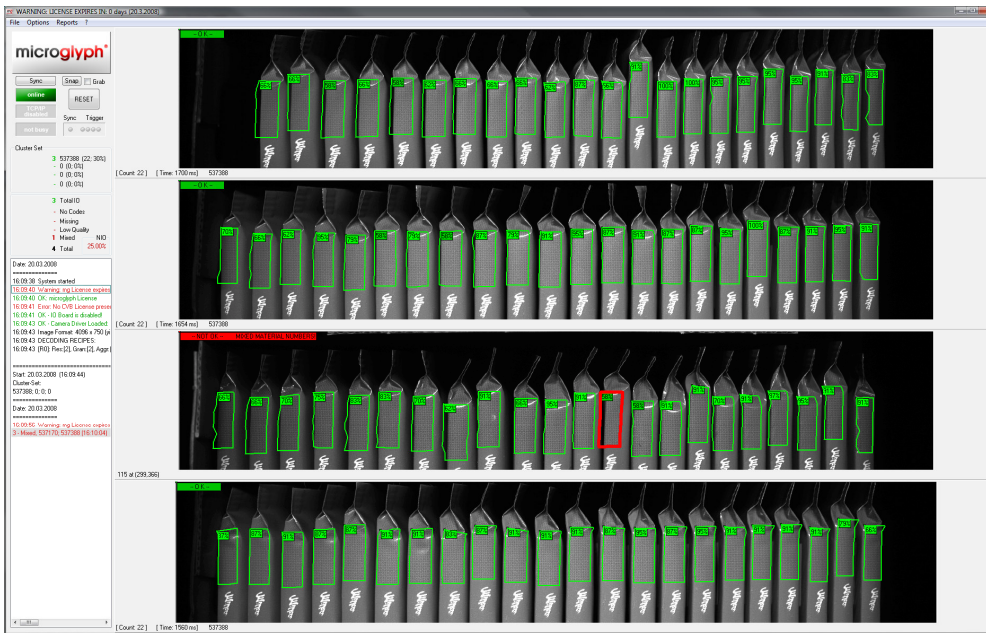


# Auto-ID for Milka chocolate: 2D code controls packaging machines



Hall 7A  
Booth B05

*Illustration 1: microglyph software with 3 rows of products that are correct and one row with a product that is not correct. Each row corresponds to a packaging carton; four cartons at a time are processed.*

**Kraft Foods Deutschland GmbH was looking for a packaging film marking process to control its packaging machines for Milka chocolate. Unchanged packaging design had high priority. microglyph Technology GmbH co-operated with the producer and printer of the packaging film to develop a process that integrates free-form microglyph codes in the product design.**

Milka chocolate is produced at the plant Kraft Foods Deutschland GmbH operates in Lörrach/Germany. In a major conversion project, the classic paper/aluminium packaging has been replaced by an OPP/OPP film pack. The new packaging process is controlled with the help of the microglyph codes. The codes control the labelling and palletisation operations, moni-

tor product correctness and completeness and enable reliable quality control checks to be made. The codes are applied to the narrow presentation surface of the products. Unobtrusiveness was therefore a particularly crucial factor in addition to an entire system that was very rugged and reliable: the codes are practically invisible to consumers.

## A summary of the process

The microglyph codes are integrated in the product layout and are printed on the packaging film by the rotogravure process. They include information about the individual product and product clusters. Following packaging of the individual products in the

film, the packs are loaded in cartons containing different quantities. The open cartons are collected on leaving the packaging machines and then move on to the microglyph image processing system randomly. They are processed there as they pass through the system at a speed of about 1 m/s. The codes carry out several assignments in this context: the contents of the

codes on all the individual products are evaluated first of all per carton. The number of products as well as the product and/or cluster consistency of the carton are determined as a result. If a carton does not contain the right clusters and/or products or if the number of products does not match the specification, the carton is eliminated from the system. The system checks the quality of each individual pack at the same time. The codes are insensitive and can be scanned even if up to 90% of the area of the code is damaged or covered, thanks to the high fault tolerance level. They are positioned on the pack in such a way that the code is exactly 100% visible in the case of optimum pack alignment. If the area of the code that is visible decreases and the code quality determined is lower than the variable tolerance level, a deviation in pack alignment that cannot be tolerated is indicated. The carton with the individual product concerned is eliminated from the system. After the checks, the product/cluster information collected about the carton is passed on to the control system. The carton lid is closed, an appropriate label is applied and the carton is transported on to the palletisation system with the product/cluster information.

### System requirements

For the new system, the code had to be applied without any changes having to be made to the design. The area of the product that is presented to the consumer must not be affected. The code therefore had to be adapted and applied to the narrow side of the product. In addition to this, the codes of all the products had to be read while the car-

ton was still open and before the lid was closed, while reliable scannability was to be guaranteed in spite of large fluctuations in the conditions, such as lighting, contrast, vibration, products in the carton at an angle etc. Since the products are checked while the machine is in operation, it also has to be possible for the codes to be identified on the packaging line while they are moving at about 1 m/s. Where just the carton is concerned, the system is required to identify whether the carton contains the correct number of individual products and whether the individual products are oriented correctly in the carton. Apart from these features, it is important that the machine determines whether the pack is aligned correctly on the product on the basis of the code quality that is determined and then transfers all the data about the contents of the code to the control system. So that faults can be eliminated more effectively, traceability of the packaging process, recording of the faults and the storage of fault images for subsequent evaluation and tracking play an important role.

### Aims of the new code

The objective in satisfying the above-mentioned requirements was to increase process efficiency. Further demands were to make it possible to check carton completeness and consistency and to guarantee packaging accuracy. The consequences of this are consistent product quality and, in the final analysis, added value for the customer too.

### Customized solution

The requirements made by Kraft Foods were met by the microglyph solution. Depend-

ing on the product and/or cluster, a carton contains different numbers of individual products. They are positioned in the carton with the microglyph-marked narrow side facing upwards. Although they are presented to the consumer in this position, the marking of this important presentation area is not noticed by the consumer. This was achieved by minimum contrast in printing the code in addition to the choice of the foreground and background colour. The codes can be scanned reliably during the process in spite of what appear to be unfavourable conditions. In extreme cases, the codes can be read with less than 1% contrast. A long, rectangular code format was chosen that includes blind areas too, in order to make it even more inconspicuous. Free forms of any kind are possible for the codes in addition to rectangular, circular or ring shapes and can be embedded in letters or logos as a result, for example. Embedding in pictures and graphics is possible too. The codes do not require any quiet zones or conspicuous synchronisation patterns. Codes with a fault tolerance level of 80% are used for the Milka application: the information can be scanned even if up to 80% of the code area is destroyed or covered up. The alignment of the film on the product can be determined with the help of the code that remains. There are large fluctuations in the scanning conditions in the process. Different numbers of products in the cartons depending on the products/clusters packaged mean, for example, that the individual products tip over or slip around. The codes can be read even at large angles, when viewed from distorted per-

spectives or in fluctuating lighting conditions.

### Hard- and software

Scanning systems with line cameras are used on the packaging lines. The codes are read as they move at a conveyor speed of about 1 m/s. Four cartons at a time are analysed by the microglyph software. Up to 800 million products are processed per year on a total of four lines. The systems are supplied in rugged stainless steel housings and are integrated in the packaging lines. Operation is via touchscreen. Comprehensive report functions enable the packaging lines to be monitored and faults to be diagnosed. Such features as rolling databases are available for the short- and long-term storage of fault pictures. Live demonstrations of the process together with the hardware supplier and system integrator took place on the Huhtamaki Deutschland GmbH Stand B05 in Hall 7A at interpack in Düsseldorf/Germany. ■



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