



**Automation
& Robotics**

COSme

QUALITY MAKES PERFECTION

**Ultra-High-Precision Automated
Cosmetic Inspection powered by
artificial intelligence (AI).**

A reliable automatic cosmetic lens inspection technology that allows you to define your desired quality criteria and implement in an objective, scalable and stable manner.

COSMETIC INSPECTION OF BLANK SURFACES

A&R and IOT share a belief that exceptional lenses result, in part, from a process that ensures complete quality control of optical and cosmetic properties. Working together, the two companies developed Cosme, the future of lens inspection, featuring AI technology that rivals--and can exceed--the best human inspection process.

Cosme is a breakthrough in lens manufacturing and process control. It helps lens blank manufacturers automate the lens inspection process, increasing quality and reliability.

Reducing cosmetic defects is one of the most complicated challenges faced by lens manufacturers. Defects are traditionally detected manually which requires intense labor and often lacks consistency.

Cosme a new, reliable and robust automatic inspection system, brings speed, efficiency and objectivity to cosmetic defect inspection.

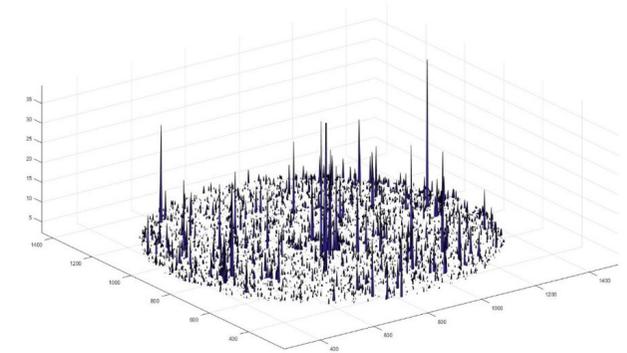
The technology combines a physical probe that mimics human vision to detect cosmetic errors, with state-of-the-art machine-learning techniques that classify defects according to their "apparent" size and location to determine whether or not the lens is acceptable. The technology can even differentiate dust from actual defects.

The system can be trained to match acceptance level of a given human inspector or a group of inspectors. Likewise, rejection levels can be adjusted to meet the quality standards of the blank manufacturer.

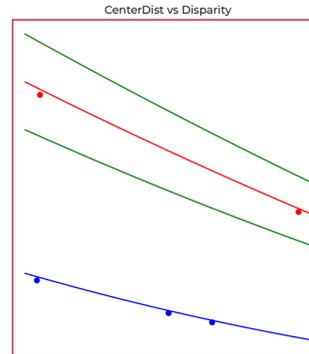
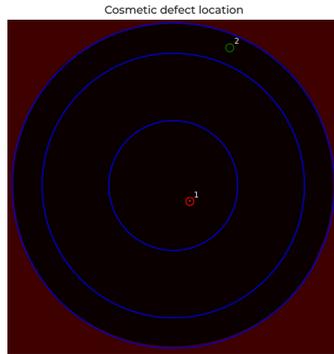
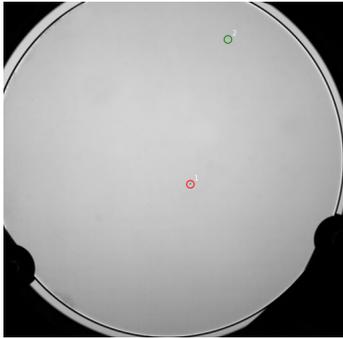
Cosme is a patented innovative solution that allows manufacturers to accurately identify cosmetic anomalies and their locations with ultra-high-precision inspection.

Cosme generates a map of potential individual defects that appear as dark spots in an enhanced image of the lens (the modulation).

Using the apparent size, position, type and number of defects, Cosme can determine if the lens meets your quality standards or not.

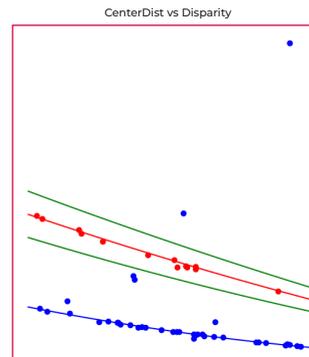
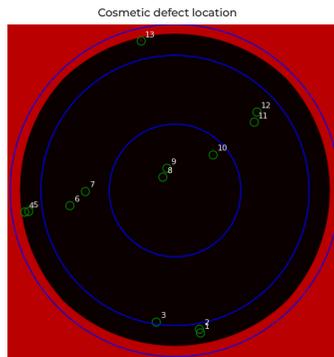
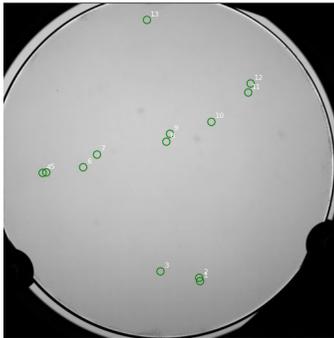


NO-GO LENSES



ID	Defect size (ISO)	Defect zone	Center dist (mm)
1	0.117	1	7.71
2	0.051	3	33.32

GO LENSES



ID	Defect size (ISO)	Defect zone	Center dist (mm)
1	0.033	2	29.92
2	0.033	2	29.05
3	0.033	2	26.01
4	0.033	2	30.79
5	0.033	2	29.86
6	0.033	2	20.50
7	0.033	2	17.33

ID	Defect size (ISO)	Defect zone	Center dist (mm)
8	0.033	2	6.77
9	0.033	2	8.87
10	0.033	2	16.85
11	0.033	2	28.76
12	0.033	2	30.75
13	0.033	2	37.69

MAIN FEATURES

Frontal and posterior defects discrimination

Clear blanks in all indexes and base curves

Compatible yields compared to human inspection:
98%-99%

Fast inspection and classification

Feature defect size: 75 μ m

Automatic dust detection

Defect zone and intensity detection

Flexibility in classification criteria

Possibility to incorporate diverse criteria for different products

Trainable system

ADVANTAGES



Fully-automated cosmetic surface inspection

Comprehensive inspections capture and map cosmetic defects of different types, sizes and levels of brightness.



Minimize time, cost and risk

Work efficiently with an automated process that replicates the results of a well-trained and reliable human inspector.



Adjust and maintain quality standards

Trainable system incorporates cosmetic go-no-go criteria automatically and reliably using manufacturer-defined parameters and standards.



Dashboard Tool

Comprehensive dashboard visually identifies cosmetic errors. Reliable and consistent inspection improves quality and increases yields over time.



Continuous supervised learning support

Quality experts analyze test lenses to continuously teach the system the manufacturer's specific quality control criteria.

OBJECTIVE AND AUTOMATED COSMETIC INSPECTION OF BLANK SURFACES

