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Don't eat your words: food-safe inks are an important issue

Packaging has traditionally been printed to provide information about the product, such as branding, sell-by date, ingredients and nutritional content. The packaging acts as a functional barrier between the ink and the food, although care must be taken to ensure that ink components do not migrate across the barrier and contaminate the food through indirect contact. In a particularly high-profile example during 2005, an ingredient used in UV-cure ink was found in milk formula for babies. There are now a number of international databases that include positive and negative lists for substances used in inks and varnishes for food packaging, and packaging manufacturers are obliged to keep all known risks to a minimum in accordance with the principles of Good Manufacturing Practice (GMP)[1].

In contrast to indirect contact with food through migration, ink can also come into direct contact with food in several ways. Food brands are fighting against increased competition in the food marketplace by advertising competitions on packaging that entice consumers to enter and win prizes. For small items, such as confectionary, space on the outside of the wrapper is limited, so prize-winning details are being printed onto the inside of the packet, bringing the ink into direct contact with the food. Ink can also be inadvertently transferred onto the inside of packaging by pressing up against the printed surface when wound onto reels; a process that printers are well aware of and take precautions to limit. In cases where absolute safety is required, end users will commonly require a statement of US Food and Drug Administration (FDA) compliance from the printer, ensuring that the entire process satisfies FDA regulations.

Not only should contamination of harmful substances be kept to safe levels, it is also necessary to consider the reactions that may occur within the food if contact with the ink is unavoidable, or indeed, desirable. Safety is a primary concern, but aesthetic issues such as color bleed, odor and taste should also be considered. The additional functionality required from the ink may impact on the visual impact achievable. For example, if the ink is required to be FDA-compliant for direct food contact, and yet also be required to adhere to a range of substrates, cure within a short time, and be durable, the achievable color gamut may be limited. Alternatively, food colorings can be used to decorate food directly, but then limitations due to the range of colors, and color bleed into the food, apply.

[1] "Legislation not Protecting Packaging Users from Ink Migration to Food", Dr. Philippe Kern, February 16th 2011.

Decoration can be applied directly to a range of foods with varying degrees of texture and lack of definite shape, from saddle-shaped crisps to cakes and cream cheese, since inkjet printheads do not make contact with the substrate. Marketers are also taking advantage of the new economic viability of short-run, fast-response marketing campaigns made possible by digital inkjet technology. This type of campaign has a higher chance of success as printing directly onto food is a novel concept and therefore more likely to be noticed by consumers.

Once a process has been classified as food-safe, either for direct or indirect contact, or both, it may also be considered for a range of other safety-critical industries, such as pharmaceutical, cosmetics and children's toys.

[1] "Legislation not Protecting Packaging Users from Ink Migration to Food", Dr. Philippe Kern, February 16th 2011.