



Direct-to-Film Report

A Comprehensive Keypoint Intelligence Evaluation

Mimaki TxF150-75

With Kodak film and Kodak Powder
Driven by the RasterLink 7



Background Specifications

Printhead	On demand piezo head
Print Resolution	720dpi, 1440dpi
Print Speed (4 colour)	Up to 3.3m ² /hr
Maximum Print Width	800mm
Maximum Media Width	810mm
Ink Type	Heat transfer pigment PHT50 (CMYKW)

OUR TAKE

The TxF150-75 is Mimaki's first foray into the fast growing direct-to-film (DTF) market.

Built on the framework of its successful WF print engine, the TxF150-75 benefits from Mimaki's rich heritage in graphic art printing with a feature rich RasterLink RIP and a host of inkjet technologies including automated nozzle checking technology allowing for consistent printing over prolonged periods.

This 'worry-free' nozzle checking technology will, for many compensate for the somewhat lower throughput speed compared to some other DTF devices.

Image quality was vibrant aided a large color gamut on both white and black t-shirts. Fine lines and text were crisp and well defined. Vector graphics had rich solids and no issues at solid borders. Halftones were equally impressive with natural skin tones and memory colours and greyscales with high definition from light to dark, with the highest quality mode delivering even better quality than the standard production mode.

Pantone spot colour matching was very accurate on white t-shirts with an average match of DeltaE of under 7.0 with the yellow to orange spectrum matching being especially strong. Results on black t-shirts were not quite as good with an average DeltaE of 9.49 across the nine tested spot colours but still competitive.

Washability results were good across both white and black t-shirt tests in production and high-quality modes. Colour gamut dropped by no more than 20% with no discernible colour changes. No visual defects were observed until 15 washes and then only minor quality defects and all t-shirts were deemed to be wearable quality after 20 washes. The second press using the T-seal sheet delivered superior results across all test scenarios.

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	75cm film
Production (720 x 720dpi)	2.29	2.41
Highest Quality (720 x 1440dpi)	1.34	1.42

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	2.25ml	2.83ml
Total White Ink Consumption	5.20ml	5.20ml

INK CONSUMPTION DURING A CLEANING CYCLE

	Soft	Normal	Hard
Ink consumed on a full head clean cycle	1.57	8.25	14.79

Vendor Ink Cleaning Cycles

Mimaki states that the device conducts regular head spits (approx. once per hour) which use very small amounts of ink. The device conducts nozzle checks and, when it detects a blocked nozzle will run a soft head cleaning cycle to remedy the issue. If, after the automated head clean routine, the nozzle is still blocked the device will activate a nozzle compensation mode where the failed nozzle will be de-activated and replacement nozzles used in their place. Mimaki states that the device does not need to be put into a 'holiday mode' during long periods of inactivity, and instead simply needs to be left powered on with the head spitting routines and nozzle checking designed to maintain head readiness.

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 ΔE^{*00}

PANTONE Colour	Home Depot 165C	Cadbury 2685C	Walmart 285C	McDonalds 123C	Coca Cola 485C	IKEA 109C	Fedex 363C	UPS 476C	Ford 294C
Production Mode	3.85	13.35	4.23	4.33	6.16	1.79	5.67	6.36	9.55
High Quality Mode	6.48	14	5.86	4.23	6.38	3.2	6.97	5.91	7.21

Black T-shirt Colour matching measured in ΔE^{*00}

PANTONE Colour	Home Depot 165C	Cadbury 2685C	Walmart 285C	McDonalds 123C	Coca Cola 485C	IKEA 109C	Fedex 363C	UPS 476C	Ford 294C
Production Mode	10.93	13.33	6.16	10.41	10.17	9.94	8.96	6.03	9.47
High Quality Mode	18.45	14.35	10.07	17.62	15.06	17.96	14.27	4.64	7.52

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)	299,882	305,757	206,102	198,072

TEXT AND FINE LINES

	White T-shirt		Black T-shirt	
	Production	High Quality	Production	High Quality
Text (min legible size)	4pt	4pt	4pt	4pt
Fine lines	Excellent	Excellent	Excellent	Excellent

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 GRAPHICS

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).

Halftone Image targets

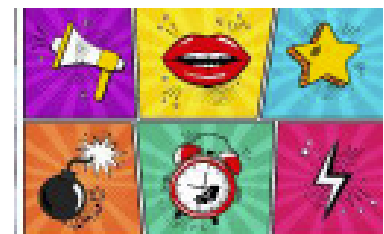
White T-shirt		
Halftone Reproduction		
	Production	High Quality
Skin Tones	Good	Very Good
Memory Colours	Good	Very Good
Greyscales	Good	Very Good
General Comments	Skin tones and memory colours had a pleasing natural appearance. Greyscales were neutral with good detail in dark and light contrast areas.	
Vector Reproduction		
	Production	High Quality
Solids	Good	Very Good
Fine Details	Very Good	Very Good
General Comments	Solids were to a high standard and transitions of colour were smooth. Fine detailing in vector graphics was crisp. Halftones provided natural skin tones and memory colours and very good neutral greyscales with high contrast in light and dark areas.	



Black T-shirts		
Halftone Reproduction		
	Production	High Quality
Skin tones	Good	Very Good
Memory Colours	Good	Very Good
Greyscales	Good	Very Good
General Comments	Skin tones and memory colours had a pleasing natural appearance. Greyscales were neutral with good detail in dark and light contrast areas. Skin tones and memory colours were very good in the highest quality mode with smooth gradations and excellent fine details.	
Vector Reproduction		
	Production	High Quality
Solids	Good	Very Good
Fine Details	Very Good	Very Good
General Comments	Solids very bright with consistent fill, no bleed between colours with production class delivering exceptional quality	



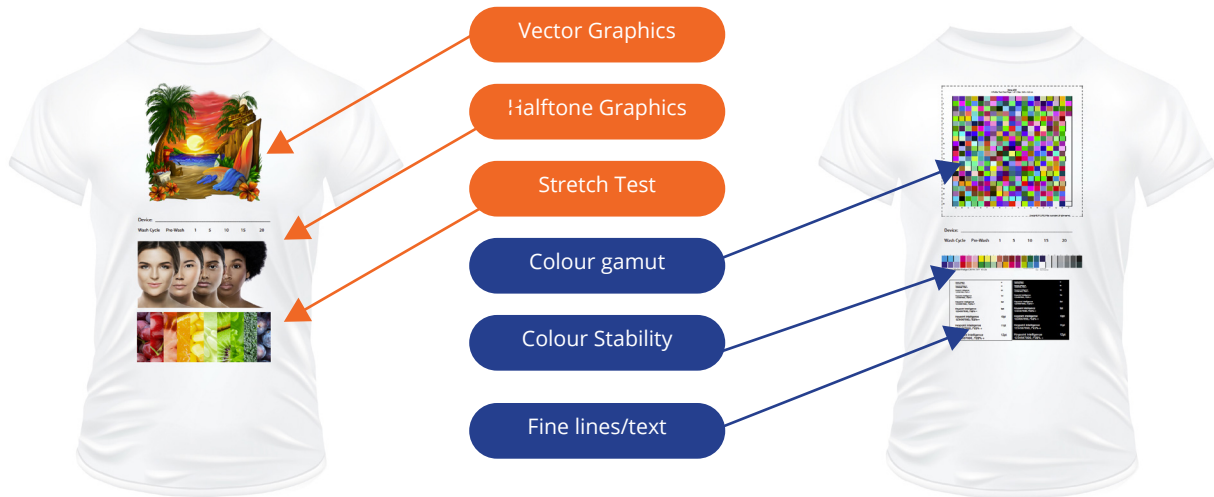
Vector Image targets



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 and high-quality mode.

Images were transferred to the t-shirts using a cold press process with 50% of the shirts also receiving a second press using a silicone sheet. 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 within the same test protocol.

COLOUR STABILITY

	Colour Stability Results							
	White T-shirt (results expressed as DeltaE00)				Black T-shirt (results expressed as DeltaE00)			
	Production Quality		High Quality		Production Quality		High Quality	
# of washes	1 Press	2 Press (T-seal)	1 Press	2 Press (T-seal)	1 Press	2 Press (T-seal)	1 Press	2 Press (T-seal)
5	0.77	0.81	0.70	0.70	0.60	0.82	0.82	0.71
10	0.80	0.82	0.72	0.71	0.65	0.84	0.86	0.75
15	0.80	0.94	0.87	0.72	0.86	0.94	1.31	0.77
20	0.98	0.96	0.89	0.75	1.14	1.00	1.32	0.80

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 DeltaE00. 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

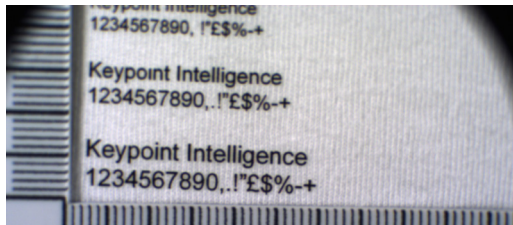
Text Degradation Scoring System	
8pt or less	***
9-11pt	**
12pt or more	*

# of washes	Text Degradation Results							
	White T-shirt				Black T-shirt			
	Production Quality		High Quality		Production Quality		High Quality	
	1 Press	2 Press (T-seal)	1 Press	2 Press (T-seal)	1 Press	2 Press (T-seal)	1 Press	2 Press (T-seal)
5	***	***	***	***	***	***	***	***
10	***	***	***	***	***	***	***	***
15	***	***	***	***	***	***	***	***
20	***	***	***	***	***	***	***	***

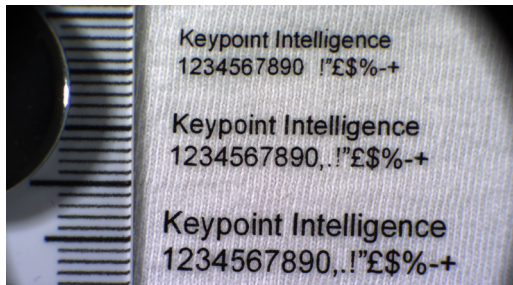
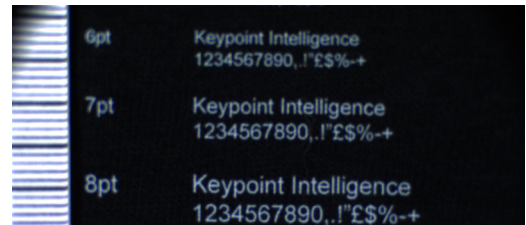
8 Point Font in HQ mode with T-seal 2nd Press (images enlarged)

White T-shirt

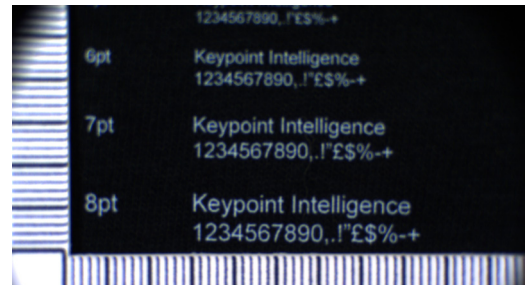
Black T-shirt



Pre-Wash



20 Washes



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)	*

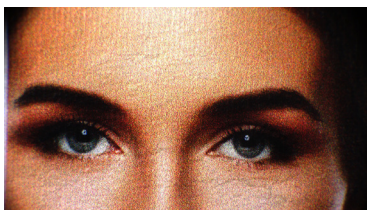
# of washes	Graphic Degradation Results							
	White T-shirt				Black T-shirt			
	Production Quality		High Quality		Production Quality		High Quality	
	1 Press	2 Press (T-seal)	1 Press	2 Press (T-seal)	1 Press	2 Press (T-seal)	1 Press	2 Press (T-seal)
5	***	***	***	***	***	***	***	***
10	***	***	***	***	***	***	***	***
15	**	***	***	***	**	**	**	***
20	**	**	***	***	**	**	**	**

Observations:

Up to 15 washes there were no discernable differences in the quality of the printed tshirts. By 15 washes some lighter colours were showing some fading and the 1-press black t-shirts were showing slight cracking and black fibre see through. Having said that, all t-shirts after 20 washes were judged to be perfectly wearable outside of the home. The t-seal second press delivered superior results across all of the wash tests.

Images in HQ mode with T-seal 2nd Press (images enlarged)

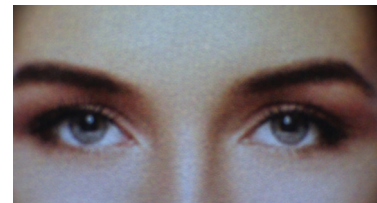
White T-shirt



Pre-Wash

20 Washes

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.

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

# of washes	Stretch Resistance Results			
	Production Quality		High Quality	
	1 Press	2 Press (T-seal)	1 Press	2 Press (T-seal)
5	***	***	***	***
20	**	**	**	**

Observations:

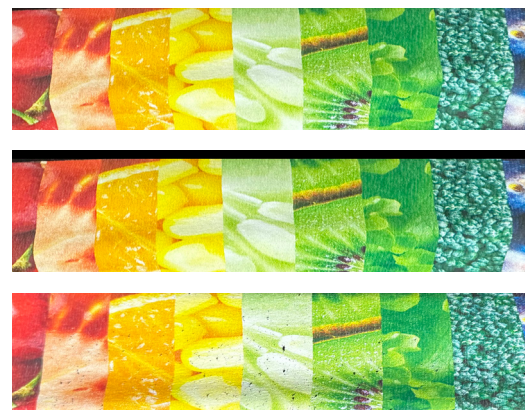
Up to 15 washes there were no discernable differences in the quality of the printed t-shirts. By 15 washes some lighter colours were showing some fading and the 1-press black t-shirts were showing slight cracking and black fibre see through. Having said that, all t-shirts after 20 washes were judged to be perfectly wearable outside of the home. The t-seal second press delivered superior results across all of the wash tests.

Images in HQ mode with T-seal 2nd Press (images enlarged)

1 Press



2 Press



Pre-Wash

10 Washes

20 Washes

COLOUR GAMUT SHRINKAGE

	Colour Gamut Shrinkage Results							
	White T-shirt (results expressed as DeltaE00)				Black T-shirt (results expressed as DeltaE00)			
	Production Quality		High Quality		Production Quality		High Quality	
# of washes	1 Press	2 Press (T-seal)	1 Press	2 Press (T-seal)	1 Press	2 Press (T-seal)	1 Press	2 Press (T-seal)
10	0%	6%	0%	7%	5%	12%	4%	12%
20	7%	20%	9%	14%	13%	18%	16%	19%

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	
Fast/Draft Mode – White	N/A
Production Mode – White	720 x 720dpi VD, 10 pass Generic DTF Film Deep_Colour_Natural colour matching
Fast/Draft Mode – Black	N/A
Production Mode – Black	720 x 1400dpi VD, 16 pass Generic DTF Film Deep_Colour_Natural colour matching
High Quality Mode - Black	720 x 1400dpi VD, 16 pass Generic DTF Film Deep_Colour_Natural colour matching

Recommended Cleaning Procedure	
Cleaning Frequency	No mandated head clean interval, device conducts regular spits by default and conducts nozzle checks automatically, head clean operation is only required when automated nozzle check detects a nozzle blockage, then a normal clean is initiated
Clean Cycle Used	Normal

Powder / Cure and Image Transfer Settings	
Feed Speed	7500 mm/hr
Pre-Heat Temp	70°C
Heat Temp	110°C
First Film Transfer Settings	158°C press on med pressure for 15 seconds
Second Press Settings	158°C press on med pressure for 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.