

ProWatcher

Quality Control

Industrial Process Quality Monitoring for Laser Machining

Quality Control Solutions for:

- Automotive Industries
- Heavy Industries
- Aircraft Industries
- Semi-conductor Industry
- Electronic Industry

- Mass Production
- Prototyping
- Application Laboratories
- Research & Development

Adaptable for all laser systems

Why use Quality Control?

The use of lasers in the manufacturing industry has led to a considerable increase in reliability and flexibility. Nevertheless, conventional off-line quality control methods are still required to monitor the reliability of the process. The **ProWatcher** product family offers solutions for automatic quality control. The quality of every process can be individually monitored and archived. The wide range of **ProWatcher** solutions offers individual tools to suit your quality needs

Which Faults can be Detected?

Weld defects

- Lack of contact
- Variation of weld depth
- Seam discontinuity
- Sagging weld
- Melt splattering
- Seam geometry
- Seam position

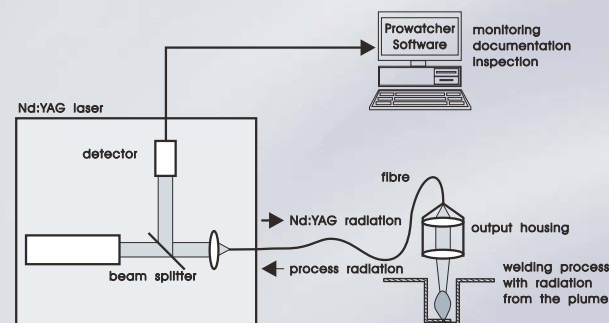
Cutting Defects

- Kerf position
- Kerf width
- Kerf quality
- Unstable process

Use **ProWatcher_{Seam}** for Seam Welding.

ProWatcher_{Seam} monitors the process radiation in a defined spectrum during continuous welding applications. Only one single sensor is necessary for CO₂ or Nd:YAG laser welding processes. In an Nd:YAG laser system, the sensor can be incorporated into the laser unit. Using digital processing methods, general quality deterioration as well as individual welding faults can be detected, statistically documented and reported to the machine tool PLC.

- Auto-referencing and automatic quality control
- 100% non-destructive testing, also for hidden seams (housings, tubes, profiles)
- Fewer rejects through automatic online fault detection and PLC link
- Reduction of repair, control and maintenance costs
- Quality report for safety-related products (for the automotive, aeronautical, nuclear, medical sectors)
- For seams with variable lengths



Setup of the **ProWatcher_{Seam}** integration in an Nd:YAG laser source

Use **ProWatcher**^{Pulse} for Spot Welding.

When dealing with pulsed applications, a fast system is required to monitor and automatically evaluate each individual pulse. This is particularly important in laser spot welding applications used in the electronic industry. The **ProWatcher**^{Pulse} evaluation of individual spot welds has been industrially tested up to a frequency of 100 Hz. The sensor integration is the same as the one for the **ProWatcher**^{Seam}.

- All features of the **ProWatcher**^{Seam}
- Quality control of individual pulses
- On-line monitoring and documentation
- Integrated PLC link

ProWatcher^{Pulse} evaluates the quality of every spot weld.

ProWatcher^{Pulse} is used to check the quality of laser spot welds in electron guns, for example.

Use **ProWatcher**^{Multi} for Cutting, Hybrid Welding and other Processes.

For some applications, the process radiation is not the only signal that can be used to monitor the quality. For these applications, **ProWatcher**^{Multi} can be used. By combining the signal information from multiple sensors, it is now possible to monitor the quality of complex processes with a high accuracy.

- Multi-sensor process monitoring in real-time
- Used in hybrid welding and cutting applications
- Independent of seam length
- Application-specific fine-tuning possible
- Can be used in non-laser applications

For further Information

The ProWatcher series was developed by the Laser Zentrum Hannover e.V.

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