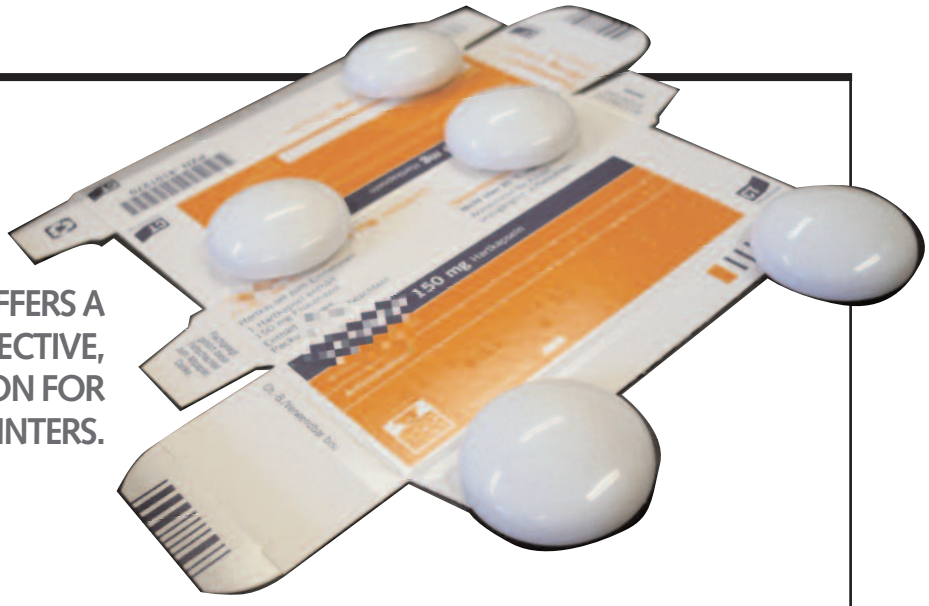

THE NEW MACHINE OFFERS A PRECISE, COST-EFFECTIVE, HIGH-SPEED SOLUTION FOR PACKAGE PRINTERS.

VISION-EXPERTS UNVEILS **BRAILLE INSPECTION SYSTEM**

By Bertalan Molnar, Vision-Experts Ltd.

Idle time has always been a major issue for anyone involved in the manufacturing industry. For one of Hungary's major printing houses, calibration of its diecutting machines used in making Braille-embossed materials used to mean twice the idle time, as not only did the machine have to be adjusted, but the samples also had to be taken away for measuring. The height of the individual Braille dots had to then be measured mechanically, which turned out to be both time-consuming and imprecise.

Recent legislation in the European Union means that pharmaceutical packaging cartons must now have Braille embossing, the readability of which is largely dependent on a sufficient height of the individual Braille dots. Therefore, before the run of the diecutting machine, the first sheet has to be checked to see whether the quality and the necessary settings are appropriate.

The Hungarian printer began looking for some professional help, but it didn't know exactly what kind of machine could solve this problem. Eventually, it came across a company, Vision-Experts Ltd. (VE), Hungary, that offered to help and presented a credible solution for a convenient price. The administration of the printing house was impressed by the idea that an optical inspection machine could actually do the job — measuring the exact height of the Braille dots — faster than the previous method used.

Right: An industrial digital camera (taking 400 photographs per second) is positioned inside the machine at 45 degrees to the vertically-projected laser beam.

Thus, a team of printing engineers ended up in a technical meeting at Vision-Experts' headquarters in Budapest to discuss the details and the particular requirements for the machine to be built. It is worth mentioning that VE's engineers have always been experts at building machines and systems that had never before been built, which helped make the printing house believe that VE would definitely be capable of constructing the very device they needed.

A Different Approach

VE uses a different method than its competitors, some of which have been present with its Braille inspection solutions on the market for years. VE chose to use precision three-dimensional scanning by using laser and a high-speed industrial digital camera (taking 400 photographs per second), which is positioned inside the machine at 45 degrees to the vertically-projected laser beam. This way, by moving the packaging to be inspected horizontally underneath the camera at a speed of 40 mm/s, having a thin laser line projected on its surface, the series of photographs taken of the laser line draw a three-dimensional "map" of the surface of the carton.

While the fundamental task of this machine, model VBR-400, is to draw a 3-D "map" and to tell the operator, by coloring the varying heights differently, whether the scanned dots fall within the accepted range or not, the VBR-400a ('a' for 'advanced') built for the printing house can also read the Braille writing printed on the surface. It is also worth mentioning that it is currently programmed to detect a text of up to four lines on a flat surface with an area of approximately the size of an A/4 page, using Braille embossing of the worldwide standard of Marburg.

Measuring a single package only takes a few seconds now, a far cry from how much time it used to take to measure the dots manually

The most astonishing value of the machine, nevertheless, is that its precision in measuring has a tolerance of +/-0.005 millimeters.

The controlling software, which is run on a regular industrial PC in Windows settings, has a user-friendly graphical interface which was developed together with engineers of the printing house based on their professional expertise. The software can store up to thousands of measuring programs (unique measuring settings for every single product to be measured). Exact product ID recognition is done by the operator reading the barcode on the selected product before placing it in the machine.

Measuring a single package only takes a few seconds now, a far cry from how much time it used to take to measure the dots manually. This means an enormous amount of idle time spared for the printing house so they can finally be satisfied.

Left: Vision-Expert's optical inspection machine can measure the exact height of the Braille dots at high-speed. Right: The controlling software is run on a regular industrial PC in Windows settings and has a user-friendly graphical interface. The software can store up to thousands of measuring programs. Below: The series of photographs taken of the laser line draw a three-dimensional "map" of the surface of the carton.