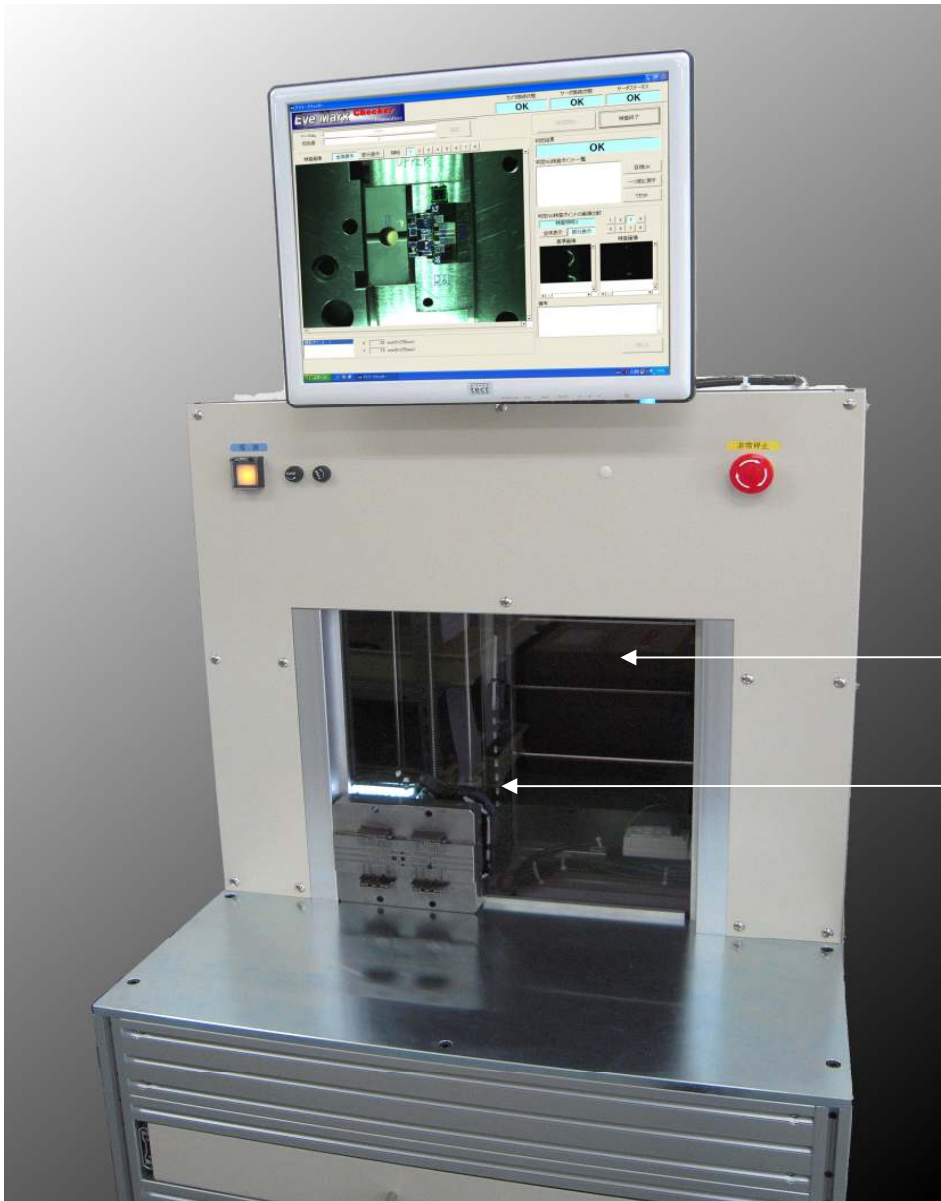




Match marks on molding tool *core pins* for visual inspection



Eye-M01

X-Y axes motor drive for camera unit to capture plural pictures.

Molding tools (4 cavity cases)

Camera Unit

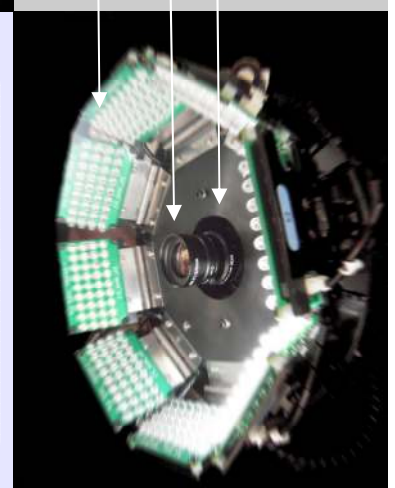
Lighting plates (8 pcs.)

Lens

Camera

What are for camera checking?

Core pins in molding tool are checked by operators carefully after ultrasonic cleaning, but it may easily miss wrong insertion or bad combination of inserted cores in the cavity. Match marks are hand scratched with pen or laser printed on the rear head of core pins for confirmation but such mistake cannot be stopped yet. **Eye-M01** captures all match marks in a cavity from eight (8) different lightings. The camera unit moves to the next cavity and takes next image in the same way until it completes all cavities. Even a complicated tool can be inspected in a few minutes. This machine eye does not miss such mistakes.



TRUE SOLTEC

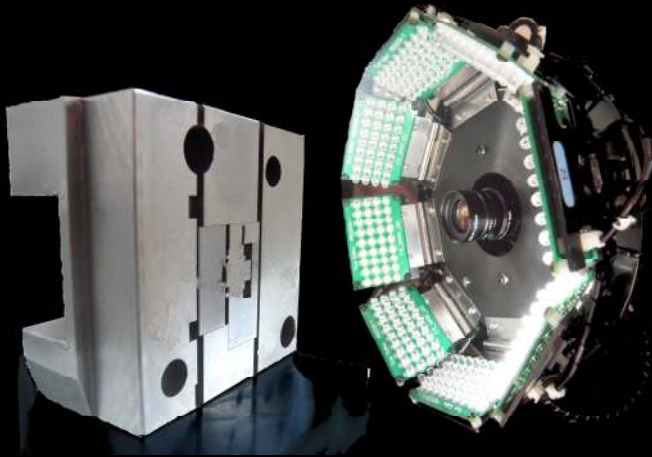
- ◇ **Eye-M01** never allows mistake of core pins assembly.
- ◇ Inspection time reduction and trustful quality increase improve productivity a lot.

Inspection way

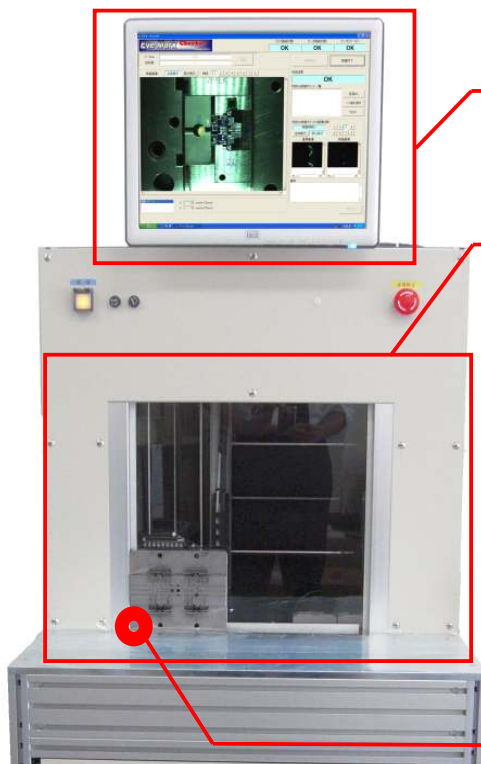
One camera captures 8 pictures from different lighting angles because thin characters are disturbed by shining tool surface. PC is programmed to select the most suitable picture among 8 images for respective match marks for comparison with master pictures taken by teach-in. Camera unit shifts position cavity to cavity while image capturing and data computing until it complete inspection of all match marks.

Eye-M01 outputs inspection result GOOD or BAD, and indicates bad piece with red frame on the picture for repair it.

Total 800 tools' master pictures can be saved and total 3200 tools' inspected tools' pictures plus data are stored in one PC. For factories running 24 hours, a new hard disc will be added to continue next inspection.



Construction



Operation

Easy and user friendly system. Touching panel access all operations.

Inspection

Camera moves on a servo motor in X-Y directions as programmed. Area: 300x300mm tool is allowed.



Camera home position



Tool is set at HOME.

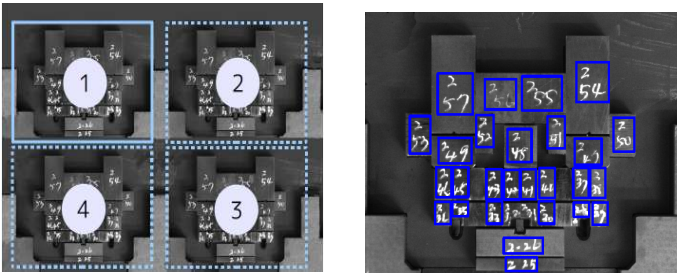
Tool Home Position

Place and align the tool here.

Flow of inspection



- Example of image capturing • Example of inspection points



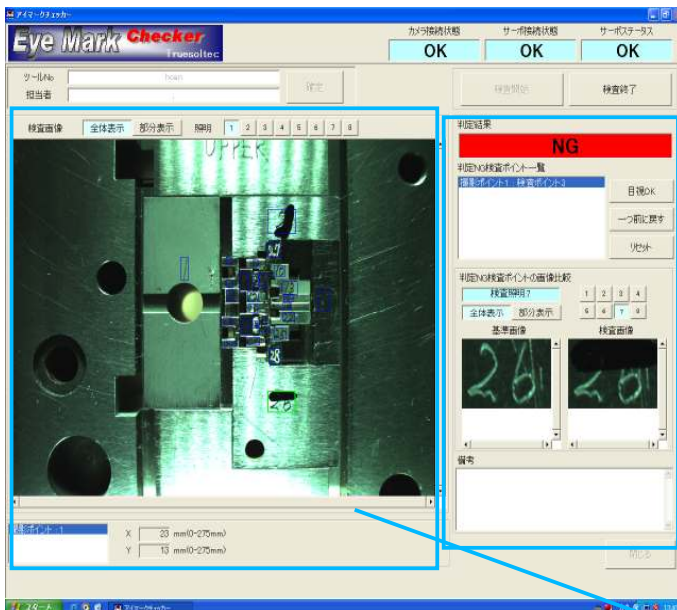
You can program image capturing positions, inspection points can be registered by picture and lighting sequence for every tool. At operation mode, the system starts from HOME position, capturing every picture and completes inspection of all programmed points in a few minutes.



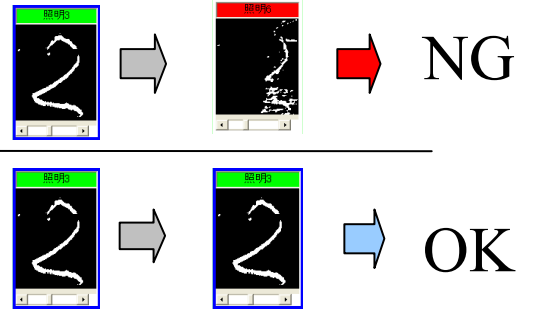
After all cores are inspected as okay, the current images are filed as the reference for the next. Because the tool is a 'living' thing whose surface always changes, we prepare many know how to compensate molding tool's characters.

Software

OPERATION screen



Master image binary Data image binary

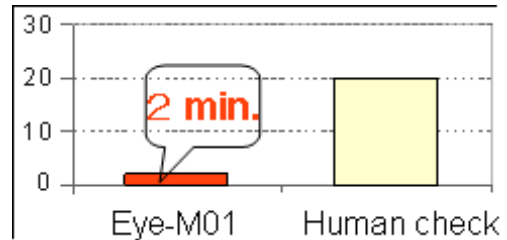


Calling a file of registered master images, you start inspection of the current tool. The program compares every core pin image piece by piece, and picks up wrong one if change should be too much.

Inspection time

For example, 4 cavity 300 parts can be performed within 3 minutes. Even a large on of 300x300mm can be done in 15 minutes. No error and 1 /10 of human check time!

Comparison: camera vs. man



User friendly and easy operation

Enter mold number and person's code, and inspection will start immediately. Inspected pictures are shown one by one.

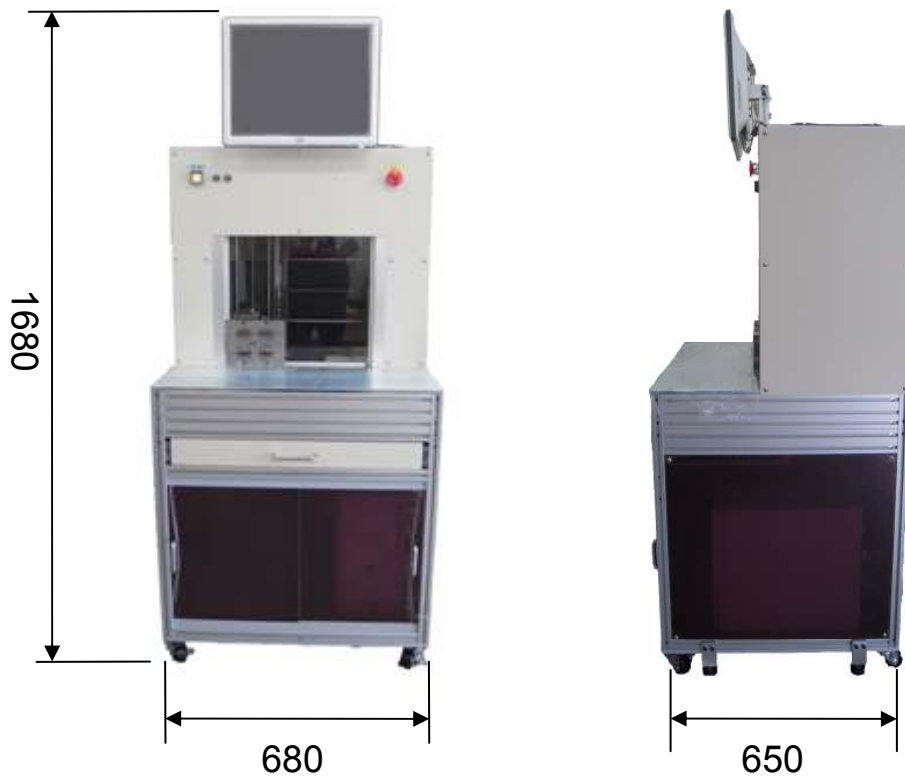
Judged result

When NG (non good) result is shown, its location and image are presented with compared master image, too.

Image

Whole image display: you can switch it to other cavity images or other images with different LED plates.

Outer dimensions (note: frame structure may change according to tools)



Descriptions	The molding die use core's matching marks inspection unit, EYE-M01
Tool size	Matching mark area 300 x 300mm max.
Match marks	Hand writing characters, laser printed, or just marks
Resolution	Camera resolution: 20 micron meter. Smallest core mark size: 1mm figure or marks
Vision system	Color vision system of 5.5 M pixels CCD camera, 8 LED plates for different lighting angles
Inspection	Core pins wrong insertion or missing
Max works registration	3000 tools (depends on Hard disc capacity of PC)
Max tools registration	Depends on Hard disc capacity (example: 1200 tools registered with 500G bytes)
Tool set	Manual sliding. Tool should stand to show match marking surface toward camera
Control software	"Eyemark Check" (OS: WindowsXP)
Environment	-5 to +60 degree C. 10 to 95%RH (no dew)
Options	Logs saving function, inspection data report function
Power	AC100 to 110V / AC220V to 240V
Dimensions	W680 x H1680 x D650mm



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