

# Field Test Report

A Comprehensive Keypoint Intelligence Field Evaluation

## Canon Colorado 1650

64-Inch Wide Format Printer  
Four Colour CMYK UVgel Ink



★★★★☆

### Image Quality

|   |   |                                   |       |
|---|---|-----------------------------------|-------|
| ◆ | ◆ | Half-tone Images                  | ★★★★☆ |
| ◆ | ◆ | Colour Accuracy                   | ★★★★☆ |
| ◆ | ◆ | Colour Gamut                      | ★★★★☆ |
| ◆ | ◆ | Multi-Panel Wallpaper Consistency | ★★★★☆ |

★★★★☆

### Usability

|   |   |                                  |       |
|---|---|----------------------------------|-------|
| ◆ | ◆ | Media Handling                   | ★★★★☆ |
| ◆ | ◆ | Device Management and Monitoring | ★★★★☆ |
| ◆ | ◆ | Maintenance and Ink              | ★★★★☆ |

★★★★☆

### Speed

(versus eco solvent/latex devices)

## OUR TAKE

The four-color, 64-inch Canon Colorado 1650 roll-to-roll UVgel printer is an exceptional choice for print shops looking to extend their application capabilities in the wide format market. It packs in all the attractive features of its Colorado 1640 sister model, but offers several new significant benefits, highlighting its impressive versatility. Thanks to both the UVgel 460 inkset and FLXfinish technology, Keypoint Intelligence technicians easily switched from gloss to matte finish without the need to switch inks or media. FLXfinish technology also enhances the device's handling of more porous materials such as soft-signage and uncoated media as each ink droplet is 'fixed' immediately on jetting (due to the gel properties), which allows for better dot gain control and more precise image quality. Double-

sided printing is achievable with print-side-out and -in support and automatic advance correction (AAC) functionality enables optimal registration for both single-sided and double sided printing and ensures consistent print quality covering typical issues caused by batch differences and environmental differences.

UVgel 460 inks provide added flexibility and elasticity necessary for applications in which prints need to be folded, creased, wrapped, or stretched on a frame, without losing the robust characteristics UVgel is known for. Not just versatile, the Colorado 1650 proves to be a true workhorse demonstrating exceptional speeds in all test scenarios when compared with eco solvent and latex ink devices tested to date. In fact, it is up to

FEBRUARY  
2021

three times faster than the competitive average across each quality mode tested. Together with automatic maintenance, user-replaceable components, on-the-fly ink replacement, and a dual input roll drawer with an easy configurable take-up system, the device promises longer uptimes and fast turnaround.

In terms of image quality, colour photographic images were cited for being routinely vibrant, while delivering exceptional neutrality in black-and-white halftones. At the most productive matte speed setting, Keypoint Intelligence judged the matte halftone images to be very good, overall, too. Another highlight, the Colorado 1650 delivered superb PANTONE colour accuracy, generating Delta E00 measurements no greater than 2.32 on average over 15 corporate colours, a feat certainly to be prized by most colour critical print shops. Plus, it yielded extremely accurate dimensional stability during its multi-panel wallpaper assessment, thereby demonstrating it can handle wall-hanging or other side-by-side printing applications with precision and ease, even for long-term applications. Notably, the device is very well-positioned for the growing digital wallpaper marketplace given its modular design that supports a Jumbo Roll interface for continuous feeding, proven KPI's five-star dimensional stability and accuracy, and matte finish capabilities (a common finishing style in wallpaper production). Operational ease of use is boosted by straightforward control panel design, while job submission and job modification are driven via the intuitive ONYX Thrive RIP, with Caldera and other common RIP's also supported. Operators will be quick to adopt the free Remote Control app – conveniently accessed via iOS or Android platforms – as it provides alerts for print status, remaining ink, media, and waste ink usage. An all-round impressive performer, the Canon Colorado 1650 is a standout choice for virtually all wide format printing applications.

## BENEFITS

- New unique FLXfinish curing technology provides added versatility, enabling gloss or matte finish options without the need to switch media or inks
- Enhanced colour matching capability and outstanding PANTONE colour accuracy ensures high-quality, consistent runs
- Double-sided printing capability for added versatility
- Automated media feeding and automatic roll switching enhance usability
- Dual-roll configuration boosts productivity; standard take-up system for longer unattended workflows
- Optional Universal Jumbo Roll interface allows for even longer uninterrupted workflows, and is well-suited for digital wallpaper production
- Straightforward print job submission and job modifications via common RIPs like ONYX, Caldera and also with drivers available for Ergosoft, Colorgate, EFI, Print Factory, and Shiraz
- Automatic maintenance eliminates the need for daily manual intervention and user-replaceable components keep service downtime to a minimum
- 2.5 litre ink reservoirs per colour capacity and on-the-fly ink replacement enable longer printing uptime
- Improved, odorless and instant dry UVgel 460 inks provide elasticity and stretch when prints need to be folded or wrapped
- UVgel technology creates an ink layer with a very high mechanical and chemical resistance, strong enough to create applications without lamination

Canon Production Printing has a heritage of innovative technology development which has often resulted in their products providing key differentiators compared to other ink devices in the marketplace; UVgel is no exception to this. Canon Production Printing promotes the following key benefits that its unique UVgel technology offers compared to alternative ink technologies:

**Stable and controlled dot gain** - UVgel ink's gel properties prevents coalescence between ink drops thereby preventing spread. Not only does this enhance speed performance (as fewer passes are required), but it allows for more precise print quality and 'stable color accuracy and repeatability'.

**Added application versatility** - thanks to a low-heat process, heat-sensitive and cost-efficient, thin media can be accommodated; UVgel 460 ink's improved flexibility and elasticity eliminates cracking on soft signage and textile media; it allows for easy application and removal around curves and edges i.e. vehicle graphics (adheres to Avery Dennison ICS warranty and 3M performance guarantee requirements) while still offering a 'significantly higher abrasion resistance than competitive in technologies'.

**Robustness** - highly durable prints suited for outdoor application thanks to 'improved levels of outdoor UV light fastness, abrasion resistance, and washability compared with prevailing technology inks'; high durability removes the need to laminate prints for a wide range of applications.

### ADVANTAGES

---

- Superlative productivity translates to faster turnaround; up to three times faster than previously-tested ink technologies
- Exceptional dimensional stability due to the absence of heat in the printing and curing process. This leads to highly accurate multi-panel printing and the ability to print on heat-sensitive media
- Excellent neutral greys; most productive device settings delivered vibrant output with very good details
- Transparent top cover enables enhanced job inspection while offering protection from UV light
- Job accounting capability via embedded web page
- Convenient alert notifications via smart phone and tablet; remote assistance for support and updates during non-working hours
- Integrated automatic cutter for more streamlined workflows

### LIMITATIONS

---

- Slightly dark appearance for skin tones on Avery Dennison MPI 1105 media, although better results have been seen on similar media

**No water content** - UVgel ink does not contain water which enables improved dimensional stability and consistency, and eliminates the problems associated with media distortion which may be experienced with other ink technologies.

**Sustainability** - UVgel inks are odourless and certified for indoor use and in sensitive environments; AgBB and GREENGUARD Gold certified.



## IMAGE QUALITY



|                                   |       |
|-----------------------------------|-------|
| Halftone Images                   | ★★★★☆ |
| Colour Accuracy                   | ★★★★★ |
| Colour Gamut                      | ★★★★★ |
| Multi-Panel Wallpaper Consistency | ★★★★★ |

## KPI TEST CHART

The KPI Test Chart is a comprehensive visual test tool. It includes a multi-colored border, a color gamut chart, a grayscale and shadow detail test (featuring an elephant), a PANTONE color accuracy chart, a 'Fruits and vegetables' color chart, a skin tone and smoothness test (featuring a woman's face), a fine details and metallic color reproduction test (featuring jewelry), and a positive/negative fine line and text reproduction test (featuring a dog jumping over a dog).

## ▲ HALFTONE IMAGE



| Images    | MPI 3000: Most Productive (2 Pass) | MPI 1105: Most Productive (4 Pass) | MPI 1105: Highest Quality (8 Pass) |
|-----------|------------------------------------|------------------------------------|------------------------------------|
| Elephants | Very Good                          | Excellent                          | Excellent                          |
| Salmon    | Very Good                          | Very Good                          | Very Good                          |
| Volcano   | Good                               | Good                               | Good                               |
| Jewellery | Good                               | Very Good                          | Very Good                          |
| Face      | Good                               | Good                               | Good                               |
| Fruit     | Very Good                          | Very Good                          | Very Good                          |

Halftone image quality was assessed using Keypoint Intelligence's proprietary A0-size wide format test target that comprises six high quality colour/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 Canon Colorado 1650, the "speed gloss 2 pass" setting was selected for the MPI 3000 media and the "high quality gloss 4 pass" setting was selected for MPI 1105. The "EuropeISOCoatedFOGRA27" colour management RIP preset was utilized for both media. The target was printed on MPI 1105 media at the highest quality "specialty 8 pass setting," as well. Each of the six images was cut from the larger target and visually appraised for colour accuracy, brightness, sharpness, and contrast by two technicians at a distance of ten feet for the MPI 3000 media and at a distance of two feet for the MPI 1105 media.

## TEST RESULTS

- Ⓐ The elephant image earned Excellent ratings on MPI 1105 media, with extremely neutral greys and a photo-like appearance with very good contrast and details.
- Ⓑ The salmon image was rated Very Good under all test conditions, exhibiting a neutral grey background with a bright appearance and very good contrast.
- Ⓒ On both media at the most productive setting (MPI 3000/2 Pass; MPI 1105/4 Pass), the volcano image exhibited average contrast and details, and was slightly grainy.
- Ⓓ The jewellery image was rated Very Good on MPI 1105 media based on its bright appearance, with very good details and contrast.
- Ⓔ The facial image exhibited very good highlight details and average contrast and smoothness, earning a Good rating for each print scenario.
- Ⓕ The fruit image was given a Very Good rating under all test conditions based on its vibrant, realistic appearance with very good details and saturation.

As the device also offers a matte print mode, Keypoint Intelligence technicians printed the test target on MPI 3000 to visually assess halftone quality; at the most productive Matte High Speed/3 Pass setting, there was no visible banding and the matte finish quality was judged to be very good, overall.

## ▲ PANTONE CORPORATE COLOUR ACCURACY



### Avery Dennison MPI 1105: Most Productive (High Quality, 4 Pass)

|                |                        |                    |                  |                    |                    |                        |               |                 |
|----------------|------------------------|--------------------|------------------|--------------------|--------------------|------------------------|---------------|-----------------|
| PANTONE Colour | 165 C<br>Home Depot    | 2685 C<br>Cadbury  | 285 C<br>Walmart | 123 C<br>McDonalds | 485 C<br>Coca Cola | 321 C<br>Siemens       | 293 C<br>IKEA | 109 C<br>IKEA   |
| ΔE00           | 4.40                   | 4.80               | 3.35             | 2.29               | 0.62               | 1.41                   | 3.58          | 2.80            |
| PANTONE Colour | 137 C<br>Veuve Cliquot | 279 C<br>Microsoft | 574 C<br>Harrods | 361 C<br>FedEx     | 476 C<br>UPS       | RHOD RED C<br>T-Mobile | 294 C<br>Ford | Average<br>ΔE00 |
| ΔE00           | 3.60                   | 3.29               | 0.94             | 0.59               | 0.62               | 1.91                   | 0.61          | 2.32            |

### Avery Dennison MPI 1105: Highest Quality (Specialty, 8 Pass)

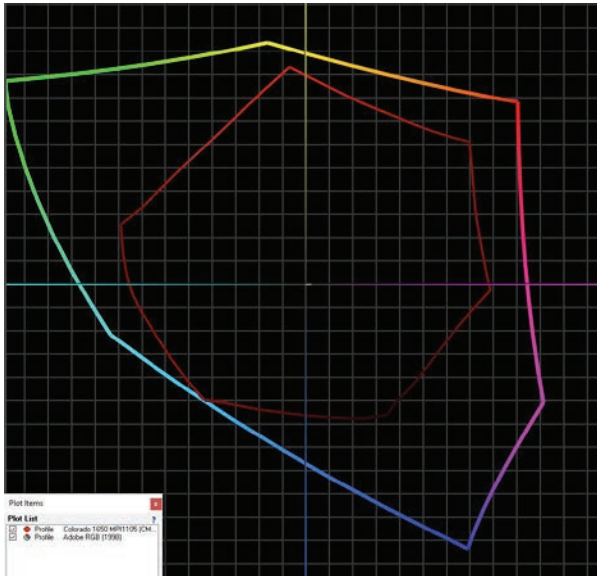
|                |                        |                    |                  |                    |                    |                        |               |                 |
|----------------|------------------------|--------------------|------------------|--------------------|--------------------|------------------------|---------------|-----------------|
| PANTONE Colour | 165 C<br>Home Depot    | 2685 C<br>Cadbury  | 285 C<br>Walmart | 123 C<br>McDonalds | 485 C<br>Coca Cola | 321 C<br>Siemens       | 293 C<br>IKEA | 109 C<br>IKEA   |
| ΔE00           | 4.30                   | 4.48               | 3.66             | 2.55               | 0.44               | 0.32                   | 3.85          | 2.79            |
| PANTONE Colour | 137 C<br>Veuve Cliquot | 279 C<br>Microsoft | 574 C<br>Harrods | 361 C<br>FedEx     | 476 C<br>UPS       | RHOD RED C<br>T-Mobile | 294 C<br>Ford | Average<br>ΔE00 |
| ΔE00           | 3.30                   | 4.57               | 0.37             | 0.23               | 0.59               | 1.96                   | 0.84          | 2.28            |

The average Delta E00 across all the 15 corporate colours measured 2.32 when printed on the Avery Dennison MPI 1105 media at the most productive High Quality/4 Pass setting. Thirteen of 15 colours measured less than 4.0 Delta E00 units under this condition (five of which measured under 1.0). A Delta E value less than 4.0 means there's no meaningful real-world difference that's discernible to the average human eye.

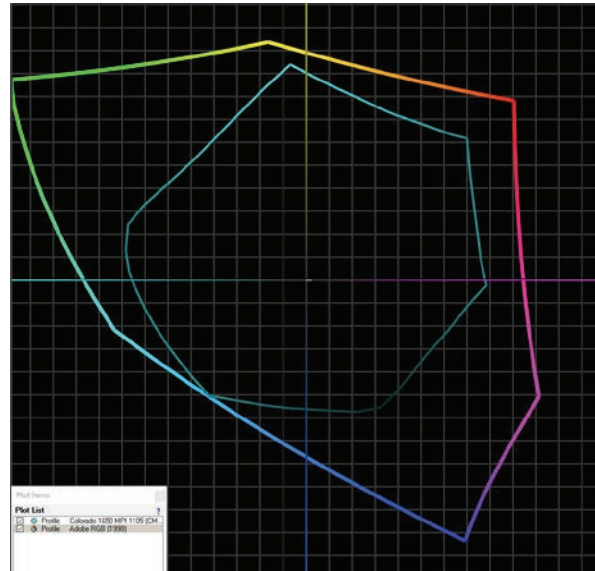
At the highest quality Specialty/8 pass setting, the average Delta E00 measured for all the colours was 2.28; twelve of 15 colours had Delta E00 measurements that were less than 4.0, with six measuring below 1.0. The Colorado 1650 is among the few devices tested to date to achieve a low Delta E00 measurement for Pantone 165, a particularly difficult to match orange; it also achieved amazingly low Delta E00 measurements for Pantone colours 574 and 476.

Even though the Canon Colorado 1650 produced very accurate colour matching results "out of the box", even more precise colour matching can be achieved by associating selected PANTONE colours in the Swatch Books function within the Onyx Thrive RIP. Here, the step range and patch size can be adjusted for further fine tuning. The colour patch chart is logically organized and each colour is printed along with its CMYK component breakdown, which helps to identify the direction to follow should they require an increase or decrease of a specific component colour, for example. Due to time constraints, Keypoint Intelligence technicians were unable to evaluate this feature as fully as hoped.

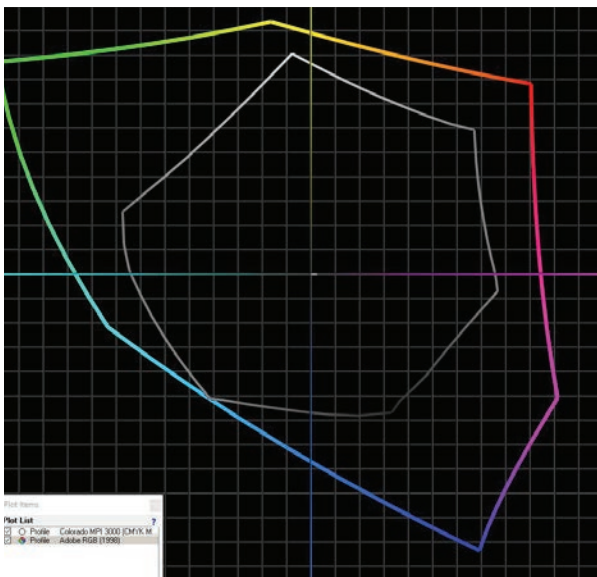
## COLOUR GAMUT



Canon Colorado 1650 colour gamut on Avery Dennison MPI 3000 most productive/2 pass setting (Gloss Speed) compared against Adobe RGB(1998) colour space (multi-colour graph).



Canon Colorado 1650 colour gamut on Avery Dennison MPI 1105 most productive/4 pass setting (Gloss High Quality) compared against Adobe RGB(1998) colour space (multi-colour graph).



Canon Colorado 1650 colour gamut on Avery Dennison MPI 1105 highest quality/8 pass setting (Gloss Specialty) compared against Adobe RGB(1998) colour space (multi-colour graph).

| Media: Setting                                  | Graphic Colour Representation | Colour Gamut (CIE) Volume |
|---|-------------------------------|---------------------------|
| <b>Avery Dennison MPI 3000: Most Productive</b> | White                         | 508,471                   |
| <b>Avery Dennison MPI 1105: Most Productive</b> | Cyan                          | 538,670                   |
| <b>Avery Dennison MPI 1105: Highest Quality</b> | Red                           | 535,863                   |

The three colour gamuts produced by the Canon Colorado 1650 on MPI 3000 and MPI 1105 media are larger than average for devices tested to date.



# Canon Colorado 1650 Field Test Report



## Density

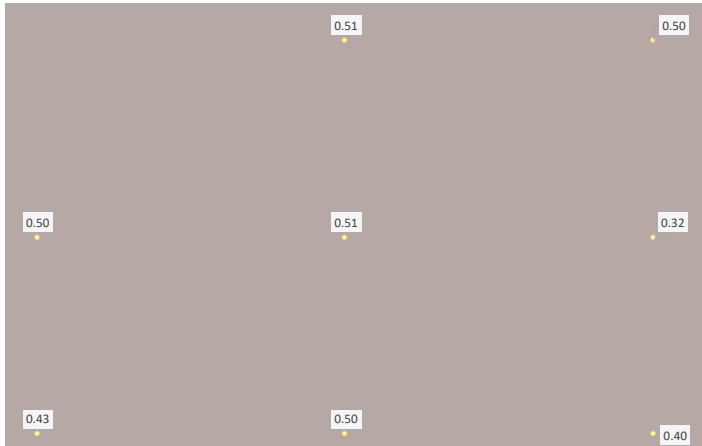
| MPI 3000:<br>Speed/2 Pass | Top Left | Top Right | Bottom<br>Left | Bottom<br>Right | Maximum Density<br>Difference |
|---------------------------|----------|-----------|----------------|-----------------|-------------------------------|
| Cyan                      | 1.61     | 1.62      | 1.64           | 1.63            | 0.03                          |
| Magenta                   | 1.47     | 1.45      | 1.47           | 1.47            | 0.02                          |
| Yellow                    | 0.90     | 0.90      | 0.90           | 0.90            | 0.00                          |
| Black                     | 1.72     | 1.72      | 1.70           | 1.71            | 0.02                          |

| MPI 1105:<br>High Quality/4 Pass | Top Left | Top Right | Bottom<br>Left | Bottom<br>Right | Maximum Density<br>Difference |
|----------------------------------|----------|-----------|----------------|-----------------|-------------------------------|
| Cyan                             | 1.48     | 1.49      | 1.46           | 1.46            | 0.03                          |
| Magenta                          | 1.35     | 1.41      | 1.35           | 1.39            | 0.06                          |
| Yellow                           | 0.78     | 0.78      | 0.78           | 0.76            | 0.02                          |
| Black                            | 1.73     | 1.75      | 1.74           | 1.71            | 0.04                          |

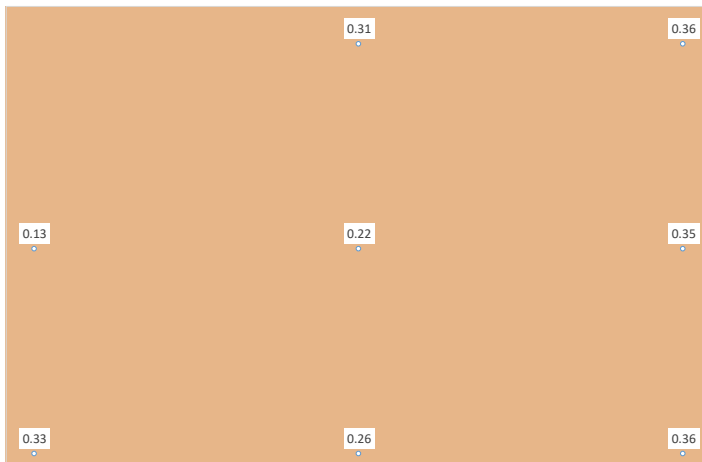
| MPI 1105:<br>Specialty/8 Pass | Top Left | Top Right | Bottom<br>Left | Bottom<br>Right | Maximum Density<br>Difference |
|-------------------------------|----------|-----------|----------------|-----------------|-------------------------------|
| Cyan                          | 1.37     | 1.29      | 1.32           | 1.27            | 0.10                          |
| Magenta                       | 1.32     | 1.29      | 1.28           | 1.26            | 0.06                          |
| Yellow                        | 0.82     | 0.82      | 0.82           | 0.80            | 0.02                          |
| Black                         | 1.63     | 1.57      | 1.67           | 1.54            | 0.13                          |

Optical density remained highly stable across the A0-size page for each colour under the three test scenarios.

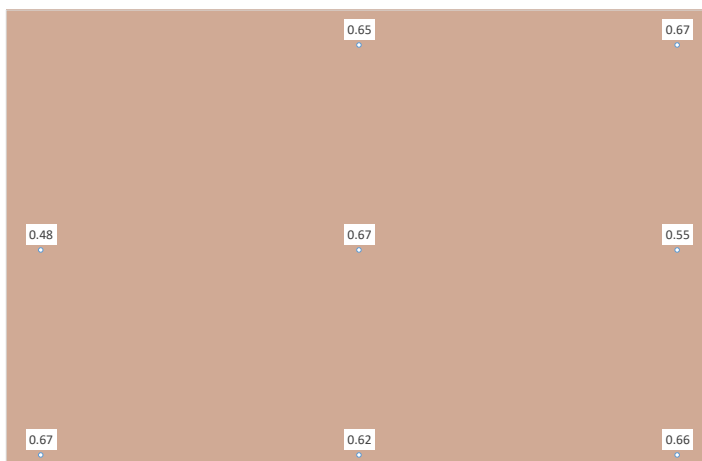
## COLOUR CONSISTENCY – DELTA E00 ACROSS PAGE



**Neutral Grey**  
 Average 0.46  
 Maximum 0.51



**Skin Tone 1**  
 Average 0.29  
 Maximum 0.36



**Skin Tone 2**  
 Average 0.62  
 Maximum 0.67

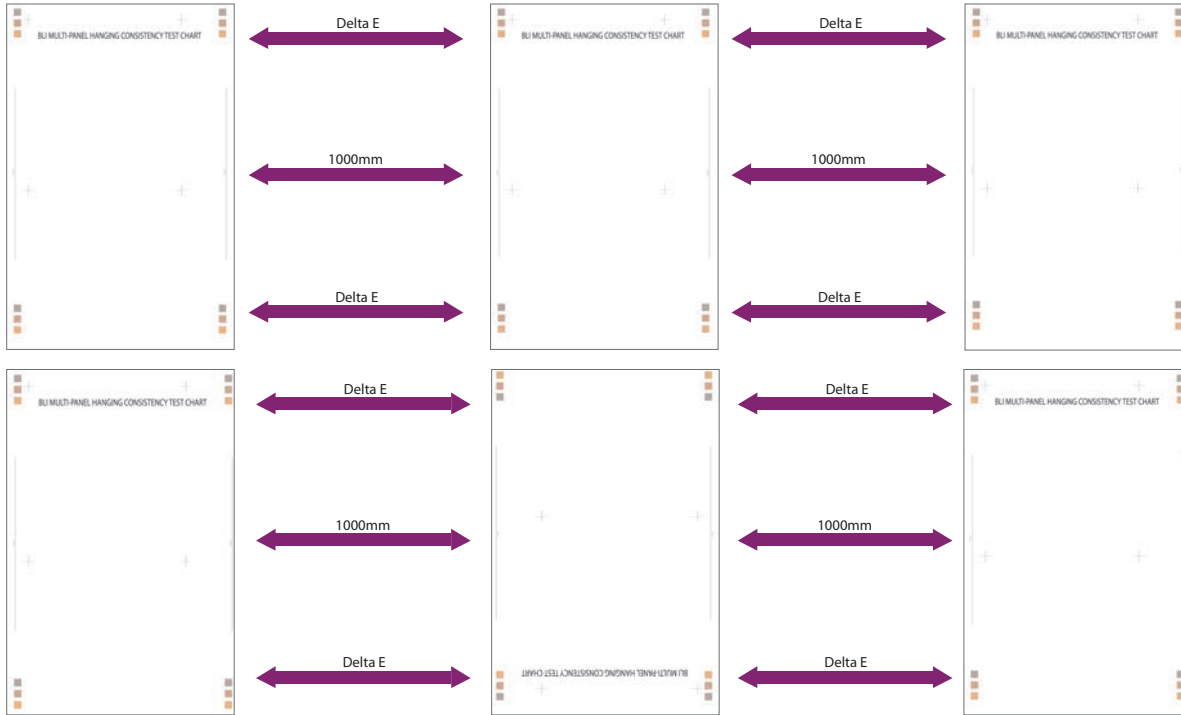
Colour consistency was assessed by comparing the top left corner against eight other locations on three A0-size targets printed on Avery Dennison MPI 1105, each target comprising a different neutral solid colour. The Delta E00 was measured using an XRite eXact<sup>XP</sup> spectrophotometer.

Each of Keypoint Intelligence's three A0-size neutral colour test targets were produced uniformly, with colour consistency remaining highly stable.

## MULTI-PANEL WALLPAPER CHART: COLOUR AND LINE CONSISTENCY



To assess the consistency of colour and line output when producing wall-hanging or other multi-panel artwork, Keypoint Intelligence printed a series of six targets each 6.5 feet in length on Avery Dennison MPI 2005 media, High Quality (4 Pass). Delta E00\* colour differences were measured on the panels' adjoining edges, and the corresponding one meter length lines were measured for accuracy with a micrometer. The panels were assessed both with and without rotation as seen below.



\* Calculated mathematically based on two colours' L\*a\*b\* values, Delta E00 is stated numerically and represents the difference between two colours; the lower the Delta E00 value, the closer the colours match.

| Colour   | Location on Page | Maximum Delta E00 On Panels in Portrait Orientation | Maximum Delta E00 On Panels Rotated 180° |
|--|------------------|---|--|
| Neutral Grey   | Top              | 0.43  | 0.41                                     |
|  | Bottom           | 0.47  | 0.37                                     |
| Skin Tone 1  | Top              | 0.29  | 0.45                                     |
|  | Bottom           | 0.49  | 0.49                                     |
| Skin Tone 2  | Top              | 0.29  | 0.63                                     |
|  | Bottom           | 0.36  | 0.44                                     |
| <b>Line Measurement Accuracy - Maximum Difference Between Panels (in mm)</b> |                  | 0.26  | 0.35                                     |

The maximum colour variation measured 0.49 Delta E units for the three neutral colours across six wallpaper panels in portrait orientation; in rotated orientation, the maximum Delta E was 0.63.

In portrait orientation, the maximum one meter line variation from panel to panel measured 0.26-mm, and for rotated oriented panels it is 0.35-mm.

## ▲ USABILITY



## ▲ MEDIA HANDLING



The media input side is located at the rear of the Colorado 1650 while the media output side is at the front. A dual drawer design enables two rolls to be loaded at any one time for added convenience; it employs auto roll-feeding and auto roll-switching, depending on media used. There are no jacks or lifts to aid media loading as the rolls aren't exposed, but the process is very straightforward. Canon recommends two people are required when loading heavier weight media rolls (up to 25 kg), in compliance with labour regulations.

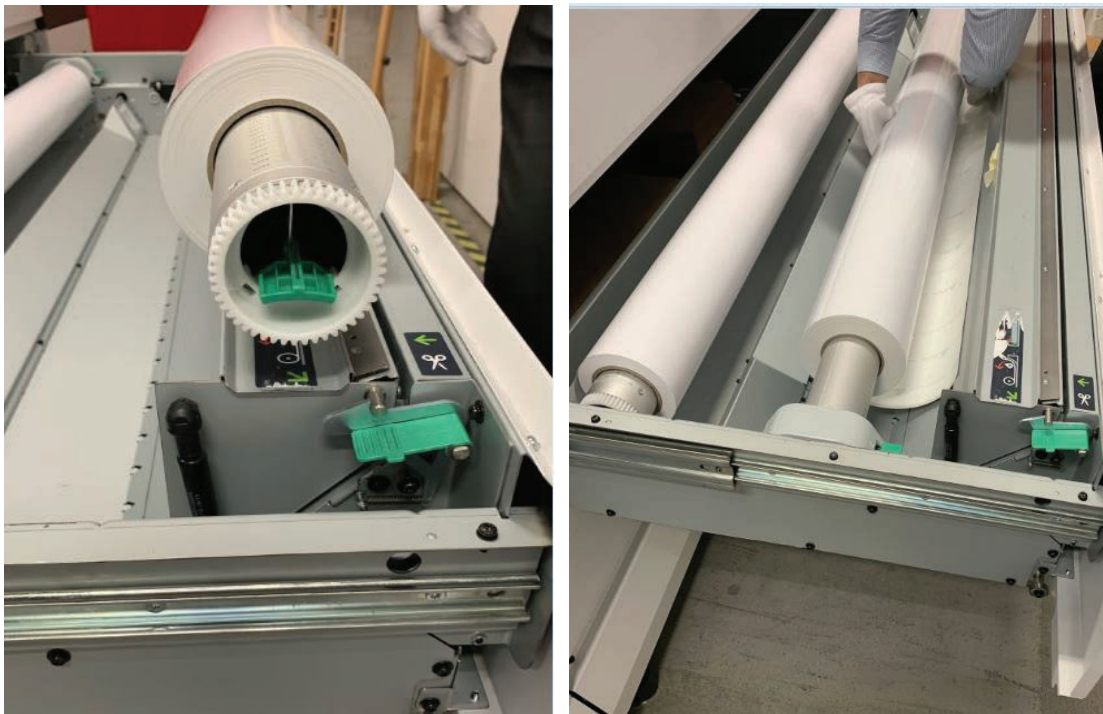
The Colorado 1650 offers significant media handling enhancements over the previous model that include 'inside out' printing for media wound with the printable surface facing in, which not only extends the range of supported media, but allows for double-sided printing, too. To achieve this effect, users must print on the outside of the media roll first, employing the take up roll winder and tension bar, and then load the roll with the printed side in the media drawer for inside printing, ensuring the roll placed in position 2 (rear). Users prepare the printed image for the second side of the double-sided print in the RIP (the user manual provides step-by-step instructions), ensuring the system's automatic advance correction (AAC) feature is enabled; this prints yellow or black markers that are then read by the system and used as a guide to optimize the media step accuracy and registration.

Another key feature, the device's new FLXfinish curing technology, combined with the UVgel 460 inkset, allows users to automatically switch between gloss and matte finish without the need to change substrates or ink—a matte finish can be achieved irrespective of the media used. Keypoint Intelligence technicians noted that even when printing at the most productive matte speed on MPI 1105 media, there was no visible banding, which means acceptable quality is achievable even at the fastest speed.



Media can be rested on the Roll Loading Station (A), a short ledge area on the media drawer, making it easy for the user to insert the media shaft. The media roll is centred on the shaft and aligned with its corresponding media size using the measurement guide that is imprinted on the shaft.





All access levers and user handles are marked green on the device for clear identification. Place media roll back in the media drawer with the edge facing towards the user, and manually feed the paper edge into the metal paper guide. An audible beep signals when media has been loaded successfully with the rest of the process automated; the user must simply confirm the media type and width on the control panel to complete the process.

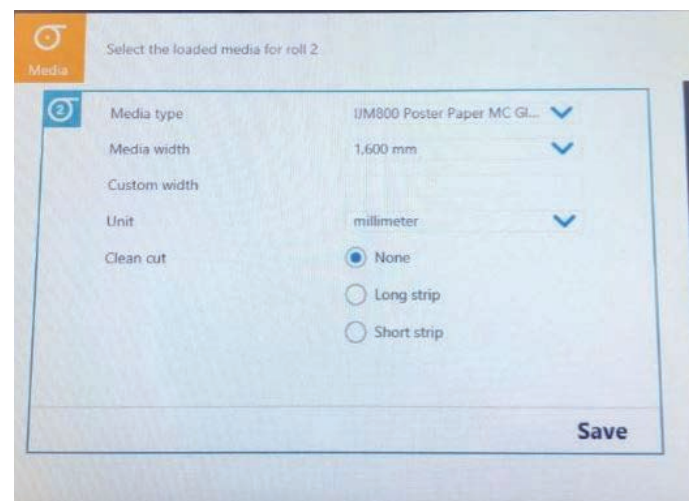
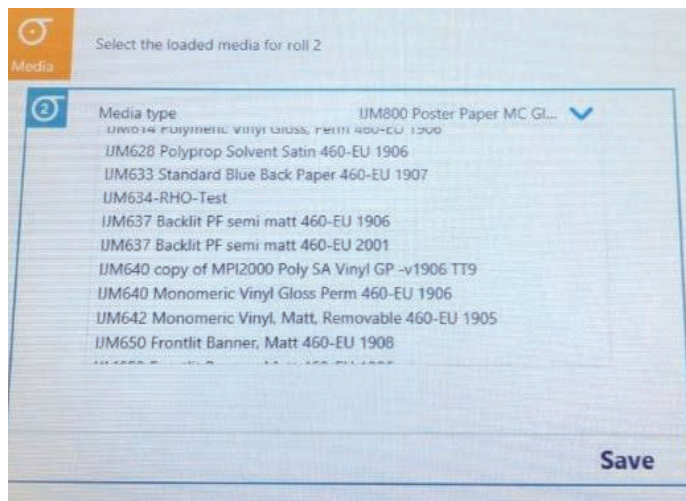


A standard take up system (referred to by Canon as a 'roll winder') enables multiple jobs to be readily collected on to a core, facilitating unattended print runs. Affixing media to the take up core is a straightforward process.

The tension bar is intended for use with flexible and stretchable substrates such as textiles or canvas, as it ensures a tighter winding process for easier media transportation; the tension bar (in the locked position) must be used to ensure smooth media handling with more rigid and stiff media.

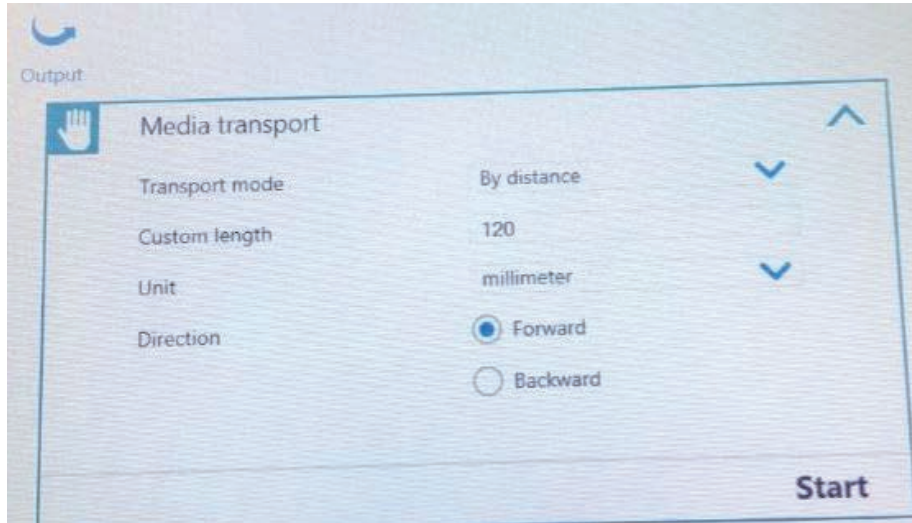


The Jumbo Roll media feeder, available via a third-party manufacturer, allows the device to run longer uninterrupted workflows, handling media rolls up to 400 kg. Moreover, when coupled with the cutter and rewinder options (increasing not just the inbound but also the outbound capacities), this modular system is designed for the continuous feeding and printing of wallpaper applications.



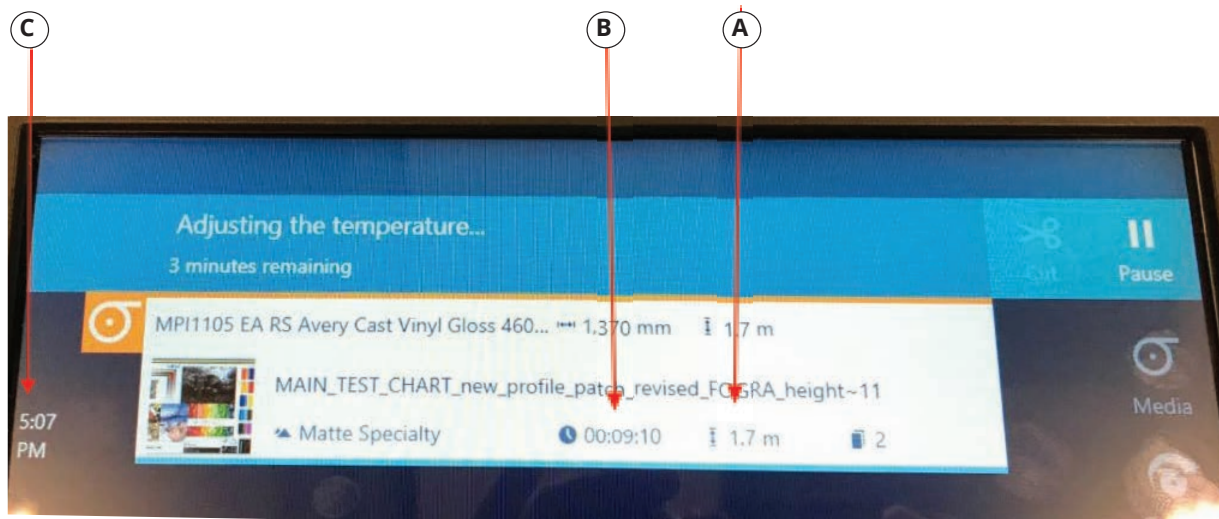
Once media is loaded, users must confirm the type and width on the control panel. For a straight line when manually cutting the media, users should select the Clean Cut 'short strip' option.





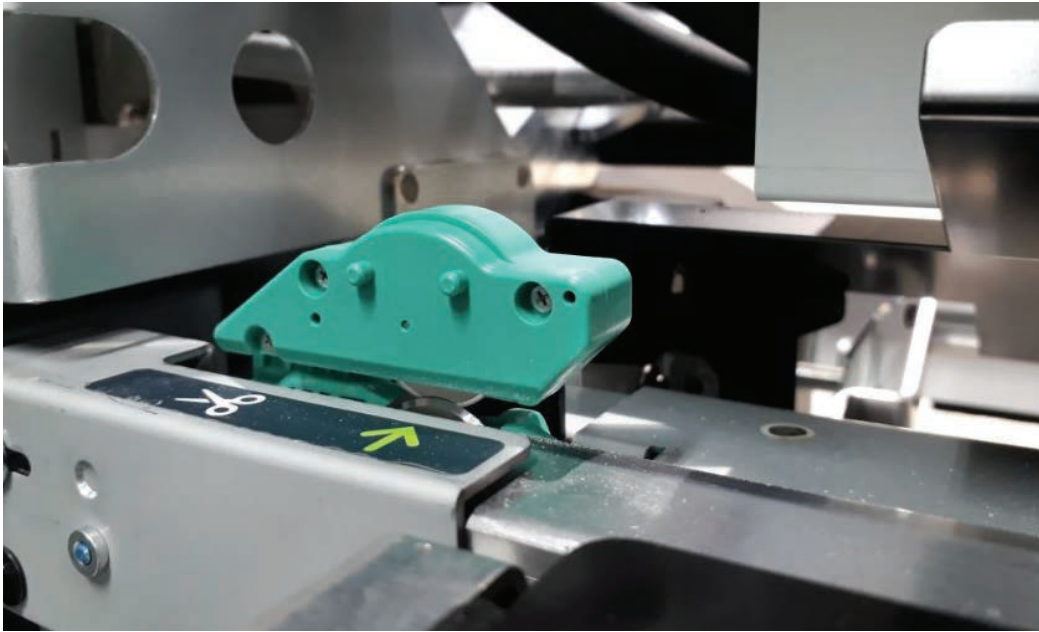
New for Colorado 1650 (and now available for the Colorado 1640), users can move the media forwards or backwards before and between jobs. There are two transport options available: the Manual option will move the media 10 cm per second until the user chooses to stop the action; the By Distance option allows the user to set a custom length.

Although it doesn't print a barcode or remaining media length information when a roll is removed, the Colorado 1650 can monitor and track the remaining media length on a full or partially-used roll. Based on information relating to media thickness, outer core diameter measurement (entered at the RIP) and the number of revolutions taken to feed a certain amount of media, the system auto calculates the remaining media length of the roll and reports it on the control panel. If a submitted job requires more media than available on the current roll, the display shows an alert against it. In the case of multiple jobs held in a queue, the first job that exceeds the amount of media available will be flagged, thereby notifying users as to when the roll should be changed to ensure jobs aren't interrupted.



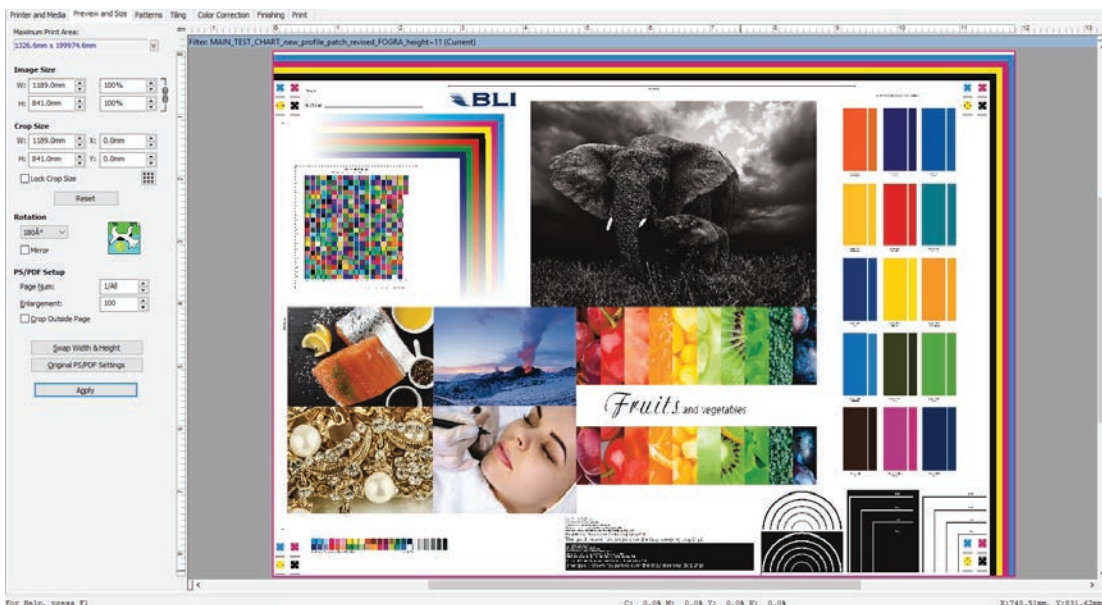
Each time a print job is submitted, the amount of media required to print a job (A), as well as the time required to print the job (B) and the time it will finish the job (C) is displayed on the control panel.

There's no ability to programme media presets nor configure job settings on the control panel, but, according to Canon, this is entirely intentional for the Colorado 1650, which is designed to be used in production environments, with jobs set up and controlled via the RIP only. This limits the potential for settings to be changed ad hoc by key operators working across shifts, and ensures consistency when running high volume jobs.



The embedded knife enables automatic cutting, which is more convenient than performing a manual cut. The knife is also user-replaceable, which helps to minimize downtime. If the user opts to cut after each printed copy, there are no clamps or guides that require removing before a sheet cut is initiated and the device will automatically return the media back to the print position so no media and time are wasted before the next job is printed.

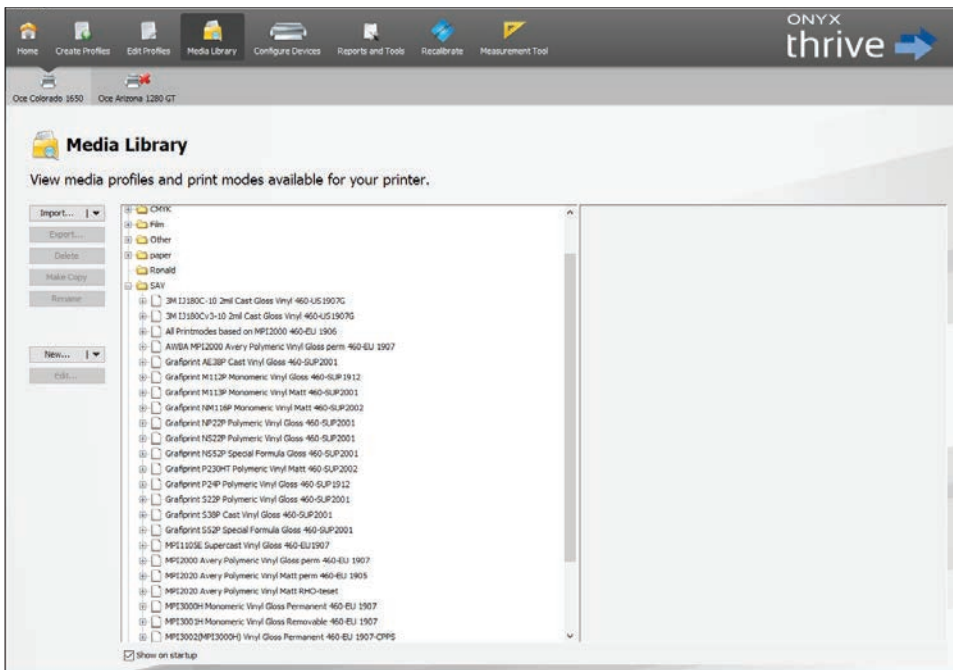
## DEVICE MANAGEMENT AND MONITORING



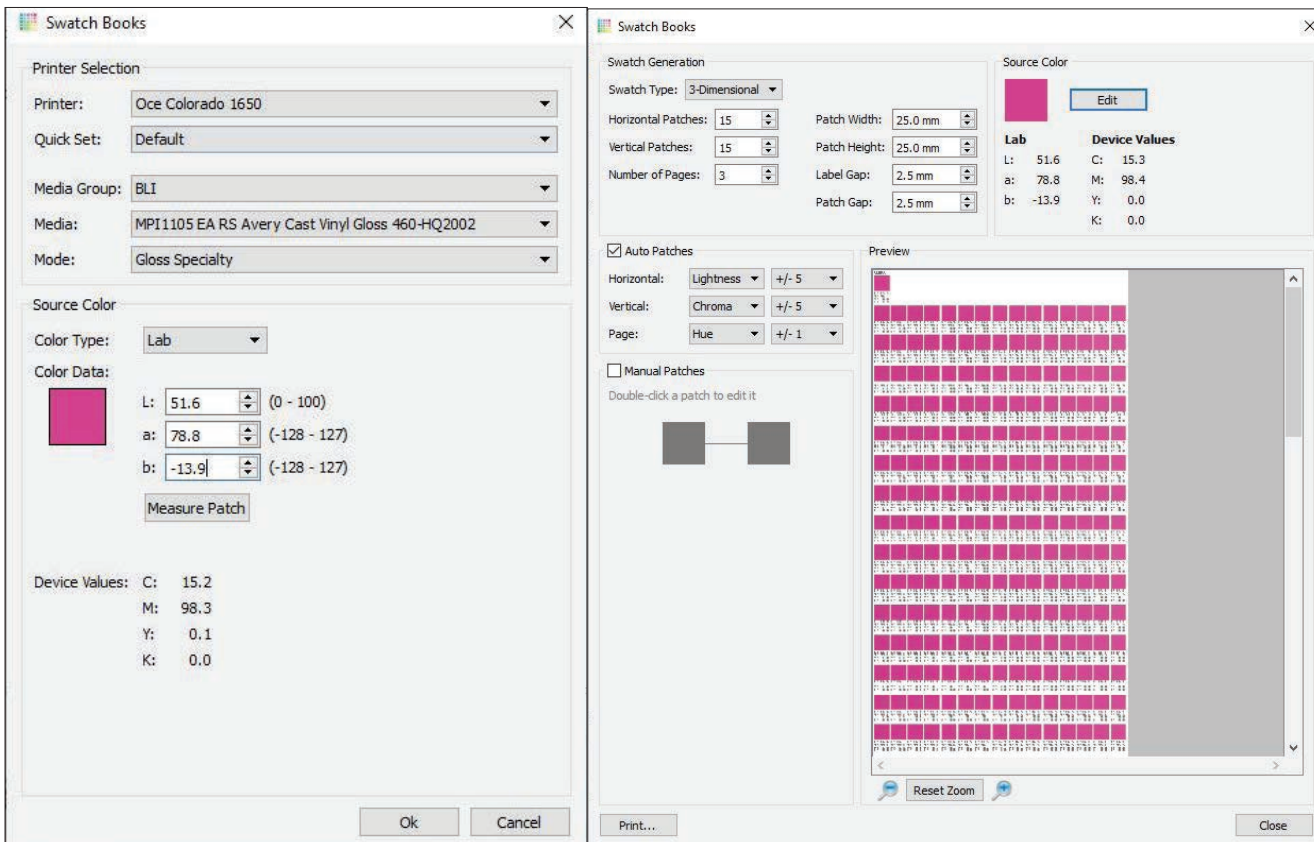
Tested with the Colorado 1650, the ONYX Thrive RIP provides precise print, device status, and job properties for each networked Colorado device. Keypoint Intelligence technicians found its operation very straightforward, with a handy preview image of the print job displayed in the Job Editor window. All job setting selections are made and controlled via the RIP. Settings for media type; print quality; colour management and correction; nesting and tiling; sizing and rotation; grommet, bleed and marks placement; as well as numerous others can be readily modified. From the main ONYX RIP window, users can monitor all jobs in the queue or the job history.



# Canon Colorado 1650 Field Test Report



The ONYX Thrive RIP offers an extensive list of media profiles for the Colorado 1650. The process to download new profiles from Canon's website or Canon's graphiPLAZA collaboration platform and import them using the RIP's Media Manager is very easy.



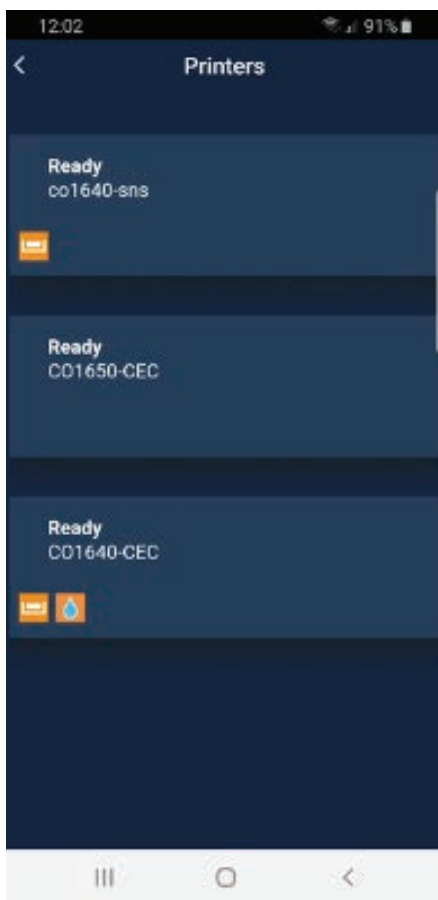
A swatch book can be created in the ONYX Thrive RIP and then printed, which enables users to modify specific colours for more accurate matching.

| jobid | jobname                                   | printmode    | startdate  | starttime | activetime | idletime | readydate  | readytime | result  |
|-------|---|--------------|------------|-----------|------------|----------|------------|-----------|---------|
| 7074  | Print_Quality_Story_Book_48x90_Sheet_V4*2 | Mate Quality | 13/02/2020 | 09:23:38  | 00:09:09   | 00:00:00 | 13/02/2020 | 09:32:40  | Stop    |
| 7074  | Print_Quality_Story_Book_48x90_Sheet_V4*2 | Mate Quality | 13/02/2020 | 09:35:10  | 00:08:59   | 00:00:00 | 13/02/2020 | 09:42:19  | Done    |
| 7075  | Print_Quality_Story_Book_48x90_Sheet_V4*2 | Mate Quality | 13/02/2020 | 09:43:10  | 00:01:17   | 00:00:00 | 13/02/2020 | 09:44:28  | Abort   |
| 7075  | Print_Quality_Story_Book_48x90_Sheet_V4*2 | Mate Quality |            |           |            |          | 13/02/2020 | 09:44:28  | Deleted |
| 7076  | PrintFactory=Quality-Evaluation=1.0*B     | High Quality | 13/02/2020 | 09:57:37  | 00:01:38   | 00:00:00 | 13/02/2020 | 09:59:15  | Done    |
|       | Media calibration                         |              | 13/02/2020 | 10:01:02  |            |          | 13/02/2020 | 10:09:04  | Done    |
|       | Media calibration                         |              | 13/02/2020 | 10:27:48  |            |          | 13/02/2020 | 10:36:34  | Done    |
| 7077  | PrintFactory=Quality-Evaluation=1.0*B     | Specialty    | 13/02/2020 | 10:40:56  | 00:01:58   | 00:00:00 | 13/02/2020 | 10:42:34  | Abort   |
| 7077  | PrintFactory=Quality-Evaluation=1.0*B     | Specialty    |            |           |            |          | 13/02/2020 | 10:42:35  | Deleted |
| 7078  | PrintFactory=Quality-Evaluation=1.0*B     | High Quality | 13/02/2020 | 10:44:01  | 00:01:37   | 00:00:00 | 13/02/2020 | 10:45:38  | Done    |

| copiesrequested | mediatype   | mediawidth | medialongthused | printed area | inkcolorcyan | inkcolormagenta | inkcoloryellow | inkcolorblack |
|-----------------|---|------------|-----------------|--------------|--------------|-----------------|----------------|---------------|
| 2               | UMB00 Poster Paper MC Gloss FSC 460-EU 1907             | 16,000     | 23,158          | 2,882,348    | 22,710       | 8,048           | 6,043          | 8,065         |
| 2               | UMB00 Poster Paper MC Gloss FSC 460-EU 1907             | 16,000     | 23,158          | 2,882,348    | 22,710       | 8,048           | 6,042          | 8,065         |
| 1               | UMB00 Poster Paper MC Gloss FSC 460-EU 1907             | 16,000     | 463             | 57,645       | 8            | 8               | 0              | 8             |
| 1               | UMB00 Poster Paper MC Gloss FSC 460-EU 1907             | 16,000     | 0               | 0            | 0            | 0               | 0              | 0             |
| 1               | NP120SE EA RS Avery Cut Vinyl Gloss 480-HQ1002          | 13,700     | 4,770           | 578,130      | 976          | 1,608           | 1,752          | 1,814         |
|                 | NP120SE Supercast Ink Gloss grey perm EA RS 480-EU 1907 | 13,700     | 12,564          | 248          | 248          | 248             | 248            | 459           |
|                 | NP120SE Supercast Vinyl Gloss 480-EU1907                | 13,700     | 12,564          | 248          | 248          | 248             | 248            | 459           |
| 1               | NP120SE Supercast Vinyl Gloss 480-EU1907                | 13,700     | 899             | 104,243      | 132          | 131             | 147            | 139           |
| 1               | NP120SE Supercast Vinyl Gloss 480-EU1907                | 13,700     | 0               | 0            | 0            | 0               | 0              | 0             |
| 1               | NP120SE Supercast Vinyl Gloss 480-EU1907                | 13,700     | 4,770           | 578,130      | 878          | 1,499           | 1,373          | 1,879         |

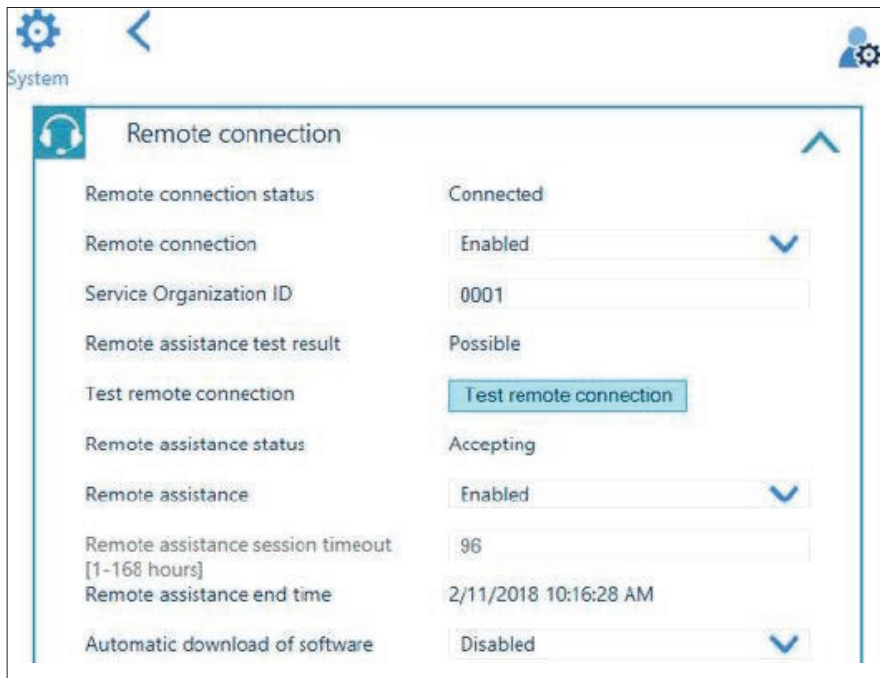
The Colorado 1650's embedded web page provides comprehensive job information that includes print area, print time and total ink consumed per colour for each print job; although cost information is not included, users can download a .csv file and manually edit it to include costs.

Not tested by Keypoint Intelligence, the Remote Control app allows users to monitor and view the status of the Colorado 1650 and other compatible devices while on the go. Administrators need to register users' email addresses to create cloud service accounts. The free app can then be downloaded via the Apple App Store or Google Play Store and installed on a mobile device. Via the app, users can view a range of events including printing, roll and ink status, as well as jobs completed, and maintenance/waste ink tray full, amongst others.

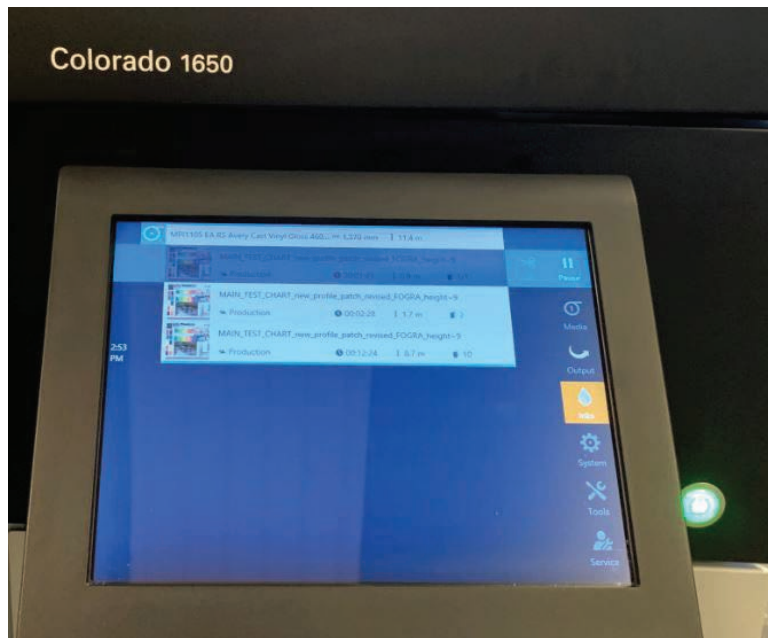


Remote Control app

# Canon Colorado 1650 Field Test Report

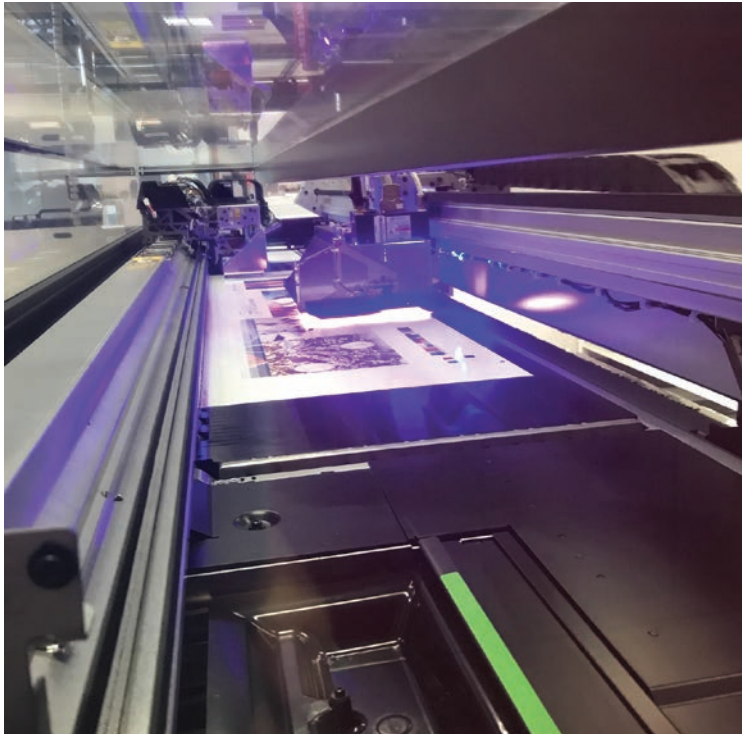


Remote assistance, when enabled, allows the Canon technical service team access to the Colorado 1650's control panel and device web interface (via two VPN connections) to operate the device and provide assistance remotely, as well as install software updates during non-working hours, which helps to reduce downtime. It's also worth noting that access is controlled by the customer. No access will be granted if the customer does not confirm the connection.



Usability is boosted by a large (10.5 inches) colour touchscreen operation panel, which can be tilted to aid accessibility. Keypoint Intelligence technicians found it very responsive and easily navigable on account of its simple design and straightforward menus. Icon buttons for Media, Output, Inks, System, Tools, and Service menus are displayed on the right hand side, and when selected, more detailed functions for common tasks such as maintenance procedures or media forward/retract are shown in the main display area.





An eye-catching design feature, the machine's transparent top cover provides users with clear access to view the printing condition of their jobs, so it's very easy to see a job being printed and dried before it emerges from the device.

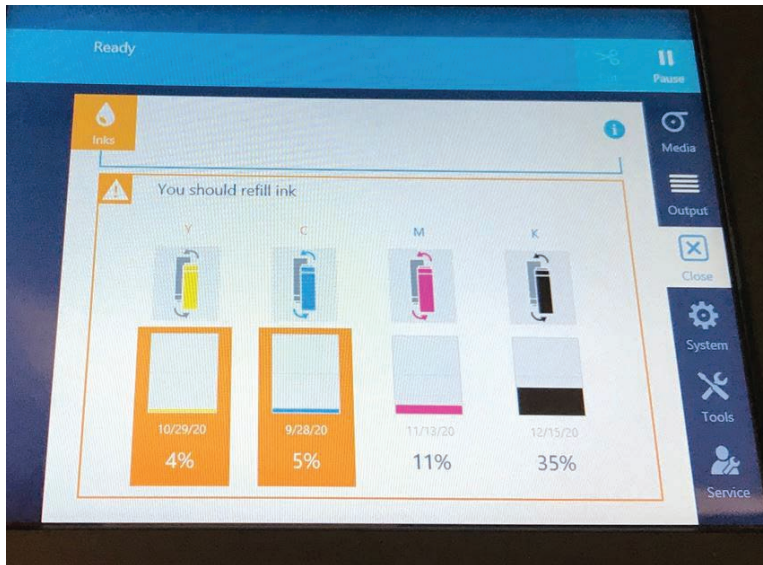
### MAINTENANCE AND INK



The four-colour ink system supports a 2.5 liter ink reservoir capacity per colour. Replacement CMYK ink bottles come in one size—one liter—and there's one slot available per colour. Replenishing ink is a clean, fast and simple process; the system's sensors do not allow ink bottles to be placed out of sequence so it's fool proof. A constant green light on the ink platform indicates that ink can be added when the reservoirs fall below 50%, and ink can be replaced during operation, allowing for longer uninterrupted workflows.

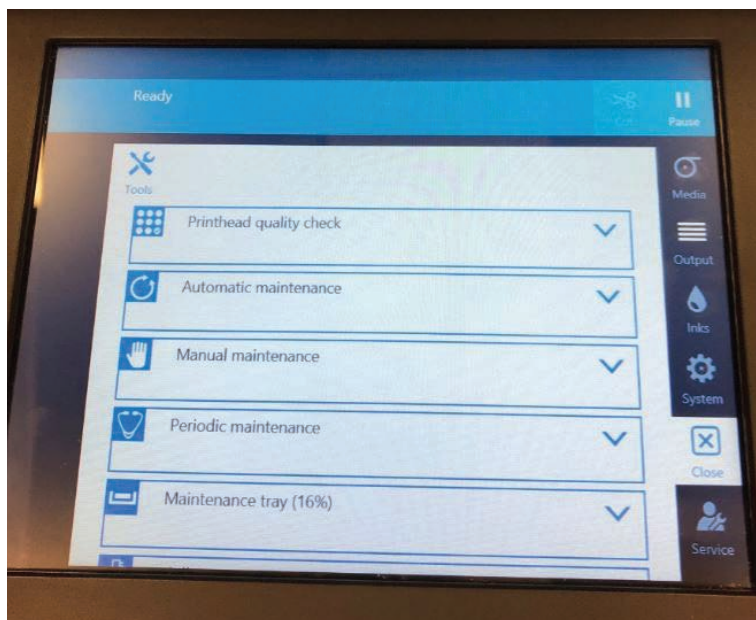


# Canon Colorado 1650 Field Test Report



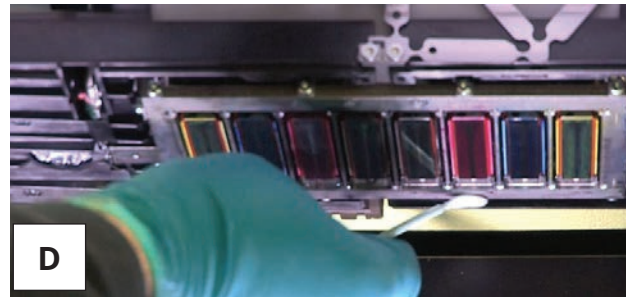
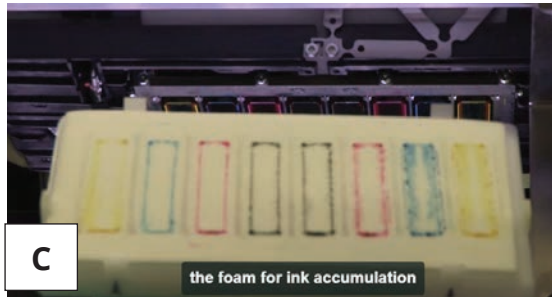
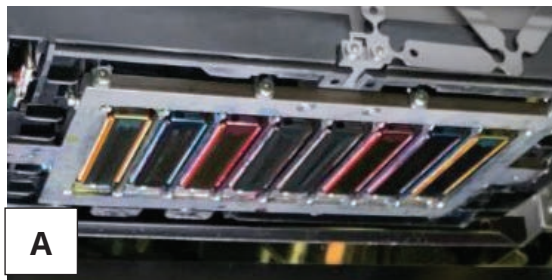
The operation panel reports the amount of remaining ink in 1% increments and displays an amber alert when levels are low, while a red alert indicates ink must be replaced before printing can continue.

A key benefit of the Colorado 1650 is its undemanding and simple maintenance procedures; it offers automatic maintenance, which helps to reduce intervention times and eliminates the need for daily manual maintenance. For example, the acoustic PAINT (Piezo Acoustic Integrated Nozzle Technology) system constantly 'listens' and monitors nozzle performance during printing and compensates for nozzle failures; if it detects an issue, the device will automatically conduct a printhead purge and wipe once the current job is printed.



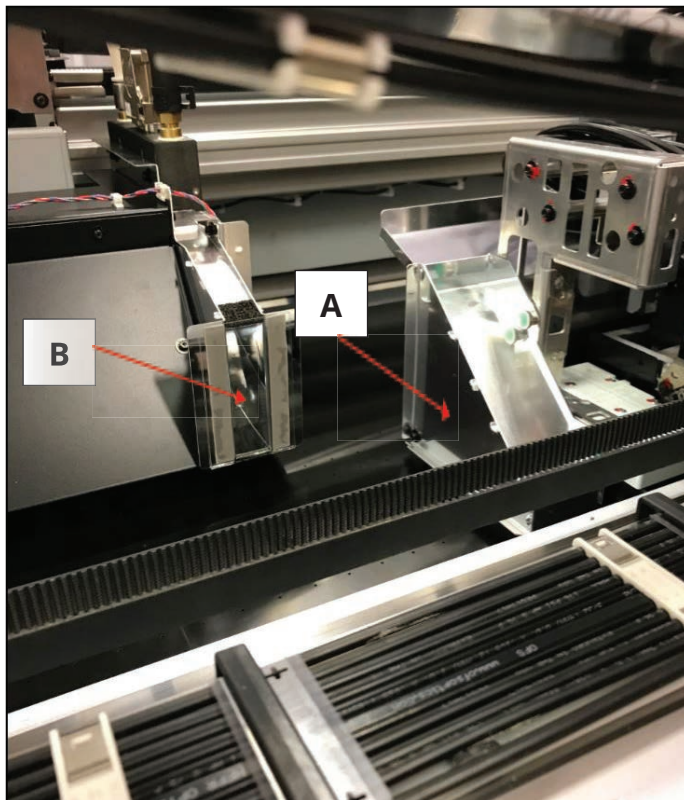
There are three maintenance programs available—Automatic, Manual, and Periodic—and users are alerted via the control panel when Periodic maintenance action is needed. Control panel instructions are clear and provide step-by-step guidance.

Automatic maintenance is required in case of image quality defects and the program is initiated at the control panel. It involves the printer performing a purge (releasing ink from the printhead in to the maintenance tray) to check for clogged nozzles; the additional print nozzle classification chart option, if enabled, will optimize the nozzles. Manual maintenance is recommended in case more maintenance is needed, depending on usage, and includes actions such as cleaning the matrix plate, the maintenance station, and the platen.



The matrix plate holds the printheads (A) and must be cleaned at regular intervals, using the matrix plate cleaning tool and foam pads. The cleaning tool is placed over the printheads and held for 30 seconds (B); the action may need to be repeated if the accumulated ink between the printheads is visible on the foam pad (C). An internal light makes it easier to clean the area around the printheads using swabs (D)

Users are advised to conduct routine monthly maintenance procedures to keep the printer in optimal condition. These include vacuuming the chiller and cleaning the mirror funnel.



The mirror funnel (see above) is a necessary component for the matte printing mode, with the curing light sent down a channel via a system of mirrors that can be contaminated by ink. To prevent the build-up of pollution inside the two-mirror boxes (A) located on the printhead carriage and the front glass plate surface (B) located on the curing carriage, the areas must be cleaned regularly using a lint free cloth and demineralized water.



## Canon Colorado 1650 Field Test Report

The operation panel conveniently provides a warning when parts need replacing on the machine. User-replaceable parts include lubricators and emission filters as well as the wiper, inks, knife cutter, and the maintenance tray.



Replacing the maintenance/waste ink tray is straightforward. Users will be prompted with an amber warning control panel message when it is nearing full capacity. The maintenance drawer is located on the right hand side of the media input. Users must raise a metal holder and secure the lid on the tray (which, conveniently, can be stored in the drawer) before removing from the device. Acknowledging the tray's replacement at the control panel resets the counter. Canon directs users to dispose the waste ink in accordance to local regulations.



The printer displays a message when demineralized water needs to be added to the chiller tank (which cools the device's UV lamps, printheads; pipes and tubes). The chiller tank is located behind a panel, the removal of which requires a standard Torx-25 screwdriver. Extra care should be taken when handling water close to sensitive parts to avoid any potential spillage that could damage the printer. Canon stipulates the machine is powered down and power plugs removed as a safety precaution.

## Care and Use – Colorado 1650

### Operator maintenance

**Every month**

**Periodic maintenance**

- Start periodic maintenance on the operator panel.
- Clean the maintenance station, wiper and clean wall.
- Clean the matrix plate area and black protection cover.
- Clean the mirrors.
- Clean the M&C scanner.
- Clean the platen.
- Clean the buffer plate.
- Vacuum the chiller.
- Clean the ink unit (if necessary).
- The printer performs a purge and wipe to clean the nozzles.

**Every Week**

**Manual maintenance - without advanced nozzle optimization:**

- Start manual maintenance on the operator panel.
- Clean the matrix plate.

**Incident-based (quality problems, paper jam, crash)**

**Automatic maintenance - without nozzle optimization:**

- Start automatic maintenance on the operator panel.
- The printer performs a purge and wipe to clean the nozzles.

**Automatic maintenance - with nozzle optimization:**

- Start automatic maintenance on the operator panel.
- The printer performs a purge and wipe to clean the nozzles.
- Print a nozzle classification chart to automatically optimise the nozzles.

**Manual maintenance - with advanced nozzle optimization:**

- Start manual maintenance on the operator panel.
- Perform any or all of the listed actions:
  - Clean the maintenance station, wiper and clean wall.
  - Clean the matrix plate area and the black protection cover.
  - Clean the M&C scanner.
  - Clean the platen.
  - Clean the buffer plate.
- The printer performs a purge and wipe to clean the nozzles.
- Print the advanced nozzle classification charts to automatically optimize the nozzles.

**Needed when indicated on the operator panel**

|                      |                               |
|----------------------|-------------------------------|
| Refill ink.          | Replace the maintenance tray. |
| Replace the wiper.   | Refill the chiller.           |
| Replace the filters. | Replace the lubricators.      |
| Replace the knife.   |                               |

Note: This is not indicated on the operator panel, but can be initiated when the knife is blunt and does not cut correctly.

For a detailed explanation see the Colorado 1650 Extended operation guide.

### Clean ink pollution on the printer

- Make sure the printer is not printing and there is no media on the platen.
- Put on the prescribed gloves.
- Clean the polluted part with a lint free cloth or swabs, use as many as necessary.
- If necessary, dampen the cloth or swab with the cleaning liquid prescribed for the polluted part.
- If necessary, wipe with a dry cloth and let the liquid evaporate.
- Dispose the gloves and other maintenance materials as chemical waste according to local regulations.

### Work safe

**CAUTION**

- Read and follow the safety information guidelines in the safety chapter of the Operation Guide and safety data sheets (SDS) in order to ensure maximum safety.
- Avoid skin contact with ink and uncured printed media.
- When ink contacts your skin, clean immediately with soap and water. Do not use alcohol or other solvents.
- When ink contacts your eyes, flush with water, consult the safety data sheet and contact a doctor.
- Wear the prescribed gloves when contact with ink or maintenance materials is possible. Gloves should always overlap sleeves. Follow the Safety Data Sheets (SDS) guidelines carefully in order to ensure maximum safety.
- Do not reuse single-use gloves.
- All waste containing uncured or partly cured UV ink is hazardous and must be disposed of separately according to local regulations. Do not mix ink waste with non-hazardous waste (household, offices, etc.). Do not allow it to reach sewage systems or drinking water supplies. Ink waste includes maintenance pads and cloths, gloves and any other material containing uncured or partly cured UV ink.

### Maintenance materials

| Material                                     | Used for   |
|--|--|
| Prescribed Colorado 1650 gloves              | Handling UV/gel ink.   |
| Cleaning liquid (IPA)                        | Cleaning ink pollution on non-heated surfaces, such as the platen, maintenance station, maintenance tray, drawer, ink unit, M&C scanner etc. |
| Cleaning liquid (cleaner MB-methyl benzoate) | Cleaning ink pollution on heated surfaces: the matrix plate, wiper and clean wall only. Used only with swabs.                                |
| Lint free cloths                             | Cleaning the printer.  |
| Prescribed Colorado 1650 swabs               | Cleaning pollution on surfaces such as the maintenance station, wiper and clean wall, matrix plate etc.                                      |
| Matrix plate cleaning tool and foam          | Cleaning the matrix plate.   |
| Wooden picks and scraper                     | Cleaning the platen.   |
| Rough lint free cloth                        | Cleaning the platen.   |
| Compressed air duster                        | Cleaning the platen.   |
| Torx-25 screwdriver                          | Opening customer-accessible covers.  |
| Pouring can                                  | Refilling the chiller.   |
| Demineralized water                          | Refilling the chiller and cleaning the mirrors.  |
| Torx-6 screwdriver                           | Replacing the knife.   |
| Torx-20 screwdriver                          | Replacing a drive gear.  |
| Crosshead screwdriver                        | Replacing the bracket with lubricators.  |
| Maintenance tray                             | Replacing a full maintenance tray.   |
| Filters                                      | Replacing saturated filters.   |
| Knife  | Replacing a blunt embedded knife.  |
| Bracket with two lubricators and pins        | Replacing the lubricators.   |

For a complete list see the Colorado 1650 Extended operation guide.

### Additional information

|  |   |
|--|---|
| <p><b>Support phone numbers</b></p> <p>Service:<br/>Consumables:</p> | <p><b>Printer information</b></p> <p>Serial number:<br/>Install date:</p> |
|--|---|

Instruction videos

Extended operation guide

Manuals and product information: downloads.cpq.canon, or via the help button (?) in the settings editor.

Canon supplies a Care and Use poster outlining maintenance procedures and guidelines, as well as a maintenance kit consisting of essential cleaning items, including lint free cloths and swabs (for cleaning the printer); a Matrix plate cleaning tool and foam pads (for cleaning the matrix plate); and MB cleaning liquid (for cleaning ink pollution on heated surfaces, such as the matrix plate and wiper).

## Colorado 1650 Key Operator Maintenance

THE POWER TO SAFEGUARD UPTIME AND PRODUCTIVITY

INSTRUCTION VIDEOS

1 - Guidelines to Maintain the Print Quality

Includes: 001-001 Operation Procedures

1 - Guidelines to Maintain the Print Quality

2 - Automatic Nozzle Optimization

Includes: 002-002 Maintenance Procedures

2 - Automatic Nozzle Optimization

3 - Clean the Nozzles

Includes: 003-003 Maintenance Procedures

3 - Clean the Nozzles

4 - Clean the Maintenance Station

Includes: 004-004 Maintenance Procedures

4 - Clean the Maintenance Station

5 - Clean the Matrix Plate

Includes: 005-005 Maintenance Procedures

5 - Clean the Matrix Plate

6 - Clean the Platen

Includes: 006-006 Maintenance Procedures

6 - Clean the Platen

Canon offers a range of short online tutorial films that provide detailed key operator guidance on replacing parts such as the knife, filters, lubricators amongst others, and conducting maintenance.

These tutorial films are easily accessible for operators via QR-codes available on the system.

24

www.keypointintelligence.com

©2021 Keypoint Intelligence. Reproduced with permission. For reprints, contact info@keypointintelligence.com.

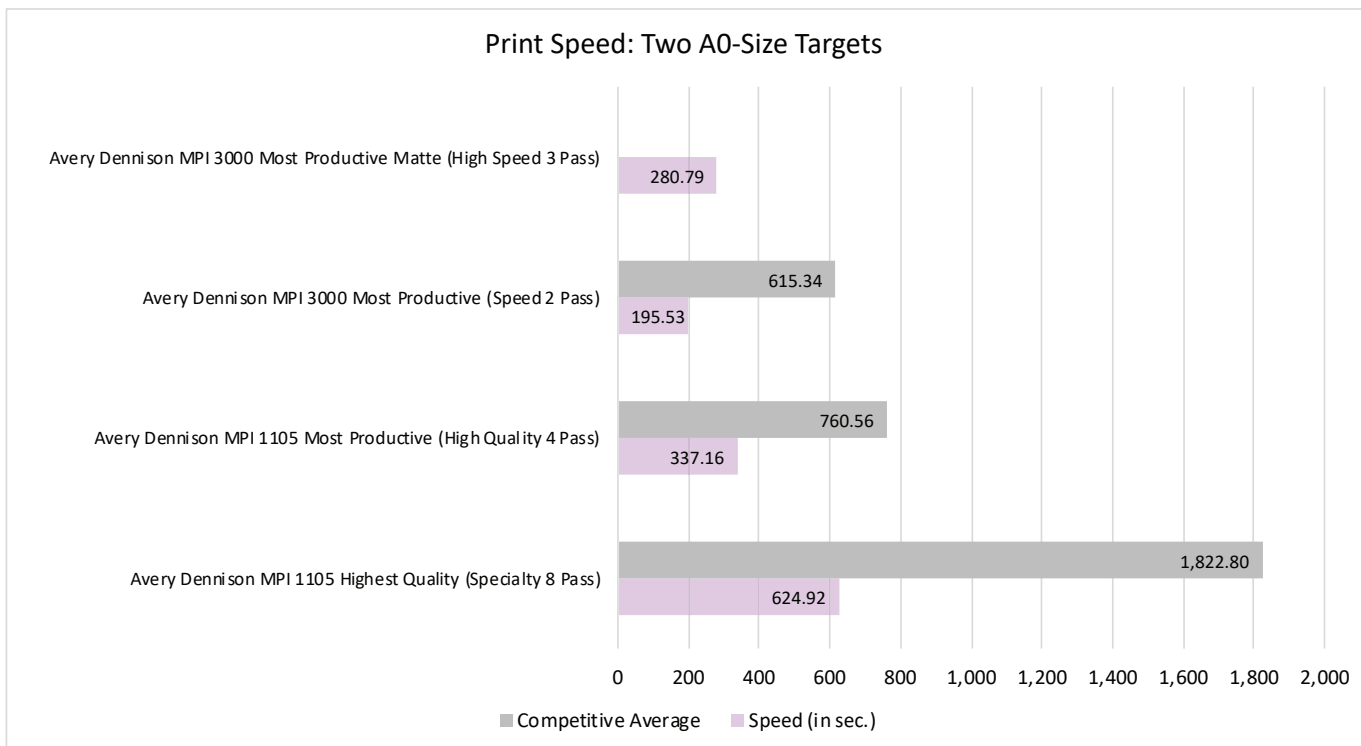


## SPEED



(compared to eco solvent/latex devices)

Devices were timed for two of Keypoint Intelligence’s A0-size image quality targets printed in succession. The stopwatch began when the printhead started the print process and ended when the second print completed printing and was ready to cut. The speeds listed below were measured at the most productive setting that produced image quality that Keypoint Intelligence determined as acceptable (no visible banding) on Avery Dennison MPI 3000 media when viewed at 10 feet and on Avery Dennison MPI 1105 media when viewed at two feet. The third speed measured was for the highest quality setting available to print two targets on Avery Dennison MPI 1105.



Note: the Colorado 1650 is the first UVgel roll-to-roll printer tested by Keypoint Intelligence and unique in its segment. The competitive average (based on eco solvent/latex devices tested to date) is included in the graph, and shows the 1650’s performance is two to three times faster when compared with previously-tested ink technologies.

A standout productivity-boosting feature is the optional Jumbo Roll media feeder, which allows the device to run longer uninterrupted workflows and means that it can continue to remain productive during overnight or non-shift hours without requiring operator attendance.

### All Speed/Quality Settings Tested (Gloss)

| Speed/Quality Setting    | Avery Dennison MPI 3000 | Avery Dennison MPI 1105 |
|--------------------------|-------------------------|-------------------------|
| Banner/Max Speed, 1 Pass | 130.40                  | N/A                     |
| Speed, 2 Pass            | 195.53*                 | N/A                     |
| Production, 2 Pass       | 257.22                  | N/A                     |
| High Quality, 4 Pass     | 309.81                  | 337.16*                 |
| Specialty, 8 Pass        | 588.60                  | 624.92*                 |

Time measured (in seconds) for two A0-size targets to be printed.

\* Indicates the speed selection for image quality assessment.

At the most productive Speed/2 pass setting, the Canon Colorado 1650 produced two A0-size targets in three minutes and 15.53 seconds on the Avery Dennison MPI 3000 media. The unit took five minutes, 37.16 seconds on Avery Dennison MPI 1105 media at the High Quality/4 Pass setting.

At the Specialty/8 pass setting, the Colorado 1650 produced two targets in 10 minutes and 24.92 seconds on MPI 1105 media.

As the Canon Colorado 1650's FLXfinish technology enables switching between a gloss and matte finish without changing inks or media, Keypoint Intelligence conducted additional testing to capture the speed utilizing the matte print mode. The most productive Matte High Speed/3 Pass setting produced no visible banding on Avery Dennison MPI 3000 media.

### All Speed/Quality Settings Tested (Matte)

| Speed/Quality Setting    | Avery Dennison MPI 3000 |
|--------------------------|-------------------------|
| Matte High Speed, 3 Pass | 280.79                  |
| Matte Speed, 4 Pass      | 364.27                  |
| Matte Quality, 6 Pass    | 499.61                  |
| Matte Specialty, 8 Pass  | 650.55                  |

Time measured (in seconds) for two A0-size targets to be printed.

## Supporting Test Data

The unit was evaluated at the manufacturer's facility located in Venlo, the Netherlands. 54-inch rolls of Avery Dennison MPI 1105 – polymeric cast vinyl, MPI 2005 – calendared vinyl film, and MPI 3000 – monomeric calendared vinyl media were used during evaluation. All test files were submitted using the ONYX Thrive RIP provided by the manufacturer. MPI 1105 and MPI 3000 media profiles were used for printing on the respective media types, while the "EuropeISOCoatedFOGRA27" colour management RIP preset was also utilized. Ratings are based on a five-star system where five is the best.

**Note:** Two Keypoint Intelligence analysts independently evaluated the individual sections of Keypoint Intelligence's subjective image quality test, each judged on its own merits, with printer identification hidden. Under standard lab lighting conditions each analyst ranked the print samples into five quality classifications (Excellent, Very Good, Good, Fair, Poor) and once completed, the individual appraisals were combined and a final image quality score was assigned. In the event of differing scores, the sample's quality was debated and a final consensus attained. Print samples on the MPI 3000 (monomeric vinyl) were evaluated at a distance of 10 feet (reflecting a walk-/drive-by viewing experience) and those printed on the MPI 1105 (cast vinyl) were evaluated at a closer distance of two feet (reflecting a close-up viewing experience).

## About Keypoint Intelligence

For 60 years, clients in the digital imaging industry have relied on Keypoint Intelligence for independent hands-on testing, lab data, and extensive market research to drive their product and sales success. Keypoint Intelligence has been recognized as the industry's most trusted resource for unbiased information, analysis, and awards due to decades of analyst experience. Customers have harnessed this mission-critical knowledge for strategic decision-making, daily sales enablement, and operational excellence to improve business goals and increase bottom lines. With a central focus on clients, Keypoint Intelligence continues to evolve as the industry changes by expanding offerings and updating methods, while intimately understanding and serving manufacturers', channels', and their customers' transformation in the digital printing and imaging sector.



**KEYPOINT**  
INTELLIGENCE