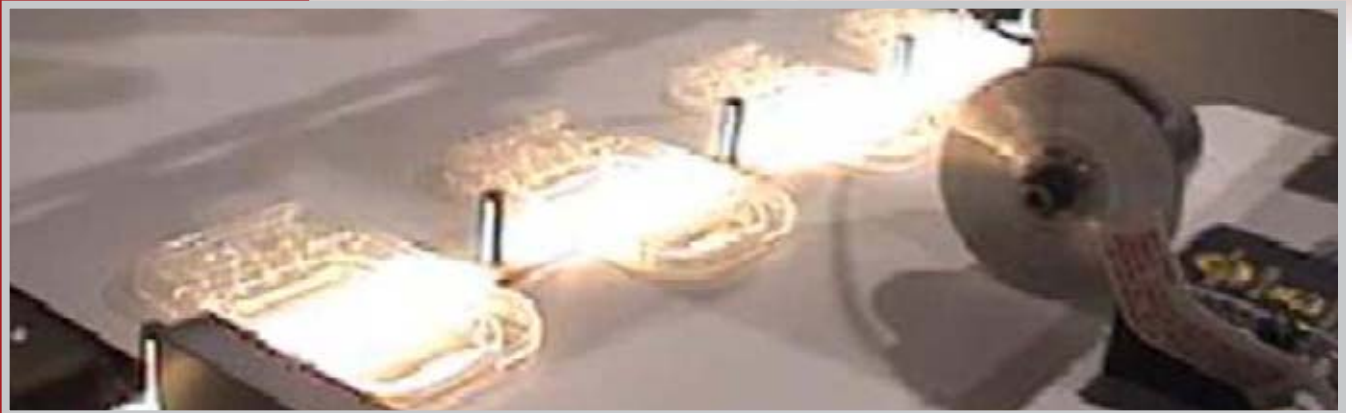


# Application Report

Molded Parts Inspection



### **The Application**

The Kidney Dialysis Cassette Inspection System has been designed to inspect a number of surface defects on injection molded cassettes, including particulate matter, verify presence/absence of different structural components, and check for critical dimensional requirements. This system provides a complete integrated solution, including a proprietary Vision System, Control System and Material Handling automation.

As in all of Automated Vision's systems, customer needs and specified inspection criteria had to be met and were built in to the tailored vision system. In this particular application, the system was required to be a part of the molding line inspecting parts placed on a continuously moving conveyor by the unload Robot.

The Cassette Inspection System had to be capable of inspecting:

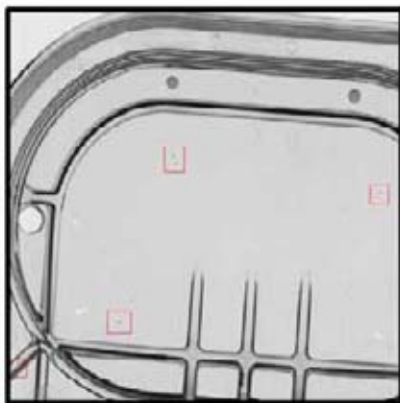
- presence and location of particulate matter
- presence and location of bubbles
- presence and location of flash
- absence and location of structural components
- absence of port holes
- cracked ports
- critical dimensional requirements



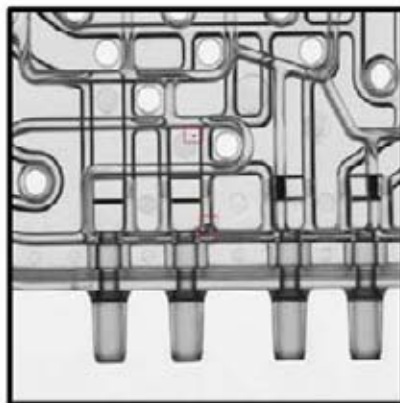
### **Solution**

Due to the complexity of the inspections involved and the high throughput required, Automated Vision designed a conveyor to have four tracks with the IDAS Vision System inspecting four cassettes simultaneously. The cassettes were rolled over a backlight where four dedicated CCD line-scan cameras provide the IDAS Vision System

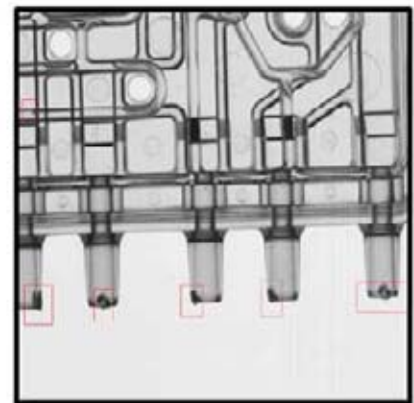
**Particulate Matter**



**Bubbles**



**Damaged Ports**



Automated Vision's IDAS systems allow the system user to readily recognize the type and location of defects and irregularities. Colored rectangles are drawn to highlight the defects on the part that were detected by the vision system.



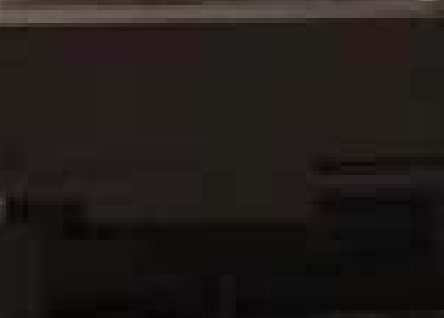
As with Automated Vision's other vision systems, the supervisor was given the ability to program the screening requirements from within a password protected menu of the program. Here, the supervisor could set the maximum deviations allowed through a very simple and intuitive dialog based interface.

### **Image Acquisition**

We applied our vast experience in high speed image acquisition and configured the detection resolution necessary for the application.

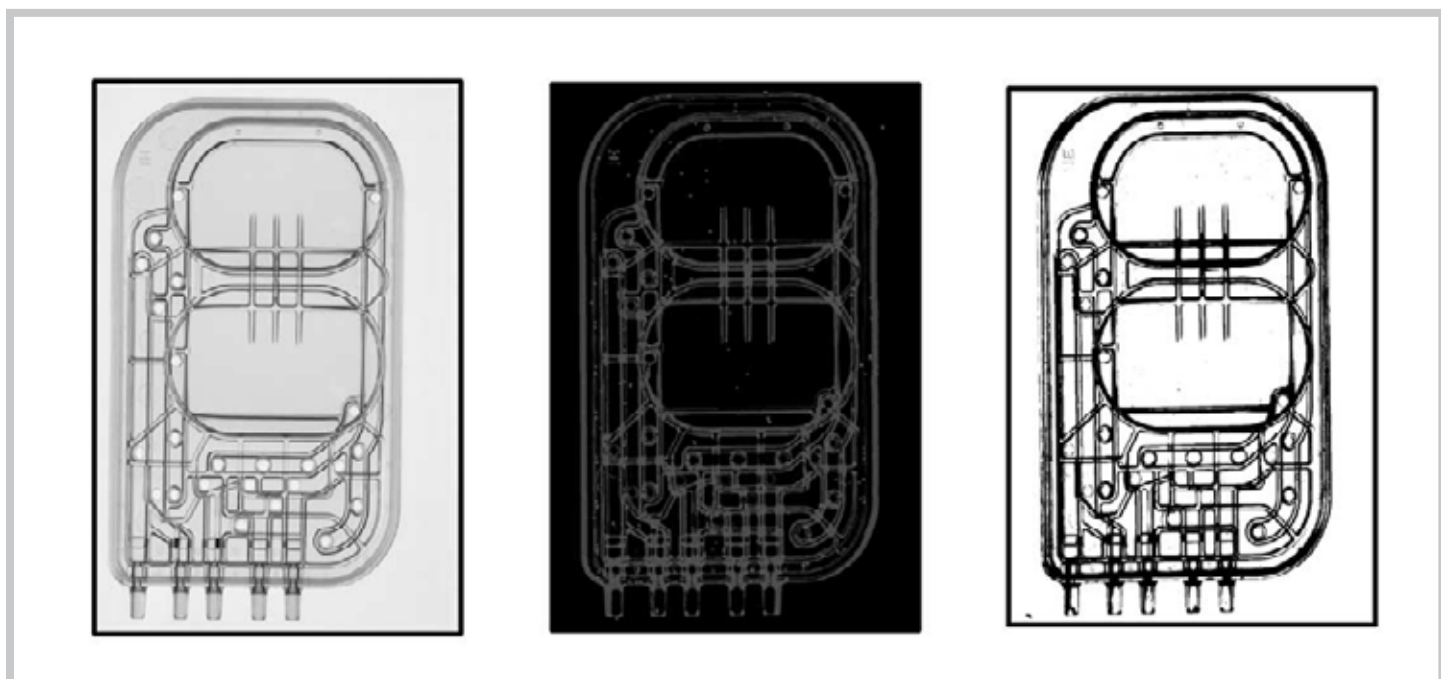
### **Typical System**

Automated Vision developed the optimum system configuration for the cassette inspection application. The system was interfaced with the on-line PLC control system and equipped with a special transport conveyor.



Backlit conveyor and Hi-res linescan cameras

with high quality images used to determine the presence and location of inspected defects. The software shows the user an easy-to-read image display from each camera with pointers to any flaws on a cassette.



Automated Vision's expertise of inline camera and lighting conditions allow for varying methods of finding defects

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## **Vision System**

- Vision Processor
- High resolution linescan CCD cameras
- Cassette inspection software
- Windows NT/2000 Operating System
- User interface
- Measurement Algorithms

## **Other Applications**

Automated Vision has successfully designed and installed a number of stand-alone systems to inspect injection molded parts. These systems were designed to perform a variety of inspection tasks on parts ranging from Greyhound seals for the automotive

industry, to Infusion Sleeves for a pharmaceutical company.

We created a vision system to inspect injection molded infusion sleeves for the pharmaceutical industry that are used during cataract surgeries. The features that were inspected were measuring the length of the sleeve, the dimensions and true position of two holes on the tubular section of the sleeve, and checking for nicks and burrs. The part to be inspected was fixtured on a spindle and rotated in front of a line scan camera. A high resolution image of the entire surface of the sleeve was captured and analyzed. The defective parts were sorted out by comparing their attributes to the allowable dimensional requirements that were set by the supervisor.

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Automated Vision is a leader in providing total system design and implementation. We specialize in the development of all aspects of speed critical systems providing you with turnkey solutions to your machine vision applications.

- image analysis
- material handling
- part presentation
- data handling
- Statistical Process Control
- installation and training
- automatic e-mail alerts
- remote support

By providing you with a completely integrated solution, Automated Vision ensures that all aspects of your machine vision application perform seamlessly in your environment without the requirement of additional resources.

A comprehensive library of image processing algorithms shortens the time from application definition to vision solution, putting your system on-line in the shortest possible time.

The Imaging Development and Application System (IDAS) is designed on the familiar and dependable Windows operating environment.

Automated Vision is your most effective approach for the necessary knowledge and experience to total integrated application solutions for quality manufacturing in:

- Automotive
- Electronics
- Industrial
- Paper
- Pharmaceutical
- Medical

