Optical inspection systems for production
As an innovative company headquartered in Erlangen, Germany, Intego develops and manufactures sophisticated inspection systems for a wide range of manufacturing industries – flexible, fast and competent, and ideally matched to your production process. Customers around the world rely upon our over 20 years of international industrial and market experience.

Your benefits
- Ensure product quality
- Reduce error rates
- Optimise processes
- Reduce production costs

Our track record
- Over 500 inspection systems installed world-wide
- Winner of the Semikron Innovation Award

Intego GmbH
Henri-Dunant-Straße 8
D-91058 Erlangen
Fon +49 9131 61082-0
Fax +49 9131 61082-999
Email info@intego.de
INDUSTRY SOLUTIONS

Focusing on your challenge

Your inspection tasks:
- Surface defects, ceramic defects, coatings and bulk defects
- Geometry and position measurement
- Determining transmission profiles and inspecting plastic welds

Our solutions:
- Reflected light, transmitted light and deflectometry
- Thermographic weld inspection
- PICTOR – transmission measurement
- R2R inspection of film webs
- OPAL – Inspection of IMD and IML parts

PLASTICS

Inspection of modern plastic and composite parts – demanding and varied.

Your inspection tasks:
- Surface and volume defects (microcracks, scratches, protrusions, flaking, particles, inclusions)
- Crystal defects (stacking faults and dislocations)
- Assessment of structures (laser patterns, etching processes, conductor paths, component arrangement)

Our solutions:
- AQUILA – Customised multi-channel microscope scanner for high-throughput and high-precision applications
- Photoluminescence scanner with special UV illumination concepts for robust defect detection in substrates, wafers and partially processed wafers

SEMICONDUCTORS

Power electronics, MEMS, ICs, photo elements and dies – Intego is at the leading edge of semiconductor wafer inspection.

Your inspection tasks:
- Material inclusions and ingot geometry
- Structure, topography and microcracks in wafers
- Print inspection, electrical properties and final inspection of cells
- String, matrix and module inspection of finished modules

Our solutions:
- ORION – NIR inspection system and 3D geometry measurement
- ANTARES and GEMINI – inspection of microcracks and grain structure
- APUS – monitoring of print steps, position deviations and layer thickness
- VELA – platform for comprehensive string and module inspection
- Thermographic assessment of performance and electrical defects

ELECTRONICS

Small, complex and multifaceted – optical inspection to ensure high quality of electronic components.

Your inspection tasks:
- Integrity inspection of electronic components and circuits
- Weld, solder and glue joints comprising the broadest possible range of materials and metals
- Layer thickness measurement and printed electronics

Our solutions:
- Detecting defective elements and joins using lock-in thermography
- Diffuse incident light for assessing the completeness and position of components and structures
- Thermographic measurement of layer thickness

SOLAR

Inspection from ingot to finished module – cost-effective systems with proven added value.

Your inspection tasks:
- Integrity inspection of electronic components and circuits
- Weld, solder and glue joints comprising the broadest possible range of materials and metals
- Layer thickness measurement and printed electronics

Our solutions:
- Detecting defective elements and joins using lock-in thermography
- Diffuse incident light for assessing the completeness and position of components and structures
- Thermographic measurement of layer thickness

CERAMICS AND GLASS

Comprehensive, high-throughput inspection of high-tech ceramic and glass components.

Your inspection tasks:
- Material defects (cracks, inclusions, shippings, bubbles, crystal defects)
- Coating, paint quality, structures and surface properties
- Geometry inspection and measuring

Our solutions:
- Transmission light and darkfield inspection as well as shape from shading to reliably detect material defects
- Deflectometry and reflected light imaging for reliably assessing surface defects
- Detection of even the most minor nonconformities using 3D laser triangulation or ultra-light interferometry

METALS

Rugged 3D measuring systems for metal parts and tubes – innovative and fast.

Your inspection tasks:
- Scanning, protrusions, scratches, overlaps, stripe deviations, etc.
- Inspection of the inner surface of short tubes
- External inspection of tubes of any length
- Inspection of weld seams and spots
- Also for polymer tubes

Our solutions:
- 2D/3D laser triangulation for detecting even the smallest scoring marks, protrusions and stripe deviations
- Integration of 2D-3D vision systems to inspect for surface defects
- High feed rates possible

PLASMA
Your added value from a single source

Your inspection task may demand a complex solution that involves multiple aspects. Intego offers many years of experience in optics and measuring technology, image processing and the fabrication of specialised machines. By combining suitable methods, we are able to reliably implement even complex and highly sophisticated solutions.

Intego's in-house design and production facilities enable a rapid and efficient fabrication and integration of our systems. This allows us to dramatically shorten our production times and respond flexibly to changes.

Intego competently and professionally resolves all aspects relating to the implementation of your inspection solution, saving you the time-consuming coordination of multiple different providers – preventing ambiguities regarding responsibilities at interfaces.

Your complete solution – from a single source!
Feasibility study / preliminary
Review of initial customer considerations:
› What defects or features need to be inspected?
› What are the minimal defect sizes?
› How are the parts to be handled?
› What is the specified cycle time?
Integration of system in production (stand-alone/inline)?

Intego:
› Evaluation of various concepts on the basis of qualified sample parts
› Preparation of a technical report with results and estimate of economic efficiency
› Preparation of quotation

Design and development
› Development of a machine layout and consultation with customer
› Definition of interfaces necessary for integrating the system on site
› Design of all components under consideration of the specification (including manufacturer’s or execution requirements, e.g., cleanroom technology)
› Selection of the handling components for process automation
› Implementation of image-processing measuring technology (cameras, lenses, illumination, lasers)
› Integration of process-relevant sensors
› Design

Software development
› Robust image processing for reliable results
› Classification (deep learning, trainable by the customer)
› Image processing can be reconfigured using CAD files (e.g. for pressure tests)
› Acceleration of evaluation for high data rates
› The Inspector – a proprietary software environment for maximum flexibility in development
› Direct machine control
› User-friendly custom GUI concept
› Meaningful statistics for process optimisation
› Interface to customer: backups, saving and tracking of inspection results, machine data
› Direct feedback loops to adjacent production machines

Setup / production
› Purchase of all necessary components
› Special custom fabrication where required
› Fabrication of custom illumination
› System setup
› Control cabinet assembly and cable management
› Control and synchronisation of camera/illumination and automation components
› Hookup of connections and media (e.g. compressed air, vacuum, cooling)
› Software integration

Pre-acceptance, delivery and commissioning
› Pre-acceptance at Intego approx. 2 weeks before delivery
› Initial extended tests
› Repeat measurements (MSA)
› Verification of measurement performance
› Final GUI adaptation
› Delivery via freight forwarder or direct transport
› System integration at customer site
› Prompt acceptance
› Employee training

Customer support
› Three-level support concept: Telephone
› Remote maintenance
› On-site visit
› Individual maintenance contract
› Additional engineering hours
› Short response times
› Designated direct contact person
› Spare parts package
› Statistical evaluation
› Process optimisation
› Upgrade options
› Automatic reporting