

Custom Test Report

A Comprehensive Keypoint Intelligence Field Evaluation

Roland DG TrueVIS SG2-640/540

54-Inch Wide Format Printer/Cutter Four Color CMYK Eco-Solvent Ink

4 Color: CMYK







OUR TAKE

The four-color, 54-inch Roland DG TrueVIS SG2-540 printer/cutter is a strong choice for print shops looking to compete in the wide format market. This entry-level model, which is also available in 30- and 64-inch widths, boasts numerous upgrades over the previous SG-540. Thanks to both the new TR2 eco-solvent inkset and "True Rich Color" VersaWorks 6 RIP preset, halftone images were consistently bright, and exhibited very good contrast and details. Print shops will undoubtedly see a boost in productivity with the TrueVIS SG2-540 owing to the redesigned middle pinch rollers that require no user intervention when performing print & cut operations, as well as new media edge clamps for automated cut sheet capability. Moreover, the SG2-series features a new perforated cut function, which eliminates the need for post-trimming. For the TrueVIS family, Roland has also added a much larger

waste ink tank that requires emptying far less frequently and will result in longer up-times. Operators will be quick to adopt the Roland DG Mobile Panel app – conveniently accessed via iOS or Android platforms – for its wide range of functionality, from performing media optimization and device maintenance procedures to checking on remaining ink, media, and waste ink usage on all networked Roland printers. The VersaWorks 6 RIP, which continues to offer intuitive operation, comes bundled with the new generation of SG2 and VG2 models and now features five print queues, enabling users to create even more time-saving workflow presets. A versatile four-color printer/cutter that delivers very good image quality and Pantone color accuracy, the Roland DG TrueVIS SG2-540 will be a solid addition to any print shop entering the wide format print space.





BENEFITS

- Above average PANTONE color matching capabilities ensures production of hard-to-match colors; boost color matching accuracy with Roland Color System Library
- Straightforward print job submission, job monitoring and color editing via complimentary VersaWorks 6
 RIP; five preset queues enhance workflow
- Environmentally friendly 500-ml. ink pouch replacement system eliminates plastic cartridge disposal and waste
- Large waste ink tank requires less frequent emptying
- Unattended printing facilitated by new TU4 roll take-up system
- New perforated cut feature eliminates post-trimming process

ADVANTAGES

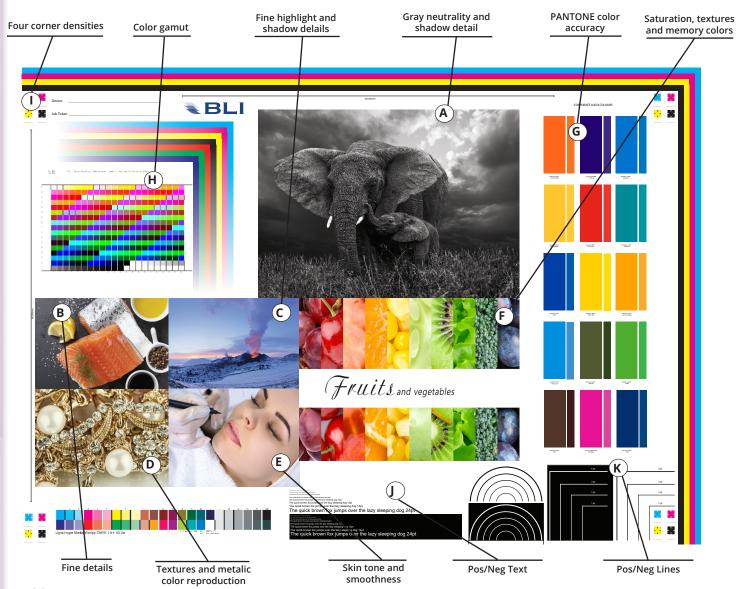
- Consistently bright halftone production with above average contrast, highlight and shadow details
- Exceptional dimensional stability leads to highly accurate multi-panel printing
- Remote access via Roland DG Mobile Panel app on Android and iOS devices for easy monitoring, and conducting maintenance tasks across all networked TrueVIS devices
- Remaining media length counted down; "print memo" length-tracking capability
- Integrated automatic cutter with redesigned edge clamps and center pinch rollers for increased productivity

IMAGE QUALITY



- The elephant image earned a "Very Good" rating at the high quality setting, displaying a neutral gray, photo-like appearance with very good contrast.
- The salmon image was rated "Excellent" for each of the three print scenarios, exhibiting a bright appearance with above average contrast and very good details.
- On both media, the volcano image was bright with very good highlight and shadow details and an overall 3D-appearance, though slightly grainy, and garnered a "Very Good" rating for each print scenario.
- The jewelry image was rated "Excellent" at the most productive 7 pass setting on MPI 1105 media based on its bright appearance, excellent details and contrast.
- Also at the most productive setting, the face image earned a "Very Good" rating for its high contrast and very good highlight details.
- The fruit image was given a "Very Good" rating for each print scenario based on its vibrant appearance with very good details and saturation.





T	a	b	e	1

Images	MPI 3000: Most Productive (7 Pass)	MPI 1105: Most Productive (7 Pass)	MPI 1105: Highest Quality (14 Pass)
Elephants	Good	Good	Very Good
Salmon	Excellent	Excellent	Excellent
Volcano	Very Good	Very Good	Very Good
Jewelry	Very Good	Excellent	Very Good
Face	Good	Very Good	Good
Fruit	Very Good	Very Good	Very Good

Halftone image quality was assessed using Buyers Lab's proprietary A0-size wide format test target that comprises six high quality color/black and white halftone images. The target was printed at the most productive speed/quality setting that produced acceptable overall quality without visible banding on both Avery Dennison MPI 1105 and MPI 3000 media. For the Roland TrueVIS SG2-540, the high speed/7 pass setting was selected for both media, as were the respective MPI 1105 and MPI 3000 media profiles. The "True Rich Color" Color Management RIP preset was also selected. The target was also printed on MPI 1105 media at the highest quality 14 pass setting using the same profile and RIP preset. Each of the six images was cut from the larger target and visually appraised for color accuracy, brightness, sharpness, and contrast at a distance of ten feet for the MPI 3000 media and at a distance of two feet for the MPI 1105 media.

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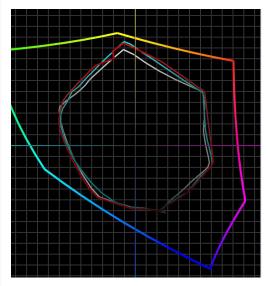
O Color Gamut



- The Roland SG2-540 device produced a color gamut volume that measured 5.6 percent larger than the competitive average when printed on MPI 1105 media at the high quality setting. However, at the high speed setting on MPI 1105 the gamut volume measured 9.4 smaller than the average, and 5.9 percent smaller than the average when printed on MPI 3000 media at the same setting.
- When compared against the SG-540 that Buyers Lab evaluated, the color gamut volumes were larger for each of the scenarios by 9.2 and 1.9 percent at the high speed setting on MPI 3000 and MPI 1105, respectively, and by 78.1 percent on the MPI 1105 media at the high quality setting.

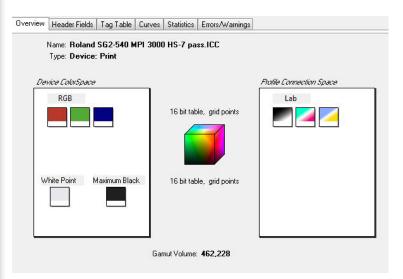
Table 2

Media: Setting	Graphic Color Rep- resentation	Roland SG2-540 Color Gamut (CIE) Volume	Competitive Average (CIE) Volume of All Tested Devices	Percent Smaller/ Larger Than Competi- tion	Roland SG-540 Color Gamut (CIE Volume)	Percent Smaller/ Larger Than Roland SG-540
Avery Dennison MPI 3000: Most Productive (7 Pass)	White	462,228	490,777	-5.8	423,245	9.2
Avery Dennison MPI 1105: Most Productive (7 Pass)	Cyan	465,898	514,445	-9.4	457,283	1.9
Avery Dennison MPI 1105: Highest Quality (14 Pass)	Red	531,590	503,164	+5.6	298,420	78.1

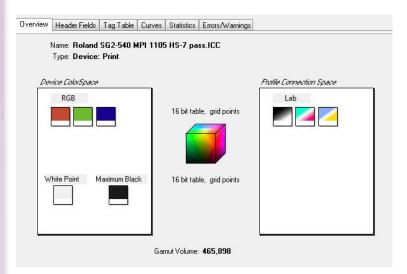


Roland SG2-540 color gamut compared against Adobe RGB(1998) color space (multi-color graph)

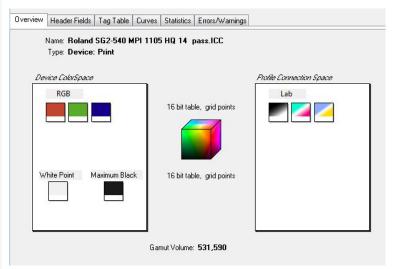




Roland SG2-540 color gamut profile on Avery Dennison MPI 3000 at high speed/7 pass setting



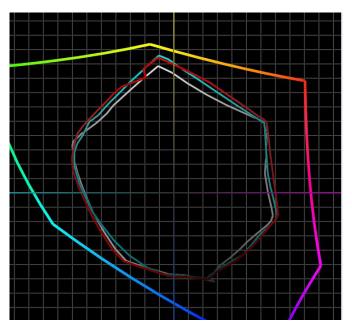
Roland SG2-540 color gamut profile on Avery Dennison MPI 1105 at high speed/7 pass setting



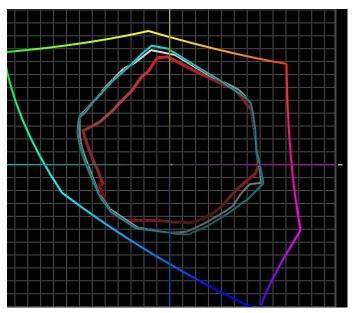
Roland SG2-540 color gamut profile on Avery Dennison MPI 1105 at high quality/14 pass setting



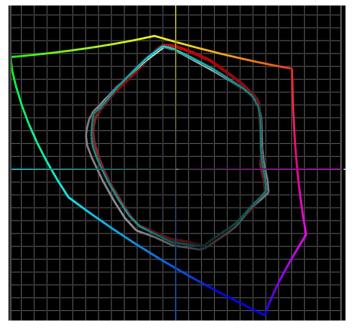
■ For comparison purposes, the color gamut graphs for the same three print scenarios for the SG2-540, the SG-540 as well as two competitor devices that employ only CMYK inks are displayed below.



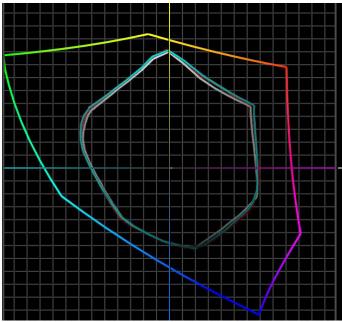
Roland SG2-540 CMYK color gamut



Roland SG-540: device color gamut



Competitor A: device color gamut



Competitor B: device color gamut



PANTONE CORPORATE COLOR ACCURACY



- As seen in Table 3, the Roland SG2-540 produced better color accuracy on Avery Dennison MPI 1105 media versus the competitive average of Buyers Lab-tested devices to date. At the most productive high speed/7 pass setting, the SG2-540 delivered a cumulative Delta E00* average of 4.18 for the 15 corporate colors, versus the competitive average of 4.55. (See Table 3)
- As seen in Table 4, the SG2-540 also fared better than the average with cumulative Delta E00 measurements of 3.82 and 4.33, respectively.
- When comparing color accuracy against the SG-540 when it was first evaluated by Buyers Lab, the new device produced a slightly higher cumulative Delta E00 measurement at the high speed setting (4.18 vs. 4.04), and a lower average measurement at the high quality setting (3.82 vs. 4.20).

	Table 3	SG2- 540: MPI 1105 High Speed/7 Pass	Com- petitive Average: MPI 1105 Most Produc- tive Print Speed	Roland SG-540 Stan- dard/10 Pass		Table 4	SG2- 540: MPI 1105 High Qual- ity/14 Pass	Com- petitive Average: MPI 1105 Highest Quality Print Speed	Roland SG-540 High Qual- ity/14 Pass
		ΔΕ00	ΔΕ00	ΔΕ00	PAN	TONE Color	ΔΕ00	ΔΕ00	ΔΕ00
165 C	Home Depot	4.55	6.81	6.72	165 C	Home Depot	4.64	6.55	7.24
2685 C	Cadbury	7.30	8.15	4.51	2685 C	Cadbury	5.00	7.23	4.56
285 C	Walmart	3.04	4.40	2.45	285 C	Walmart	4.33	4.02	2.65
123 C	McDonalds	6.98	4.27	5.02	123 C	McDonalds	4.24	4.38	5.28
485 C	Coca Cola	1.68	2.88	5.99	485 C	Coca Cola	2.32	2.85	6.42
321 C	Siemens	0.62	3.57	2.91	321 C	Siemens	0.65	3.07	2.64
293 C	IKEA	4.25	6.45	4.57	293 C	IKEA	7.54	6.25	4.98
109 C	IKEA	5.77	3.68	4.32	109 C	IKEA	2.51	3.49	4.60
137 C	Veuve Clicquot	7.05	5.37	5.63	137 C	Veuve Clicquot	8.21	5.51	5.58
279 C	Microsoft	2.26	4.31	3.33	279 C	Microsoft	3.14	4.05	3.62
574 C	Harrods	5.13	2.55	2.27	574 C	Harrods	0.92	2.50	2.48
361 C	FedEx	5.56	2.65	1.39	361 C	FedEx	4.34	2.50	1.29
476 C	UPS	2.24	2.79	2.89	476 C	UPS	1.40	2.44	2.45
Rhod C	T-Mobile	3.13	4.28	5.26	Rhod C	T-Mobile	3.75	4.26	5.64
294 C	Ford	3.16	6.04	3.37	294 C	Ford	4.28	5.88	3.52
Ave	erage ΔE00	4.18	4.55	4.04	Ave	erage ΔE00	3.82	4.33	4.20

^{*} Delta E00 represents the difference in L*a*b* values measured for a specific color against its equivalent that is stored in the X-Rite eXact spectrophotometer's Pantone coated color library. A lower Delta E00 value denotes better color accuracy.





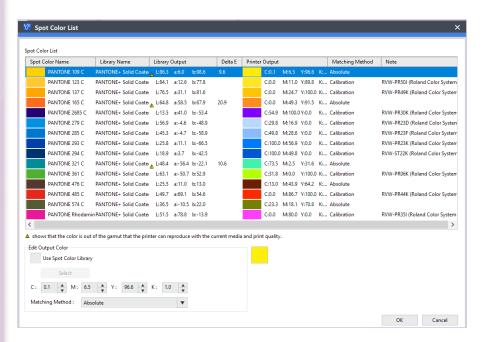
Roland Color System Library

■ Even though very accurate color matching results were achieved "out of the box" by the TrueVIS SG2-540, Buyers Lab analysts were able to achieve even better color matching by associating the PANTONE colors to the Roland Color System Library within the VersaWorks 6 RIP. This is an easy and accurate, albeit manual method for even more accurate spot and PANTONE color matching. Buyers Lab first printed a color patch chart containing all of the colors in the Roland library. Then, using an X-rite eXact spectrophotometer, we scanned color patches from the Roland color library printouts in search of colors that were a closer match to the PANTONE reference library within the eXact library. Buyers Lab analysts were able to find closer matches for ten of the fifteen colors versus the "out of box" results, after which the color names from the library were substituted for the PANTONE color equivalents in VersaWorks 6. After the modifications, Buyers Lab's test chart was reprinted on MPI 1105 media, using the same media profile at the high speed setting, which produced considerably lower Delta E00 values for 10 colors as outlined in Table 5.

Tab	le 5	SG2-540: MPI 1105 High Speed/7 Pass	After Adjustments In VersaWorks 6 Using Roland Color Library
PANTON	NE Color	ΔΕ00	ΔΕ00
165 C	Home Depot*	4.55	4.55
2685 C	Cadbury*	7.30	7.30
285 C	Walmart	3.04	1.79
123 C	McDonalds	6.98	5.12
485 C	Coca Cola*	1.68	1.68
321 C	Siemens*	0.62	0.62
293 C	IKEA	4.25	1.86
109 C	IKEA	5.77	2.30
137 C	Veuve Clicquot	7.05	3.76
279 C	Microsoft*	2.26	2.26
574 C	Harrods	5.13	1.40
361 C	FedEx	5.56	3.83
476 C	UPS	2.24	0.93
Rhod. Red C	T-Mobile	3.13	2.07
294 C	Ford	3.16	0.98
Averag	ge ΔE00	4.18	2.70

^{*}A closer color match was not found for five test target colors





PANTONE color adjustments made in VersaWorks 6 RIP

Density

- Optical density remained highly stable across the A0-size page for each color under each test scenario.
 (Table 6)
- Against the competitive averages, cyan and black densities were considerably higher on the MPI 1105 media, while black density matched the competitive average on MPI 3000 media. Yellow matched the competitive averages under each test scenario. While magenta measured slightly higher on MPI 1105 media at the high quality setting, densities for the other two print scenarios was marginally lower.

Table 6

MPI 3000 – High Speed/7 Pass	Top Left	Top Right	Bottom Left	Bottom Right	Maximum Den- sity Difference	Competitive Average Density
Cyan	1.74	1.70	1.73	1.72	0.04	1.58
Magenta	1.29	1.27	1.29	1.31	0.04	1.38
Yellow	1.00	1.00	0.98	0.98	0.02	0.96
Black	1.80	1.84	1.80	1.79	0.05	1.80

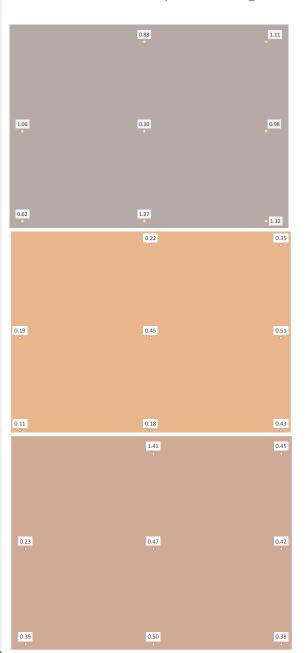
MPI 1105 – High Speed/7 Pass	Top Left	Top Right	Bottom Left	Bottom Right	Maximum Den- sity Difference	Competitive Average Density
Cyan	1.78	1.78	1.79	1.79	0.01	1.57
Magenta	1.32	1.31	1.32	1.32	0.01	1.45
Yellow	0.96	0.96	0.97	0.97	0.01	0.96
Black	1.92	1.92	1.92	1.94	0.02	1.79



MPI 1105 – High Quality/14 Pass	Top Left	Top Right	Bottom Left	Bottom Right	Maximum Den- sity Difference	Competitive Average Density
Cyan	1.75	1.74	1.78	1.77	0.04	1.56
Magenta	1.59	1.58	1.58	1.59	0.01	1.51
Yellow	1.06	1.06	1.05	1.05	0.01	1.02
Black	1.83	1.81	1.88	1.85	0.07	1.75

COLOR CONSISTENCY - DELTA E00 ACROSS PAGE

■ Each of Buyers Lab's three neutral color test targets was produced uniformly, with Delta E00 color variation averaging less than 1.00 for each of them. The average Delta E for two of the three colors also measured lower than the competitive average values.



Neutral Gray Device Average 0.94 Competitive Average 0.84

Skin Tone 1Device Average 0.31 Competitive Average 0.79

Skin Tone 2 Device Average 0.53 Competitive Average 0.62



MULTI-PANEL WALLPAPER CHART: COLOR AND LINE CONSISTENCY



- In Buyers Lab's wallpaper consistency test, the Roland SG2-540 produced extremely accurate dimensional stability on Avery Dennison MPI 2105 media. As seen at the bottom of Table 8, the largest difference in one meter line lengths between panels measured 0.28-mm in portrait orientation, and 1.13-mm on panels that were rotated 180°.
- The maximum color variation for three neutral colors between the six panels was slightly higher than average. In portrait orientation, the maximum Delta E00 color difference between panels measured 2.16, while in rotated orientation the maximum Delta E00 measurement was 2.50.

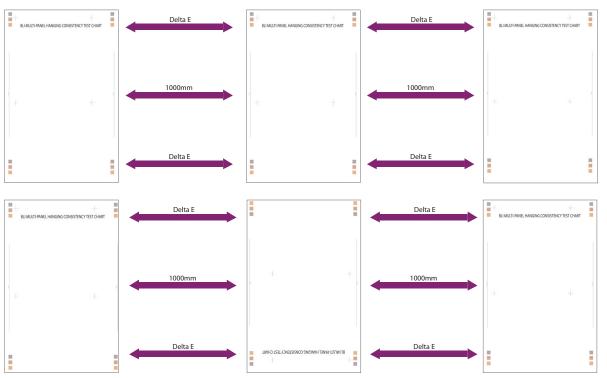


Table 7 Color	Location on Page	Maximum Delta E00 On Panels in Portrait Orientation	Maximum Delta E00 On Panels Rotated 180°
Noutral Cray	Тор	2.16	1.62
Neutral Gray	Bottom	0.99	1.73
Clair Tono 1	Тор	1.54	1.91
Skin Tone 1	Bottom	0.92	0.51
Skin Tone 2	Тор	1.04	2.50
Skill Tolle 2	Bottom	1.96	0.77
Line Measurement Accuracy – Maximum Difference Between Panels (in mm)		0.28	1.13
Line Measurement Accuracy – Competitive Average (in mm)		0.73	0.60



USABILITY



- The SG2 series has a reduced start up process that enables the printer to begin the print process more quickly than the legacy TrueVIS devices, enhancing overall productivity.
- The tension has been improved on the TU4 media take-up unit that supplies more accurate handling of the media as it is being rolled onto a core using the new Standard setting, according to Roland.
- The SG2 series printers now feature a two liter waste ink tank, which is substantially larger in capacity over legacy devices' 0.50 liter tanks, and is larger than most competitive devices' waste tanks, and will require less frequent emptying, thus providing for longer uptime.
- The sheet cutting process on the TrueVIS SG2 devices has been significantly improved in two ways and Buyers Lab believes it is now among the best available among devices tested. The edge clamps that hold the media in place during printing have been modified so that they no longer have to be removed before a sheet-cut is initiated. Operators can now set the VersaWorks 6 RIP to sheet-cut automatically once printing and contour-cutting is done, after which no further intervention is required. Likewise, the center pinch rollers, which had to be removed in the past, can remain in place during printing and cutting. These improvements provide significant time savings since no user intervention is needed when a cut is made. This process is superior to some competing devices that don't offer automatic sheet-cutting, integrated contour/die-cutting function, or other devices that offer only a manual sheet-cut option. (Buyers Lab did not perform any custom/contour cutting during testing.)





A new perforated cut function has been introduced with Roland's SG2- and VG2-series printers that, when used in conjunction with the VersaWorks 6 software, enables the production of die-cut, ready-made prints. This productivity-boosting feature eliminates the need for post-trimming and is ideal for creating unique, custom-shaped stickers and decals that can be shipped immediately after cutting.





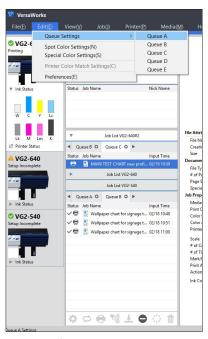
■ The Roland DG Mobile Panel app now has better connectivity, and Buyers Lab successfully utilized it throughout the evaluation without issue. As an alternative to accessing operations at the device control panel, the mobile app provides straightforward, intuitive operation for all processes that are typically found in sub-menus at the panel.



- As the device is warming up, the Roland SG2-540 now displays the heater temperatures directly on the control
- panel so an operator can readily see when the device reaches operating temperature and will be ready to print.
- The SG2-540 features three printhead height selections versus two that were available for the legacy models, enabling improved optimization of print quality.



- A new "multi-cropmark" feature is available in the VersaWorks 6 RIP for more accurate printing and cutting alignment, even with lengthy jobs.
- Roland has incorporated an "accessory box" on top of the device, able to hold a mobile device and/or tools such as spare cutting blades or blade holders, etc.
- There are new/more input profiles available for the SG2 series of printers than there were for the legacy models. In fact, Buyers Lab utilized the new Roland-recommended "True Rich Color" input profile for all testing that provided the results outlined throughout this report.
- There are now five queues (A through E) available in the VersaWorks 6 RIP offering a greater number of configurable presets/queues vs. the two queues available in the previous RIP version.



Queue Selection

SPEED



- The print speeds and all quality assessments for the Roland TrueVIS SG2-540 were measured for two A0-size test targets using the Avery Dennison MPI 1105 profile, while the "PCV4" profile was used for previous testing on the SG-540 device. An Avery Dennison MPI 3000 media profile was used for that media during this test, while the "GCVP" profile was used during the previous SG-540 evaluation. Notably, the high speed/7 pass setting provided acceptable image quality results for the SG2-540, while the slower standard/10 pass setting was required to deliver suitable quality during the SG-540 evaluation.
- As seen in Table 9, at the high quality/14 pass setting it took 23 minutes and 39.25 seconds to print on MPI 1105 media, which is significantly faster than the competitive average, by 22.1 percent. The SG2-540 also printed two targets in 14 minutes and 19.15 seconds at the high speed/7 pass setting on the same media, which is 13.0 percent slower than the competitive average.



- As seen in Table 10, on Avery Dennison MPI 3000 media, the SG2-540 produced the two targets in 14 minutes and 19.19 seconds at the high speed/7pass quality setting, which is 29.7 percent slower than the competitive average.
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Table 9

SG2-540	Profile/ Quality Setting	Speed (sec)	Speed (sec)	Competitive Average 2	% Faster/ Slower than Competitive
	MPI 1105	1 Job	2 Jobs	Jobs (sec)	Average
MDI 1105	HS/7 Pass	428.50	859.15	760.63	-13.0%
MPI 1105	Std/10 Pass	498.19	999.44	*	*
	HQ/14 Pass	702.97	1419.25	1821.15	+22.1

SG-540 (Previous model)	Profile/ Quality Setting	Speed (sec)	Speed (sec)
	PCV4	1 Job	2 Jobs
MDI 110E	Std/10 Pass	462.51	931.63
MPI 1105	Std/12 Pass	548.90	1,103.47
	HQ/14 Pass	655.61	1,320.00



Table 10

SG-540 CMYK (Previous Model)	Profile/ Quality Setting	Speed (sec)	Speed (sec)	Competitive Average 2 Jobs (sec)	% Faster/ Slower than Competitive
	MPI 3000	1 Job	2 Jobs	Jobs (sec)	Average
MBI 2000	HS/7 Pass	427.25	859.19	662.54	-29.7%
MPI 3000	Std/10 Pass	503.88	1,010.78	*	*
	HQ/14 Pass	706.82	1,427.22	*	*

SG-540 CMYK (Previous Model)	Profile/Quality Setting	Speed (sec)	Speed (sec)
MPI 3000	GCVP	1 Job	2 Jobs
	HS/7 Pass	384.11	768.90
	Std/10 Pass	461.06	925.95
	HQ/14 Pass	657.10	1,318.00

^{*} Competitive averages are not calculated for these quality settings.

TEST OBJECTIVE AND SUPPORTING TEST DATA

Keypoint Intelligence - Buyers Laboratory was commissioned by Roland DG Corporation, Hamamatsu, Japan to conduct confidential imaging device performance testing on the pre-launch Roland DG TrueVIS SG2-540 single CMYK eco-solvent ink 54-inch large format device. This report highlights the relative strengths and weaknesses in the areas of image quality, usability and speed and provides analyses against the competitive averages for devices previously tested by Buyers Lab. The unit was evaluated at the manufacturer's facility in Hamamatsu, Japan. 54-inch rolls of Avery Dennison MPI 1105 – polymeric cast vinyl, MPI 2105 – calendared vinyl film and MPI 3000 – monomeric calendared vinyl media were tested in each device. All test files were submitted using the VersaWorks 6 RIP provided by the manufacturer. The respective Avery Dennison MPI 1105 and MPI 3000 profiles were used for printing all samples, as was the "True Rich Colors" color management RIP setting.



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