



## Overview

Product name	TE42-LL 2AR
Principle	<p>A multipurpose test chart for the analysis of resolution, texture reproduction, acutance, dynamic range, noise, color reproduction, distortion, shading, chromatic aberration, and visual analysis.</p> <p>The ability to analyze all of the critical low-light and image quality factors in one image. ISO 19093 recommends using this chart for the best measurement results. This version combines the two aspect ratios 4:3 and 16:9 in one chart layout.</p>

## Features

### OECF

Type/s of pattern	Grayscale
Number of steps	20
Contrast	≈ 20:1 (26 dB, 4.4 f-stops)
Density/Reflection values	Individually measured values are provided in a separate Acceptance Protocol. Production tolerance is ± 0.03 OD.

### Siemens stars

Type/s of pattern	<p>18 Sinusoidal Siemens stars</p> <ul style="list-style-type: none"> <li>• 1 center star, full circle, full contrast</li> <li>• 1 center star, full circle, low contrast</li> <li>• 8 corner stars, full circle, full contrast, 4 stars for each aspect ratio</li> <li>• 4 lateral stars, full circle, full contrast, 2 stars for each aspect ratio</li> <li>• 4 lateral stars, full circle, low contrast, 2 stars for each aspect ratio</li> </ul>
Modulation	<p>Full contrast: ≈ 95 % (S) / ≈ 92 % (H)</p> <p>Low contrast: ≈ 55 % (S) / ≈ 58 % (H)</p> <p>Production tolerance is ± 3%.</p>
Cycles	144



Diameter stars	A1066	100 mm		
	A460	38 mm		
Diameter registration marks		A1066	A460	
	H	8 mm	5 mm	
	S	12 mm	---	
Sample rate* [MP]		minimum	maximum	
	A1066 H	2	70	(> 8K)**
	A1066 S	2	30	(HDTV - 8K)**
	A460 H	2	40	(HDTV - 8K)**

## Slanted edges

Type/s of pattern	8 Slanted Edges <ul style="list-style-type: none"> <li>All sub-charts in horizontal and vertical orientation</li> <li>Four in the center part, four in the lateral area</li> <li>Each has a low and high contrast</li> </ul>			
Modulation	Low contrast: $\approx 48\%$ , high contrast: $\approx 82\%$			
Size of sub-chart	A1066	104 x 30		
	A460	40 x 11.5		
Sample rate* [MP]		minimum	maximum	
	A1066 H	---***	70	(> 8K)**
	A1066 S	---***	30	(HDTV - 8K)**
	A460 H	---***	40	(HDTV - 8K)**
Density / Reflection values	Individually measured values are provided in a separate Acceptance Protocol. Production tolerance is $\pm 0.03$ OD.			

## Dead Leaves/Noise patches

Type/s of pattern	2 Dead Leaves in the center area, according to the approach from 2016 <ul style="list-style-type: none"> <li>One sub-chart low contrast</li> <li>One sub-chart high contrast</li> </ul>			
Modulation	High contrast Low contrast			
Size of sub-chart	A1066	94 x 94		
	A460	36 x 36		
Sample rate* [MP]		minimum	maximum	
	A1066 H	2****	70	(> 8K)**
	A1066 S	2****	30	(HDTV - 8K)**
	A460 H	2****	40	(HDTV - 8K)**



## Color patches

Type/s of pattern	96 patches (similar but not identical to the X-Rite ColorChecker SG) <ul style="list-style-type: none"> <li>• 12 gray steps</li> <li>• RGBCMY</li> <li>• 12 skin tones</li> <li>• 10 pastel colors</li> <li>• 56 mixed colors</li> </ul>
Color values	Individually measured values are provided in a separate Acceptance Protocol.

## Distortion grid

Type/s of pattern	10 black and white registration marks distributed around the chart
-------------------	--

## Shading

Type/s of pattern	Neutral, uniform gray background
-------------------	----------------------------------

## Visual appraisal, digitalization process

Type/s of pattern	grass, stones
-------------------	---------------

## General description hardware

Type	Reflective
Aspect ratio	4:3 and 16:9
Chart size tolerances	+/- 2 mm as they are handmade in-house and depend on the edge protection type
Chart size [W x H x D]	W [mm]    H [mm]    D [mm]
	A1066    1400    835    3.2
Picture size	W [mm]    H [mm]
	A1066    1200    675
Material	A460    460    258.75
	S version background, Siemens stars, slanted edges: matt print H version background, Siemens stars, slanted edges, Dead Leaves, OECF: photographic paper with matt finishing. All versions colors, grass + stones: matt print A1066 is made from three parts, which can differ in gray value with a tolerance of $\pm 0.03$ OD.
Mounting	Aluminum composite panel (aluminum Dibond), size A1066 Aluminum, size A460
Edge protection	A1066 – No A460 – Fabric tape
Service life	2 years
Storage	Dark, dry, and free from harmful gas (e.g., formaldehyde or ozone). 20 °C and 25 °C with a humidity of 60% – 65% and no direct sunlight at any time.
Scope of delivery	Test chart, stable cardboard envelope (A460 charts)



## Miscellaneous

Evaluation/Assessment	Supported by iQ-Analyzer-X since 1.9.0, visual appraisal is possible
Reference data iQ-Analyzer-X	An individual reference file is provided
Measurement device	X-Rite eXact <a href="https://www.image-engineering.de/content/products/charts/IE_reference_data_accuracy.pdf">https://www.image-engineering.de/content/products/charts/IE_reference_data_accuracy.pdf</a>
Accessories	Chart case A460, A1066
Related Products	iQ-Chartmount, LED-Panel, iQ-Near Focus, iQ-Flatlight, VCX
Terms & Conditions	<a href="https://www.image-engineering.de/terms-and-conditions">image-engineering.de/terms-and-conditions</a>

\* If the chart fills the image height, the chart can be used with a camera of a minimum/maximum sample rate, stated in megapixels (MP).

\*\* HDTV ~ 2.1 MP, 4K ~ 8.3 MP, 8K ~ 33 MP

\*\*\* No lower limit for slanted edges. Small ROI increases variance, min. 100-pixel ROI required.

\*\*\*\* ROI should be reproduced by at least 128 by 128 pixels, with a lower limit based on this requirement.