KEYPOINT INTELLIGENCE

Direct-to-Film Report

A Comprehensive Keypoint Intelligence Evaluation

InkTec SP62-2

With InkTec film and ink, TexTek powder
Driven by SAI Flexi RIP v22.0

Background Specifications	
Printhead	On demand Piezo head
Print Resolution	720 x 1800dpi
Print Speed (4 head model)	Up to 10.45m2/hr in 6 pass mode
Maximum Printable Area	630mm
Maximum Media Width	650mm
Ink Type	InkTec Heat transfer pigment (CMYKW)

OUR TAKE

Korean headquartered print vendor InkTec has 30cm and 60cm DTF printers built on the same engine supporting CMYKW printing. The 60cm we tested can be bought in 2- and 4-head configurations using Epson i3200 printheads. According to InkTec the 2-head 60cm model which we tested is their most popular format.

Some of the key technology benefits highlighted by InkTec include reduced risk of static build up due to the use of fluorine rubber pressure rollers, less risk of printhead damage with an automated anti-collision system and easier maintenance procedures due to a liftable capping station. The oven/shaker unit is very compact with a vertical film curing path. The system uses an auto-powder recycling system reducing waste and limiting risk of powder entering the work atmosphere..

The device performed very well in our tests. Ink consumption on our standard test target was the lowest we have seen to date. Ink used for head cleaning was also among the lowest. Colour gamut was slightly smaller than average on both white and black t-shirts and colour matching was also slightly below average. Having said that the general quality of output was to a very high level. Text was clearly defined down to a very impressive 4pt on white t-shirts and 5pt on black. Fine lines were classified as very good.

Halftone images were reproduced to a high standard with realistic memory colours, very smooth skin tones, with rich metallics generated in high quality mode. There was some loss of fine detail in dark contrast areas in the greyscale image which is not uncommon. Vector graphic were reproduced to an excellent standard, with rich solids exhibiting no banding, crisp transitions between solids and smooth gradations.

Washability results were also excellent with halftones and text maintaining our highest rating over the entire 20-wash /tumble dry cycle test. Colour changes were minimal with an average colour change of no more than DeltaE 1.43 and a colour gamut shrinkage of only 13% and 18% on white and black t-shirts respectively. There was also no degradation in stretch resistance after 20 cycles resulting in all garments being classified as suitable for external wearing after the test was completed.

JULY
2024

PRINT SPEED

Print speed was assessed using the vector graphic shown to the right with 540mm (W) x 450mm (L) dimensions. The image was submitted to the device in various quality modes.

Timings were taken from the moment the printhead started printing the film to the moment the printhead has finished printing and commenced returning to the docking station.

Where multiple film widths are provided for testing, speed analysis shall be conducted on each film with the print speed expressed in m2/hr based on the film width provided.

Note: Film widths tested below the maximum supported width of the device will show slightly reduced maximum print speeds due to the higher impact of each carriage step versus the carriage width covered.

	Maximum Print Speed
	60cm film
Production (720 x 1800dpi) 6-pass, Eclosion mode Fog	5.75
Highest Quality (720 x 2400dpi) 6-pass Eclosion mode Strong	2.75

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INK CONSUMPTION

Ink consumption was assessed using the graphic shown to the right with 320mm x 350mm dimensions. The image was submitted to the device in production and high-quality modes.

If the vendor recommends different quality settings for transfer onto white versus black t-shirts then testing shall be conducted accordingly

Provide courtesy of Great Dane Graphics

	Production	High Quality
Total CMYK Ink Consumption	0.85 ml	0.95 ml
Total White Ink Consumption	1.42 ml	1.42 ml

INK CONSUMPTION DURING A CLEANING CYCLE

	Soft	Normal	Hard
Ink Consumed on a Full Head Clean Cycle	0.9 ml	2.7 ml	4.1 ml

Vendor Ink Cleaning Cycles

InkTec recommend conducting a strong head clean at the start of the day. If the device is inactive for a period of an hour or more they recommend running a light head clean. The device also has an automatic head clean option which runs a strong head clean at a defined interval. This can be deactivated during week days but activated during the weekend when the device is unattended.

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IMAGE QUALITY

All image quality analysis conducted by Keypoint Intelligence is carried out using white and black Next Level 3600 premium 100% combed ring-spun cotton T-shirts manufactured in a single batch shipment. Jobs are submitted using the vendors recommended settings. Information on settings provided in the Supporting Test Data section at the back of the report.

COLOUR ACCURACY

The KPI test target containing 9 PANTONE spot colours was released to the device with the RIP set to Spot Colour Matching ON. The printed patches were compared to the Pantone reference library, with the Delta E00 variance measured using a calibrated XRite Exact spectrophotometer.
Note: a DeltaE00 value of less than 4.0 is typically regarded as a near perfect visual match.

White T-shirt Colour Matching Measured in **ΔE⁰⁰**

PANTONE Colour	Home Depot 165C	Cadbury 2685C	Walmart 285C	McDonalds 123C	Coca Cola 485C	IKEA 109C	Fedex 363C	UPS 476C	Ford 294C
Production Mode	9.61	15.97	5.21	6.91	8.1	8.89	9.17	9.65	11.88
High Quality Mode	9.14	14.57	5.9	6.1	7.46	8.58	8.87	9.04	8.79

Black T-shirt Colour Matching Measured in **ΔE⁰⁰**

PANTONE Colour	Home Depot 165C	Cadbury 2685C	Walmart 285C	McDonalds 123C	Coca Cola 485C	IKEA 109C	Fedex 363C	UPS 476C	Ford 294C
Production Mode	14.08	15.46	6.78	11.99	10.93	13.48	11.59	10.38	10.54
High Quality Mode	14.44	14.3	7.22	12.51	11	13.42	12.21	10.93	9.22

COLOUR GAMUT

Colour Gamut Analysis

A 400 colour patch profiling target was printed with colour matching disabled. The patches were read using an Xrite i1iO table/ES 2000 spectrophotometer with XRite's Color Profiler software to create an icc profile. The icc profile was assessed using Chromix ColorThink software to determine the CIE colour gamut volume measurements. The graphical representations of colour gamut presented below were created using Chromix ColorThink Pro software)

	White T-Shirt		Black T-Shirt	
	Production	High Quality	Production	High Quality
Colour Gamut (CIE)	191,494	200,347	138,298	137,586

TEXT AND FINE LINES

	White T-Shirt		Black T-Shirt	
	Production	High Quality	Production	High Quality
Text (Minimum Legible Size)	4 pt	4 pt	5 pt	4 pt
Fine lines	Very Good	Very Good	Very Good	Very Good

Text and Fine Line Analysis

Visual assessment of the output was conducted with and without magnification. Fonts were assessed using the sans serif Arial font recording the smallest font size with clear definition. Fine lines and circles are evaluated using a selection of standard laundry symbols with a rating scale from Excellent to Poor.

HALFTONE AND VECTOR GRAPHIC REPRODUCTION

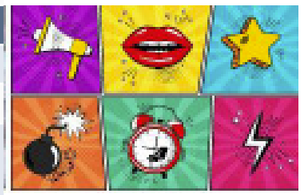
Image quality files were submitted using the vendor recommended settings. The output was visually appraised in a professional D50 light viewing booth by two technicians assessing the output independently across a range of quality attributes with scores assessed over a five-scale rating (Excellent, very Good, Good, Fair, Poor).

White T-shirt		
Halftone Reproduction		
	Production	**High Quality**
Skin Tones	Very Good	Very Good
Memory Colours	Very Good	Very Good
Greyscales	Good	Good
General Comments	Realistic memory colours across all test elements and very smooth skin tones. Some loss of fine detail in dark contrast areas. Slight magenta hue to greyscales. Metallic gold was richer in highest quality mode.	
Vector Reproduction		
Solids	Excellent	Excellent
Fine Details	Excellent	Excellent
General Comments	Excellent solids with consistent rich fills, smooth gradations of colour and crisp boundaries between solids.	

Halftone Image targets

Black T-shirts		
Halftone Reproduction		
	Production	**High Quality**
Skin tones	Very Good	Very Good
Memory Colours	Very Good	Very Good
Greyscales	Good	Good
General Comments	Realistic memory colours across all test elements and very smooth skin tones. Some loss of fine detail in dark contrast areas. Slight magenta hue to greyscales. Metallic gold was richer in highest quality mode.	
Vector Reproduction		
Solids	Excellent	Excellent
Fine Details	Excellent	Excellent
General Comments	Excellent solids with consistent rich fills, smooth gradations of colour and crisp boundaries between solids.	

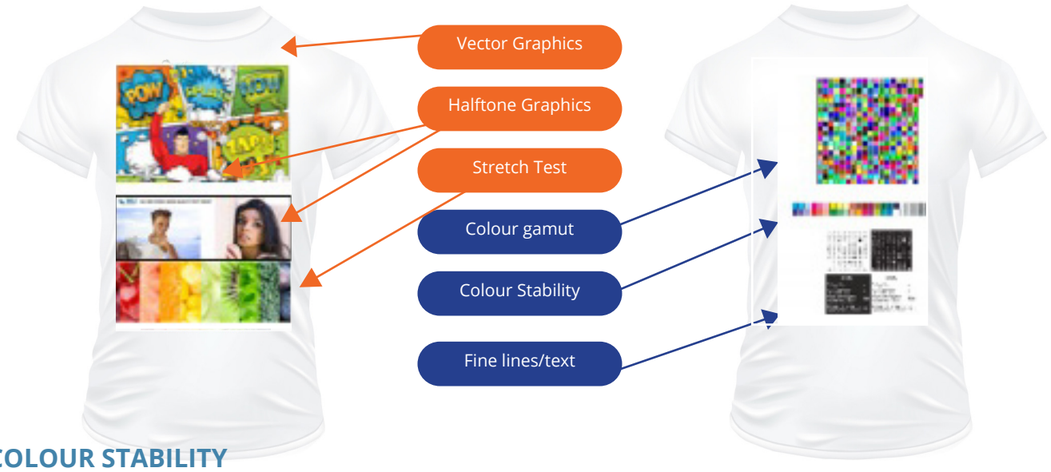
Vector Image targets



WASHABILITY PERFORMANCE

Washability testing was conducted using two apparel types; Next Level 3600 100% cotton white and black t-shirts. Tests were conducted with the device printing in production mode with two presses. Garments were washed inside out using a Hoover H-Wash 300 H3W 410TAE 10Kg washing machine, at 30°C with a Proctor & Gamble's Fairy non bio detergent and dried between each wash using a Candy CSE H8A2LE 8Kg heat pump tumble dryer set to hang dry setting. The impact of washing on garment quality over 5/10/15 and 20 wash/dry cycles was assessed across a range of quality attributes comparing back to the garment prior to the first wash/dry cycle.

Note: Keypoint Intelligence washability test performance should NOT be compared against results quoted by vendors based of AATCC or other standards which maybe limited to assessing one parameter (color fastness alone) or use different test parameters for washing and drying and can greatly influence results. Comparisons should ONLY be conducted with-in the same test protocol.



COLOUR STABILITY

	Colour Stabilty Results	
	White T-shirt (results expressed as DeltaE00)	**Black T-shirt (results expressed as DeltaE00)**
# of washes		
5	1.06	1.33
10	1.27	1.38
15	1.3	1.41
20	1.36	1.43

Colour stability was assessed using a 84 patch IDEAlliance ISO12647-7 media wedge. The media wedge was measured using an X-Rite spectrophotometer and colour stability versus the original pre-washed output using EFI Verifier software, recording the mean and max colour shift in DeltaEOO. Note: DeltaE00 is a measure of colour difference. A DeltaE00 of 4 is commonly regarded as being undetectable by the human eye.

TEXT DEGRADATION

Font legibility was assessed throughout the washability test routine. On white T-shirts the black fonts were assessed, and on the black T-shirts the white fonts were assessed.

Assessments are judged by two analysts from a 1m viewing distance based on a three-star system (see table to right).

Assessments are carried out before washing, and after 5,10, 15 and 20 washes

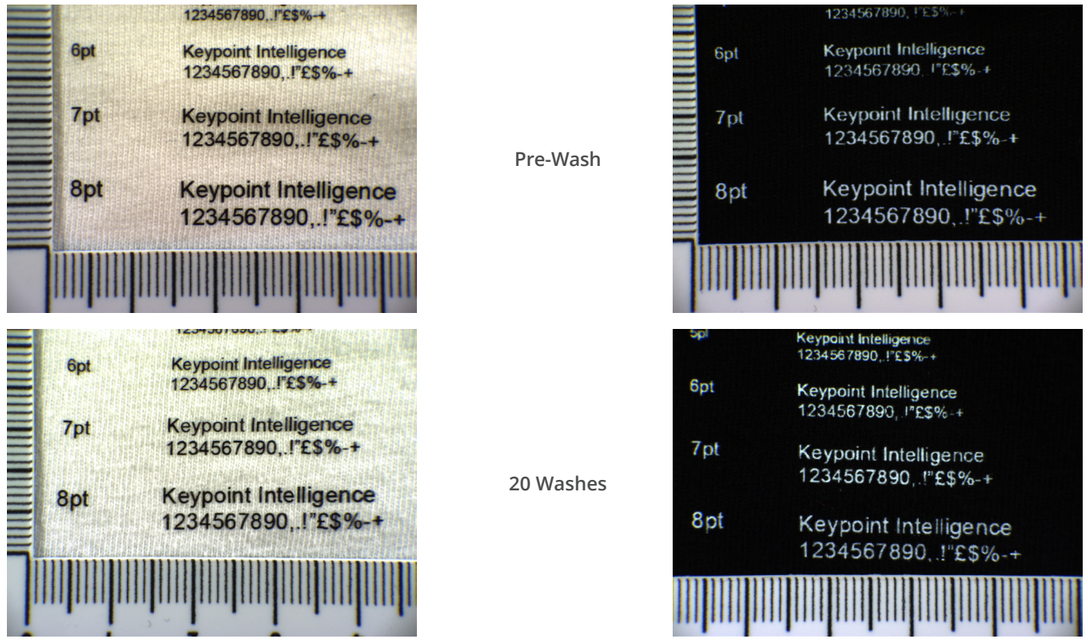
Text Degradation Scoring System	
8pt or less	***
9-11pt	**
12pt or more	*

	Text Degradation Results	
	White T-shirt (results expressed as DeltaE00)	Black T-shirt (results expressed as DeltaE00)
# of washes		
5	***	***
10	***	***
15	***	***
20	***	***

8 Point Font in HQ mode with T-seal 2nd Press (images enlarged)

White T-shirt

Black T-shirt



HALFTONE AND VECTOR IMAGE DEGRADATION

Halftone and vector graphic quality retention was assessed throughout the washability test routine.

Assessments are judged by two analysts from a 1m viewing distance based on a three-star system (see table to right).

Assessments are carried out before washing, and after 5,10, 15 and 20 washes

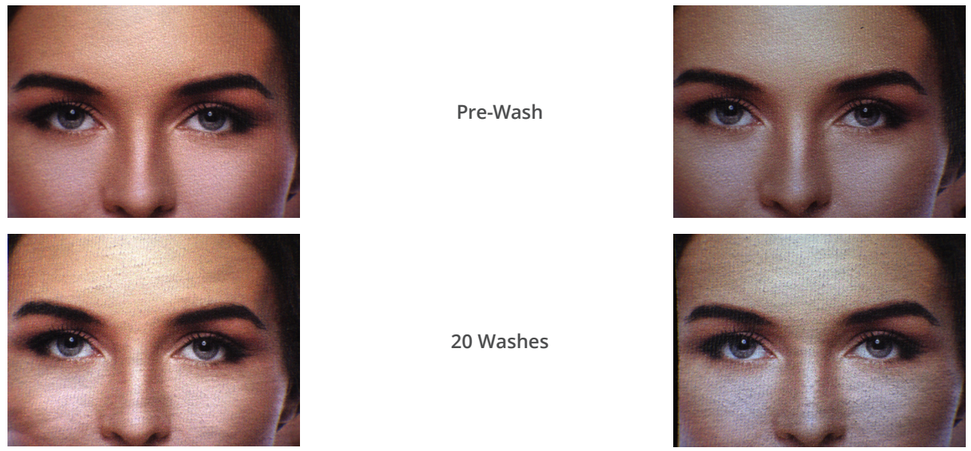
Graphics Degradation Scoring System	
No degradation	***
Minor Degradation (still suitable for wearing in public)	**
Major Degradation (unsuitable for wearing in public)	*

	Graphic Degradation Results	
	White T-shirt (results expressed as DeltaE00)	Black T-shirt (results expressed as DeltaE00)
# of washes		
5	***	***
10	***	***
15	***	***
20	***	***

Images in Production mode with 2nd Press (images enlarged)

White T-shirt

Black T-shirt



STRETCH RESISTANCE

Ink elasticity was assessed throughout the washability test routine using both halftone and solid graphics. Stretch testing was conducted on black t-shirts with a 150% stretch applied using clamps and a set weight over 10 seconds in a horizontal orientation (parallel to shoulders). Images were then taken with a 115% stretch applied simulating modest stretch during wearing. Stretch tests were conducted after 10 and 20 washes.

Stretch Degradation Scoring System	
No degradation	***
Minor Degradation (still suitable for wearing in public)	**
Major Degradation (unsuitable for wearing in public)	*

	Dstretch Resistance Results
	Black T-shirt (results expressed as DeltaE00)
# of washes	
10	***
20	***

Images in Production Mode (images enlarged)

Pre Wash

10 Washes

20 Washes

COLOUR GAMUT SHRINKAGE

	Colour Gamut Shrinkage Results	
	White T-shirt	Black T-shirt
# of washes		
10	8%	13%
20	13%	18%

Colour gamut shrinkage was assessed using a 400 colour patch IT8 profile target. The target was measured with an X-Rite spectrophotometer using XRite Profilemaker to create an icc profile. The resulting icc profile was then assessed using Chromix ColorThink Pro software to determine the colour gamut size expressed as a CIE volume. The CIE volume after each set number of wash cycles was compared versus the original pre-washed output to determine gamut shrinkage.

SUPPORTING TEST DATA

Device Speed Modes Used For Test	
Production Mode – White	720 x 1800dpi 6 pass, Eclosion Setting mode depth/ type Fog
High Quality Mode – White	720 x 1800dpi 6 pass, Eclosion Setting mode depth/ type Strong
Production Mode – Black	720 x 1800dpi 6 pass, Eclosion Setting mode depth/ type Fog
High Quality Mode - Black	720 x 1800dpi 6 pass, Eclosion Setting mode depth/ type Strong

Recommended Cleaning Procedure	
Cleaning Frequency	InkTec recommend conducting a strong head clean at the start of the day. If the device is inactive for a period of an hour or more they recommend running a light head clean. The device also has an automatic head clean option which runs a strong head clean at a defined interval. This can be deactivated during weekdays but activated during the weekend when the device is unattended.
Clean Cycle Used	Strong daily, light after inactive day period

Powder / Cure and Image Transfer Settings	
Feed Speed	INA
Pre-Heat Temp	40°C
Heat Temp	100°C
First Film Transfer Settings	150°C press on med pressure for 10 seconds
Second Press Settings	150°C press on med pressure for 5-10 seconds

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.