



SENTINEL

A PPT VISION Mold Protection Solution

Sen•ti•nel [sen-tn-l] –noun; a person or thing that watches or stands as if watching.



PPT VISION's SENTINEL Smart Vision System Protects Mold Machinery





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IMPACT A-Series Camera



IMPACT T-Series Camera

SENTINEL Protects and Simplifies Molding Operations

- SENTINEL protects high-value molds while improving productivity and part quality
- SENTINEL "smart camera" solution is a fraction of the price of PC-host solutions
- Saves \$10,000 molds and OEM equipment from "Penny part" damage
- Protects ejector pins and molds
- Improves quality by identifying short shots, poorly positioned 'inserts'
- "Headless" operation eliminates need for PC and associated costs, floor space
- 3-tab simplified software setup gets SENTINEL up and running in minutes
- Connect with PPT VISION engineers via the Internet from the shop floor
- Flexible training and support solutions answer all your questions

Like a carefully choreographed Super Bowl half time show, Dickten Masch Plastics (Milwaukee, WI) shuttles metal and plastic components from metal forming machines to multi-stage plastic and rubber injection molding machines, producing millions of precision electrical connectors and similar parts each year. One thing Dickten Masch certainly does not need is a short shot, jammed ejector pin, damaged mold, or misplaced insert bringing the multi-million dollar operation to a halt.

"We realized we needed a fully-automated machine vision system to look at the parts in the plastic injection molding process, catch short shots and protect our molds from parts that failed to eject, or jammed ejector pins," explains John Berges, Manufacturing Engineer at Dickten Masch. "We were looking for ease of use, reasonable price, and good service. After interviewing 3 candidate suppliers, we choose PPT VISION's SENTINEL, and we're very happy with what we've seen so far."

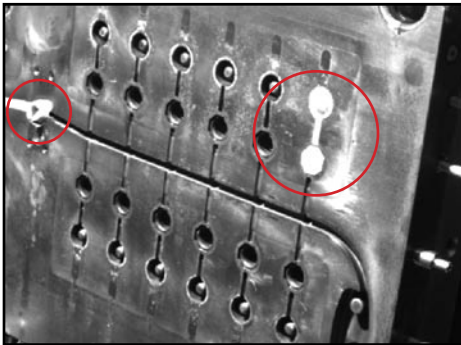
SENTINEL's Smart Camera Solution Saves Space, \$\$

This was Berges' second experience with machine vision. Dickten Masch had previously installed a PPT VISION IMPACT smart camera system to inspect "out of mold" parts for flashing, short shots, and other defects. This new vision system would check rubber-insulated electrical connectors used in automobiles for short shots before the parts are ejected from the mold. The vision system would also protect the mold by looking for parts that weren't ejected, or ejector pins that failed to retract after ejecting.

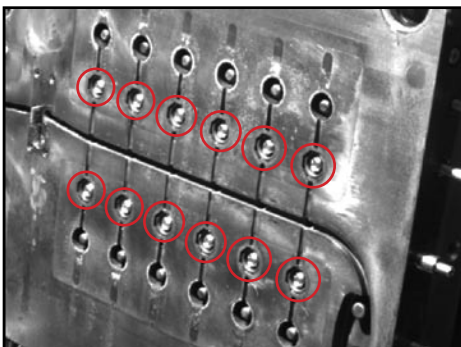
"Real estate is really tight on our floor," says Dickten Masch's Berges. "PPT VISION's SENTINEL system is so small, you don't even know it's there. It's mountable in multiple locations, and we only bring out the laptop to display the system's operation during tours with customers or to check something with the mold system. Seeing each connector inspected in real time really gives the customer a good feeling that they can count on us to deliver the parts they need."

PPT VISION's SENTINEL delivers new levels of functionality, simplicity, and support at a fraction of the price and size of existing PC-based vision systems for inspecting and protecting plastic injection mold tooling equipment.

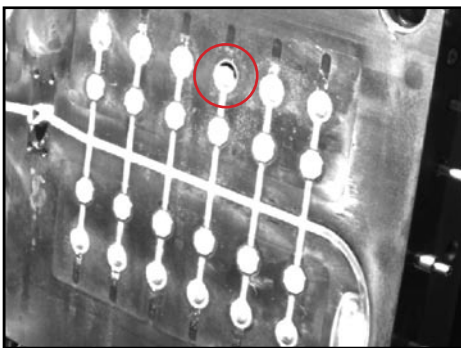
Inspection Capabilities



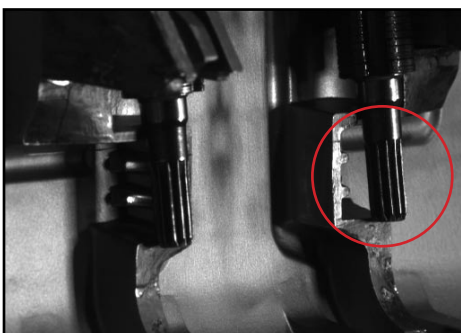
Parts not ejected



Ejection pins not retracted



Short shots



Insert not in correct position

Seeing a need for a cost-effective molded part inspection and mold protection system, PPT VISION engineers developed their powerful IMPACT line of general purpose smart camera machine vision systems into a software wrapper that offers molded part manufacturers the features they need, in a small footprint, and at a cost they can afford – particularly in today's troubled economic times.

Gary Kocken, Director of Sales for PPT VISION Inc. suggested that Dickten Masch use a two "smart" camera SENTINEL solution to inspect the two rows of rubber-injection molded electrical connectors – one camera for the top row of four connectors, and a second camera for the lower four connectors. The SENTINEL system offers up to four cameras without requiring any additional processing or I/O hardware, although multiple SENTINEL solutions can be networked together to provide an almost unlimited number of machine vision inspection stations. SENTINEL's "smart" camera approach to mold inspection means the computer processing elements are inside the system itself, eliminating the need for a separate computer to run the SENTINEL mold inspection software. This cuts down on the acquisition cost of an industrial PC, expensive framegrabbers to convert analog video to digital information for the machine vision software, maintenance costs to find and replace PC parts, and production floor space for the inspection system.

3-Tabs Simplify SENTINEL Software Setup

During a short training session, which can be held either on-site or at PPT VISION's



training facilities, Berges learned the SENTINEL system in a matter of hours using SENTINEL's 3-tab simplified software setup. The first tab contains information on the number of camera's SENTINEL will use, camera settings for each inspection step (SENTINEL can handle up to 5 inspection steps per production process, or recipe) and a diagnostic area to make sure the system and cameras are communicating. Like many molding companies, Berges uses a custom variety of the molding industries SPI data interface for his I/O needs. Tab #1 allows customers to configure the 8 in/8 out I/O to adapt to the molding equipment interface.

The second tab allowed Berges to set up the inspection routine, or recipe, for the high-tension electrical connectors. By viewing a picture of the mold, and using a laptop mouse that's temporarily connected to SENTINEL during setup, Berges acquired images of good product in the mold, then drew regions of interest around critical areas

