帝国インキ製造株式会社
Teikoku Printing Inks Mfg. Co., Ltd.

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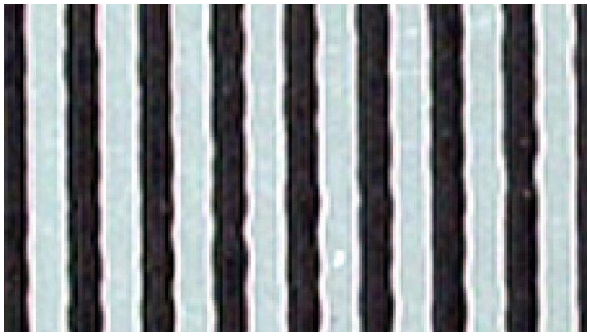
TECHNICAL REPORT

To the designers and technical experts who expect new possibilities of screen printing

Introduction of 7 benefits of High Definition Ink (High Quality and High Definition Screen Printing Ink)

Introduction of 7 benefits



We will introduce 7 benefits which High Quality and High Definition Screen Printing Ink provides to the customers.
Note1) Now we still deliver High Definition Ink in Japan only.
Note2) High Definition Screen Printing Ink obtained patent.

1. 7 benefits of High Quality and High Definition Screen Printing Ink

7 benefits provided by High Quality and High Definition Screen Printing Ink are as follows. All of these benefits had not been realized until now. This High Quality and High Definition Screen Printing Ink provides excellent decoration printability as described as follows.

1). Fine printability
Enables printing 100μm line with accuracy within 100 – 116μm. (We have actual result of printing 30μm fine line).

2). Solid printing and fine line printing at the same time.
Enables mixed pattern of solid, gradation, and fine line printing with 1 stencil.

3). Measure for saw edge (concavo-convex on printed boundary surface)
Enables printing of beautiful straight line and circle with saw edge below 10μm

4). Continuous printability
Enables continuous printing of 1500 sheets with no deformation in fine line and dot.

5). High-speed printability
Enables fine printing of 800 – 1500 sheets/hour by cylinder press.

6). Re-printability
Enables restarting printing even after stopping printer for 1 hour while ink is on stencil.

7). Reduction of the number of cleaning stencil

Enables reduction of the number of cleaning stencil from once/300 sheets to once/1500 sheets.

2. Introduction of benefits related to improvement of decoration characteristics and quality

1st benefit: Fine printability

	Conventional ink	High Quality and High Definition Ink
Fine line	Printing 100μm fine line makes ink sagging width at one side 20μm thicker (line width about 140μm).	In printing 100μm fine line, stable printing with ink sagging width below 8μm at one side is possible (line width 100 – 116μm) .
Gradation	Dot gain occurs.	Enables stable printing.
Outline character printing	Outline character printing of 100μm, character becomes thinner or blur.	Enables stable outline printing of 100μm character. Enables solid printing without pinhole.

2nd benefit: Solid and fine line printing at the same time

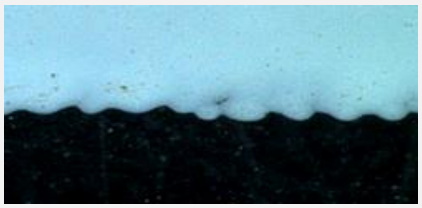
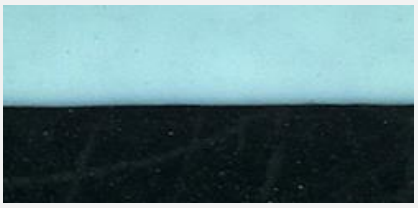
Conventional ink	High Quality and High Definition Ink
Solid and fine line printing at the same time causes bleed of line, ink spatter, and blur.	Enables solid and fine line printing (fine pattern) with one stencil at the same time.

3rd benefit: Countermeasure for saw edge (Solution of saw edge (concavo-convex in printed boundary line)

Conventional ink	High Quality and High Definition Ink
・ Concavo-convex in line is conspicuous. ・ Concavo-convex or distortion occurs in curved line at the time of outline printing of true circle.	Enables printing line with concavo-convex below 10μm and outline printing of circle with concavo-convex below 10μm.

– Printing White Ink on glass with semi-automatic screen printing machine. Comparing the 50th sheet printed.

Printing conditions: Polyester stencil (L420 mesh, thread diameter 27μm) Printing from top down.

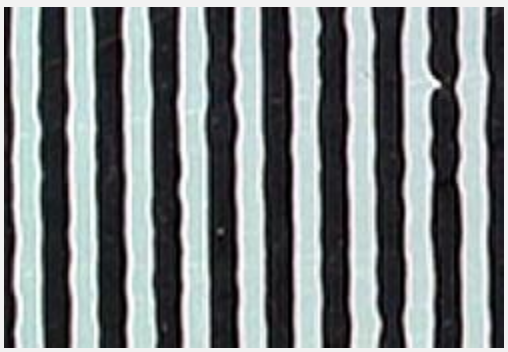
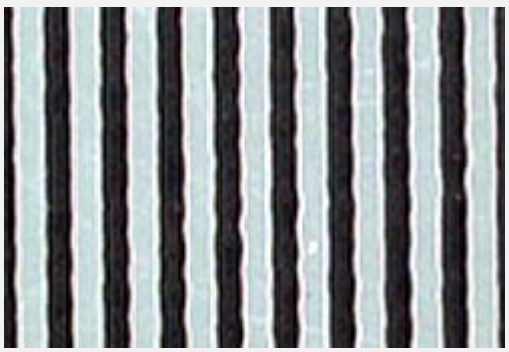
Conventional ink (GLS-HF679 WHITE)	High Quality and High Definition Ink (XGL-HF679 WHITE)
There is concavo-convex of 50μm level. 	Concavo-convex hardly occurs. 

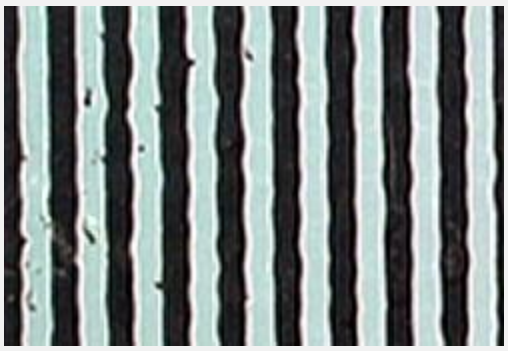
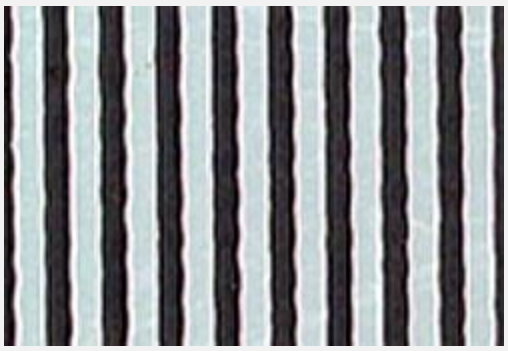
3. Introduction of benefits related to productivity and workability

4th benefit: Continuous printability

Conventional ink (GLS-HF679 WHITE)	High Quality and High Definition Ink
・At the time of printing 100μm line, about 20μm is thicker on one side. (line width: about 140μm) ・Ink spatter occurs after printing 300 sheets.	XER ink: Capable of ink sagging width below 8μm on one side even after printing 400 sheets with semi-automatic screen printing machine and 1500 sheets with automatic screen printing machine. Enables stable printing (line width 100 – 116μm).

Printing conditions: Polyester stencil (L355 mesh, thread diameter 27μm)

Conventional ink (ERX-971 BLACK)	High Quality and High Definition Ink (XER-971 BLACK)
50th sheet print Line is thickened by ink sagging, which is barely acceptable. 	**50th sheet print** Realizes beautiful line with no thickened line caused by ink sagging and without concavo-convex. 

100th sheet print	1500th sheet print
No good as ink spatter occurred in addition to thickened line caused by ink sagging	Realizes beautiful line & space in 1500th sheets without halt by cleaning stencil, etc.
	

5th benefit: High-speed printability

Conventional ink	High Quality and High Definition Ink
Unable to perform stable printing of 100μm line with automatic screen printing machine.	Enables printing of 100μm line with automatic screen printing machine at following speed. XER : 800 – 1500shot/hour XIP-HF : 800 – 1000shot/ hour XFM : 800 – 1000shot/ hour

6th benefit: Re-printability

Conventional ink	High Quality and High Definition Ink
Wiping off stencil is required after leaving ink on stencil 3 – 5 minutes.	Enables printing after waste printing of 5 sheets even after 1 hour of leaving ink on stencil.

7th benefit: Reduction of the number of cleaning stencil

Conventional ink	High Quality and High Definition Ink
Cleaning stencil about every 20 minutes is required depending on printing pattern. (About once per 300 sheets)	Cleaning stencil is required only about every 90 minutes. (About once per 1500 sheets)

4. Product information of High Quality and High Definition Ink

Ink Series	XER Ink series	XIP-HF Ink series	XGL-HF Ink series	XFM Ink series
Type	1 pack type	2 pack type	2 pack type	1 pack type
Substrate	Treated PET, PC	Treated PET, PC	Glass	PC
Application	Applicable to printing name plates.	Applicable to injection molding.	Exclusive for printing glass	Applicable to thermoforming (vacuum forming)

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