

CustomTest Report

A Comprehensive Keypoint Intelligence Field Evaluation

Roland DG TrueVIS VG2-640/540

Eight color (CMYKLcLmLkWt) Eco-Solvent Wide Format Printer/Cutter with White Ink

8 Color: CMYKLcLmLk White







OUR TAKE

The successor to Roland's TrueVIS VG-series, the VG2-640, as tested in its white ink configuration (CMYKLcLmLkWt), delivered a strong overall performance in BLI's evaluation. Featuring Roland's new TR2 eco-solvent inkset, the 64-inch printer produced halftone images that were vibrant, smooth-appearing, with high contrast, earning very good or excellent ratings for a majority of our image quality targets. Furthermore, the VG2-640 was able to reproduce a wide range of colors as demonstrated by the larger-than-average color gamut volumes, while also delivering extremely low Delta E* measurements for many coporate colors out of the box, ensuring exceptional color accurracy. In our multi-panel wallpaper consistency test, the VG2-640 produced panels with near-perfect dimensional stability and color accurracy, guaranteeing output for side-by

-side display will always be spot on. In the usability category, Roland has made several noteworthy improvements to the VG2-640 over the VG-series. Two that BLI most appreciates are the newly-designed media edge clamps and center pinch rollers that no longer have to be removed when a sheet cut or contour cut is initiated, a definite productivity booster. The upgraded complimentary VersaWorks 6 RIP, which continues to offer intuitive operation for all large format print and cut tasks, now features five queues instead of two, so operators can create even more time-saving workflow presets. Intended for sign shops, PSPs, vehicle graphics producers and a multitude of other print and cut applications, the TrueVIS VG2-640 with white ink will be a welcomed addition to any print shop.

*Delta E is a way of showing the degree of color differences between two colors. A lower delta E value represents a better color accuracy.

July **2019**



BENEFITS

- Exceptional PANTONE color matching capabilities ensures precise 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 Roland 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

ADVANTAGES

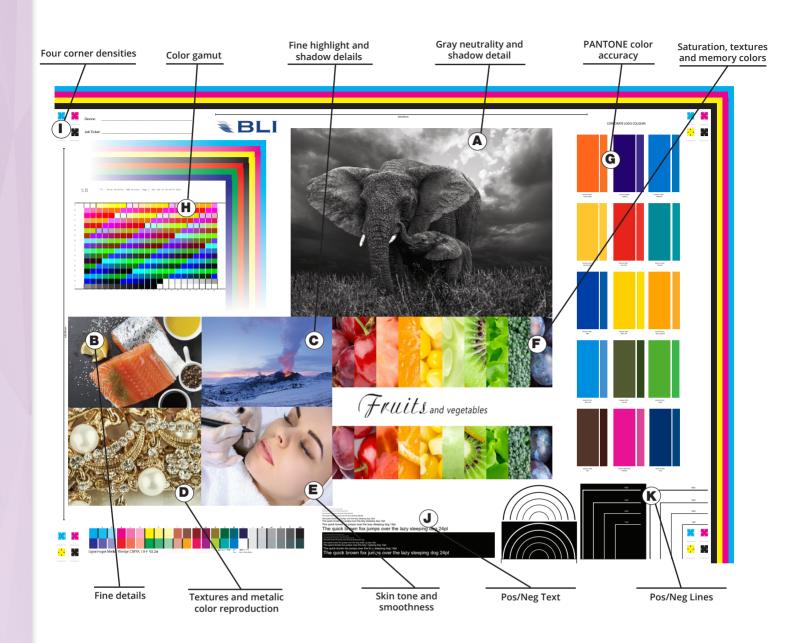
- Majority of halftone images are vibrant with very good contrast and fine details
- Exceptional dimensional stability leads to highly accurate multi-panel printing
- Remote access via Mobile Panel app on Android or iOS devices for easy monitoring and conducting maintenance tasks
- Remaining media length counted down; "print memo" length-tracking capability
- Integrated automatic cutter with redesigned edge clamps and center pinch rollers for increased productivity

IMAGE QUALITY



- Among the printer's many strengths is the above average image quality that the TrueVIS VG2-640 delivered. A large majority of BLI's halftone images were rated either very good or excellent at each of the test conditions as seen in Table 1. These results compare favorably against the previously-tested Roland VG-640 device configured with white ink, which had a cumulative halftone image quality score of 4.0 stars. The halftone score for the TrueVIS VG2-640 is 4.5 stars.
- The elephant image earned a "Very Good" rating for two of the three print scenarios and was described as having a photo-like appearance, neutral gray with above average contrast, though slightly dark.
- The salmon image was rated "Excellent" for two of the three scenarios and described as vibrant with high contrast, neutral gray background and very good details.
- The volcano image was rated "Excellent" at the high quality setting with a photo-like, smooth and bright appearance.





- The jewelry image garnered a "Very Good" rating for each print scenario with above average sharpness and an overall bright appearance.
- The face image printed on MPI 1105 at the most productive setting received an "Excellent" rating and described as having a bright, smooth appearance with excellent details and contrast.
- The fruit image also earned a "Very Good" rating for each print scenario exhibiting bright, realistic colors with very good details and saturation.

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Table 1

Images	MPI 3000: Most Productive (6 Pass)	MPI 1105: Most Productive (5 Pass)	MPI 1105: Highest Quality (13 Pass)
Elephants	Very Good	Good	Very Good
Salmon	Excellent	Excellent	Very Good
Volcano	Very Good	Very Good	Excellent
Jewelry	Very Good	Very Good	Very Good
Face	Very Good	Excellent	Very Good
Fruit	Very Good	Very Good	Very Good

Halftone image quality was assessed using BLI'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 VG2-640, the high speed/6 pass setting was selected for MPI 3000 and the high speed/5 pass for the MPI 1105 media, as was the "Generic Vinyl 1" profile and the "True Rich Color" Color Management RIP preset. The target was also printed on MPI 1105 media at the highest quality/13 pass setting. 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.

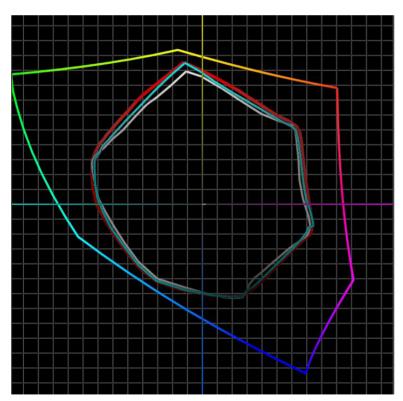
Color Gamut



- The Roland VG2-640 white ink device produced slightly larger color gamuts for the three test scenarios compared against all eco-solvent/latex ink devices tested to date. At the most productive 6 pass setting on MPI 3000 media, the color gamut CIE volume measured 491,808, which is 0.9 percent larger than the competitive average. Likewise, at the most productive 5 pass setting on MPI 1105 media, the device produced a 2.8 percent larger color gamut volume than the average. At the highest quality setting, the Roland device's gamut was 8.3 percent larger than the average. (See Table 2)
- When compared against the white ink Roland VG-640 that BLI previously tested, the new device's color gamut volumes were smaller at two of the three print scenarios, by 1.5 percent on MPI 3000 media and by 19.3 percent on MPI 1105 at the high speed setting. At the high quality setting, however, the color gamut volume for the VG2 printer surpassed that of the legacy device by 4.4 percent. It should be noted that although the media used in both tests were identical, the media profile, color management settings and the RIP version were different, which could be cause for these variances.

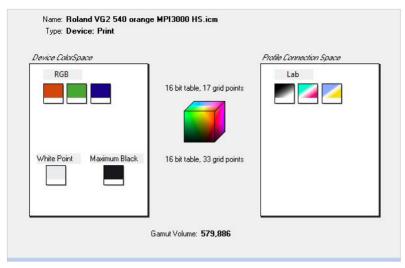
Table 2

Media: Setting	Graphic Color Representa- tion	Roland VG2- 640 Color Gamut (CIE) Volume	Competitive Average (CIE) Volume of All Tested Devices	Percent Smaller/ Larger Than Competition	Roland VG-640 Dual CMYK Ink Color Gamut (CIE Volume)	Percent Smaller/ Larger Than Roland VG-640
Avery Dennison MPI 3000: Most Productive (6 Pass)	White	491,808	487,460	+0.9%	499,224	-1.5%
Avery Dennison MPI 1105: Most Productive (5 Pass)	Cyan	520,851	506,782	+2.8%	645,755	-19.3%
Avery Dennison MPI 1105: Highest Quality (13 Pass)	Red	551,862	509,538	+8.3%	528,512	+4.4%

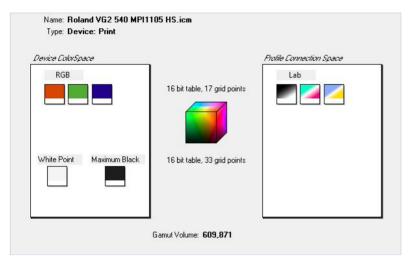


Roland VG2-640 with white ink compared against Adobe RGB(1998) color space (multi-color graph)

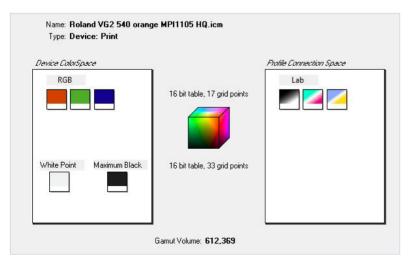
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Roland VG2-640 color gamut volume on Avery Dennison MPI 3000 at high speed/6 pass setting



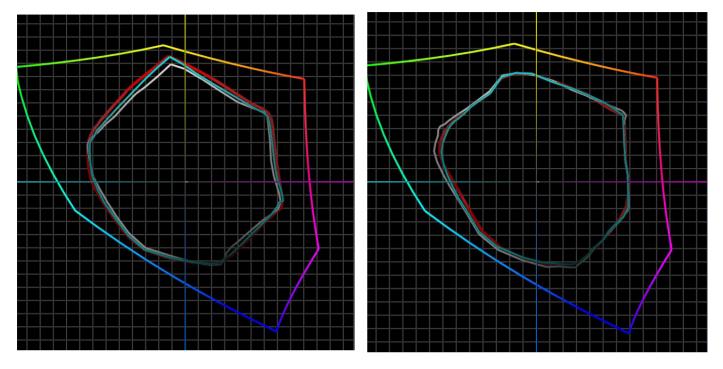
Roland VG2-640 color gamut volume on Avery Dennison MPI 1105 at high speed/5 pass setting



Roland VG2-640 color gamut volume on Avery Dennison MPI 1105 at high quality/13 pass setting

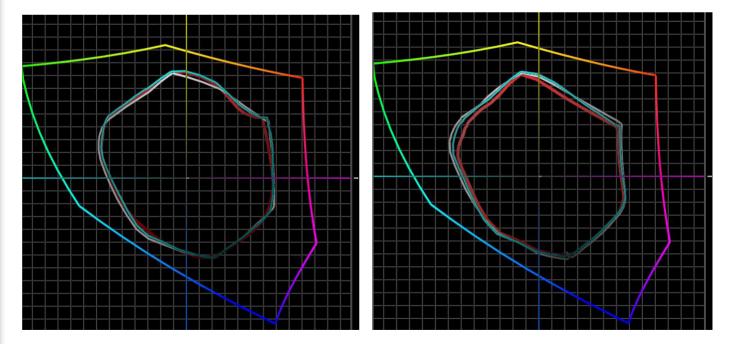


For comparison purposes, the color gamut graphs for the same three print scenarios for three competitor devices that employ six or seven ink colors are displayed below.



VG2-640 with white ink color gamut

Competitor A: device color gamut



Competitor B: device color gamut

Competitor C: device color gamut

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PANTONE CORPORATE COLOR ACCURACY



- As seen in Table 3, the Roland VG2-640 produced better color accuracy on Avery Dennison MPI 1105 media versus the competitive average of BLI-tested devices to date. At the most productive high speed/5 pass setting the VG2-640 delivered a cumulative Delta E00 average of 3.32 for 15 corporate colors versus a competitive average of 4.79. The VG2-640 also produced 13 of 15 colors with better Delta E00 values than their competitive average.
- As seen in Table 4, the VG2-640 produced better color accuracy at the high quality setting as well, with a Delta E00 average of 3.00 versus a competitive average of 4.30. Fourteen of 15 colors were produced with lower Delta E00 values than the competitive average.
- At the high speed setting, the new Roland VG2-640 with white ink produced virtually identical Delta E00 results (3.32 vs. 3.34) versus when the previous model, the VG-640, was evaluated by BLI. At the high quality setting the difference in color accuracy was slightly better for the new device (3.00 vs. 3.40). Again, it should be noted that although the media used in both tests were identical, the RIP software versions and RIP settings were not.

	Table 3	VG2- 640: MPI 1105 High Speed/5 Pass Generic Vinyl 1	Com- petitive Average: MPI 1105 Most Pro- ductive Print Speed	Roland VG-640 w/White Ink	Table 4		VG2- 640: MPI 1105 High Qual- ity/13 Pass Generic Vinyl 1	Com- petitive Average: MPI 1105 Highest Quality Print Speed	Roland VG-640 w/White Ink
PAN	TONE Color	ΔΕ00	ΔΕ00	ΔΕ00	PAN	TONE Color	ΔΕ00	ΔΕ00	ΔΕ00
165 C	Home Depot	4.34	7.50	5.60	165 C	Home Depot	4.00	6.42	5.90
2685 C	Cadbury	7.03	8.26	4.66	2685 C	Cadbury	5.16	7.22	4.90
285 C	Walmart	3.91	4.61	2.24	285 C	Walmart	3.59	4.07	3.04
123 C	McDonalds	4.00	4.08	4.78	123 C	McDonalds	3.85	4.25	5.09
485 C	Coca Cola	2.53	2.83	3.37	485 C	Coca Cola	2.23	2.79	3.87
321 C	Siemens	1.91	4.23	2.99	321 C	Siemens	1.45	3.32	1.76
293 C	IKEA	3.67	7.35	2.86	293 C	IKEA	3.29	6.06	2.68
109 C	IKEA	4.37	3.52	3.95	109 C	IKEA	3.72	3.39	3.72
137 C	Veuve Clicquot	3.58	5.56	4.44	137 C	Veuve Clicquot	4.04	5.12	4.58
279 C	Microsoft	5.17	4.39	3.20	279 C	Microsoft	3.49	4.24	4.12
574 C	Harrods	1.57	2.43	1.12	574 C	Harrods	2.50	2.61	1.53
361 C	FedEx	1.41	2.55	1.34	361 C	FedEx	1.85	2.48	1.95
476 C	UPS	1.43	2.95	2.89	476 C	UPS	1.75	2.49	0.58
Rhod. C	T-Mobile	3.17	4.59	3.94	Rhod. C	T-Mobile	3.09	4.26	5.05
294 C	Ford	1.76	7.05	2.73	294 C	Ford	1.05	5.80	2.16
Ave	erage ΔE00	3.32	4.79	3.34	Ave	erage ΔE00	3.00	4.30	3.40

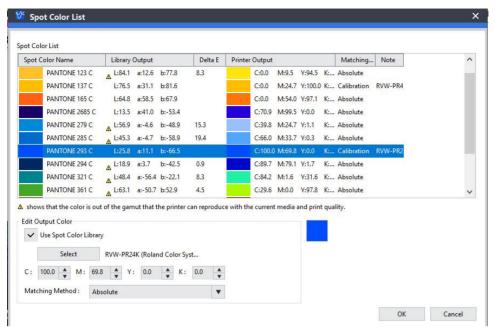


■ Even though very accurate color matching results were achieved "out of the box" by the TrueVIS VG2-640 with white ink, BLI analysts were able to achieve even better color matching by associating the PANTONE colors to the Roland Color System Library within the VersaWorks 6 RIP. This is an easy and accurate, albeit manual, method for even more accurate spot and PANTONE color matching. BLI 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, looking for colors that were a closer match to the PANTONE reference library within the spectrophotometer's library. We were able to find closer matches for six of the 15 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, BLI's test chart was reprinted on MPI 1105 media, again using the Generic Vinyl 1 profile at the high speed setting, which produced the lower Delta E values for six colors as outlined in Table 5.

Tab	le 5	VG2-640: MPI 1105 High Speed/5 Pass Generic Vinyl 1	After Adjustments In VersaWorks 6 Using Roland Color Library
PANTON	NE Color	ΔΕ00	ΔΕ00
165 C	Home Depot*	4.34	4.34
2685 C	Cadbury*	7.03	7.03
285 C	Walmart	3.91	2.89
123 C	McDonalds	4.00	2.66
485 C	Coca Cola*	2.53	2.53
321 C	Siemens*	1.91	1.91
293 C	IKEA	3.67	2.11
109 C	IKEA*	4.37	4.37
137 C	Veuve Clicquot	3.58	3.02
279 C	Microsoft	5.17	2.46
574 C	Harrods*	1.57	1.57
361 C	FedEx*	1.41	1.41
476 C	UPS*	1.43	1.43
Rhod. Red C	T-Mobile	3.17	1.35
294 C	Ford*	1.76	1.76
Averag	je ΔΕ00	3.32	2.72

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





PANTONE color adjustments made in VersaWorks 6 RIP

DENSITY

- Optical density remained highly stable across the image for each color under the three print scenarios on the A0-size target. (Table 6)
- At the high speed setting on both media, cyan and black densities were appreciably higher for the VG2-640 than the competitive average, while yellow density met the average and magenta density was slightly below average. At the highest quality setting, the VG2-640 delivered higher cyan and magenta densities, while yellow and black were on par with the average.

Table 6

MPI 3000 – High Speed/6 Pass	Top Left	Top Right	Bottom Left	Bottom Right	Maximum Density Difference	Competitive Average Density
Cyan	1.97	1.86	1.90	1.93	0.11	1.57
Magenta	1.33	1.29	1.28	1.29	0.05	1.38
Yellow	0.97	0.97	0.98	0.97	0.01	0.96
Black	2.08	2.10	2.10	2.12	0.04	1.80

MPI 1105 – High Speed/5 Pass	Top Left	Top Right	Bottom Left	Bottom Right	Maximum Density Difference	Competitive Average Density
Cyan	2.01	2.03	2.08	2.07	0.07	1.55
Magenta	1.35	1.35	1.36	1.35	0.01	1.46
Yellow	0.97	0.95	0.95	0.95	0.02	0.96
Black	1.90	1.94	1.92	1.92	0.04	1.78



MPI 1105 – High Quality/13 Pass	Top Left	Top Right	Bottom Left	Bottom Right	Maximum Density Difference	Competitive Average Density
Cyan	1.95	1.97	1.95	2.00	0.05	1.54
Magenta	1.60	1.59	1.61	1.59	0.02	1.51
Yellow	1.02	1.00	1.02	1.01	0.02	1.01
Black	1.78	1.80	1.79	1.82	0.04	1.75

COLOR CONSISTENCY - DELTA E00 ACROSS PAGE

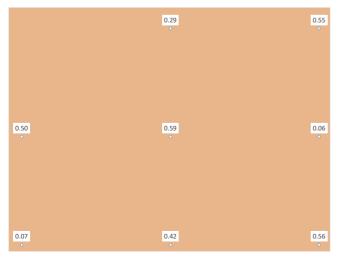
■ Each of BLI's three neutral color test targets were produced uniformly with Delta E00 color variation averaging less than 1.00 for each. The average Delta E measurements were on par with the competitive averages. (Table 7)

Table 7



Neutral Gray

Device Average 0.92 Competitive Average 0.81



Skin Tone 1

Device Average 0.38 Competitive Average 0.83





Skin Tone 2
Device Average 0.67
Competitive Average 0.63

MULTI-PANEL WALLPAPER CHART: COLOR AND LINE CONSISTENCY



- In BLI's wallpaper consistency test, the Roland VG2-640 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 1.01-mm in portrait orientation, and just 0.10-mm on panels that were rotated 180°.
- The maximum color variation for three neutral colors between the six panels was also quite low. In portrait orientation the maximum Delta E00 color difference between panels measured 1.50 in portrait orientation, while in rotated orientation the maximum Delta E00 measurement was 1.15.





Table 8

Color	Location on Page	Maximum Delta E00 On Panels in Portrait Orientation	Maximum Delta E00 On Panels Rotated 180°
Noutral Cray	Тор	1.14	1.15
Neutral Gray	Bottom	0.32	0.35
al: = 4	Тор	1.50	0.50
Skin Tone 1	Bottom	0.89	0.70
Clair Tono 2	Тор	0.80	0.59
Skin Tone 2	Bottom	1.02	0.42
Line Measurement Accuracy -		1.01	0.10

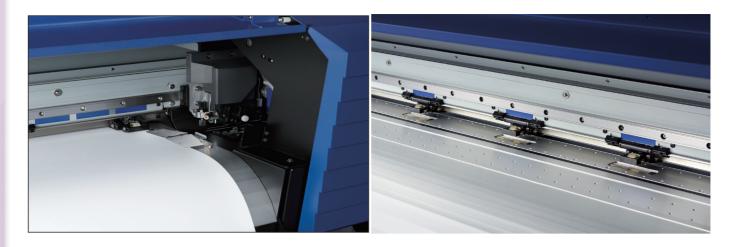
Line Measurement Accuracy – Maximum Difference Between Panels (in mm)	1.01	0.10
Line Measurement Accuracy – Competitive Average (in mm)	0.73	0.60

USABLITY



- The VG2 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 VG2 series printers now feature a 2 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 VG2 devices has been significantly improved in two ways and BLI believes it is now among the best available compared against devices previously 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-cut 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 during cutting. 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. (BLI did not perform custom/contour cutting during testing.)





■ The Roland DG Mobile Panel app now has better connectivity, and BLI successfully utilized it throughout the weeklong 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.



Trinter Else Bevice states intent settings media reserv

 As a device is warming up, the Roland VG2-640 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.

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- The VG2-640 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 media profiles available for the VG2 series of printers than there were for the legacy models. In fact, BLI 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 VG2-640 with white ink were measured for two A0-size test targets using the Roland-recommended "Generic Vinyl 1" profile. The "PCV4" profile was used for the MPI 1105 media and the "GCVP" profile was used for MPI 3000 media when the VG-640 device with white ink was tested.
- As seen in Table 9, on Avery Dennison MPI 1105 media the VG2-640 printed two targets in 11 minutes and 28.66 seconds at the high speed/5 pass setting, which is 12.5 percent faster than the competitive average. At the high quality/13 pass setting, it took 24 minutes and 6.86 seconds to print, 21.7 percent faster than the competitive average.

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As seen in Table 10, on Avery Dennison MPI 3000 media, the VG2-640 with white ink using the same "Generic Vinyl 1" profile produced the two targets in 13 minutes and 35.41 seconds at the high speed/6 pass quality setting, which is 21.4 percent slower than the competitive average.

Table 9

VG2-640 8 color w/ white	Quality Setting	Speed (sec)	Speed (sec)		
MPI 1105	Generic Vinyl 1	1 Job	2 Jobs	Competitive Average 2 Jobs (sec)	% Faster/ Slower than Competitive Average
	HS/5 Pass	338.85	678.66	775.84	+12.5%
	Std/10 Pass	544.69	1098.85	*	*
	HQ/13 Pass	717.88	1446.86	1847.97	+21.7%

VG-640 Dual CMYK (Previous model)	Profile/Quali- ty Setting	Speed (sec)	Speed (sec)
	PCV4	1 Job	2 Jobs
MPI 1105	HS/6 Pass	332.43	670.36
IVIPI I 105	Std/10 Pass	465.33	938.51
	HQ/13 Pass	1167.07	2351.41

Table 10

VG2-640 8 color w/ white	Profile/Quality Setting	Speed (sec)	Speed (sec)		
MPI 3000	Generic Vinyl 1	1 Job	2 Jobs	Competitive Average 2 Jobs (sec)	% Faster/ Slower than Competitive Average
	HS/6 Pass	407.94	815.41	671.63	-21.4%
	Std/10 Pass	544.69	1098.69	*	*
	HQ/13 Pass	718.00	1447.84	*	*



VG-640 Dual CMYK (Previous model)	Profile/Quali- ty Setting	Speed (sec)	Speed (sec)
MPI 3000	GCVP	1 Job	2 Jobs
	HS/6 Pass	332.13	670.48
	Std/10 Pass	465.28	938.46
	HQ/13 Pass	1166.93	2351.36

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

TEST OBJECTIVE AND SUPPORTING TEST DATA

Keypoint Intelligence - Buyers Laboratory (BLI) was commissioned by Roland DG Corporation, Hamamatsu, Japan to conduct confidential imaging device performance testing on three pre-launch Roland DG TrueVIS eco-solvent ink large format devices - the 54-inch VG2-540 eight color (CMYKLcLmLkOr) printer with orange ink, the 64-inch VG2-640 four color dual CMYK printer, and the 64-inch VG2-640 eight color (CMYKLcLmLkWh) printer with white ink. This report highlights the relative strengths and weaknesses of the eight color VG2-640 with white ink in the areas of image quality, speed and usability and provides analyses against the competitive averages for devices previously tested by BLI. 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. A Roland-recommended Generic Vinyl 1 media profile was used for printing all samples, as was the "True Rich Colors" color management RIP setting.

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