Technical white paper

HP Latex Inks: Health and environmental advantages

Water-based HP Latex Inks offer health and environmental advantages - compared to eco-solvent, solvent, or UV-curable inks - from the work zone to the point-of-display of finished prints and recycling of consumables.

Introduction

Third-generation HP 831 Latex Inks in the HP Latex 310, 330, and 360 Printers and HP 881 Latex Inks in the HP Latex 3000 Printer include a number of significant innovations that take the benefits of HP Latex Inks to a new level. HP Latex Inks provide outdoor durability and versatility across all common media types used in sign and display applications together with high quality, odorless prints, low maintenance, and the reduced environmental impact of water-based inks.

HP Latex Printing Technologies address environmental and health concerns across a broad range of attributes throughout the entire life cycle of a print from production to disposal. The water-based formulation of HP Latex Inks fundamentally provides healthier print production without trading off performance.

Health and environmental performance and certifications

The water-based formulation of HP 831 and HP 881 Latex Inks and HP Latex Optimizer offers a healthier solution that better meets the health and environmental objectives of both print service providers and their customers.

Performance

No special ventilation is required with HP Latex Inks.[1] HP Latex Inks have no hazard warning labels, contain no Hazardous Air Pollutants (HAPs),[2] are non-flammable and non-combustible,[3] and are nickel-free.[4] HP Latex Inks allow print service providers to produce odorless prints for indoor display in sensitive environments such as hospitality and healthcare.

Certifications

HP Latex Inks have qualified for certifications that demonstrate they meet some of the world's most rigorous and comprehensive standards for low chemical emissions into indoor air.

[1] Special ventilation equipment (air filtration) is not required to meet U.S. OSHA requirements. Special ventilation equipment installation is at the discretion of the customer—see the Site Preparation Guide for details. Customers should consult state and local requirements and regulations.

[2] HP Latex Inks were tested for Hazardous Air Pollutants, as defined in the Clean Air Act, per U.S. Environmental Protection Agency Method 311 (testing conducted in 2013) and none were detected.

[3] Water-based HP Latex Inks are not classified as flammable or combustible liquids under the USDOT or international transportation regulations. Testing per the Pensky-Martins Closed Cup method demonstrated flash point greater than 110° C.

[4] Nickel free demonstrated according to testing conducted for HP Latex Inks to achieve UL ECOLOGO®Certification. UL ECOLOGO®Certification to UL 2801 demonstrates that an ink meets a range of stringent criteria related to human health and environmental considerations (see ul.com/EL).

UL ECOLOGO®Certified HP Latex Inks meet a range of stringent human health criteria.[5] As of January 2014, HP is the only large format digital printing manufacturer to earn UL ECOLOGO®Certification for latex printing inks. HP Latex Inks are GREENGUARD GOLD Certified to standards for low chemical emissions into indoor air.[6]

In addition, prints produced using HP Latex Inks on HP PVC-free Wall Paper meet AgBB criteria for health-related evaluation of VOC emissions of indoor building products.[7] These prints are rated A+ (very low-emission) according to the *Émissions dans l'air intérieur*.statement on the level of emission of volatile substances in indoor air posing health risks if inhaled.[8]

Recyclability

An important component of total environmental performance is the recyclability of used consumables. All HP 831 printing supplies—including ink cartridges, printheads, and maintenance supplies—as well as HP 881 Latex Printheads are recyclable through the HP Planet Partners program.[9] HP 881 Latex Inks are supplied in 5-liter ink cartridges, where approximately 70% of the weight of the used ink cartridge is a recyclable cardboard container.

Health and environmental performance compared

The entries in Table 1 on the following page compare HP Latex Ink technology to competitors with leading market share as of December 2013. Entries are based primarily on analysis of published MSDS/SDSs[10] accompanied by HP internal analysis and evaluation where needed. Performance of specific attributes may vary by competitor and variations in ink formulation within a printer product line.

Results

Table 1 clearly demonstrates that HP Latex Inks offer a healthier solution than competing ink technologies in commercial large format print production.

Summary

Compared to other leading inkjet ink technologies used in commercial large format print production, water-based HP Latex Inks offer a healthier solution from the print shop to the customer's point-of-display and the recycling of consumables.9 HP Latex Inks meet a range of stringent human health criteria represented by UL ECOLOGO®and GREENGUARD GOLD Certifications.5,6

[5] UL ECOLOGO®Certification to UL 2801 demonstrates that an ink meets a range of stringent criteria related to human health and environmental considerations (see ul.com/EL).

[6] GREENGUARD GOLD Certification to UL 2818 demonstrates that products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit ul.com/gg or greenguard.org.

[7] HP WallArt printed on HP PVC-free Wall Paper and other prints on HP PVC-free Wall Paper printed with HP Latex Inks meet AgBB criteria for health-related evaluation of VOC emissions of indoor building products (see umweltbundesamt.de/en/topics/health/commissions-working-groups/ausschuss-zur-gesundheitlichen-bewertung-von).

[8] Émissions dans l'air intérieur provides a statement on the level of emission of volatile substances in indoor air posing health risks if inhaled—on a scale from A+ (very low-emission) to C (high-emission).

[9] Visit hp.com/recycle to see how to participate and for HP Planet Partners program availability; program may not be available in your area. Where this program is not available, and for other consumables not included in the program, consult your local waste authorities on appropriate disposal.

[10] MSDS is the ink's Material Safety Data Sheet. SDS is the Site Data Sheet.

Table 1 – Attributes of Competing Ink Technologies

Attributes	HP Latex Inks	UV Curable ink	Hard Solvent ink	"Ecosolvent" ink-1	"Ecosolvent" ink-2
Print odor	Odorless	Low odor	Solvent odor	Slight odor	Slight odor
Special ventilation required1	None	*Typically none for this ink category.*	*Typically required for this ink category.*	None	None
Cleaning fluids: health hazards labels	Cautionary statement only: Contact with skin and eyes may result in irritation. No "R" phrases.	Xi; R36/R38 Irritating to eyes and skin.	Xn; Xi; R36/R66/R67. Irritating to eyes. Repeated exposure may cause skin dryness or cracking. Vapors may cause drowsiness and dizziness.	May be harmful if swallowed. Causes skin irritation. Causes serious eye damage.	Cleaning cartridge, Ink cleaning kit: Skin corrosion/ irritation; Hazard category 2
Ink health hazards labels – general handling	Cautionary statement only: Contact with skin and eyes may result in irritation. No "R" phrases.	Xi; R36/R37/R38. Irritating to eyes, respiratory system, skin.	Xi; R36 Irritating to eyes R36. Xn harmful if inhaled or swallowed.	May be harmful if swallowed. Causes skin irritation. Causes serious eye damage. May damage fertility or the unborn child.	Skin corrosion/ irritation; Hazard category 2, CA Prop 65: toluene 108-88-3 <0.03% by weight of proprietary organic materials.
Flammability/ combustibility	FP > 93.3C	White FP > 90C, others > 95C	R10 flammable	FP > 71C	Inks > 74.4C, cleaning kit FP > 70C
HAPs free (inks and maintenance fluids)	None according to EPA Method 311	Claims "UV inks generally do not contain HAPs"	*Ink category typically contains HAPs.*	*Ink category typically contains HAPs.*	B, C, M, Y, cleaning cartridge, ink cleaning kit: Section 15 lists 112-36-7 and 1002-67-1 as CAA 112 HAP
VOCs: inks, pre- and post-treatments	231 g/L – 294 g/L	Claims "No VOCs"	*Typically above 800 g/L for this category of ink.*	C, M, Y, K, Lc, Lm: 920 g/L, White: 800 g/L., Silver: 930 g/L	*Typically above 800 g/L for this category of ink.*
VOCs: Maintenance fluids	241 g/L	60-100% is 2-(2-ethoxyethoxy)ethyl acetate (112-15-2)	*Typically above 800 g/L for this category of printer.*	Cleaning fluid > 940 g/L	*Typically above 800 g/L for this category of printer.*
Waste profile labels for inks	None	R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.	*Typically hazard labels required for this category of ink.*	No information	Copper content < 3,400 ppm
GREENGUARD GOLD	Yes	Yes	No	Yes	No
UL ECOLOGO®	Yes	No	No	No	No
Recyclable consumables	Yes	No	No	No information	No

Legend: Entries in Table 1 are color-coded by relative ranking of health and environmental attributes as follows:

Green - highest *Yellow* - moderate *Red* - lowest.

Note: Ranking by HP R&D. Cells with *entries in italics* represent the results of HP internal analysis.

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