# Eyebot Application

## Inspecting Gel caps for the Presence of White Print

**Customer Problem**

A pharmaceutical manufacturer of prescription decongestants needed to find a system to inspect their amber round gel caps for the presence of small white print. It was imperative to verify that this white print was present because it identifies the type of prescription.



The manufacturer had to take action when a customer returned an entire shipment because a small percentage of the pills were missing the white print.

Initially, the manufacturer hired two individuals to manually check each pill for the presence and proper positioning of the print on the gel caps. The gel caps were placed in a petri dish for inspection. If the gel caps contained the white print, and it was located in the proper position, they would manually remove them with tweezers. This process was unreliable and extremely time consuming.

The incorporation of a machine vision system would allow them to replace these individuals, provide a more reliable inspection process, and eliminate product rejections.

**SIGHTech Solution**

SIGHTech provided the manufacturer with an extremely accurate and affordable solution: Eyebot. They decided to utilize Eyebot's Spectrum mode, to inspect the gel caps for the presence or absence of the white print and not inspect the actual shape of the print. The total cost for the Eyebot system (including monitor, camera, and lens) was under $8,000.

The manufacturer wanted to complete the inspection process offline. The manufacturer incorporated a small vibrating table to use as their inspection table. The vibration from the table would separate the gel caps allowing Eyebot to inspect them individually.

A Continuous Diffuse Illuminator was purchased from Nerlite and placed behind the application to provide the back lighting that was essential in the success of the inspection process.

Without proper lighting, the presence or absence of the small white print was difficult to see since the reflection from the gel cap would appear white.

The Eyebot user positioned a standard color NTSC off-the-shelf camera and 8 mm lens approximately 9" from the area of inspection. Eyebot's WINDOW option allowed him to adjust the size and location of Eyebot's inspection area. The user set Eyebot's Window to a viewing area of approximately 3" x 3". By pressing the UP and DOWN buttons while in VIEW mode, the user adjusted Eyebot's video threshold to eliminate any excess video snow.

**Learned Colors**

**Ignored Colors**
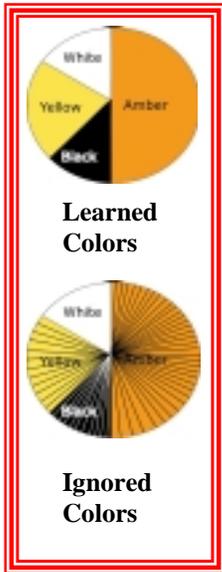
Eyebot's knob was turned to the LEARN position and the YES button was pressed.

Eyebot was taught the colors that would come into its field of view. In this case, Eyebot learned white, amber, yellow and black.

Next, the manufacturer presented Eyebot a gel cap without the white lettering, and turned Eyebot's knob to IGNORE. This made Eyebot ignore all the colors that were currently in the field of view, which were amber, yellow and black.

As a result, Eyebot now detected the presence of white print and ignored the remaining colors that it had originally learned.

Switching to the RUN position, Eyebot's optically isolated outputs (which power 3 amps at 60 volts) were activated. Eyebot's outputs were connected to an air ejection mechanism. If Eyebot detected the presence of the color white on the gel cap, then a signal was sent to the ejection mechanism. This signal would activate the air ejector and remove the gel cap from the line.

In this application, the pills removed from the inspection line were "good" and could be packaged for shipment. The gel caps that were not ejected remained on the table allowing Eyebot to complete another round of inspection on the pills.

Eyebot provided the manufacturer with an affordable and reliable inspection solution. Eyebot replaced the individuals performing the manual inspection and was capable of inspecting and sorting gel caps at a rate of 160 parts per minute with 100% accuracy.

Eyebot was installed without costly programming or sending its employees to a training school.

The manufacturer expects to have ultra-low support costs over the life of the product since Eyebot is extremely easy to re-teach.

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*SIGHTech's Eyebot is a revolutionary inspection device. It is a trainable machine vision system that enables manufacturer's to inspect their products and processes for visual defects in order to improve their quality control.*

*Eyebot relies on SIGHTech's breakthrough Neuro-RAM™ technology. Neuro-RAM is the self-learning, highly memory efficient algorithm that allows Eyebot to learn moving objects just by looking at them, without any programming whatsoever.*

*Eyebot requires no PC, no frame-grabber, and no software. Eyebot is inexpensive to install and maintain, and can easily be incorporated in quality control inspection processes throughout a wide array of industries.*

*Many pharmaceutical manufacturers are relying on machine vision systems to inspect their products for the presence of print on prescription and non-prescription pills during their production runs.*