

# LAUE-HT

Single Crystal Orientation Measurement Systems

TECHNOLOGY  
THAT DELIVERS  
ACCURATE  
RESULTS™

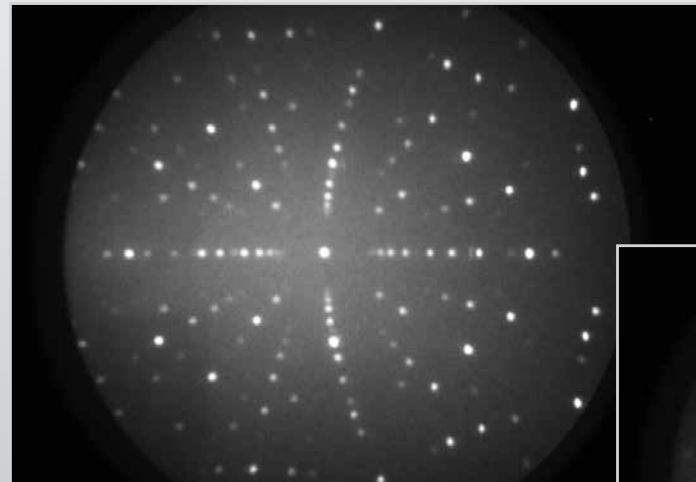
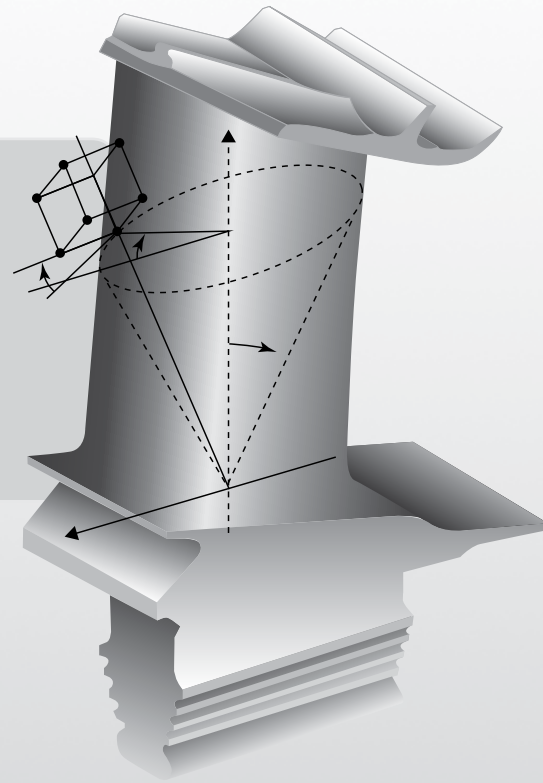


For High-Throughput  
Production Environments

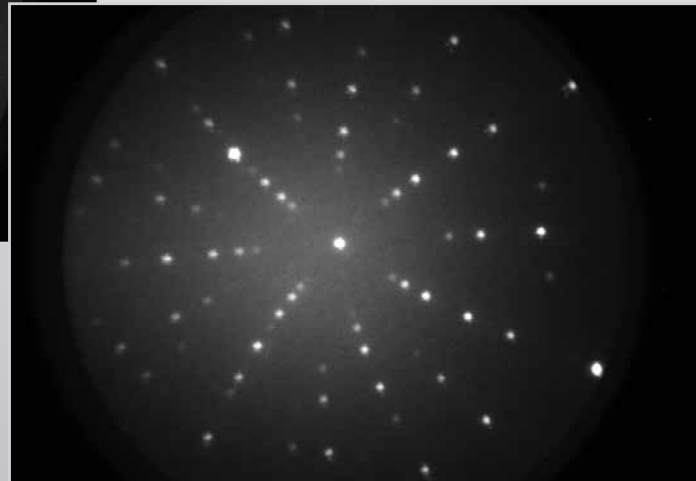
# PROTO

# LAUE-HT OVERVIEW

High-throughput single crystal orientation measurements. Utilizing the Laue technique, measurements can be performed in as little as a few seconds. Excellent for nickel-based alloy single crystal orientation turbine blade inspection.



HT Laue image of aligned (001) silicon



HT Laue image of turbine blade

## WE HAVE A SOLUTION FOR YOUR PRODUCTION ENVIRONMENT

### LAUE-HT STANDARD

For smaller components such as aerospace turbine blades.

### LAUE-HT VERTICAL

Ideal for large aerospace components.

### LAUE-HT HIGH CAPACITY

Available for large, heavy power generation components.



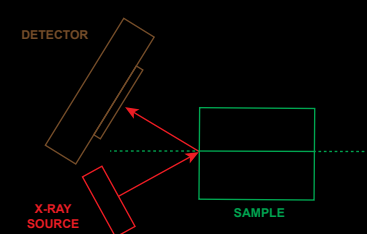
AEROSPACE • POWER GENERATION • TURBINE BLADES  
 SINGLE CRYSTALS • WAFERS • INGOTS • DIAMONDS

## ANGLE CAPABILITIES

The LAUE-HT is capable of measuring both US and UK primary angles.

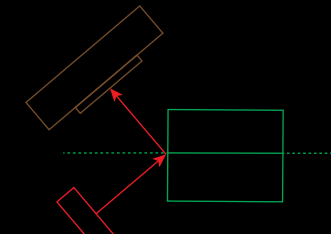
- US angles: gamma, delta, alpha, beta
- UK angles: gamma, delta, theta, alpha, kappa, rho, omega
- R-value grain misorientation measurement

## AVAILABLE LAUE MEASUREMENT GEOMETRIES



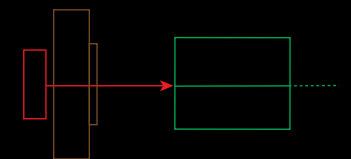
60° SIDE-REFLECTION

- optimal balance between sensitivity and accessibility



90° SIDE-REFLECTION

- improved sensitivity with some reduction in accessibility



BACK-REFLECTION

- reduced sensitivity with highest part accessibility for large parts and R-values



# FEATURES & OPTIONS

## VIDEO CAMERA

Assists operator in viewing individual grains while measuring R values.



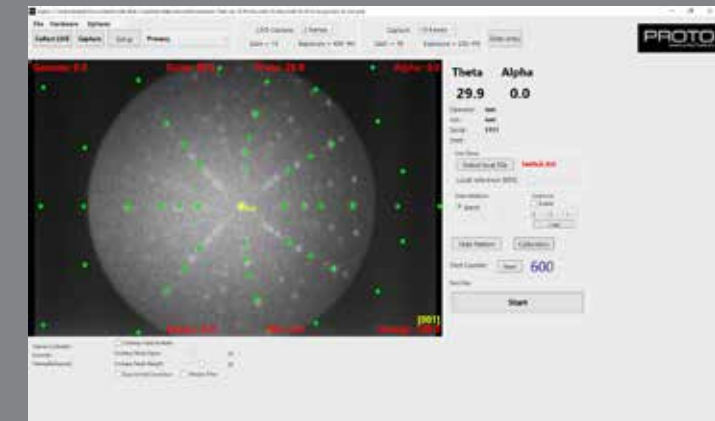
## LASER DISTANCE SENSOR

Digital read-out of sample to detector distance.



## SAMPLE POSITIONING

Automated X and Y axes



## XRDWIN LAUE SOFTWARE

At the heart of the LAUE-HT system is our powerful yet user-friendly XRDWIN software, which includes a comprehensive set of controls for data collection, and analysis of LAUE patterns. This modular program can be customized for each customer's workflow.

### FEATURES:

- 001, 011 & 111 overlays for manual matching of Laue patterns
- Editable custom hkl overlays
- Space mouse control for rotation of overlay
- Live Image mode for real-time viewing of Laue patterns
- Orientation detection limit  $\pm 0.1^\circ$
- R-value calculations available using: *REL cos (R-2cos)*, *REL rms (R-2RMS)*, *DIFF cos (R-3cos)*, *DIFF rms (R-3RMS)*, *Single-angle cos (R-1cos)*
- Off orientation mode with both nearest 001 reference option and a local reference option
- Option to do set angle and disposition requirements within the software for each type of casting
- Automated indexing and computerized matching of patterns
- Multiple user level access control for program configuration and preferences



## JOYSTICK

Control of XY Slides



# LAUE-HT models



**STANDARD**

- Horizontal sliding door
- Can measure parts up to 500 mm
- Recommended for smaller aerospace turbine blades & parts

Overall Size (W x D x H)	2030 mm x 965 mm x 2055 mm (80 x 38 x 81 in)
Cabinet Size (W x D x H)	1370 mm x 915 mm x 1090 mm (54 x 36 x 43 in)
Load Capacity	25 kg (55 lbs)
Maximum Sample Length	500 mm (20 in)
Camera Option	side-reflection
Motorized Sample Stage	Z-axis (Up/Down) 175 mm (7 in), Y-axis (In/Out) 200 mm (8 in) travel
Manual Sample Positioning	X-axis focusing (Left/Right) 200 mm (8 in)



**VERTICAL**

- Vertical sliding door
- Can measure parts up to 860 mm
- Recommended for large turbine blades & parts

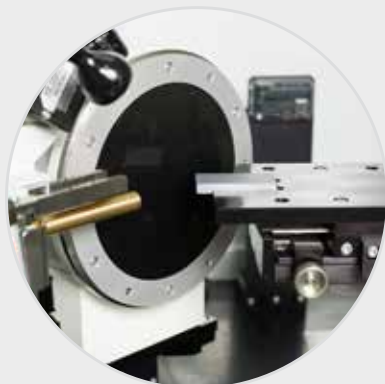
Overall Size (W x D x H)	1675 mm x 1220 mm x 3225 mm (66 x 48 x 127 in)
Cabinet Size (W x D x H)	1450 mm x 1090 mm x 1090 mm (57 x 43 x 43 in)
Load Capacity	25 kg (55 lbs)
Maximum Sample Length	860 mm (34 in)
Camera Option	side-reflection
Motorized Sample Stage	Z-axis (Up/Down) 175 mm (7 in), Y-axis (In/Out) 200 mm (8 in) travel
Manual Sample Positioning	X-axis focusing (Left/Right) 200 mm (8 in)



**LARGE CAPACITY**

- Vertical sliding door
- Heavy duty XYZ sample positioning stages for large power generation blades and parts
- Sample transfer cart
- Back-reflection camera option

Overall Size (W x D x H)	1675 mm x 1220 mm x 3225 mm (66 x 48 x 127 in)
Cabinet Size (W x D x H)	1450 mm x 1090 mm x 1090 mm (57 x 43 x 43 in)
Load Capacity	100 kg (220 lbs)
Maximum Sample Length	860 mm (34 in)
Camera Type	side-reflection or back-reflection
Motorized Sample Stage	Z-axis (Up/Down) 305 mm (12 in), Y-axis (In/Out) 355 mm (14 in)
Manual Sample Positioning	X-axis focusing (Left/Right) 355 mm (14 in), Y-axis (In/Out) 508 mm (20 in)





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Power Requirements	200-240V, 24 Amps, 50/60Hz, Single Phase
X-Ray Tube	Tungsten (W)
X-Ray Power Supply	3000 W (60 kV / 50 mA)
Geometry	side-reflection or back-reflection
X-ray Beam Apertures	0.5, 0.75, 1.0, 1.25, 1.5, 2.0 mm
Computer	desktop computer included
Software	PROTO XRDWIN Laue
System Compliance	ANSI N43.2, CE, ASTM E82

PROTO Manufacturing engages in continuous research and development, therefore specifications in this publication are subject to change. Please call for details. Various items and methods in this brochure are covered by patents or patents pending.

# PROTO

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