



# Quality check of folding cartons and label applications. **Diana Eye 42/55.**



# Top level quality inspection. **Diana Eye 42/55.**

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The world of packaging is dynamic and therefore constantly changing. Packaging printers that supply the pharmaceutical industry are faced with new regulations regarding codes, track-and-trace systems and protection against counterfeiting, while their customers are expecting increasingly higher quality and 100 percent control. In the field of luxury products, new embellishment technologies open up almost endless possibilities for packaging design, and, at the same time, this is a rapidly growing market. While applications such as foils or drip-off coating were, in the past, more or less exclusive to cosmetic folding cartons, they can today also be found on packaging for cell phones, coffee capsules, CD sleeves, and even in commercial printing.

But how can print shops respond to all these challenges and still deliver flawless quality? Single blank inspection is a new and clever way which offers folding carton producers many advantages such as:

- Significant reduction of defects
- Prevention of complaint costs and re-sorting
- Sound quality documentation
- Meeting demanding customer requirements

The Diana Eye 42/55 is the fully-fledged solution for full control of every single folding carton's printed image. Inspection of the single blank takes place at a speed of up to 120,000 cartons per hour, before the product enters the folder gluer.

The intelligent software allows the inspection of different areas in the layout with different levels of tolerance, and the combination of state-of-the-art camera technology and unique lighting system enable not only the inspection of the printed image, but also of:

- Hot/cold foil applications
- Embossings
- Holograms
- Drip-off coating patterns
- Metalized surfaces
- 1D or 2D codes
- Serialization

An inline blank ejection removes all the blanks identified as defective – without damaging them. The ejected blanks therefore not necessarily end up in the waste. They can be either re-sorted by hand, or fed back into the Diana Eye at reduced tolerance, so that these blanks could, for example, be offered as “second choice”. At a working width of 42 or 55 cm, the Diana Eye can process a wide range of products, from small straightline folding cartons to large-format ups like presentation folders, or mailings.

The Diana Eye 42/55 is manufactured by Masterwork, exclusively distributed by Heidelberg and backed up by the professional and renowned, worldwide Heidelberg sales and service network.

➔ [heidelberg.com/offline-inspection](https://heidelberg.com/offline-inspection)

# Outstanding characteristics.

## The facts at a glance.

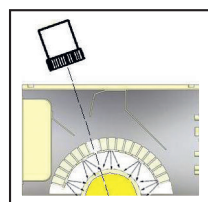
### Highlights:

#### Patented light dome with adjustable light angle

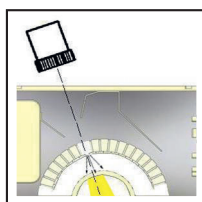
- Four different light angles
- Detects metalized substrates, hot foil and hologram applications without reflections
- Aluminum housing keeps the light source cool without blowers or water cooling
- Adjustable light intensity (repeatable)

#### Low angle camera system

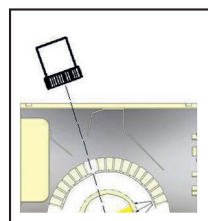
- For use with defects that cannot be detected from a straight angle
- Makes different embellishments, surface damage, coating patterns etc. visible
- Adjustable light intensity (repeatable)



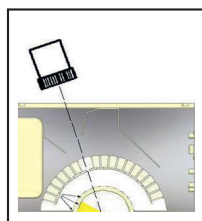
Homogeneous light



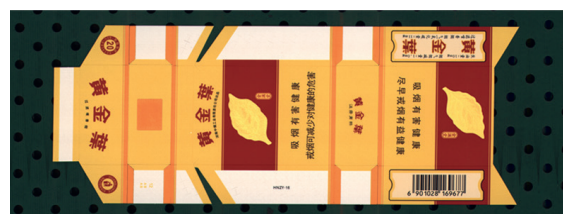
Coaxial light



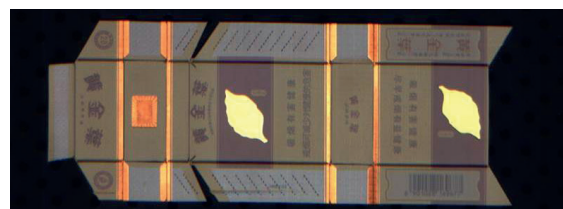
Side light I



Side light II



Front view



Low angle view



长荣股份  
MASTERWORK



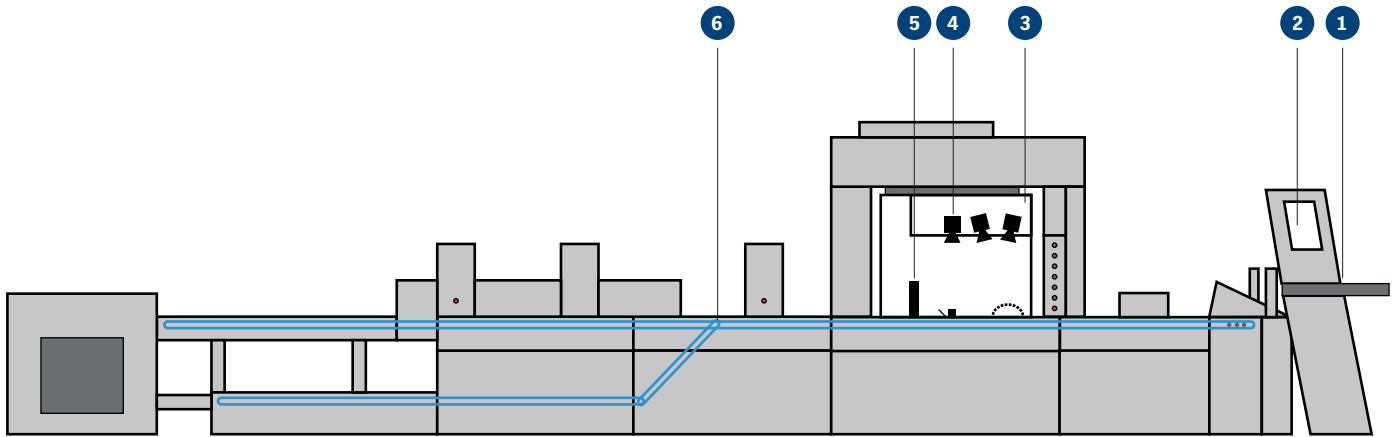
For value retention and maximum performance:

#### **Service agreements**

- Service agreements offer security and peace of mind, while at the same time providing you with the benefits of full cost control and simple administration
- Servicing by highly trained technicians
- Exclusive use of original service parts
- Protection of your machine investment
- Retention of a high resale value

→ [heidelberg.com/service-agreements](https://heidelberg.com/service-agreements)



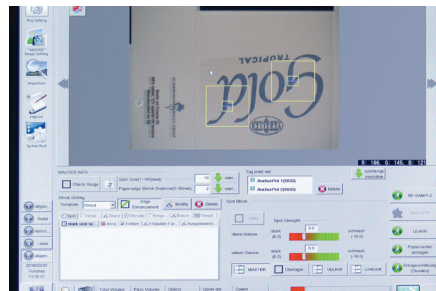


The machine shown is a sample configuration.  
Some of the equipment features mentioned are optional.



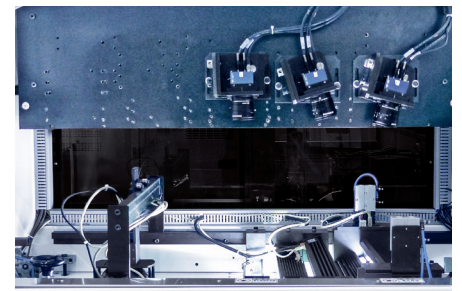
### 1 Image processing

- GPU+CPU computing for fast data processing of large image data
- Master/replica solution
- Easy to retrofit



### 2 Operator interface

- Operator terminal with 15-inch screen
- Easy to set up through a guided process
- Visualization of tolerances
- Advanced setting options for special applications



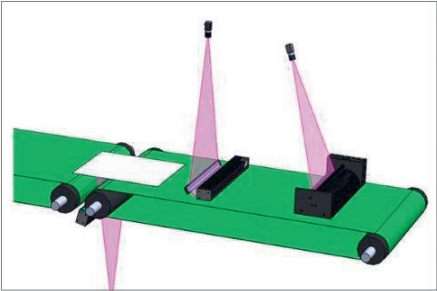
### 3 Inspection unit

- Suction belt for safe and stable blank transport
- Space for up to four cameras from above, two additional area cameras, and one rear side camera
- Easy retrofitting of cameras thanks to master/replica solution
- Darkened window for anti-glare protection

Technical data

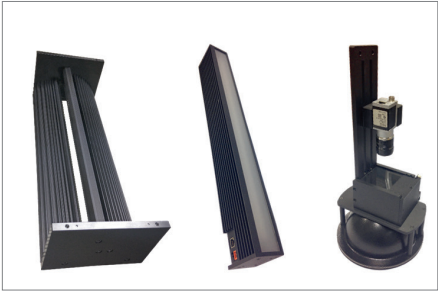
	Diana Eye 42	Diana Eye 55
Material grammage	90 to 650 g/m <sup>2</sup> (cardboard)	90 to 650 g/m <sup>2</sup> (cardboard)
Max. speed	300 m/min	300 m/min
Max. output (e. g. 90 mm (3.54 in) long, small-format carton)	80,000 to 120,000 sheets per hour	80,000 to 120,000 sheets per hour
Max. sheet format	420 × 350 mm (16.54 × 13.78 in)	550 × 500 mm (21.65 × 19.68 in)
Min. sheet format	70 × 70 mm (2.76 × 2.76 in)	70 × 70 mm (2.76 × 2.76 in)

Line scan cameras	4K RGB color camera	8K B/W mono camera	RGB area camera (frame)
Pixels	4K	8K	1.2 M
Camera recording speed Line rate	40 k/s	80 k/s	60 fps
Resolution at 420 mm/300 m/min	0.1 × 0.15 mm (0.0039 × 0.0059 in)	0.05 × 0.07 mm (0.0020 × 0.0028 in)	0.04 × 0.04 mm (0.0016 × 0.0016 in)
Resolution at 550 mm/300 m/min	0.13 × 0.13 mm (0.0051 × 0.0051 in)	0.07 × 0.07 mm (0.0028 × 0.0028 in)	0.04 × 0.04 mm (0.0016 × 0.0016 in)



4 Cameras

- 4K color cameras for inspection from above in combination with unique LED lighting technology
- Mirror system for low angle inspection
- 4K color camera for inspection of the rear side
- 8K black/white camera for inspection from above (e.g. of finest debossing)
- Area cameras with maximum resolution for inspection of critical areas (e.g. QR codes)
- Cameras can optionally be switched on/off



5 Light sources

- Patented light dome
- Four different lighting modes available
- Detects metalized substrates, hot foil and hologram applications without reflections
- Aluminum housing with cooling fins keeps the light source cool
- Adjustable light intensity (repeatable)



6 Blank ejection

- Damage-free ejection of defective blanks
- Re-sorting or inspection of defective blanks possible
- Minimization of waste without compromising quality
- Ejection optionally by air nozzles or mechanically

# Features and benefits.

## Diana Eye 42/55.

### Quality

#### Two-stage ejection:

Direct separation of good and bad blanks without destroying the bad blanks. Sorted out cartons can be re-inspected with reduced fault tolerance and sold as B-grade products.

#### Comparing against the golden image.

System calculates a mean value from 50 to 200 reference blanks. Additionally manual fine-tuning of each camera possible.

**Patented light dome** guarantees clean illumination of even highly reflective surfaces, and thus ensures high-quality verification of the printed image.

#### Wide range of applications.

Detection of punching residues and verification of the printed image as well as finishing processes such as embossing, special coatings, e.g. coating patterns, hot and cold foil applications, holograms, serializations, metalized surfaces, etc.

### Productivity

Fast processing.

Belt speed of up to

**300  
m/min.**



#### Wide range of materials.

Processing of materials from 90 to 650 g/m<sup>2</sup>.

#### Saves make-ready times.

Stores digital job data and camera settings.

More than

**100,000**

cartons per hour.

### User-friendliness



**Safe operation.**  
Confirmed by GS certification.

**Reduction of manual touchpoints.**  
Expandable with a stacker.



#### Error analysis.

Each identified error is clearly indicated.

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