

# Quality

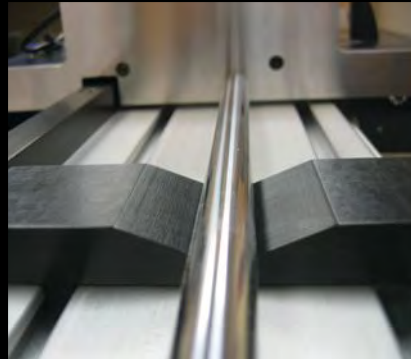
## MAGAZINE

IMPROVING YOUR MANUFACTURING PROCESS

### VISION & SENSORS

### NDT

nondestructive testing  
including materials test



# HOW TO GUIDE

## 2015

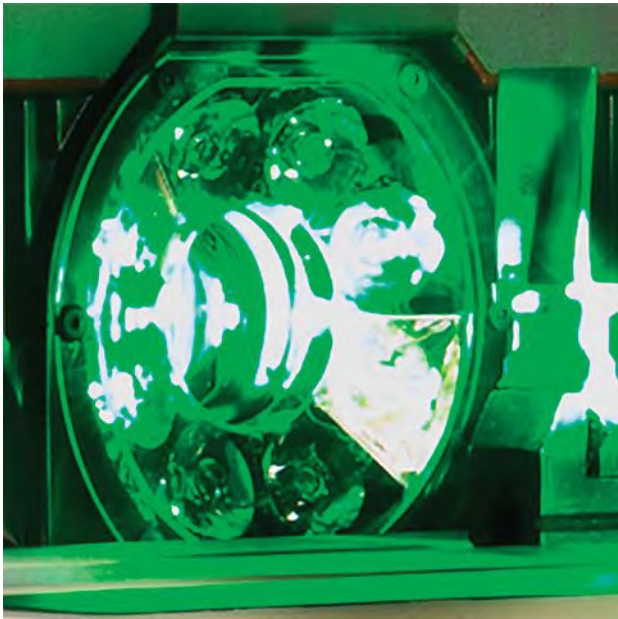


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# How to Improve Productivity with Advances in Optical Comparator Technology

The fundamentals of optical comparators have changed very little since they originated over 90 years ago - and for good reason - their large viewing screen and robust platforms provide a reliable and cost-effective solution to a variety of measurement applications in manufacturing quality control.

What has changed are the technologies of comparator optical systems, illumination, and controls. These new technologies make measurement faster, easier and more accurate, adding more value to shop-floor manufacturing operations.



## LED ILLUMINATION

Proper illumination is the most vital technology for part inspection using an optical comparator. Conventional optical comparators were equipped with halogen or mercury arc light sources, both of which suffer from temperature cycling due to their extremely high operating temperature. Thermal cycling causes these light sources to fatigue quickly, requiring them to be replaced often.

The latest comparator technology uses LED light sources instead of tungsten halogen or mercury arc sources. LEDs are ideal comparator light sources. They are cool operating, have very long life, are very bright, and have control electronics that allow easy adjustment of intensity and instant on/off. LEDs are very versatile since they are compact and can fit into smaller lamp houses and be arranged in arrays to provide directional illumination. They also have very low energy consumption in comparison to tungsten halogen and mercury arc light sources.

## VIRTUAL CHARTS GAGES

Standard comparator measurement techniques involve the use of Mylar overlay charts, which serve as a guide for direct comparison of an ideal part to the projected profile of the part being measured. Traditional Mylar overlay charts are easily damaged by everyday handling, require significant storage space and if misfiled can lead to downtime in the inspection process. Mylar overlays are also expensive to make and certify, and frequently need to be replaced due to changes in product design.

The latest chart gage technology is all electronic, eliminating the need for traditional overlay charts. An internal projector and CAD software displays an accurate virtual chart directly on the comparator screen. These digital charts rescale automatically when the magnification lens is changed - an operation that would require a physical change of charts using existing technology. Virtual charts can be instantly updated from their native CAD files when designs change - without the need to make a new overlay.

Virtual chart gages are especially effective in quality control operations with a low volume, high mix of parts, allowing the operator to import a limitless number of CAD files for automated part comparison, and safely store these files on a secure network for easy access.

Virtual charts can be turned off any time they are not needed, or a standard line or thread chart can be projected. Traditional overlay charts can still be used





too – so there's no need to worry about measuring parts without CAD files.

#### CCP TECHNOLOGIES

Only CCP offers QVI® TruLight® all-LED illumination, providing operators with variable intensity control, no warm-up time, and low maintenance– even for large 20" comparators. CCP comparators offer QVI's exclusive TruLight ring light for oblique surface illumination. The ring light allows for the most effective measurement of surface details offered on a comparator.

CCP also offers eCAD® virtual chart gages, which eliminate the need to create, verify, and calibrate traditional overlay charts by projecting a high resolution virtual chart directly on the comparator screen using CAD software. eCAD's coupling feature automatically moves the CAD overlay along with the comparator stage and screen image, allowing an entire part to inspected without repositioning or restaging the part. eCAD is now available on 30" comparators.

Consider how implementing the latest advances in optical comparator technology can improve productivity in your manufacturing quality control process.



**Certified Comparator Products**  
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# eCAD

Now available on 30" comparator

## Eliminate Overlay Charts with eCAD

eCAD combines CAD software and technology to project a high resolution virtual chart gage directly on the comparator screen.

#### eCAD virtual charts:

- Improve accuracy
- Eliminate costly re-calibration requirements
- Reduce inspection time
- Available on 14", 16", 20", and 30" comparators



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