

CALIBRATION TOOL

Calibration Tool is a tool for profiling Cretaprint printers. It lets you create a profiling package for your specific print conditions. Each profiling package takes into account a particular combination of ink type, ink colors, the printing order of inks, the composition of the ceramic tiles, the glaze and other factors. A valid profiling package is absolutely essential if you want to print color-accurate tiles.

Calibration Tool also lets you create a profiling package for third-party ceramic tile printers. This document refers to Cretaprint printers throughout. However, unless otherwise stated, the steps in this document apply to both Cretaprint and non-Cretaprint printers.

Profiling

You can create profiling packages for a Cretaprint printer or any third-party ceramic tile printer.

The calibration and profiling procedure requires you to print tiles and measure charts. Be aware that you will be required to transfer files via USB stick or other data storage medium from one device to another.

Cretaprint printers

To create a profiling package for a Cretaprint printer, you require Calibration Tool. Calibration Tool is installed as part of the standard Fiery proServer client software.

Non-Cretaprint printers

You can apply ink limits and linearization curves to TIFF jobs at the printer. If your ceramic tile printer does not have a feature for saving linearization curves, you can create them in Calibration Tool and apply them to your jobs using Fiery Curve Processor.

Fiery Curve Processor is installed in the Program Files (x86)\EFI\Fiery Curve Processor folder. To run the program, double-click the Fiery Curve Processor shortcut icon on the desktop.

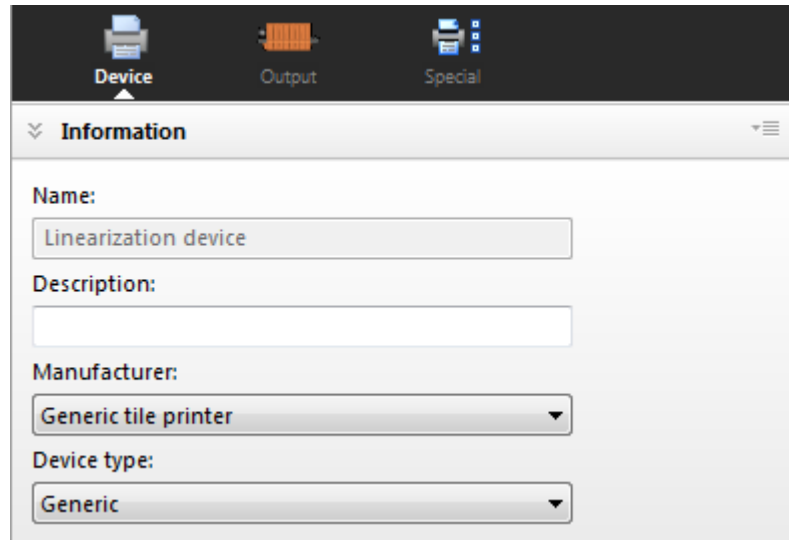
Before you can create a profiling package for a non-Cretaprint printer, you need to:

- Purchase a license for the non-Cretaprint option
- Set up the linearization device in the Fiery proServer software.



TO SET UP THE LINEARIZATION DEVICE IN THE FIERY PROSERVER SOFTWARE

- 1 Go to System Manager. On the Device tab, open the Information pane.



- 2 Under "Manufacturer", select "Generic tile printer".

This setting is available only if you have a license for the non-Cretaprint option.

- 3 Click Save.

Creating a profiling package

If you need to interrupt the calibration and profiling procedure at any time, you can save the current measurement data by clicking File > Save Calibration, and continue later by clicking File > Load Calibration.

NOTE: You can continue with the calibration on a different computer. The only prerequisite is that the computer must be running the Fiery proServer software. Copy the subfolder with the saved calibration files from the C:\ProgramData\EFI\EFI XF\Client\Working folder to the second computer. If you cannot see the folder, make sure that you set the Windows folder options to view hidden folders. The subfolder can be located anywhere on the second computer, e.g. on the desktop.

TO SET UP THE PRINTER IN CALIBRATION TOOL

- 1 Connect your measuring device to your computer.
- 2 In the toolbar of the Fiery proServer software, click the Calibration Tool icon to start the program.

- 3 Under “Device name”, select the printer for which you want to create a profiling package.

- Users of Cretaprint printers: Select your printer model.
- Users of non-Cretaprint printers: Select “Linearization device (Generic)”.

If you cannot see “Linearization device (Generic)”, make sure that you have correctly set up the linearization device in the Fiery proServer software. This setting is available only if you have selected “Generic tile printer” as the printer manufacturer. For more information, see “[Non-Cretaprint printers](#)” on page 1.

- 4 Make your production line settings.

NOTE: Under “Rendering configuration”, the grayscale settings refer to the dot size. The higher the grayscale level, the bigger the dot size.

5 Enter a profile name.

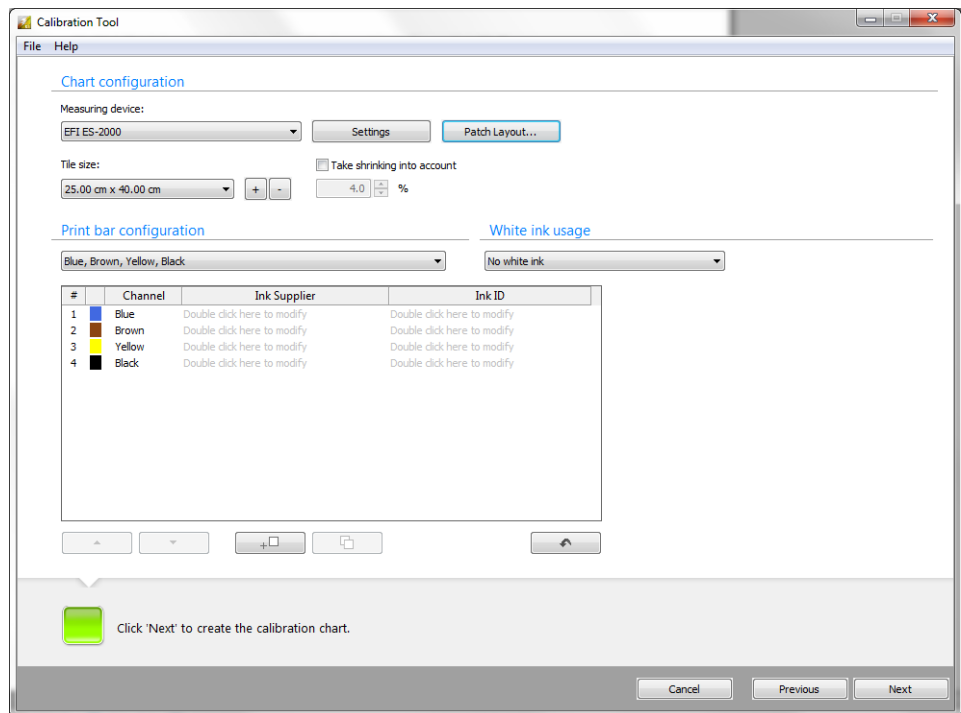
The default profile name is based on the selected printer. If you enter a glaze ID in the production configuration settings, it is also incorporated into the default profile name when you click Next. The glaze ID is useful to indicate the type of production workflow.

To enter a custom profile name, clear the “Generate profile name from settings” check box. The name that you enter here is the profile name that you select in the Fiery proServer software later.

A profile name can consist of up to fifty characters. Language-specific characters are permitted as long as Windows is running in the appropriate language version. For example, a Chinese Windows version is required to create a profile with Chinese characters in its name.

You cannot create two custom profiles with the same name. If you enter a profile name that already exists, Calibration Tool creates a profile with “Copy_1” added to the name.

6 Click Next.



7 Select your measuring device.

Special settings are available for some measuring devices.

If you are using an ES-2000, you can select from three types of measuring conditions. They are defined by ISO 13655, as follows:

- M0
The UV content of the specimen illumination is not defined. Measuring occurs in one step. This is the recommended setting because ceramic tiles do not use optical brighteners.
- M1
The UV content of the specimen illumination is defined as D50. Measuring occurs in two steps.
- M2
Requires that the spectral power distribution of the specimen illumination is in the wavelength range of 420 nm to 700 nm, with no substantial radiation power in wavelengths below 400 nm. Corresponds to UV cut. Measuring occurs in two steps.

Furthermore, if you are using an ES-2000 or an ES-1000, you can:

- Measure single color patches or color strips
The calibration procedure requires you to print out a chart and measure the color values of each color patch. You can measure the chart a row at a time, or you can measure each color patch individually.
- Rotate the ruler by 180°.

This setting is intended primarily for left-handed users for whom it is easier to measure the chart with strip 1 positioned on the right. By rotating the ruler, you avoid dragging it across unmeasured strips. Scratched patches can mar the color reading.

An illustration is available to show you how this feature works. Click Show me how in the measurement window before you measure the first chart.

8 Click Patch Layout, and make the following settings. Then, click OK.

- Define a patch size. Some measuring devices have an aperture that requires a certain patch size.
- Define a horizontal and vertical gap between color patches. Make sure that the gap is wide enough to prevent bleeding between color patches.
- Change the color of the separator (optional). The separator is the line that separates one color patch from another. It helps to prevent reading errors during measuring. The default color is 100% black. However, if your print bar configuration does not include black ink, Calibrator Tool prints separators made from a mixture of all the available inks. By default, 50% ink of each color is used, but you can edit this percentage for each color.
- Center the chart of the tile (optional). It can be preferable to print the chart in the middle of the tile.

9 Under "Tile size", select your tile size, or click the Plus (+) button to create a custom tile size.

10 Select the “Take shrinking into account” check box (optional).

This setting compensates for any tile shrinkage that takes place in the kiln. The color patches are enlarged by the defined percentage to ensure that they shrink to the correct size during the firing process. Be aware that the number of kiln passes also affects the amount of shrinkage.

11 Select the correct print bar configuration for your printer.

The selected combination of ink colors is displayed in the table. The table is editable.

- You can add details of the ink supplier and enter an ink ID, such as the order number.




You must enter these ink details if you want to apply smart ink savings. Smart ink savings reduces costs by replacing expensive inks with lower-priced inks, without compromising on color quality. By adding ink details, you allow the Fiery proServer client to differentiate between two differently priced inks of the same color. For example, if you use two types of blue ink, you must enter ink details here.

Ink details are optional if you do not want to apply smart ink savings, or if you always use the same ink per color — for example, blue ink with the order number B03.

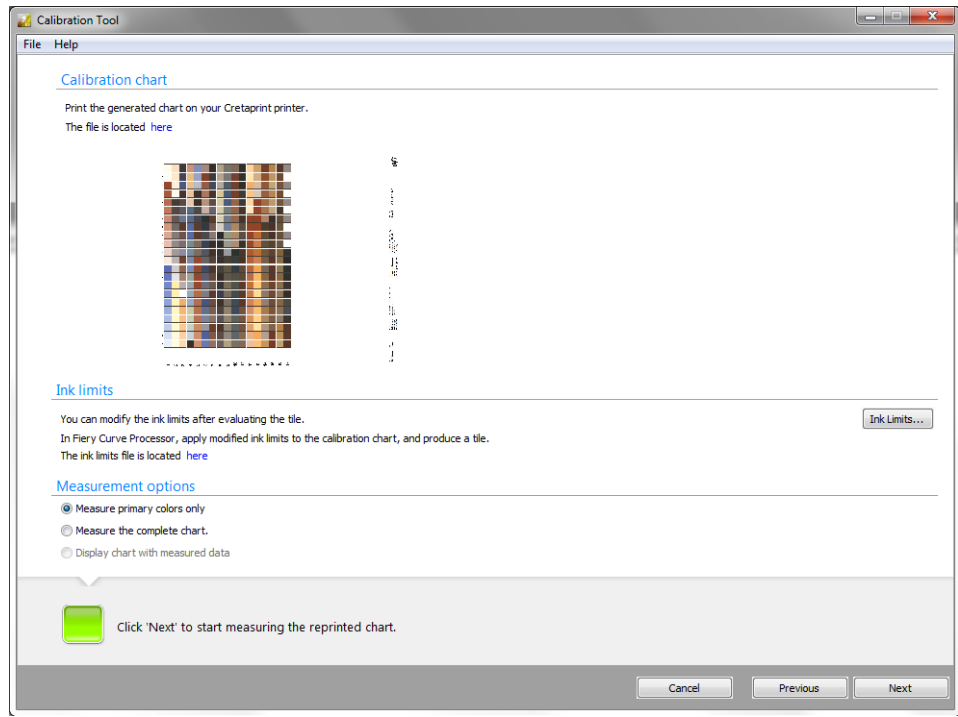
For more information on how to set up smart ink savings in the Fiery proServer client, see the *Smart Ink Savings Guide* on <http://help.efi.com/fieryproservercretaprint/index.html>.

- To enter an ink supplier, double-click where indicated. Then, select or type a supplier name, and press <Enter>. Calibration Tool automatically enters the same supplier name for all ink colors. You can overwrite individual names, if required. New names are automatically added to the list when you create the profiling package.
- To enter an ink ID, double-click where indicated. Then, select or type an ink ID, and press <Enter>. New ink IDs are automatically added to the list.
- You can change the order in which the ink channels are printed on the Cretaprint printer — for example, if the print bars have been swapped around at the printer and the order no longer matches the order defined in the package.

Click in the first column of the row, and then use the up/down buttons to rearrange the order.

- Click  to add an empty print bar (0% ink). A maximum of eight print bars is permitted.
- Click  to duplicate the selected ink channel. By duplicating a color channel, you can increase the total ink coverage for a specific ink color.
- Click  to reset your changes and revert the print bars to their original order.

12 Click Next.



13 Print a tile of the calibration chart (*.tif) on your ceramic tile printer.

The calibration chart is generated dynamically and is based on the settings that you have made. Click “Here” to open the folder in which the file is saved. Depending on the tile size and the patch layout you selected, you may have to print out two charts.

You can now go on to create a profiling package:

- Users of Cretaprint printers: See “To create a profiling package for Cretaprint printers” on page 8.
- Users of non-Cretaprint printers: See “To create a profiling package for non-Cretaprint printers” on page 9.



TO CREATE A PROFILING PACKAGE FOR CRETAPRINT PRINTERS

Before continuing with the following steps, make sure that you have set up the printer in Calibration tool and printed a tile of the calibration chart. For more information, see [“To set up the printer in Calibration Tool” on page 3](#).

1 Assess the printed tile. Then, do one of the following:

- If the print quality could be better, linearize the printer. In this case, it is sufficient to measure only the primary colors. Afterwards, to create a profiling package, you must reprint and measure the complete calibration chart.
- If the print quality is good, select “Measure the complete chart”. To create a profiling package, you must measure the complete chart.
- If you have previously saved a calibration job, select “Display chart with measured data”.

2 Click Next, and follow the on-screen instructions to measure the calibration chart.

For ES-2000/ES-1000 users: You can switch from single-patch to row measuring and vice versa, by clicking  for single patches or  for rows.

You can change the measuring mode before measuring each row. You must measure the full row, starting at patch 1-A (for the first row) or patch 2-A (for the second row).

3 Click Next.

The Dot gain curves window shows two dot gain curves. The dot gain curve on the left represents the measured values. The dot gain curve on the right is the compensation curve. It shows what dot gain values are needed to return the printer to its linearized state.

4 Under “Dot gain calibration”, click an item.

- Calibrate your Cretaprint printer.

The dot gain quality chart indicates whether the printer needs calibrating. Ideally, the dot gain curves should be within the green spectrum of the dot gain quality chart.

If the curves are within the red spectrum of the dot gain quality chart, calibrate the printer before you create a profiling package. When you measured the chart, a calibration file was automatically created for each ink color. Upload these files to the Cretaprint printer, and reprint the chart.

After you have reprinted the chart, you can get confirmation that the calibration has worked by measuring the primary colors. Select “Check primary colors after reprinting the chart”. Afterwards, you must measure the complete chart before you can create the profiling package.

- Measure the complete chart

If the dot gain curves are only slightly non-linear, measure the whole chart to check the effect of the compensation curves on the print quality.

- Display chart with measured data

If you have previously saved a calibration job, select “Display chart with measured data”.

- Create package

If you are satisfied with the effect of the compensation curves on the print quality, you can now incorporate the compensation curves into the profiling package.

5 Click Next.

6 Check carefully the summarized settings before you submit the measurement data to create a profiling package.

7 Click Create Profile.

Your package is created in the My Profiles folder.

After the profile has been created, you can inspect it as a two-dimensional or a three-dimensional model in the L*a*b* color space by clicking the Inspect Profile button. Profile Inspector also lets you display multiple profiles for easy visual comparison.

You can now apply the new profiling package to your jobs. For more information, see the *Quick Start Guide*.

TO CREATE A PROFILING PACKAGE FOR NON-CRETAPRINT PRINTERS

Before continuing with the following steps, make sure that you have set up the printer in Calibration tool and print a tile of the calibration chart. For more information, see [“To set up the printer in Calibration Tool” on page 3](#).

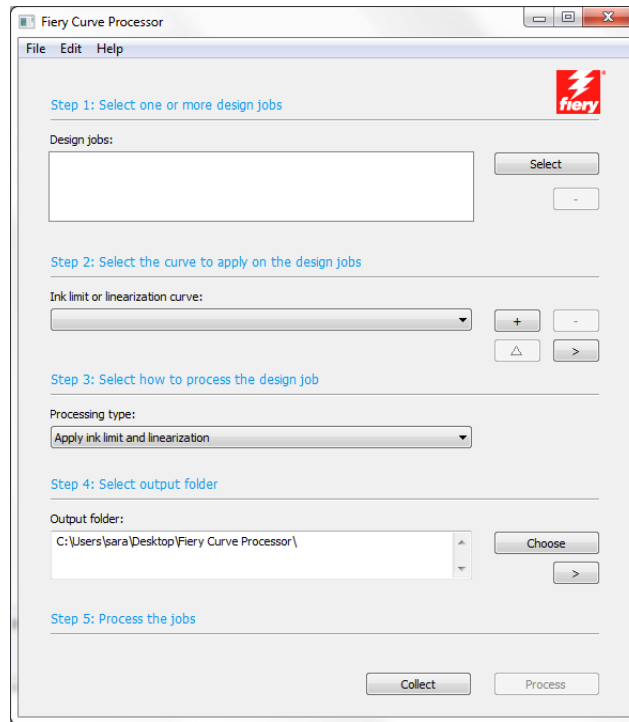
The profiling procedure described below requires you to load files in Calibration Tool, Fiery Curve Processor and on the ceramic tile printer. Be aware that you may have to transfer files via USB stick or other data storage medium from one device to another.

1 Assess the printed tile. In particular, check the primary colors.

2 Click “Ink Limits”, and reduce the ink limits for individual ink colors, if required. Then, click OK.

A file with the name Linearization.device_yyyy-mm-dd-hhhh.inlimit.fcp is created in a subfolder of the Client\Working folder. Click “Here” to open the folder in which the file is saved.

3 Start Fiery Curve Processor.



4 Under “Design jobs”, click Select and load the Linearization.device_yyyy-mm-dd-hhhh_P1.tif file.

If the Client\Working folder is open on your desktop, you can drop files into Fiery Curve Processor.

5 Under “Ink limit or linearization curve”, click the Plus (+) button and load the Linearization.device_yyyy-mm-dd-hhhh.inklimit.fcp file.

If the Client\Working folder is open on your desktop, you can drop files into Fiery Curve Processor.

6 Click Process.

A print file with the name Linearization device_yyyy-mm-dd-hhhh_P1.inklimit.tif is created in the defined output folder. The print file incorporates the new ink limits.

7 Click Collect to open the output folder. Print the file on the ceramic tile printer, and produce the tile.

8 Assess the printed tile. In particular, check the primary colors which are printed with the ink limits applied.

9 In Calibration Tool, do one of the following:

- If you are not satisfied with the quality of the primary colors, the printer needs linearizing. Go to [step 10](#), and measure the primary colors.
- If the primary colors are satisfactory, go to [step 14](#), and measure the complete chart.

10 Under “Measurement options”, click “Measure primary colors only”.

11 Click Next, and measure the chart.

12 Click Next.

The Dot gain curves window shows two dot gain curves. The dot gain curve on the left represents the measured values. The dot gain curve on the right is the compensation curve. It shows what dot gain values are needed to return the printer to its linearized state.

A file with the name Linearization.device_YYYY-MM-DD-hhhh.linearization.fcp is created in a subfolder of the Client\Working folder. Click “Here” to open the folder in which the file is saved.

13 Start Fiery Curve Processor, and print and produce a new tile using the *.linearization.fcp that you created in [step 12](#).

14 In Calibration Tool, under “Measurement options”, click “Measure the complete chart”.

15 Click Next, and measure the complete chart.

16 Click Next.

17 Check carefully the summarized settings before you submit the measurement data to create a profiling package.

Before you create your profile, you should modify the brightness of the glaze. Although glaze and proofing paper achieve the same brightness value when measured, the tile will always appear brighter to the human eye. You can compensate for this by increasing the L* value to make the paper proof look more like the tile.

18 Under “Glaze color”, click Measure.

19 Place the measuring device in the calibration cradle to calibrate it.

The measuring device is calibrated when the button changes to Stop.

20 Measure several different white points of the tile with the printed calibration chart, and make a note of the L* value in each case.

21 Find the average L* value and add 1.5 to 2.0 to it.

22 Enter the value in the L* box. Then click Stop.

23 Click Create Profile.

Your package is created in the My Profiles folder.

After the profile has been created, you can inspect it as a two-dimensional or a three-dimensional model in the L*a*b* color space by clicking the Inspect Profile button. Profile Inspector also lets you display multiple profiles for easy visual comparison.

- 24 In the Fiery proServer software, open System Manager, and set up a new output device for a generic tile printer.**

Make sure to set the linearization device offline first because the non-Cretaprint option entitles you to connect to one generic tile printer only.

- 25 Connect the new output device to a workflow, and load and print a job.**

The profiling package is applied, and a TIFF file is created in the Export folder.

- 26 Load the job from the Export folder in Fiery Curve Processor.**

- 27 Make sure that you use the right *.linearization.fcp for the profile.**

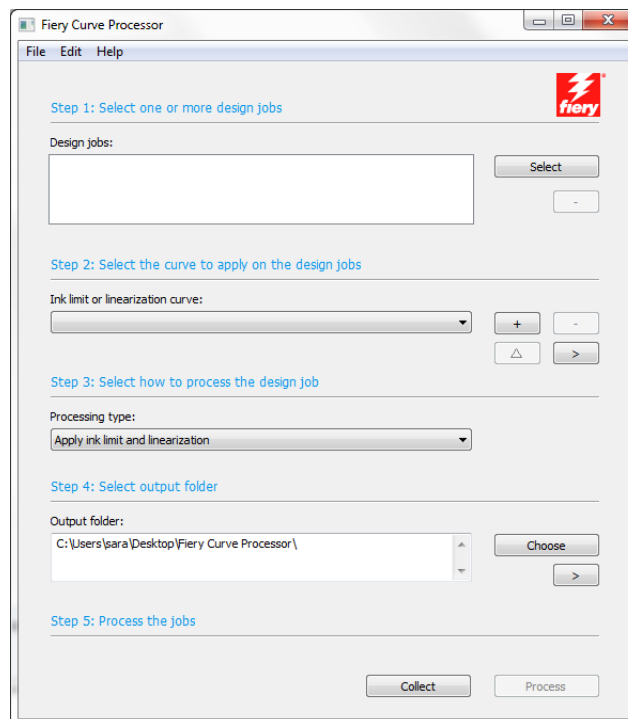
- 28 Click Process.**

A print file is created in the defined output folder.

- 29 Click Collect to open the output folder. Print the file on the ceramic tile printer, and produce the tile.**

Fiery Curve Processor user interface

Fiery Curve Processor enables you to apply ink limits and linearization curves to TIFF jobs at the printer. If your ceramic tile printer does not have a feature for saving linearization curves, you can create them in Calibration Tool and apply them to your jobs using Fiery Curve Processor.



The following main settings are available:

- File > Language

You can change the language of the user interface on the File menu. The menu command “Also in English” displays the selected localized language, as well as the original English term in parentheses.

- File > Output file format

You can select an output file format for your print jobs on the File menu. Your printer must be able to process the selected file format. The following output file formats are available:

- TIFF
- Photoshop CMYK + spot
- Photoshop multichannel

- Design jobs

Jobs in TIFF format are supported. To load a job, do one of the following:

- Click Select and browse to your job.
- Drop your job into Fiery Curve Processor.

You can remove a job from the job list by clicking the Minus (-) button.

- Ink limit or linearization curve

Load a Linearization.device_yyyy-mm-dd-hhhh.inklimit.fcp file to apply ink limits to your job, or load a Linearization.device_yyyy-mm-dd-hhhh.linearization.fcp file to apply a linearization curve to your job. The linearization file is created in Calibration Tool when you create a profiling package for a non-Cretaprint printer.

Do one of the following:

- Click the Plus (+) button and browse to the file.
- Drag the file into Fiery Curve Processor.

You can remove a selected file by clicking the Minus (-) button.

You can rename a selected file by clicking the Triangle button.

You can display the file location by clicking the right-arrow button.

- Processing type

If you have selected a `Linearization.device_yyyy-mm-dd-hhhh.linearization.fcp` file, you can apply:

- Ink limits and linearization
- Ink limits only
- A reverse linearization

A reverse linearization removes the currently applied linearization file from the job. It enables you to reprocess the job in its original state, with only a slight difference in color quality.

- Output folder

By default, processed files are created to the Fiery Curve Processor folder on your desktop. You can change the location by clicking Choose and browsing to a different folder.

You can display the folder location by clicking the right-arrow button.

- Process

Click Process to apply ink limits or a linearization to a loaded job. The print file is created in the output file format that you selected on the File menu.

- Collect

Click Collect to open the output folder that contains the print file. You can now print the file on the ceramic tile printer, and produce the tile.