Installation Test Procedure

ThermoFlex Wide II

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Revision History

Revision	Date	Author	Comments
1	March 14	Brian Muir	
2	May 9	Brian Muir	Removed verification of e-stop, interlocks. Changed references to flash cover. Fixed assorted typos.
3	September 03	Brian Muir	Major update focused on sleeve mode
4	September 03	Brian Muir	Polishing revision
A	December 03	Andre Blignaut	Added document number for release. Corrected reference doc #s.

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1. INTRODUCTION

The Installation Test Procedure is offered to the customer as a demonstration that the installation is complete and the ThermoFlex Wide II system is fully operational. Each ThermoFlex Wide II is rigorously tested before shipment and the tests described here are a subset of the overall testing program. They are instructive to the user and are designed to verify the functionality of the ThermoFlex Wide II system, ensuring the customer that it is performing according to the specifications listed in ThermoFlex Wide II Specification document (707-00157A).

The tests generally consume up to ten plates or pieces of film over a period of four to eight hours, during which time a customer representative should be present to verify the results.

At the completion of the tests, the warranty period begins and the ThermoFlex Wide II system is ready for ongoing production work with the full service support of the Creo Customer Service organization.

2. THERMOFLEX WIDE II SYSTEM DESCRIPTION

The ThermoFlex Wide II is a Computer to Plate imaging system that produces UV-exposure-ready flexographic photopolymer plates and/or processless thermal film. The ThermoFlex Wide II device is designed for full white or yellow light conditions.

The ThermoFlex Wide II system consists of the following subsystems:

- Output Device — An external drum imaging device.
- Workstation — A Windows operating system platform serving as a control host for the Device and as a platform for the TIFF-based Print Console workflow and quality control software.
- Debris Removal Unit — A vacuum and filtration system designed to remove all debris and out-gassing products that are generated during thermal imaging of digital flexographic plates and film. The filtration unit is external to the device.
- Drum Vacuum Pump — A vacuum source connected to the plotting engine to enable vacuum mounting of the plates or film on the drum. The drum vacuum pump is also external to the device.
- Chiller — The chiller is used to cool the imaging head down during operation. This unit is external to the device.

3. MEDIA

The media is a vital part of Computer-To-Plate applications and as such, the particular capabilities and limitations of the media must be considered. In particular, the environment in the installation site must conform to the specifications for the customer's chosen media, and the media must be used in accordance with the manufacturer's recommendations. The media must be fully qualified by Creo for use in the ThermoFlex Wide II device.

Media used in testing (list the manufacturer and brand name):

Digital Flexographic Plates

1)_____

2)_____

3)_____

4)_____

Thermal Imaging Film

1)_____

2)_____

Digital Flexographic Sleeve (if applicable)

1) _____

2) _____

4. PRE-TEST REQUIREMENTS

4.1 Customer's Responsibilities

The installation site must be prepared as described in ThermoFlex Wide II Site Preparation & Requirements Document (725-00093A).

The customer must provide a sufficient supply of plates or thermal imaging film. The customer is also responsible for supplying a dotmeter for measuring plate optical density and screen density.

Note: Digital flexographic plates may not be readable by standard film densitometers, which is why a dotmeter is specified. If a dotmeter is not available, a densitometer may be substituted only with Creo's permission.

It is highly recommended that the customer have a light table available close to the ThermoFlex device for inspecting imaged plates and film.

4.2 Creo's Responsibilities

Creo personnel will fully install and pre-test the ThermoFlex Wide II system so that all imaging and plate handling features are operational and the device is producing properly imaged plates and/or film with accurate screen calibrations.

Creo will also supply the TIFF format files for imaging during this test.

5. SHEET MODE

5.1 Basic Operation

5.1.1 Description

These procedures are designed to demonstrate and verify the following ThermoFlex Wide II system features:

- Plate load and unload functionality.
- Imaging speed and plate throughput.
- Automatic rejection of interrupted plates.
- Capability to image multiple output media sizes and thicknesses without operator adjustment of the device.

Note: The thermally ablative masks of the digital flexographic photopolymer plates are not sensitive to daylight. However, as with conventional photopolymer plates, extended exposure to stray UV light before processing may affect final image quality.

At the completion of this section, the customer should have a greater understanding of these features and be satisfied that they are working to specification.

5.1.2 Procedures

Verification of the Throughput

Create an output media type sized either 40" x 30" (1016mm x 762mm) or 42" x 30" (1066.8mm x 762mm) with the greater dimension wrapping around the drum (portrait format). Any plate thickness preferred by the customer may be used. Submit the test files **TFX_ITP1_40x30.tif**, **TFX_ITP2_40x30.tif**, and **TFX_ITP4_40x30.tif** into the Print Console system queue, and then approve the jobs to begin the test.

As the system completes these files, measure the throughput in accordance with the method below, and evaluate the images in accordance with the list of procedures given in section 6.

Actual throughput of the ThermoFlex Wide II system is operator-dependant due to the manual loading architecture of the machine. Therefore, only the laser imaging time plus retrace interval is measured to confirm throughput. Note this time for the first three files submitted above by recording the "Outputting" time from the Print Console status window as each plate is being unloaded.

t_1 = Image time for TFX_ITP1_40x30.tif = _____minutes,

t_2 = Image time for TFX_ITP2_40x30.tif = _____minutes,

t_3 = Image time for TFX_ITP4_40x30.tif = _____minutes

Calculate the average imaging speed $I = 30/((t_1 + t_2 + t_3)/3)$ = _____in/min

The average imaging speed should be greater than or equal to the maximum plate width divided by the full area imaging time in the specifications document, whichever is applicable.

Successfully demonstrated:_____

Verification of Plate Loading and Unloading Functionality

Watch the loading and unloading cycles on the device as the plates are imaged. Verify the following:

- An operator can effectively apply and remove the leading, trailing, and side edge tapes during the load and unload cycles.
- An operator can effectively inspect the loaded media and identify bumps and bubbles caused by debris under the loaded media.
- An operator can unload a plate with a bump caused by debris during the load cycle, correct the problem, and reload the plate without aborting the job at the Print Console workstation.
- A plate properly loaded onto the drum is not imaged until the table is fully closed by the operator.
- A fully imaged plate does not unload from the drum until the operator places its trailing edge onto the table covering the table plate sensor.

Successfully demonstrated:_____

Maximum Size Plate Handling

Create an output media type sized at the maximum plate size on hand within the maximum output format of the device's configuration. This is generally 42" x 60" (1066.8mm x 1524mm) or 52" x 80" (1320.8mm x 2032mm). Any plate thickness preferred by the customer may be used, though it should differ from the output media type created in section 5.2. Submit the test file **TFX_ITP3_42x60.tif** into the Print Console system queue, and then approve the job to begin this test.

After the file is submitted and approved, load the plate onto the drum. Verify that the plate moves freely from the table onto the drum and does not hang up on the table or stall the drum. When the plate is unloaded, verify that the plate moves smoothly back onto the table from the drum without buckling.

Successfully demonstrated:_____

Verification of Multiple Output Media Sizes and Thicknesses

In sections 5.2.1, 5.2.3, and 5.2.4, three different output media sizes were imaged. The system will have automatically balanced the drum and repositioned the imaging head to focus on the output media. Verify that the system performed these tasks without operator intervention.

Successfully demonstrated:_____

5.2 Imaging Performance

5.2.1 Description

The following procedures are designed to demonstrate and verify the following:

- Halftone calibration
- Halftone uniformity
- Image quality

5.2.2 Procedures

Image quality and calibration are evaluated on the following files that have been plotted during the procedures in section 5.2.1. :

- TFX_ITP1_40x30.tif
- TFX_ITP2_40x30.tif
- TFX_ITP4_40x30.tif

Verification of Halftone Calibration

These measurements are done with a dotmeter. Calibrate the dotmeter and measure the percent dot area of the given screens on the file **TFX_ITP1_40x30.tif**. Enter the measurements in the table below. Verify that the results are within ± 4% of the target values.

Note: Digital flexographic plates may not be readable by standard film densitometers, which is why a dotmeter is specified. If a dotmeter is not available, a densitometer may be substituted only with Creo's permission. Alternatively, thermal imaging film may be used to test calibration.

Successfully demonstrated:_____

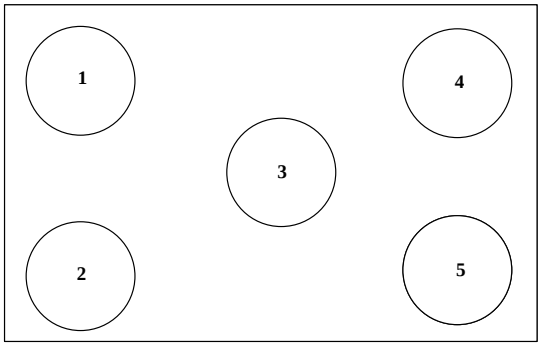
Halftone Calibration

Enter values from measurements taken in section 6.2.1.

	150 LPI				133 LPI				120 LPI			
% screen	7.5°	22.5°	37.5°	67.5°	7.5°	22.5°	37.5°	67.5°	7.5°	22.5°	37.5°	67.5°
30%												
40%												
50%												
60%												

Verification of Halftone Uniformity

On the **TFX_ITP2_40x30.tif** plate, measure the screen densities measured at different locations in the image using the dotmeter. Verify that measurements taken at each of the five locations shown below are all between 46% and 54%.



Density at location 1: _____%

Density at location 2: _____%

Density at location 3: _____%

Density at location 4: _____%

Density at location 5: _____%

Successfully demonstrated:_____

Verification of image quality

Inspect the vignettes and large halftone areas on the appropriate resolution version of **TFX_ITP4_40x30.tif** and verify that the transition through the vignettes are smooth and without discontinuities or artifacts.

Successfully demonstrated:_____

6. SLEEVE MODE

6.1 Basic Operation

These tests apply equally to continuous sleeve mode and plates pre mounted to the sleeve. The scope of this Installation Test Procedure does not include use of the cutting table or mounting equipment.

6.1.1 Description

These procedures are designed to verify and demonstrate the following Sleeve features:

- Conversion between sheet operation and sleeve operation
- Sleeve Loading/Unloading

At the completion of this section, the customer should have a greater understanding of these features and should be satisfied that they are working.

6.1.2 Procedures

Sheet/Sleeve Mode Conversion Operation

- Demonstration of Sheet Mode to Sleeve Mode Conversion

Demonstrated _____

- Demonstration of Sleeve Mode to Sheet Mode Conversion

Demonstrated _____

Shell Loading Operation

This section demonstrates how the transport cart and Production Hub are used to load sleeves in and out of the device.

At the start of this demonstration, the device must be configured for sleeve mode. The shell support shaft will be installed on the Production Hub. A shell must be available, but it is not necessary for the shell to be loaded with media.

Demonstrate the process of loading the shell. This procedure is explained in detail in the ThermoFlex Wide II Operator Guide.

1. Load the shell onto the transport cart.

2. Slide the shell onto the Production Hub, and then into the device.
3. Couple the tailstock back to the arbor, tighten the arbor hydraulic clamp, press the arbor clamp button, and turn the brake override switch to the Brake Operation position.

Demonstrate the process of unloading the shell

1. Turn the drum brake override switch to the Brake Override position and uncouple the tailstock to the arbor.
2. Position the Production Hub and slide the sleeve onto the shaft.
3. Use the transport cart to unload the sleeve from the Production Hub.

Successfully demonstrated _____

Sleeve Throughput

Sleeve throughput is determined by the sleeve load/unload time and the imaging time. The speed of manual sleeve loading is dependant on the operator. Imaging time is a function of the sleeve diameter. These factors make it difficult to devise a standard test measuring sleeve throughput. The recommended alternative is to demonstrate the device speed using the throughput test for Plate on Drum. This test can be found in section 0.

6.2 Imaging Performance

6.2.1 Description

These tests demonstrate that the ThermoFlex Wide II device meet specifications in terms of image performance on sleeve media. The tests cover halftone calibration, maximum line screen, halftone uniformity, and image quality.

A descriptions of each test file is provided in Appendix A.

6.2.2 Image Quality

Expose ITP test file #1 of the size appropriate for the sleeve you are using. Do not process the sleeve.

Visually inspect the vignettes and large halftone areas to ensure they are free of artifacts. The file contains 175lpi data, the maximum recommended.

Successfully demonstrated:_____

6.2.3 Halftone calibration

Required Equipment:

- ProScope portable CCD Microscope
- Custom ProScope stand
- Computer with Matlab Software

Using the sleeve exposed in the previous step, measure the percent dot area of the given screens and fill in the table. Verify that the results are within +- 4% of the expected values.

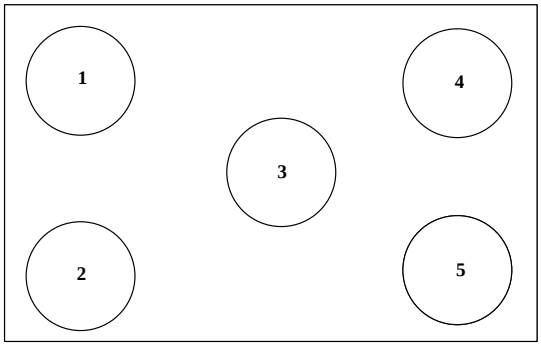
Tint	Measured Dot Area

Successfully demonstrated: _____

6.2.4 Halftone uniformity

Expose the ITP test file #2 in the size appropriate for the sleeve you are using. Do not process the sleeve.

Compare the dot areas of similar patterns at different locations on the image using the ProScope system. Verify that measurements taken at each of the five locations shown below are all between 46% and 54%.



- Density at location 1: _____%
- Density at location 2: _____%
- Density at location 3: _____%
- Density at location 4: _____%
- Density at location 5: _____%

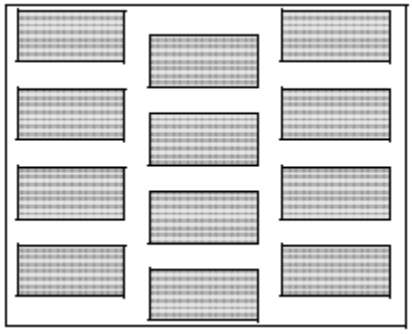
Successfully demonstrated :_____

6.3 Imaging in the Round

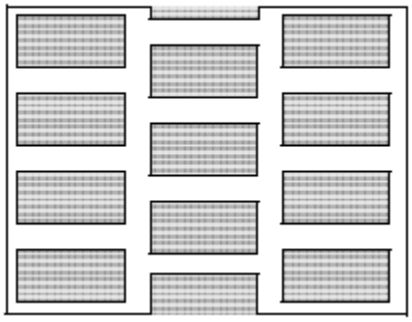
This test demonstrates the ability of the device, in conjunction with the sleeve toolkit, to expose plates pre-mounted on the sleeve.

A sleeve of exactly 17.5 inch repeat is required for this test.

Example showing an image before and after rectangularization:



Before



After

Procedure:

1. Using Sleeve Toolkit, open the file "SleeveSeamlessTest"[1].
2. "Rectangularize" the image and define the seam.
3. Cut and mount the plate following the instructions provided by the Sleeve Toolkit.
4. Load the sleeve and expose the file.
5. Inspect the result and verify there are no visible defects.

Successfully demonstrated _____

[1] Exact filename tbd

7. INITIATION OF WARRANTY PERIOD

The Installation Test Procedure has been successfully completed.

Creo representative: Name: .....

Signature: .....

Date: .....

Customer representative: Name: .....

Signature: .....

Date: .....

APPENDIX A – TEST FILES

All ThermoFlex Wide II ITP test files are RIPped for 3 different output media sizes:

- 30” x 20” (762mm x 508mm)
- 40” x 30” (1016mm x 762mm)
- 42” x 60” (1066.8mm x 1524mm)

File	Purpose	Description
TFX_ITP1_<size>.tif	Halftone calibration and resolution.	Fine linework, fine text, vignettes, and screening at various line frequencies and screen angles. Round dots.
TFX_ITP2_<size>.tif	Halftone uniformity test	A 50% halftone screen at 133 lpi and 22.5° screen angle using round dots.
TFX_ITP3_<size>.tif	Image throughput test	100% and 50% patches along with small images in the corners of the plate. Creo logo in the center. Round dots.
TFX_ITP4_<size>.tif	Halftone calibration and resolution.	Same image as TFX_ITP1, except RIPped with Euclidian (round-square-round) dots.