

BI-TELECENTRIC APPLICATIONS



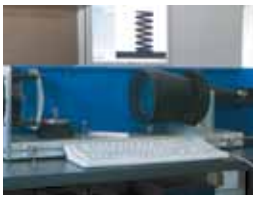
Mechanical parts measurement

The most common application of telecentric lenses is the measurement of precision mechanical parts. Many of them are components produced for the automotive industry, such as shafts, valves, pistons and other parts of the engine.

Parts like tubes or extruded aluminium profiles are typically controlled off-line by dedicated machines.

Telecentric lenses are frequently used to control the dimensions of smaller mechanical parts like:

- springs
- screws
- nuts
- washers



Milling or turning machines tools need to be measured by specific gauging devices, called "tool presettlers", which make wide use of small telecentric lenses and collimated sources.



Plastic parts measurement

Another typical application of telecentric lenses is to measure rubber sealings, o-rings and plastic caps which definitely need non-contact optical measurement techniques as they are difficult to handle without changing their shape thus altering the inspected dimensions.



Glass and pharmaceutical parts measurement

Many pharmaceutical glass containers like carpules, vials, capsules, phials are typically measured using telecentric optics so as to ensure a perfect sealing and to prevent the glass from being damaged. Some relevant applications can also be found in the beverage industry, for instance to measure the thread of a glass bottle neck. Syringes as well as many other passive medical components also benefit from telecentric inspection techniques.



Electronics components measurement

Electronics connectors, which are often made of metal parts surrounded by moulded plastics, need to be controlled to assure that they are manufactured according to certain tolerances and that the male and female connectors will fit together.

Many other components (like resistors, transistors and integrated circuits) need small telecentric optics to be inspected to check their integrity, their dimensions and the position and bending of the connection pins. Electronic boards are very often controlled as to the distances between components.

Recently, also solar cells have begun to be controlled in transmission by Near Infrared Telecentric lenses to ensure their integrity. Silicon wafers and LCDs surfaces are often imaged by means of telecentric optics.



Special applications

Some other kinds of applications can be mentioned, like:

- particle measurement
- high precision colour measurement of printing
- photolithography mask measurement
- filter control
- blood analysis and cell counting

