




OpticsQualityMonitor OQM

For productivity reasons, the beam powers used in the production with lasers are more and more increased up to the range of 6 to 8 kW or even 10 kW and more. This leads to an increasing impact on the optics used in the processing heads, i.e. a power-dependent focusing shift. The absorption characteristics and the degree of pollution of the optics are thus increasingly important. The same applies to the quality assurance for optics, which has to be ensured by optics manufacturers, processing head manufacturers, and manufacturers by laser systems.

Measuring Procedure – the Principle

The OpticsQualityMonitor enables the control of absorption characteristics of optics in the the supplier's, processor's and user's quality assurance. This does not only ensure that the optics was manufactured within the specification but also that it meets the requirements when in use. This makes it easier to detect production- or handling errors in the manufacturing chain and it is made sure that the optics is up to high performances.

The OQM compares the absorption of a translucent optical element, e.g. from a processing head (lens or flat optics), with the absorption of a reference optics (same type: material or refraction index, diameter, radii of curvature and anti-reflective coating). What is measured is the temperature increase of the optics' surface, which results from the laser power absorbed in the optics.

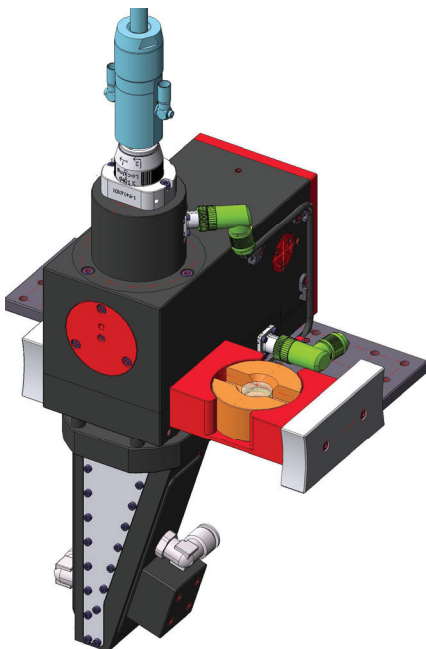
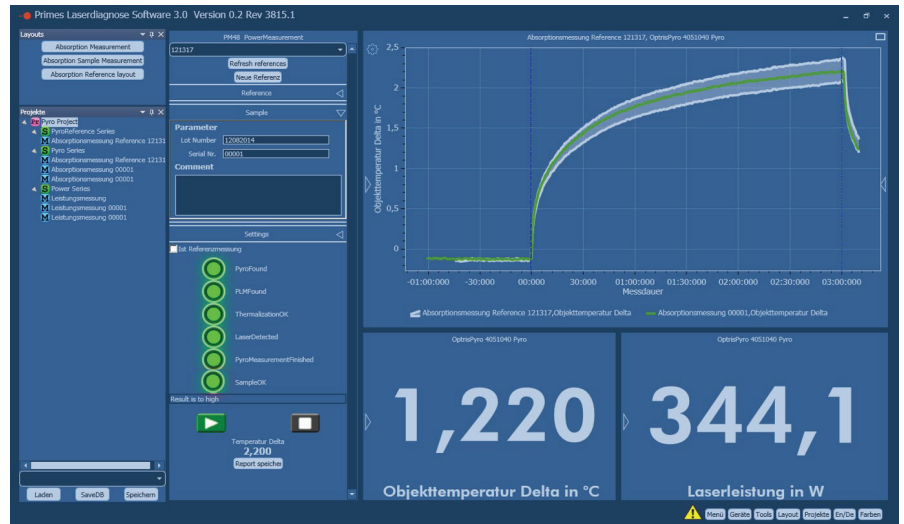
Operation

The temperature measurement is effected without contact, i.e. there is not change to the optics due to the measurement or due to the mounting of the optics during the measurement. Thus, the OQM is particularly suitable for the incoming- and outgoing goods inspection of optics employed in the high-power range.

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The measurement of the temperature increase of the optical surface enables comparative statements with regard to the absorption of optics within a serial production, between different serial productions or between the deliveries from different suppliers. The absolute absorption value, however, is not determined.

The OpticsQualityMonitor is supplied in a laser class 1 housing with an integrated laser and cooler. The device is intended for the operation in a cleanroom.



AbsorptionTestModule with QBH plug and GUI

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Technical Data

Measurement Parameters	
Power range	500 W
Wavelength range	1070 nm
Beam dimensions	2 mm
Accuracy	± 200 mK
Reproducibility	± 100 mK
Test capacity	~4 optics per hour
Temperatur Measurement, Pyrometer	
Time constant	10 ms
Resolution	10 mK (12 – 16 µm)
Supply Data	
Operating Voltage (three-phase alternating current)	400 V
Dimensions and Weight	
Dimensions (LxWxH)	1000 x 1635 x 880 mm
Weight, approx.	340 kg
Ambient Conditions	
Operating temperature range	+20 up to +30 °C
Storage temperature range	+5 up to +45 °C
Reference temperature	+24 °C
Permissible relative humidity (non-condensing)	0 – 80%
Optics Data	
Diameter	up to 60 mm
Thickness	up to 25 mm
Radius of curvature	> 12 mm
Anti-reflective coating	required



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