



# ADVANCED INSPECTION WITH PHLOX BACKLIGHTS

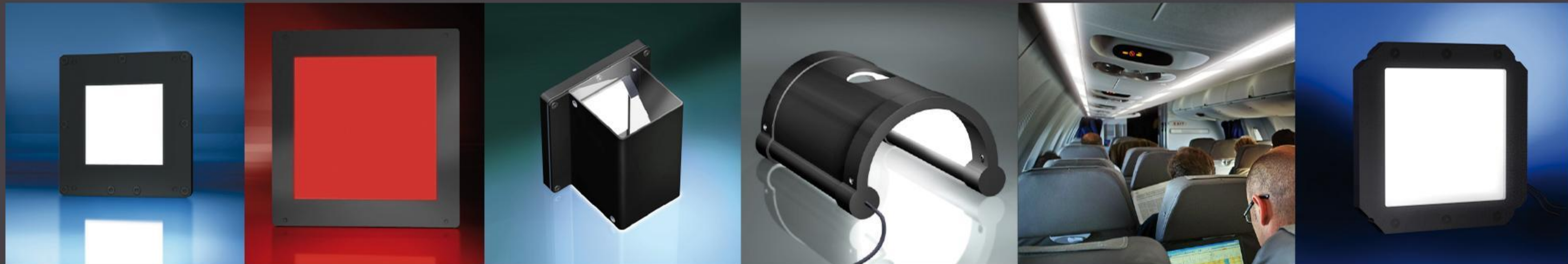
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PHLOX develops and commercializes high technology products for

- Machine Vision Backlighting
- Wireless Power Transfer Lightings
- Avionic Display & Lighting



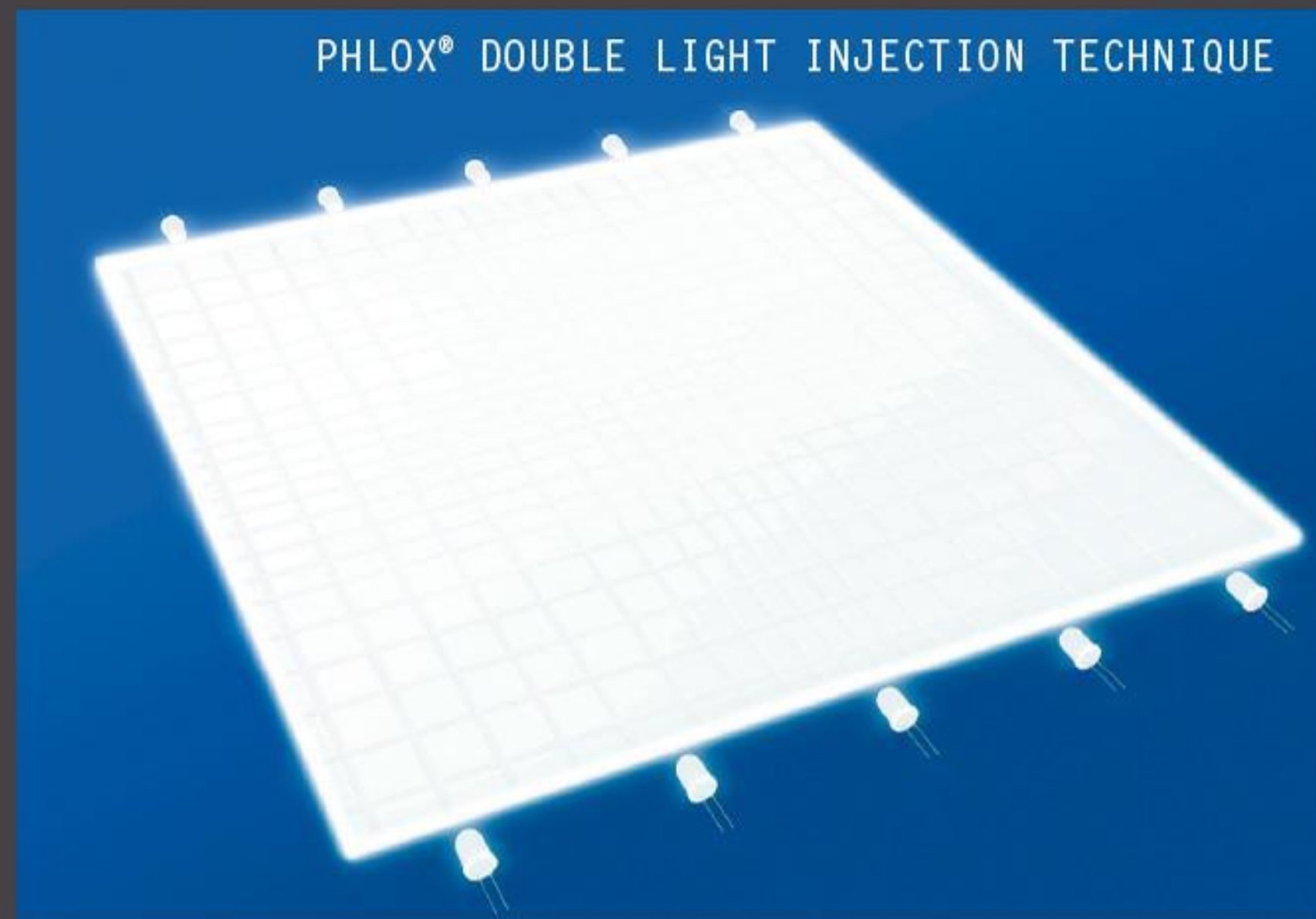
... and more



NASA already uses PHLOX® technology

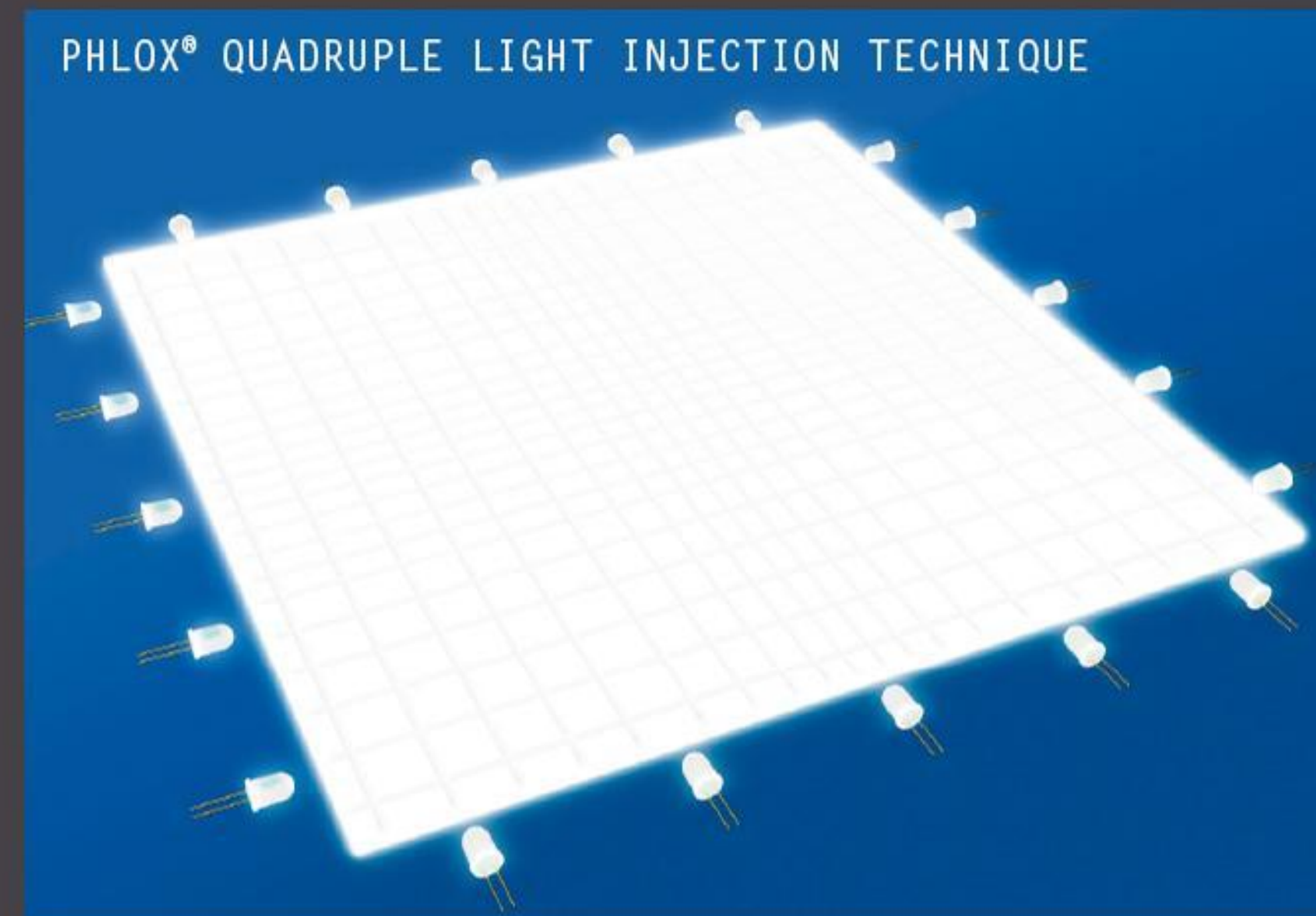


# PHLOX® EXCLUSIVE TECHNOLOGY



PHLOX® uses optical processes. It is composed of a polymethacrylate pipe lighted by a linear source made up of light emitting diodes (L.E.D.)

PHLOX makes micro prisms with a CO2 laser. Up to 80% of the light injected is reemitted on the surface.



Thanks to the use of mathematical models, Phlox emits light in a determinist and perfectly controlled manner. Light can be injected from 1, 2, 3 or 4 edges.

PHLOX® light pipe technology is the most efficient on the market.



NASA already uses PHLOX® technology







NOTHING COMPARES TO  
**PHLOX<sup>®</sup> BACKLIGHTS**



# MAJOR ADVANTAGES:

- LESS STRAY LIGHT & BETTER CONTRASTS
- LESS THICK
- IP65, RATED, SCRATCH RESISTANT
- EXTREME UNIFORMITY
- ALL COLOURS AVAILABLE,  
SOLVE ANY APPLICATION WITH THE RIGHT WAVELENGTH
- CUSTOM SIZES WITH FAST DELIVERY



NASA already uses PHLOX® technology

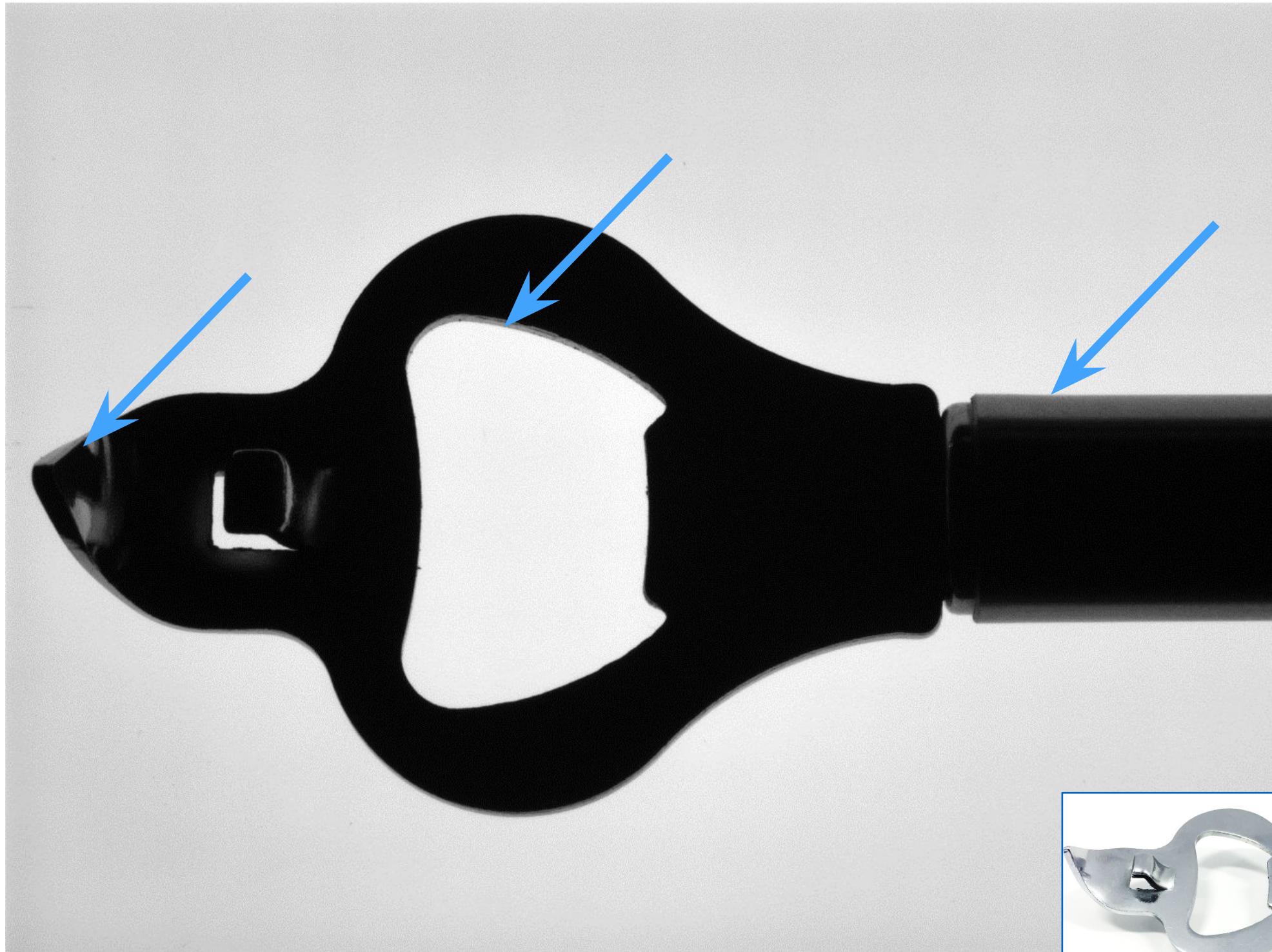




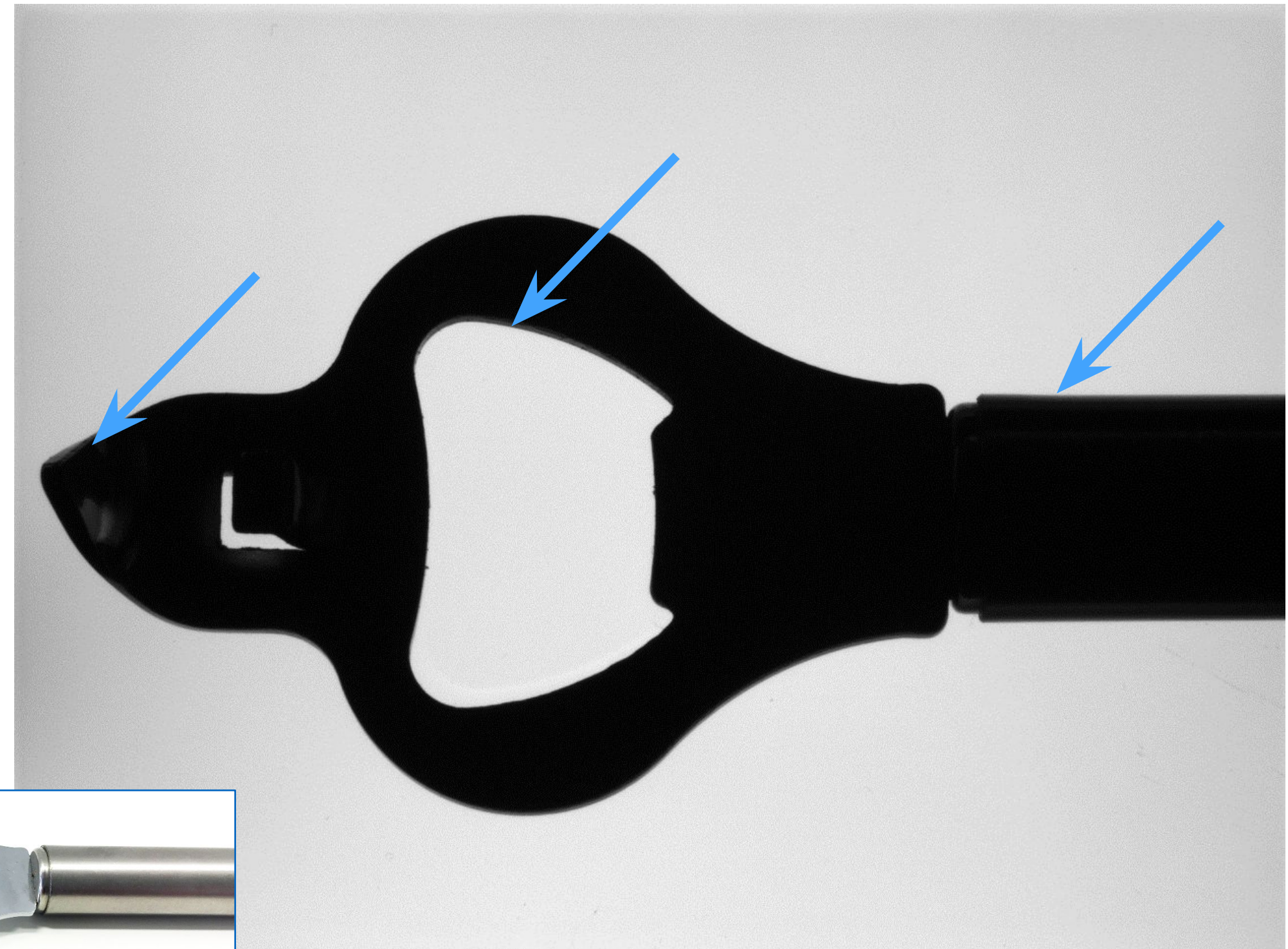
ADVANTAGE

# LESS STRAY LIGHT & BETTER CONTRASTS

Conventional backlight



PHLOX backlight



PHLOX backlights are more directed. Higher edge contrasts are created with shiny surfaces. This will cause more reliable applications and better measurement results.



NASA already uses PHLOX® technology

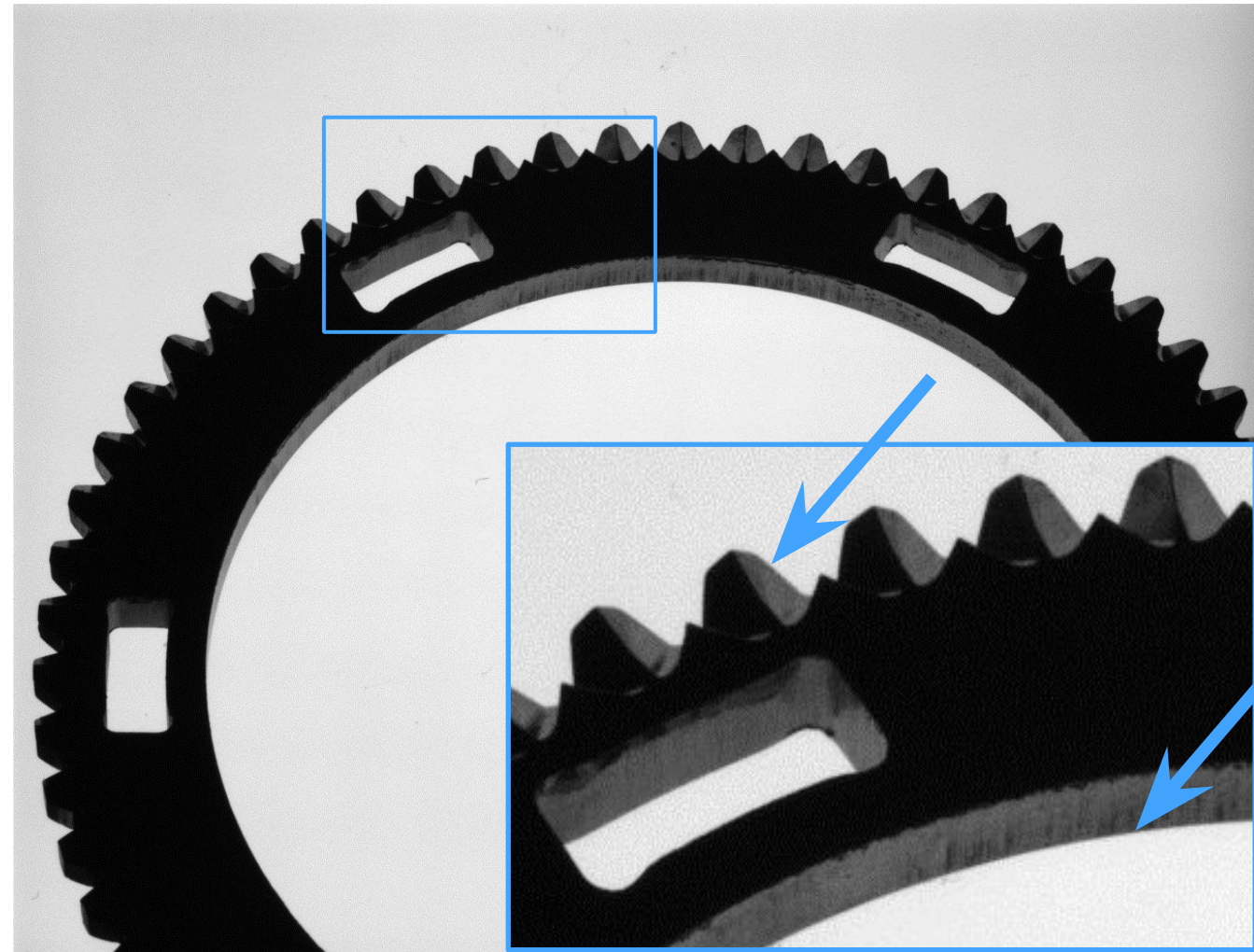




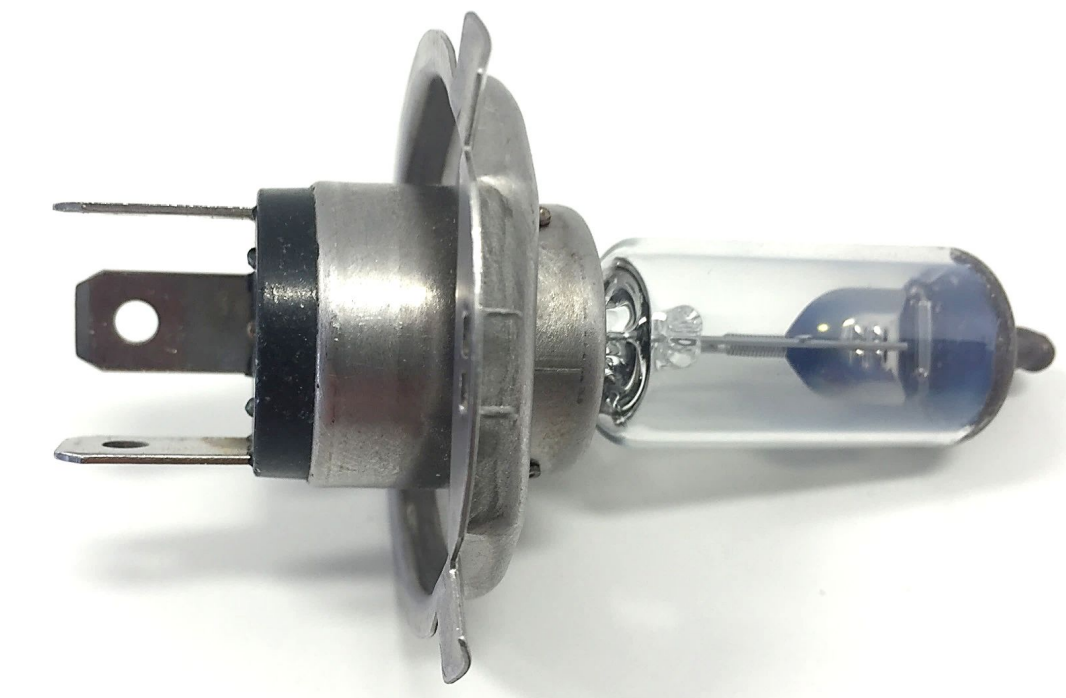
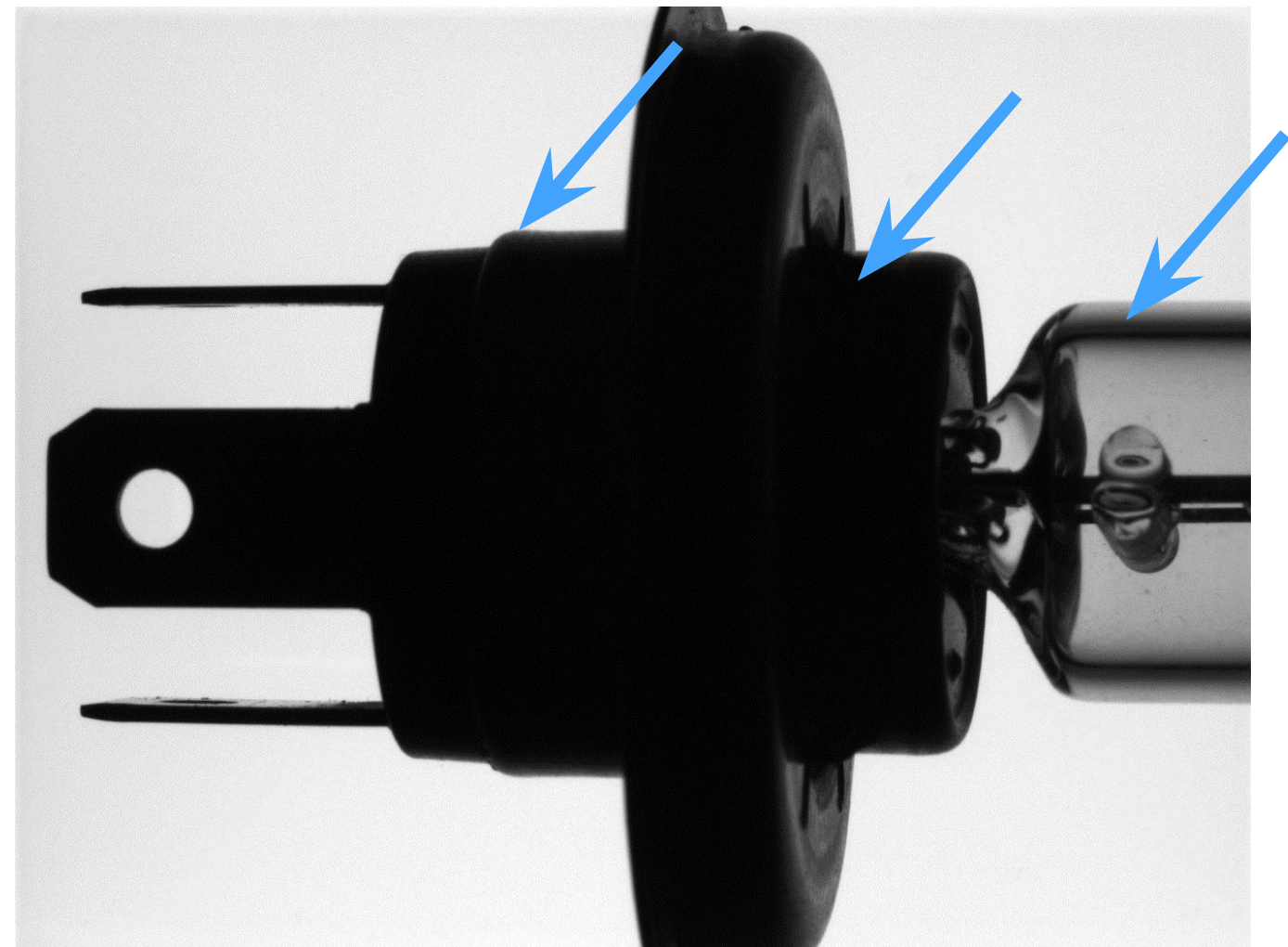
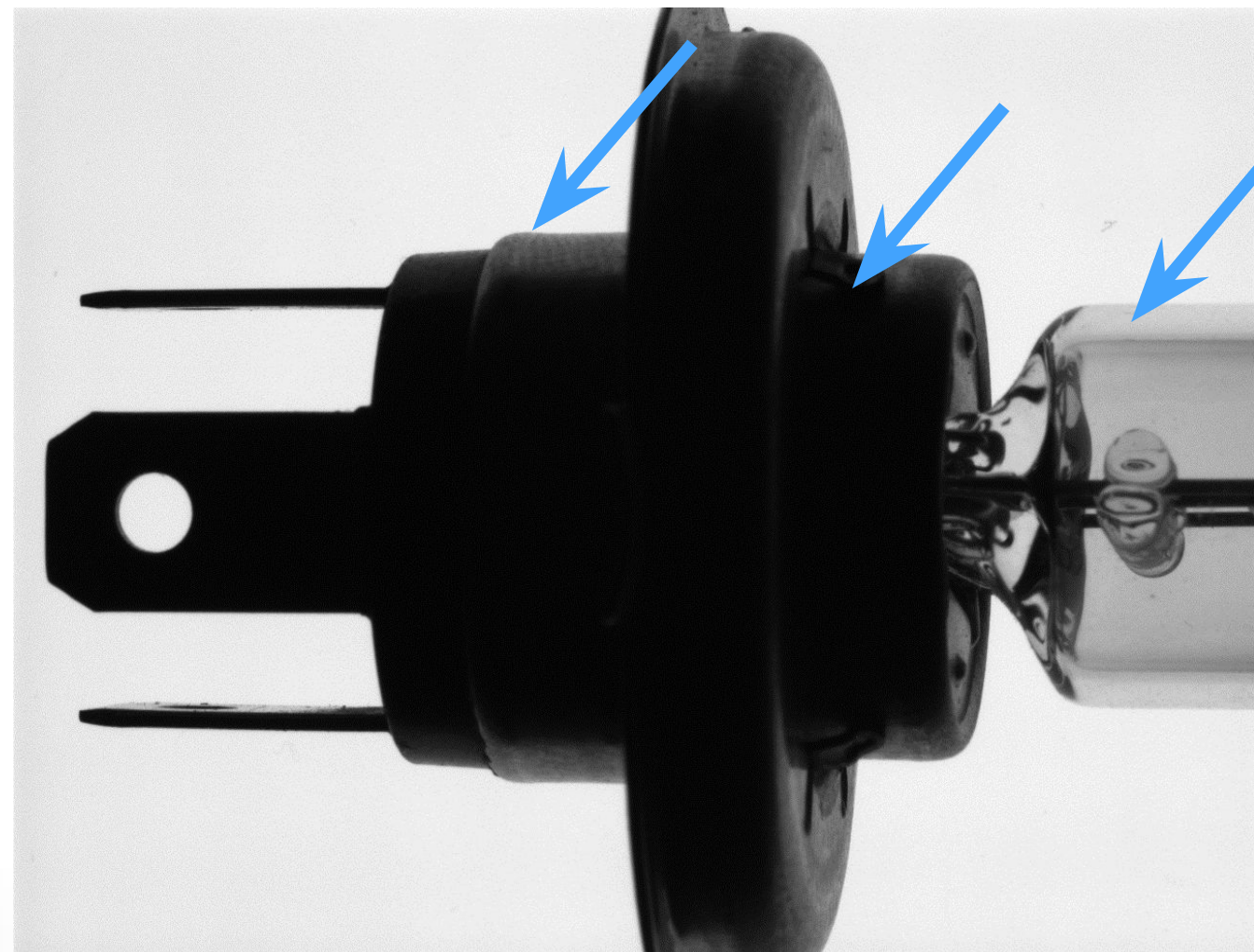
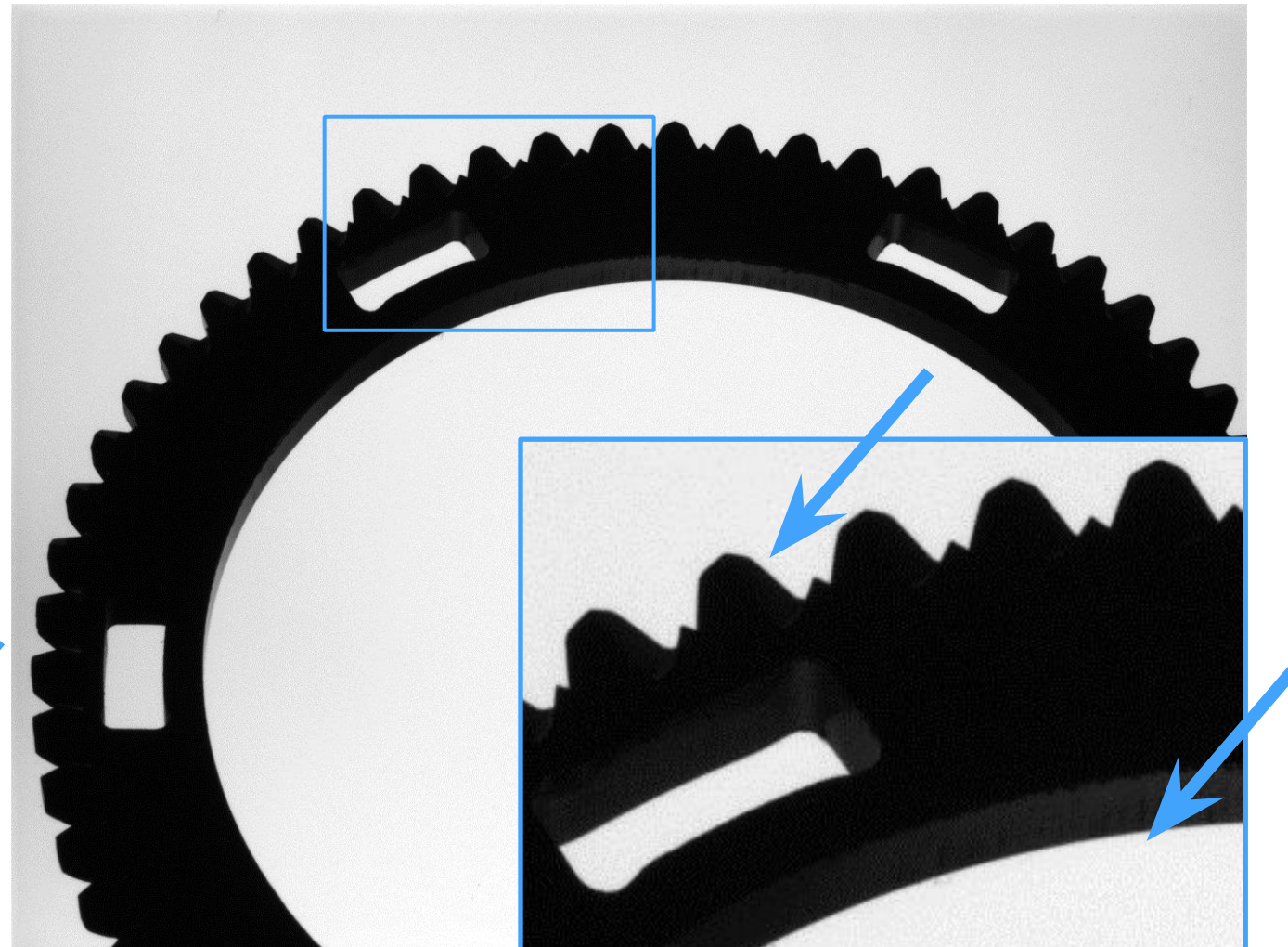
ADVANTAGE

# LESS STRAY LIGHT & BETTER CONTRASTS

Conventional backlight



PHLOX backlight



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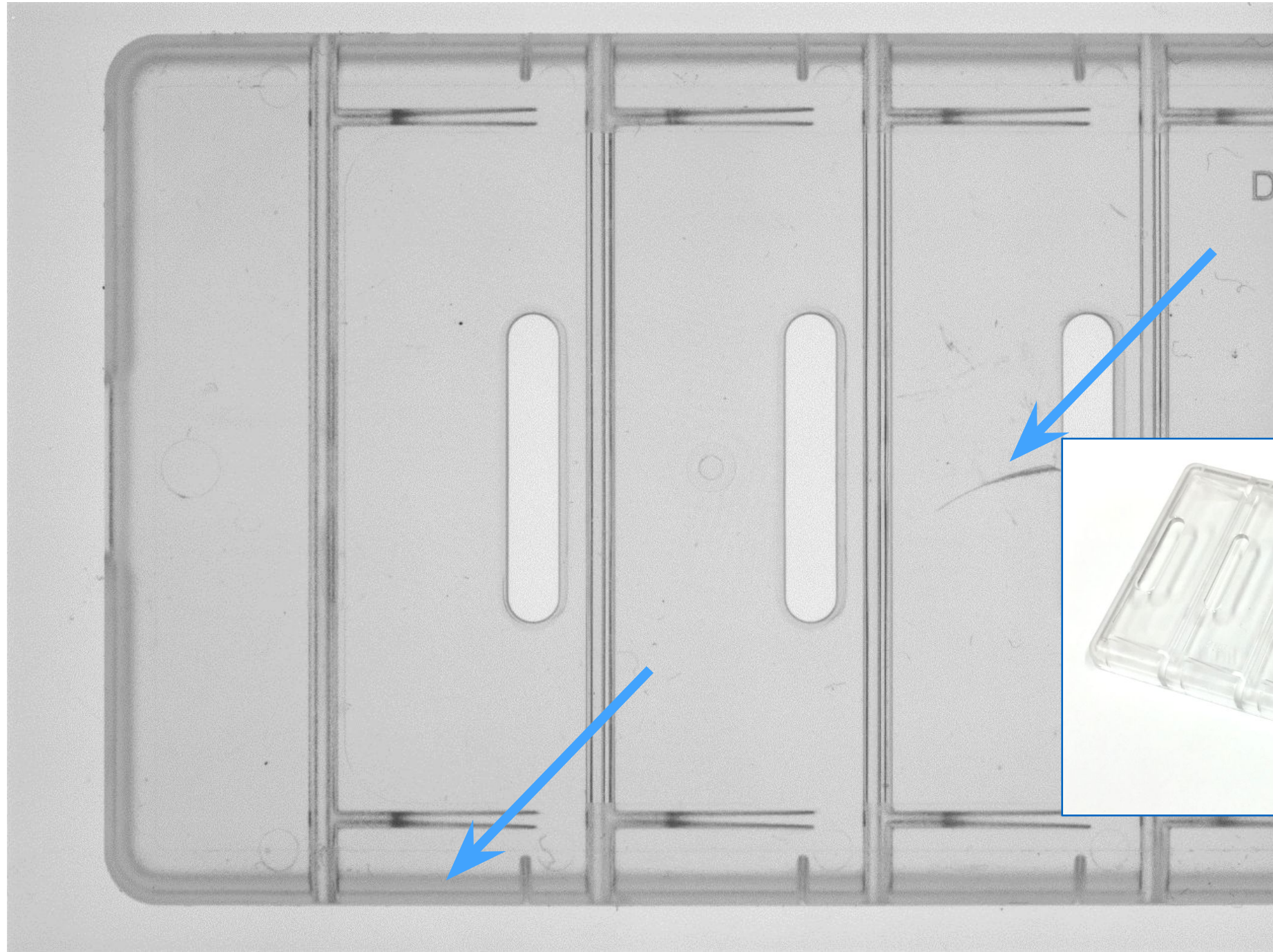




ADVANTAGE

# LESS STRAY LIGHT & BETTER CONTRASTS

Conventional backlight



PHLOX backlight



PHLOX backlights emit more directed light.

Structures and cracks in transparent plastics and glass become more visible.



NASA already uses PHLOX® technology

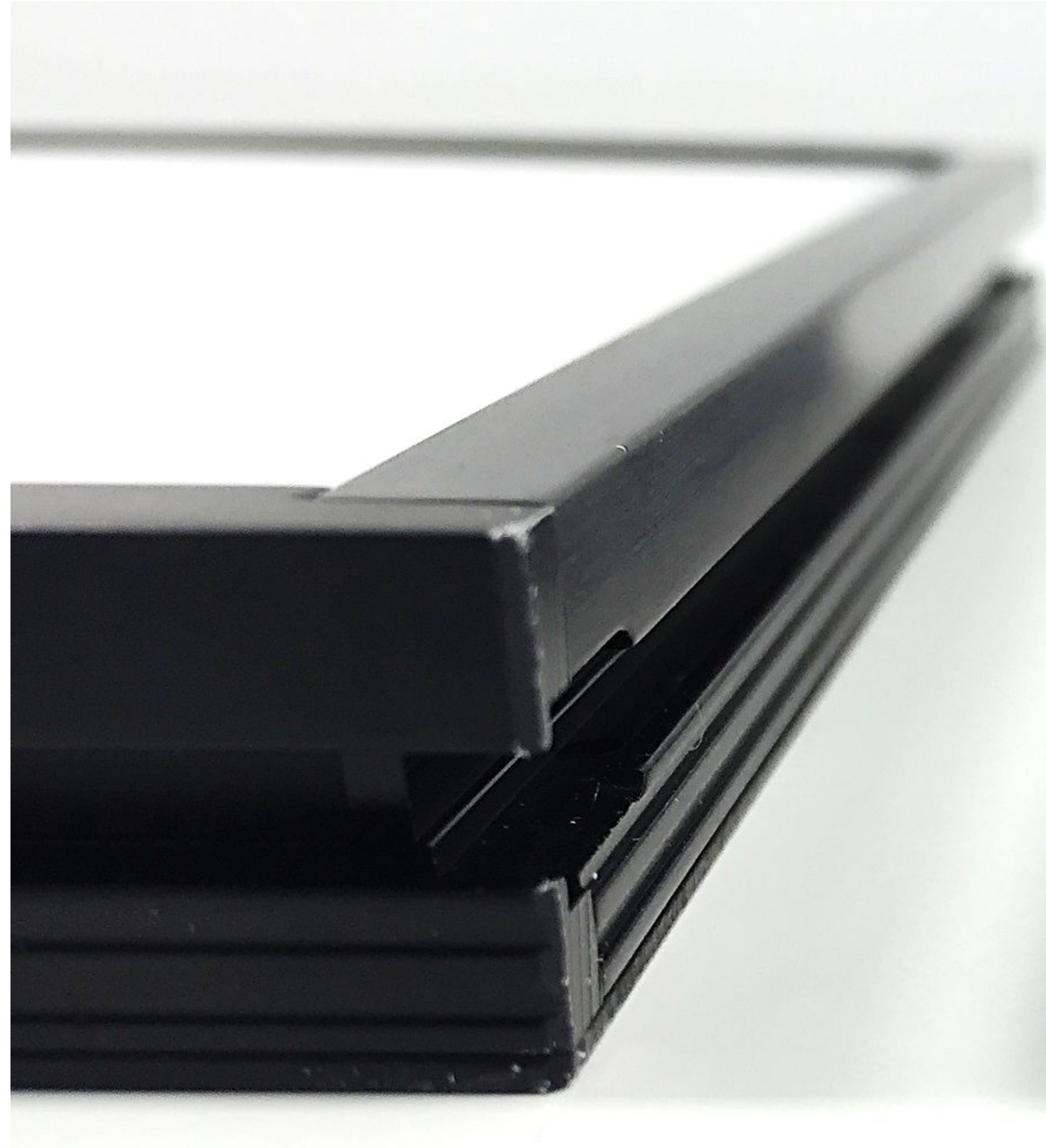




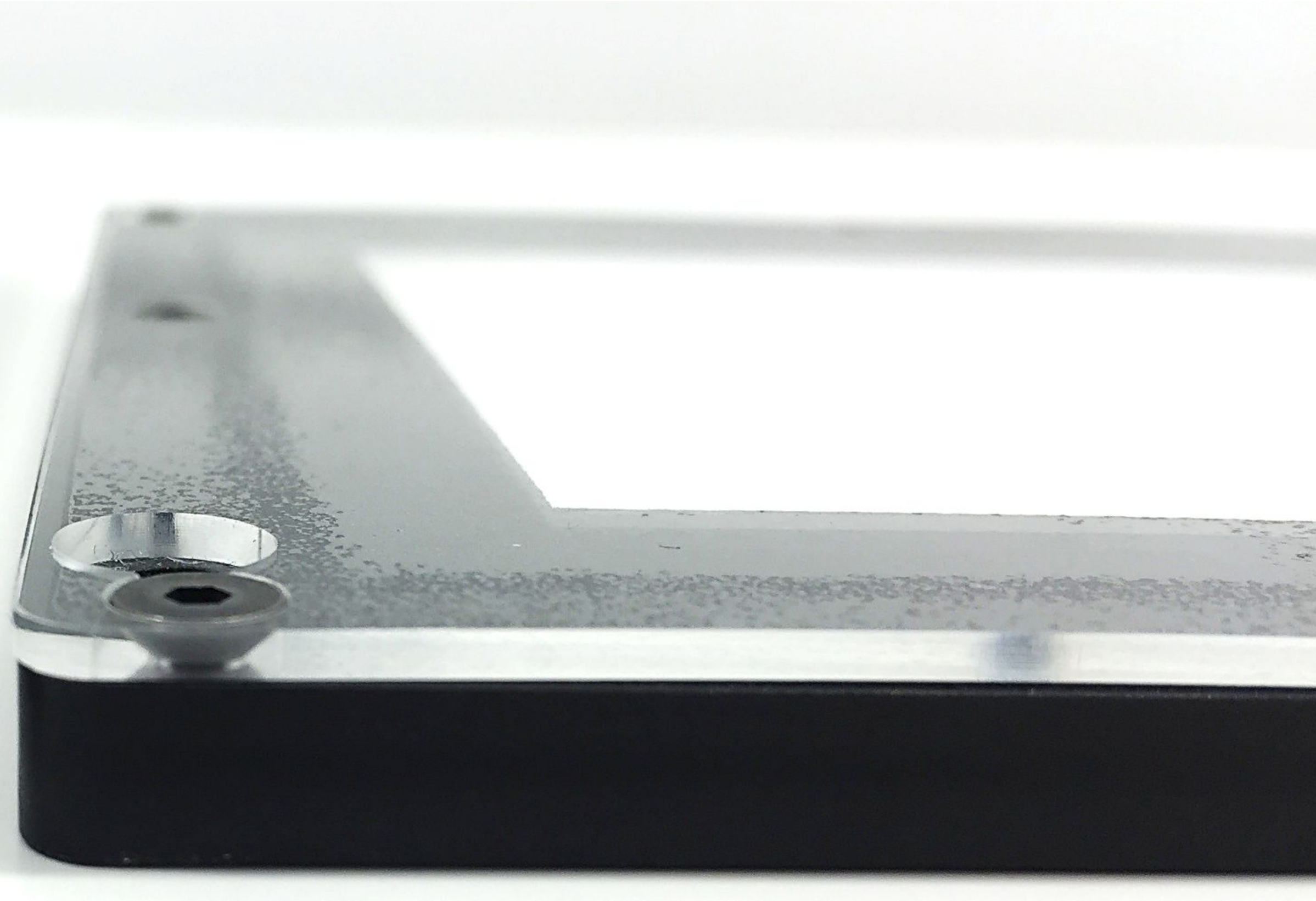
ADVANTAGE

# LESS THICK

Conventional backlight



PHLOX backlight



PHLOX backlight with its edge oriented LED design and light pipe diffuser techniques allow slim design factors.



NASA already uses PHLOX® technology





ADVANTAGE

# IP65, RATED, SCRATCH RESISTANT



PHLOX backlight with monoblock aluminium body and sealed diffuser plate

- Ideal for wet and harsh environments
- Scratch resistant Gorilla Glass™ available on demand



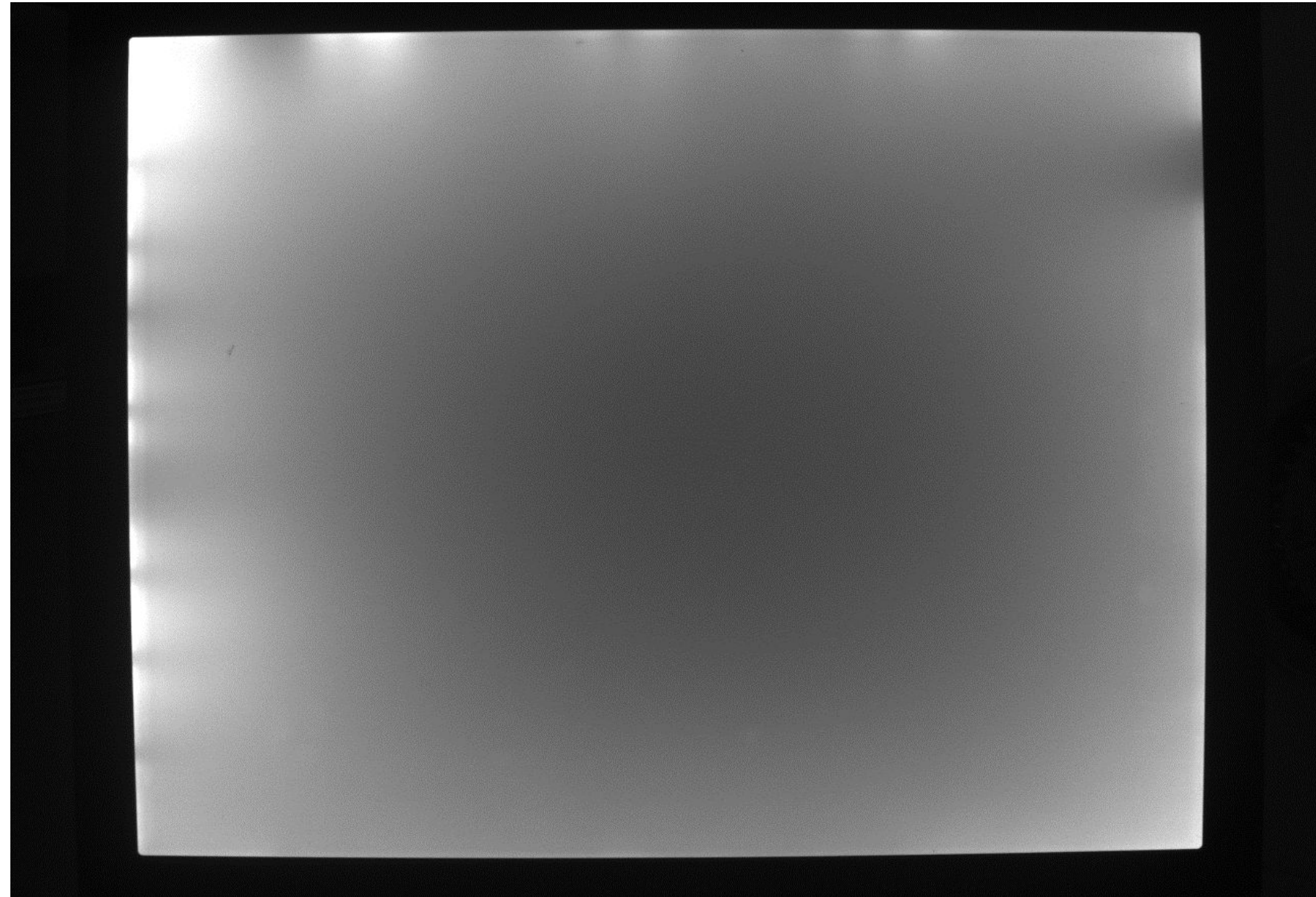
NASA already uses PHLOX® technology





# EXTREME UNIFORMITY

Conventional backlight, edge illuminated (300x250mm)



PHLOX backlight



PHLOX light pipe diffuser techniques create more homogeneity. Natural light falloff and shading effects are compensated.

**Easier software programming and more stable results!**





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ADVANTAGE

# ALL COLOURS AVAILABLE

SOLVE ANY APPLICATION WITH THE RIGHT WAVELENGTH

PHLOX offers a full colour spectrum for it's illuminations.  
Red, Green, Blue, White, Full colour RGB or Infrared  
with different wavelengths will help to solve applications.



NASA already uses PHLOX® technology

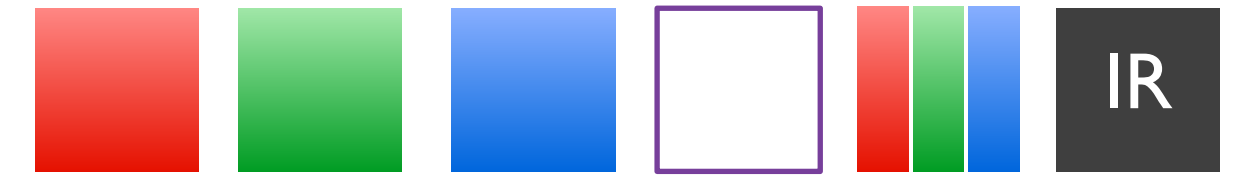




ADVANTAGE

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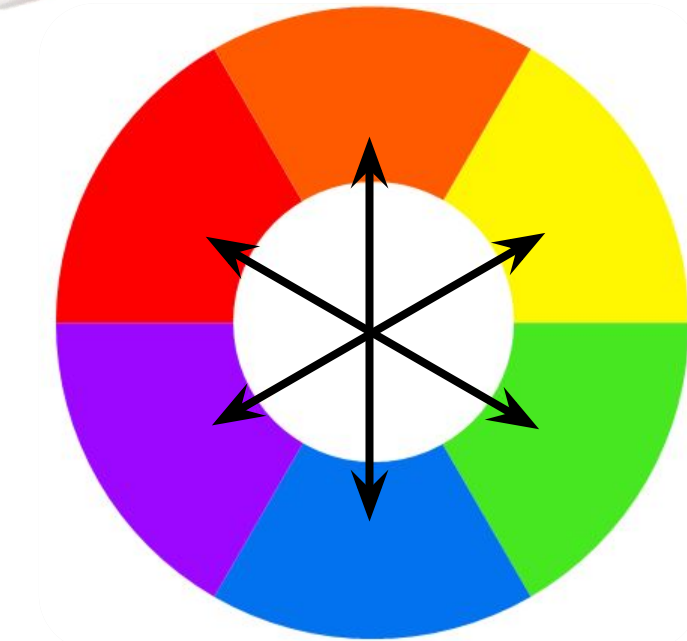


## INSPECTION OF COLOURED PARTS:

Red leds & red object



Green leds & red object



Complementary contrasts

With identical lighting colour, the inspected semitransparent object will appear brighter, complementary colours will appear darker.



NASA already uses PHLOX® technology

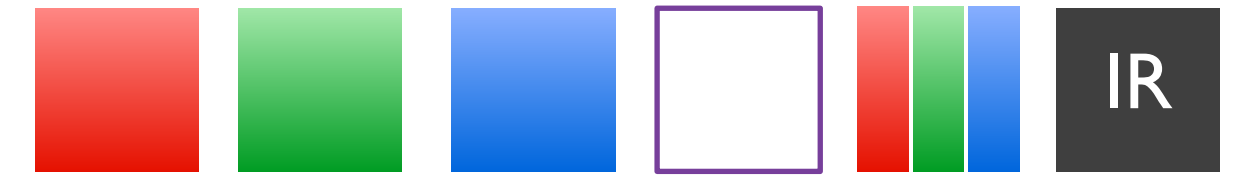




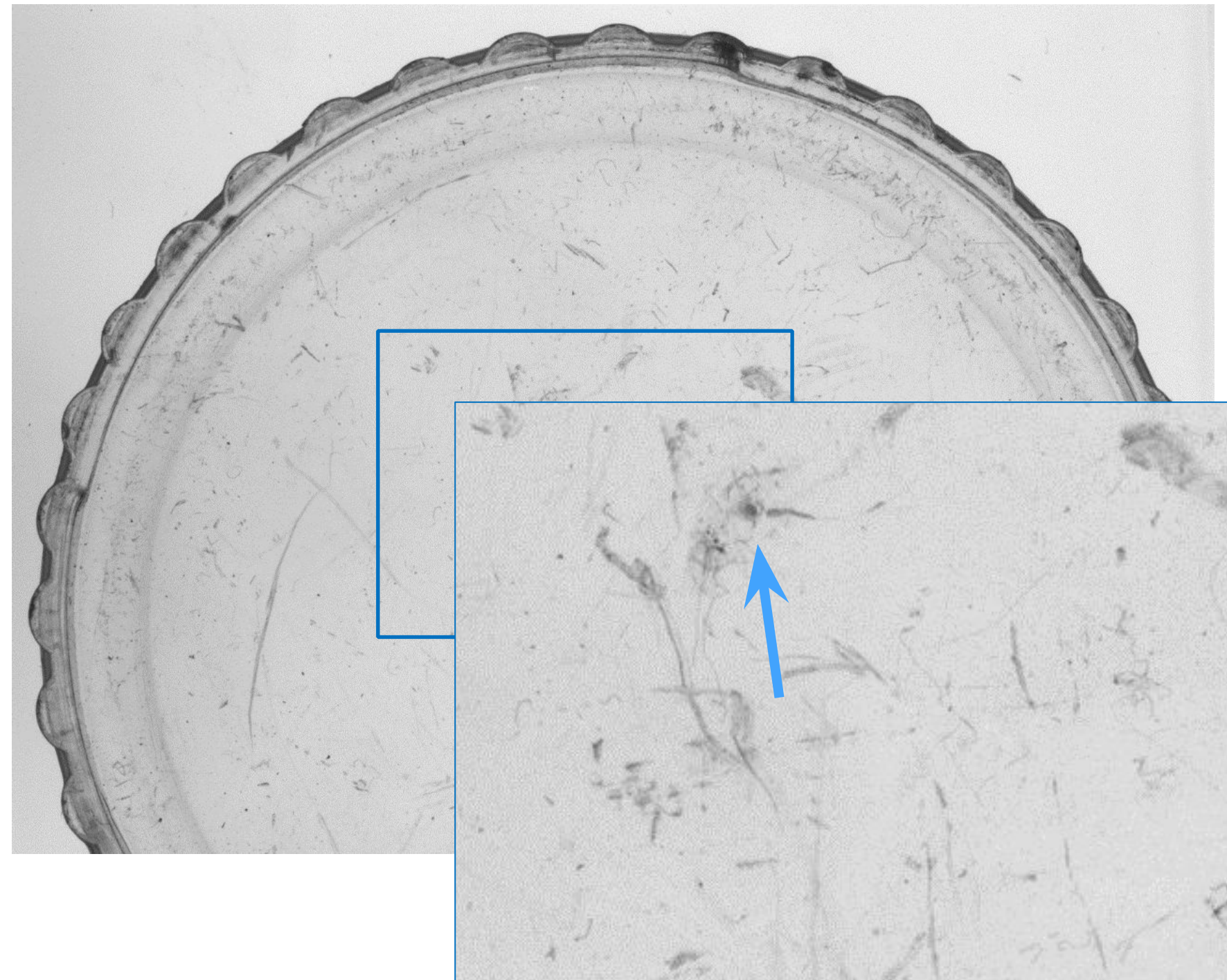
ADVANTAGE

# ALL COLOURS AVAILABLE

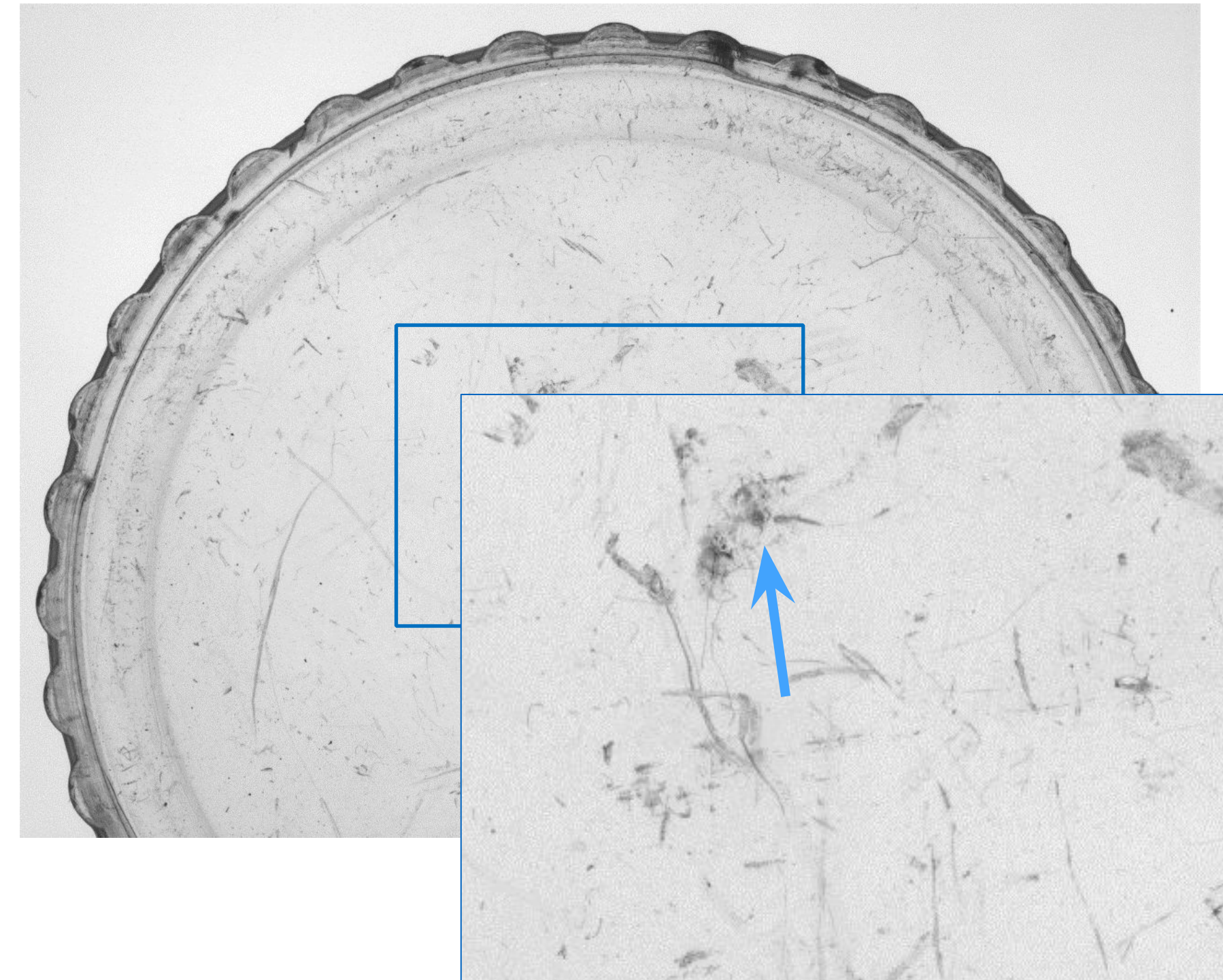
SOLVE ANY APPLICATION WITH THE RIGHT WAVELENGTH



Red PHLOX backlight



Blue PHLOX backlight (better contrasts)



Create contrasts with semitransparent, non coloured objects.  
Blue wavelength creates more scattering light, less transmission.

**More contrast helps to detect scratches.**

(Scratches anyway better visible with collimated Phlox illumination. See slide 6)



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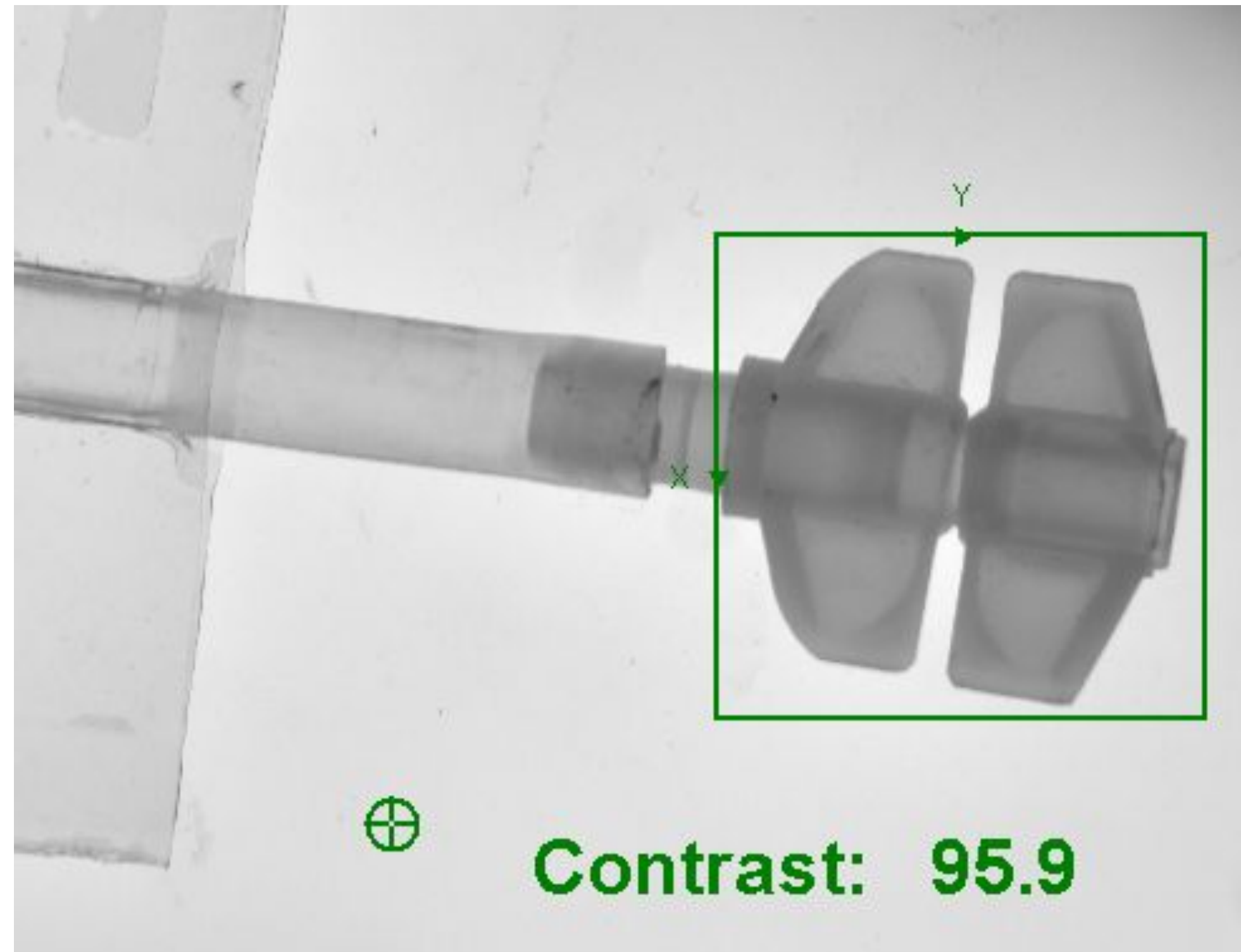
ADVANTAGE

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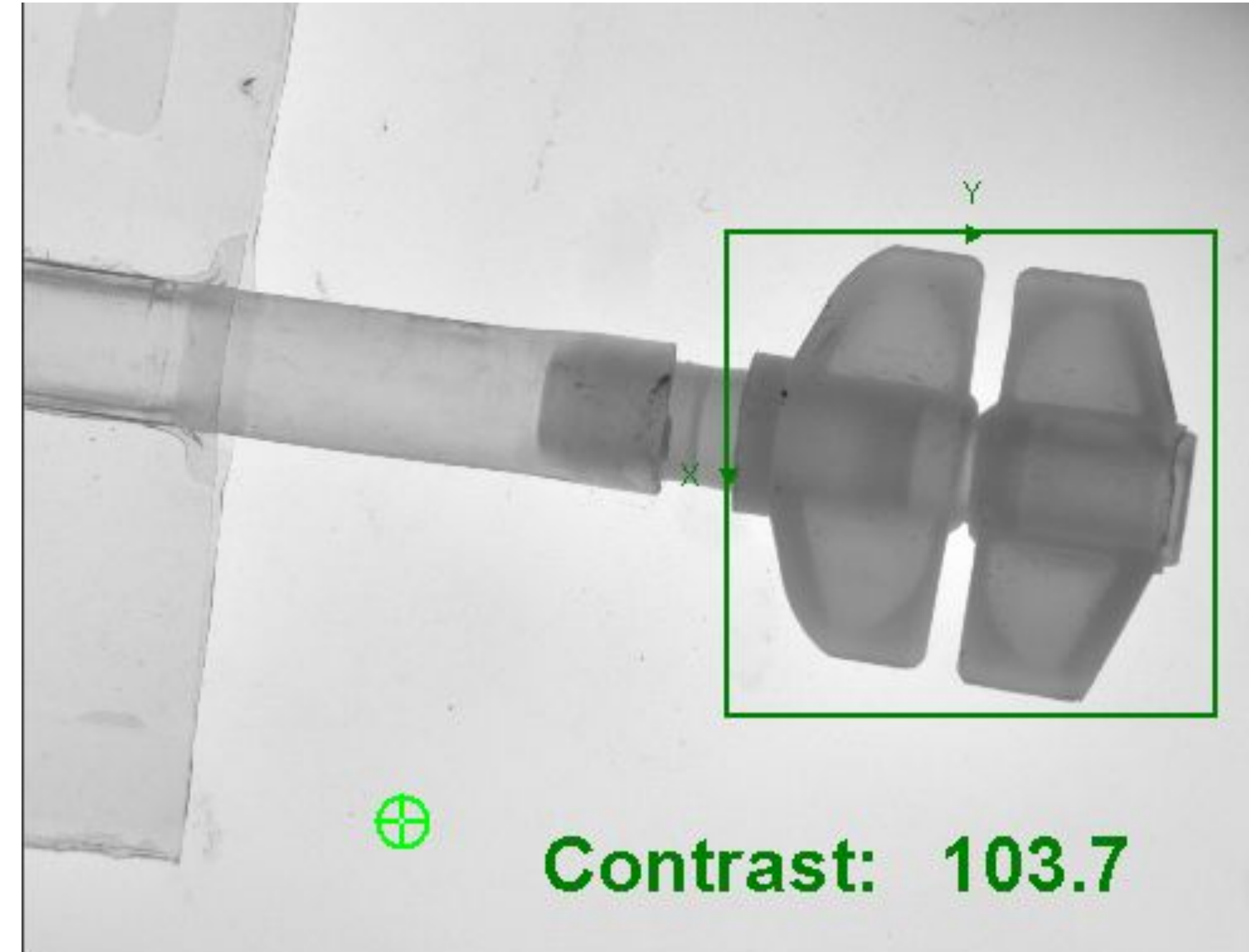
SOLVE ANY APPLICATION WITH THE RIGHT WAVELENGTH



Red PHLOX backlight



Blue PHLOX backlight (better contrasts)



Create contrasts with semitransparent objects.

Blue wavelength creates more scattering light, less transmission.

**More contrast helps to detect small defects and causes more robust applications.**



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ADVANTAGE

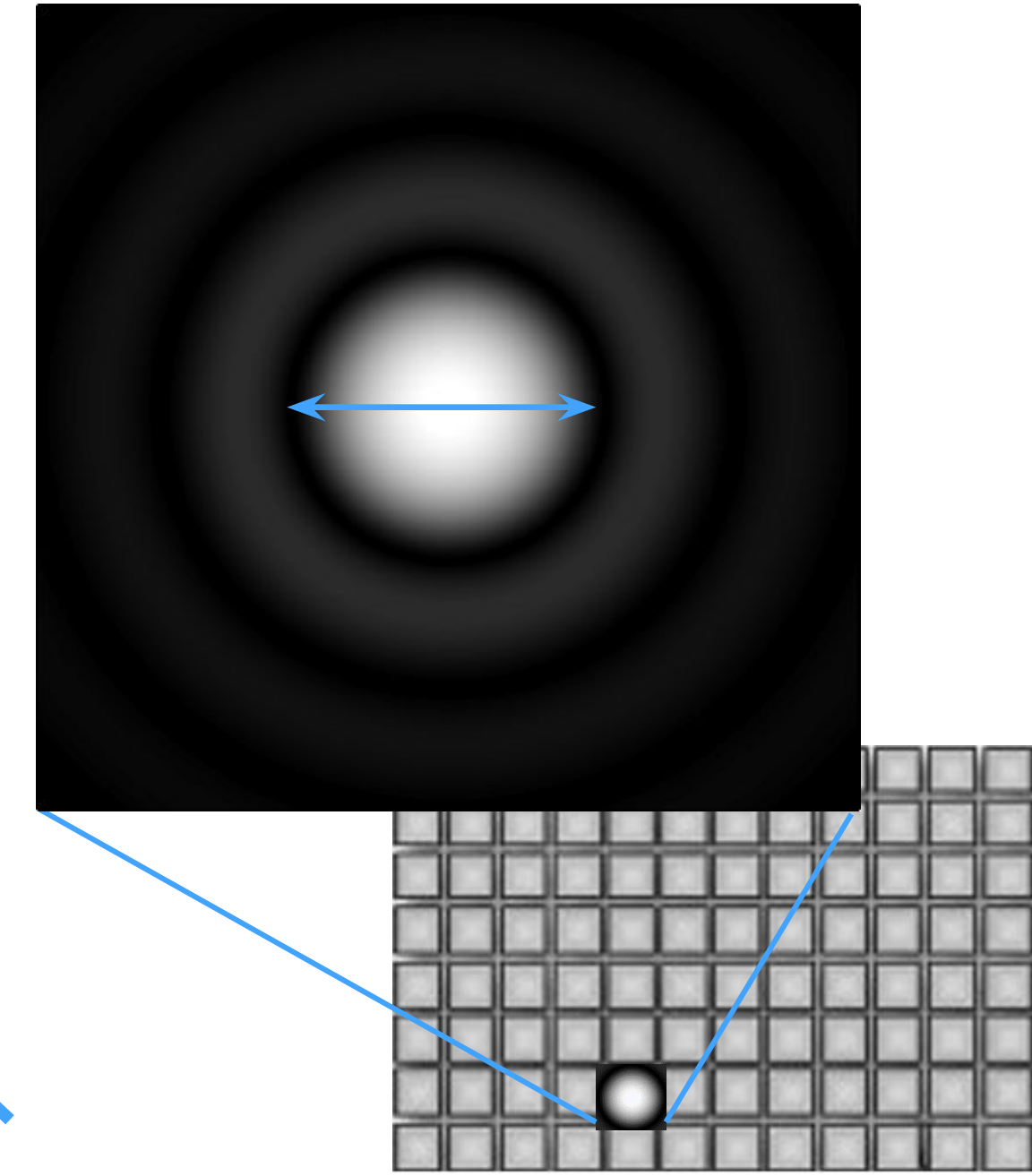
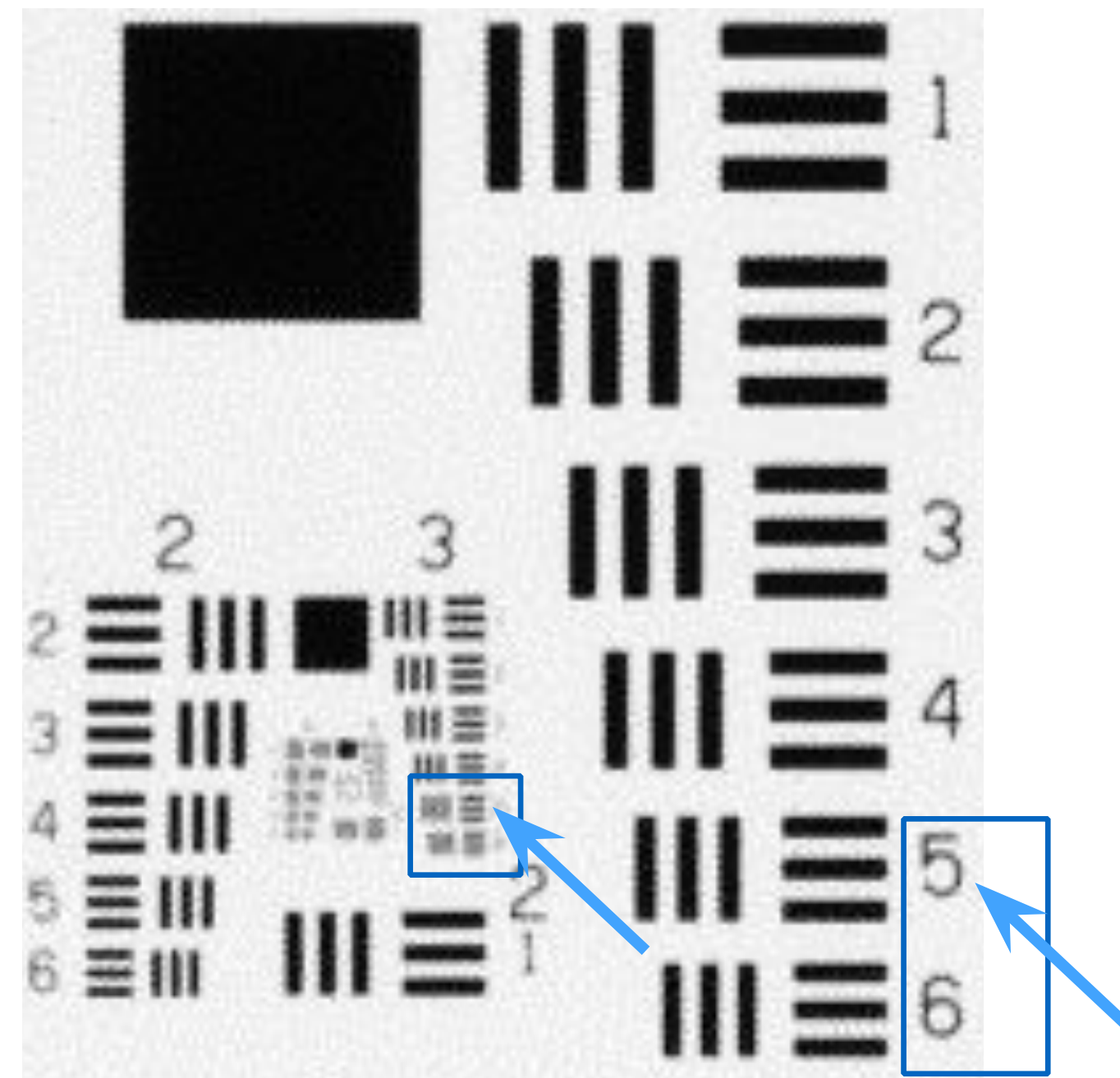
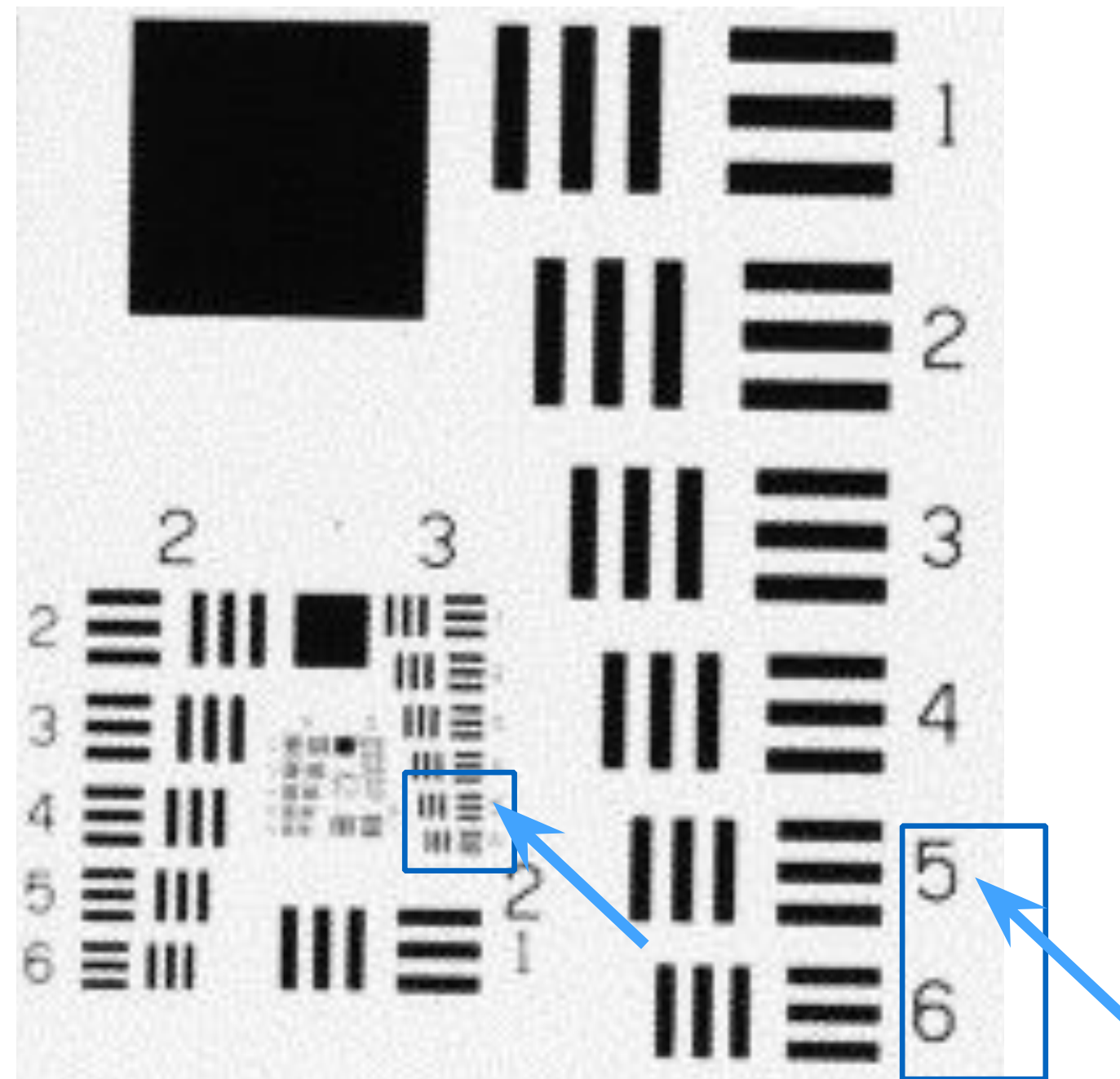
# ALL COLOURS AVAILABLE

## SOLVE ANY APPLICATION WITH THE RIGHT WAVELENGTH



Different optical limiting resolution  
More resolution using shorter wavelengths  
Blue vs Red (f-stop 8 @ 3.75µm sensor pixels)

“Airy disk” diameter  
(diameter of light spot, diffraction limited)  
 $2.44 * f\text{-number} * \text{wavelength}$



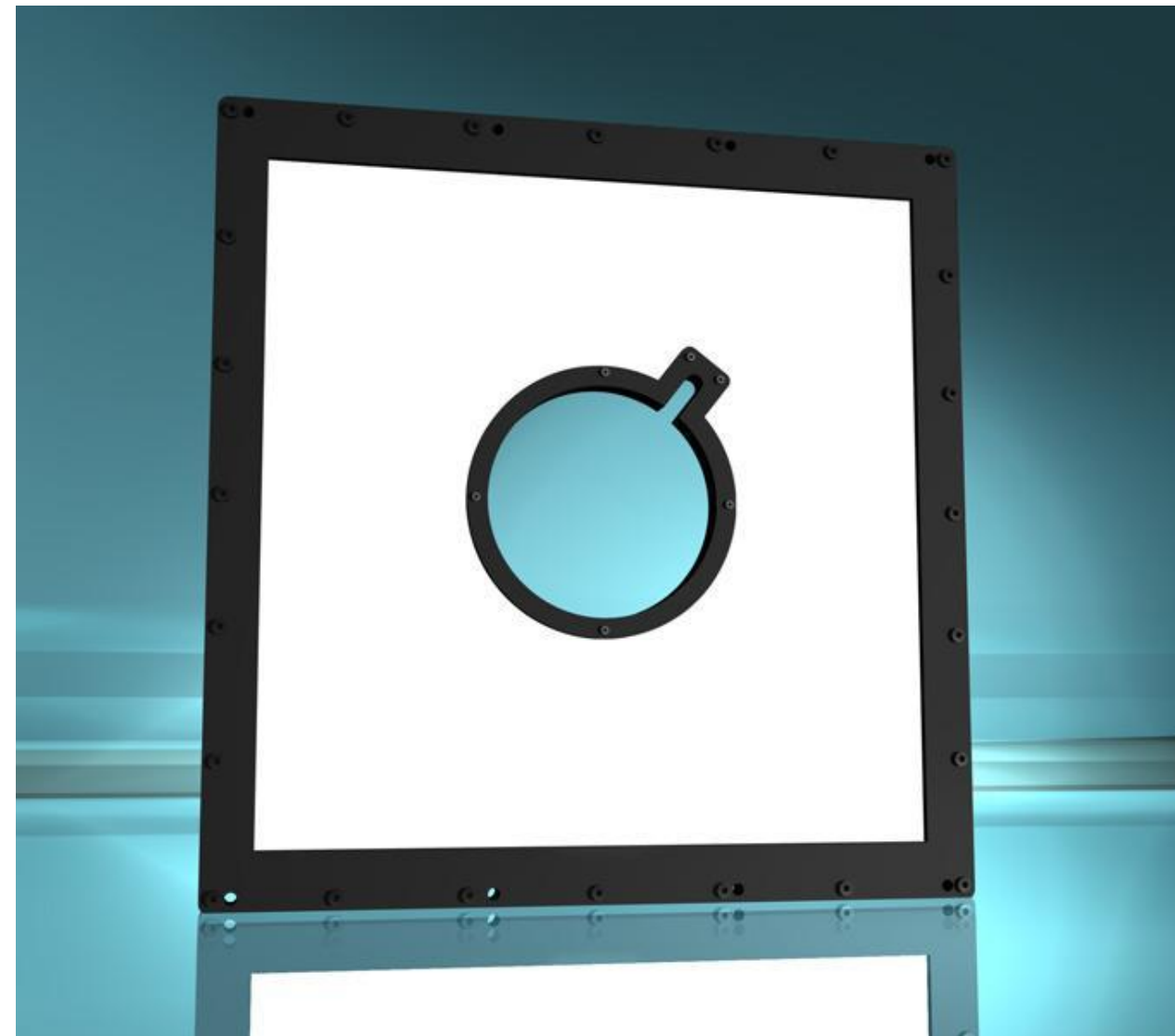
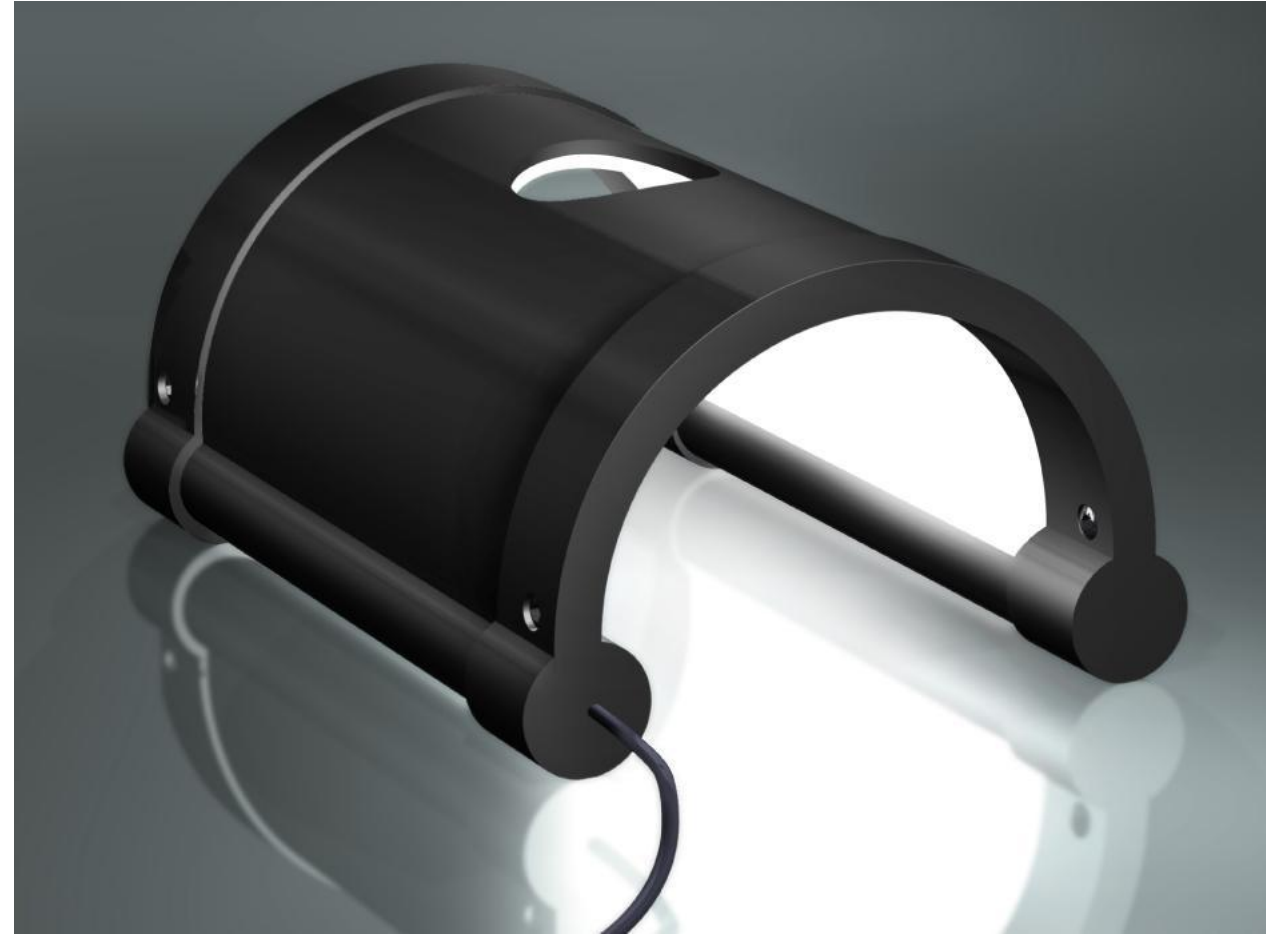
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ADVANTAGE

# CUSTOM DESIGN WITH FAST DELIVERY



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PHLOX COMMITMENT:

# WE PROVIDE MUCH MORE THAN LIGHTING

**More uniformity:** the precision of the mathematical model and the micro prisms enable us to reach up to + or -5% uniformity for the backlight surface. Uniformity of luminance but also with chromaticity. The light injected get mixed inside the light pipe allowing greater results.

**More luminance:** up to 80% of the light injected is reemitted on the surface, up to twice as much as light pipes using refraction or diffusion.

**More compact design:** our technology is particularly adapted to the manufacture of very thin pipes (0.5mm) which enables us to create extra flat products in response to the need to reduce bulk for various applications.

**Longer life cycle:** the combination of our technology and the quality of our designs ensures constant control of temperatures and provides our products with an exceptional life cycle (over 100 000 hours).

**Faster response:** 48 hours at the most for a quote and the delivery of a standard format product and 5 weeks on the average for the design and delivery of a prototype or custom made product.

**Various wavelengths:** IR (850 & 950nm), UV (385nm), Red (630nm), Green (520nm), Blue (450, 470nm), RGB (630, 520, 470nm).

Different products all at the forefront of technology for great performances : Backlights, On-axis lights, Tunnels, Lights with orifice for camera.



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Our promise to you:  
**BEST QUALITY  
PRICE RATIO**  
**EXPRESS  
DELIVERY  
TIME**



- 24** TO 48H STANDARD SIZES DELIVERY
- 5** WEEKS CUSTOM SIZES
- 24** TO 48H QUOTE
- 24** MONTH WARRANTY



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