

1. Details of the book

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- Author/Editor
- Date of Publication
- ISBN
- DOI number

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The screenshot shows the Wiley Online Library interface for the book 'The Wiley Encyclopedia of Packaging Technology, Third Edition'. Callout 1 points to the book title and metadata. Callout 2 points to the 'Table of Contents' link. Callout 3 points to the book summary. Callout 4 points to the 'PDF' icon for Chapter 2. Callout 5 points to the 'PDF(21756K)' link for Chapter 3.

The screenshot shows the article 'DATE CODING AND MARKING' by Dale Voney. It includes a table of parts for a continuous ink jet printhead and a detailed diagram of the printhead.

| | |
|----|---------------------|
| 6 | Canon |
| 7 | Charge electrode |
| 8 | Detection electrode |
| 9 | Deflector plates |
| 10 | Recovery gunner |
| 11 | Head cover |
| 12 | Gutter plate |

Figure 1. Continuous ink jet printhead.

DATE CODING AND MARKING
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Date coding and marking serves many crucial purposes. Within a single date code or product label, one or many of the following functions can be filled: product marketing, product identification, traceability, date and/or time of product creation, expiration of product, product ingredients/chemical composition information, and product usage information. Depending on the type of product produced, where the product is produced, and where the product is sold, state and federal agencies may have specific requirements for the date code.

Most products will receive multiple date codes as they are created, packaged, and processed throughout a supply chain. In the different stages of a production cycle, various technologies are used to efficiently and accurately apply the proper marking. Depending on the objective of the date code and all of the variables involved in a particular application, one may choose from the following coding and marking technologies: continuous ink jet, drop-on-demand, laser, thermal transfer, direct thermal, and contact.

In this article, we will examine each of these technologies and discuss their proper application.

TECHNOLOGIES

Industrial printers used for marking and coding can use a variety of technologies. The most prevalent technologies are described in the following subsections.

CIJ (Continuous Ink Jet)

The principle of CIJ technology is to apply ink to the substrate by deflecting calibrated droplets from a continu-

to a series of droplets that are marginally connected. As the ink stream leaves the canon, marginally connected "teardrops" begin to form. Due to fluid dynamics, these teardrops eventually form individual, spherical droplets. The size of the drop varies and is dependent on the modulation of the resonator, canon size, and ink pressure. The droplets continue down the print head and through a charge electrode. Since CIJ inks are conductive, the ink droplets can be selectively charged simply by changing the electrical current on the charge electrode. Only those droplets needed to form the desired matrix pattern or characters will be charged. Droplets then pass through two parallel plates, called deflection plates, whereby the charged droplets are deflected by applying voltage. The remaining uncharged droplets fall directly into a small vacuum tube at the bottom of the print head. The vacuum tube returns the ink to the ink reservoir.

For industrial packaging, CIJ technology is mainly used in small-character ink jet printers (SCPs). Small-character printers are typically used to print directly onto products or primary packages. Depending on character height and dpi requirements, SCPs can also be used for secondary package printing. Here is a brief list of