www.tichawa-vision.com

Tichawa *Vision* GmbH

CIS Illumination Guide

25+ different Illuminations make sure YOUR defects become clearly visible

Tichawa Vision GmbH • Burgwallstrasse 14 • 86316 Friedberg, Germany • Phone: +49 (0) 821 455 553 0 • E-mail: info@tichawa.de

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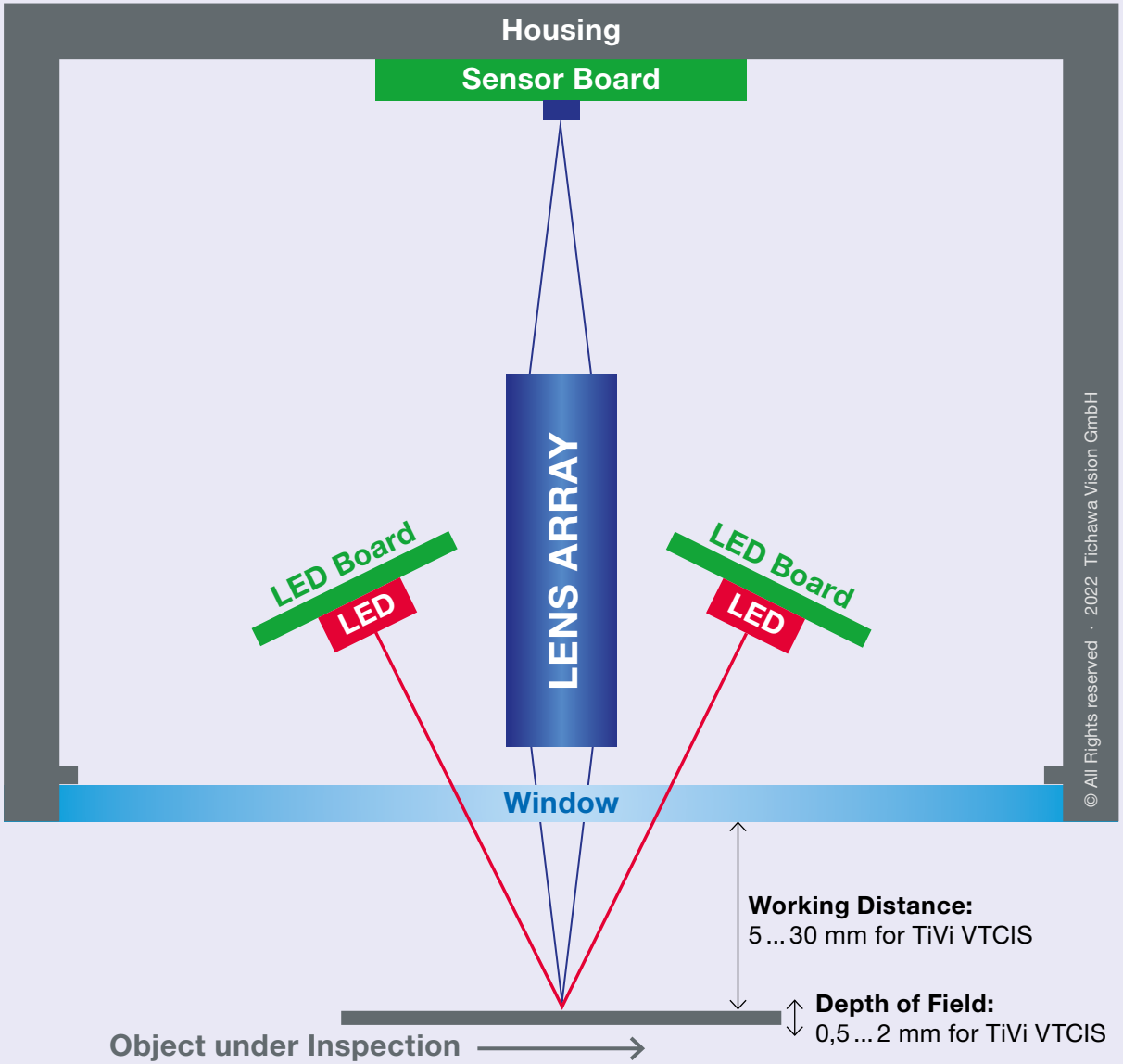
CIS Operating Principle

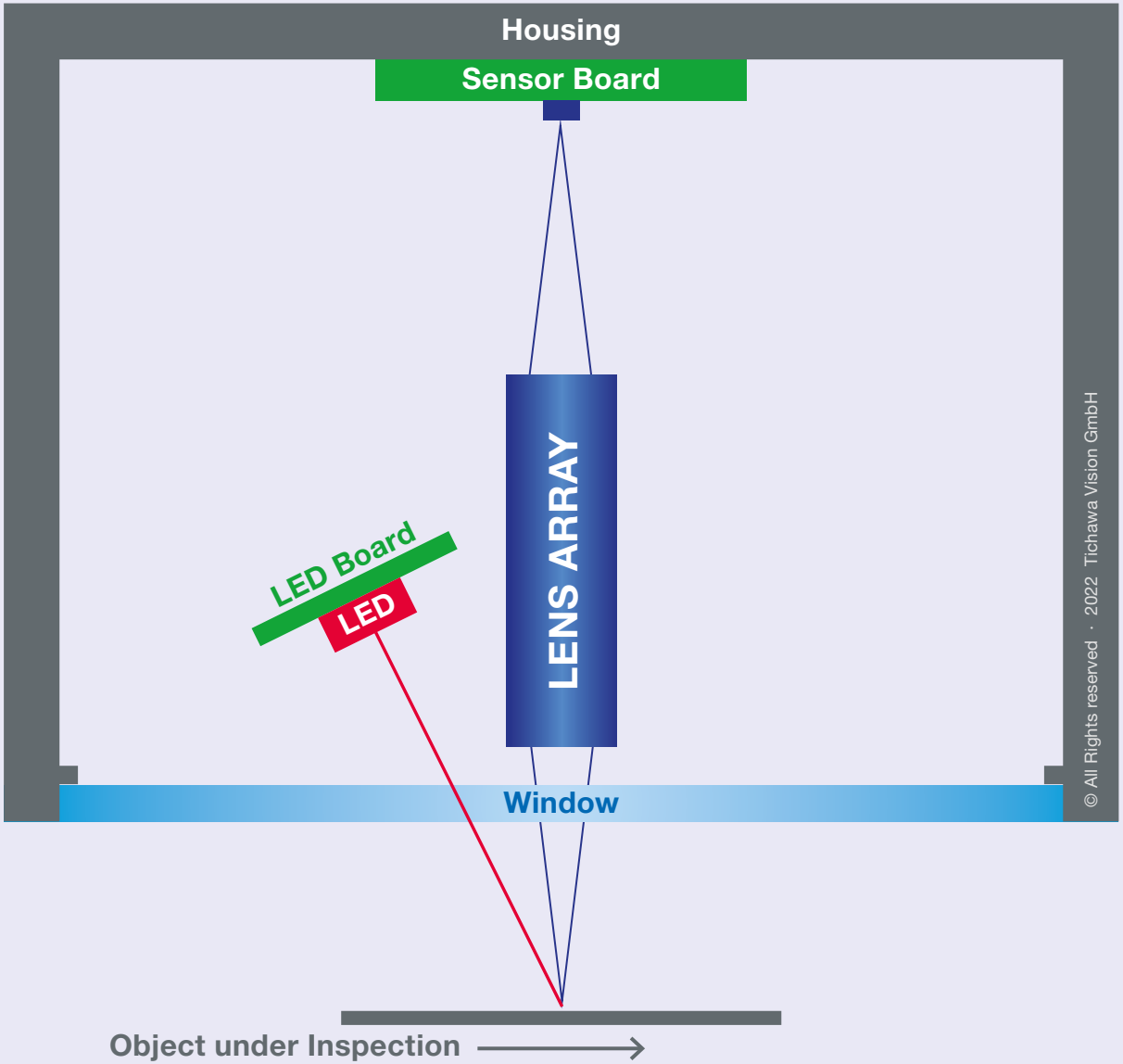


A CIS is made up from one or more Light Sources, typically LEDs illuminating the target under investigation and a Lens Array projecting the target onto the Sensor Board.

Both Lens Array and Sensor Board must match or exceed the target's size.

All these components are mounted into a single protective housing with a window.

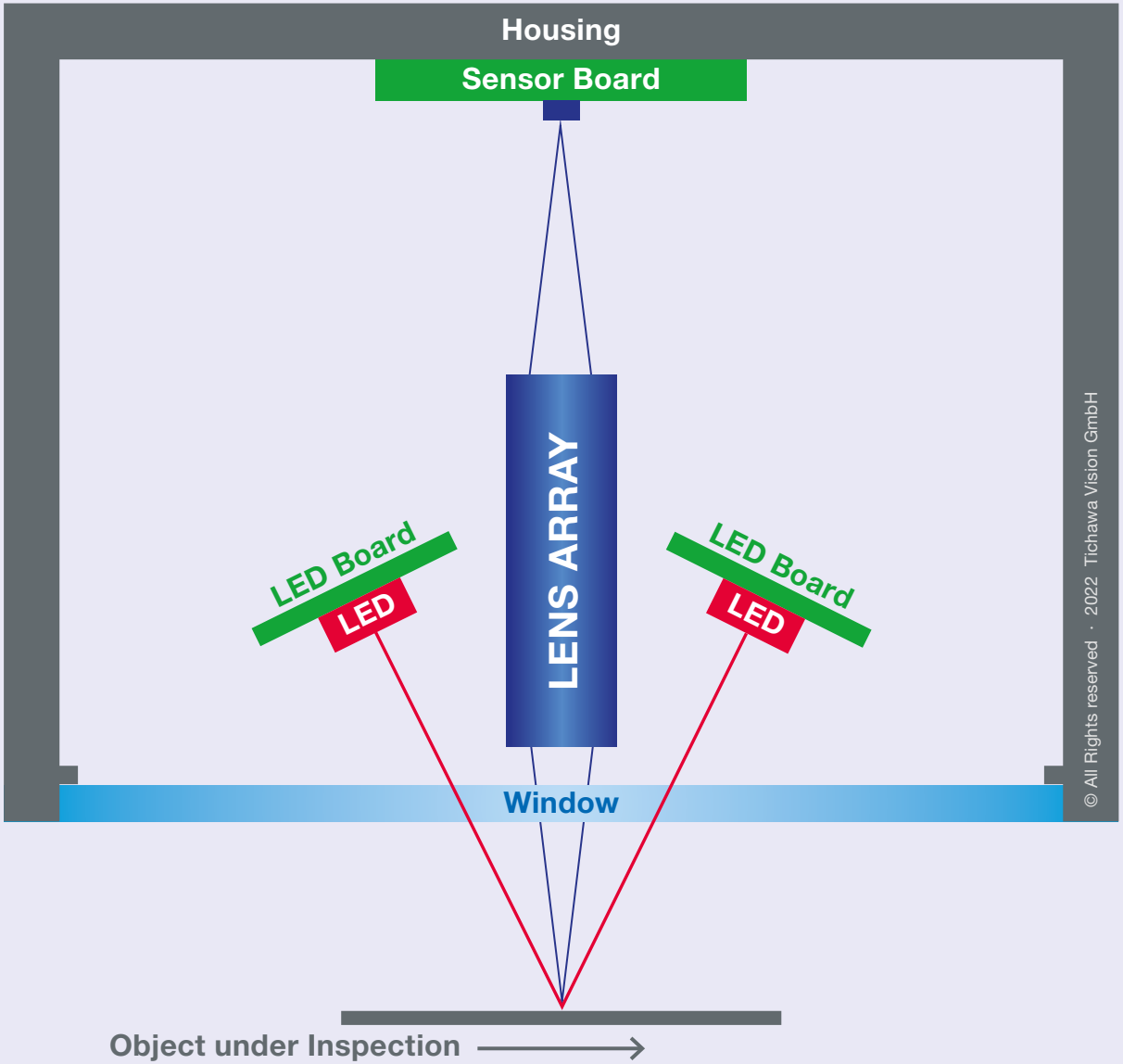
Bright Field Single Sided



Recommended for

- Color images (e.g. RGB)
- Matt objects
- Medium speed
- Textured paper
- Textured cardboard

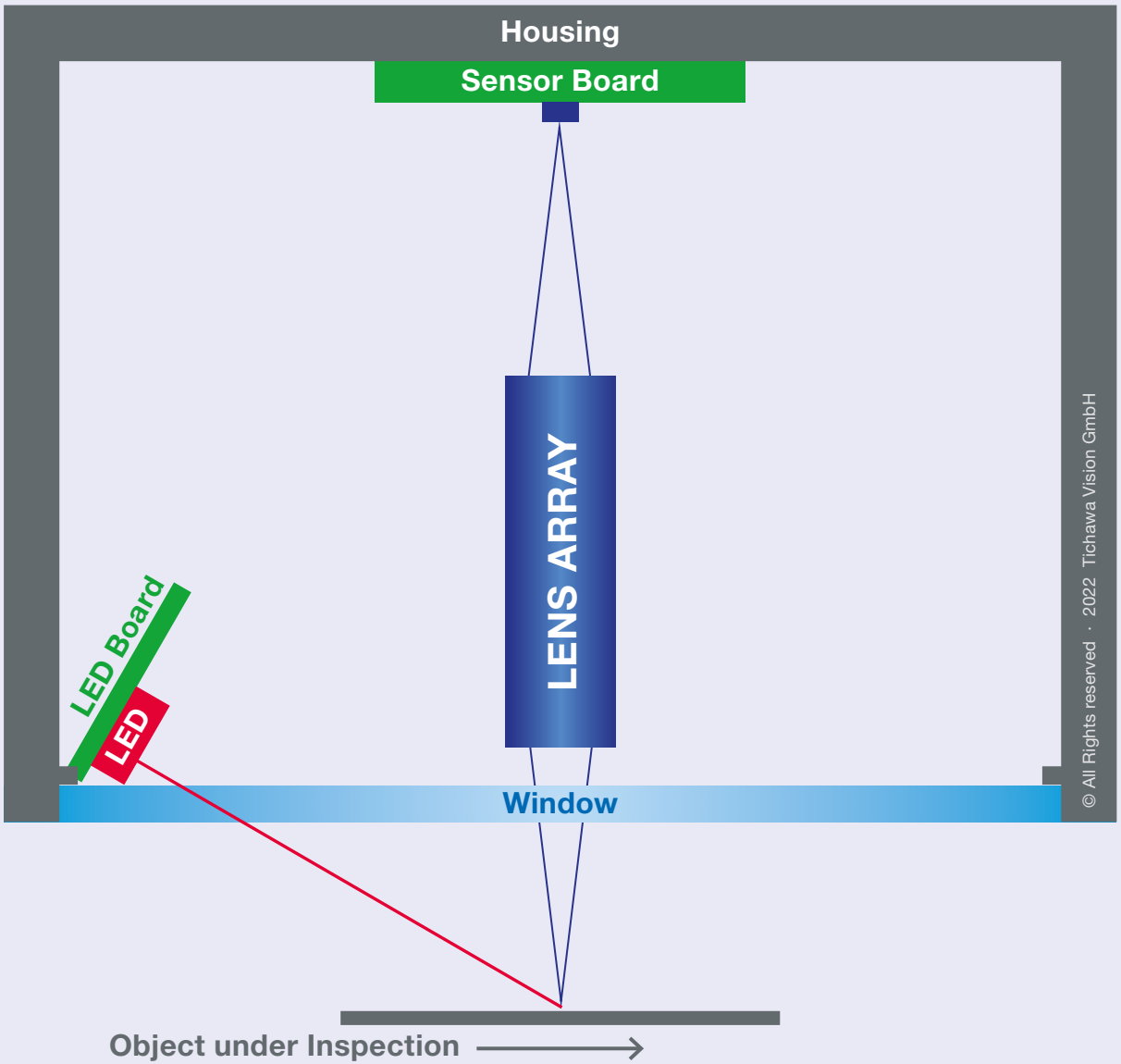
Bright Field Double Sided



Recommended for

- Color images (e.g. RGB)
- Matte objects
- High speed
- Textured paper
- Textured cardboard

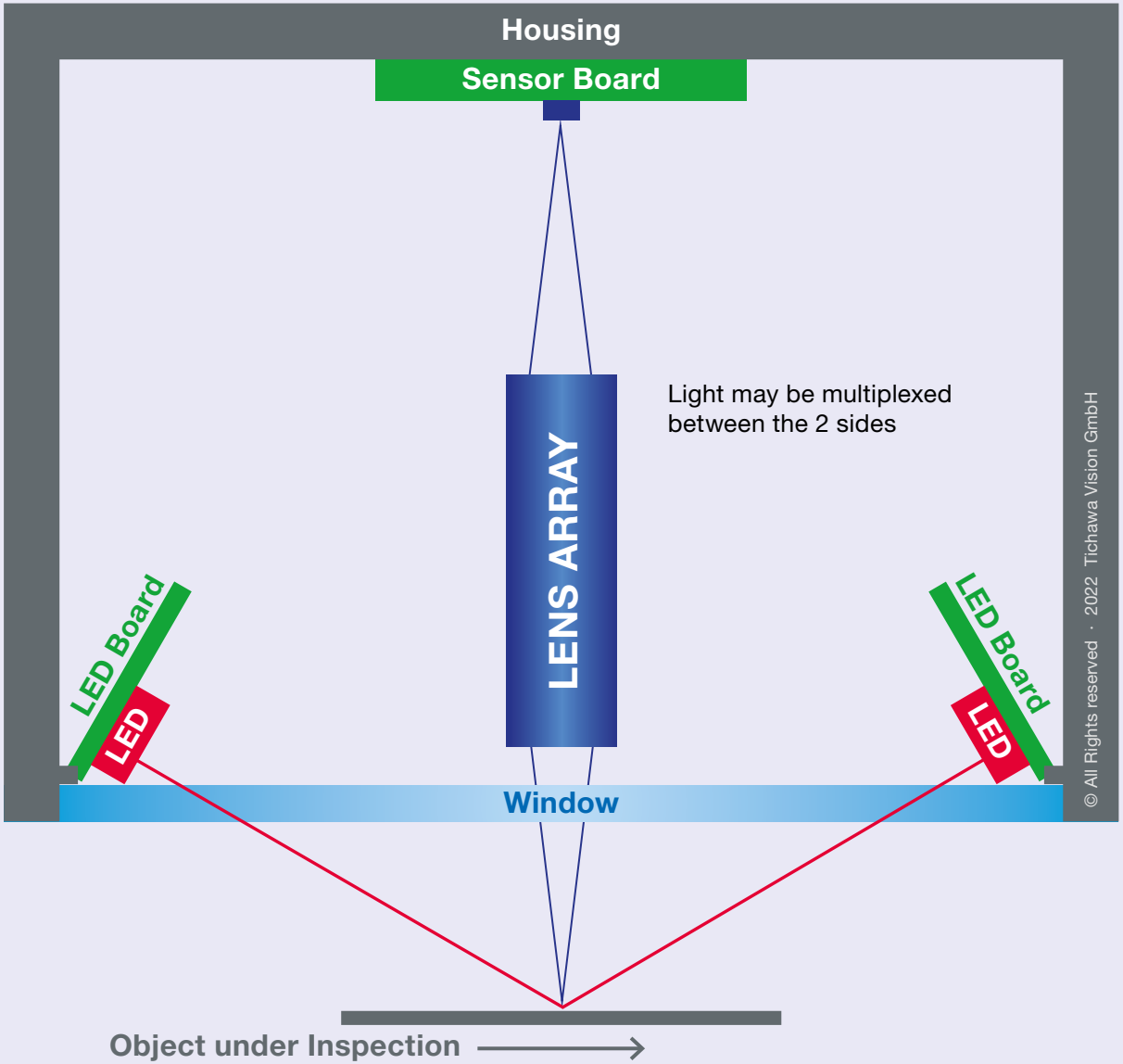
Dark Field Single Sided



Recommended for

- Embossed text
- Coins
- Credit cards
- Dust particles

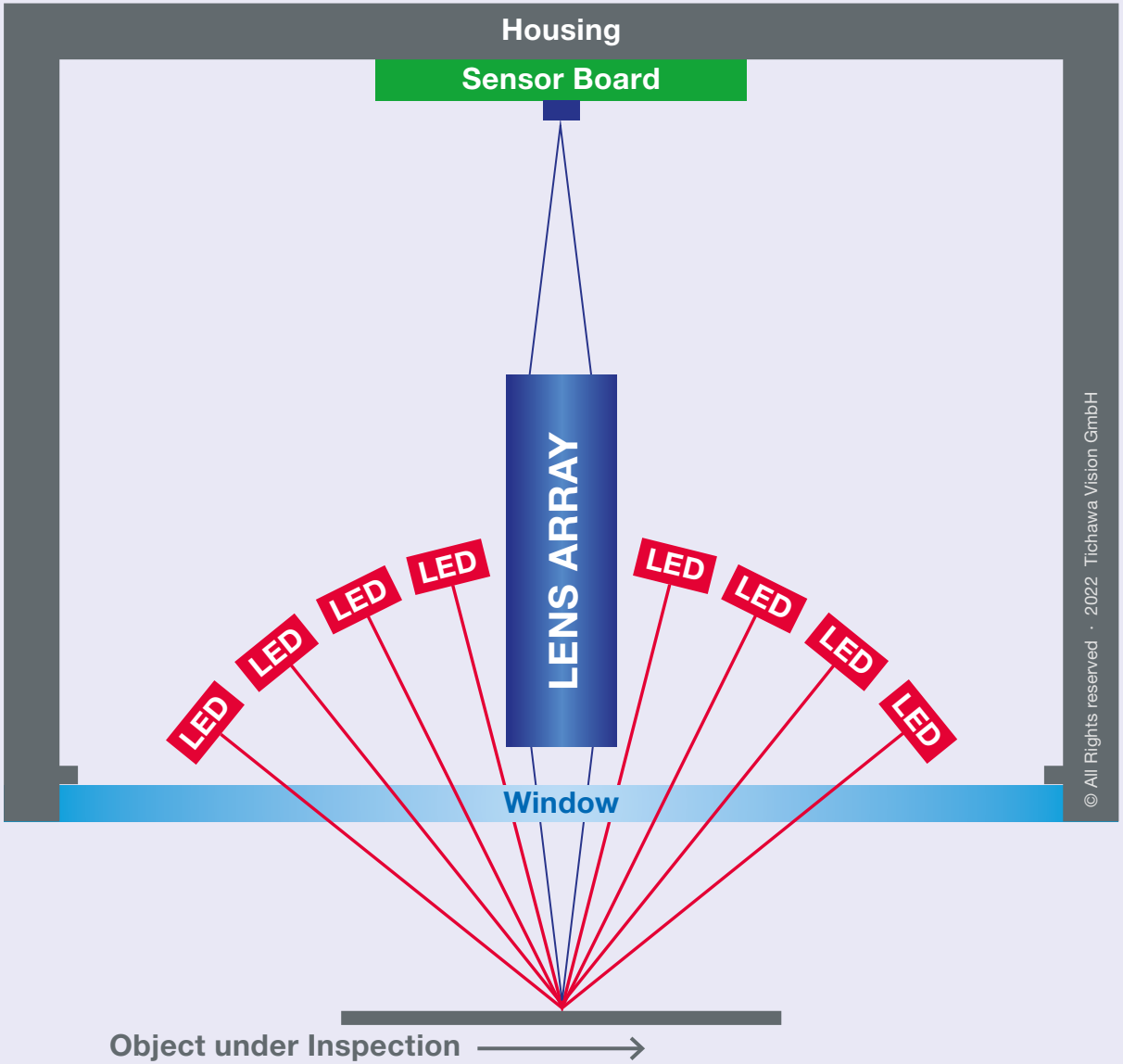
Dark Field Double Sided



Recommended for

- Embossed text
- Coins
- Credit cards
- Dust particles

Cloudy Day

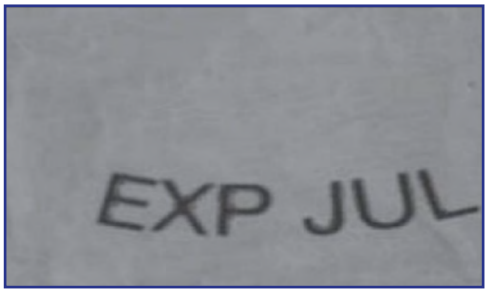


Recommended for

- Blister packs
- Aluminum foil
- Suppresses structures

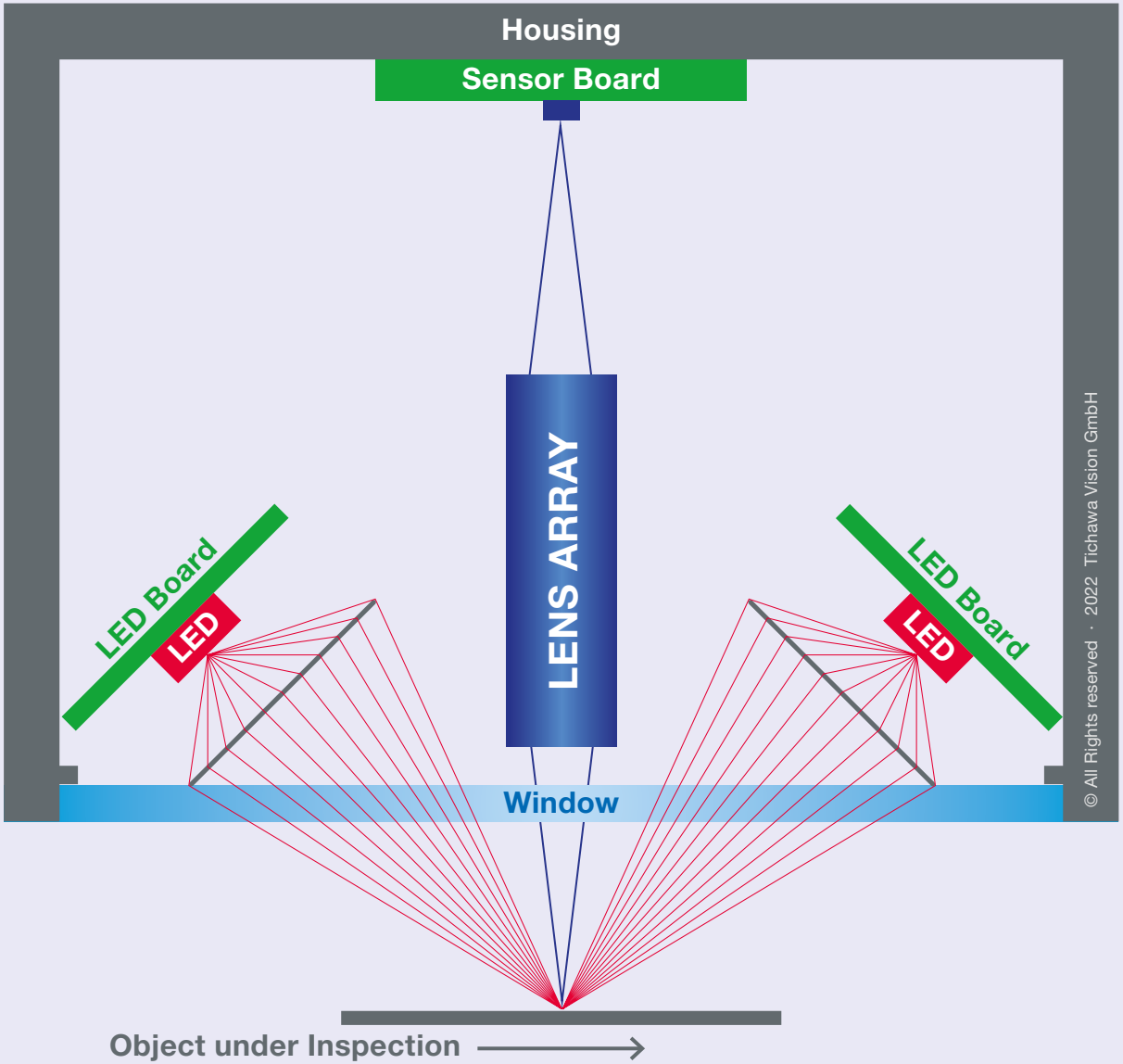
Examples

Standard Bright Field Illumination:
Text barely visible



Cloudy Day Illumination:
Text clearly legible

Practical Cloudy Day

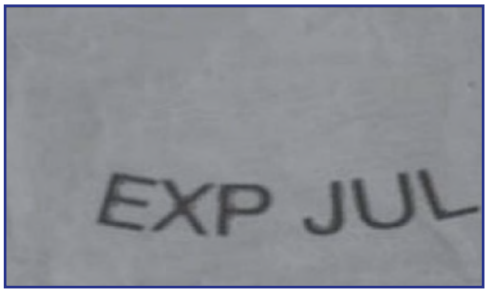


Recommended for

- Blister packs
- Aluminum foil
- Suppresses structures

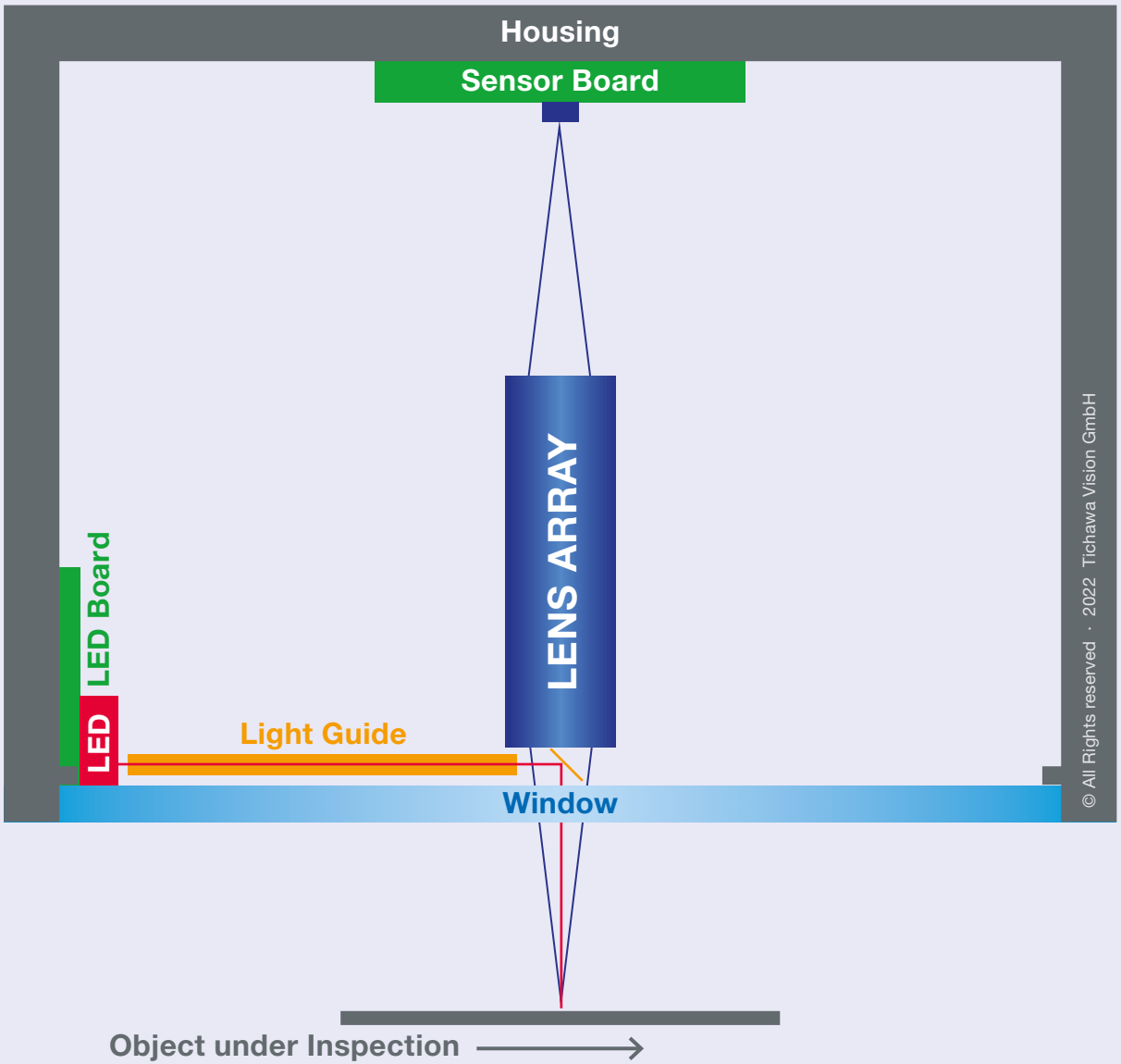
Examples

Standard Bright Field Illumination:
Text barely visible



Cloudy Day Illumination:
Text clearly legible

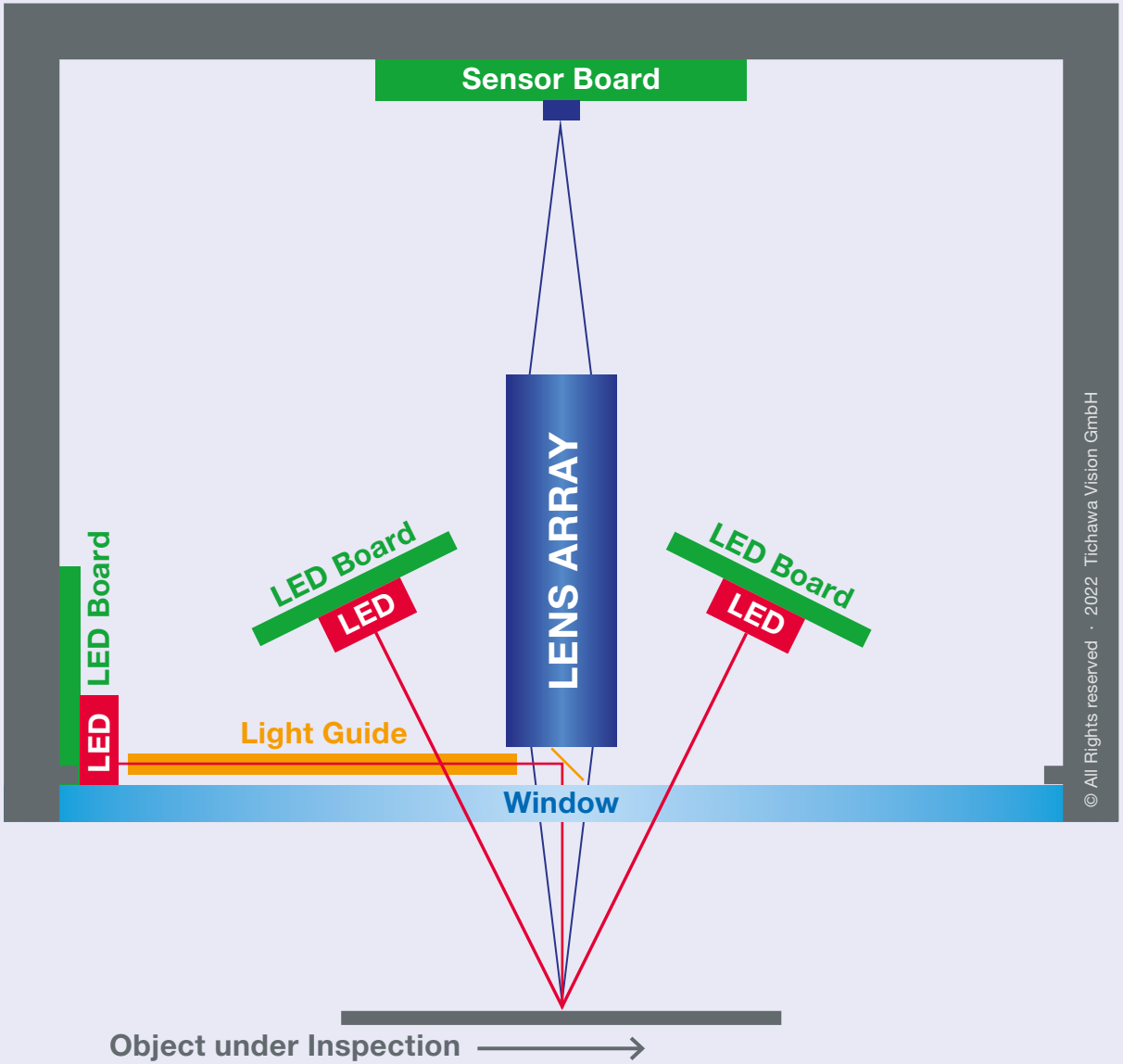
Coaxial Light



Recommended for

- Glossy material
- Metal
- Metal/plastic compounds
- Printed circuit boards
- Semiconductor wafers

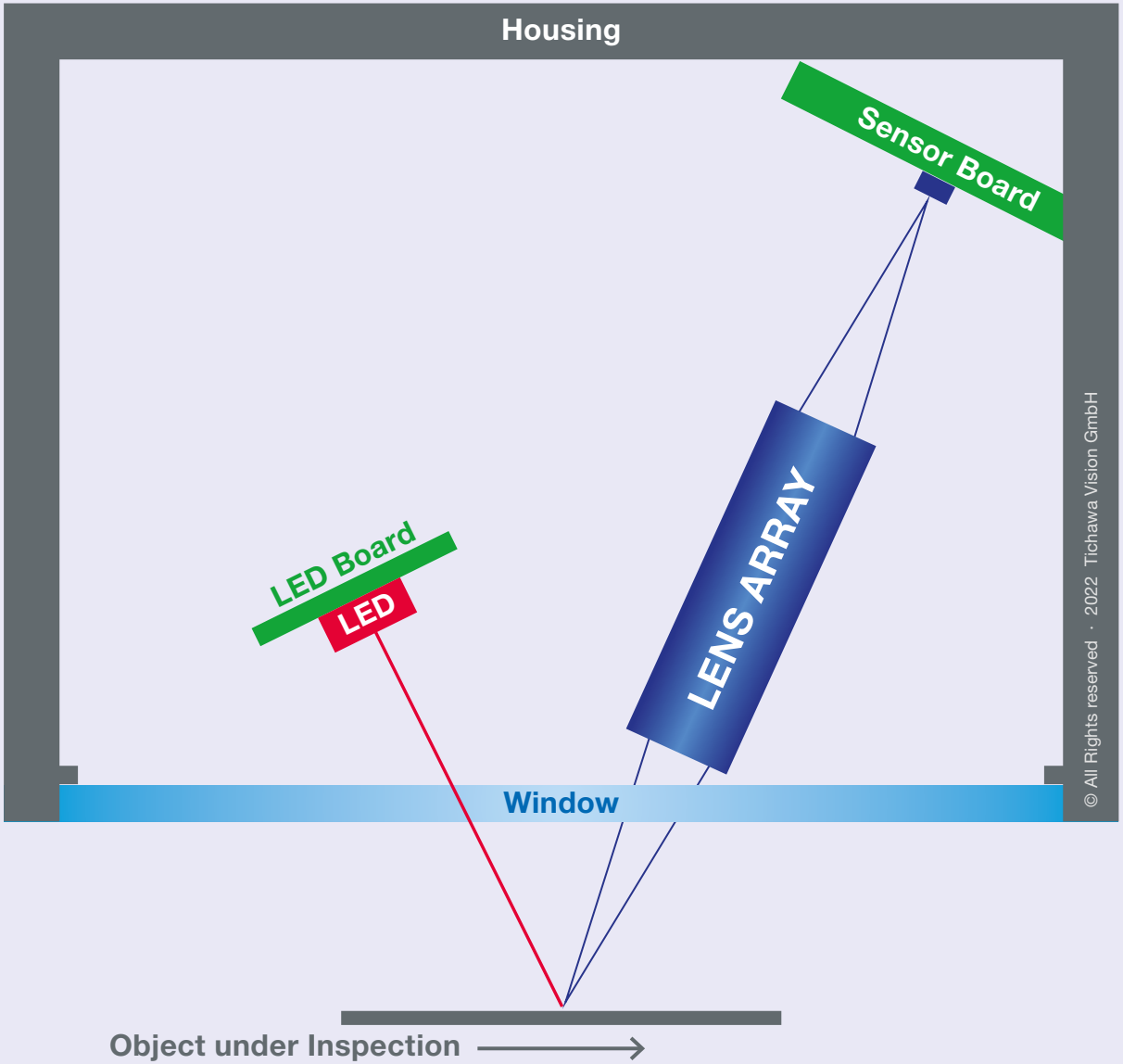
Coaxial plus Bright Field Double Sided



Recommended for

- Mixture of glossy & matt materials
- Wafer inspection
- Metal/plastic compounds
- Printed circuit boards

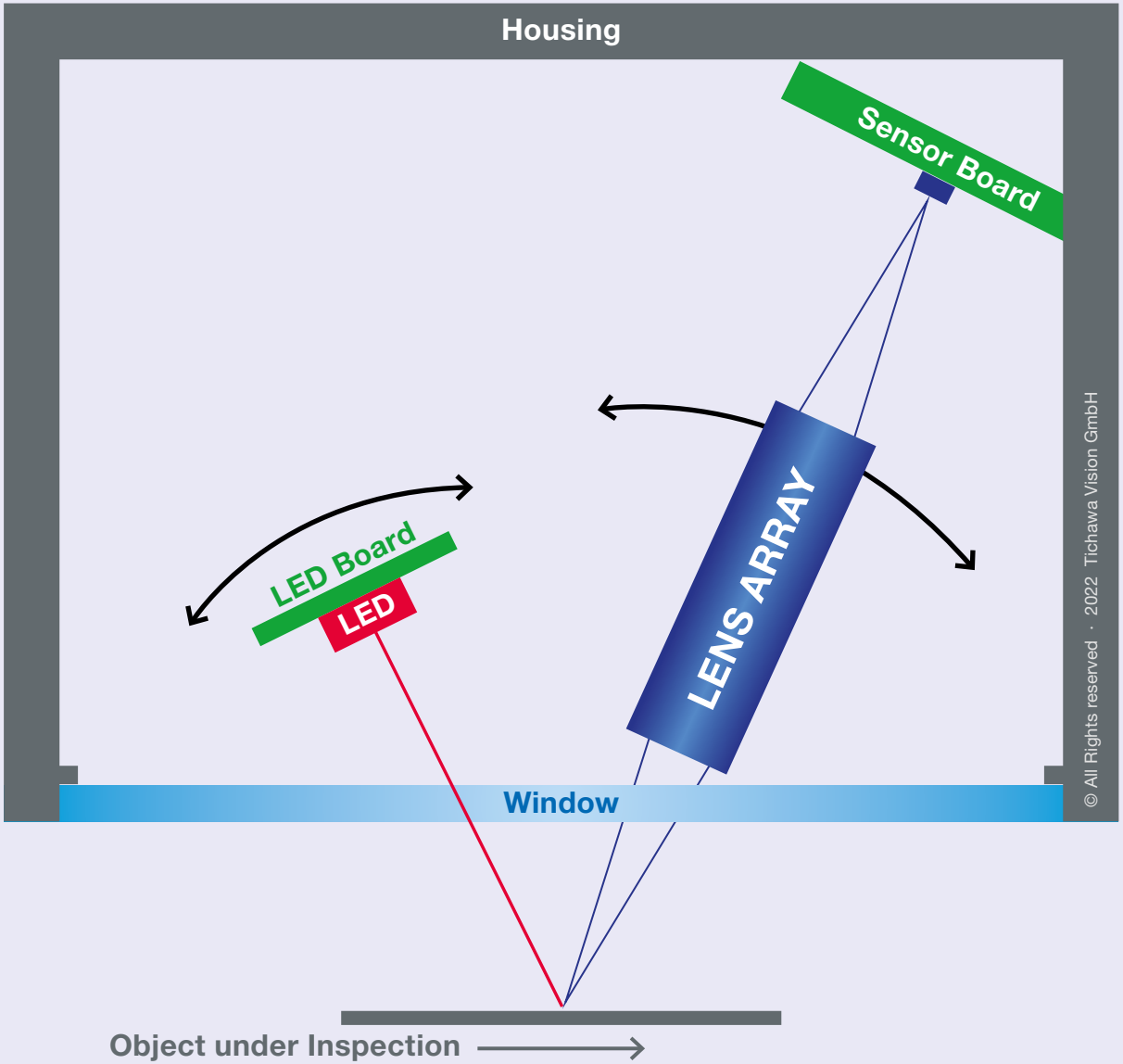
Reflection Fixed Angle



Recommended for

- Glass surface defect
- Metal surface defect
  - Chips
  - Scratches
- Film
- Foil

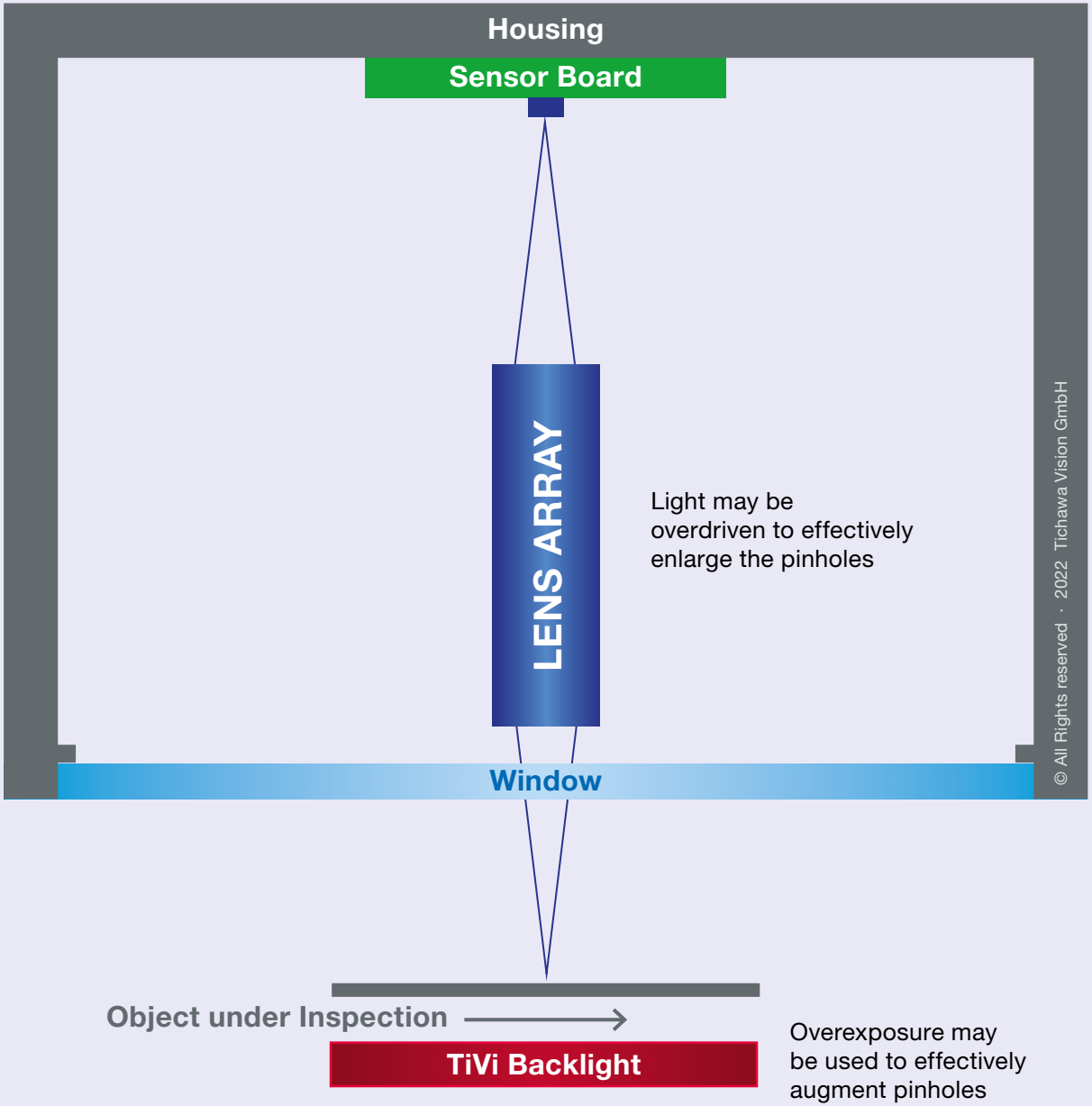
Reflection Variable Angle



Recommended for

- Film
- Foil
- Glass surface defect
- Metal surface defect
  - Chips
  - Scratches
- Special Coatings
- Transparent plastic

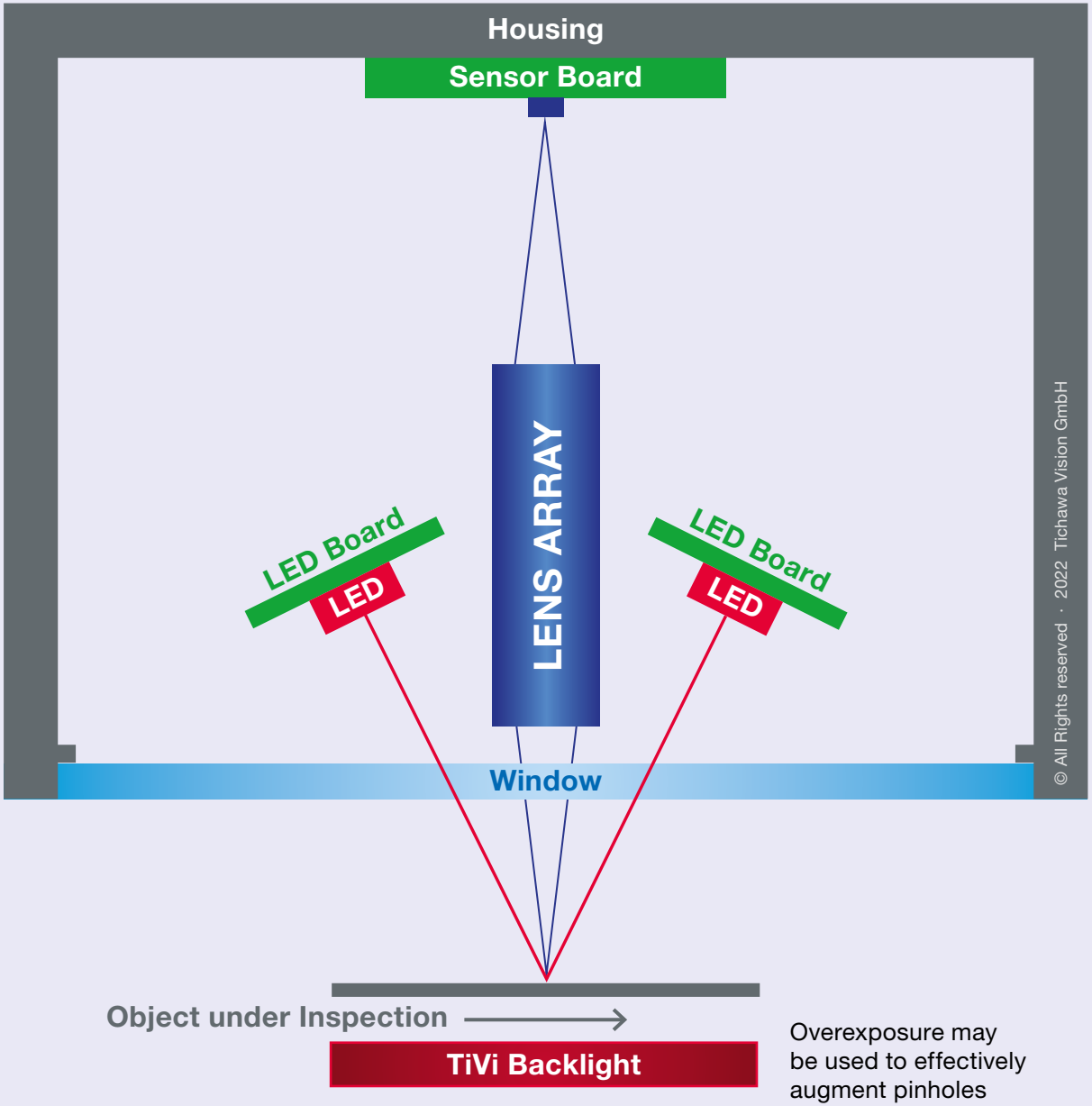
Plain Backlight



Recommended for

- Pinholes in opaque material
- Transparent stuff
- Translucent stuff
- Watermarks
- Metal Stripes in paper e. g. banknotes

Bright Field & Backlight

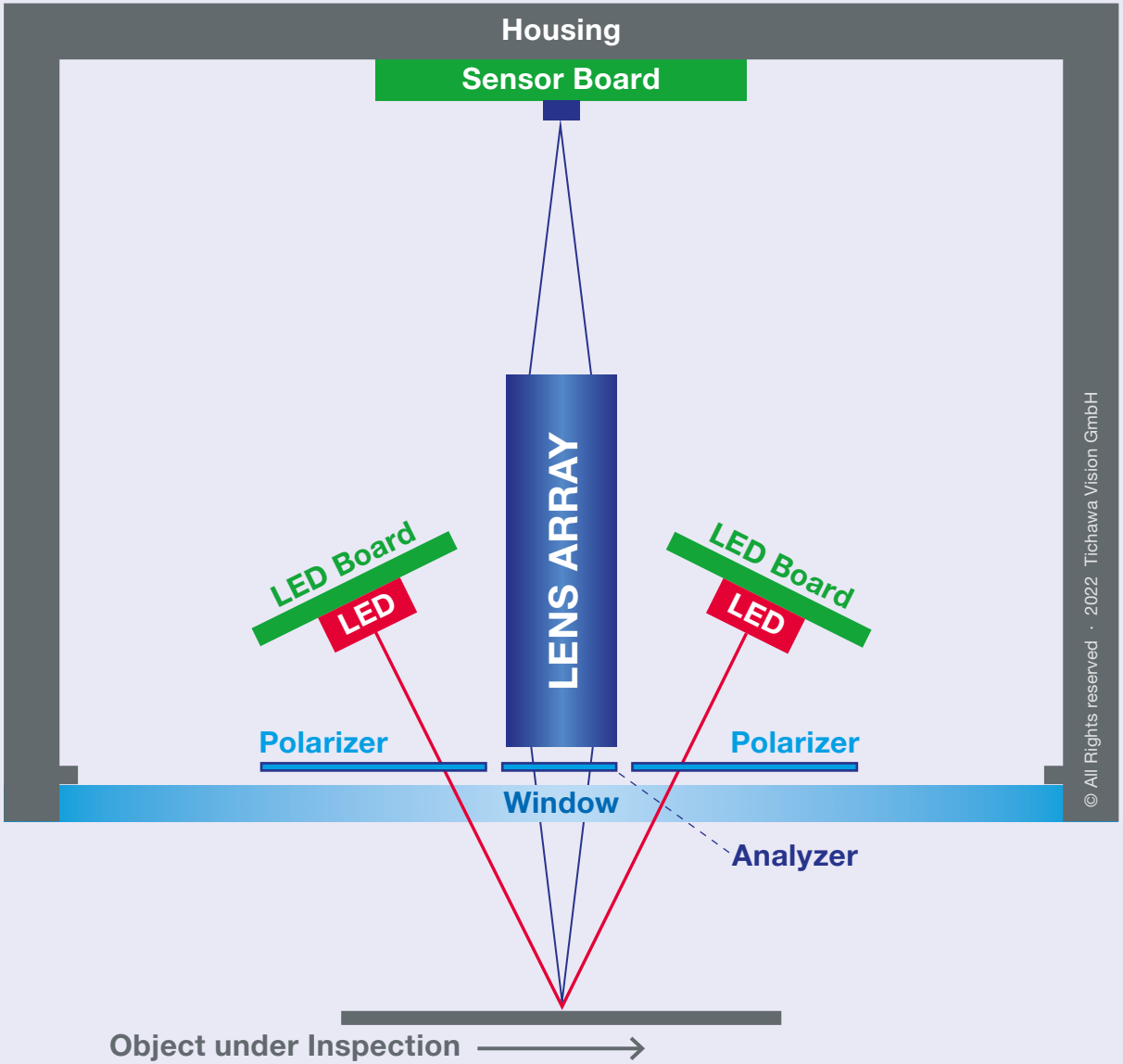


Overexposure may be used to effectively augment pinholes

Recommended for

- Watermarks
- Security print
- Distinguish transparent from opaque materials
- Coatings on transparent foils

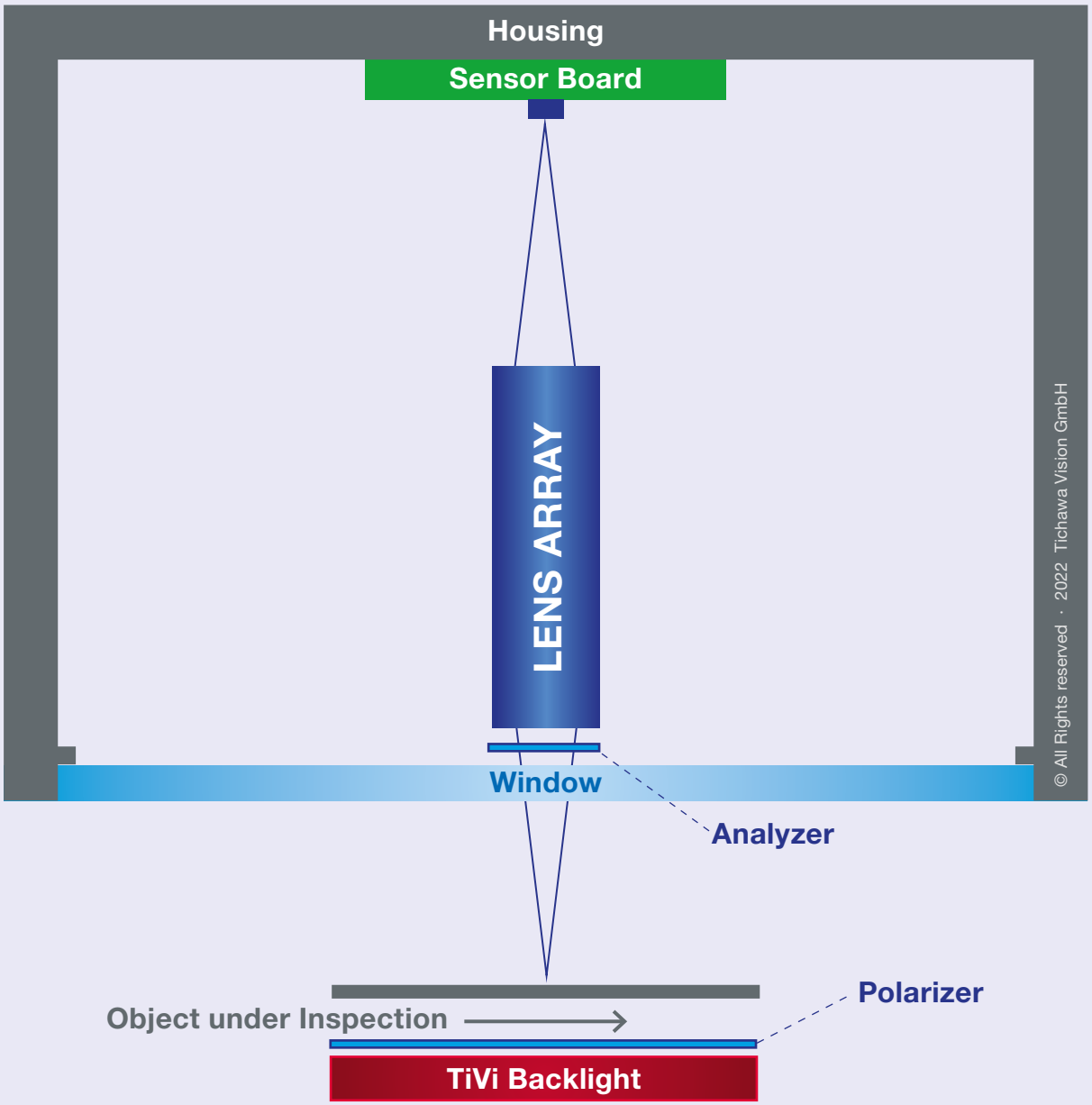
Polarized Light



Recommended for

- Detecting stress in film
- Detecting Stress in foil
- Reflection suppression

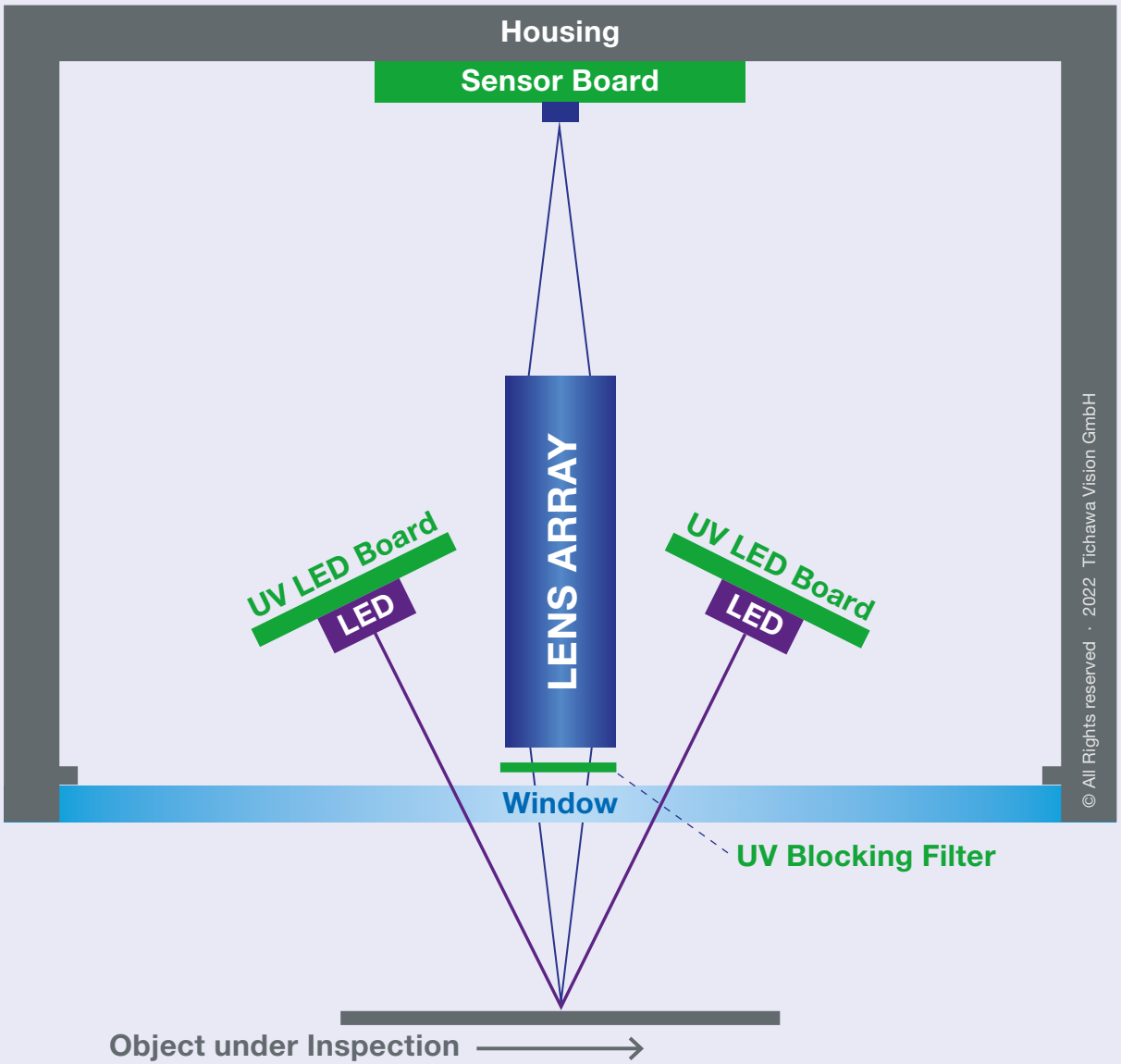
Polarized Backlight



Recommended for

- Detecting stress in glass
- Detecting stress in transparent plastics
- Gauging

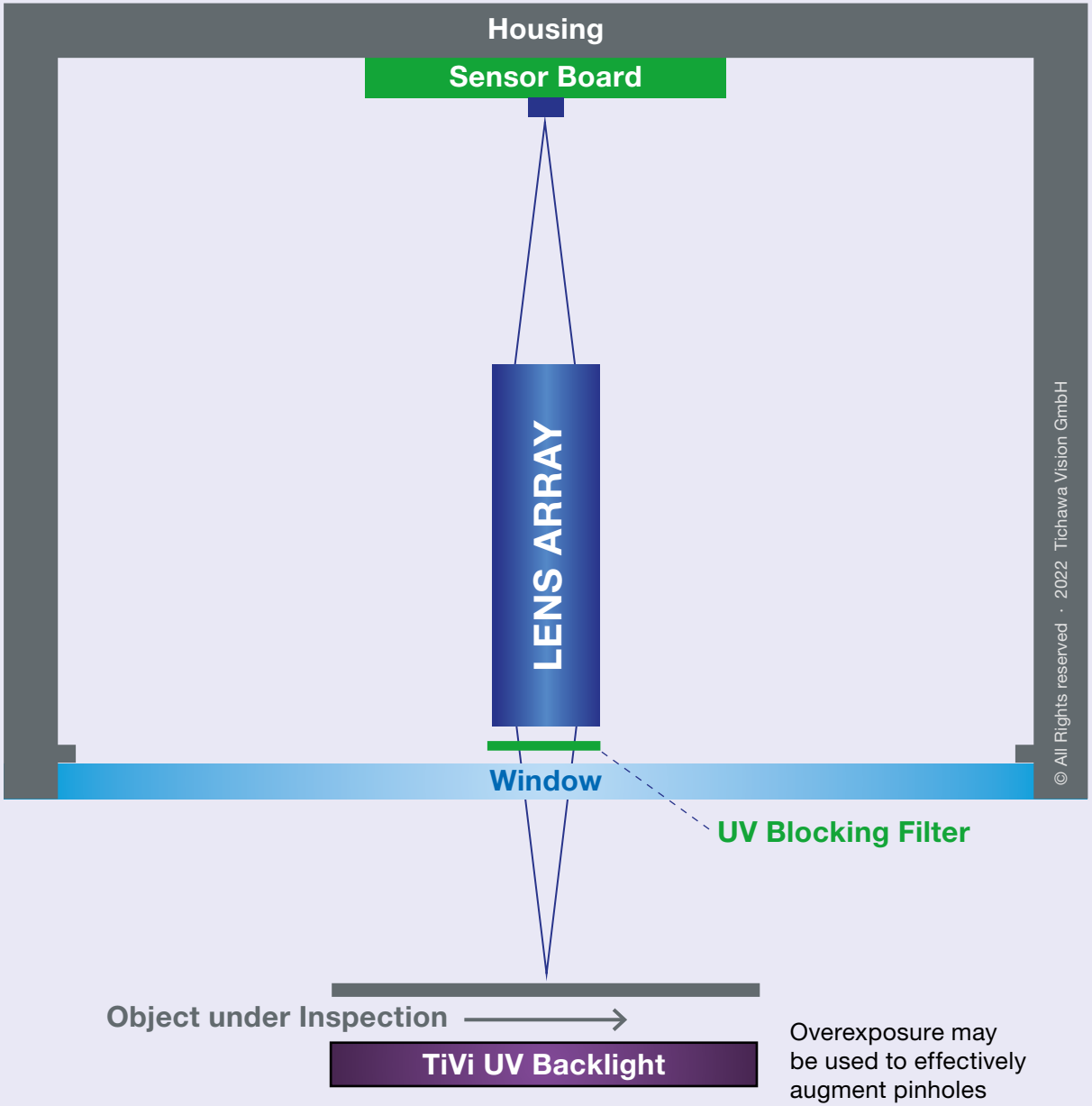
Flourescence



Recommended for

- Crack detection in steel (in magnetic field)
- General fluorescence applications
- Security print
  - Banknotes
  - ID documents
  - Drivers licenses

Fluorescent Backlight

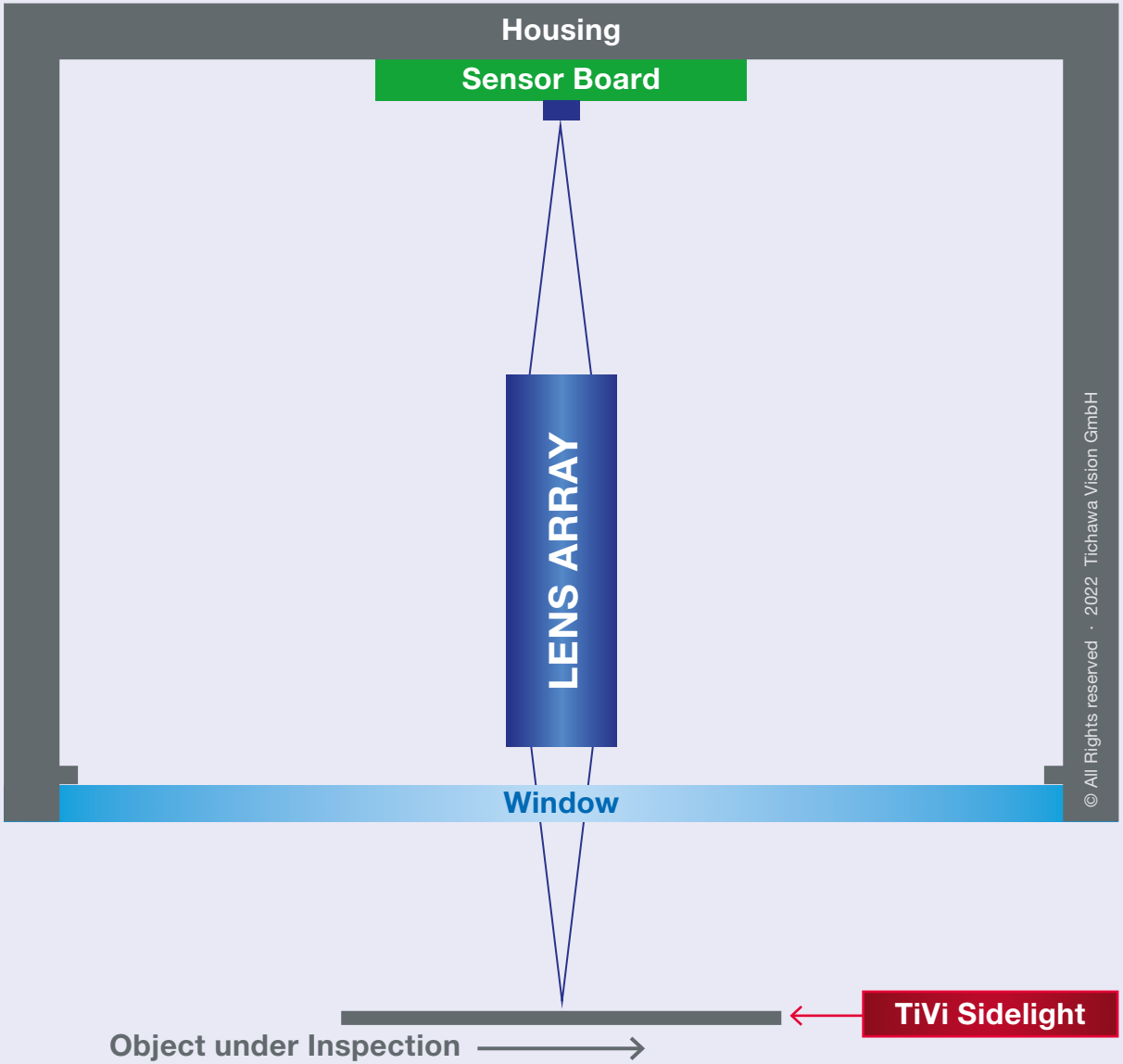


Overexposure may be used to effectively augment pinholes

Recommended for

- Security print
- Fluorescence applications on transparent substrates

Light coupled into Object

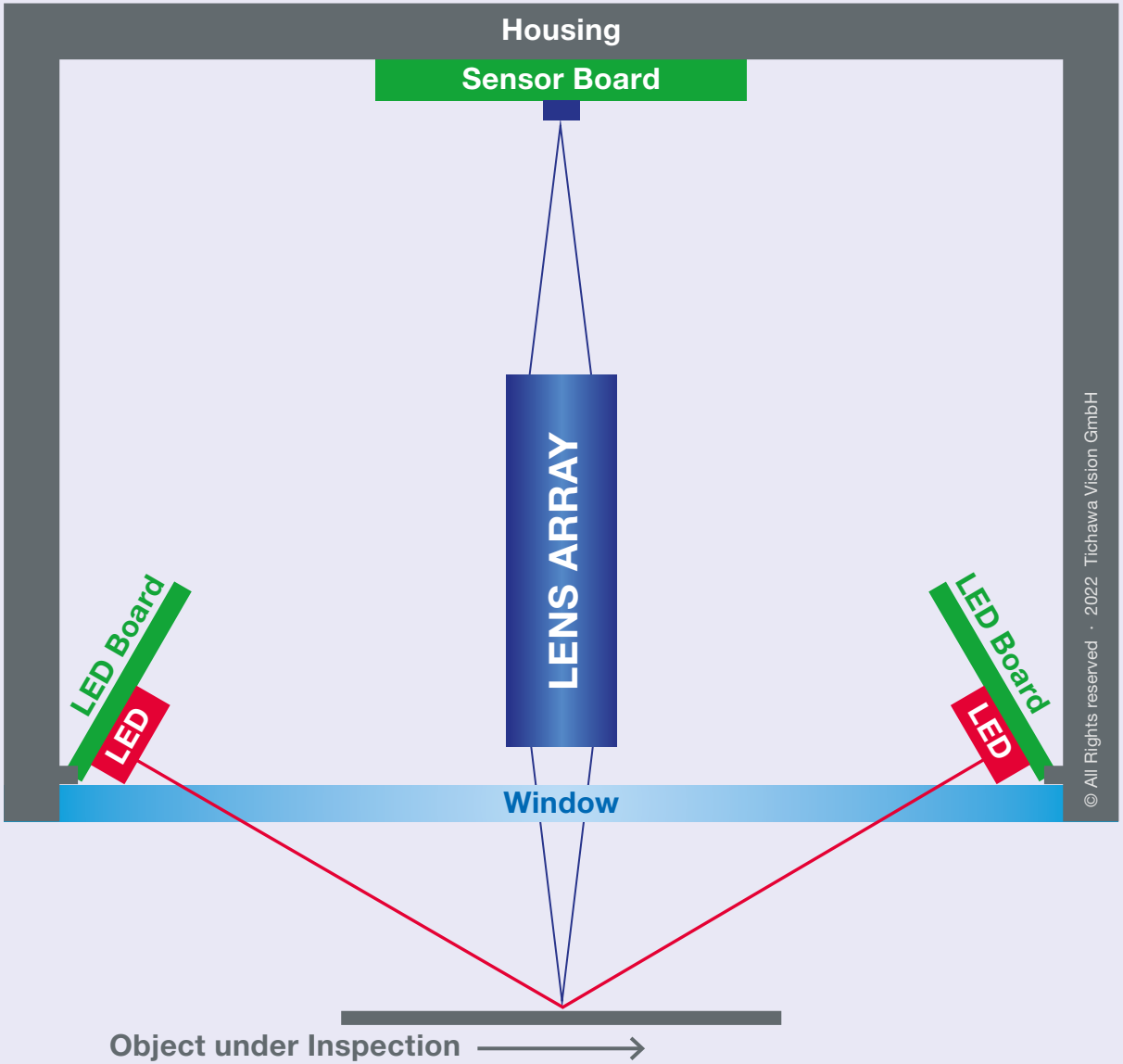


Other combinations on request

Recommended for

- Transparent media
- Bubble detection
- Inclusion detection

Shape from Shading: Front View

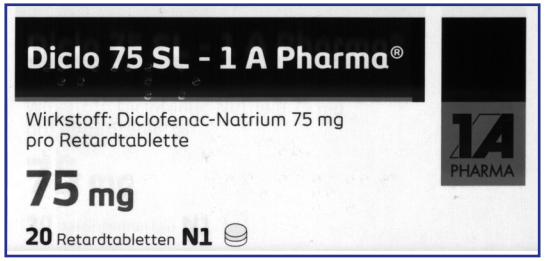


Text Beispiele?

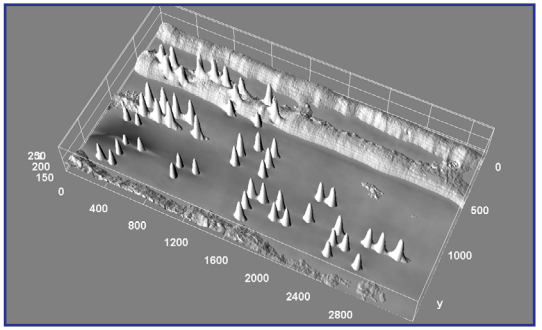
Recommended for

- Detect shape
  even on printed objects
- Detect inner defects
- Topographies for 3D representations
- Matt surface
- Structured surface

Examples

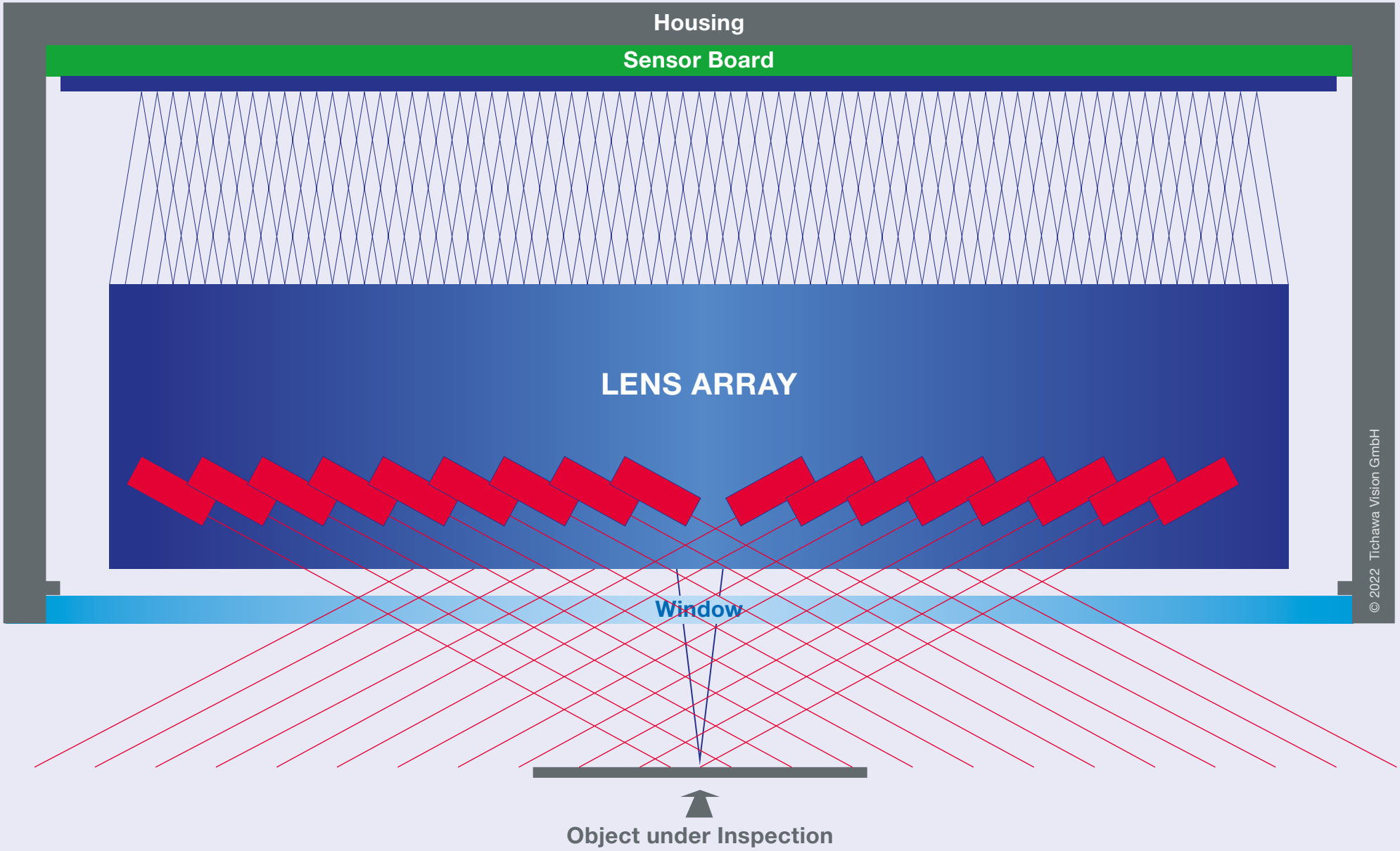


Text



Text

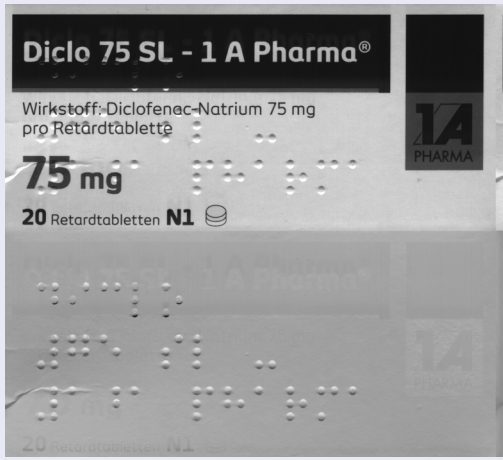
Shape from Shading: Side View



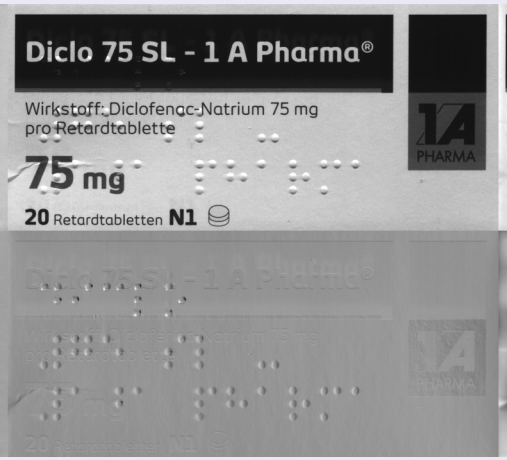
Example

Headline?

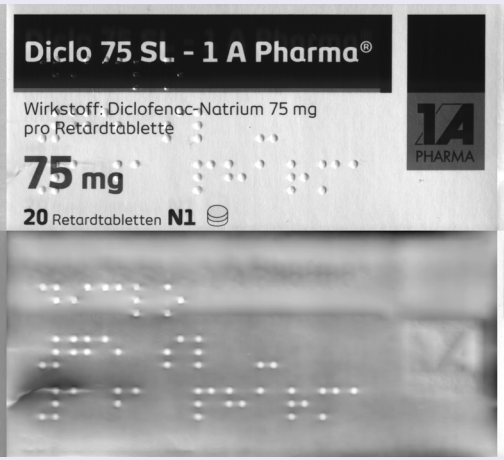
Raw Image #1



Raw Image #2



Raw Image #3



Raw Image #4“

Gradient Y

Gradient X

Height Image

Albedo

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