Prototype Proofing:
Pros and cons of the most common printers

gmg color

Proofing for packaging printing

We compared the most important printers and technologies for true prototype proofing

Anyone working with proofing for the packaging industry will come across three common technologies: water-based inkjet printing, eco-solvent and UV inkjet printing.

- Water-based inkjet printing is the most common technology for conventional digital proofing. Ink pigments are dissolved in water and the droplets have to penetrate the proofing paper to dry. Therefore, with this technology only specially coated papers and proof media can be printed on.

- In eco-solvent inkjet printing, solvent-based inks are used. The ink solution dries by evaporation. This technology enables printing on different materials, such as transparent or metalized foils.

- UV inkjet printing takes on a special role because its inks are cured and fixed with a special UV light. Flexible substrates such as roll-fed or sheet-fed media and even rigid materials like wooden boards or glass can be printed on.

All three technologies have their strengths and production requirements decide the technology of choice.

GMG's solution: flexibility meets accurate colors

Prototype Proofing from GMG combines the flexibility of different printing technologies with superior color management, proofing software and a vast range of substrates. GMG ColorProof, GMG OpenColor and the corresponding printer plus substrates with realistic feel – equals true prototype proofing.

	Epson SC-P7000V (Spectro)	Epson Stylus Pro WT7900 *discontinued*	Epson SC-S80600	Roland VS300i	Roland LEC2-330	Kodak Approval NX / Kodak 800XL Laminator *discontinued*
Color and print technology						
Inkjet technology	Piezo Inkjet Technology / 1 printhead	Piezo Inkjet Technology / 1 printhead	Piezo Inkjet Technology / 2 printheads	Piezo Inkjet Technology / 1 printhead	Piezo Inkjet Technology / 1 printhead	Thermal Laser Imaging
Maximum print resolution	2,880 × 1,440 dpi	1,440 × 1,440 dpi	1,440 × 1,440 dpi	1,440 dpi	1,440 dpi	2,540 dpi
Ink technology	Water-based inks UltraChrome® HDX	Water-based inks Ultrachrome® HDR with White Ink Technology	Eco solvent inks UltraChrome® GS3 with Red	Eco solvent inks Roland ECO-SOL MAX-ink	UV Inkjet Roland ECO-UV EUV5	Digital Donors
Ink set / colors	CMYK + OGV 11 colors: Light Black, Photo Black, Matte Black, Cyan, Light Cyan, Yellow, Vivid Magenta, Vivid Light Magenta, Purple, Orange, Green	CMYKOG + White 9 colors: Photo Black, Cyan, Light Cyan, Yellow, Vivid Magenta, Vivid Light Magenta, Orange, Green, White	CMYKOR + White/ Metallic Silver 9 or 10 colors: Black, Light Black, Metallic Silver, Cyan, Light Cyan, Yellow, Magenta, Light Magenta, Red, Orange, White/Silver	CMYK + White + Metallic 8 colors: Cyan, Magenta, Yellow, Black, Light Black, Light Magenta, White, Silver	CMYKOR + White + Gloss varnish/Primer 8 colors: Cyan, Magenta, Yellow, Black, Orange, Red + White and Gloss varnish/Primer	CMYKOGB + White + Metallic 9 color foils (donors): Cyan, Magenta, Yellow, Black, Orange, Green, Blue, White, Silver
Pros and cons						
Color accuracy	+ extended color space through purple, orange and green + very high color accuracy	+ extended color space through purple, orange and green + very high color accuracy	+ extended color space through red and orange + white or silver are also available + very high color accuracy	⊖ no extended color space ⊖ lower color accuracy with saturated colors (spot colors)	+ extended color space through red and orange + white and gloss varnish are also available + high color accuracy	+ expanded color space through orange, green and blue + good simulation of saturated colors (spot colors) ⊖ less influence on the simulation of overprinting colors (density and curve adjustment, device link profiling with change of separation)
Variety of substrates	⊖ only special proof media can be used (plus some select ink-jet foils – be aware of long drying time)	⊖ only special proof media can be used (plus some select ink-jet foils – be aware of long drying time)	+ use of special solvent injection papers as well as metallic, transparent and transfer foils (JetComp). Some production substrates can also be printed on, subject to their properties	+ use of special solvent injection papers as well as metallic and transparent foils. Some production substrates can also be printed on, subject to their properties	+ direct proofing on production substrates is possible	+ use of production substrates (lamination of an image transfer foil onto the original substrate) – the requirement is that the original substrate can be laminated with the image transfer foil
Simulation of white ink, varnish and metallic effects	⊖ no white print ⊖ no simulation of metallic effects through ink application ⊖ no simulation of flood or spot varnish effects	+ white print (full surface and partial) ⊖ no simulation of metallic effects through ink application ⊖ no simulation of flood or spot varnish effects	+ white print (full surface and partial) + simulation of metallic effects through ink application is possible ⊖ white and metallic silver can't be used at the same time ⊖ no simulation of spot varnish effects (full surface varnish effects can be achieved by subsequent lamination of the printed substrate)	+ white print (full surface and partial) + simulation of metallic effects through ink application is possible + white and metallic silver can be used at the same time ⊖ no simulation of spot varnish effects (full surface varnish effects can be achieved by subsequent lamination of the printed substrate)	+ white print (full surface and partial) ⊖ no simulation of metallic effects through ink application + simulation of full surface and spot varnish effects through ink application; variable varnish thickness enables the simulation of raised spot varnish effects (traditionally achieved through screen printing for example)	+ white print (full surface and partial) + simulation of metallic effects (full surface and partial) ⊖ no simulation of spot varnish effects (full surface varnish effects can be achieved by subsequent lamination with finishing foils) -> Degloss sheets

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Additional technical equipment						
Color measurement	Spectro variant: EPSON Spectroproofer M0 / M1 / M2 (Mounter + ILS30EP)	–	–	–	–	–
Drying (after print)	optional active drying by blower	–	material preheating and print roller heating post-print heating via heated media plate optional additional drying (fan)	printer heating post-print heating via heated media plate optional additional drying (fan)	dual UV LED lamp (faster ink curing)	–
Integrated proof cutter	automatic cut after print	automatic cut after print	–	automatic cut after print	automatic cut after print	Ink and transfer foils in sheet format – no automatic cut after imaging necessary
Integrated contour cutter	–	–	–	integrated cutting plotter for contour cutting	integrated cutting plotter for contour cutting and creasing	–
Pros and cons						
Color measurement/ calibration	+ Inline color measurement for automatic calibration and proof verification	⊖ no inline color measurement; color measurements for calibration and proof verification must be done manually	⊖ no inline color measurement; color measurements for calibration and proof verification must be done manually	⊖ no inline color measurement; color measurements for calibration and proof verification must be done manually	⊖ no inline color measurement; color measurements for calibration and proof verification must be done manually	⊖ density calibration with external color measuring device; no automatic proof verification
Inline finishing	+ automatic cut ⊖ no inline contour cutting, creasing or perforation	+ automatic cut ⊖ no inline contour cutting, creasing or perforation	⊖ no automatic cut; print jobs have to be cut manually ⊖ no inline contour cutting, creasing or perforation	+ automatic cut + integrated cutting plotter enabling a contour cut / die cut of labels or stickers	+ automatic cut + integrated cutting plotter enabling a contour cut / die cut of labels or stickers	⊖ manual cutting before or after lamination if required ⊖ no inline contour cutting, creasing or perforation
Drying (after print)	+/⊖ active drying by fan and adjustable drying time is sufficient for water-based inkjet printing (Inkjet foils have to dry out separately as the ink cannot penetrate the material – possibly very long drying times) + active drying leads to minor impairments in the print room; no heat or odour nuisance	⊖ long drying times after printing on foil (possibly 24h) + active drying leads to minor impairments in the print room; no heat or odour nuisance	+ the strength and type of heating / drying can be adjusted very well to each individual material (shrink foils, for example, should be processed without the influence of heat, otherwise they will shrink; drying must mainly take place by means of a fan) ⊖ additional heat elements generate heat in the print room; fan ensures that the escaping solvent is distributed in the printing room; a separate, closed, air-conditioned room for the device is recommended	+ the strength and type of heating / drying can be adjusted very well to each individual material (shrink foils, for example, should be processed without the influence of heat, otherwise they will shrink; drying must mainly take place by means of a fan) ⊖ additional heat elements generate heat in the print room; fan ensures that the escaping solvent is distributed in the printing room; a separate, closed, air-conditioned room for the device is recommended	+ no additional drying units necessary ⊖ with UV inkjet, harmful molecules could be formed (e.g., ozone); UV inkjet printers require a suitable production environment and, if necessary, an air filtration or extraction system	+ no additional drying units necessary

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Technical data						
Measurements	1,356 mm (W) × 667 mm (D) × 1,218 mm (H) with stand	1,356 mm (W) × 667 mm (D) × 1,218 mm (H) with stand	2,620 mm (W) × 880 mm (D) × 1,338 mm (H) with stand	1,700 mm (W) × 795 mm (D) × 1,270 mm (H) with stand	1,934 mm (W) × 795 mm (D) × 1,303 mm (H) with stand	Kodak Approval: 1,930 mm (W) × 890 mm (D) × 1,780 mm (H) Kodak Laminator: 1,910 mm (W) × 1,220 mm (D) × 1,180 mm (H)
Weight	144 kg	101 kg	284 kg	100 kg	125 kg	Kodak Approval: 817 kg Kodak Laminator: 300 kg
Noise (operational)	47dB(A)	47dB(A)	59dB(A) (without additional drying fan)	69dB(A) (without additional drying fan)	63dB(A)	n/a
Energy consumption (operational)	±65 W	±60 W	n/a	±670 W	±290 W	n/a
Printing speed	n/a	n/a	95.1 m²/h (two heads)	n/a	n/a	Imaging time NX68: 4 full format proofs per hour with 4 colors
Thickness (min. – max.) of printing substrate	min. 0.08 mm – max. 1.5 mm	min. 0.08 mm – max. 1.5 mm	max. 1 mm	max. 1 mm with carrier (printing) max. 0.40 mm with carrier and 0.22 mm without carrier (cut)	max. 1 mm with liner (printing) max. 0.40 mm with liner and 0.22 mm without liner (cut)	max. 7.5 mm (21pt) – for lamination
Media handling	Roll and sheet fed	Roll and sheet fed	Roll and sheet fed	Roll and sheet fed	Roll and sheet fed	Sheet fed
Pros and cons						
Weight and size	+ comparatively small and light printing system + moderate operating noise and low energy consumption	+ comparatively small and light printing system + moderate operating noise and low energy consumption	⊖ comparatively large and heavy printing system ⊖ noisy and high energy consumption	+ comparatively small and light printing system ⊖ noisy and high energy consumption	⊖ comparatively large and light printing system ⊖ noisy and high energy consumption	⊖ large and heavy printing system ⊖ noisy and high energy consumption
Speed	+ normal printing speed	+ normal printing speed	+ high printing speed (with 2 heads)	⊖ low printing speed	⊖ low printing speed	⊖ low printing speed ⊖ two-step process (imaging and lamination)
Maintenance	+ low maintenance	⊖ high maintenance	+ low maintenance industrial and reliable production system	⊖ high maintenance	⊖ high maintenance	⊖ high maintenance and labour intense

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