

Labeling & Food Safety.

Food labeling is a rapidly growing business. And with increasing government regulations, as well as changes to how and where labels are being used, the ability to print short runs of food labels quickly, safely and affordably is in high demand.

The food labeling market is big...

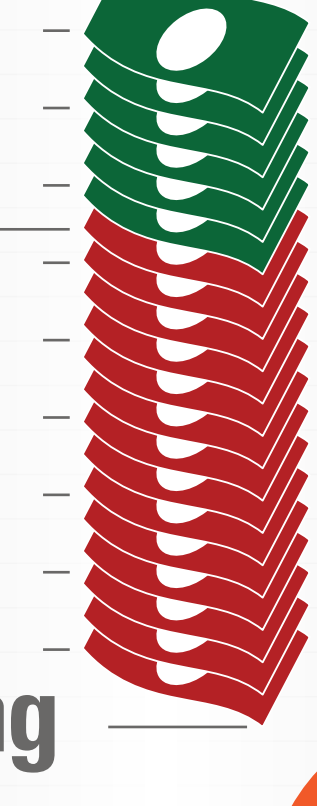
Really big.

19.6

BILLION

square meters of labels are printed annually.

Food and beverage make up **64%** of the global printed label market by end use.



That's over

\$20 BILLION annually!

Source: SMITHERS PIRA APRIL 2014

Label printing on demand.

Label changes happen. Whether businesses are required to make a change to a label, or they choose to create new versions of labels, the ability to print short runs on demand decreases costs of inventory management and waste.



Food labeling trends.

LOCAL/FRESH:

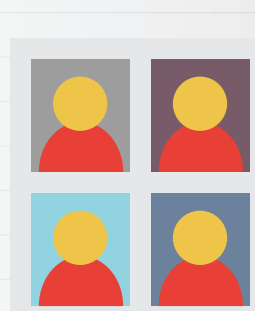
Consumers want locally grown food. These local producers need cost-effective solutions for high-quality labels and shorter runs.

CRAFT/SPECIALTY:

Small batch, handmade food is on the rise. These products are often labeled at the filling line, or even in store.

GOVERNMENT REGULATIONS:

Governments require accurate, clear labeling of food products. When regulatory standards change, this can lead to label waste.



BRAND PERSONALIZATION:

Label customization is being used to differentiate brands, engage consumers, and increase interaction.

Why Memjet for food labeling?

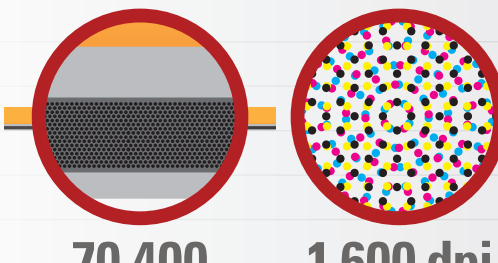
Safe. Fast. Effective.

GOOD CHEMISTRY:

In addition to being environmentally friendly, Memjet's water-based inks meet global regulations and many industry compliance standards. Being water-based, they have lower toxicity than most UV-curable inks and toner.



WINNING TECHNOLOGY:



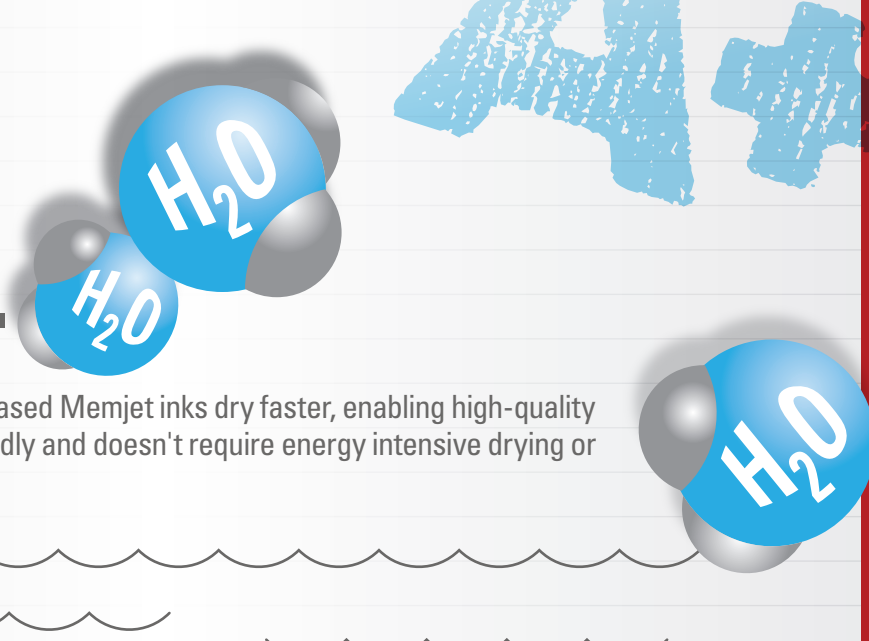
70,400 NOZZLE PRINTHEAD

1,600 dpi

With over 70k nozzles per printhead and quality up to 1600dpi, Memjet provides a fast and flexible solution for printing short runs and producing small fonts necessary to meet regulatory labeling standards.

Smarter ink. Safer labels.

Developed by in-house chemists, water-based Memjet inks dry faster, enabling high-quality color printing that is environmentally-friendly and doesn't require energy intensive drying or curing equipment.



Regulatory statements are specific to Guthega inks.

FULLY COMPLIANT WITH THESE US STANDARDS:

- US - ASTM Standard Consumer Safety Specification on Toy Safety
- US CONEG Model Toxics in Packaging Legislation, and EU Packaging Directive 92/62/EC
 - Memjet inks contain no: mercury, lead, cadmium or hexavalent chromium
 - NOTE: None of these metals are intentionally added to the ink formulations, though small amounts may exist as trace contaminants. Memjet can confirm that any incidental presence is < 10 parts per million based on our testing of the final ink formulations.
- Memjet inks do not contain phthalate esters or bisphenol-A
- Memjet inks contain no Proposition 65 chemicals

FULLY COMPLIANT WITH THESE ASIAN STANDARDS:

- Japan Printing Ink Makers (JPIMA), Negative List, September 2011
- No Memjet ink components are on the list

FULLY COMPLIANT WITH THESE EU STANDARDS:

- EuPIA Exclusion List for Printing Inks (8th Revised Edition, November 2012)
 - No Memjet ink components are on the list or have DPD/GHS classifications as referenced in this document.
- European Chemical Association (ECHA) Substances of Very High Concern (SVHC) Candidate List
 - No Memjet ink components are on the SVHC Candidate List
- Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU (RoHS 2)
 - Memjet inks do not contain Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent Chromium (Cr VI), Polybrominated Biphenyls (PBB), or Polybrominated Diphenyl Ethers (PBDE)
- European Standard EN71-3 if ink is used as a surface coating material.
- Commission Regulation (EC) No 2023/2006 of 22 December 2006 on good manufacturing practice for materials and articles intended to come into contact with food. This regulation covers Good Manufacturing Practice (GMP) in Articles 4-7.
 - Memjet cannot confirm compliance with the Annex because Memjet has no control over how printed materials are handled and stored.

PARTIALLY COMPLIANT WITH THIS EU STANDARD:

- Swiss Ordinance of the FDHA on Materials and Articles, and the Nestle Guidance Note on Packaging Inks - version 02-2014
- Memjet inks are not fully compliant, because they contain proprietary dyes not yet listed on Annex 6.

Safety, set-off and migration: insights and recommendations

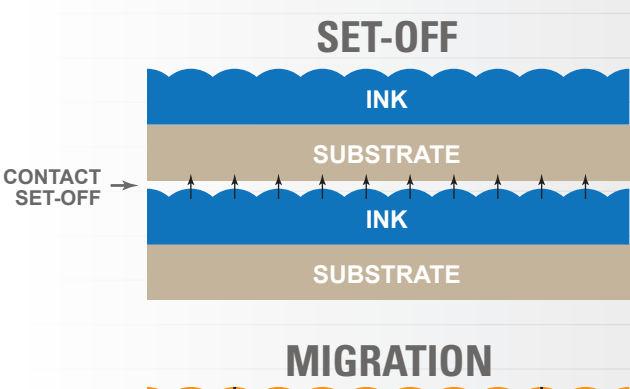
SAFETY:

1. Never print directly on food.
2. Media must be compliant with FDA adhesive regulations (FDA 21 CFR 175.105).
3. Paper / paperboard in contact with food (especially aqueous, acidic or fatty food) must be compliant with FDA regulation 21 CFR 176.170

Note: Media data sheets usually provide regulatory compliance information

SET-OFF AND MIGRATION:

1. The base assumption is that any materials used in food contact applications will become part of the food unless documented testing proves otherwise.
2. Inks that do not have direct food contact are not regulated, as long as there is a "functional barrier" between that food and the ink or coating, and the inks do not migrate to the food contact side during various steps in the process.
3. Using Memjet-approved medias with fast dry time as well as high-end synthetic medias with better water fast properties is recommended for these reasons: to protect against set-off and maintain the quality of what's printed on the label, in turn upholding the integrity of your brand image.
4. Thicker medias are generally better to help mitigate ink migration.
5. Label lamination and varnishes do not protect against potential ink migration (back side of label), they do help to limit set-off, therefore protecting what's printed on the label as well as upholding your brand image.
6. The following are recommended starting scenarios for the use of Memjet inks: labels that are placed on glass, tin cans, aluminum foil, or on the box of a 'bag in a box' package where the bag is made of an approved barrier material.
7. Always examine the thickness of plastic packaging. Thicker barriers will perform better as functional barriers to ink migration, but further testing will be required.
8. Remember that environmental conditions play a role in possible ink migration or set-off. Foods stored in the refrigerator/freezer and used in the microwave will experience greater condensation and therefore require more substantial media or overcoat solutions.



OTHER:

Investigate appropriate media solutions that hold up to the requirements of the food & its packaging.

- a) Is the food packaging multiuse such as in a honey container or jam jar?
- b) Will the packaging need to stand up to abuse on store shelves?
- c) Does the food packaging have to endure a wide range of environmental extremes from cold to hot and wet and humid environments?