Kodak

Troubleshooting Flexo Press Artifacts

1. BACKGROUND

Troubleshooting the cause of press artifacts is sometimes difficult due to the number of factors that can introduce them. This procedure is designed to help isolate the causes and guide you to a solution.

2. PARTS/TOOLS NEEDED

- ITP test file (http://techplanet.creo.com/software/TESTFILES/TFX_Wide/flexo-ATP_2400b.p.1A.K.zip) available on the TechPlanet Installation page
- ITP checklist (http://techplanet.creo.com/AgileContent/Extranet/732-00146A-EN-A119689644.doc) available on the TechPlanet Installation page

3. DETERMINE AND ELIMINATE DEVICE FAULTS

3.1 Diode Check

WARNING: Before you begin this test, ensure that there is no media on the drum and that the z-stage is in the home position.

Check for issues with dead or weak laser diodes using the following TFX commands:

TFX>>ld all 1000 mw

TFX >>ld all read All values reported should be close to 1000 mw.

TFX >> ld all 250 mw

TFX >>ld all read All values reported should be close to 250 mw.

Example of a good result for a TFX head testing for 1200 mw:

```
TFX>> ld all 1200 mw
*** Command Success ***
ld all read
TFX>> ld all read
--- Head stage must be in HOME position. -- Continue (Y/N)?
1145 1150 1152 1150 1135 1151 1149 1153 1149 1154 1153 1152 1148 1155 1157 0
1149 1155 1152 1149 1148 1152 1151 1155 1157 1151 1148 1156 1154 1164 1156 0
1154 1140 1150 1151 1140 1150 1151 1153 1147 1155 1152 1153 1157 1150 1156 0
1157 1155 1157 1151 1152 1149 1157 1153 1152 1156 1150 1155 1154 1159 1157 0
*** Command Success ***
```

Note: A single dead diode will seldom cause artifacts due to TFX head overwriting but a dead diode at either end of the15 pixel swath signature, such as diode 14, could be a cause for concern. More than one dead diode (especially if they are adjacent to each other) can cause artifacts.

3.2 Autofocus System Check

To check the hall effect and PSD sensors:

1. Load a small piece of media.
2. Once the media is loaded, select the media:

   `MPE>>mode media 1` (assuming Cyrel media)

   `MCE>>media 1`

3. Zero the head to the media:

   `MPE>>stage zero` (wait for approximately one minute until the head finishes zeroing)

   `MCE>>zdrice focus 432 THK` (thickness in mm)

4. Stream the focus data to get the Lpos (lens position) value:

   `TFX>>foc stream on`

   Focus signal during **foc stream on**:

Sum	Error	Lpos	Actuator Current
+1077.548	-128.456	+147.029	+0.000
+1077.304	-128.456	+147.533	+0.000
+1077.736	-128.456	+147.835	+0.000
+1077.580	-128.456	+147.331	+0.000
+1079.716	-128.456	+147.835	+0.000
+1082.976	-128.456	+147.533	+0.000
+1083.692	-128.457	+147.432	+0.000
+1086.184	-128.457	+147.734	+0.000
+1087.512	-128.457	+147.835	+0.000
+1086.844	-128.457	+147.231	+0.000
+1083.708	-128.456	+147.835	+0.000
+1079.768	-128.456	+148.137	+0.000
+1098.788	-128.458	+146.929	+0.000
+1097.588	-128.458	+147.835	+0.000

5. Use the **`foc current xxx`** command to slowly increase the actuator current until the Lpos reaches 0.

   In the following example, the current is around 0.86A. This is called nominal current. It refers to the current that is required for 150um movement of the actuator.

   `TFX>>foc current 0.86`

Sum	Error	Lpos	Actuator Current
+993.244	-5.659	-3.223	+0.870
+995.248	-5.611	-3.223	+0.870

6. Continue to increase the actuator current until Lpos reaches -150.

   In the following example, the current is around 1.18A. This is the current that is required for the complete 300um movement of the actuator called the dynamic range.

   TFX>>foc current 1.18

Sum	Error	Lpos	Actuator Current
+1142.444	+140.686	-150.554	+1.180
+1141.692	+140.666	-150.755	+1.180
+1140.368	+140.713	-150.453	+1.180
+1139.976	+140.786	-150.252	+1.180
+1141.316	+140.795	-150.352	+1.180
+1140.268	+140.732	-150.453	+1.180
+1140.388	+140.712	-150.755	+1.180
+1140.340	+140.706	-150.050	+1.180
+1141.532	+140.724	-150.453	+1.180
+1143.756	+140.719	-150.655	+1.180
+1142.120	+140.665	-150.655	+1.180
+1140.652	+140.713	-150.755	+1.180
+1139.432	+140.752	-150.755	+1.180

7. Turn off the focus stream and return the current to 0:

   TFX>>foc stream off

   TFX>>foc current 0

8. Check the linearity movement of the whole dynamic range:

   TFX>>foc act lin 1.18 0 0.05

   where 1.18A is the dynamic range current that deflected the actuator Lpos to -150, 0A is the starting current, and 0.05 is the increment to be used.

   In the following example the Lpos changes are relatively linear in relation to the current increments. A result like this iindicates that the hall effect and PSD sensors are working correctly.

   Focus Dynamic Range vs. Current

Current	Lpos (1/10 um)
0.000	1463
0.050	1459

Current	Lpos (1/10 um)
0.100	1448
0.150	1441
0.200	1403
0.250	1386
0.300	1344
0.350	1308
0.400	1250
0.450	1191
0.500	1122
0.550	1034
0.600	942
0.650	830
0.700	692
0.750	541
0.800	337
0.850	88
0.900	-235
0.950	-535
1.000	-783
1.050	-1018
1.100	-1236
1.150	-1402
1.180	-1482
1.130	-1344
1.080	-1163
1.030	-939
0.980	-707
0.930	-442
0.880	-125
0.830	179
0.780	404
0.730	584
0.680	738
0.630	868
0.580	982
0.530	1057
0.480	1146
0.430	1219
0.380	1281
0.330	1321
0.280	1357
0.230	1400
0.180	1424

Current	Lpos (1/10 um)
0.130	1437
0.080	1452
0.030	1464

3.3 Initial ITP Quality Check

1. Image the ITP test file (http://techplanet.creo.com/software/TESTFILES/TFX_Wide/flexo-ATP_2400b.p.1A.K.zip).
2. Evaluate the device image quality using the ITP checklist (http://techplanet.creo.com/AgileContent/Extranet/732-00146A-EN-A119689644.doc).
3. Measure the 50 % tint and verify the dot percentage is 50 +/-2%.

   If the 50% tint does not read correctly, adjust the exposure settings using the media technical note procedures. Check to see if the customer has had the exposure misadjusted to match another device. If the exposure is matched to another device but is still acceptable then leave it as is.
4. Check the surface depth (SD):

   If the SD alignment is correct, all horizontal lines should be straight and flat.

   If the SD is not optimal, perform the SD alignment procedure in the media technical note.
5. Check the tint boxes on the ATP file for diagonal slashes.

   You may see faint slashes in dot% for high screen rulings (150 and 175 lpi) in the highlights but with the use of bump-ups they should not affect the prints.
6. Check the solid areas of the ITP file for excessive debris.

   Prominent thicker debris lines every15 pixels that are visible on the mask indicate problems with the debris system.

3.4 Check and Clean the Debris System

1. Clean and inspect the debris cabinet filter, debris nozzle, and TFX window.
2. Check the debris system vacuum using the following commands:

   For ThermoFlex Wide I:

   `MPE: dr on`

   `MPE: dr`

   For ThermoFlex Wide II:

   `MCE: debris 3 on`

   `MCE: debris` This command should report a value xxx.
3. Inspect the debris plate for all air jets to make sure that they are functioning correctly. (You will need a service key to turn on the air jet while the doors are open.)

3.5 Perform Media Calibration

If the 50% tints did not measure correctly or the horizontal lines were not flat or straight in the ITP quality evaluation, perform both an SD and Power calibration for the customer's media. See the correct media technical note for specific instructions on calibrating SD and Power.

3.6 Final ITP Quality Check

Re-run the ITP file from section 3.3 and verify that the media calibration for SD and Power are correct and that there are minimal debris lines in the solids:

- Measure the 50 % tint and verify the dot percentage is 50 +/-2%.
- Check the SD—Horizontal lines should be straight and flat.
- Check the tint highlights (tints < 10%) for diagonal slashes.
- Check the solid areas of the ITP file for excessive debris (15 pixel signature).

Note: On the ATP plot, the tint patterns for 7.5 and 82.5 degree angles are the most likely to have diagonal slash patterning. This is due to a beating with the 90 degree head diode signature. Some very minor artifacts at these angles may be normal.

4. TROUBLESHOOT PREPRESS

Gather the following details regarding the prepress:

- Customer's plate types and thicknesses
- Times for Main, Back, Post and De-Tack UV exposures
- Workflow used – Kodak Prinergy® or 3rd party
- Screen ruling to be used
- Screen angles used for the for CMYK & Spot colors

5. OPTIMIZE SCREENING VALUES ON AN UNPROCESSED PLATE

This portion of the procedure requires either the customer's assistance or a Kodak representative specializing in flexographic implementation with Prinergy or Prinergy Evo™ software.

The process creates test files that can be used to determine the best combination of screen angles that will eliminate or minimize plate and press artifacts.

1. RIP the *15Centimetergradient.pdf* file (http://techplanet.creo.com/output/computer_to_plate/thermoflex_II/content/docs/15cmGradient.p1.pdf) at the customer's desired frequency at all six possible combinations listed below.

Note: Due to Prinergy optimization when ripping files, the resulting angles and frequencies will be slightly adjusted based on the screen angle used for the Yellow. You must perform these tests using all of the following combinations:

- three test files with yellow at 22.5, 52.5 and 82.5 when C,M and K are at 7.5, 37.5 and 67.5

- three test files with yellow at 7.5, 37.5 and 67.5 when C, M and K are at 22.5, 52.5 and 82.5

2. Use TIFF Assembler Plus to put all TIFF files on the same layout and output to the required Print Console Hot Folder.
3. Once the plate is exposed, evaluate the LAMS quality on the light table.

   Look for slash artifacts (diagonal lines on the plate). This effect is basically caused by an interference pattern between the head signature and the screen ruling/angle combination.
4. If you see any artifacts, refrain from using this combination and make a note of it.

Screening Tips

The screen angles most likely to produce image artifacts are 7.5 and 82.5 degrees.

The goal is to be able to get a full set of 3 angles for the dominant colors (CMK – 30 degrees apart, that is, 7.5, 37.5 and 67.5 degrees or 22.5, 52.5 and 82.5 degrees—always Round dots).

Try to get the Black close to 45 degrees (37.5 or 52.5 degrees) and the Yellow at 7.5 degrees. This is because yellow has the least contrast and 7.5/82.5 are the angles most likely to cause artifacts with the head signature.

5. If you cannot get a proper set for the dominant colors, RIP the file again using neighboring screen ruling, for example, 151 instead of 150 lpi.
6. Repeat the exercise until you get an optimal set of angles.
7. Ensure that all this information is recorded so that the customer avoids using the bad values in the future.

6. ESCALATION

1. If you cannot find acceptable screening values, complete the *Screening Escalation Form* (http://techplanet.creo.com/output/computer_to_plate/thermoflex_II/content/docs/Tflex_Screen_Escalation_Form.doc) on the TechPlanet Troubleshooting page before requesting an escalation.
2. For each escalation, you may also be asked to send the following for evaluation:
   - Unprocessed plate sample of the customer file with the artifact
   - Processed plate sample of the customer file with the artifact
   - Printed samples if possible
   - Unprocessed plate sample of the ITP file (http://techplanet.creo.com/software/TESTFILES/TFX_Wide/flexo-ATP_2400b.p.1A.K.zip)

Note: It is important not to cover the mask of any unprocessed plate during shipping. Pack the plate using the shipping box example below. This protects the mask without needing any cover layer.

