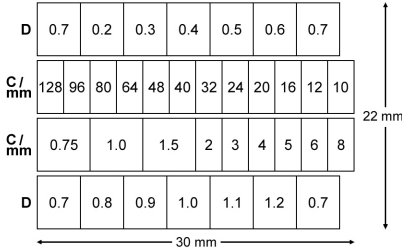
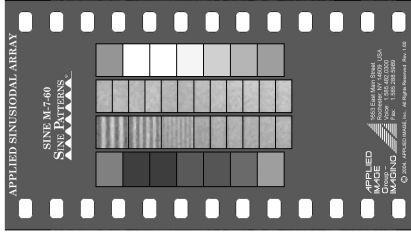
The overall size of the array is 46mm x 70mm; centered on an 8.5 inch (215mm) strip of 70mm film.

A digital microdensitometer scan is included with each test target.

Part No.	Transmission Material		
	SINE M-6-35-TM	SINE M-6-60-TM	SINE M-6-80-TM
Image Area	70mm x 46mm	70mm x 46mm	70mm x 46mm
Type	Transmission	Transmission	Transmission
Modulation	35%	60%	80%

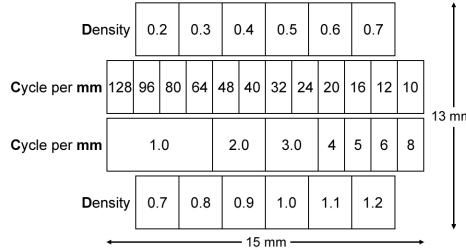
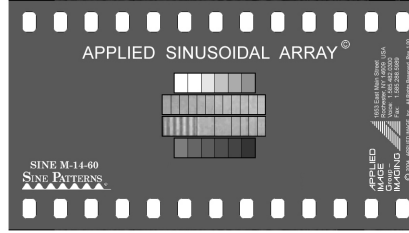
Transmission Material - Mounted between Glass		
SINE M-6-35-G	SINE M-6-60-G	SINE M-6-80-G
Image Area	70mm x 46mm	70mm x 46mm
Type	Transmission	Transmission
Modulation	35%	60%

SINE M-7



The *Sinusoidal Array SINE M-7* has an overall size of 22mm x 30mm which makes it small enough to fit into a standard 35mm projection frame. The gray scale is contained in the outer rows. It is made on 35mm perforated film. Also available, as a custom item, on a wider film (without perforations) cemented between glass.

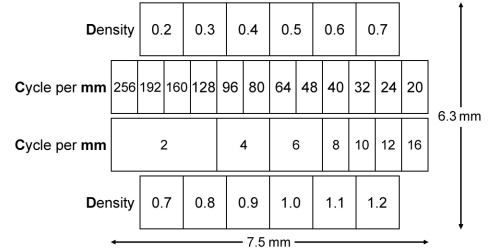
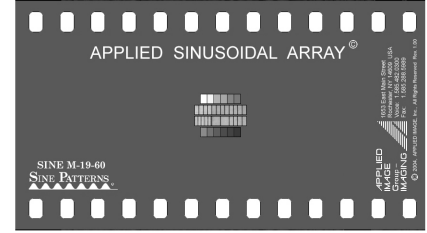
SINE M-14



The *Sinusoidal Array SINE M-14* was designed for various electro-optical applications, particularly where a small array is needed to fit into the frame. It can fit into an 18mm diameter circle or into a standard 35mm motion picture frame.

The lines in the **SINE M-14** lie perpendicular to the length of the film. In addition the pattern is available on a wider film (without perforations) cemented between glass.

SINE M-19



The *Sinusoidal Array SINE M-19* is a remarkable new test array that achieves 256 cycles per mm while maintaining a significant modulation. It is designed for testing high resolution optical systems such as microscopes. Because its maximum width is 7.5mm, the **SINE M-19** is small enough to fit easily onto a standard microscope slide. A 1" x 3" micro-slide, with cover slip, is an available mounting option.

Array	Transmission Material			Transmission Material - Mounted between Glass		
	35% Modulation	60% Modulation	80% Modulation	35% Modulation	60% Modulation	80% Modulation
SINE M-7	SINE M-7-35-TM	SINE M- 7-60-TM	SINE M- 7-80-TM	SINE M-7-35-G	SINE M- 7-60-G	SINE M- 7-80-G
SINE M-14	N/A	SINE M-14-60-TM	SINE M-14-80-TM	N/A	SINE M-14-60-G	SINE M-14-80-G
SINE M-19	N/A	N/A	SINE M-19-80-TM	N/A	N/A	SINE M-19-80-G

SINUSOIDAL SINGLE FREQUENCY GRATINGS

The Single Frequency Transmission Arrays have proven to be very useful for specialized MTF measurements as well as for applications such as moire contouring.

The modulation values for the harmonics are generally 2% or less. Minimum densities are approximately 0.2 and the average transmittance is about 30%.

Reflective single frequency arrays can also be custom produced for lower spatial frequencies.

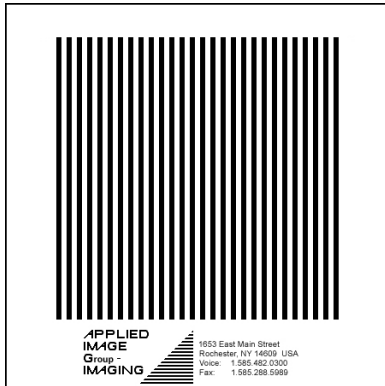
Frequency	Transmission Material	
	80% Modulation	90% Modulation
0.1 c/mm	SF-0.1-80-TM	SF-0.1-90-TM
0.2 c/mm	SF-0.2-80-TM	SF-0.2-90-TM
0.5 c/mm	SF-0.5-80-TM	SF-0.5-90-TM
1.0 c/mm	SF-1.0-80-TM	SF-1.0-90-TM
1.5 c/mm	SF-1.5-80-TM	SF-1.5-90-TM
2.0 c/mm	SF-2.0-80-TM	SF-2.0-90-TM
2.5 c/mm	SF-2.5-80-TM	SF-2.5-90-TM
3.0 c/mm	SF-3.0-80-TM	SF-3.0-90-TM
4.0 c/mm	SF-4.0-80-TM	SF-4.0-90-TM
5.0 c/mm	SF-5.0-80-TM	SF-5.0-90-TM
6.0 c/mm	SF-6.0-80-TM	N/A
8.0 c/mm	SF-8.0-80-TM	N/A
10.0 c/mm	SF-10.0-80-TM	N/A
12.0 c/mm	SF-12.0-80-TM	N/A
16.0 c/mm	SF-16.0-80-TM	N/A
20.0 c/mm	SF-20.0-80-TM	N/A
24.0 c/mm	SF-24.0-80-TM	N/A

Mounted between Glass	
80% Modulation	90% Modulation
SF-0.1-80-G	SF-0.1-90-G
SF-0.2-80-G	SF-0.2-90-G
SF-0.5-80-G	SF-0.5-90-G
SF-1.0-80-G	SF-1.0-90-G
SF-1.5-80-G	SF-1.5-90-G
SF-2.0-80-G	SF-2.0-90-G
SF-2.5-80-G	SF-2.5-90-G
SF-3.0-80-G	SF-3.0-90-G
SF-4.0-80-G	SF-4.0-90-G
SF-5.0-80-G	SF-5.0-90-G
SF-6.0-80-G	N/A
SF-8.0-80-G	N/A
SF-10.0-80-G	N/A
SF-12.0-80-G	N/A
SF-16.0-80-G	N/A
SF-20.0-80-G	N/A
SF-24.0-80-G	N/A

- Catalog Number for Ordering Sinusoidal Single Frequency Gratings:
SF - [frequency/mm] **G** - [percent - modulation] - [material] - (suffix "G" for Mounted in Glass) Ex: **SF-0.2-80-TM**
SF = Single Frequency - **0.2G** = frequency grating - **80** = percent modulation - **TM** = Transparent Material (film, photo)
 [add the suffix "- G" = for Mounted between Glass]
 - **A digital microdensitometer scan is included with all Sinusoidal gratings.**

Ronchi Rulings

and GRATINGS



APPLIED IMAGE precision **RONCHI RULINGS** are generated using our unique semi-conductor pattern-generators. The result is an extremely accurate ronchi pattern with smooth line edges and square edge profile.

Other optical-grade substrate materials (such as Quartz, Silicon, Alumina, etc.) as well as other frequencies (cycle/mm) are available upon request. In addition all substrate material can be machined to your specific size and requirements.

English **RONCHI RULINGS** are also available. Contact **APPLIED IMAGE** for the complete list.

	Transparent Material	Reflective Material
Image Area:	4 inch x 4 inch	4 inch x 4 inch
Overall Size:	5 inch x 5 inch	5 inch x 5 inch
0.5 c/mm	RR0.5-N-TM	RR0.5-N-RM
1.0 c/mm	RR1-N-TM	RR1-N-RM
2.0 c/mm	RR2-N-TM	RR2-N-RM
2.5 c/mm	RR2.5-N-TM	RR2.5-N-RM
3.0 c/mm	RR3-N-TM	RR3-N-RM
4.0 c/mm	RR4-N-TM	RR4-N-RM
5.0 c/mm	RR5-N-TM	RR5-N-RM
10.0 c/mm	RR10-N-TM	RR10-N-RM
20.0 c/mm	RR20-N-TM	N/A
30.0 c/mm	RR30-N-TM	N/A
40.0 c/mm	RR40-N-TM	N/A
50.0 c/mm	RR50-N-TM	N/A

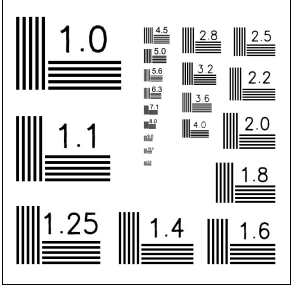
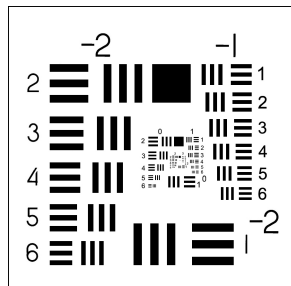
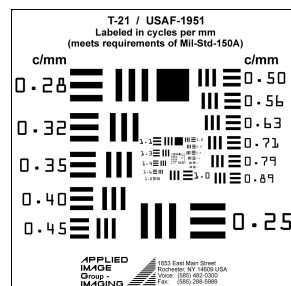
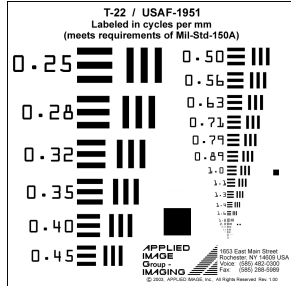
	Chrome on Glass		
Image Area:	1 inch x 1 inch	2 inch x 2 inch	4 inch x 4 inch
Overall Size:	2.5 inch x 2.5 inch	4 inch x 4 inch	5 inch x 5 inch
0.5 c/mm	RR0.5-12-CG	RR0.5-24-CG	RR0.5-45-CG
1.0 c/mm	RR1-12-CG	RR1-24-CG	RR1-45-CG
2.0 c/mm	RR2-12-CG	RR2-24-CG	RR2-45-CG
2.5 c/mm	RR2.5-12-CG	RR2.5-24-CG	RR2.5-45-CG
3.0 c/mm	RR3-12-CG	RR3-24-CG	RR3-45-CG
4.0 c/mm	RR4-12-CG	RR4-24-CG	RR4-45-CG
5.0 c/mm	RR5-12-CG	RR5-24-CG	RR5-45-CG
10.0 c/mm	RR10-12-CG	RR10-24-CG	RR10-45-CG
20.0 c/mm	RR20-12-CG	RR20-24-CG	RR20-45-CG
30.0 c/mm	RR30-12-CG	RR30-24-CG	RR30-45-CG
40.0 c/mm	RR40-12-CG	RR40-24-CG	RR40-45-CG
50.0 c/mm	RR50-12-CG	RR50-24-CG	RR50-45-CG
100.0 c/mm	RR100-12-CG	RR100-24-CG	RR100-45-CG
150.0 c/mm	RR150-12-CG	RR150-24-CG	RR150-45-CG
200.0 c/mm	RR200-12-CG	RR200-24-CG	RR200-45-CG
250.0 c/mm	RR250-12-CG	RR250-24-CG	RR250-45-CG
300.0 c/mm	RR300-12-CG	RR300-24-CG	RR300-45-CG
400.0 c/mm	RR400-12-CG	RR400-24-CG	RR400-45-CG
500.0 c/mm	RR500-12-CG	RR500-24-CG	RR500-45-CG

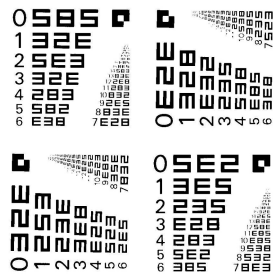
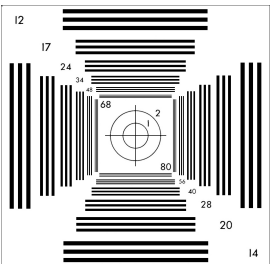
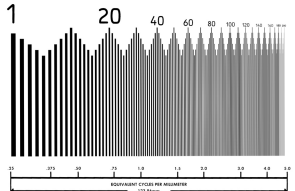
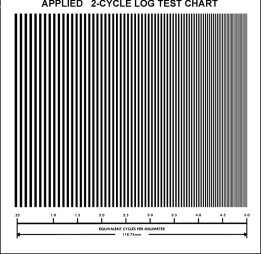
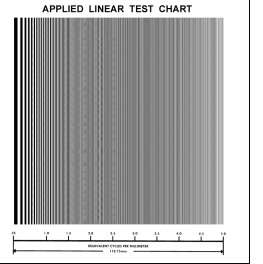
	OPal glass		
Image Area:	1 inch x 1 inch	2 inch x 2 inch	4 inch x 4 inch
Overall Size:	2.5 inch x 2.5 inch	4 inch x 4 inch	5 inch x 5 inch
0.5 c/mm	RR0.5-12-OP	RR0.5-24-OP	RR0.5-45-OP
1.0 c/mm	RR1-12-OP	RR1-24-OP	RR1-45-OP
2.0 c/mm	RR2-12-OP	RR2-24-OP	RR2-45-OP
2.5 c/mm	RR2.5-12-OP	RR2.5-24-OP	RR2.5-45-OP
3.0 c/mm	RR3-12-OP	RR3-24-OP	RR3-45-OP
4.0 c/mm	RR4-12-OP	RR4-24-OP	RR4-45-OP
5.0 c/mm	RR5-12-OP	RR5-24-OP	RR5-45-OP
10.0 c/mm	RR10-12-OP	RR10-24-OP	RR10-45-OP
20.0 c/mm	RR20-12-OP	RR20-24-OP	RR20-45-OP
30.0 c/mm	RR30-12-OP	RR30-24-OP	RR30-45-OP
40.0 c/mm	RR40-12-OP	RR40-24-OP	RR40-45-OP
50.0 c/mm	RR50-12-OP	RR50-24-OP	RR50-45-OP
100.0 c/mm	RR100-12-OP	RR100-24-OP	RR100-45-OP
150.0 c/mm	RR150-12-OP	RR150-24-OP	RR150-45-OP
200.0 c/mm	RR200-12-OP	RR200-25-OP	RR200-45-OP
250.0 c/mm	RR250-12-OP	RR250-25-OP	RR250-45-OP
300.0 c/mm	RR300-12-OP	RR300-25-OP	RR300-45-OP
400.0 c/mm	RR400-12-OP	RR400-25-OP	RR400-45-OP
500.0 c/mm	RR500-12-OP	RR500-25-OP	RR500-45-OP

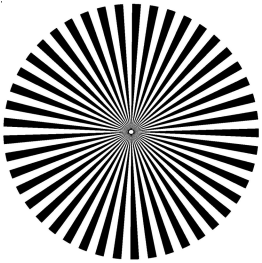

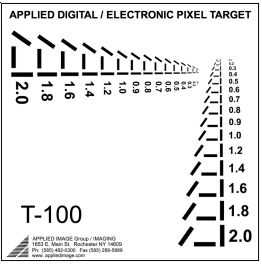
Catalog Number for Ordering Ronchi Rulings: **RR** - [cycle/mm] - [size] - [polarity] - [material]
 Ex: **RR-2.5-12-N-CG**: **RR** = ronchi ruling **2.5** = cycle/mm **12** = size **N** = polarity **CG** = Substrate Material
 Substrate Material **CG** = Chrome on Glass **OP** = OPal glass
RM = Reflective Material (paper, photo) **TM** = Transparent Material (film, photo)

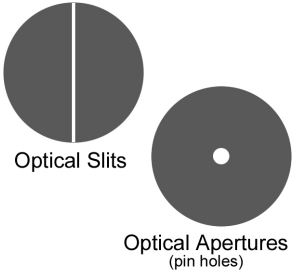
Test Targets

OPTICAL / IMAGING / RESOLUTION

 <p>Overall Size: 102mm x 102mm</p>	<p>T-10 MICROCOPY TEST TARGET</p> <p>Data: Conforms to NIST/NBS 1010A, & ANSI/ISO test chart #2; frequency shown in cycles per mm and changes by an average of 12.2% per step; image overall 38mm x 45mm.</p> <p>Notes: Read direct resolution; ideal for evaluation of Optical / Mechanical Systems where reduction and low resolution is of interest.</p> <table border="1"> <thead> <tr> <th></th> <th>Cycles/mm</th> <th>Polarity</th> <th>Chrome on Glass</th> <th>OPal glass</th> <th>Trans. Material</th> <th>Refl. Material</th> </tr> </thead> <tbody> <tr> <td>T-10</td> <td>1 - 18 c/mm</td> <td>Positive</td> <td>T-10-P-CG</td> <td>T-10-P-OP</td> <td>T-10-P-TM</td> <td>T-10-P-RM</td> </tr> <tr> <td></td> <td></td> <td>Negative</td> <td>T-10-N-CG</td> <td>T-10-N-OP</td> <td>T-10-N-TM</td> <td>T-10-N-RM</td> </tr> <tr> <td>T-10-1</td> <td>1 - 180 c/mm</td> <td>Positive</td> <td>T-10-1-P-CG</td> <td>T-10-1-P-OP</td> <td>T-10-1-P-TM</td> <td></td> </tr> <tr> <td></td> <td></td> <td>Negative</td> <td>T-10-1-N-CG</td> <td>T-10-1-N-OP</td> <td>T-10-1-N-TM</td> <td></td> </tr> <tr> <td>T-10-2</td> <td>1 - 512 c/mm</td> <td>Negative</td> <td>T-10-2-N-CG</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Cycles/mm	Polarity	Chrome on Glass	OPal glass	Trans. Material	Refl. Material	T-10	1 - 18 c/mm	Positive	T-10-P-CG	T-10-P-OP	T-10-P-TM	T-10-P-RM			Negative	T-10-N-CG	T-10-N-OP	T-10-N-TM	T-10-N-RM	T-10-1	1 - 180 c/mm	Positive	T-10-1-P-CG	T-10-1-P-OP	T-10-1-P-TM				Negative	T-10-1-N-CG	T-10-1-N-OP	T-10-1-N-TM		T-10-2	1 - 512 c/mm	Negative	T-10-2-N-CG			
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T-10-1	1 - 180 c/mm	Positive	T-10-1-P-CG	T-10-1-P-OP	T-10-1-P-TM																																						
		Negative	T-10-1-N-CG	T-10-1-N-OP	T-10-1-N-TM																																						
T-10-2	1 - 512 c/mm	Negative	T-10-2-N-CG																																								
	<p>T-20 USAF 1951 TEST TARGET</p> <p>Data: Designed to MIL-STD-150A; frequency changes by $6\sqrt{2}$ progression; image overall 71mm x 58mm; also available in custom sizes and contrasts. Ideally suited for Imaging materials, Visual resolution or Optical systems.</p> <p>Overall Size: T-20 102mm x 102mm T-20-2 102mm x 102mm T-20-M 305mm x 305mm T-20-L 965mm x 1016mm</p> <table border="1"> <thead> <tr> <th></th> <th>Cycles/mm</th> <th>Polarity</th> <th>Chrome on Glass</th> <th>OPal glass</th> <th>Trans. Material to 181 c/mm</th> <th>Refl. Material to 22.64 c/mm</th> </tr> </thead> <tbody> <tr> <td>T-20</td> <td>0.25 - 228</td> <td>Positive</td> <td>T-20-P-CG</td> <td>T-20-P-OP</td> <td>T-20-P-TM</td> <td>T-20-P-RM</td> </tr> <tr> <td></td> <td></td> <td>Negative</td> <td>T-20-N-CG</td> <td>T-20-N-OP</td> <td>T-20-N-TM</td> <td>T-20-N-RM</td> </tr> <tr> <td>T-20-2</td> <td>0.25 - 512</td> <td>Negative</td> <td>T-20-2-N-CG</td> <td></td> <td></td> <td></td> </tr> <tr> <td>T-20-M</td> <td>0.0625 - 3.56</td> <td>Positive</td> <td></td> <td></td> <td></td> <td>T-20-M-P-RM</td> </tr> <tr> <td>T-20-L</td> <td>.015625 - 3.56</td> <td>Positive</td> <td></td> <td></td> <td></td> <td>T-20-L-P-RM</td> </tr> </tbody> </table>		Cycles/mm	Polarity	Chrome on Glass	OPal glass	Trans. Material to 181 c/mm	Refl. Material to 22.64 c/mm	T-20	0.25 - 228	Positive	T-20-P-CG	T-20-P-OP	T-20-P-TM	T-20-P-RM			Negative	T-20-N-CG	T-20-N-OP	T-20-N-TM	T-20-N-RM	T-20-2	0.25 - 512	Negative	T-20-2-N-CG				T-20-M	0.0625 - 3.56	Positive				T-20-M-P-RM	T-20-L	.015625 - 3.56	Positive				T-20-L-P-RM
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	<p>T-21 USAF 1951 TEST TARGET - with IMPROVED LABELING</p> <p>Data: All bars and spaces are the same as provided in the traditional USAF 1951 Test Target chart T-20 and the spiral type element layout is the same. Meeting all requirements as specified in MIL-STD-150A. The following improvements have been made:</p> <ul style="list-style-type: none"> - The chart has DIRECT frequency Labeling in C/MM. Thus, no cross reference documentation is required to determine frequencies. - Numeric labeling is enhanced and based on OCR-A extended font, to maximize recognizability. <p>Overall Size: T-21 102mm x 102mm T-21-2 102mm x 102mm</p> <table border="1"> <thead> <tr> <th></th> <th>Cycles/mm</th> <th>Polarity</th> <th>Chrome on Glass</th> <th>OPal glass</th> <th>Trans. Material to 181 c/mm</th> <th>Refl. Material to 22.64 c/mm</th> </tr> </thead> <tbody> <tr> <td>T-21</td> <td>0.25 - 228</td> <td>Positive</td> <td>T-21-P-CG</td> <td>T-21-P-OP</td> <td>T-21-P-TM</td> <td>T-21-P-RM</td> </tr> <tr> <td>T-21-2</td> <td>0.25 - 512</td> <td>Negative</td> <td>T-21-2-N-CG</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Cycles/mm	Polarity	Chrome on Glass	OPal glass	Trans. Material to 181 c/mm	Refl. Material to 22.64 c/mm	T-21	0.25 - 228	Positive	T-21-P-CG	T-21-P-OP	T-21-P-TM	T-21-P-RM	T-21-2	0.25 - 512	Negative	T-21-2-N-CG																								
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T-21-2	0.25 - 512	Negative	T-21-2-N-CG																																								
	<p>T-22 USAF 1951 TEST TARGET - with IMPROVED LAYOUT and FEATURES</p> <p>Data: All bars and spaces are the same as provided in the traditional USAF 1951 Test Target chart T-20; Meeting all requirements as specified in MIL-STD-150A. The following improvements have been made:</p> <ul style="list-style-type: none"> - The chart has DIRECT frequency Labeling in C/MM. - Numeric labeling is enhanced and based on OCR-A extended font. - Bars are laid out in two straight columns, for easier scanning. - Smaller elements have finder squares next to them to aid in determining their locations. <p>Overall Size: T-22 102mm x 102mm T-22-2 102mm x 102mm</p> <table border="1"> <thead> <tr> <th></th> <th>Cycles/mm</th> <th>Polarity</th> <th>Chrome on Glass</th> <th>OPal glass</th> <th>Trans. Material to 181 c/mm</th> <th>Refl. Material to 22.64 c/mm</th> </tr> </thead> <tbody> <tr> <td>T-22</td> <td>0.25 - 228</td> <td>Positive</td> <td>T-22-P-CG</td> <td>T-22-P-OP</td> <td>T-22-P-TM</td> <td>T-22-P-RM</td> </tr> <tr> <td>T-22-2</td> <td>0.25 - 512</td> <td>Negative</td> <td>T-22-2-N-CG</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Cycles/mm	Polarity	Chrome on Glass	OPal glass	Trans. Material to 181 c/mm	Refl. Material to 22.64 c/mm	T-22	0.25 - 228	Positive	T-22-P-CG	T-22-P-OP	T-22-P-TM	T-22-P-RM	T-22-2	0.25 - 512	Negative	T-22-2-N-CG																								
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 <p>Overall Size: 100mm x 100mm</p>	<p>T-30 RIT ALPHANUMERIC CHART</p> <p>Data: Alphanumeric configuration with frequency range 1-18 cycles/mm in 25 groups. Image overall 50mm x 50mm divided into 4 quadrants. Available in custom sizes and contrasts as well.</p> <p>Notes: Especially useful in Optical / Visual evaluation or where cross consistency among users is important.</p> <table border="1"> <thead> <tr> <th></th> <th>Cycles/mm</th> <th>Polarity</th> <th>Chrome on Glass</th> <th>OPal glass</th> <th>Trans. Material</th> <th>Refl. Material</th> </tr> </thead> <tbody> <tr> <td>T-30</td> <td>1 - 18c/mm</td> <td>Positive</td> <td>T-30-P-CG</td> <td>T-30-P-OP</td> <td>T-30-P-TM</td> <td>T-30-P-RM</td> </tr> <tr> <td></td> <td></td> <td>Negative</td> <td>T-30-N-CG</td> <td>T-30-N-OP</td> <td>T-30-N-TM</td> <td>T-30-N-RM</td> </tr> </tbody> </table>		Cycles/mm	Polarity	Chrome on Glass	OPal glass	Trans. Material	Refl. Material	T-30	1 - 18c/mm	Positive	T-30-P-CG	T-30-P-OP	T-30-P-TM	T-30-P-RM			Negative	T-30-N-CG	T-30-N-OP	T-30-N-TM	T-30-N-RM							
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T-30	1 - 18c/mm	Positive	T-30-P-CG	T-30-P-OP	T-30-P-TM	T-30-P-RM																							
		Negative	T-30-N-CG	T-30-N-OP	T-30-N-TM	T-30-N-RM																							
 <p>Overall Size: 100mm x 100mm</p>	<p>T-40 NBS-1952 RESOLUTION TEST CHART</p> <p>Data: The NBS-1952 Resolution Test Chart is described in the NBS circular 533-1953 in the section "Method of Determining the Resolution Power of Photographic Lenses". Design features of this target reduce edge effects, minimize spurious resolution and permit one pass scanning.</p> <p>Notes: The NBS method of using this chart to test lenses involves placing the chart at a distance from the lens equal to 26 times the focal length of the lens, resulting in a 25x reduction. The reduction effective cycles per mm is 12 to 80 c/mm.</p> <table border="1"> <thead> <tr> <th></th> <th>Cycles/mm</th> <th>Polarity</th> <th>Chrome on Glass</th> <th>OPal glass</th> <th>Trans. Material</th> <th>Refl. Material</th> </tr> </thead> <tbody> <tr> <td>T-40-1</td> <td>0.48 - 3.2</td> <td>Positive</td> <td>T-40-1-P-CG</td> <td>T-40-1-P-OP</td> <td>T-40-1-P-TM</td> <td>T-40-1-P-RM</td> </tr> </tbody> </table>		Cycles/mm	Polarity	Chrome on Glass	OPal glass	Trans. Material	Refl. Material	T-40-1	0.48 - 3.2	Positive	T-40-1-P-CG	T-40-1-P-OP	T-40-1-P-TM	T-40-1-P-RM														
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T-40-1	0.48 - 3.2	Positive	T-40-1-P-CG	T-40-1-P-OP	T-40-1-P-TM	T-40-1-P-RM																							
	<p>T-60 SAYCE TARGET</p> <p>Data: Frequency range in c/mm (20:1 range). Other frequencies available on request.</p> <p>Notes: Each bar and space is progressively smaller in a log manner. Peaked groups every 10 bars; ideally suited for microdensitometric scanning. Other reduction ranges, contrasts and material are available.</p> <p>Overall Size: T-60-1 150mm x 150mm T-60-2 25mm x 75mm T-60-3 25mm x 75mm</p> <table border="1"> <thead> <tr> <th></th> <th>Cycles/mm</th> <th>Polarity</th> <th>Chrome on Glass</th> <th>OPal glass</th> <th>Trans. Material</th> <th>Refl. Material</th> </tr> </thead> <tbody> <tr> <td>T-60-1</td> <td>0.25 - 5</td> <td>Positive</td> <td>T-60-1-P-CG</td> <td>T-60-1-P-OP</td> <td>T-60-1-P-TM</td> <td>T-60-1-P-RM</td> </tr> <tr> <td>T-60-2</td> <td>2.50 - 50</td> <td>Positive</td> <td>T-60-2-P-CG</td> <td>T-60-2-P-OP</td> <td>T-60-2-P-TM</td> <td></td> </tr> <tr> <td>T-60-3</td> <td>25.0 - 500</td> <td>Positive</td> <td>T-60-3-P-CG</td> <td>T-60-3-P-OP</td> <td></td> <td></td> </tr> </tbody> </table>		Cycles/mm	Polarity	Chrome on Glass	OPal glass	Trans. Material	Refl. Material	T-60-1	0.25 - 5	Positive	T-60-1-P-CG	T-60-1-P-OP	T-60-1-P-TM	T-60-1-P-RM	T-60-2	2.50 - 50	Positive	T-60-2-P-CG	T-60-2-P-OP	T-60-2-P-TM		T-60-3	25.0 - 500	Positive	T-60-3-P-CG	T-60-3-P-OP		
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T-60-2	2.50 - 50	Positive	T-60-2-P-CG	T-60-2-P-OP	T-60-2-P-TM																								
T-60-3	25.0 - 500	Positive	T-60-3-P-CG	T-60-3-P-OP																									
	<p>T-61 2-CYCLE LOG TARGET</p> <p>Data: Frequency range 0.25 to 5c/mm and 2.50 to 50 c/mm. Other frequencies and sizes are available on request.</p> <p>Notes: Equivalent cycles increase logarithmically; with two full cycles in each range. Ideally suited for scanning and micro densitometry. Each group of 2 bars and 2 spaces is progressively smaller in size.</p> <p>Overall Size: T-61-1 150mm x 150mm T-61-2 25mm x 75mm</p> <table border="1"> <thead> <tr> <th></th> <th>Cycles/mm</th> <th>Polarity</th> <th>Chrome on Glass</th> <th>OPal glass</th> <th>Trans. Material</th> <th>Refl. Material</th> </tr> </thead> <tbody> <tr> <td>T-61-1</td> <td>0.25 - 5</td> <td>Positive</td> <td>T-61-1-P-CG</td> <td>T-61-1-P-OP</td> <td>T-61-1-P-TM</td> <td>T-61-1-P-RM</td> </tr> <tr> <td>T-61-2</td> <td>2.50 - 50</td> <td>Positive</td> <td>T-61-2-P-CG</td> <td>T-61-2-P-OP</td> <td>T-61-2-P-TM</td> <td></td> </tr> <tr> <td>T-61-3</td> <td>2.50 - 500</td> <td>Positive</td> <td>T-61-3-P-CG</td> <td>T-61-3-P-OP</td> <td></td> <td></td> </tr> </tbody> </table>		Cycles/mm	Polarity	Chrome on Glass	OPal glass	Trans. Material	Refl. Material	T-61-1	0.25 - 5	Positive	T-61-1-P-CG	T-61-1-P-OP	T-61-1-P-TM	T-61-1-P-RM	T-61-2	2.50 - 50	Positive	T-61-2-P-CG	T-61-2-P-OP	T-61-2-P-TM		T-61-3	2.50 - 500	Positive	T-61-3-P-CG	T-61-3-P-OP		
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	<p>T-62 LINEAR TARGET</p> <p>Data: Frequency range 0.25 to 5c/mm; 2.50 to 50 c/mm; and 25 to 500c/mm. Other frequencies and sizes are available on request.</p> <p>Notes: Lines and spaces for which the equivalent cycles per mm increases as the function of linear position; with each bar and space progressively smaller size, by linear change of the c/mm value. Ideally suited for sensing & scanning equipment.</p> <p>Overall Size: T-62-1 150mm x 150mm T-62-2 25mm x 75mm</p> <table border="1"> <thead> <tr> <th></th> <th>Cycles/mm</th> <th>Polarity</th> <th>Chrome on Glass</th> <th>OPal glass</th> <th>Trans. Material</th> <th>Refl. Material</th> </tr> </thead> <tbody> <tr> <td>T-62-1</td> <td>0.25 - 5</td> <td>Positive</td> <td>T-62-1-P-CG</td> <td>T-62-1-P-OP</td> <td>T-62-1-P-TM</td> <td>T-62-1-P-RM</td> </tr> <tr> <td>T-62-2</td> <td>2.50 - 50</td> <td>Positive</td> <td>T-62-2-P-CG</td> <td>T-62-2-P-OP</td> <td>T-62-2-P-TM</td> <td></td> </tr> <tr> <td>T-62-3</td> <td>25.0 - 500</td> <td>Positive</td> <td>T-62-3-P-CG</td> <td>T-62-3-P-OP</td> <td></td> <td></td> </tr> </tbody> </table>		Cycles/mm	Polarity	Chrome on Glass	OPal glass	Trans. Material	Refl. Material	T-62-1	0.25 - 5	Positive	T-62-1-P-CG	T-62-1-P-OP	T-62-1-P-TM	T-62-1-P-RM	T-62-2	2.50 - 50	Positive	T-62-2-P-CG	T-62-2-P-OP	T-62-2-P-TM		T-62-3	25.0 - 500	Positive	T-62-3-P-CG	T-62-3-P-OP		
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T-62-3	25.0 - 500	Positive	T-62-3-P-CG	T-62-3-P-OP																									

 <p>Overall Size: 100mm x 100mm</p>	<p>T-50 STAR SECTOR TARGET</p> <p>Data: Wedge shaped segments with 45 equal bar and space widths (8 degrees per cycle or 4 degrees per spoke) over a 360 degree circumference circle. Overall image size 50mm diameter.</p> <p>Notes: An ideal target for detecting Optical Astigmatism, Focus Errors and other aberrations. Can easily be incorporated into complete target arrays.</p> <table border="1"> <thead> <tr> <th></th> <th>Cycles/mm</th> <th>Polarity</th> <th>Chrome on Glass</th> <th>OPal glass</th> <th>Trans. Material</th> <th>Refl. Material</th> </tr> </thead> <tbody> <tr> <td>T-50-1</td> <td>0.29 - 20</td> <td>Positive</td> <td></td> <td></td> <td></td> <td>T-50-1-P-RM</td> </tr> <tr> <td>T-50-2</td> <td>0.29 - 100</td> <td></td> <td>T-50-2-P-CG</td> <td>T-50-2-N-OP</td> <td>T-50-2-P-TM</td> <td></td> </tr> </tbody> </table>		Cycles/mm	Polarity	Chrome on Glass	OPal glass	Trans. Material	Refl. Material	T-50-1	0.29 - 20	Positive				T-50-1-P-RM	T-50-2	0.29 - 100		T-50-2-P-CG	T-50-2-N-OP	T-50-2-P-TM								
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T-50-2	0.29 - 100		T-50-2-P-CG	T-50-2-N-OP	T-50-2-P-TM																								
 <p>Overall Size: 50mm x 50mm</p>	<p>T-90 ULTRA HIGH RESOLUTION TARGET</p> <p>Data: Frequency range from 1 c/mm to 500 c/mm; 100:1 or greater contrast; Bar width to length ratio 1:10; chrome image area on glass substrate.</p> <p>Notes: The bar pattern gives direct limit of cut-off resolution. Ideal for microdensitometer scanning, hi-power optical systems, semi-conductor processing and CCD devices.</p> <table border="1"> <thead> <tr> <th></th> <th>Cycles/mm</th> <th>Polarity</th> <th>Chrome on Glass</th> <th>OPal glass</th> <th>Trans. Material</th> <th>Refl. Material</th> </tr> </thead> <tbody> <tr> <td>T-90</td> <td>1 - 500c/mm</td> <td>Negative</td> <td>T-90-N-CG</td> <td>T-90-N-OP</td> <td></td> <td></td> </tr> <tr> <td>T-90-1</td> <td>1 - 20c/mm</td> <td>Positive</td> <td></td> <td></td> <td></td> <td>T-90-1-P-RM</td> </tr> <tr> <td>T-90-2</td> <td>1 - 100c/mm</td> <td>Positive</td> <td></td> <td></td> <td>T-90-2-P-TM</td> <td></td> </tr> </tbody> </table>		Cycles/mm	Polarity	Chrome on Glass	OPal glass	Trans. Material	Refl. Material	T-90	1 - 500c/mm	Negative	T-90-N-CG	T-90-N-OP			T-90-1	1 - 20c/mm	Positive				T-90-1-P-RM	T-90-2	1 - 100c/mm	Positive			T-90-2-P-TM	
	Cycles/mm	Polarity	Chrome on Glass	OPal glass	Trans. Material	Refl. Material																							
T-90	1 - 500c/mm	Negative	T-90-N-CG	T-90-N-OP																									
T-90-1	1 - 20c/mm	Positive				T-90-1-P-RM																							
T-90-2	1 - 100c/mm	Positive			T-90-2-P-TM																								
 <p>Overall Size: 100mm x 100mm</p>	<p>T-100 DIGITAL / ELECTRONIC PIXEL TARGET</p> <p>Data: Range from 0.1 to 2.0mm in discrete steps of 2.0, 1.8, 1.6, 1.4, 1.2, 1.0, 0.9, 0.8, 0.7, 0.6, 0.5, 0.4, 0.3, 0.2 and 0.1 in vertical, horizontal and angled design.</p> <p>Notes: Ideally suited to test sensor chip technology for minimum pixel sensing where dithering and cross linking can occur with other type of multi-cycle test targets.</p> <table border="1"> <thead> <tr> <th></th> <th>Polarity</th> <th>Chrome on Glass</th> <th>OPal glass</th> <th>Trans. Material</th> <th>Refl. Material</th> </tr> </thead> <tbody> <tr> <td>T-100</td> <td>Positive</td> <td>T-100-P-CG</td> <td>T-100-P-OP</td> <td>T-100-P-TM</td> <td>T-100-P-RM</td> </tr> </tbody> </table>		Polarity	Chrome on Glass	OPal glass	Trans. Material	Refl. Material	T-100	Positive	T-100-P-CG	T-100-P-OP	T-100-P-TM	T-100-P-RM																
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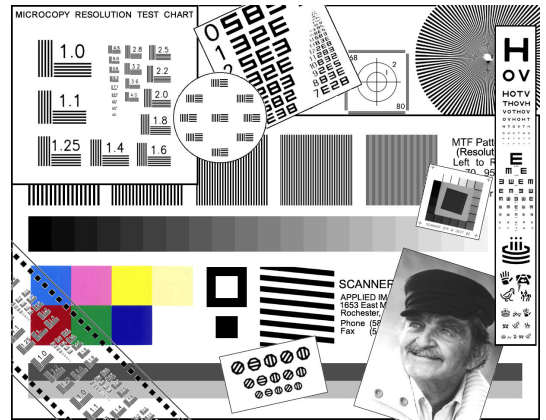
Quality Assurance

GRAPHIC / PHOTO / COPIER TEST ARRAYS

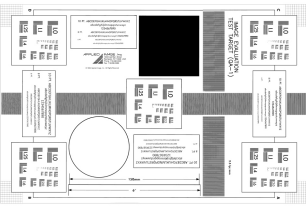
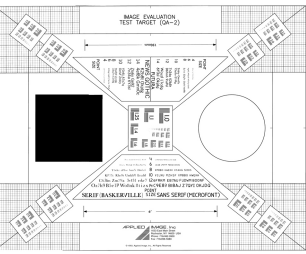
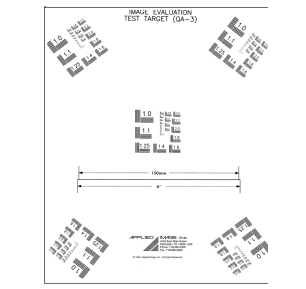
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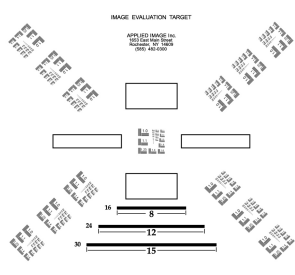
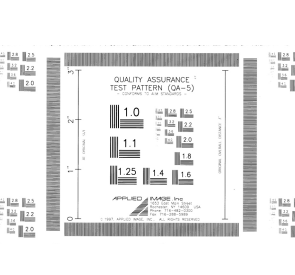
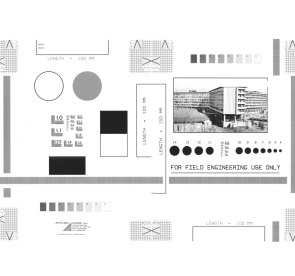
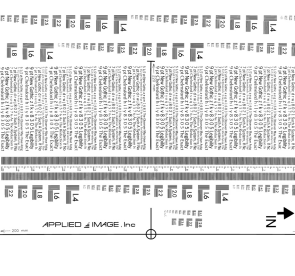
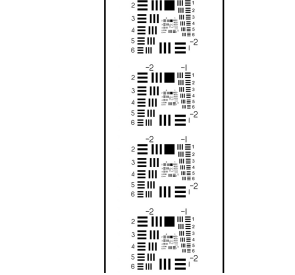
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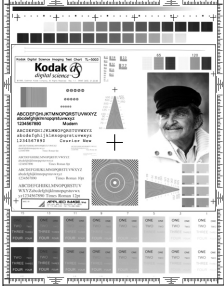
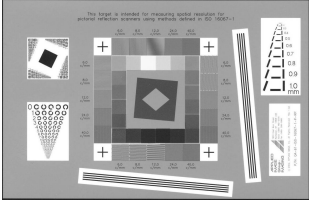
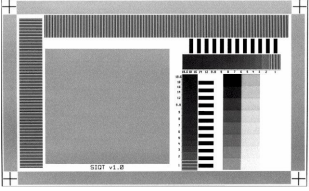
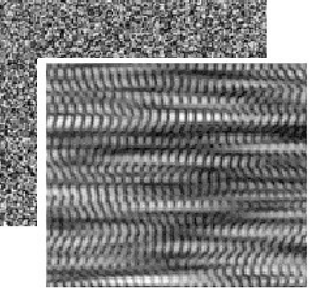
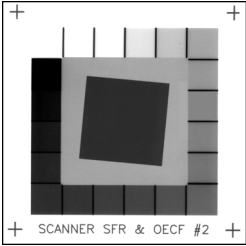
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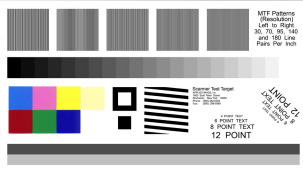
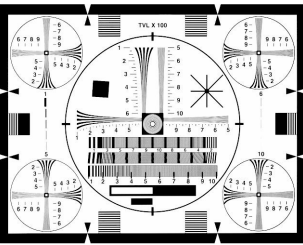
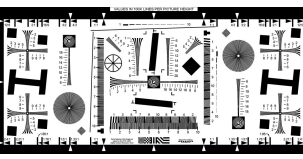
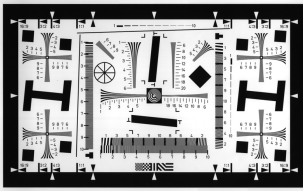
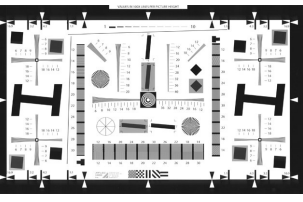
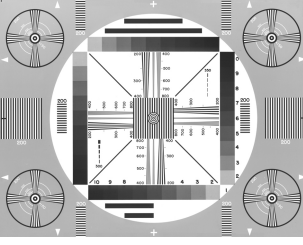
 <p>Overall Size: 15.0" x 9.625" 381mm x 254 mm</p>	<p>QA-1 MOTION TARGET (Rotary)</p> <p>Data: Image area 229mm x 356mm (9" x 14"); encompassing five NBS 1010A / ISO Test Chart #2 targets (see T-10); 3c/mm ladder charts; variety of type sizes and density patches; reduction scale.</p> <p>Notes: Suited for evaluation of motion or rotary systems as in scanners, rotary micrographics or copiers where there is a synchronized motion component.</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Part No.</th> <th style="text-align: left; border-bottom: 1px solid black;">Overall Size</th> <th style="text-align: left; border-bottom: 1px solid black;">Material</th> </tr> </thead> <tbody> <tr> <td>QA-1-P-RM</td> <td>254mm x 381mm</td> <td>Reflective Material</td> </tr> </tbody> </table>	Part No.	Overall Size	Material	QA-1-P-RM	254mm x 381mm	Reflective Material						
Part No.	Overall Size	Material											
QA-1-P-RM	254mm x 381mm	Reflective Material											
 <p>Overall Size: 15.0" x 11.5" 381mm x 292 mm</p>	<p>QA-2 STATIC TARGET (Planetary)</p> <p>Data: Image area 280mm x 356mm (11" x 14"); outer array with 216mm x 280 mm (8½" x 11") inner array; encompassing nine NBS 1010A / ISO Test Chart #2 targets (see T-10); variety of type sizes and distortion grids. 150mm and 6 inch reduction scales are included.</p> <p>Notes: Useful for multi-evaluation of graphic or still camera imaging systems. Also available in a Metric version (QA-2M).</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Part No.</th> <th style="text-align: left; border-bottom: 1px solid black;">Divisions</th> <th style="text-align: left; border-bottom: 1px solid black;">Overall Size</th> <th style="text-align: left; border-bottom: 1px solid black;">Material</th> </tr> </thead> <tbody> <tr> <td>QA-2-P-RM</td> <td>(English)</td> <td>292mm x 381mm</td> <td>Reflective Material</td> </tr> <tr> <td>QA-2M-P-RM</td> <td>(Metric)</td> <td>305mm x 425mm</td> <td>Reflective Material</td> </tr> </tbody> </table>	Part No.	Divisions	Overall Size	Material	QA-2-P-RM	(English)	292mm x 381mm	Reflective Material	QA-2M-P-RM	(Metric)	305mm x 425mm	Reflective Material
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QA-2M-P-RM	(Metric)	305mm x 425mm	Reflective Material										
	<p>QA-3 SMALL AREA TARGET (AIM MS-303-1980)</p> <p>Data: Size 216mm x 280mm (8½" x 11"); conforms to Navy specifications. Five NBS 1010A / ISO Test Chart #2 targets (see T-10) radially positioned; includes reduction scale of 150mm and 6 inch.</p> <p>Notes: Ideal for evaluation of Optical / Mechanical Systems; where reduction and low resolution is of interest.</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; border-bottom: 1px solid black;">Part No.</th> <th style="text-align: left; border-bottom: 1px solid black;">Overall Size</th> <th style="text-align: left; border-bottom: 1px solid black;">Material</th> </tr> </thead> <tbody> <tr> <td>QA-3-P-RM</td> <td>216mm x 280mm</td> <td>Reflective Material</td> </tr> </tbody> </table>	Part No.	Overall Size	Material	QA-3-P-RM	216mm x 280mm	Reflective Material						
Part No.	Overall Size	Material											
QA-3-P-RM	216mm x 280mm	Reflective Material											

	<p>QA-4 LARGE AREA TARGET (ANSI/AIIM MS-24-1980 R1987)</p> <p>Data: QA-4 conforms to US MIL-M9868D; designated for 16x, 24x, and 30x reduction. Thirteen NBS 1010A / ISO Test Chart #2 targets (see T-10); reduction lines; 6% and 50% density patches. Includes set of ST-10 patches. Ideal for large graphic & reduction camera systems. Also available in Metric form.</p> <p>Notes: AO, A1, A2 (QA-4M) and US MIL-M9868E (QA-4E) formats.</p> <table border="1"> <thead> <tr> <th>Part No.</th> <th>Overall Size</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>QA-4-P-RM MIL-M9868D</td> <td>870mm x 1215mm</td> <td>Reflective Material</td> </tr> <tr> <td>QA-4E-P-RM MIL-M9868E</td> <td>920mm x 1238mm</td> <td>Reflective Material</td> </tr> <tr> <td>QA-4M-P-RM Metric</td> <td>870mm x 1215mm</td> <td>Reflective Material</td> </tr> </tbody> </table>	Part No.	Overall Size	Material	QA-4-P-RM MIL-M9868D	870mm x 1215mm	Reflective Material	QA-4E-P-RM MIL-M9868E	920mm x 1238mm	Reflective Material	QA-4M-P-RM Metric	870mm x 1215mm	Reflective Material
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QA-4M-P-RM Metric	870mm x 1215mm	Reflective Material											
	<p>QA-5 CHECK SIZE TARGET</p> <p>Data: Size 102mm x 178mm (4" x 7"); five NBS 1010A / ISO Test Chart #2 targets (see T-10); ladder charts and reduction lines included.</p> <p>Notes: Specially designed for Rotary Microfilm Systems; ideally suited for high speed automatic feed applications such as in automatic check recorders. Available in a variety of materials for stack interlacing for quality tests.</p> <table border="1"> <thead> <tr> <th>Part No.</th> <th>Quantity</th> <th>Overall Size</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>QA-5-P-PP</td> <td>(package of 25)</td> <td>102mm x 178mm</td> <td>Plain Paper / ink printed</td> </tr> <tr> <td>QA-5-P-RM</td> <td>(package of 5)</td> <td>102mm x 178mm</td> <td>Reflective Material / emulsion printed</td> </tr> </tbody> </table>	Part No.	Quantity	Overall Size	Material	QA-5-P-PP	(package of 25)	102mm x 178mm	Plain Paper / ink printed	QA-5-P-RM	(package of 5)	102mm x 178mm	Reflective Material / emulsion printed
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QA-5-P-RM	(package of 5)	102mm x 178mm	Reflective Material / emulsion printed										
	<p>QA-6 COPIER TEST ARRAY</p> <p>Data: Split design for 11" x 17" size and 8½" x 11" applications; array includes NBS 1010A / ISO Test Chart #2 targets (see T-10)</p> <p>Notes: Ideal for testing copiers; can be cut in half for smaller sizes and applications; tests incorporated includes resolution, distortion, density, motion, size and alphanumeric recognition.</p> <table border="1"> <thead> <tr> <th>Part No.</th> <th>Overall Size</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>QA-6-P-RM</td> <td>11 inch x 17 inch</td> <td>Reflective Material</td> </tr> </tbody> </table>	Part No.	Overall Size	Material	QA-6-P-RM	11 inch x 17 inch	Reflective Material						
Part No.	Overall Size	Material											
QA-6-P-RM	11 inch x 17 inch	Reflective Material											
	<p>QA-17 ROTARY TEST TARGET</p> <p>Data: Includes NBS 1010A / ISO Test Chart #2 resolution targets (see T-10); synchronization ladder charts; various alphanumeric; dual purpose English (A size) and Metric (A4 size)</p> <p>Notes: Ideal for testing of distortion, resolution, astigmatism, size reduction / enlargement and synchronization of rotary microfilm systems, scanning and motion imaging devices.</p> <table border="1"> <thead> <tr> <th>Part No.</th> <th>Overall Size</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>QA-17-P-RM</td> <td>8½ inch x 11inch</td> <td>Reflective Material</td> </tr> </tbody> </table>	Part No.	Overall Size	Material	QA-17-P-RM	8½ inch x 11inch	Reflective Material						
Part No.	Overall Size	Material											
QA-17-P-RM	8½ inch x 11inch	Reflective Material											
	<p>QA-30 (Previously FS-10) FILM STRIP TARGET</p> <p>Data: Length 254mm (10") of film, twenty-three frames with USAF 1951 target (see T-20) in the center and spaced apart every 6.47mm. Resolution at 1:1 from 4 to over 100 cycles per mm.</p> <p>Notes: Ideal for splicing into reels of film for testing the quality of projection or microfilm systems. Available in 16mm or 35mm format.</p> <table border="1"> <thead> <tr> <th>Part No.</th> <th>Strip Type</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>QA-30-16-P-TM</td> <td>Film Strip Target</td> <td>16mm width Transparent Material</td> </tr> <tr> <td>QA-30-35-P-TM</td> <td>Film Strip Target</td> <td>35mm width Transparent Material</td> </tr> </tbody> </table>	Part No.	Strip Type	Material	QA-30-16-P-TM	Film Strip Target	16mm width Transparent Material	QA-30-35-P-TM	Film Strip Target	35mm width Transparent Material			
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QA-30-35-P-TM	Film Strip Target	35mm width Transparent Material											

Quality Assurance


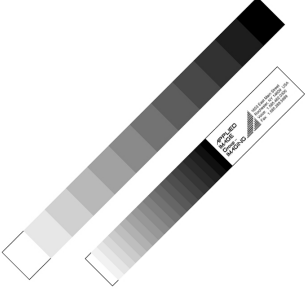
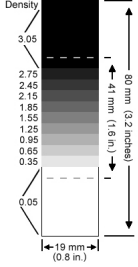
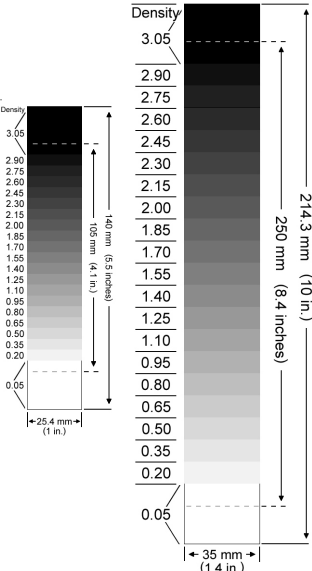
DIGITAL / VIDEO / CAMERA TEST ARRAYS

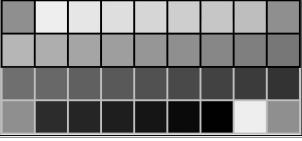
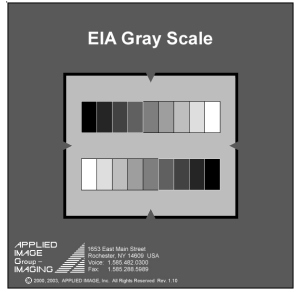
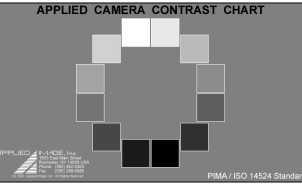
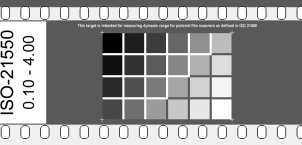
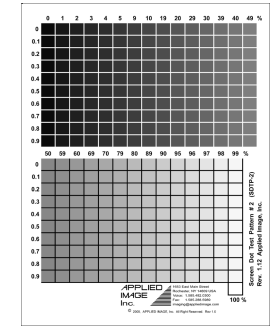
	<p>QA-60 COPIER / SCANNER DIGITAL TEST TARGET</p> <p>Data: Eastman Kodak / Digital Science Imaging Test Chart (TL5003). Size 216mm x 279 mm (8½" x 11"); 15 grey patches; 5 Ronchi patterns (30, 50, 75, 100, 150 cycles per inch); text (2 to 12 point); half tone screen dots (65 and 120 per inch); star pattern (50, 100 & 200 lines per inch); resolution chart (1.5 to 18 c/mm) and 16 combinations of multi-density text.</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; border-bottom: 1px solid black;"><u>Part No.</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>Overall Size</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>Material</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">QA-60-TL5003-P-RP</td> <td style="text-align: center;">216mm x 279mm</td> <td style="text-align: center;">RP - photo paper</td> </tr> </tbody> </table>	<u>Part No.</u>	<u>Overall Size</u>	<u>Material</u>	QA-60-TL5003-P-RP	216mm x 279mm	RP - photo paper			
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QA-60-TL5003-P-RP	216mm x 279mm	RP - photo paper								
	<p>QA-61 REFLECTIVE SCANNER TEST CHART (ISO-16067-1)</p> <p>Data: Size 100mm x 152mm (4" x 6"); Designed to ISO-16067-1 specifications. Includes Landolt Ring, alphanumeric resolution and slant edge charts; grey step patches, horizontal, vertical and slanted ronchi patterns (6 to 40 c/mm) plus the APPLIED T-100 Digital Electronic Pixel target.</p> <p>Notes: Used for determining reflective light resolution & imaging characteristics of digital scanning systems.</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; border-bottom: 1px solid black;"><u>Part No.</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>Overall Size</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>Material</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">QA-61-ISO-16067-1-P-RP</td> <td style="text-align: center;">152mm x 152mm</td> <td style="text-align: center;">RP - photo paper</td> </tr> </tbody> </table>	<u>Part No.</u>	<u>Overall Size</u>	<u>Material</u>	QA-61-ISO-16067-1-P-RP	152mm x 152mm	RP - photo paper			
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QA-61-ISO-16067-1-P-RP	152mm x 152mm	RP - photo paper								
	<p>QA-74 FBI SIQT SCANNER TEST CHART</p> <p>Data: The FBI designed this chart for gray level and resolution testing of the new Integrated Automated Fingerprint Identification System (IAFIS). The chart includes Ronchi areas with frequencies from 1 c/mm to 19.6 c/mm and uniform gray areas having consistency better than ± 0.02 OD.</p> <p>Notes: See SINE M-13-60-1x and SINE M-15-60 FBI standards for fingerprint scanners</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; border-bottom: 1px solid black;"><u>Part No.</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>Overall Size</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>Material</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">QA-74-P-RM</td> <td style="text-align: center;">200mm x 125mm</td> <td style="text-align: center;">Reflective Material</td> </tr> </tbody> </table>	<u>Part No.</u>	<u>Overall Size</u>	<u>Material</u>	QA-74-P-RM	200mm x 125mm	Reflective Material			
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QA-74-P-RM	200mm x 125mm	Reflective Material								
	<p>QA-80 & QA-81 RANDOM TEST PATTERN</p> <p>Data: QA-80 The Imaged Random Test Pattern is a reflective target, which is imaged onto a detector array. This pattern is a 15.2 cm square image on semi-matte photographic paper. Its power spectral density (PSD) is 'white' and has equal power at all spatial frequencies.</p> <p>Notes: QA-81 In applications where the MTF of the detector array <i>alone</i> is required, the Projected Random Test Pattern can be projected directly onto the the detector array.</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; border-bottom: 1px solid black;"><u>Part No.</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>Image Size</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>Material</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">QA-80-P-RM</td> <td style="text-align: center;">152mm x 152mm</td> <td style="text-align: center;">Reflective Material</td> </tr> <tr> <td style="text-align: center;">QA-81-P-TM</td> <td style="text-align: center;">28mm x 35mm</td> <td style="text-align: center;">Transparent Material</td> </tr> </tbody> </table>	<u>Part No.</u>	<u>Image Size</u>	<u>Material</u>	QA-80-P-RM	152mm x 152mm	Reflective Material	QA-81-P-TM	28mm x 35mm	Transparent Material
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QA-80-P-RM	152mm x 152mm	Reflective Material								
QA-81-P-TM	28mm x 35mm	Transparent Material								
	<p>QA-62 SLANT EDGE TARGET</p> <p>Data: Size 75mm x 75mm (3" x 3"); 25mm dark grey square rotated (5 degree) on a light grey background; surrounded by 20 - 9mm square grey scale patches.</p> <p>Notes: Ideal for evaluation response of digital systems to the slanted sharp edge function and used for MTF analysis.</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; border-bottom: 1px solid black;"><u>Part No.</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>Overall Size</u></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>Material</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">QA-62-SFR-P-RP</td> <td style="text-align: center;">95mm x 76mm</td> <td style="text-align: center;">RP - photo paper</td> </tr> </tbody> </table>	<u>Part No.</u>	<u>Overall Size</u>	<u>Material</u>	QA-62-SFR-P-RP	95mm x 76mm	RP - photo paper			
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 <p>8 COLORS TARGET</p>	<p>QA-69 PICTURE / CHECK SIZE SCANNER COLOR TARGET</p> <p>Data: Size 110mm x 190mm (4¼" x 7½"); five MTF patterns (30, 70, 95, 140, & 180 Line Pairs Per Inch); 20 density step wedge; various alphanumeric, two density strips, 8 color patches, 5.71 degrees (10:1 ratio) angle ronchi ruling.</p> <p>Notes: Ideal for evaluation of color flatbed scanners and digital imaging devices.</p> <table border="1"> <thead> <tr> <th>Part No.</th> <th>Overall Size</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>QA-69-P-RM</td> <td>110mm x 190mm</td> <td>Reflective Material</td> </tr> </tbody> </table>	Part No.	Overall Size	Material	QA-69-P-RM	110mm x 190mm	Reflective Material																					
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	<p>QA-71 IEEE VIDEO RESOLUTION CHART</p> <p>Data: The IEEE Video Resolution Chart conforms to standard STD 208-1995, "Measurement of Resolution of Camera Systems". This standard is used to test frequency response, characteristics performance of the lens, camera and display device. It replaces the EIA Resolution Chart. Image area: 203mm x 152mm.</p> <table border="1"> <thead> <tr> <th>Part No.</th> <th>Overall Size</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>QA-71-P-RM</td> <td>229mm x 184mm</td> <td>Reflective Material</td> </tr> </tbody> </table>	Part No.	Overall Size	Material	QA-71-P-RM	229mm x 184mm	Reflective Material																					
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	<p>QA-76 DIGITAL CINE RESOLUTION CHART</p> <p>Data: Digital CINE Camera Resolution Chart is an adaptation of the features of the "ISO12233 standard (QA-72)", to higher aspect ratios and also include new higher resolution features. This target's active area measures 60cm x 144cm.</p> <table border="1"> <thead> <tr> <th>Part No.</th> <th>Active Size</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>QA-76-P-RM</td> <td>600mm x 1440mm</td> <td>Reflective Material</td> </tr> </tbody> </table>	Part No.	Active Size	Material	QA-76-P-RM	600mm x 1440mm	Reflective Material																					
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	<p>QA-72 DIGITAL STILL CAMERA RESOLUTION CHART / ISO-12233</p> <p>Data: Includes 100 -1000 Line Width / Pixel Height; checker pattern; multiple lightly slanted square, lines; and other geometries; framing 1:1, 4:3, 3:2, and 16:9 aspect ratios; Center focus zone plate; 100 - 600 LW/PH and 500 - 2000 LW/PH hyperbolic wedges.</p> <table border="1"> <thead> <tr> <th>Part No.</th> <th>Active Size</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>QA-72-1-P-CG</td> <td>20mm x 36mm</td> <td>Chrome on Glass</td> </tr> <tr> <td>QA-72-1-P-OP</td> <td>20mm x 36mm</td> <td>OPal glass</td> </tr> <tr> <td>QA-72-2-P-CG</td> <td>100mm x 178mm</td> <td>Chrome on Glass</td> </tr> <tr> <td>QA-72-2-P-OG</td> <td>100mm x 178mm</td> <td>OPal glass</td> </tr> <tr> <td>QA-72-2-P-RM</td> <td>100mm x 178mm</td> <td>Reflective Material</td> </tr> <tr> <td>QA-72-P-RM</td> <td>200mm x 356mm</td> <td>Reflective Material</td> </tr> <tr> <td>QA-72-3-P-RM</td> <td>400mm x 711mm</td> <td>Reflective Material</td> </tr> <tr> <td>QA-72-4-P-RM</td> <td>800mm x 1422mm</td> <td>Reflective Material</td> </tr> </tbody> </table>	Part No.	Active Size	Material	QA-72-1-P-CG	20mm x 36mm	Chrome on Glass	QA-72-1-P-OP	20mm x 36mm	OPal glass	QA-72-2-P-CG	100mm x 178mm	Chrome on Glass	QA-72-2-P-OG	100mm x 178mm	OPal glass	QA-72-2-P-RM	100mm x 178mm	Reflective Material	QA-72-P-RM	200mm x 356mm	Reflective Material	QA-72-3-P-RM	400mm x 711mm	Reflective Material	QA-72-4-P-RM	800mm x 1422mm	Reflective Material
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QA-72-4-P-RM	800mm x 1422mm	Reflective Material																										
	<p>QA-77 ENHANCED DIGITAL CAMERA RESOLUTION CHART</p> <p>Data: Based on ISO-12233, the QA-77 has all of the original features as the QA-72 plus several new ones, such as; Star Sector target; 5 degree slant bar; 5 degree dark gray square for SFR analysis as well as a greater resolution range, from 100-4000 Line Width / Pixel Height. (* QA-77-4-P-RM will not contain gray features - black line only)</p> <table border="1"> <thead> <tr> <th>Part No.</th> <th>Active Size</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>QA-77-P-RM</td> <td>200mm x 356mm</td> <td>Reflective Material</td> </tr> <tr> <td>QA-77-3-P-RM</td> <td>400mm x 711mm</td> <td>Reflective Material</td> </tr> <tr> <td>QA-77-4-P-RM*</td> <td>800mm x 1422mm</td> <td>Reflective Material</td> </tr> </tbody> </table>	Part No.	Active Size	Material	QA-77-P-RM	200mm x 356mm	Reflective Material	QA-77-3-P-RM	400mm x 711mm	Reflective Material	QA-77-4-P-RM*	800mm x 1422mm	Reflective Material															
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	<p>QA-70 (Previously QA-7) VIDEO RESOLUTION PATTERN</p> <p>Data: Based on EIA 1956 chart. Includes linear and pie shapes from 200 to 1000 lines, 10 step density tables, measurement bars and edge definition points.</p> <p>Notes: Measurements of Tele-cine cameras for streaking, ringing, aspect ratio; scan linearity and other video and cine systems. Available in other custom sizes on request.</p> <table border="1"> <thead> <tr> <th>Part No.</th> <th>Overall Size</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>QA-70-1-P-RM</td> <td>228mm x 305mm (9" x 12")</td> <td>Reflective Material</td> </tr> <tr> <td>QA-70-1-P-TM</td> <td>208mm x 305mm (9" x 12")</td> <td>Transparent Material</td> </tr> <tr> <td>QA-70-2-P-CG</td> <td>50mm x 50mm (2" x 2")</td> <td>Chrome on Glass</td> </tr> <tr> <td>QA-70-2-P-OP</td> <td>50mm x 50mm (2" x 2")</td> <td>OPal glass</td> </tr> </tbody> </table>	Part No.	Overall Size	Material	QA-70-1-P-RM	228mm x 305mm (9" x 12")	Reflective Material	QA-70-1-P-TM	208mm x 305mm (9" x 12")	Transparent Material	QA-70-2-P-CG	50mm x 50mm (2" x 2")	Chrome on Glass	QA-70-2-P-OP	50mm x 50mm (2" x 2")	OPal glass												
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Step Tablets

GRAY SCALES - DENSITY REFERENCE CHARTS

	<p>ST-10 (Previously T-70 / QA-41) DENSITY PATCHES</p> <p>Data: 3 density patches on durable, flexible reflective material; reflections of 6% (density of 1.22D), 50% (density of 0.30D) and white; meet MIL-M-9868E requirements. Size of patches: 6 inch x 6 inch.</p> <p>Notes: Useful in graphics & macro-systems where exposure & process control is important. Meets AIIM, engineering & graphic requirements.</p> <table border="0"> <tr> <td><u>Part No.</u></td> <td><u>Image Size</u></td> <td><u>Material</u></td> </tr> <tr> <td>ST-10-RM</td> <td>6 inch x 6 inch /ea.</td> <td>Reflective Material</td> </tr> </table>	<u>Part No.</u>	<u>Image Size</u>	<u>Material</u>	ST-10-RM	6 inch x 6 inch /ea.	Reflective Material														
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ST-10-RM	6 inch x 6 inch /ea.	Reflective Material																			
	<p>ST-20 (Previously T-80 / QA-42) STEP DENSITY WEDGE</p> <p>Data: Multi-step wedge consisting of D-min, D-max and incremental density steps. Calibration data available. Reflective density range 0.10 to 2.0 D Transmission density range 0.06 to 2.2 D</p> <table border="0"> <tr> <td></td> <td><u>Steps</u></td> <td><u>Overall Size</u></td> <td><u>Step Size</u></td> <td><u>Trans. Material</u></td> <td><u>Reflective Material</u></td> </tr> <tr> <td>ST-20-2</td> <td>12 Step Tablet</td> <td>230mm x 25mm</td> <td>steps of 19mm</td> <td></td> <td>ST-20-2R-RM</td> </tr> <tr> <td>ST-20-8</td> <td>21 Step Tablet</td> <td>170mm x 25mm</td> <td>steps of 5mm</td> <td>ST-20-8T-TM</td> <td>ST-20-8R-RM</td> </tr> </table>		<u>Steps</u>	<u>Overall Size</u>	<u>Step Size</u>	<u>Trans. Material</u>	<u>Reflective Material</u>	ST-20-2	12 Step Tablet	230mm x 25mm	steps of 19mm		ST-20-2R-RM	ST-20-8	21 Step Tablet	170mm x 25mm	steps of 5mm	ST-20-8T-TM	ST-20-8R-RM		
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	<p>ST-21 STEP DENSITY WEDGE</p> <p>Data: Multi-step wedge consisting of D-min, D-max and incremental density steps. Calibration data available. Transmission density range 0.05 to 3.05 D (0.30 per step)</p> <table border="0"> <tr> <td></td> <td><u>Steps</u></td> <td><u>Overall Size</u></td> <td><u>Step Size</u></td> <td><u>Trans. Material</u></td> </tr> <tr> <td>ST-21</td> <td>11 Step Tablet</td> <td>80mm x 19mm</td> <td>steps of 3.75mm</td> <td>ST-21-TM</td> </tr> </table>		<u>Steps</u>	<u>Overall Size</u>	<u>Step Size</u>	<u>Trans. Material</u>	ST-21	11 Step Tablet	80mm x 19mm	steps of 3.75mm	ST-21-TM										
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	<p>ST-22 STEP DENSITY WEDGE</p> <p>Data: Multi-step wedge consisting of D-min, D-max and incremental density steps. Calibration data available. Transmission density range 0.05 to 3.05 D (0.15 per step)</p> <table border="0"> <tr> <td></td> <td><u>Steps</u></td> <td><u>Overall Size</u></td> <td><u>Step Size</u></td> <td><u>Trans. Material</u></td> </tr> <tr> <td>ST-22</td> <td>21 Step Tablet</td> <td>140mm x 25.4mm</td> <td>steps of 5mm</td> <td>ST-22-TM</td> </tr> </table> <p>ST-23 STEP DENSITY WEDGE</p> <p>Data: Multi-step wedge consisting of D-min, D-max and incremental density steps. Calibration data available. Transmission density range 0.05 to 3.05 D (0.15 per step)</p> <table border="0"> <tr> <td></td> <td><u>Steps</u></td> <td><u>Overall Size</u></td> <td><u>Step Size</u></td> <td><u>Trans. Material</u></td> </tr> <tr> <td>ST-23</td> <td>21 Step Tablet</td> <td>250mm x 35mm</td> <td>steps of 11.9mm</td> <td>ST-23-TM</td> </tr> </table>		<u>Steps</u>	<u>Overall Size</u>	<u>Step Size</u>	<u>Trans. Material</u>	ST-22	21 Step Tablet	140mm x 25.4mm	steps of 5mm	ST-22-TM		<u>Steps</u>	<u>Overall Size</u>	<u>Step Size</u>	<u>Trans. Material</u>	ST-23	21 Step Tablet	250mm x 35mm	steps of 11.9mm	ST-23-TM
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	<u>Steps</u>	<u>Overall Size</u>	<u>Step Size</u>	<u>Trans. Material</u>																	
ST-23	21 Step Tablet	250mm x 35mm	steps of 11.9mm	ST-23-TM																	

 <table border="1" data-bbox="142 348 441 478"> <tr><td>0.70</td><td>0.10</td><td>0.15</td><td>0.20</td><td>0.25</td><td>0.30</td><td>0.35</td><td>0.40</td><td>0.70</td></tr> <tr><td>0.45</td><td>0.50</td><td>0.55</td><td>0.60</td><td>0.65</td><td>0.70</td><td>0.75</td><td>0.80</td><td>0.85</td></tr> <tr><td>0.90</td><td>0.95</td><td>1.00</td><td>1.05</td><td>1.10</td><td>1.15</td><td>1.20</td><td>1.25</td><td>1.30</td></tr> <tr><td>0.70</td><td>1.35</td><td>1.40</td><td>1.45</td><td>1.50</td><td>1.55</td><td>1.60</td><td>0.10</td><td>0.70</td></tr> </table>	0.70	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.70	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00	1.05	1.10	1.15	1.20	1.25	1.30	0.70	1.35	1.40	1.45	1.50	1.55	1.60	0.10	0.70	<p>ST-50 REFLECTION GRAY CHART</p> <p>Data: The ST-50 gray scale chart is a reflection object on semi-matte photographic paper. It is available either calibrated or uncalibrated. The four corner patches for the calibrated scales are within 0.02 density of each other. Each area is 10mm square.</p> <table border="0" data-bbox="922 432 1474 485"> <tr> <td><u>Part No.</u></td> <td><u>Overall Size</u></td> <td><u>Material</u></td> </tr> <tr> <td>ST-50-RM</td> <td>40mm x 90mm</td> <td>Reflective Material</td> </tr> </table>	<u>Part No.</u>	<u>Overall Size</u>	<u>Material</u>	ST-50-RM	40mm x 90mm	Reflective Material
0.70	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.70																																			
0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85																																			
0.90	0.95	1.00	1.05	1.10	1.15	1.20	1.25	1.30																																			
0.70	1.35	1.40	1.45	1.50	1.55	1.60	0.10	0.70																																			
<u>Part No.</u>	<u>Overall Size</u>	<u>Material</u>																																									
ST-50-RM	40mm x 90mm	Reflective Material																																									
	<p>ST-51 EIA HALFTONE GRAY SCALE</p> <p>Data: The EIA grayscale pattern is a standard 2" square projection slide. It contains two parallel gray scales. The upper scale has nine nominally equal transmission steps while the lower contains the same number of nominally equal density steps. The transmission values range from 3% to 60%, corresponding to density values of 1.52 and 0.22 respectively. The slide is chrome on glass and densities are achieved by a fine halftone pattern.</p> <table border="0" data-bbox="959 774 1484 827"> <tr> <td><u>Part No.</u></td> <td><u>Overall Size</u></td> <td><u>Material</u></td> </tr> <tr> <td>ST-51-CG</td> <td>2 inch x 2 inch</td> <td>Chrome on Glass</td> </tr> </table>	<u>Part No.</u>	<u>Overall Size</u>	<u>Material</u>	ST-51-CG	2 inch x 2 inch	Chrome on Glass																																				
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ST-51-CG	2 inch x 2 inch	Chrome on Glass																																									
	<p>ST-52 ISO DIGITAL CAMERA CONTRAST CHART</p> <p>Data: This Camera Contrast Chart conforms to International Standard ISO 14524, "Photography - Electronic Still Picture Cameras - Methods for Measuring Opto-Electronic Conversion Functions (OECF's)".</p> <p>Notes: Chart area measures 356mm x 200mm with 12 gray levels on a durable material. Density range from 0.10 to 2.30.</p> <table border="0" data-bbox="911 1108 1474 1161"> <tr> <td><u>Part No.</u></td> <td><u>Overall Size</u></td> <td><u>Material</u></td> </tr> <tr> <td>ST-52-RM</td> <td>356mm x 200mm</td> <td>Reflective Material</td> </tr> </table>	<u>Part No.</u>	<u>Overall Size</u>	<u>Material</u>	ST-52-RM	356mm x 200mm	Reflective Material																																				
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ST-52-RM	356mm x 200mm	Reflective Material																																									
	<p>ST-53 ISO 21550 DYNAMIC RANGE FILM TARGET</p> <p>Data: This target conforms to International Standard ISO 21550, "Electronic Scanners for Photographic Images - Dynamic Range Measurement". The ST-53 is available in two different target configurations; ST-53-1-TM has 0.1 to 4.0 Optical Densities which are appropriate for imaging media associated with direct visual viewing situations such as photographic slides or paper prints; and ST-53-2-TM has 0 to 6.0 Optical Densities which are appropriate for intermediate imaging media such as negatives.</p> <table border="0" data-bbox="786 1430 1474 1514"> <tr> <td><u>Part No.</u></td> <td><u>Overall Size</u></td> <td><u>Material</u></td> </tr> <tr> <td>ST-53-1-ISO-21550-N-TM</td> <td>35mm x 85mm</td> <td>Trans. Material</td> </tr> <tr> <td>ST-53-2-ISO-21550-N-TM</td> <td>35mm x 85mm</td> <td>Trans. Material</td> </tr> </table>	<u>Part No.</u>	<u>Overall Size</u>	<u>Material</u>	ST-53-1-ISO-21550-N-TM	35mm x 85mm	Trans. Material	ST-53-2-ISO-21550-N-TM	35mm x 85mm	Trans. Material																																	
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ST-53-2-ISO-21550-N-TM	35mm x 85mm	Trans. Material																																									
	<p>SDTP-2 SCREEN DOT TEST PATTERN</p> <p>Data: Ideally useful for very fine incremental testing the effects of very small feature size and area changes.</p> <p>Notes: The image consists of 301 patches, in a grid layout, approx. 71mm (w) by 83mm (h) with each patch being approx. 4.7mm (w) by 4.0mm (h). Selected ranges of screen dot percentage patterns are provided in increments of 0.1%; and the ranges presented are; 0.0- 5.9%; 9.0-10.9%; 19.0-20.9%; 29.0-30.9%; 39.0-40.9%; 49.0-50.9%; 59.0-60.9%; 69.0-70.9%; 79.0-80.9%; 89.0-90.9%; and 95.0-100%.</p> <table border="0" data-bbox="873 1791 1474 1906"> <tr> <td><u>Part No.</u></td> <td><u>Overall Size</u></td> <td><u>Material</u></td> </tr> <tr> <td>SDTP-2-N-RM</td> <td>127mm x 127mm</td> <td>Reflective Material</td> </tr> <tr> <td>SDTP-2-N-TM</td> <td>127mm x 127mm</td> <td>Trans. Material</td> </tr> <tr> <td>SDTP-2-P-CG</td> <td>127mm x 127mm</td> <td>Chrome Glass</td> </tr> </table>	<u>Part No.</u>	<u>Overall Size</u>	<u>Material</u>	SDTP-2-N-RM	127mm x 127mm	Reflective Material	SDTP-2-N-TM	127mm x 127mm	Trans. Material	SDTP-2-P-CG	127mm x 127mm	Chrome Glass																														
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SDTP-2-P-CG	127mm x 127mm	Chrome Glass																																									

Bar Code

CALIBRATION CONFORMANCE STANDARDS

In 1989, ANSI established a Bar Code Print Quality program creating a relative scale for bar code print quality levels which is now known as ANSI X3.182 methodology. As an adjunct to the ANSI standard, **APPLIED IMAGE** in conjunction with UCC and AIM, developed a unique set of bar code calibration standards, which are based on the ANSI X3.182 & ANSI/UCC5 standards and the proposed EN 1635 and GEN/TC225 Quality standards. The production of the bar code standards is monitored using a specialized, custom-built scanning microdensitometer, "The Judge", which has been calibrated to ANSI methodology and is traceable to NIST.

CALIBRATED CONFORMANCE STANDARD ©
TEST CARD
FOR EAN/UPC SYMBOL VERIFIERS

EAN-13 MASTER GRADE UPC-A MASTER GRADE

5 0 1 2 3 4 5 6 7 8 9 0 0 1

DECODABILITY: _____
CONTRAST: _____
MODULATION: _____

DEFECTS (VOID)

0 1 2 3 4 5 6 7 8 9 0 1 5

DECODABILITY: _____
CONTRAST: _____
MODULATION: _____

DECODABILITY (BAR)

QUIET ZONE TEST

FAIL PASS

CALIBRATION #: _____
WAVE LENGTH: _____
EFF. APER.: _____

CONTRAST

UNIFORM CODE COUNCIL, INC.

- Per ANSI X3.182 & ANSI/UCC5 Standards
- Proposed EN1635 Standard
- Proposed GEN/TC225 QUALITY Standard

© 1987, APPLIED IMAGE, Inc. All Rights Reserved PART NO. CCSV-1 REV. J

UCC/EAN Calibrated CONFORMANCE Standard

Part No. CCSV-1

This special UCC/EAN Calibrated Conformance Standard chart has been designed in conjunction with the Uniform Code Council. The purpose of this chart is to provide the U.P.C. bar code industry with an accurate calibration tool in which a minimum performance level must be met. The chart is ideal for testing of verifiers, scanners, and other U.P.C. bar code reading equipment. In addition, this tool can also be used as a training mechanism for new operators to assure proper "methodology" in the use of verifiers. Each symbol comes complete with individually certified values.

UCC / EAN Primary CALIBRATION Standard Set

Part No. UPC-SET

The U.P.C. Verification Calibration Standard is a unique set of symbols that assures an exact and reliable primary bar code standard that exist for U.P.C. codes based on ANSI X3.182 methodology. The complete group of 32 Calibrated Bar Code Primary Standards assures that manufacturers of verification equipment, scanners, QC labs and the "need to know" users now have a basis for comparison reading performance of various equipment.

These standards are intended as a fundamental calibration set

for any QC program, providing a continuous scale from "best" to "worst" case characteristics of each parameter with full traceable data. Ideally suited to those requiring traceability, such as ISO certification.

AIM Code 39 & Code 128 Verification CALIBRATION Standards

Part No. Code 39
Code 128

Until now, when verifying or scanning Code 39 or Code 128, there was no basis for system accuracy which assured that the system met the ANSI X3.182 standard. In cooperation with AIM, a unique group of Calibrated Bar Code Standards were developed which check the functionality of the systems based on the ANSI methodology.

Each test card has been designed to test at two levels (the highest A grade and an acceptable C performance grade). In addition, a full compliment of characteristics are checked for each symbol and reported. In this way one can check to see how close their device is functioning to a known standard. Each card is fully compatible under the guidelines of AIM – USA, as well as AIM – Europe.

APPLIED CODE 39 (X DIM = 7.5 MIL)
VERIFICATION CALIBRATION STANDARD ©
(PER ANSI X3.182 AND ISO/IEC 15416)

7CM23G5

DECODABILITY: _____ R min: _____
CONTRAST: _____ R max: _____
MODULATION: _____ Avg. Bar: _____
DEFECT: _____

FOR USE IN CALIBRATION TESTING & DIAGNOSTICS

DECODABILITY: _____ R min: _____
CONTRAST: _____ R max: _____
MODULATION: _____ Avg. Bar: _____
DEFECT: _____

CAL. SERIAL # _____
WAVE LENGTH _____ EFF. APERTURE: _____

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APPLIED CODE 128 (X DIM = 7.5 MIL)
VERIFICATION CALIBRATION STANDARD ©
(PER ANSI X3.182 AND ISO/IEC 15416)

7 1 0 d * , U < 7

DECODABILITY: _____ R min: _____
CONTRAST: _____ R max: _____
MODULATION: _____ Avg. Bar: _____
DEFECT: _____

FOR USE IN CALIBRATION TESTING & DIAGNOSTICS

7 1 0 d * , U < 7

DECODABILITY: _____ R min: _____
CONTRAST: _____ R max: _____
MODULATION: _____ Avg. Bar: _____
DEFECT: _____

CAL. SERIAL # _____
WAVE LENGTH _____ EFF. APERTURE: _____

APPLIED IMAGE GROUP INC. 1655 East Main Street, Rochester, NY 14609 USA

Each standard is imaged on special high definition plastic polymer materials, laminated to minimize reflection changes and packaged in special storage boxes for protection. All calibration standards come complete with a Certificate of Compliance, traceability documentation and calibration data.

Cat No.

CCSV-1 UCC/EAN Calibrated CONFORMANCE Standard

One piece durable test chart having all test samples in a simple to use array. Each chart, designed to be fully applicable in both EAN or U.P.C. applications, has the following characteristics; perfect Grade A symbols (EAN-13 and UPC-A) with Quiet Zone Test Areas; three Grade C symbols that test for Defects (Voids), Decodability (Bar) and Contrast. All symbols are 100% size; U.P.C./EAN. Each chart comes with NIST traceable calibration.

UPC-SET UCC/EAN Primary CALIBRATION Standard Set

Complete group of 32 bar code calibration standards, master perfect to system and step reflective chart. All calibration bar code standards are fully compatible with U.P.C. and EAN bar codes. All symbols are 100% size; U.P.C./EAN. Each chart comes with NIST traceable calibration. (Custom Boxed Set)

UPC Primary – Individual Components

(Actual values are recorded on symbol and individually serialized)

Grade	Symbol Contrast Cat no.	Modulation Cat no.	Defect Spots Cat no.	Defect Voids Cat no.
Grade A	UPC-CONT-A	UPC-MODU-A	UPC-SPOT-A	UPC-VOID-A
Grade B	UPC-CONT-B	UPC-MODU-B	UPC-SPOT-B	UPC-VOID-B
Grade C	UPC-CONT-C	UPC-MODU-C	UPC-SPOT-C	UPC-VOID-C
Grade D	UPC-CONT-D	UPC-MODU-D	UPC-SPOT-D	UPC-VOID-D
Grade F	UPC-CONT-F	UPC-MODU-F	UPC-SPOT-F	UPC-VOID-F
UPC Number	0 1234567890 5	0 00000 41000 7	0 00006 30000 5	0 00006 30000 5

Grade	Decodability Edge Cat no.	Decodability Bar Cat no.	Cat no. UPC-MAST-R Master Perfect to System Reflection Standard (UPC # 0 1234567890 5)
Grade A	UPC-DEDG-A	UPC-DBAR-A	Cat no. CODE-GRAY 6-Step Reflectance Chart Gray Scale
Grade B	UPC-DEDG-B	UPC-DBAR-B	
Grade C	UPC-DEDG-C	UPC-DBAR-C	
Grade D	UPC-DEDG-D	UPC-DBAR-D	
Grade F	UPC-DEDG-F	UPC-DBAR-F	
UPC Number	0 00044 00000 4	0 00011 00000 6	

Individual Symbol Contrast, Modulation, Defect Spots, Defect Voids, Decodability Edge, Decodability Bar, Master Perfect to System Reflection Standard and the 6-Step Reflective Chart can be purchased separately.

CODE-39 AIM Code 39 Verification CALIBRATION Standard - Set of two charts (X DIM = 4.4 MILS and X DIM = 7.5 MILS) Grade A plus Grade C test symbols which check for contrast, decodability, modulation and defects. This standard comes with NIST traceable calibration.

CODE-128 AIM Code 128 Verification CALIBRATION Standard - Set of two charts (X DIM = 4.4 MILS and X DIM = 7.5 MILS) Grade A Plus Grade C test symbols which check for contrast, decodability, modulation and defects. This standard comes with NIST traceable calibration.

APPLIED IMAGE, a worldwide leader in the **PHOTONICS** industry, offers a wide array of standard off-the-shelf products as well as **high quality custom manufacturing capabilities** for your every need. **TARGETS, SCALES, RETICLES, ROBOTIC VISION, MASKS, IMAGING CALIBRATION STANDARDS, BAR CODE Symbols**, and **ENCODERS**. Our experienced technical staff is ready to assist you in your next project, or on your existing products using your exact specifications; from initial design engineering, through prototyping and into final manufacturing.

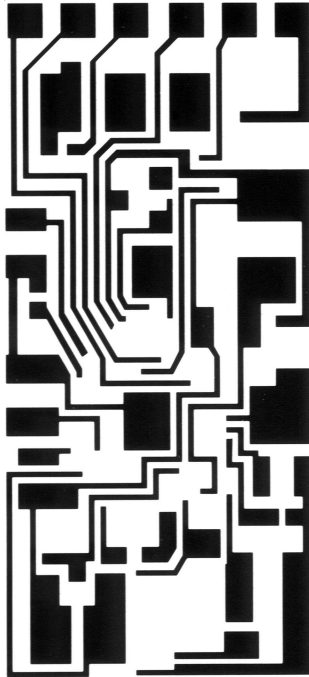
Let **APPLIED IMAGE Group** help put **PHOTONICS IMAGING** to work for you!

Mask Making

SERVICES

IC MCM HYBRIDS

Thin and thick film masks and screens can be accommodated in all substrates and sizes to meet your requirements. Work can be performed from your data base or our expert CAD group would be pleased to layout the design for you.



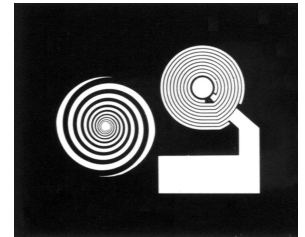
◆ ACCURATE PHOTOTOOLS

For a quarter of a century, **APPLIED IMAGE** has been serving the needs of the imaging industry with precision masks, reticles, test targets and phototools of the highest quality. Our thorough knowledge of **HYBRIDS** (both thin and thick film), microwaves, large displays, surface mounted technology and encoders assures that our customers will receive the quality product they expect, on time and at a reasonable price.

APPLIED's unique state-of-art equipment, facilities and professional staff provides a wide variety of solutions for today's mask needs. **APPLIED** is truly a "one step" imaging center where the solutions to your needs are our expertise.

MICROWAVE | GUIDE

Designing and imaging microwaves can be tricky, but our wide assortment of equipment and facilities assures meeting even the most stringent government specifications.



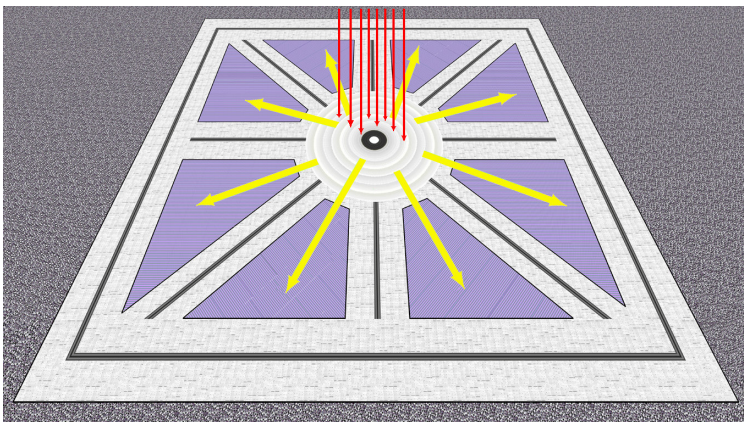
◆ COMPLETE SOLUTIONS

The first step in making the mask is the design. **APPLIED** starts with your CAD data or, if you prefer, our extensive CAD department will design the layout for you.

After appropriate checks, the output is then routed to either our micro or macro group, depending on your particular needs. The micro group pattern generates, step and repeats, and duplicates the masks to the highest standards. Or the macro group might photoplot, rubulith cut, camera reduce, step and repeat, duplicate or make screens as your needs require.

◆ SUBSTRATE FLEXIBILITY

A wide variety of masks, film tools and screens are available with formats up to 8 inch x 10 inch for hybrids and semiconductors as large as 25 inch x 30 inch for special applications (such as displays or thick films). The choice of substrates include emulsion, chrome, see-thru chrome, iron oxide on a sodalime glass base, low expansion quartz, or other specialty glass based materials. Or perhaps your requirements are for film tools, screens or even sandwiched hinged glass phototools all of which **APPLIED IMAGE** can provide.



◆ QUALITY

The single most important commodity is quality. This process starts with the review of the job when it first comes in. It is then carried through to check plot procedures established by our CAD group with our customers. Further, this same attention is carried through in process QC checks.

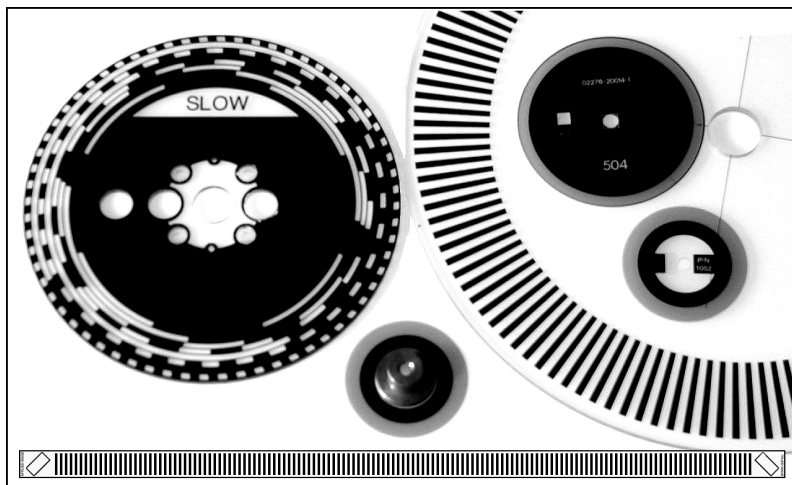
Finally, all jobs go through our final QC department. All QC checks are performed in stringent environmentally controlled and class 100 clean room facilities assuring you the highest quality.

◆ ONE LAST WORD

If you need masks and designs for a hybrid, microwave, encoder, flat panel display, surface mounted devices or other specialized imaging needs, give us a call. We are ready to serve your needs.

Encoder Scales

ROTARY and LINEAR



- ◆ LINEAR SCALES
- ◆ ROTARY DISCS
- ◆ TIMING ENCODERS
- ◆ GRAY ENCODER CODES
- ◆ MEASUREMENT SCALES

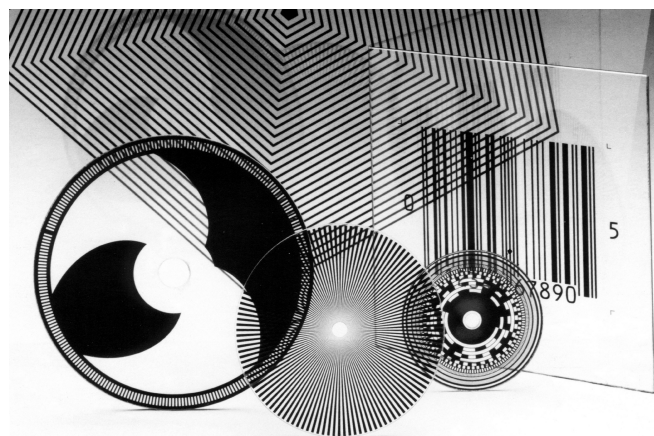
With 25 years of experience producing ENCODER strips, discs, scales and gray codes, the **APPLIED IMAGE** has become one of the foremost leaders in the art & science of producing such tight toleranced components.

APPLIED IMAGE offers custom and standard encoder discs and linear scales to meet your most demanding applications. With the accuracy of our equipment, traceable to the National Institute of Standards and Technology, we can custom design with guaranteed adherence to critical tolerances.

APPLIED will assist in identifying cost effective options for selecting the right material substrate in developing your encoder. Available materials include: photo emulsions on film; glass or plastics.

Chromium, aluminum, gold and inconel on glass as well as beryllium, copper, nickel electroform and other sophisticated metals.

Our reputation for technical expertise in the fields of imaging science and micro-imaging affords you the right combination necessary for accomplishing even the most difficult of designs.



Whether your needs is in printers and scanners, machine tools, robotics, industrial or military applications select **APPLIED IMAGE**, leaders in micro-imaging technology, to provide for those needs ... on time & within budget.



Brother
Buehler
Cepheid
Compaq
Canon

Dell
Encad
Espon
Hewlett Packard
Kodak

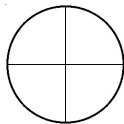
Lexmark
Samsung
TRW
U-Max
Xerox

Standard Reticles

GRATICULES

The **APPLIED IMAGE** has been manufacturing high quality STANDARD RETICLES for over two decades. Call **APPLIED IMAGE** to find out what design styles and sizes are available on specific reticles.

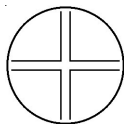
SIMPLE and DASHED CROSSHAIRS



Simple Cross Hair, 9µm wide		
<u>PART No.</u>	RET 42-19	19mm dia.
	RET 42-21	21mm dia.
Simple Cross Hair, 17µm wide		
<u>PART No.</u>	RET 41-19	19mm dia.
	RET 41-21	21mm dia.
Simple Cross Hair, 25µm wide		
<u>PART No.</u>	RET 43-19	19mm dia.
	RET 43-21	21mm dia.
Simple Cross Hair, 44µm wide		
<u>PART No.</u>	RET 40-19	19mm dia.
	RET 40-21	21mm dia.

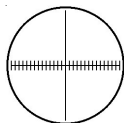
Dashed Cross Hair, 13µm wide		
<u>PART No.</u>	RET 50-19	19mm dia.
	RET 50-21	21mm dia.
Dashed Cross Hair, 63µm wide w/spurs		
<u>PART No.</u>	RET 51-19	19mm dia.
	RET 51-21	21mm dia.
OffSet Dashed Cross Hair, 63µm wide		
<u>PART No.</u>	RET 54-19	19mm dia.
	RET 54-21	21mm dia.

PARALLEL CROSSLINES



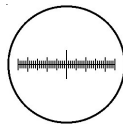
Parallel Cross Lines 0.025mm gap		
<u>PART No.</u>	RET 60-19	19mm dia.
	RET 60-21	21mm dia.
Parallel Cross Lines 0.075mm gap		
<u>PART No.</u>	RET 61-19	19mm dia.
	RET 61-21	21mm dia.
Parallel Cross Lines 0.125mm gap		
<u>PART No.</u>	RET 62-19	19mm dia.
	RET 62-21	21mm dia.
Parallel Cross Lines 0.500mm gap		
<u>PART No.</u>	RET 63-19	19mm dia.
	RET 63-21	21mm dia.
Parallel Cross Lines 1.00mm gap		
<u>PART No.</u>	RET 64-19	19mm dia.
	RET 64-21	21mm dia.
Parallel Cross Lines 2.00mm gap		
<u>PART No.</u>	RET 65-19	19mm dia.
	RET 65-21	21mm dia.

CROSSHAIR W/SCALES



CrossHair w/scale 20mm, div. of 0.10mm		
<u>PART No.</u>	RET 21-19	19mm dia.
	RET 21-21	21mm dia.

SCALES



Scale 2mm long, 200 div. of 0.01mm		
<u>PART No.</u>	RET 14-19	19mm dia.
	RET 14-21	21mm dia.
Scale 5mm long, 50 div. of 0.1mm		
<u>PART No.</u>	RET 15-19	19mm dia.
	RET 15-21	21mm dia.
Scale 5mm long, 100 div. of 0.05mm		
<u>PART No.</u>	RET 11-19	19mm dia.
	RET 11-21	21mm dia.
Scale 10mm long, 100 div. of 0.10mm		
<u>PART No.</u>	RET 10-19	19mm dia.
	RET 10-21	21mm dia.
Scale 10mm long, 200 div. of 0.05mm		
<u>PART No.</u>	RET 16-19	19mm dia.
	RET 16-21	21mm dia.
Scale 15mm long, 150 div. of 0.10mm		
<u>PART No.</u>	RET 13-19	19mm dia.
	RET 13-21	21mm dia.
Scale 20mm long, 200 div. of 0.10mm		
<u>PART No.</u>	RET 12-19	19mm dia.
	RET 12-21	21mm dia.

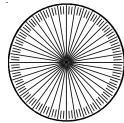
CROSSED SCALES



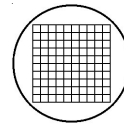
Cross Scale 10mm, 100 div. of 0.10mm		
<u>PART No.</u>	RET 30-19	19mm dia.
	RET 30-21	21mm dia.
Cross Scale 20mm long, 200 div. of 0.10mm		
<u>PART No.</u>	RET 32-19	19mm dia.
	RET 32-21	21mm dia.

PROTRACTOR

360 degrees at 1 deg increments		
<u>PART No.</u>	RET 94-19	19mm dia.
	RET 94-21	21mm dia.



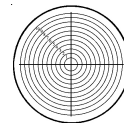
SIMPLE GRIDS and LABELED GRIDS



Grid 5mm x 5mm x 0.5mm w/0.025mm line		
<u>PART No.</u>	RET71-19	19mm dia.
	RET71-21	21mm dia.
Grid 10mm x 10mm x 1mm w/0.025mm line		
<u>PART No.</u>	RET73-19	19mm dia.
	RET73-21	21mm dia.
Grid 5mm x 5mm x 1mm w/0.025mm line		
<u>PART No.</u>	RET70-19	19mm dia.
	RET70-21	21mm dia.
Grid 10mm x 10mm x 0.5mm w/0.025mm		
<u>PART No.</u>	RET74-19	19mm dia.
	RET74-21	21mm dia.

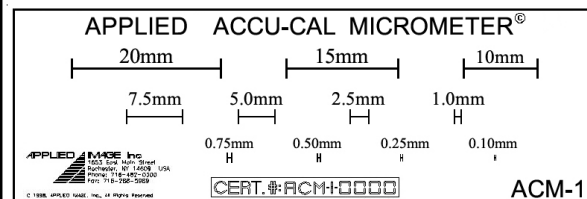
Labeled Grid 5mm x 5mm x 1mm w/0.01mm line - 1-5 horiz. / 1-5 vert,		
<u>PART No.</u>	RET 83-19	19mm dia.
	RET 83-21	21mm dia.
Labeled Grid 10mm x 10mm x 1mm w/0.01mm line - 1-10 horiz. / A-J vert,		
<u>PART No.</u>	RET 81-19	19mm dia.
	RET 81-21	21mm dia.
Labeled Grid 10mm x 10mm x 0.50mm w/0.025mm line - 1-10 horiz. / 1-10 vert,		
<u>PART No.</u>	RET 80-19	19mm dia.
	RET 80-21	21mm dia.

CONCENTRIC CIRCLES w/ CROSSHAIRS



10 Concentric Circles 0-5mm dia., 0.5mm div		
<u>PART No.</u>	RET 92-19	19mm dia.
	RET 92-21	21mm dia.
10 Concentric Circles 0-10mm dia., 1.0mm div		
<u>PART No.</u>	RET 93-19	19mm dia.
	RET 93-21	21mm dia.

APPLIED ACCU-CAL™ CALIBRATING MICROMETER



Part No. ACM-1

The ideal standard for Accurate Calibration of any eyepiece, reticle, filar instrument, electronic imaging or optical tube system. With a full array of fixed calibration

lengths for quick set up and ease of use. Calibration magnification range: from 1x to 1000x power, with bar lengths 20mm to 0.10mm.

Overall size: 1" x 3" / image: chrome on glass / positive image

CUSTOM APPLICATIONS

Providing the customer with decades of experience in the design and manufacturing of precision photonic IMAGED products and services. Our 6-Point System assures that you receive the exact product and service that you've come to expect.

▶ **Feasibility Review**

The process begins with an initial exchange of information with the customer, engineering drawing review when available, and need analysis, with an eye towards minimizing costs and throughput. A multiple of questions are asked to assure that all important items are covered before an actual engineering concept and quotation is prepared.

▶ **Quotation**

Our quotation includes an outline of what we are to produce, to what specification requirements, tooling costs & unit pricing, and how long the task will take. In addition, our quote may include alternate suggestions that may save cost or speed up the process.

▶ **Job Acceptance & Implementation**

Before we actually move forward with a new job, our design team will engineer & CAD design your component for your approval (when applicable). This extra step is done to minimize potential problems often involving complex designs and tasks. This also gives our customer an opportunity to review the project and make changes before proceeding, saving valuable time and money.



▶ **Prototype / 1st Article Inspection**

Upon completion of the designs, when applicable, prototypes or first articles are produced for review before proceeding to full production.

▶ **Quality System**

Each lot of parts must pass stringent QC tests throughout our production process. This assures you of optimum quality based on MIL & ISO quality control standards, and in compliance with the American Association for Laboratory Accreditation guidelines.

▶ **Closure & Archiving**

Once concluded, all jobs are reviewed for possible future production improvements. This assures that our engineers & technicians continue our commitment to continuous process improvements "to create the best product at the lowest cost". Then, each job (data, designs, tooling) is carefully identified and secured in our archival room for a minimum of at least 5 years. This is done free of charge as a service to our customers.

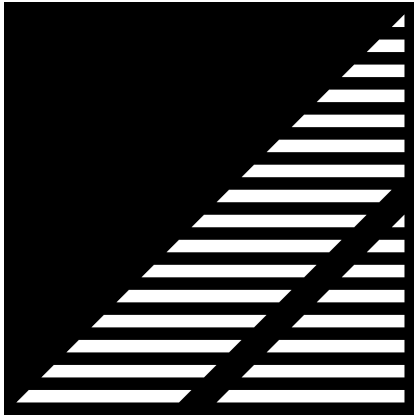
CALIBRATION / CERTIFICATION SERVICES

Adhering to the American Association for Laboratory Accreditation guidelines and MIL and ISO protocol, **APPLIED IMAGE** provides calibration services traceable to N.I.S.T. assuring that your standards, or imaged components, can be used with your internal quality program.

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e-mail: imaging@appliedimage.com



APPLIED IMAGE MISSION STATEMENT

All of us, at **APPLIED IMAGE**, have a single clear mission:

To create quality innovative “**Precision IMAGE Products & Services**” that meet or exceed the specific needs as defined by you, our customer.

How well we fulfill this mission will be the measure of our success. Our customer will reward this success by trusting us with their future business needs.

*All of us at **APPLIED IMAGE**, individually and collectively, will work diligently to earn and keep that trust!*

