

Machine vision solutions

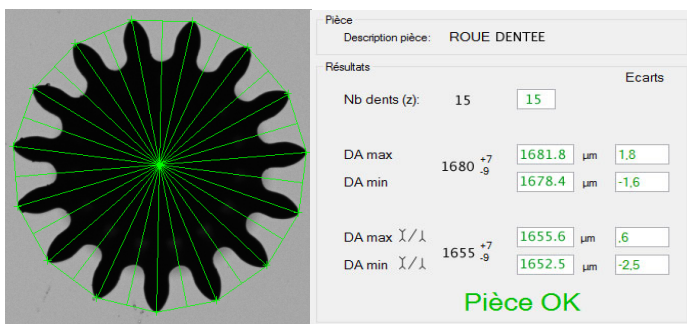
From image processing algorithms to optical installations, **idonus** provides partial or full machine vision solutions. Typical applications include high-throughput automated measurement of mechanical parts, surface quality inspection, positioning, quality control or identification. Our custom developed solutions can be combined with robotized or manual equipment.

AUTOMATED MEASUREMENTS

Machine vision is well suited for metrology and control of mechanical parts where non contact measurement is preferable. **Telecentric optical systems** are commonly used to project a high-precision profile of the part on the sensor. Images are then processed in order to automatically recognize patterns and retrieve the desired parts dimensions, in a fraction of a second, with subpixel accuracy. This is particularly advantageous for mass produced or complex parts. All kinds of information can be extracted from the projected features, including:

- Lengths and diameters
- Radii, chamfers
- Geometrical characteristics
- Shape measurement
- Comparison with CAD drawings
- Virtual gauges
- Part recognition

We have already designed several algorithms that are used for the measurement of miniature parts such as cogwheels, screws, complex axis and flat parts. In terms of production throughput, our client could significantly increase the number of controlled parts, while decreasing the measurement time.



Automated and simultaneous measurement over all the pins of a cogwheel and final quality diagnostics. In this example, the gear has an external diameter of 1.68 mm.

BENEFITS

Inspection with machine vision can lead to several improvements:

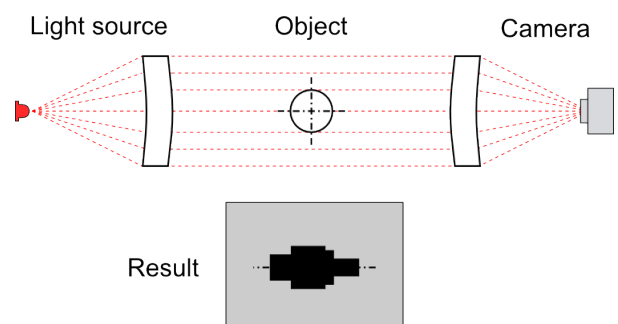
- **One shot measurement** of all the dimensions
- **Operator independent**
- Quality chain **tracking**
- **100%** of production controlled
- **Time saving**

TYPICAL PERFORMANCES

Submicrometer measurement resolution	Subpixel resolution enables $< 1 \mu\text{m}$ resolution, depending on the required magnification
Inspection time	< 1 second

Telecentric technology

Telecentric optical systems are characterized by parallel light rays resulting in a high-precision projection of a part on the sensor. Border effects that would usually be observed with standard illuminations are strongly reduced and the depth of focus is increased.



Optical system with telecentric backlight illumination and resulting image.

OUR OFFER – custom hardware and software for optimal results

idonus is specialized in the design and fabrication of custom equipments for the microengineering industry. This expertise in the development of complex systems is completed with our know-how acquired in the design of **optical systems** and in **image processing**.

Hardware

From telecentric optical systems to microscopes, **idonus** can provide customized optical solutions according to your particular needs. Based on your requirements, we can use standard equipment or build unique optical elements that will fit your application.

Based on our experience, we are able to choose the most suitable components, from camera to lenses, illumination, software, CPU and calibration elements.

Machine vision algorithms

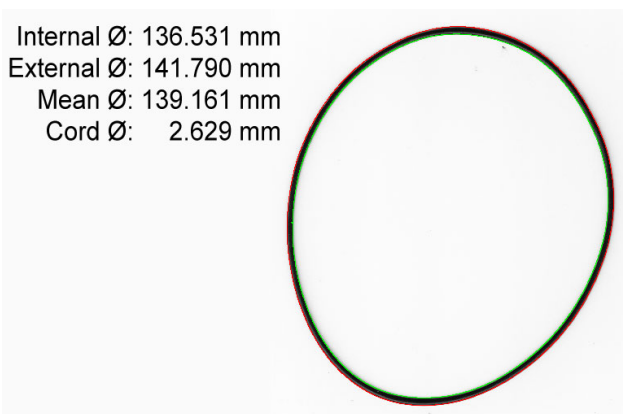
We develop our own algorithms using a leading machine vision software. Our approach enables accelerated development and time to market, as well as important costs savings.

This development environment contains large libraries that are already used in all types of industries for image processing operations such as measuring, identification, 3D vision, blob analysis, morphology or matching.

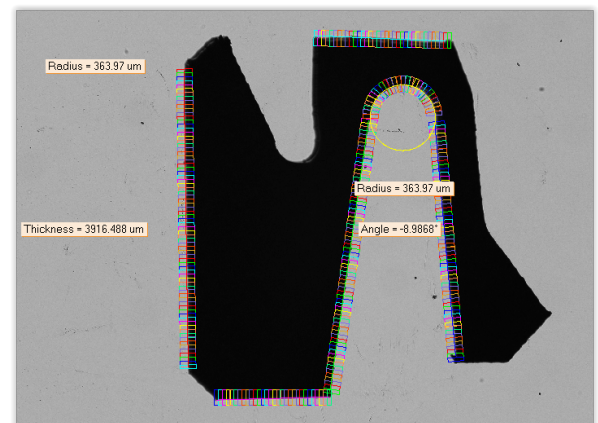
We are also able to deliver custom machine vision procedures that you will be able to include in your own C, C++ or .NET/C# softwares.

Graphical user interface and software

User interfaces and custom softwares can also be developed according your particular requirements.



Measurement of the length of an o-ring in order to dermine its dimensional characteristics.



Measurements performed on complex shapes.

Screenshot reproduced with client's permission.

At idonus, our engineering team will also develop products according to your needs. In-house machining and assembling facilities shorten the time from concept to finished product.