"TORAY"

Toray Waterless Plate

Technical Information (Basic)

2007.2 1st edition

Toray Waterless Plate

Contents

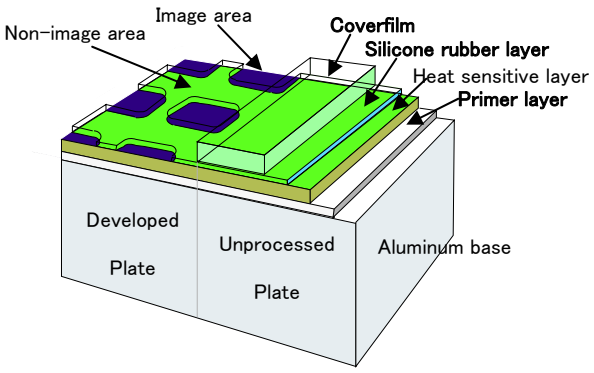
【1】 Feature of Toray Waterless CTP Plate

The non-image area consists ink repellent silicone rubber layer. This silicone layer acts as a dampening solution of the conventional wet litho plate. The plate is a thermal type which reacts to near-infrared ray, and the exposed part will be the imaged area (negative working type).

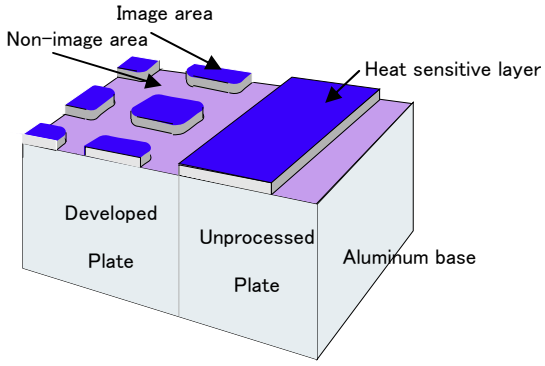
1.1 Structure and function of Toray Waterless CTP Plate

Cover film	Protects silicone rubber layer from scratches and dust during handling of unprocessed plate.
Silicone rubber layer (Ink repellent: non-image area)	Forms the non-image area utilizing the ink repellent feature, and acts as the dampening solution of the conventional wet litho plate.
Heat sensitive layer (Ink receptive: image area)	Accepts ink and forms the image area. The silicone layer of the image area is removed in the developing process.
Primer layer	Allows dot readability by blocking the grain of the aluminum

Toray Waterless Plate：Deep etch plate



Conventional wet litho plate: Plano-convex plate



1.2 How to handle Toray Waterless CTP Plate

Storage of unprocessed plate	Avoid direct light, and store in a cool place
Handling of Cover film	Coverfilm is there to protect the silicone layer. Peel off the cover film before developing.
Safety light of unprocessed plate	The plate will not react to visible light or ultraviolet ray, but it will react if it is exposed to near-infrared ray for a long period of time. Please keep the plate away from the window or a fluorescent light without infrared shielding and do not leave the plates under those conditions for a long time.
Unprocessed plate handling	Touching the plate surface with bare hands will not affect developing performance. Avoid contact of dust, grease or chemistry.

It may cause problem during pre-press if there is a foreign object on the plate before exposure. Poor development may occur if grease or chemistry adheres to the plate surface before development.。

【2】 Exposure

Absorption maximum wavelength of the photosensitive layer is at the near-infrared ray, and every type of thermal plate setter loading a laser whose oscillation wavelength is 830nm can expose the plate. The plate is a negative working type. Please make sure that the setting of the plate setter is correct.

2.1 Platesetter model

Special adjustments or modification may be needed according to the model of the platesetter. Please refer to the platesetter manufacturer or contact us before using Toray Waterless CTP Plate.

2.2 Platesetter adjustment

The platesetter manufacturer will mainly do the following three operations to adjust the platesetter. Please contact the platesetter manufacturer for maintenance.

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Sensor adjustment

Adjust the sensor of each part to output without any problem.

Focus adjustment

Record several points of focus adjusting internal patterns, which is supplied with the platesetter, varying fitfully towards both plus and minus directions from the basic point to adjust the focus.

By setting the output slightly lower than the basic output point, the effect of the focus variation can be seen clearly, and it would be easier to decide the focus setting.

Output adjustment

Record several points varying fitfully towards both plus and minus directions from the basic output point, and decide the optimum output condition according to the reproduction of each point.

The image area will turn from black to white, and then to red when raising the output power. The optimum output condition is normally right before turning white.

2.3 Precaution during exposure

Handling of Coverfilm

Plate can be exposed either with or without coverfilm.

Exposing performance

The imaged area would be slightly black.

The Image area would turn from black to white, and to red when raising output power. The Exposing performance will increase, but may give negative effect to dot reproduction. Do not increase output power beyond necessity

Leaving the exposed plate undeveloped

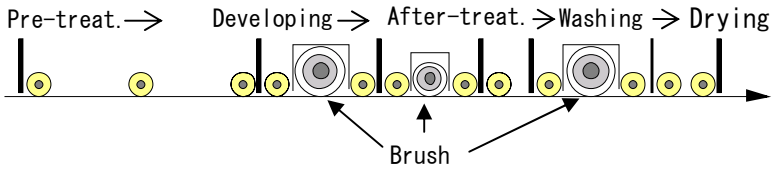
Be sure to develop the plate immediately after exposure. The developing performance will decrease when the exposed plate is left undeveloped for a long time.

The plate may be left undeveloped for a few days

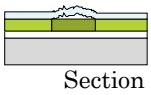
【3】 Development

The image area of Waterless CTP Plate is formed by scrubbing off the silicone rubber layer of the exposed area by a brush.

3.1 Developing process



Pre-treatment



The pre-treatment solution weakens the bond between the silicone rubber layer and the heat-sensitive layer of the exposed area, to help brush off the silicone at the developing unit.

Developing

Mechanically brushes off the silicone rubber layer of the exposed layer by a brush and water.

The water avoids scratches caused by brush (lubrication action), and washes away the silicone residue.。

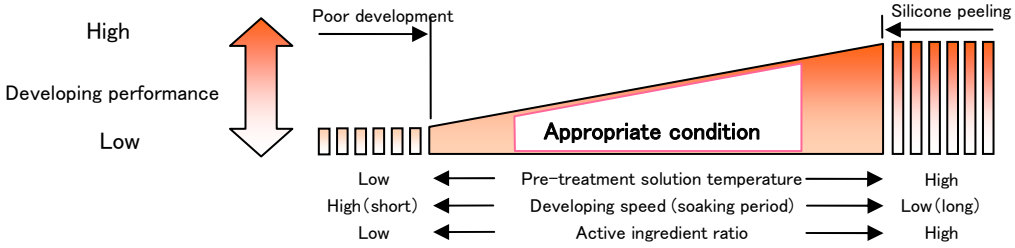
After-treatment

Adjusts the figure of dots by brushing off the fringes with a brush rotating in the opposite direction to developing brush. The after-treatment solution dyes the surface of the heat-sensitive layer, and improves the dot readability.

Washing

Adjusts the figure of dots and washes the plate surface with water and a brush rotating in the opposite direction to developing brush.

3.2 Change in the processor developing performance



Brush pressure

The brush pressure will decrease by deterioration caused by continuous use, and lead to poor developing performance. Check the brush pressure periodically, and make necessary adjustments.

Please refer to the processor manual for checking and adjusting method of brush pressure.

Pre-treat. solution temperature/ soaking period

Higher pre-treat. solution temperature leads to high developing performance. Lower speed leads to longer soaking period and more contact to developing brush, which leads to higher developing performance.

Excess setting of temperature and speed may damage the non-image area, or lead to poor development or toning.

Active ingredient ratio of pre-treat. solution

Pre-treatment solution contains ingredients which contributes to developing performance of waterless CTP plate. This ingredient decreases by continuous use, and leads to poor development.

3.3 Standard developing condition

The standard developing condition of waterless CTP plate under the standard exposing condition (2400dpi, 175L/inch) is as follows.

Standard developing condition

Processor type	Pre-treat. solution	Temperature	Processor speed	Brush pressure Developing	Brush pressure After-treat.	Brush pressure Washing
TWL-860F /1160F	DP-1	35℃	80cm/min [70～90cm/min]	14mm [13～15mm]	10mm [9～11mm]	10mm [9～11mm]
TWL-650F			40cm/min [35～45cm/min]	11mm [10～12mm]	7mm [6～8mm]	9mm [8～10mm]

3.4 Maintenance of processor

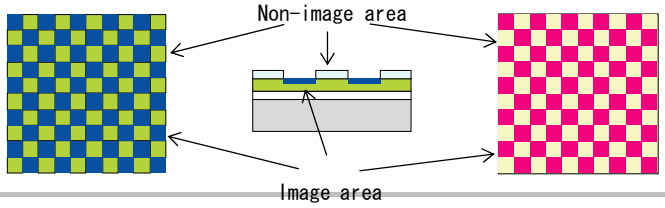
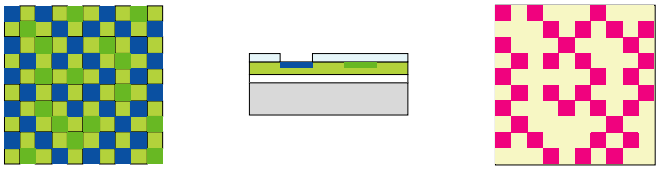
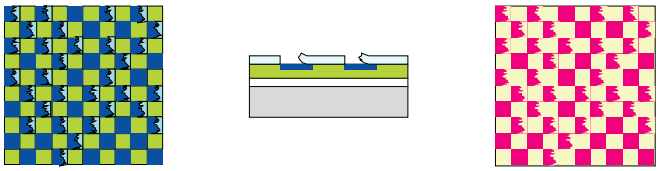
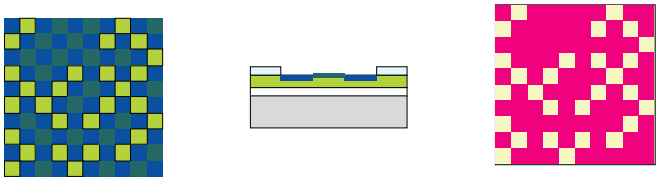
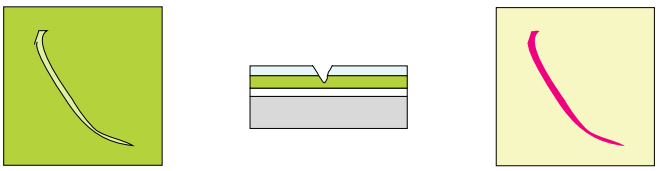
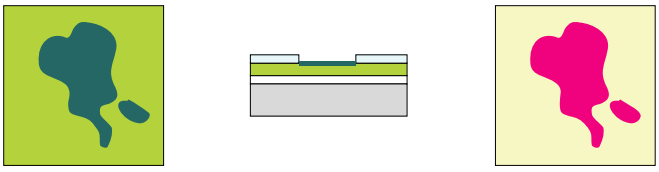
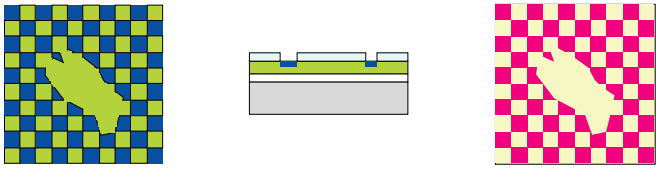
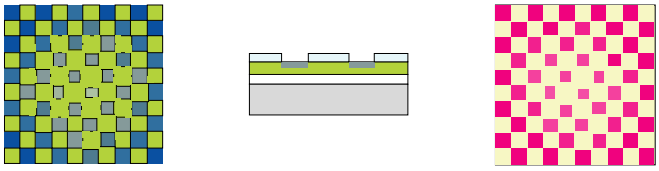
Be sure to carry out checking and maintenance to maintain the performance of processor. Please keep an inventory of the consumables necessary for maintenance, and refer to the instruction manual for detailed information.

Processor maintenance list

Frequency	Timing	Check and work item	Where to check	Reference page
Daily	Before operation	Leaking at piping	Floor below piping	23
		Silicone residue	Developing unit overflow filter	
	Before operation・ During machine stop	Check each treatment solution (Check/replenish)	Level gauge	23
	Pump operation mode	Solution amount and direction (Check／adjust)	Shower flow	32
	During operation	Abnormal noise (identify/response)	Abnormal noise place	86
		Solution dry off (check／adjust)	Transportation roller nip pressure	38
Weekly	Before operation (power ON)	Safety device operation check	Side cover limit switch	16
			Emergency stop switch	15
	During machine stop (power OFF)	Silicone residue removal/ clean up (All three units)	Transportation roller	42, 43
			Brush cover	
			Brush	
Monthly	During machine stop (power OFF)	Greasing	Brush bearing(left/right)	40, 41
			Carrying chain	
			idler sprocket	
	Brush pressure Check mode	Check pressure of each brush (measure／adjust)	Brush pressure	44, 45
	Before (power ON)	Check temperature setting	Operation panel temp. controller	18
	After (power ON)	Total processed plates	Operation panel counter	
Periodically	Frequency individually set	Replacing filter	Pre-treatment filter	48,64
			Developing filter	50,65
			After-treatment filter	52,65
			Washing filter	54,65
	During machine stop	Replacing molton	Dirt on the molton surface	56

【4】 Developing problem and print condition

When developing problem occurs, obtain the plate and print sample and check with a magnifying glass. Compare with the following case and determine the cause and solution.

Case	Plate condition		Print condition	
	Expanded image	Cross-section image	Expanded image	⇨ Solution
				Dots are reproduced without problem. Standard
A				Silicone is left on the image area, due to poor developing performance. ⇨ 4.1 Missing dots
B				Silicone is partly left on the image area, due to poor developing performance. ⇨ 4.1 Missing dots
C				Silicone layer of non-image area is peeled off, due to excess developing performance. ⇨ 4.2 Silicone peeling
D				Silicone layer is scratched off. ⇨ 4.3 Scratch
E				Silicone layer is peeled off by treatment solution. ⇨ 4.4 Irregular peeling
F				Laser is blocked off by foreign object (particle), and the image area is not formed. ⇨ 4.5 Particle
G				The image is not formed properly due to defocus caused by particle. ⇨ 4.6 Defocusing

【Caution】 Be sure to obtain the print with problem, together with the plate used for that particular print. First determine the cause using those samples.

【Caution】 Be sure to keep the print and plate sample until the problem is solved.

4.1 Missing dots

Some dots are not reproduced. In some cases unevenness of print occurs due to missing dots, and a stripe-form shade can be seen.

【Cause】Poor developing performance on processor

OK 【Cause】Shower flow (Pre-treatment/Developing/After-treatment/Washing)

OK ↓ NG: Shower flow is too low, or there is no flow

【Solution】Exchange filter

↓ NG: No shower flow even though the filter is new

【Solution】Clean pump circulation pipeline

【cause】pre-treatment solution temperature

OK ↓ NG: Irregular pre-treatment temperature setting

【Solution】Change the temperature setting to standard value

↓ NG: The temperature setting and actual setting is different for 2℃ or more

【Solution】Repair the processor

【Cause】Processor speed

OK ↓ NG: Irregular processor speed setting

【Solution】Change the speed setting to standard value

↓ NG: The speed setting and actual speed is different for 5cm/min or more

【Solution】Repair the processor

【Cause】Pre-treatment solution

OK ↓ NG: Amine concentration is below the lower limit(Check amine concentration)

【Solution】Exchange pre-treatment solution

【Cause】Brush pressure

↓ NG: Insufficient brush pressure

【Solution】Set the brush pressure setting to standard value

↓ NG: Brush pressure is appropriate, but missing dot occurs

【Solution】Exchange developing brush

【Cause】Variation of Platesetter output condition

【Cause】Focus

OK ↓ NG: Irregular focus setting

【Solution】Set the focus to standard value

【Cause】Output power

↓ NG: Output power is too low

【Solution】Set the output power to standard value

4.2 Silicone peeling

Silicone peeling occurs partially. In some cases unevenness of print occurs due to missing dots, and a stripe-form shade can be seen.

【Cause】Over developing on processor

OK 【Cause】Shower flow (Pre-treatment/Developing/After-treatment/Washing)

↓ NG: Shower flow is too low, or there is no flow

【Solution】Exchange filter

↓ NG: No shower flow even though the filter is new

【Solution】Clean pump circulation pipeline

【Cause】Pre-treatment solution temperature

OK ↓ NG: Irregular pre-treatment temperature setting

【Solution】Change the temperature setting to standard value

↓ NG: The temperature setting and actual setting is different for 2℃ or more

【Solution】Repair the processor

【Cause】Processor speed

OK ↓ NG: Irregular processor speed setting

【Solution】Change the speed setting to standard value

↓ NG: The speed setting and actual speed is different for 5cm/min or more

【Solution】Repair the processor

【Cause】Brush pressure

OK ↓ NG: Brush pressure is too high

【Solution】Set the brush pressure setting to standard value

【Cause】Pre-treatment solution

↓ NG: Suspicious chemical contamination in pre-treatment solution

【Solution】Exchange pre-treatment solution

【Cause】Long time exposure of plates under sunlight and/or room light

【Cause】Exposure under near-infrared ray

↓ NG: Long time exposure under room light, more than half day

【Solution】Use a room light with a near-infrared ray shield, or store the plate in a place where there is no exposure to room light.

↓ NG:Long time exposure under sunlight, for more than a few hours

【Solution】Shield sunlight, or store in a place where there is no exposure to sunlight.

4.3 Scratch

Silicone rubber layer of Waterless CTP plate may be damaged by contact to hard object or excess pressure.

【Cause】Human handling

OK Arcuate scratch、Scratch seen on a certain point of plate, discontinuous scratch

【Cause】Carelessness

↓ NG: Work on the plate, place something on the plate

【Solution】Be careful not to place something or work on the plate

↓ NG: Scratch plate surface with the corner or aluminum side of another plate

【Solution】Slip in interleaf paper when piling plates

【Cause】Machine problem

Straight scratch, scratch parallel to one side of plate, continuous scratch

【Cause】Platesetter

OK ↓ NG: Scratch is occurring at the outlet of platesetter

【Solution】Ask manufacturer to adjust or repair platesetter

【Cause】Processor/brush

OK ↓ NG: Brush pressure is too high

【Solution】Adjust brush pressure to standard value

↓ NG: Foreign object is adhering to brush

【Solution】Condition the brush

↓ NG: Scratch continuously occurs after brush conditioning

【Solution】Exchange brush

【Cause】Press/Attaching pre-pressed plate

↓ NG: Silicone layer of plate contacts the press when attaching pre-pressed plate to press

【Solution】Adjust or repair press

4.4 Irregular peeling

Partially round, irregular silicone peeling occurs.

【Cause】Adhesion of chemical

Caused by adhesion of alkaline solution or long time adhesion of organic solvent

【Cause】Pre-treatment solution

OK ↓ NG: Adhesion of pre-treatment solution

【Solution】Check spill/adhesion of agent in the working area and clean

【Cause】Stop out solution for conventional wet litho plate

OK ↓ NG: Adhesion of stop out solution for conventional wet litho plate

【Solution】Check spill/adhesion of agent in the working area and clean

【Cause】Developer for conventional wet litho

↓ NG: Adhesion of developer for conventional wet litho

【Solution】Check spill/adhesion of agent in the working area and clean

4.5 Particle

The image is not formed because the laser is blocked off

【Cause】Adhesion of foreign object/ block off of laser

If there is a foreign object adhering above silicone layer during exposure by platesetter, the laser will be blocked off by this foreign object and the image on this area will not be formed.

【Cause】Adhesion of foreign object (particle)

【Solution】Check the adhesion of foreign object on automatic stocker, drum and roller inside platesetter, and clean

4.6 Defocusing

Accurate image is not formed due to defocusing of laser

【Cause】Adhesion of foreign object/Defocus of laser

When there is a foreign object adhesion between aluminum side of Waterless CTP Plate and the platesetter drum, it will create a space between the plate and drum during exposure. This will lead to defocus of laser beam, and cause blurr.

【Cause】Adhesion of foreign object

OK ↓

↓ NG: Adhesion of foreign object

【Solution】Check the adhesion of foreign object on automatic stocker, drum and roller inside platesetter, and clean

【Cause】Defocus of laser

↓ NG: The focus is not in the right setting

【Solution】Adjust the platesetter focus to the appropriate setting