FCO 512-00454A: Optic Lens 1:3

Document number: 719-00875A Rev B

Product

- Kodak® ThermoFlex® Mid/Mid II (S/N lower than FM207)
- ThermoFlex® Narrow (S/N lower than FN 188)

Note: Devices with S/N higher than FM207 or FN188 already have the optic lens 1:3 assembly.

FCO priority

Next failure

Background

The optic lens 1:3 assembly improves image quality and makes calibration easier.

Solution

Replace the lens 1:2 assembly with the optic lens 1:3 assembly.

Important: After installing the optic lens 1:3 assembly, you must perform full calibration. See step 7 on page 10.

Time required

The lens assembly replacement procedure takes three-four hours, and the calibration procedure takes about one day.

Parts required

Part Number	Part Name	Quantity
500-06466A	Lens 1:3 N/A-0.14 assy	1
690-01426A	Jig: spacer	1
719-00875A Rev B	FCO document	1
651-00781A	FCO updater CD	1

Tools required

Jig: Optic head outer key (291B7B867)



Procedure

The full lens assembly replacement procedure includes performing ITP, replacing the lens assembly, testing the replacement, calibrating the platesetter, and then performing ITP to confirm improved quality.

Getting Started

1. Expose an ITP file. This file will serve as a basis for comparison.
2. In ThermoFlex Controller, send the carriage to position 300 (Narrow) or to 700 (Mid), or to any position that enables you to work comfortably on the head.
3. Take the necessary steps to access the carriage, quit ThermoFlex Controller, turn off the platesetter, and disconnect the main power supply.

Removing the Lens Assembly

The following illustration provides an at-a-glance, five-step overview of the lens assembly replacement procedure. Basically, you remove everything from the telescope, remove the lens assembly, install the new lens assembly, and reassemble the components in the telescope.

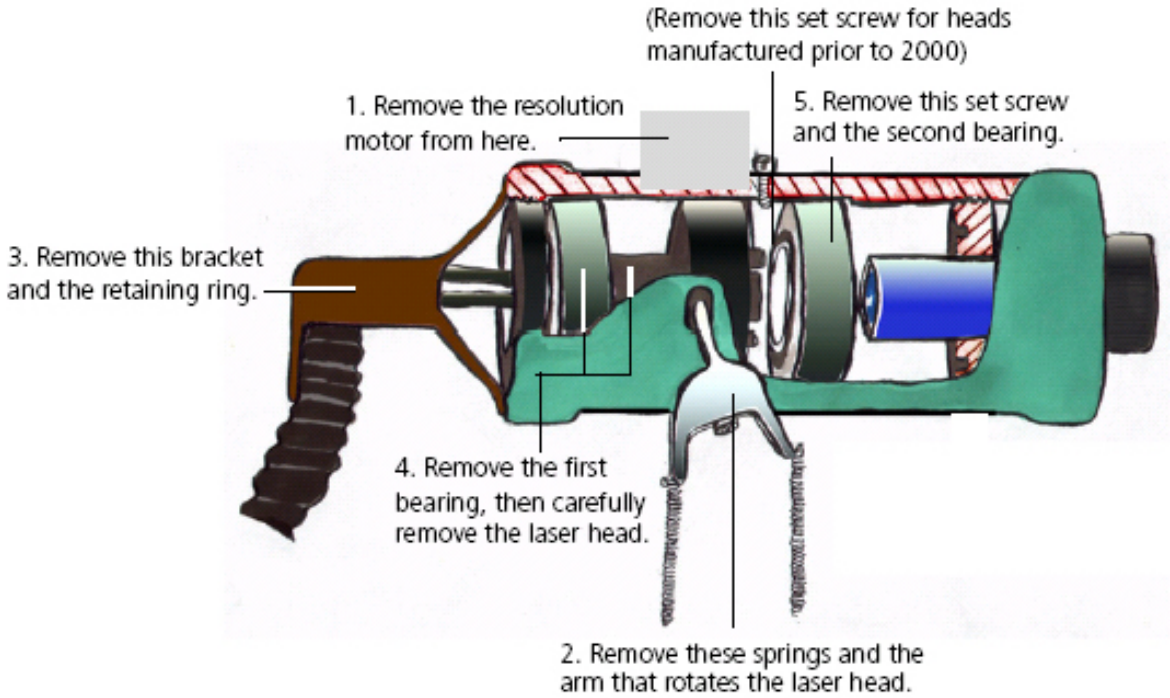


Figure 1. Overview of the lens assembly replacement procedure

To remove the resolution motor and head rotation arm:

When removing the motor and springs, mentally note how to reassemble them. Pay close attention to how the resolution motor fits with the head rotation arm.

1. Disconnect the two detector connectors and the motor power connector, as shown in Figure 2.

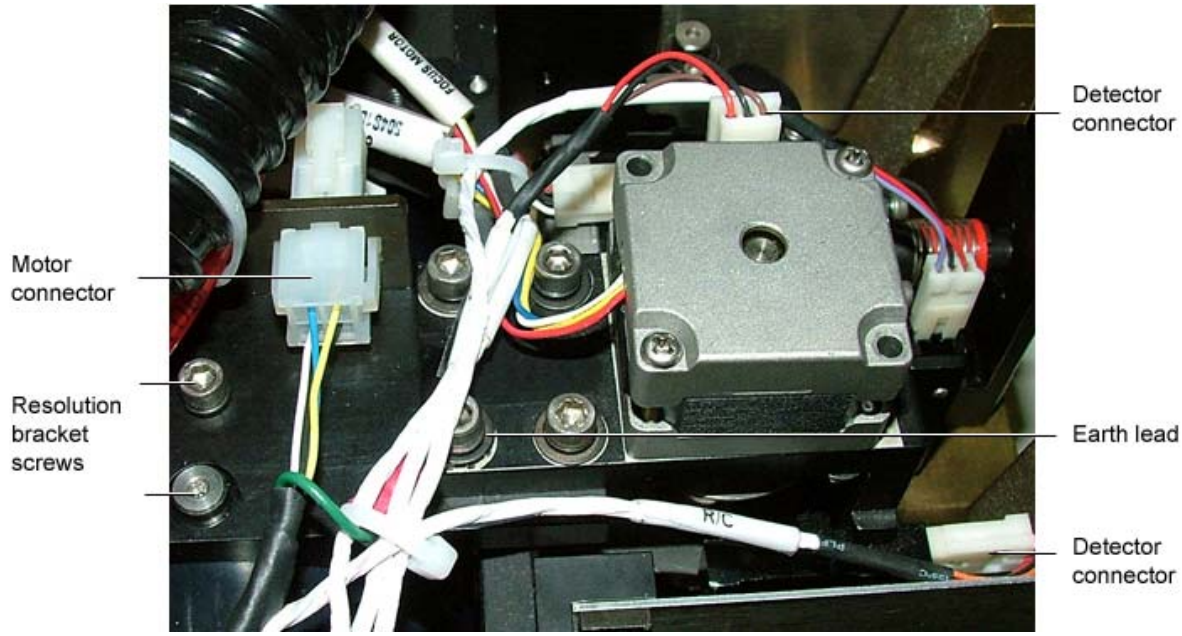


Figure 2. Resolution motor

2. Manually rotate the resolution motor disk counterclockwise so that the fork moves as far down as possible.This reduces tension on the springs.

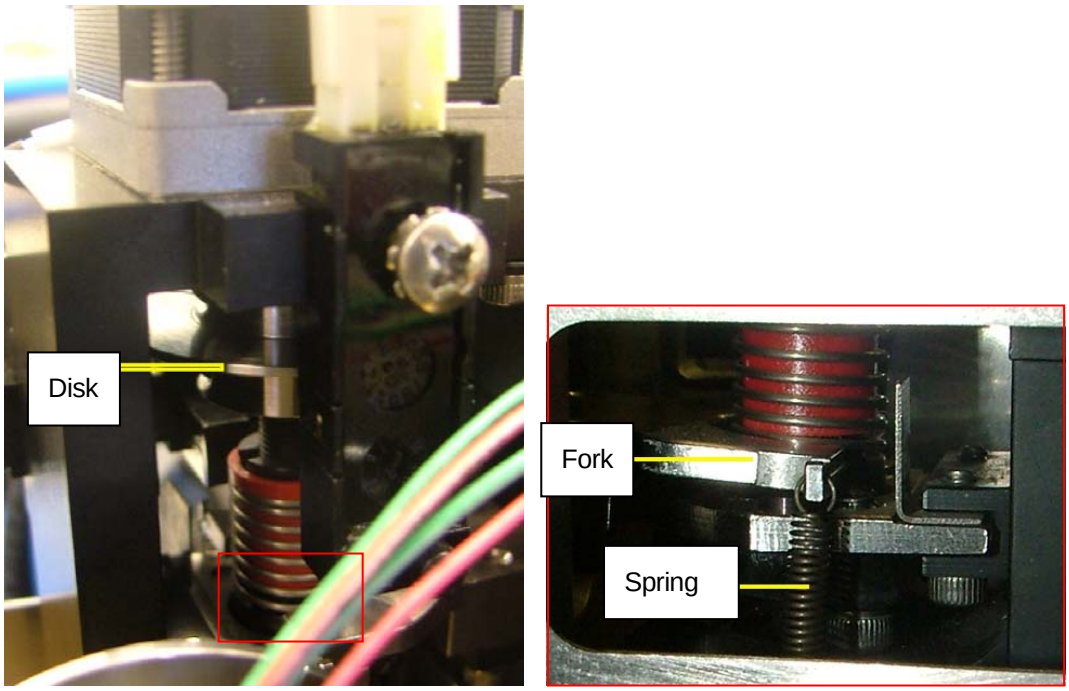


Figure 3. Resolution motor disk and fork

3. Remove the two resolution bracket screws shown in Figure 2.
4. Remove the earth lead screw shown in Figure 2.
5. With the resolution motor assembly released, unhook the two springs (underneath the motor). The arm and springs are shown in Figure 1.
6. Remove the resolution motor assembly and set it aside.
7. Using a screwdriver, remove the head rotation arm from where it protrudes from the telescope, as shown in Figure 1.

To remove the laser head:

Note: Before removing the cable ties in the next step, pay attention to how they are threaded through the two brackets. You will need to put them back in the same way.

8. At the back of the telescope, cut and remove the cable wraps that secure the black plastic tubing in place.

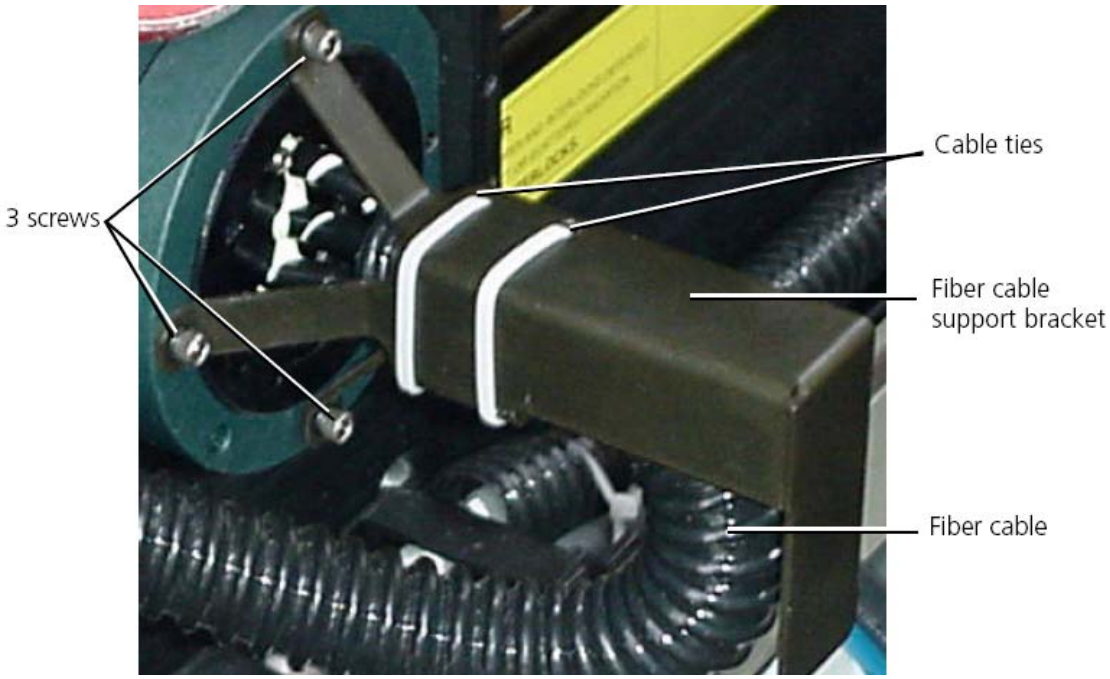


Figure 4. Fiber cable support bracket

CAUTION: **From this point on, the fibers are unsupported. You must be very careful with them.**

9. Remove the three screws from the fiber cable support bracket shown in Figure 4 and set the cable support bracket aside.

10. From the back of the head/lens assembly telescope, remove the black retaining ring, using the optic head outer key.

    Note: There is a large spring washer directly behind the retaining ring. The washer will fall out when you remove the retaining ring. Remember to put it back at the end of the procedure.

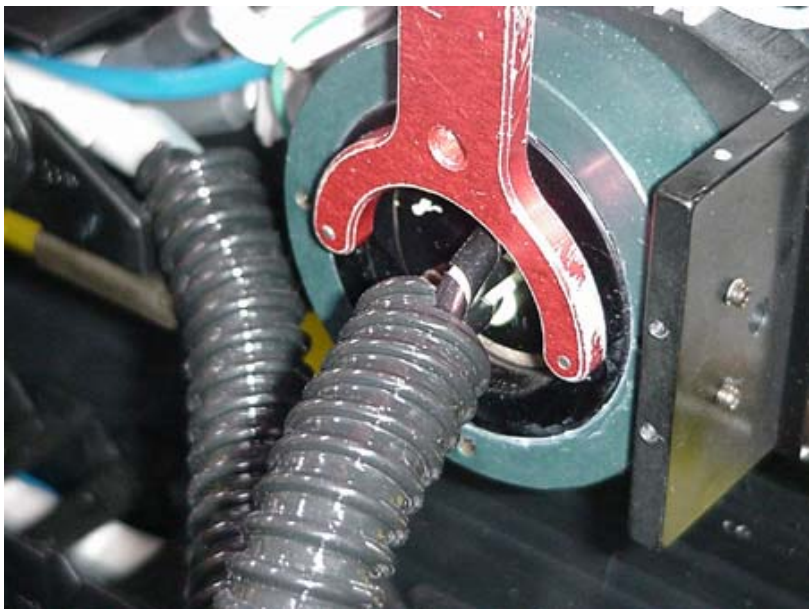


Figure 5. Removing the retaining ring

    Note: To prevent rotation as you unscrew, temporarily reinsert the head rotation arm through the telescope so that you can hold it.

11. Set aside the retaining ring and remove the bearing behind it, as shown in Figure 1 and in Figure 6.

12. Remove the laser head and lay it over the V-block.

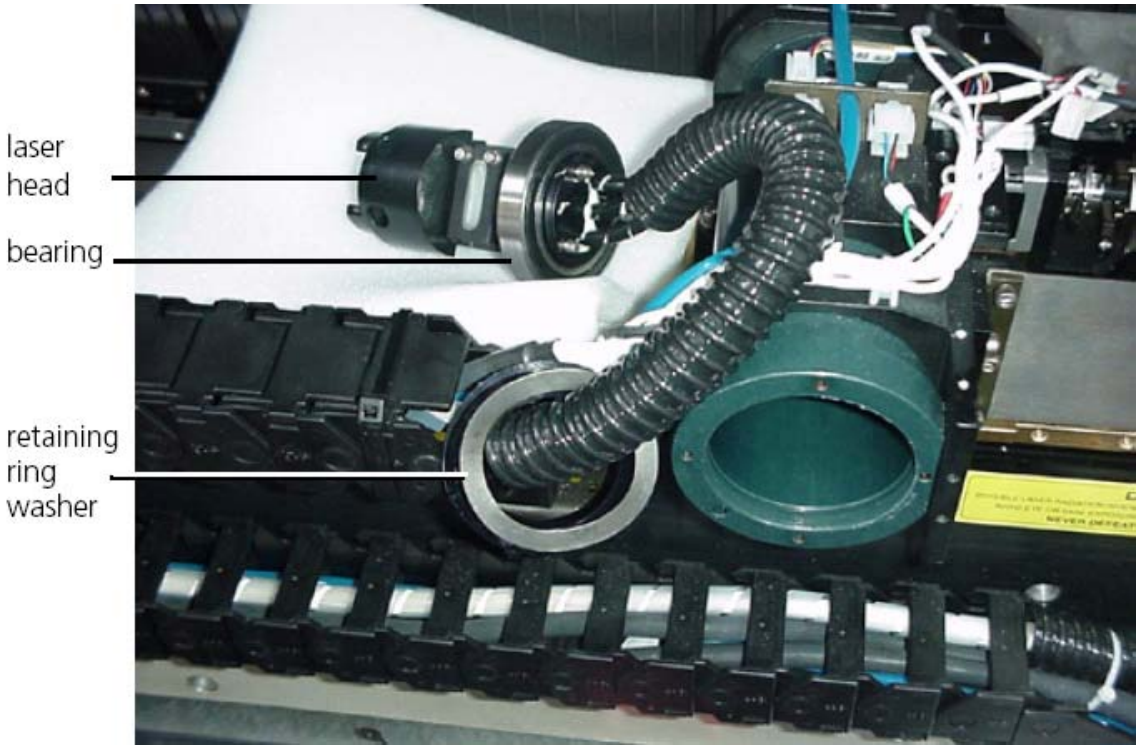


Figure 6. Laser head on the V-block

13. Remove the telescope holder screws and pull the telescope with the lens assembly out of the holder.

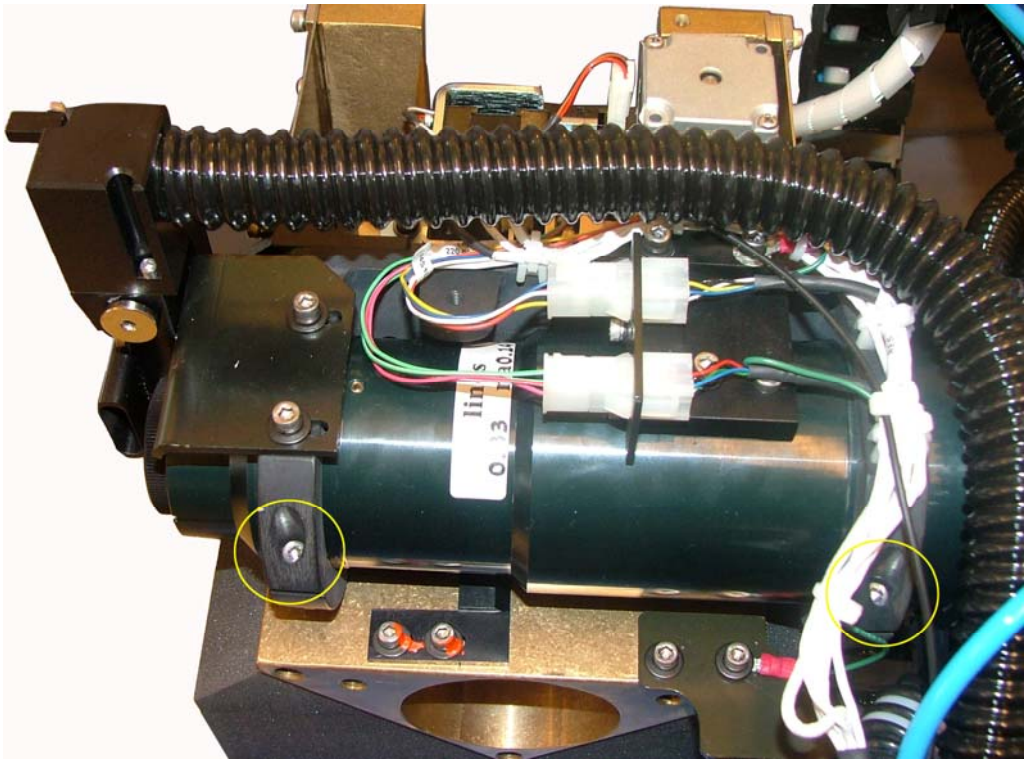


Figure 7. Hex screws in telescope holder

Installing the Lens Assembly

1. On the new telescope, remove the stickers and coverings from the openings on the telescope.
2. Insert the telescope into the telescope holder and tighten the telescope holder screws.
3. Carefully insert the laser head into the telescope so that the rotation arm can pass through the telescope and screw into it.
4. From the back of the telescope, insert the bearing and then use the optic head outer key to secure the black retaining ring, as shown in Figure 5.
5. Do not overly tighten the retaining ring. (Overtightening the rataining ring will cause an unsmooth resolution rotation.) The retaining ring should protrude slightly, as shown in Figure 1.
6. Insert the fiber cable support bracket and secure it with the three screws that you removed in step 9 of the Removing the Lens Assembly section.
7. Secure the black tubing to the fiber cable support bracket with cable ties, as described in step 8 in the Removing the Lens Assembly section.

8. Thread the rotation arm through the telescope and screw the rotation arm back into the head assembly.
9. Put the resolution motor assembly in place and then connect the two springs, as shown in Figure 1, to secure the rotation arm.
10. Install and tighten the earth lead screw.
11. Install and tighten the two resolution bracket screws.
12. Connect the detector connectors and the motor power connector.

Testing the Procedure

1. Verify that the resolution motor moves freely.
2. Turn on the platesetter and start ThermoFlex Controller.
3. Load the media that the customer plans to work with.
4. Adjust the focus motor position:
   a. Move the carriage so that the lens is in front of the media.
   b. Move the focus motor to the required position for the media. For example:
      For a 1.7 mm plate, the focus motor position should be 3400 steps.
      For a 2.7 mm plate it should be 2400 steps.

      To calculate the focus value for a 0.3 mm thick plate, use the required focus for a 0.17 mm thick plate (4950):
      X = 4950 - [(0.3-0.17) x 1000] = 4950 - [0.13 x 1000] = 4950 - 130 = 4820 steps
   c. Measure the space between the edge of the lens and the media. It should be 20.5 mm. If it is not, open the two hex screws on the telescope holder and adjust the telescope position.

      Note: You can use the jig spacer (690-01426A) to set the space between the edge of the lens and the drum surface.
   d. From the **Resolution Motor** menu, on the **Properties** tab, check the **Max Pos App** value, and then move the resolution motor back and forth a few times between home position (HP) and the Max Pos App value.
5. Verify that the focus motor moves freely:
   a. Select **Hardware > Database > Focus Motor** and check the **Max Pos App** value.
   b. From the **Focus Motor** menu, move the focus motor back and forth a few times between HP and the Max Pos App value.
6. If the ThermoFlex Controller version is earlier than 1.32.350.004, before starting exposure, in the registry, locate **LOTEMFLEXO\Machine** and change the **Min Delay Value** parameter from **118** to **75**.

7. Fully calibrate the platesetter, including focus motor preload, focus, intensity, resolution, delay, and elevation, as described on TechPlanet on the ThermoFlex Procedures page under *Calibration*.

   Notes:
   - Adjust the focus stopper location as described on TechPlanet in the Focus Calibration Test.
   - The resolution motor step should be between 1400–1900.
   - The **Test Delay Value (µm)** range for this lens is between 80–84.

8. Expose an ITP file and verify improved quality. See Table 3 or Table 4, in the Plate Image Quality section.

Test Verification

Fill in the relevant information in the following table and send it to the PD PSS (Viki Arviv):

System Details

Device serial number	
Resolution	☐ 2400 dpi ☐ 2540 dpi ☐ Other_____
Speed	☐ V
System options	
Flexo plate type(s) and drum speed	Plate type Drum speed
	Plate type Drum speed
	Plate type Drum speed
	Plate type Drum speed
Offset plate type(s) and drum speed	Plate type Drum speed
	Plate type Drum speed
	Plate type Drum speed
	Plate type Drum speed
All Offset plate sizes	
☐ **mm** ☐ **in.**	
Workflow	☐ Brisque® Version: ☐ Prinergy® Version: ☐ Prinergy Evo Version: ☐ TIFF Front End Version: ☐ Third-party TIFF Version:

	Third-party TIFF type:
Flexo plates all screening (LPI)	
Offset plates all screening (LPI)	

Plate Throughput

The plate throughput test is designed to verify and demonstrate that the output device meets the specified imaging time. The Kodak service engineer exposes one plate for each media type and thickness, calculates the throughput, and records the results in Table 1.

Note: Actual throughput of a ThermoFlex Mid II or Narrow Hybrid system is operator-dependent due to the manual loading architecture of the platesetter. Therefore, only the laser imaging time is measured to confirm throughput. In addition, imaging speed is dependent upon media sensitivity, so all media should be Kodak-approved.

Table 1: Throughput test targets and results

Plate size	Offset plate	Flexo plate

Table 2: Average throughput

	ThermoFlex Mid II		ThermoFlex Narrow	
	Offset plate	**Flexo plate**	**Offset plate**	**Flexo plate**
Area exposed per hour	14.2 m^2/hr	4.56 m^2/hr	10.5 m^2/hr	3.4 m^2/hr
Throughput per minute	9.4 in./min (240 mm/min)	3 in./min (76.8 mm/min) *2 in./min (52.8 mm/min)	9.4 in./min (240 mm/min)	3.96 in./min (100.8 mm/min) *3 in./min (76.8 mm/min)
Imaging time for one full format exposure	5 min	15.6 min	3.1 min	9.9 min

* For Flexo plates on ThermoFlex platesetters with the Offset option

- **Area exposed** = (drum speed) x (number of beams/100) x width (around the drum) x 0.00006

  ** Example for Narrow offset: (500 rpm) x (0.48 mm) x 735 mm x 0.00006 = 10.5 m^2/hr
- **Throughput per minute** = (drum speed) x (number of beams/100)

  ** Example for Narrow or Mid II offset: (500 rpm) x (0.48 mm) = 240 mm/min
- **Imaging time for full format** = (full format exposing size)/(distance exposed per minute)

  ** Example for Narrow offset: 762/240 mm = 3.1 min

Plate Image Quality

To test plate image quality and halftone uniformity, the Kodak service engineer selects the file type, resolution, size, and screen option that best suits your requirements:

File type: TIFF

Resolution: 2400/2540 dpi

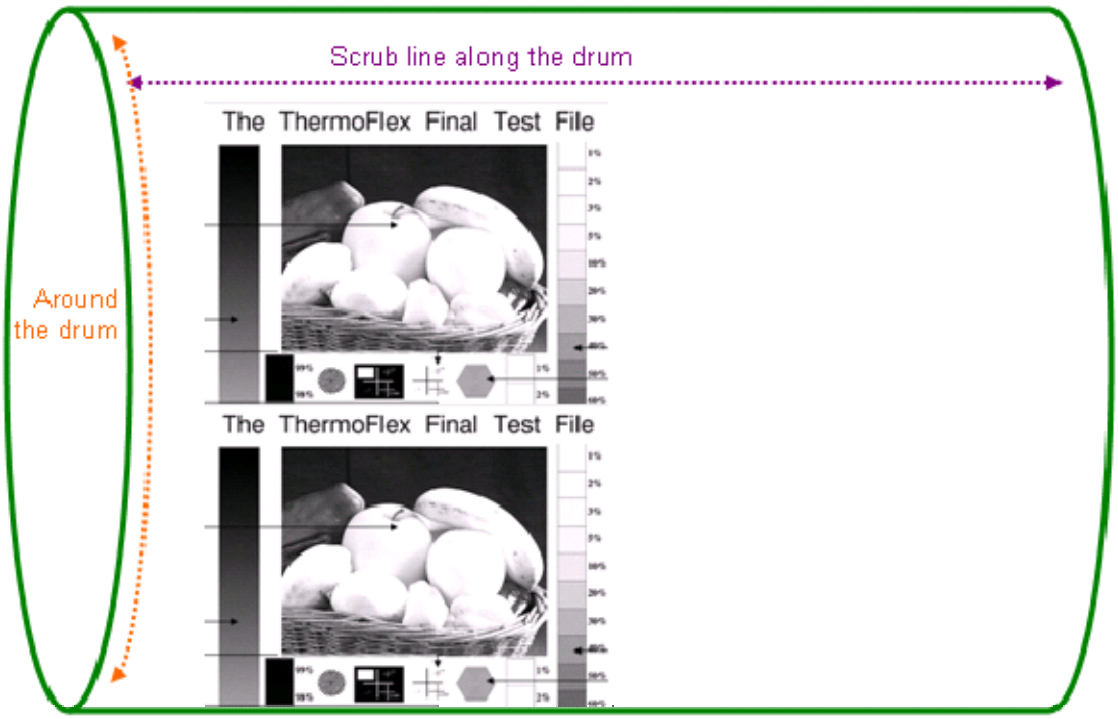
Size:
Flexo = 170 mm*200 mm;
Offset = 280 mm*210 mm

Screen type: AM Flexo=150 lpi; AM Offset=175 lpi

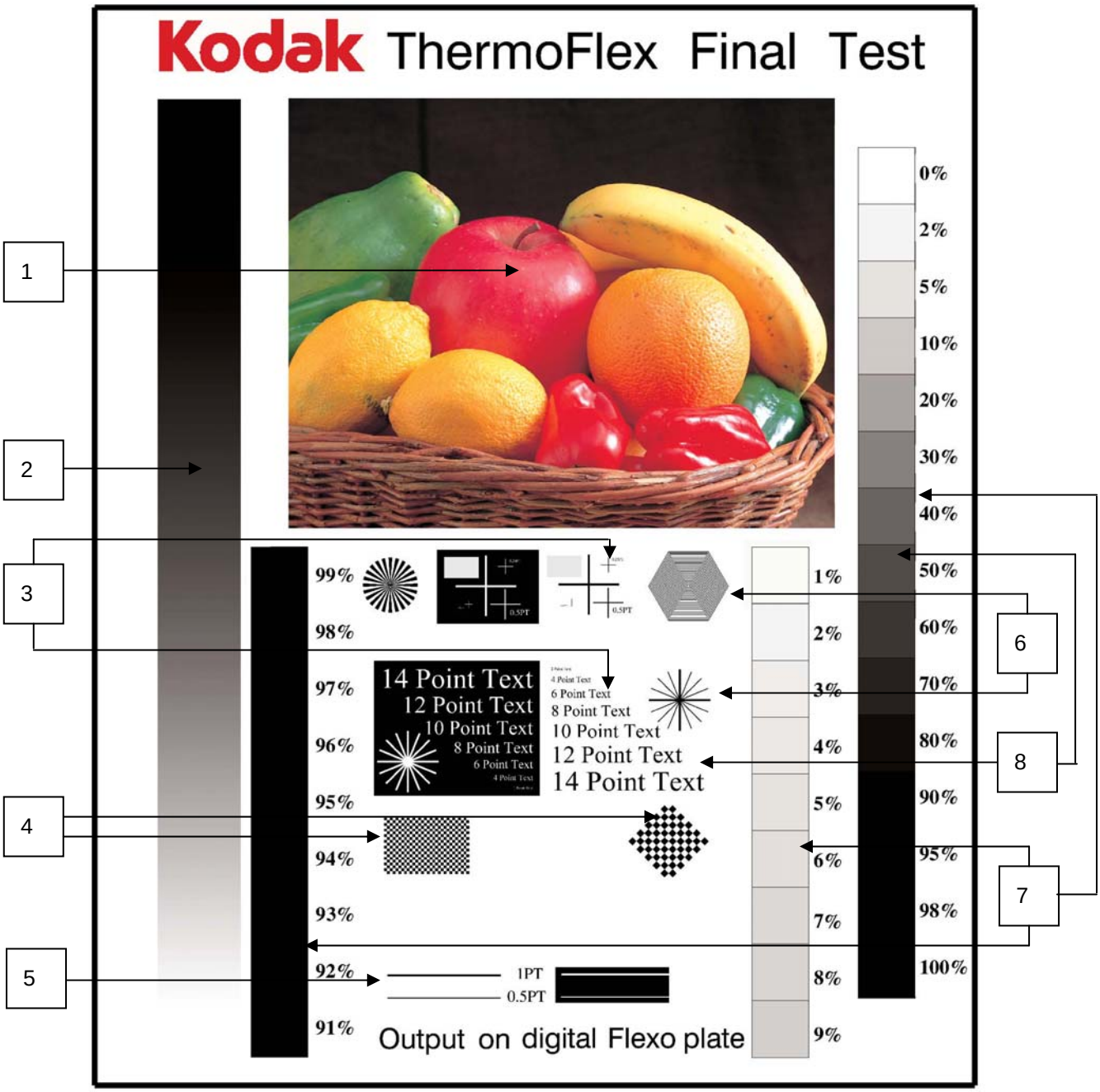
Then the Kodak service engineer sends the Plate Test File to the output device, and then inspects a series of test elements on the exposed plate.

- For flexo plates, the test image is shown in Figure 2, and the service engineer records the results of each test element in Table 3.
- For offset plates, the test image is shown in Figure 3, and the service engineer records the results of each test element in Table 4.

Figure 1: Expose orientation for Flexo plates:



Flexo Plate Test File



Flexo plate image quality test results

Plate Test Target Element	Description	Completed
Raster image	CY raster image file 150 lpi at 2540/2400 dpi Flexo angles	☐
Vignette	Use to ensure no shade stepping is present. (There is a smooth transition from 0% to 100%.)	☐
Cross lines and text from positive to reverse	Ensure that crosses and text for focus and density are the same thickness.	☐
Checkerboards	Ensure that squares border without any bridges and gaps.	☐
Lines from positive to reverse	Ensure that lines are identical and straight	☐
Slur and star targets	Use as a target reference for dot gain/loss, slur, and doubling effects.	☐
Tonal scales	Ensure that calibration target for gray scale is 0-100% without bump curves, TIFF file is 150 lpi at 2400/2540 dpi.	☐
Dmin and 50% dot	Ensure that Dmin is 0.06 ±1 and 50% dot ±4.	☐

Figure 3: Offset Plate Test File

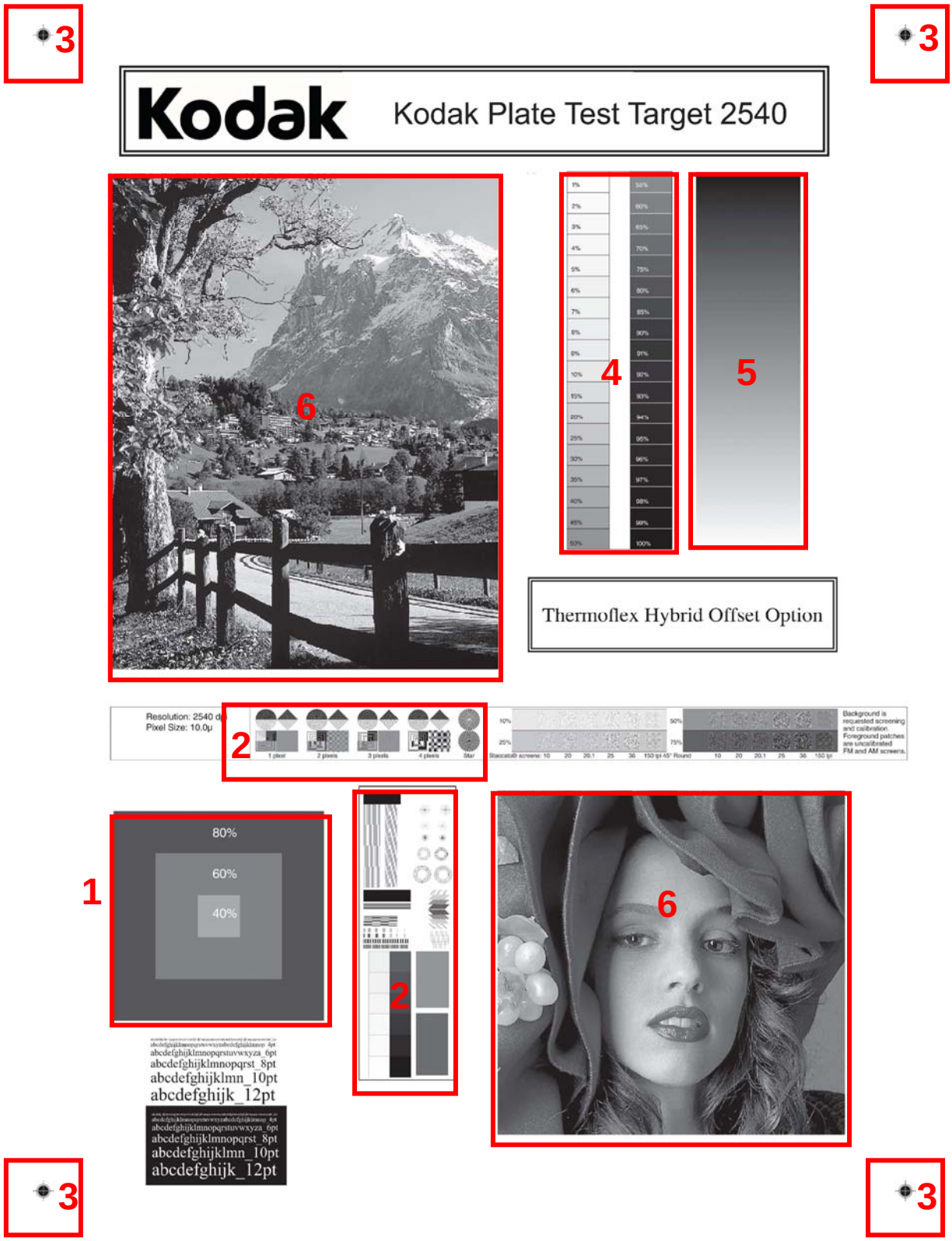


Table 4: Offset Plate Image Quality Test Results

Plate Test Target Element	Description	Completed
Uniformity patches	Use to test the uniformity of the processing line across the plate.	☐
CTTP test strip	Use to test the tone scales.	☐
Registration	Use to ensure proper registration.	☐
Tone scales	Use for visual inspection to confirm that image quality is acceptable with tone scales.	☐
Vertical vignettes	Use to ensure that no shade-stepping is present. (There is smooth transition from 0% to 100%).	☐
Grayscale images	Use during the sales cycle by Marcom to set customer expectations.	☐

Material disposition	Return to KIL
Technical contact	Viki Arviv
Date submitted	12 Feb 2008
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