

# **ORIS CxF Toolbox**

## **V1.1**

### **User Manual**



CGS Publishing Technologies International

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# 1

# Introduction

## Global Brand Color Communication via CxF/X-4

In a global world, electronically communicating brand colors accurately and consistently is quickly becoming a requirement. Global and in-house workflows from designer to press are demanding common, adequate and effective means to communicate color and appearance.

X-Rite's Color Exchange Format (CxF) was designed to meet these requirements. CxF files allow the seamless digital communication of all commercially significant aspects of color across devices, applications and locations.

*CxF/X-4* is defined in *ISO 17972* as a subset of the *CxF3* standard. *CxF/X-4* files characterize a spot color in conjunction with a print substrate by means of its spectral reflectance data and include a wide range of metadata.

The PDF V2.0 format is defined in *ISO 32000-2*. PDF 2.0 files can embed *CxF/X-4* data and print order information. This accurately characterizes the spot colors used in the file. PDF/X files with embedded *CxF/X-4* data provide all the color information required along the entire supply chain.

Printers are provided with press-critical variables such as target colors, TVI aims, opacity and ink laydown order. Proofing applications can use the spectral data to provide excellent matches of spot color tints and overprints. Ink formulation software uses *CxF/X-4* data to accurately formulate ink recipes.

## ORIS CxF Tools

If brand color consistency is an important part of your business, then you need to be able to utilize *CxF/X-4* files easily.

ORIS CxF Tools were designed to make creating, managing and applying *CxF/X-4* data as easy and effective as possible. The tools provide all the information required to improve quality, reduce costly errors and improve customer satisfaction.

The tool set comprises the ORIS CxF Toolbox application and the ORIS CxF Designer plug-in for Adobe Illustrator.

# ORIS CxF Toolbox

ORIS CxF Toolbox creates *ISO 17972* compliant CxF/X-4 files from existing color data, such as *CGATS* measurement files, *QTX* files and legacy *CxF* formats, or by measuring printed samples.

Spectral reflectance data can be viewed in detail, including data embedded in PDF/X files. All metadata information can be added and corrected.

ORIS CxF Toolbox also allows you to conveniently assign CxF/X-4 data to the spot colors in a PDF/X file and to extract such data to a file. Missing CxF/X-4 data is assigned automatically if a CxF/X-4 library file is specified. You can also modify the ink laydown order and extract the output intent profile. Missing output intent profiles can be assigned manually.

The report function provides an overview of all spectral and colorimetric data both graphically and numerically. It also includes data for print process control such as TVI aims and ink properties.

Print quality can be verified by measuring spot ink characterization charts against the tolerances defined in the CxF/X-4 metadata. Alternatively, if your measurement device is not supported, you can load a *CGATS* measurement file or *QTX* file. Process color verification based on the PDF output intent or a user-selected ICC profile is also supported. The verification results can be saved as a *PQX* file and sent on for evaluation.

ORIS CxF Toolbox also allows you to access CxF/X-4 data stored on the *Global Brand Assurance* web server. The data can be analyzed, extracted and used for verifying print quality. The verification results can be uploaded to the GBA database.

## ORIS CxF Toolbox Features

ORIS CxF Toolbox allows you to do the following:

- Measure spectral reflectance of color samples
- Import color data from *CGATS* measurement files
- Import color data from *CxF1*, *CxF3*, *CxF/X-4*, *QTX* and PDF files
- Download color data from *Global Brand Assurance* web server
- Create CxF/X-4 files from measured, imported or downloaded data
- Compile CxF/X-4-defined brand color libraries from various files
- View spectral reflectance curves for each color and tint value
- Add and correct CxF/X-4 metadata
  - Including brand owner identification and contact information
  - Bulk editing mode for quickly changing multiple colors
- Analyze and modify PDF/X files:

- Indication of spot colors with missing CxF/X-4 data
- Assign CxF/X-4 data to spot colors
- Automatically assign CxF/X-4 data from library file
- View, extract, replace or remove CxF/X-4 data
- Extract ICC profile defining output intent
- Assign output intent profile if missing
- Change ink laydown order
- Create CxF/X-4 reports:  
Spectral data, CIE Lab data, TVI aims, opacity, print contrast and other ink properties – all displayed both graphically and numerically
- Verify print quality (certification)
  - Measure spot ink charts against tolerances defined in CxF/X-4 data (delta E, metamerism index)
  - Measure process colors against target values derived from PDF/X output intent profile or user-selected ICC profile
  - Load measurement results stored in CGATS or QTX files (allows use of unsupported measurement devices)
  - Save certification results as a *PQX* file (for evaluation at remote sites)
  - Upload certification results to Global Brand Assurance web server

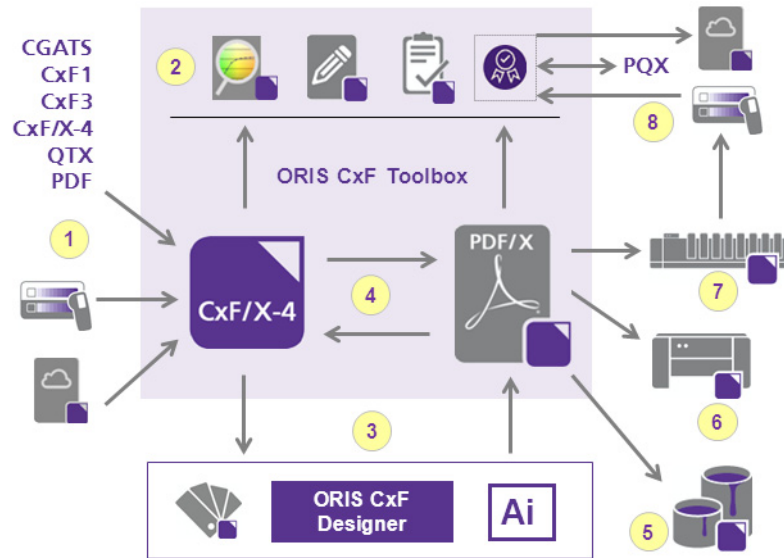
## ORIS CxF Designer

ORIS CxF Designer is a plug-in for Adobe Illustrator which imports CxF/X-4-defined spot colors into Illustrator's swatch palette.

This allows designers to use exact brand colors in the creation of any packaging or other printed product. On exporting the documents to PDF/X format, the CxF/X-4 data – including spectral data, opacity information and metadata – is embedded into the file.

Designers no longer need to wait for the perfect color to be created. What is used on screen can be sent directly with the final PDF file.

# CxF/X-4 Workflow



*Figure 1-1: Using ORIS CxF Tools to Effectively Manage CxF/X-4 Data*

- 1** Creating CxF/X-4 data with ORIS CxF Toolbox:
  - Importing files
  - Measuring spot ink charts
  - Accessing Global Brand Assurance web server
- 2** ORIS CxF Toolbox functions:
  - Viewing spectral data and metadata
  - Editing CxF/X-4 metadata, renaming and deleting colors
  - Creating spot color reports
  - Certification (print validation)
- 3** Using Adobe Illustrator and ORIS CxF Designer plug-in:
  - Importing CxF/X-4 data into swatch palettes
  - Designing pages using CxF/X-4-defined spot colors
  - Exporting pages with CxF/X-4 data to PDF/X format
- 4** Managing CxF/X-4 data in PDF/X files:
  - Assigning CxF/X-4 data to spot colors
  - Updating or removing CxF/X-4 data
  - Extracting CxF/X-4 data from PDF/X files
- 5** CxF/X-4 data can be used for accurate ink formulation

- 6 Proofing:  
Creating excellent spot color matches from PDF/X file
- 7 Printing:  
All press-critical data included in PDF/X file
- 8 Certification:
  - Measuring print results against CxF/X-4 data
  - Uploading certification results to GBA web server
  - Saving certification results as PQX file
  - Loading PQX file to remeasure same job

Related information:

CGATS (page 73)  
CxF1 (page 73)  
CxF3 (page 73)  
CxF/X-4 (page 73)  
GBA (page 74)  
PQX (page 75)  
QTX (page 76)

# System Requirements for ORIS CxF Toolbox

## Operating System

Windows 7 or higher

## Measurement Device

- X-Rite i1Pro 2 – or
- X-Rite eXact (single-patch measurements only)

Other devices are supported indirectly via import of *CGATS* measurement files or *QTX* files.


## Software License

When you start the program for the first time, enter the license code and activate it.

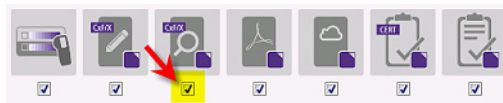
Without a valid license, the program can be activated as a trial version which will be functional for 30 days.

# Selecting Available Tools

ORIS CxF Toolbox provides various tools which are accessible via icons located on the left of the main window. Some of the tools may be essential for a particular user, others may not be required. You can hide and display each tool as you see fit.

1. Click  at the top right.
2. Click the check boxes underneath the icons to enable or disable the respective tools.

Disabled tools are immediately removed from the main window.



*Figure 1-2: Example – Selecting the ‘View’ Tool*



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# 2


# Using ORIS CxF Toolbox


## Creating CxF/X-4 Data by Measurement


How to create CxF/X-4 files by measuring the spectral reflectance of spot ink characterization charts or single spot color patches.


1. Make sure the measurement device is connected to your PC.
2. Click  on the left.
3. Click  on the top right to configure the measurement device.
4. Specify the number of patches on your spot ink chart.
5. *Optional:* Enable the **Average** option and specify the number of measurements to be averaged.


Average measurements of the same printout to minimize imprecisions of your measurement device. Average measurements of different printouts to minimize imprecisions of your printing press.



6. Specify whether you are measuring color strips or individual patches.  
Color strips can be measured from either left to right or right to left. It is only important to measure both strips in the same direction.
7. Click  to start the measuring process.
8. If requested to do so, place the measurement device on the white reference, then click **OK**.
9. Perform the measurements.

In case of errors click  to repeat the last measurement. This button is only available if *all* color strips have been measured. You cannot repeat a single strip.

Click  if you want to cancel the measuring process. All measurements will be discarded and you have to repeat the process from the beginning.

10. If **Average** is enabled, always click  after completing one measurement in order to start the next.

You can choose to average less measurements than specified by not clicking .

11. Click  after completing all measurements.  
The spectral curve for one of the tints (usually 100%) appears.
12. To view the spectral curves, click on a patch in the tint ramp. Ctrl-click to add the spectral curve to those displayed already.
13. Enter a spot color name, substrate name and substrate type (mandatory). Also complete the other *metadata* fields.  
Measurement device details and various default values are added automatically.
14. Click  to save the measurements as a CxF/X-4 file. Select a folder and click **Save**.  
The file name will be identical to the spot color name specified in the metadata.

Related information:

- Spot ink characterization chart (page 76)
- System Requirements for ORIS CxF Toolbox (page 5)
- CxF/X-4 Metadata (page 68)
- Measure CxF/X-4 Data (page 39)

## Example

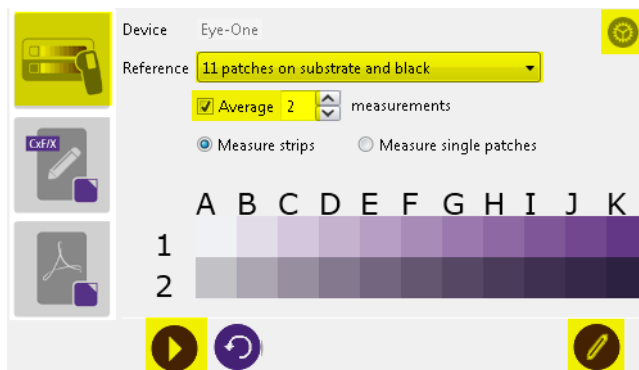


Figure 2-1: Measuring Spot Ink Charts

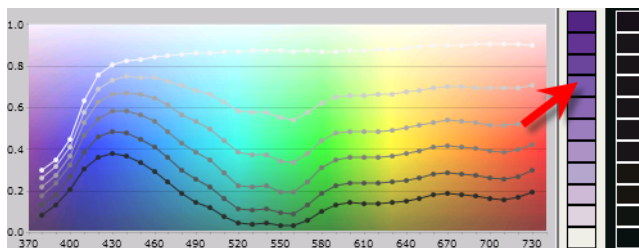


Figure 2-2: Viewing Spectral Curves



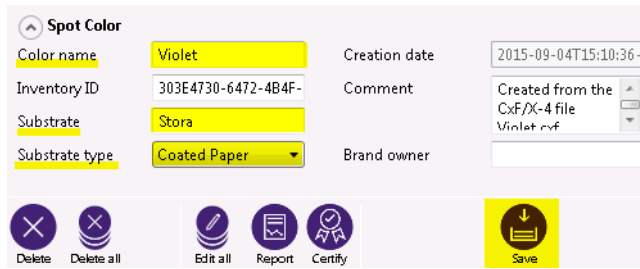




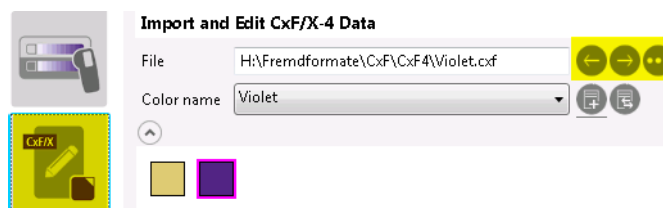


Figure 2-3: Entering Metadata and Saving as CxF/X-4 File

## Creating CxF/X-4 Data from Files

You can create CxF/X-4 files from the color data stored in CGATS measurement files, legacy CxF1 and CxF3 files, and QTX files. It is also possible to import the CxF/X-4 color data stored in PDF/X documents and existing CxF/X-4 files. The metadata information can be corrected, missing metadata can be added.

1. Load the files to be imported or converted:
  - Drag a CxF1, CxF3, Cx/F/X-4, CGATS or QTX file onto the ORIS CxF Toolbox window.
  - Click  on the left, then click  on the right and select such files or PDF/X files. Hold the Shift or Ctrl key pressed down to select multiple files.
  - Use  and  to successively load all files of the selected type available in the current folder (only one at a time).



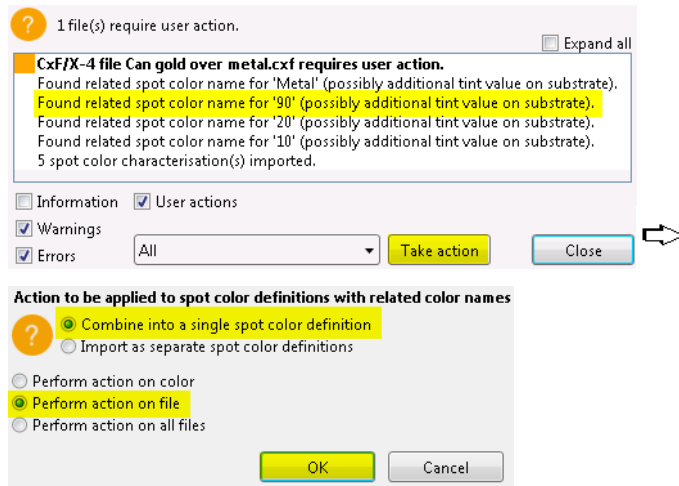
2. If a log window appears, click on the messages to see more details, then close the window.

If a user action is required, however, click on the message details. Then click on a color name, select the action and specify whether to apply it to all colors or all files. Then click **OK** and close the window.

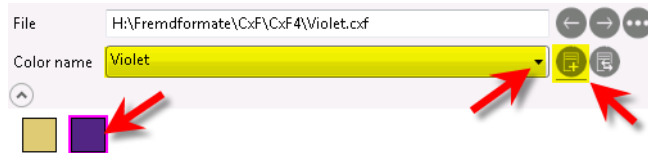
The following situations require a user action, for example:

- Spot colors with invalid spectral data. Such definitions can be discarded.
- Spot colors with similar names interpreted as different tint values of the same color. Example: Blue, Blue10, Blue20 ... Blue90. Such colors can be combined into a single color.

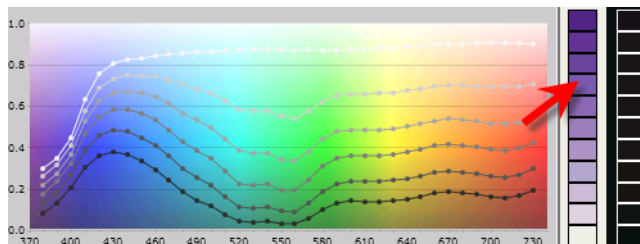
- Spot colors with similar names interpreted as identical tints of the same color, one printed on the substrate and one on black. Example: Blue and Blue\_K. Such colors can also be combined.



- If you want to load color data from additional files, click . Now the button is displayed with an underline . The color definitions will no longer be removed from the dialog when additional files are loaded.
- Select a CxF/X-4 color definition using the **Color name** list or by clicking on the color box underneath the list. Click the button if the color boxes are not visible.



- To view the spectral curves, click on a patch in the tint ramp. Ctrl-click to add the spectral curve to those displayed already.

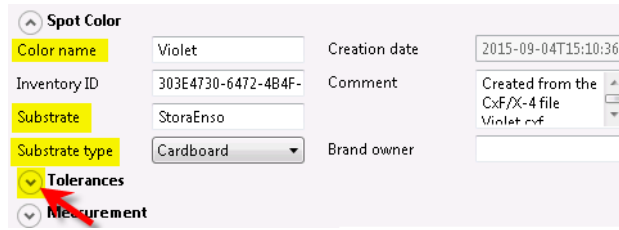


- Correct or complete the *metadata* fields of the selected color definition.

Metadata already tagged in the imported files is added automatically to the appropriate fields if applicable. Some fields are automatically set to default values.

Click the buttons to expand the metadata groups if required.


**NOTE:** Specifying a spot color name, substrate name and substrate type is mandatory. These fields cannot be left empty or undefined.



7. Repeat steps 4 and 6 to view and edit additional color data.

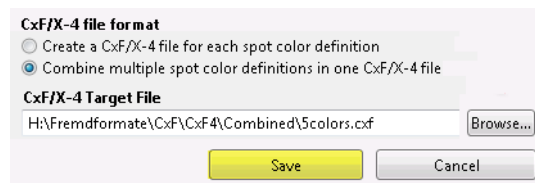
In bulk-edit mode, you can change multiple color definitions in one go. Click  and refer to *Multi-Color Editing and Deleting* for more details.

8. Click  if you want to delete the selected color definition.

9. Click  to save the color data in CxF/X-4 format. There are two options

- Create a single file with all color definitions. Then specify the target directory and file name and click **Save**.
- Create a separate file for every color definition. Then select the target directory and click **Save**.

The files names will be identical to the color names.



Related information:

[Editing CxF/X-4 Data \(page 11\)](#)

[Viewing Spectral Curves and Metadata \(page 15\)](#)

[CxF/X-4 Metadata \(page 68\)](#)

## Editing CxF/X-4 Data

**You can add and modify the CxF/X-4 metadata stored for a spot color. It is also possible to rename and delete color definitions. Most actions can be applied quickly to multiple color definitions in one go.**

Related information:


[Viewing Spectral Curves and Metadata \(page 15\)](#)

[CxF/X-4 Metadata \(page 68\)](#)

## Single-color Editing and Renaming


**How to make changes to a single spot color definition.**

In single-edit mode, you can add or change all of the CxF/X-4 metadata including the color name and inventory ID. You can delete a single color definition or all.

- Import  a CxF/X-4, CxF1, CxF3, CGATS, QTX or PDF/X file.
- Refer to *Creating CxF/X-4 Data from Files* for more details.


## Multi-Color Editing and Deleting

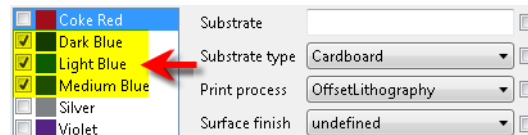
**How to quickly change a set of spot color definitions in one go. In bulk-edit mode, you can change the CxF/X-4 metadata of multiple color definitions, except for the color name and inventory ID. It is also possible to delete multiple color definitions or all in one go.**


1. Import  CxF/X-4, CxF1, CxF3, CGATS, QTX or PDF files.  
Refer to *Creating CxF/X-4 Data from Files* for details.

2. Click  to change to bulk-edit mode.

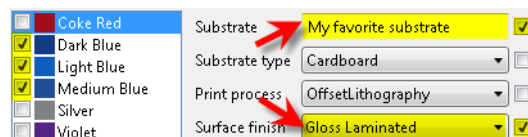
3. Using the check boxes on the left, select the color definitions to be edited or deleted.

In a long list, it is a good idea to first deselect all color definitions by clicking  and then individually select the color definitions you want.



4. If you want to delete the selected color definitions, click .
5. If you want to edit *metadata* information for the selected color definitions, do the following:

- To add or change metadata, enter text or select a list item on the right.




- To remove metadata, delete the text from the field or select the list item **Undefined**.
- To assign the value being displayed in a metadata field to all selected color definitions, enable the check box to the right of this field.

The check boxes on the right always indicate the metadata fields you have changed. The changes will be applied to all color definitions

which are currently selected on the left. Metadata fields with a disabled check box will be left unchanged.

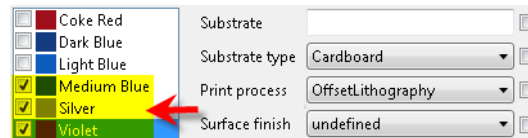
**NOTE:** Metadata fields displayed as empty are either really empty or have 'mixed contents'. The latter means that each of the selected color definitions has different information in this metadata field.

**NOTE:** Enabling the check box of an empty or undefined field causes the metadata information to be deleted from all selected color definitions.

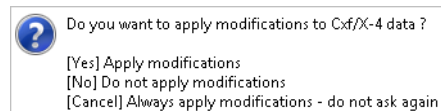
**NOTE:** The **Color name** and **Inventory ID** can only be changed in single-color editing mode . Some fields such as **Creator** or **Creation date** are read-only and cannot be changed at all.

**NOTE:** Some metadata fields such as **Substrate name** and **type** are mandatory and cannot be left empty or undefined. Some tolerances are automatically set to default values.

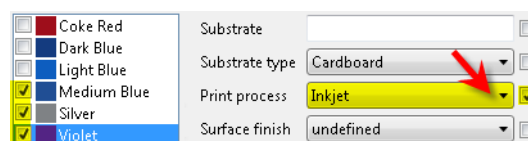
- To make changes to a different set of color definitions, select these color definitions using the check boxes on the left (see step 3).



- A question dialog appears when you click on the first check box. Select **Yes** to apply the metadata changes you have just made. Select **Cancel** if the program should always apply these changes automatically without asking again.





- Edit or delete the selected color definitions as explained above.



- Repeat the steps above until you have changed all color definitions.
- If you want to save only some of the color definitions, enable the check boxes displayed next to the respective color names (on the left).

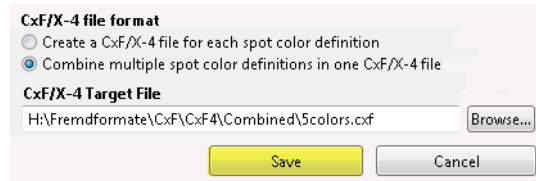


- Click  to save the selected colors as a CxF/X-4 file or click  to save all colors. There are the following options:

- Create a single file with all color definitions. Then specify the target directory and file name and click **Save**.

- Create a separate file for every color definition. Then select the target directory and click **Save**.

The files names will be identical to the color names.










Related information:

CxF/X-4 Metadata (page 68)

## Creating CxF/X-4 Libraries

You can create library files containing a large set of spot color definitions, e.g. all colors required for a certain customer. Do this by importing color data from various sources into a single CxF/X-4 file. Such library files can be used for conveniently assigning missing CxF/X-4 data to the spot colors used in a PDF file, for example.

- 
- Import  color definitions from CxF/X-4, CxF1, CxF3, CGATS, QTX or PDF/X files as explained under *Creating CxF/X-4 Data from Files*.
  - Click  after loading the first file to prevent existing color definitions from being removed when the next file is loaded. The button will then be displayed with an underline:  .
  - To remove a color definition, select it from the list and click .  
In bulk-edit mode  you can select multiple color definitions and remove all of them in one go. Refer to *Multi-Color Editing and Deleting* for more details.
  - Click  and save all color definitions to a single CxF/X-4 file. Make sure to enable the option **Combine multiple spot color definitions....**
- 

Related information:

Managing CxF/X-4 Data in PDF Files (page 18)

Assigning CxF/X-4 Data Automatically (page 19)

## Example



Figure 2-4: Importing and Deleting Color Data

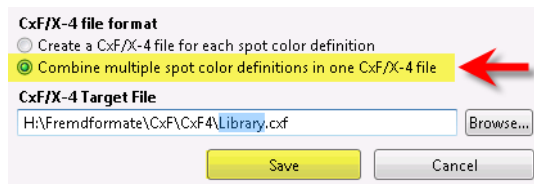
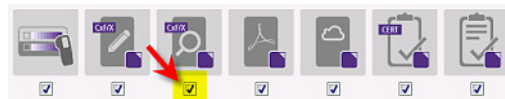




Figure 2-5: Saving all Color Data to a Single File



## Viewing Spectral Curves and Metadata

You can inspect spectral reflectance curves and CxF/X-4 metadata information in a safe mode. In this mode all metadata fields are write-protected and cannot be changed. This tool allows you to load CxF1, CxF3, CxF/X-4, QTX and PDF files as well as CGATS measurement files.

1. If the  tool is not available, click  and enable it.



2. Click  on the left of the main window.
3. Load the files to be analyzed:
  - Drag a CxF1, CxF3, CxF/X-4, CGATS or QTX file onto the ORIS CxF Toolbox window.
  - Click  and select such files or PDF/X files. Hold the Shift or Ctrl key pressed down to select multiple files.

- Use  and  to successively load all files of the selected type available in the current folder (only one at a time).

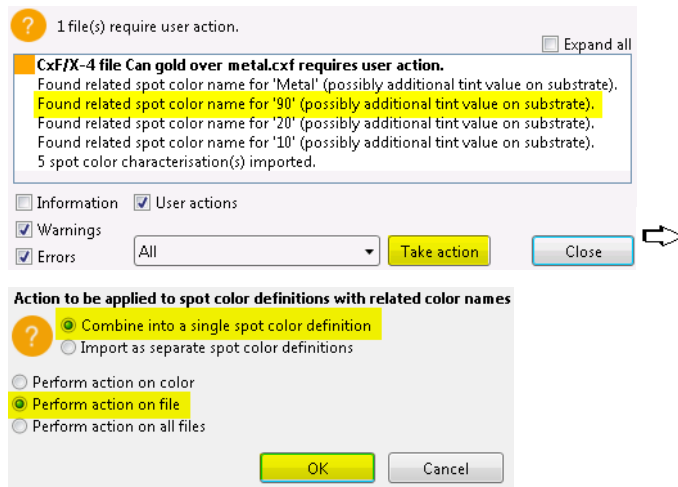



4. If a log window appears, click on the messages to see more details, then close the window.

If a user action is required, however, click on the message details. Then click on a color name, select the action and specify whether to apply it to all colors or all files. Then click **OK** and close the window.

The following situations require a user action, for example:

- Spot colors with invalid spectral data. Such definitions can be discarded.
- Spot colors with similar names interpreted as different tint values of the same color. Example: Blue, Blue10, Blue20 ... Blue90. Such colors can be combined into a single color.
- Spot colors with similar names interpreted as identical tints of the same color, one printed on the substrate and one on black. Example: Blue and Blue\_K. Such colors can also be combined.

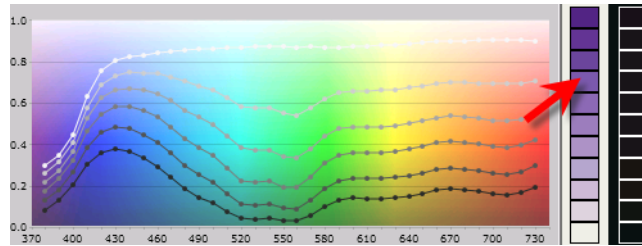



5. Select a CxF/X-4 color definition using the **Color name** list or by clicking on the color box underneath the list. Click the  button if the color boxes are not visible.



6. To view the spectral curves, click on a patch in the tint ramp. Ctrl-click to add the spectral curve to those displayed already.











7. Click the  buttons to expand the metadata groups if required.

Related information:  
Editing CxF/X-4 Data (page 11)

## Alternatives






There are additional tools which allow you to view CxF/X-4 data in a write-protected mode. Examples:




- Click , then . See also *Managing CxF/X-4 Data in PDF Files*.
- Click , then . See also *Print Validation (Certification)*.
- Click , then . See also *Print Validation of GBA Jobs (Certification)*.

## Managing CxF/X-4 Data in PDF Files

CxF/X-4 color definitions can be assigned to the spot colors in a PDF/X file if missing or incorrect. Color definitions are assigned automatically if a suitable CxF/X-4 library file is specified. You can extract or remove CxF/X-4 color definitions and view the spectral curves and metadata. It is also possible to change the ink sequence and to extract the embedded output intent profile or to embed an ICC profile if missing.

1. Load a PDF/X file with spot colors in one of the following ways:
  - Drag the PDF file onto the ORIS CxF Toolbox window.

- Click  on the left, then click  on the right and select a PDF file.
  - Use  and  to successively load all PDF files available in the current folder.
2. A message appears if the PDF file has no embedded output intent profile. In this case click  and select a suitable ICC profile. Otherwise it will not be possible to assign CxF/X-4 color definitions.
  3. Examine the data stored in the PDF/X file (output intent, CxF/X-4 data, ink laydown order).
 

Click  to view the spectral curves and metadata for the selected spot color. Editing the data is not possible. Click  to return to the dialog for editing PDF files.
  4. Add, correct or manage the data in the PDF file as you see fit. See below for more details.
  5. Click  to save your modifications to this PDF/X file or as a new file.

## Example

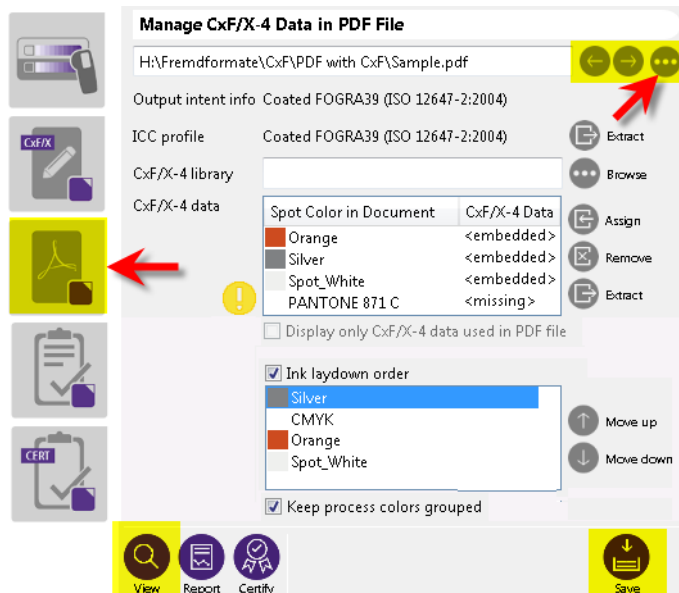



Figure 2-6: Loading and Saving PDF Files

## Assigning CxF/X-4 Data to Spot Colors

You can assign CxF/X-4 color definitions to the spot colors in a PDF/X file if such data is missing or needs to be replaced. The data is assigned automatically if a CxF/X-4 library with suitable color definitions is used.

### Assigning CxF/X-4 Data Automatically

How to have the program automatically assign CxF/X-4 color definitions to the spot colors in a PDF file.

1. Click  next to the **CxF/X-4 library** option.
2. Select a CxF/X-4 file with a large number of color definitions.

Now the program searches this file for CxF/X-4 color definitions which are named exactly like the spot colors in the PDF/X file. Such color definitions are automatically assigned to the corresponding spot colors. A message appears if there are no matching color definitions in the library file.

This search is always performed when a PDF file or CxF/X-4 library is loaded.

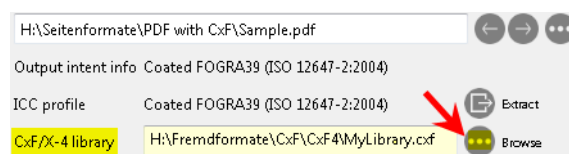
3. To switch this functionality off, delete the path name from the input box.

---

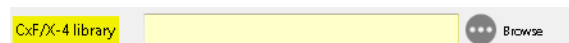
Related information:

[Creating CxF/X-4 Libraries \(page 14\)](#)

### Example





*Figure 2-7: Specifying a CxF/X-4 Library*





*Figure 2-8: Automatic Search Switched Off*


### Assigning CxF/X-4 Data Manually



How to manually assign CxF/X-4 color definitions to the spot colors in a PDF file.

1. Click the  button to the right of the color list. A *dialog* opens.
2. Click  and select a CxF/X-4 file. Hold the Shift or Ctrl key pressed down to select multiple files.
3. From the **Color name** list, select one of the spot colors in the PDF/X file.
4. From the **CxF/X-4 definition** list, choose the CxF/X-4 data to be assigned to the selected spot color.

This list contains the color definitions from all CxF/X-4 files you have loaded.

Click  if you want to view the metadata and spectral curves of the selected CxF/X-4 data. The data appears in the background and cannot be edited. Reclick  to redisplay the **Manage CxF/X-4 Data in PDF File** dialog.

5. Click  to assign the CxF/X-4 color definition to the spot color.  
In the color list, the status `<missing>` or `<embedded>` changes to indicate the spot color name defined in the CxF/X-4 file.
6. Select the next spot color and assign a CxF/X-4 color definition to it. Repeat these steps (3–5) until all spot colors have embedded CxF/X-4 data.
7. Click the **Close** button.

The icon  is displayed next to the color list if there are still spot colors without CxF/X-4 data. Having assigned CxF/X-4 data to all spot colors, the icon changes to .

## Example

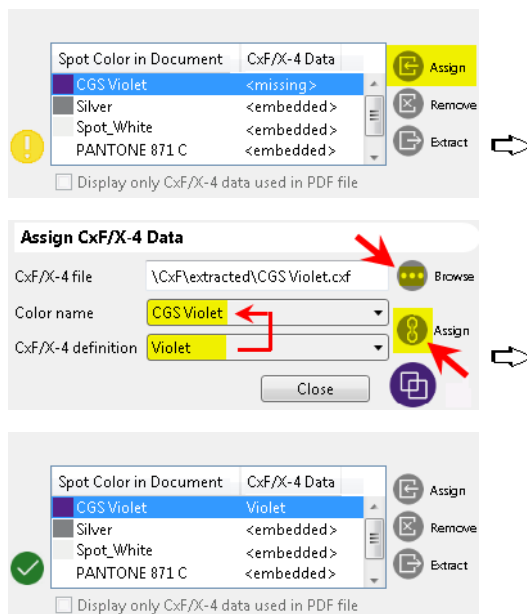



Figure 2-9: Manually Assigning CxF/X-4 Data to Spot Colors in a PDF File

## Removing CxF/X-4 Data from PDF Files

You can remove CxF/X-4 color definitions from the spot colors in a PDF file. Unused CxF/X-4 definitions which are not assigned to any spot color can be hidden or removed from the PDF file.

### Removing embedded CxF/X-4 data


Select a spot color in the list, then click .

The CxF/X-4 status changes from <embedded> to <removed>.

### Having assigned CxF/X-4 data, undoing this and restoring the data embedded originally

Select a spot color in the list, then click .

The CxF/X-4 status changes back to <embedded>.


To remove the embedded CxF/X-4 data from the spot color, click  again.

### To hide unused CxF/X-4 data

Enable the option **Display only CxF/X-4 data used in PDF file**.

All color definitions with the status <not used> disappear and will not be written to the PDF file when the file is saved. Disable this option to make the unused color definitions visible again.

### To remove unused CxF/X-4 data

Select a color definition with the status <not used>, then click .

The color definition disappears permanently and will not be written to the PDF file when the file is saved.

Related information:

Assigning CxF/X-4 Data to Spot Colors (page 19)

## Example

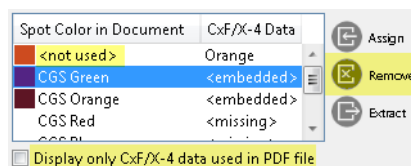



Figure 2-10: Removing CxF/X-4 Data From a Spot Color

## Extracting Data From PDF Files

The CxF/X-4 color definitions and the output intent stored in a PDF/X file can be extracted and saved as a file.

## Extracting Cx F/X-4 Data

Each Cx F/X-4 color definition stored in the PDF file can be saved as a separate Cx F/X-4 file.

1. From the list at the top, select a spot color with embedded Cx F/X-4 data.
2. Click the  button located next to this list.
3. Select a folder and enter a file name, then click **Save**.

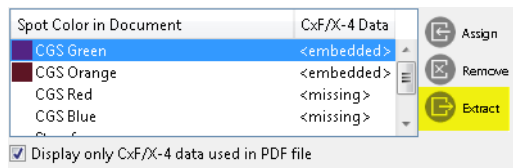



Figure 2-11: Extracting Cx F/X-4 Data From PDF File

## Extracting Output Intent

The ICC profile defining the PDF output intent can be saved to a file (\*.icc). The name of the output intent and the profile name are indicated at the top of the dialog.

1. Click the  button displayed next to the profile name.
2. Select a folder and, if required, modify the file name.
3. Click the **Save** button to save the ICC profile to the specified location.

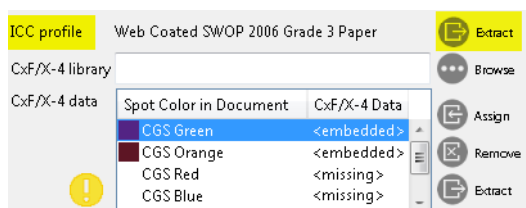


Figure 2-12: Extracting PDF Output Intent Profile

## Changing Ink Laydown Order

ORIS Cx F Toolbox allows you to change the information about the order in which Cx F/X-4-defined spot colors and process colors are printed. This information can also be removed from the PDF file.

1. Make sure the **Ink laydown order** option is enabled.  
If disabled, the ink sequence information cannot be changed and will not be written to the PDF file when being saved.
2. Disable the **Keep process colors grouped** option if the sequence of CMYK process colors should be interrupted by spot colors.  
This replaces the list entry named **CMYK** with the entries **Cyan**, **Magenta**, **Yellow** and **Black**. Now each process color can be moved individually and you can place spot colors between process colors.
3. Click on the color to be moved.
4. Repeatedly click the **↑** or **↓** button to move the selected color the position you want.  
The color at the top will be printed first, the color at the bottom will be printed last.

## Examples

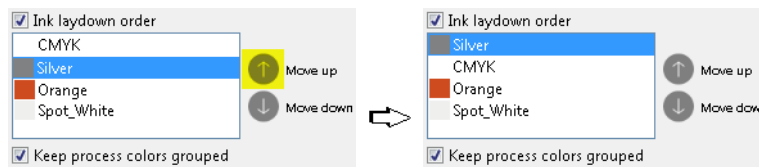


Figure 2-13: Moving a Spot Color to Start of Ink Sequence

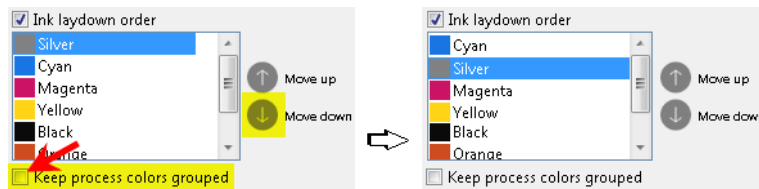


Figure 2-14: Placing a Spot Color Between Process Colors

## Creating Reports



You can create a report for the CxF/X-4-defined spot colors you have loaded. A report includes important data for design, proofing, ink formulation and process control as well as customer tolerances for print quality verification. The data is presented both graphically and numerically.

1. Load CxF/X-4 data by measuring colors, importing data or loading PDF files.




Proceed as explained in the following sections:

- *Creating CxF/X-4 Data by Measurement*
- *Creating CxF/X-4 Data from Files*
- *Managing CxF/X-4 Data in PDF Files*
- *Connect to GBA Server and Select Job*


2. Open the **Spot Color Report** dialog:

- Click  on the left. Or:
- Click  at the bottom. (This button is only available if CxF/X-4 data is loaded.)

3. Load CxF/X-4 data if the **Spot Color Report** dialog is empty:

- Click  and select a CxF/X-4, QTX file or PDF file. Hold the Shift or Ctrl key pressed down to select multiple files.
- Use  and  to successively load all files with the currently selected type available in the current folder.

4. If the file contains more than one CxF/X-4-defined color, select a color from the **Color name** list or click on the color box.


5. If various tint values are defined for this color, select a tint value from the list .

6. To view a large chart with spectral curves for all tint values of the color, select **Spectral data** from the list at the bottom right.

Select **CxF/X-4 data** from this list to switch back to the way the report was displayed previously.

7. If you need help with understanding the various charts and tables, refer to the *Reports* section.

8. Click the **Print** button to print the report with the charts that are currently displayed on the screen.

9. If you want to change the logo, close the report, click the  button and select another image file.

---

Related information:

Reports (page 65)



## Example

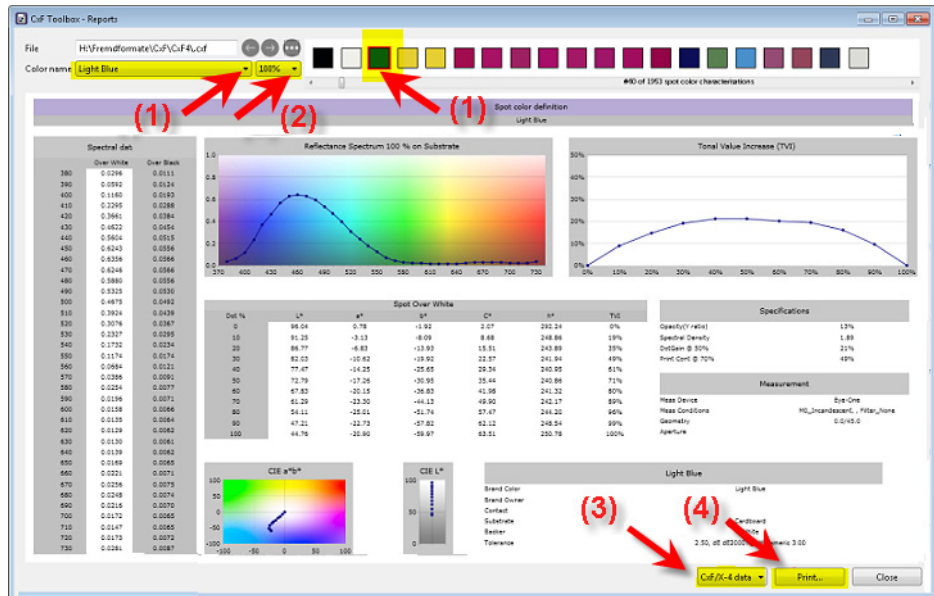


Figure 2-15: Understanding a CxF/X-4 Report

- 1 Select spot color here.
- 2 Select tint value here.
- 3 Click here to display spectral curves for all tint values.
- 4 Click here to print the report.

## Print Validation (Certification)

You can check print quality by measuring spot ink characterization charts against CxF/X-4 color definitions. The application provides an instant pass/fail indication and various charts for assessing the deviations both visually and numerically. Process colors can be checked against the target values defined in the PDF/X output intent or a user-defined ICC profile. The complete set of certification data can be saved as a PQX file.

Related information:







Print Validation of GBA Jobs (Certification) (page 33)

## Load CxF/X-4 Data

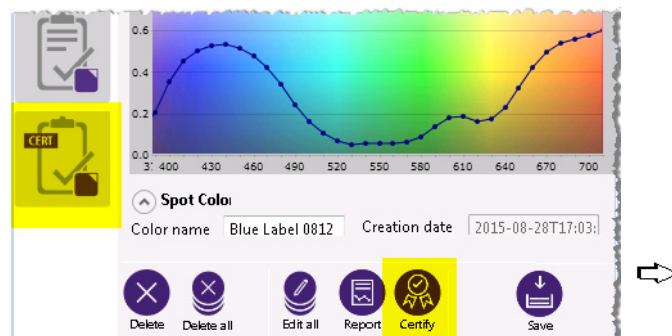
You can load and certify the color data stored in CxF/X-4, QTX and PDF/X files. Load certification results stored as a PQX file to conveniently certify the same job again.

## First-time Job Certification

How to load CxF/X-4 color definitions for certification if a PQX file is not available. This is usually the case when certifying a print job for the first time.

1. Load CxF/X-4 data by measuring colors, importing data or loading PDF files.  
Proceed as explained in the following sections:
  - *Creating CxF/X-4 Data by Measurement*
  - *Creating CxF/X-4 Data from Files*
  - *Managing CxF/X-4 Data in PDF Files*
2. Do the following if you want to conveniently view the metadata defined for each spot color as you select these colors during the certification process.
  1. Click  if the **Manage CxF/X-4 Data in PDF File** dialog is displayed.
  2. Resize the main window in such a way that you can see all of the CxF/X-4 metadata you are interested in.
3. Open the **Certification** dialog by doing one of the following:
  - Click  on the left.
  - Click  at the bottom. (This button is only available if CxF/X-4 data is loaded.)
4. Load CxF/X-4 data if the **Certification** dialog is empty:
  - Click  and select a CxF/X-4, QTX file or PDF file.
  - Use  and  to successively load all files with the currently selected type available in the current folder.

## Example



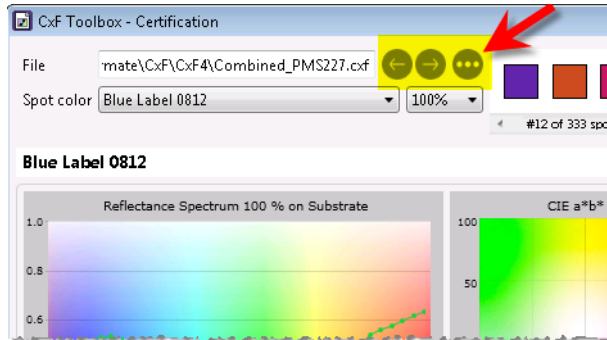






Figure 2-16: Starting Certification Function and Loading Color Data

## Follow-Up Certification with PQX File

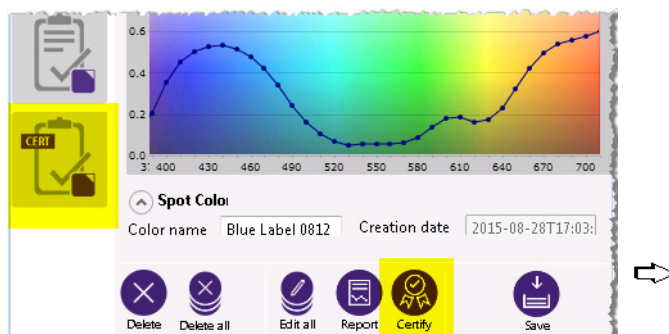
The following assumes that you have performed the certification process already and saved the result as a PQX file. To certify the same job again, simply load this PQX file. This will reload the CxF/X-4 color definitions, tolerance values and all other certification settings. The settings can be modified, if required.

1. Do the following if you want to conveniently view the metadata defined for each spot colors as you select these colors during the certification process.
  1. Click  if the **Manage CxF/X-4 Data in PDF File** dialog is displayed.
  2. Resize the main window in such a way that you can see all of the CxF/X-4 metadata you are interested in.
2. Do one of the following:
  - Drag a PQX file on the ORIS CxF Toolbox main window.
  - Click  and drag a PQX file onto the **Certification** dialog.
  - Click , then click  at the bottom right and select a PQX file.

Related information:

Save Certification Results (page 32)

## Example



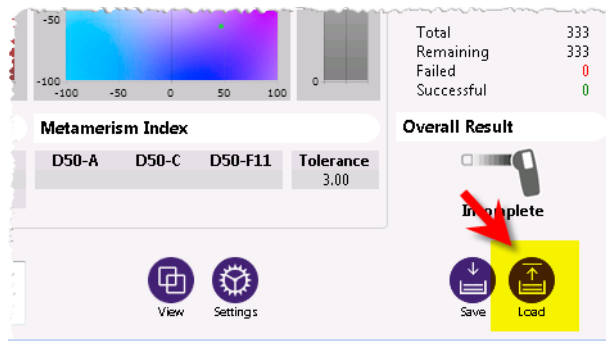



Figure 2-17: Starting Certification Function and Loading PQX File

## Make Certification Settings

The default certification settings stored in the CxF/X-4 data can be adjusted according to your preferences. You can choose to measure different tint values, certify also process colors, or use different tolerances. This step is usually not required if you have loaded a PQX file.

1. Successively select the CxF/X-4 color definitions and examine the list of tint values and the tolerances defined for each spot color.
2. Click  at the bottom if you want to change the default settings.
3. In the **Certification Parameters** dialog you can do the following:
  - Select a different set of tint values to be measured (default: 100% only).
  - Modify the tolerance values (*delta E*, *metamerism index*)
  - Choose to also certify CMYK process colors
  - Choose to apply these settings to all color definitions (default) or to the selected color definition only (disable option at the bottom)
4. Click **OK** to close the dialog.

---

Related information:

Certification Parameters (page 61)

## Example

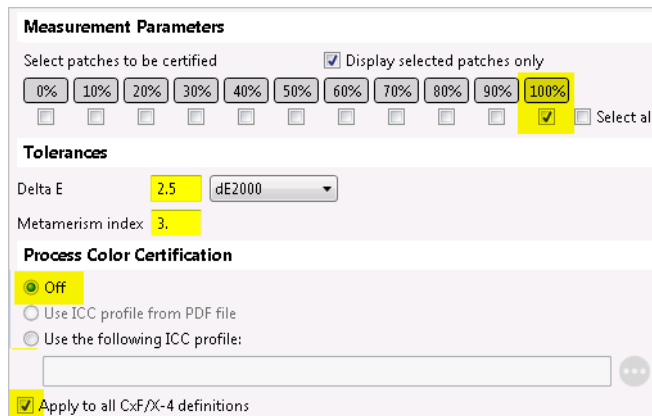






Figure 2-18: Default Certification Settings

## Measure Colors

To verify print quality, measure your spot ink characterization chart against the CxF/X-4 color definitions you have loaded. You can use a supported measurement device connected to your PC or load measurement files created with a different device.

## Measuring with ORIS CxF Toolbox

How to measure a spot ink characterization chart against the specifications in the CxF/X-4 data using a measurement device which is supported by ORIS CxF Toolbox and connected to your computer.

1. Select a CxF/X-4 color definition from the **Spot color** list or by clicking on a color box displayed next to the list. Also, from the list of tint values, select the patch to be measured.
2. *Optional:* Click  if the spectral data and metadata should always be displayed automatically for the currently selected color.  
The data appears in the main window in the background. Reclick  to redisplay what was shown before.
3. *Optional:* Click  at the bottom if you want to change the certification settings for the selected color definition.  
Select a different set of tint values to be measured or change the tolerances. Make sure to disable the **Apply to all CxF/X-4 color definitions** option. Then click **OK**. For more details refer to the *Parameter Reference* section.
4. Click  at the top right to start the measuring function.
5. If a white calibration is required, follow the instructions on the screen.

6. Measure the selected color patch.  
The application checks the measurement against the specifications in the CxF/X-4 data. The result (✓ or ✗) is indicated separately for delta E and the metamerism index. The measurement result is counted as *successful* if both icons are ✓.
7. Examine the various charts and tables which indicate the color deviations both visually and numerically. For more details, refer to the *Parameter Reference* section.
8. Select the next color or tint value and measure it as explained above. Do this until all colors have been measured.

The table on the right indicates the number of measurements which were successful, which failed, and which remain to be made.

The overall certification result is indicated using a large icon as soon as the last measurement has completed. Certification is *successful* ✓ if all measurement results are successful, otherwise certification has *failed* ✗.

Related information:

- System Requirements for ORIS CxF Toolbox (page 5)
- Certification (page 56)
- Certification Parameters (page 61)

## Example

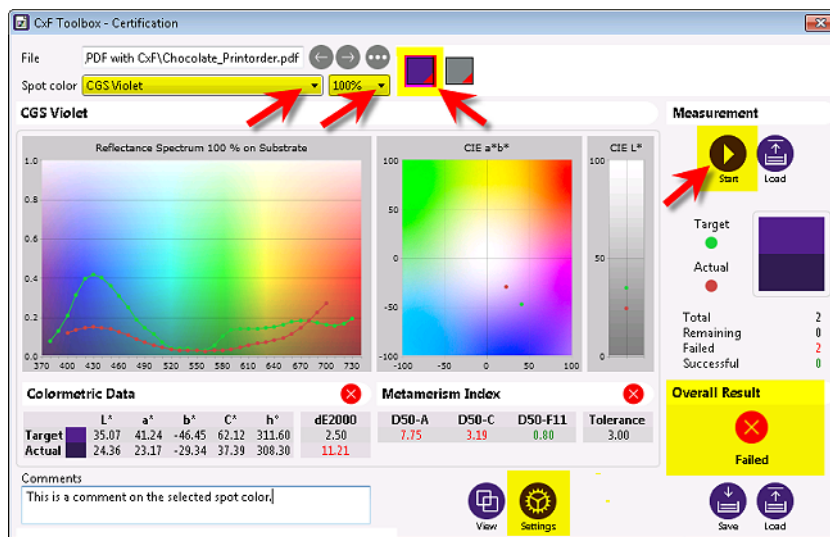







Figure 2-19: Making Certification Measurements




## Measuring with a Third-Party Tool



Certification is also possible if your measurement device is not supported by ORIS CxF Toolbox. Measure the spot ink characterization chart with another tool, save the measurements as a CGATS or QTX file and assign them to the CxF/X-4 color definitions as explained below.

1. Click  at the top to open the **Assign Measurements** dialog.
2. Click  and select the measurement files to be loaded. Hold the Shift or Ctrl key pressed down to select multiple files.

The **Measurement** drop-down list will be populated with all measurements from all selected files.
3. *Optional:* Click  if the spectral curves and metadata should always be displayed automatically for the currently selected measurement.

The data appears in the main window in the background. Reclick  to redisplay what was shown before.
4. From the **Color name** list, select a CxF/X-4 color definition.
5. From the **Measurement** list, select the data that was measured for the selected color definition.
6. Click  to assign the measurement to the color definition.

The application checks the measurement against the specifications in the CxF/X-4 data and indicates the result in the background.  
The result ( or ) is indicated separately for delta E and the metamorphism index. The measurement result is counted as *successful* if both icons are .
7. Examine the various charts and tables which indicate the color deviations both visually and numerically. For more details, refer to the *Parameter Reference* section.
8. Select the next color definition and assign a measurement to it as explained above. Do this until all colors have measurement data.
9. Click **Close**.

The table on the right indicates the number of measurements which were successful, which failed, and which remain to be made.  
The overall certification result is indicated using a large icon as soon as the last measurement has completed. Certification is *successful*  if all measurement results are successful, otherwise certification has *failed* .

Related information:

Certification (page 56)

## Example

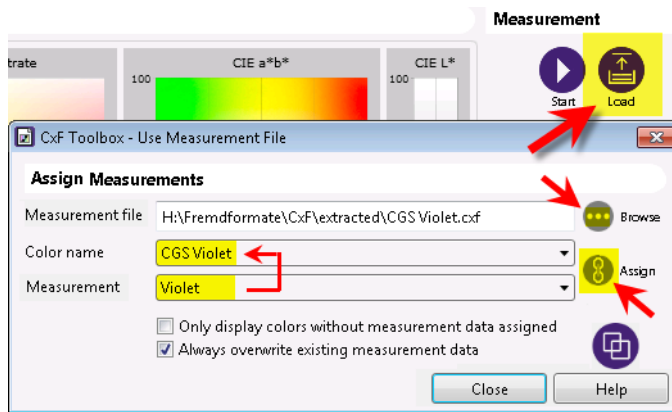


Figure 2-20: Assigning Measurements to CxF/X-4 Color Definitions

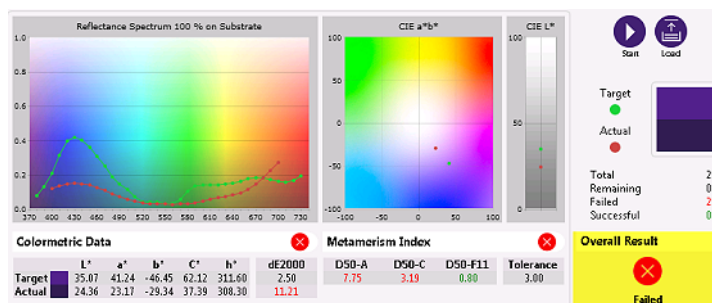



Figure 2-21: Certification Results

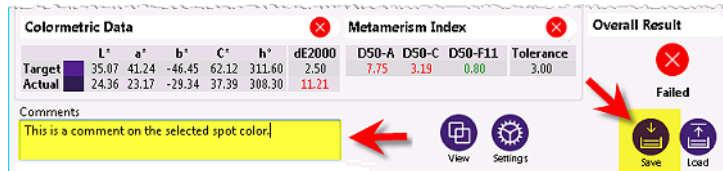
## Save Certification Results

The data currently loaded in the *Certification* dialog can be saved as a PQX file. These files include the complete set of data required for certifying a particular job – spot color definitions, target values and tolerances – as well as the measurement data. PQX files can therefore be sent on for print quality evaluation at remote sites or loaded in ORIS CxF Toolbox in order to quickly certify the same print job again.

1. Into the box at the bottom left, enter a comment on the selected CxF/X-4 color definition. This is only possible if the 100% tint value is selected.
2. Click  at the bottom right to save the certification settings as a PQX file.

When certifying the same job again, load this file as explained under *Load CxF/X-4 Data*. This will save you the trouble of having to reload the original PDF job files or having to adjust any certification parameters.





## Print Validation of GBA Jobs (Certification)





You can check print quality by measuring spot ink characterization charts against CxF/X-4 color definitions maintained in the database of the Global Brand Assurance web server. The application provides an instant pass/fail indication and various charts for assessing the deviations both visually and numerically. The certification results can be uploaded to the GBA web server.

Related information:

Print Validation (Certification) (page 25)

### Connect to GBA Server and Select Job

Login in to the GBA web server and select a job from the database. The CxF/X-4 color definitions stored for this job can then be used for the certification measurements.

1. Click  on the left to change to the **Global Brand Assurance** tab.
2. Enter your user name and password. Then click  to log in to the **GBA** web server.  
The **Job** list will be populated with the names of the print jobs you are allowed to access.
3. Select the job which contains the spot colors to be verified.  
These colors will be listed underneath the job name.
4. Click  on the left or  on the bottom to open the **Certification** dialog.

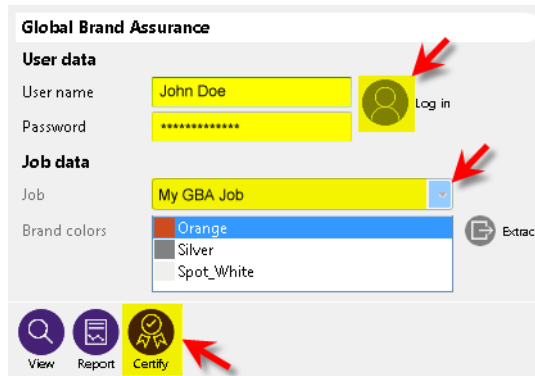


Figure 2-22: Selecting Jobs from GBA Database

Related information:

Creating Reports (page 24)




Viewing Spectral Curves and Metadata (page 15)

## Measure Colors


To verify print quality, measure your spot ink characterization chart against the CxF/X-4 color definitions you have loaded. You can use a supported measurement device connected to your PC or load measurement files created with a different device.

### Measuring with ORIS CxF Toolbox

How to measure a spot ink characterization chart against the specifications in the CxF/X-4 data using a measurement device which is supported by ORIS CxF Toolbox and connected to your computer.



1. The **File** list displays the *GBA* job selected in the main window. If this is not the correct job, close the dialog and select another job on the **Global Brand Assurance** tab.
2. Select a CxF/X-4 color definition from the **Spot color** list or by clicking on a color box displayed next to the list. Also, from the list of tint values, select the patch to be measured.
3. *Optional:* Click  if the spectral data and metadata should always be displayed automatically for the currently selected color.  
The data appears in the main window in the background. Reclick  to redisplay what was shown before.
4. Click  at the top right to start the measuring function.
5. If a white calibration is required, follow the instructions on the screen.
6. Measure the selected color patch.

The application checks the measurement against the specifications in the CxF/X-4 data. The result (✓ or ✗) is indicated separately for

delta E and the metamerism index. The measurement result is counted as *successful* if both icons are .

7. Examine the various charts and tables which indicate the color deviations both visually and numerically. For more details, refer to the *Parameter Reference* section.
8. Select the next color or tint value and measure it as explained above. Do this until all colors have been measured.

The table on the right indicates the number of measurements which were successful, which failed, and which remain to be made.

The overall certification result is indicated using a large icon as soon as the last measurement has completed. Certification is *successful*  if all measurement results are successful, otherwise certification has *failed* .

Related information:

- System Requirements for ORIS CxF Toolbox (page 5)
- Certification (page 62)

### Example

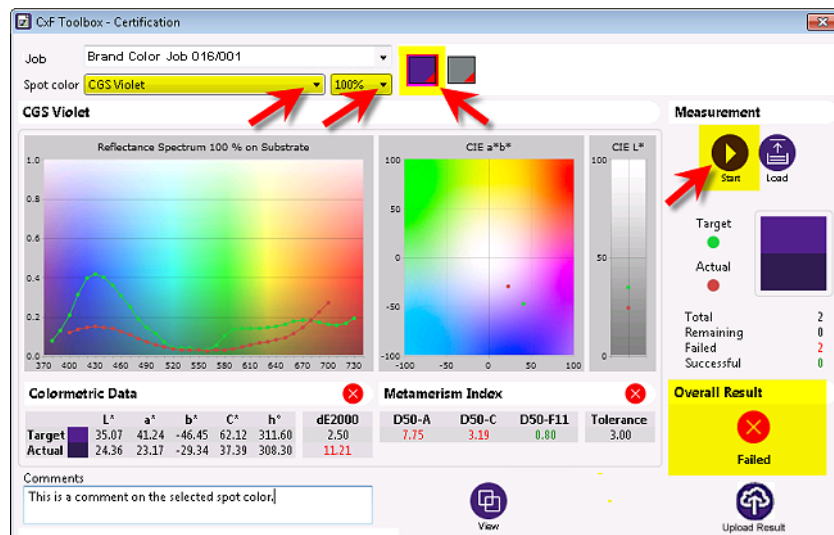





Figure 2-23: Making Certification Measurements


### Measuring with a Third-Party Tool


Certification is also possible if your measurement device is not supported by ORIS CxF Toolbox. Measure the spot ink characterization chart with another tool, save the measurements as a CGATS or QTX file and assign them to the CxF/X-4 color definitions as explained below.

1. Click  at the top to open the **Assign Measurements** dialog.
2. Click  and select the measurement files to be loaded. Hold the Shift or Ctrl key pressed down to select multiple files.




The **Measurement** drop-down list will be populated with all measurements from all selected files.

3. *Optional:* Click  if the spectral curves and metadata should always be displayed automatically for the currently selected measurement.

The data appears in the main window in the background. Reclick  to redisplay what was shown before.



4. From the **Color name** list, select a CxF/X-4 color definition.
5. From the **Measurement** list, select the data that was measured for the selected color definition.
6. Click  to assign the measurement to the color definition.

The application checks the measurement against the specifications in the CxF/X-4 data and indicates the result in the background.

The result ( or ) is indicated separately for delta E and the metamorphism index. The measurement result is counted as *successful* if both icons are .

7. Examine the various charts and tables which indicate the color deviations both visually and numerically. For more details, refer to the *Parameter Reference* section.
8. Select the next color definition and assign a measurement to it as explained above. Do this until all colors have measurement data.
9. Click **Close**.

The table on the right indicates the number of measurements which were successful, which failed, and which remain to be made.

The overall certification result is indicated using a large icon as soon as the last measurement has completed. Certification is *successful*  if all measurement results are successful, otherwise certification has *failed* .

Related information:

Certification (page 62)

## Example

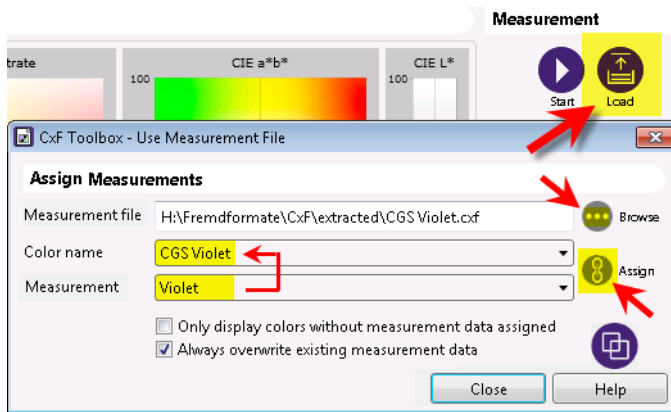


Figure 2-24: Assigning Measurements to CxF/X-4 Color Definitions

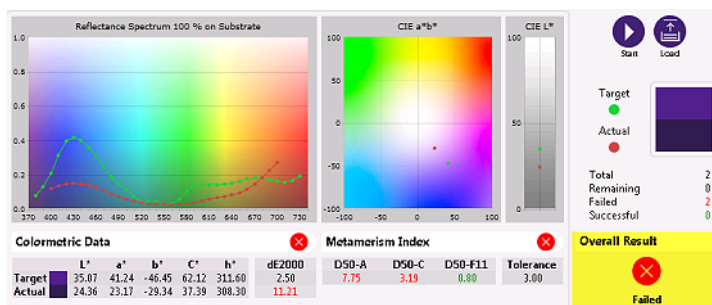


Figure 2-25: Certification Results

## Upload Results to GBA Server

Click  to upload the measurement results to the Global Brand Assurance web server.

The GBA web server provides a wide range of reporting and analysis tools which help you monitor print quality and clearly indicate trends that can affect color.

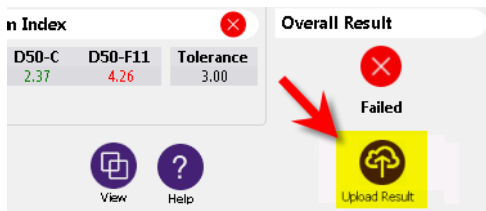


Figure 2-26: Uploading Certification Results to GBA Web Server



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# 3

# Parameter Reference

## Measure CxF/X-4 Data

Use this dialog to create CxF/X-4 files by measuring the spectral reflectance of spot ink characterization charts or single spot color patches.

For step-by-step instructions, refer to *Creating CxF/X-4 Data by Measurement*.

### Device

Name of the measurement device. If supported, the device is detected automatically.



Click this icon to configure the measurement device. This opens the *Properties* dialog.

### Reference

Select the type of spot ink characterization chart (number of color patches).

### Average

If you want to average multiple measurements, enable this option and specify the number of measurements.

Average measurements of the same printout to minimize imprecisions of your measurement device. Average measurements of different printouts to minimize imprecisions of your printing press.


### Measure strips/single patches

Specify whether you are measuring color strips or individual patches. Color strips can be measured from either left to right or right to left. It is only important to measure both strips in the same direction.

## Buttons



Click this button to start the measuring process. Usually a white calibration will be performed.

When averaging measurements, click this icon after completing one measurement in order to start the next. You can choose to average less measurements than specified by not clicking .



Click this button if you want to cancel the measuring process. All measurements will be discarded and you have to repeat the process from the beginning.



Click this button to repeat the last measurement if a measurement error has occurred.

This button is only available if all color strips have been measured. You cannot repeat a single strip if a chart consists of more than one strip.



Click this button after completing all measurements. This opens the *Import and Edit CxF/X-4 Data* dialog allowing you to view the spectral curves and enter metadata information. You can then save the data as a *CxF/X-4* file.

Related information:

Spot ink characterization chart (page 76)

Creating CxF/X-4 Data by Measurement (page 7)

System Requirements for ORIS CxF Toolbox (page 5)

## Properties

**Use this dialog to configure the measurement device.**

### **Response status**

Standard to be used for measuring color density.

### **Filter**

Specify whether a UV-cut filter should be used for measuring.

### **Illuminant**

Expected viewing conditions, i.e. the light source (color temperature) to be used for viewing the print jobs. The illuminant selected here determines the white point used for calculating the measurements.

### **Standard observer**

Standardized observation angle of the average human eye (2° or 10°). This angle determines the field of view and thus the way a person perceives color.



### Measurement mode

Light source (illuminant) used during measurement.

ISO 13655 M0 Illuminant A: Traditional unfiltered tungsten light

ISO 13655 M1 CIE D50: Normal daylight, defined UV content

ISO 13655 M2 UV-cut: Non-polarized light, UV filtered out

Measuring color strips in M1 or M2 mode with i1Pro 2 requires the use of a special aluminium ruler. Each row has to be measured twice, in opposite directions. The second measurement uses UV light. M0 is the light source used with first-generation i1Pro devices.

### Device signal on

If you disable this option, the device will not send any 'beep' signals.

Related information:

Creating CxF/X-4 Data by Measurement (page 7)


Measure CxF/X-4 Data (page 39)



## Import and Edit CxF/X-4 Data

**Use this dialog to create CxF/X-4 files from the color data stored in CGATS measurement files, legacy CxF1 and CxF3 files, and QTX files. It is also possible to import the CxF/X-4 color data stored in PDF/X documents and existing CxF/X-4 files. You can view the spectral curves, add or correct the CxF/X-4 metadata and rename or delete color definitions. This is a single-color editing mode.**

For step-by-step instructions, refer to *Creating CxF/X-4 Data from Files and Editing CxF/X-4 Data*.

### File

Click  and select the files to be loaded. Hold the Shift or Ctrl key pressed down to select multiple files.

Use  and  to successively load all files of the selected type available in the current folder (only one at a time).

Alternatively, drag a file (any except PDF) onto the ORIS CxF Toolbox window.

### Color name

Use this list to select the CxF/X-4 color definition to be viewed, edited or deleted. The list is populated with all color definitions from all files you have loaded. Alternatively, click on a color box displayed under the list.

Ascending numbers – ( 1 ), ( 2 ), etc. – are automatically appended to the color name to distinguish different color definitions with identical names.



Use these buttons to toggle between two modes of handling the import of additional files. The active mode is indicated with an underline.





All color definitions are removed from the dialog, i.e. replaced by those imported from the new files (default).



All color definitions remain in the dialog, the new color definitions are added to them. Use this mode to create CxF/X-4 library files, for example.



Click  to expand the area containing the color boxes. Click  to hide it.



Click a color box to select the CxF/X-4 color definition represented by the color. This has the same effect as using the **Color name** drop-down list.

## Diagram

### Reflectance spectrum

Spectral reflectance curves for the selected color and tint values.

X-axis: Wavelength of incident light in nanometers.

Y-axis: Portion of reflected light (1,0 = 100%)

Curve points: Measurement data


### Tint ramp

Solids and tint values (10% steps) of the spot color printed on the substrate (left) and on a black background (right). See also *Tint ramp*.


Click on a patch in the tint ramp to display its spectral curve.

Ctrl-click on a patch to add the spectral curve to those displayed already. Ctrl-click on the same patch again to remove this curve. Click normally on a patch to display its spectral curve and remove all others.

## CxF/X-4 Metadata

Metadata information stored for the selected CxF/X-4 color definition. Click the  buttons to expand the metadata groups if required. Refer to section *CxF/X-4 Metadata* for more details.

Add and correct information or rename colors as you see fit. Metadata already tagged in the imported files is added automatically to the appropriate fields if applicable. Some fields are automatically set to default values.

**NOTE:** Specifying a spot color name, substrate name and substrate type is mandatory. These fields cannot be left empty or undefined. Switch to bulk-edit mode  to change metadata fields for multiple color definitions in one go.

## Buttons




Click this button to remove the selected CxF/X-4 color definition from the dialog.



Click this button to remove all CxF/X-4 color definitions from the dialog.



Click this button if you want to edit or delete multiple color definitions in one go. This switches to *bulk-edit mode*. Click  to return to the single-color edit mode.



Click this button to create a *report* for all CxF/X-4 color definitions loaded in this dialog.



Click this button to verify print quality by measuring spot colors against the CxF/X-4 color definitions loaded in this dialog (*certification*).



Click this button to *save* the color definitions in CxF/X-4 format. You can choose to save all colors to a single CxF/X-4 file or create a separate CxF/X-4 file for every color.

### Related information:

- CGATS (page 73)
- CxF1 (page 73)
- CxF3 (page 73)
- CxF/X-4 (page 73)
- QTX (page 76)
- Creating CxF/X-4 Data from Files (page 9)
- Editing CxF/X-4 Data (page 11)
- Creating CxF/X-4 Libraries (page 14)
- Creating Reports (page 23)
- Print Validation (Certification) (page 25)
- Import and Edit CxF/X-4 Data (page 47)

## Log

This dialog summarizes the result of the file import process and provides a list of errors, warnings and actions to be taken by the user.

### Import summary

Total number of files with a specific import status.

### Import status for each file

List of all imported files with file name, file type and import status. There are four different types of import statuses:

- **Success** All color definitions imported successfully.
- **Warning** Some color definitions cannot be imported. Example: Missing data for 100% tint on substrate.
- **Error** No color definitions imported. Example: Invalid XML data.
- **User action** Data import can be handled in various ways. User needs to choose the action to be taken.


To see more details, click on a status message or enable the **Expand all** option underneath this list. When a user action is performed, the message details change to indicate the result.

### Information, Warnings, Errors, User actions

Use these check boxes to narrow down the list of status messages. You may want to see only files that have produced an import error, for example.

Use the list underneath **User actions** if you only want to see user actions of the type *invalid spectral data* or *related spot color names*.

### Take action

Click this button if a user action  is required for the file with the selected status message. Alternatively, click on the details for the import status. The result of this action will be indicated in the list of status messages.

Related information:

[Creating CxF/X-4 Data from Files \(page 9\)](#)

## User Action: Related Spot Color Names

Some of the spot color names defined in the imported files are similar and may therefore relate to the same color. The color data may characterize variants of the same color with different tint values or different backgrounds (substrate or black). Choose whether related spot color definitions should be combined into a single color definition or imported separately.

## Parameters

### Combine into single spot color definition

Spot color definitions with similar names will be interpreted as belonging to the same color. The application will create a single color definition which includes patches of different tint values or patches printed on substrate and black.

### Import as separate spot color definitions

Spot color definitions with similar names are interpreted as belonging to different colors. The application does *not* combine them into a single color definition.

### Perform action on...

Choose the scope of the action selected above. There are the following options:

- Only the currently selected color will be combined with the related color or imported separately.
- All colors in the currently selected file will be combined with the related colors or imported separately.
- All colors of all imported files will be combined with the related colors or imported separately.

## Supported Color Name Patterns

Spot color names are only interpreted as relating to the same color if they follow certain patterns. The supported patterns are explained below. In these patterns, <color> stands for the name of any spot color and <nn> for a two-digit number.

<color>\_K

Example: DarkBlue and DarkBlue\_K

The first name is interpreted as spot color printed on the substrate, the second as the same color printed on black.

<color><nn>

Example: DarkBlue and DarkBlue10, DarkBlue20, DarkBlue30, etc.

The first name is interpreted as a 100% tint printed on substrate, the other names as 10%, 20%, 30%... tint values of the same color.

**Special pattern which matches CxF files created with X-Rite *Color iQC*, for example:**

Color name	Tint value assumed
metal or paper	0% ink = substrate
10	10% ink printed on substrate

Color name	Tint value assumed
20	20% ink printed on substrate
30	30% ink printed on substrate
etc.	Additional tint values (not all need to be defined)
90	90% ink printed on substrate
<color> over metal or <color> over paper or <color> metal or <color> paper or	100% ink printed on substrate = solid ink (This will be used as new spot color name.)

Two examples:

Color names combined	Metal, 20, 40, 60, 80, Gold Over Metal	Paper, 30, 50, 70, 90, Salmon Pink Paper
Result	Gold Over Metal	Salmon Pink Paper

Related information:

Creating CxF/X-4 Data from Files (page 9)  
 Log (page 44)

## User Action: Invalid Spectral Data

The spectral reflectance data defined in some of the imported files are outside the valid range of values, e.g. owing to measurement errors. Choose whether or not color definitions with invalid spectral data should be imported.

### Accept spot color definition

Yes, import spot color definitions with invalid spectral data.

### Discard spot color definition

No, do not import spot color definitions with invalid spectral data.

### Perform action on...

Choose the scope of the action selected above. There are the following options:

- Only the currently selected color will be accepted or discarded.
- All colors with invalid spectral data in the currently selected file will be accepted or discarded.

- All colors with invalid spectral data of all imported files will be accepted or discarded.

Related information:

Creating CxF/X-4 Data from Files (page 9)


Log (page 44)



## Import and Edit CxF/X-4 Data

Use this dialog to create CxF/X-4 files from the color data stored in CGATS measurement files, legacy CxF1 and CxF3 files and QTX files. It is also possible to import the CxF/X-4 color data stored in PDF/X documents and existing CxF/X-4 files. This is a bulk-edit mode which allows you to quickly change a set of spot color definitions in one go. The CxF/X-4 metadata of multiple colors can be modified and some or all colors can be deleted.

For step-by-step instructions, refer to *Creating CxF/X-4 Data from Files* and *Multi-Color Editing and Deleting*.

### File

Click  and select the files to be loaded. Hold the Shift or Ctrl key pressed down to select multiple files.

Use  and  to successively load all files of the selected type available in the current folder (only one at a time).

Alternatively, drag a file (any except PDF) onto the ORIS CxF Toolbox window.



Use these buttons to toggle between two modes of handling the import of additional files. The active mode is indicated with an underline.



All color definitions are removed from the dialog, i.e. replaced by those imported from the new files (default).



All color definitions remain in the dialog, the new color definitions are added to them. Use this mode to create CxF/X-4 library files, for example.

## Spot Color List (left)


The list is populated with all color definitions from all files you have loaded. Select the CxF/X-4 color definition to be edited, saved or deleted by clicking on the boxes in front of the color name. Selected colors have a check mark.

Use  to select all colors and  to deselect all colors in one go.


Ascending numbers – ( 1 ) , ( 2 ) , etc. – are automatically appended to the color name to distinguish different color definitions with identical names.

*NOTE: If you have changed metadata and then select a different set of color definitions, you are asked to apply your changes. Select **Yes**, otherwise these changes will be lost.*

## CxF/X-4 Metadata List (right)

This is the metadata information stored for the CxF/X-4 color definitions selected on the left. Click the  buttons to expand the metadata groups if required. Refer to section *CxF/X-4 Metadata* for more details.

Enter missing information or correct it as you see fit. To remove metadata, delete the text or select **Undefined**.

*NOTE: The **Color name** and **Inventory ID** can only be changed in single-color editing mode . Some metadata fields such as **Substrate name** and **type** are mandatory and cannot be left empty or undefined.*

To assign the value being displayed in a metadata field to all selected color definitions, enable the check box to the right of this field.

*NOTE: Enabling the check box of an empty or undefined field causes the metadata information to be deleted from all selected color definitions.*

Metadata fields displayed as empty are either really empty or have 'mixed contents'. The latter means that each of the selected color definitions has different information in this metadata field.

## Buttons




Click this button to remove the selected CxF/X-4 color definition from the dialog.



Click this button to remove all CxF/X-4 color definitions from the dialog.




Click this button to select all color definitions listed on the left. The button will change to .



Click this button to deselect all colors. The button will change to .





Click this button if you want to switch to single-color editing mode. You can then view the spectral curves and edit or rename colors individually. Click  to return to the bulk-edit mode.



Click this button to create a *report* for all CxF/X-4 color definitions loaded in this dialog.



Click this button to verify print quality by measuring spot colors against the CxF/X-4 color definitions loaded in this dialog (*certification*).



Click this button to save the selected color definitions, i.e. the colors with a check mark displayed next to their name.

You can choose to save all colors to a single CxF/X-4 file or create a separate CxF/X-4 file for every color.



Click this button to save all color definitions even if they are not selected.

You can choose to save all colors to a single CxF/X-4 file or create a separate CxF/X-4 file for every color.

Related information:

[CGATS \(page 73\)](#)

[CxF1 \(page 73\)](#)

[CxF3 \(page 73\)](#)

[CxF/X-4 \(page 73\)](#)

[QTX \(page 76\)](#)


[Import and Edit CxF/X-4 Data \(page 41\)](#)



## View CxF/X-4 Data

**Use this dialog to inspect the spectral reflectance curves and meta-data information for spot colors defined in CxF1, CxF3, CxF/X-4, QTX, PDF and CGATS measurement files. All metadata fields are read-only to protect them against modifications.**

For step-by-step instructions, refer to *Viewing Spectral Curves and Meta-data*.

### File

Click  and select the files to be loaded. Hold the Shift or Ctrl key pressed down to select multiple files.

Use  and  to successively load all files of the selected type available in the current folder (only one at a time).



Alternatively, drag a file (any except PDF) onto the ORIS CxF Toolbox window.

### Color name

Use this list to select the CxF/X-4 color definition to be inspected. The list is populated with all color definitions from all files you have loaded. Alternatively, click on a color box displayed under the list.

Ascending numbers – ( 1 ), ( 2 ), etc. – are automatically appended to the color name to distinguish different color definitions with identical names.



Click  to expand the area containing the color boxes. Click  to hide it.



Click a color box to select the CxF/X-4 color definition represented by the color. This has the same effect as using the **Color name** drop-down list.

## Diagram

### Reflectance spectrum

Spectral reflectance curves for the selected color and tint values.

X-axis: Wavelength of incident light in nanometers.

Y-axis: Portion of reflected light (1,0 = 100%)

Curve points: Measurement data


### Tint ramp

Solids and tint values (10% steps) of the spot color printed on the substrate (left) and on a black background (right). See also *Tint ramp*.

Click on a patch in the tint ramp to display its spectral curve.

Ctrl-click on a patch to add the spectral curve to those displayed already. Ctrl-click on the same patch again to remove this curve. Click normally on a patch to display its spectral curve and remove all others.

## CxF/X-4 Metadata

Metadata information stored for the selected CxF/X-4 color definition. Click the  buttons to expand the metadata groups if required. Modifications are not possible. Refer to section *CxF/X-4 Metadata* for more details.

## Buttons



Click this button to return to the dialog that was displayed previously. This button is only available if you have opened the dialog by clicking





# Manage CxF/X-4 Data in PDF File

Use this dialog to assign CxF/X-4 color definitions to the spot colors in a PDF/X file. You can extract or remove CxF/X-4 color definitions and view the spectral curves and metadata. It is also possible to change the ink sequence and to extract the embedded output intent profile or to embed a profile if missing.

For step-by-step instructions, refer to *Managing CxF/X-4 Data in PDF Files*.

### Icons

Click  and select the PDF/X file to be modified.

Use  and  to successively load all PDF files available in the current folder.

Alternatively, drag a PDF/X file onto the ORIS CxF Toolbox window.

### Output intent info

Description of the embedded ICC profile which specifies the output intent of the PDF/X file.

If no output intent is embedded, a message stating this appears instead. In this case it is not possible to assign any CxF/X-4 data. Embed an ICC profile as described below.


### ICC profile

File name of the embedded output intent profile.

Click  to extract the ICC profile and save it as a separate file.

Click  to embed an ICC profile if the output intent is missing.

### CxF/X-4 library

Use this option to assign missing CxF/X-4 color definitions automatically. Click  and select a CxF/X-4 file with a large number of color definitions.



The library file is then searched for color definitions which are named exactly like the spot colors in the PDF/X file. Such color definitions are automatically assigned to the corresponding spot colors.

This search is always performed when a PDF file or CxF/X-4 library is loaded. A message appears if there are no matching color definitions in the library file.

To switch this functionality off, delete the path name from the input box.

## CxF/X-4 Data

This table indicates, for each spot color defined in the PDF file, whether CxF/X-4 data is embedded or missing. The icon at the bottom left summarizes the status:

-  There is at least one spot color without CxF/X-4 data.
-  All spot colors have embedded CxF/X-4 data.

For step-by-step instructions, refer to *Assigning CxF/X-4 Data to Spot Colors*.

### Spot Color in Document

The column on the left is the list of spot colors defined in the PDF file.

The name `<not used>` indicates that the CxF/X-4 data listed on the right is not used for any spot color in the PDF/X file.

### CxF/X-4 Data

The column on the right indicates the status of the spot colors listed on the left:

<code>&lt;embedded&gt;</code>	CxF/X-4 data is embedded in the PDF/file.
<code>&lt;missing&gt;</code>	No CxF/X-4 data embedded for this spot color.
<code>&lt;removed&gt;</code>	CxF/X-4 data has been removed by the user.
[Spot color name]	The user has assigned CxF/X-4 data to this spot color.





Click this button if CxF/X-4 data is missing or needs to be replaced. This opens a *dialog* allowing you to load CxF/X-4 files and then assign color definitions to the spot colors. You can also view the spectral curves and metadata.

The status `<missing>` or `<embedded>` changes to indicate the spot color name defined in the CxF/X-4 file.



Click this button to remove the CxF/X-4 color definition from the selected spot color. The spot color status changes to `<removed>`.

You can also use  for the following purposes:

- To remove selected CxF/X-4 definitions with the status `<unused>`.
- To restore the CxF/X-4 data embedded originally if you have replaced this data. The status will change back to `<embedded>`. Click  again to remove the CxF/X-4 data from the spot color.



Click this button to save the selected color definition as a CxF/X-4 file. Specify a folder and a file name.

#### Display only CxF/X-4 data used in PDF file

Enable this option to hide all CxF/X-4 color definitions with the status <not used>. Such color definitions disappear from the list and will not be written to the PDF file when the file is saved. Disable this option to make the unused color definitions visible again.

## Ink laydown order

This list shows the order in which process and spot colors will be printed. The color at the top will be printed first, the color at the bottom will be printed last.

For step-by-step instructions, refer to *Changing Ink Laydown Order*.

#### Ink laydown order

Enable  this option if you want to change the ink sequence. If disabled, the ink sequence information cannot be changed and will not be written to the PDF file when being saved.



Use these buttons to move the selected color up or down, respectively. Click repeatedly until the color is at the position you want.


#### Keep process colors grouped

Disable this option if the sequence of CMYK process colors should be interrupted by spot colors.

This replaces the list entry named **CMYK** with the entries **Cyan**, **Magenta**, **Yellow** and **Black**. Now each process color can be moved individually and you can place spot colors between process colors.

## Buttons



Click this button to view the spectral curves and metadata for the selected spot color. Editing the data is not possible. Click  to return to the dialog displayed previously.



Click this button to create a *report* for all CxF/X-4 color definitions loaded in this dialog.



Click this button to verify print quality by measuring spot colors against the CxF/X-4 color definitions loaded in this dialog (*certification*).



Click this button to save the modified PDF file. This will save all changes to CxF/X-4 data and, if the **ink laydown order** option is enabled, also the changes to the ink sequence. Overwrite the PDF file or save it under a new name.

Related information:

Managing CxF/X-4 Data in PDF Files (page 17)  
Viewing Spectral Curves and Metadata (page 15)  
Creating Reports (page 23)  
Print Validation (Certification) (page 25)

## Assign CxF/X-4 Data

Use this dialog to load CxF/X-4 files and then assign color definitions to the spot colors in the PDF file. Do this if CxF/X-4 data is missing or needs to be replaced.

### CxF/X-4 file

Click and select a CxF/X-4 file. Hold the Shift or Ctrl key pressed down to select multiple files.

### Color name

This is the list of all spot colors defined in the PDF/X file. Select a color with missing or incorrect CxF/X-4 data.

### CxF/X-4 definition

This list contains the color definitions from all CxF/X-4 files you have loaded. Choose the CxF/X-4 data to be assigned to the selected spot color.



Click this button to assign the selected CxF/X-4 color definition to the selected spot color.

In the color list, the status `<missing>` or `<embedded>` changes to indicate the spot color name defined in the CxF/X-4 file.



Click this button if you want to view the metadata and spectral curves of the selected CxF/X-4 data. The data appears in the background and cannot be edited. Reclick to redisplay the **Manage CxF/X-4 Data in PDF File** dialog.


Related information:

Assigning CxF/X-4 Data to Spot Colors (page 19)

# Global Brand Assurance

Use this dialog to download jobs with CxF/X-4-defined spot colors from the Global Brand Assurance web server. The color definitions can then be used in the same way as CxF/X-4 files stored on your local file system.

## User data

Enter your user name and password, then click  to log in to the *Global Brand Assurance* web server. The **Jobs** list will be populated with print jobs maintained in the GBA database.

Click  if you want to log off from the web server.

## Job data

### Job

This is the list of print jobs which you are allowed to access on the GBA web server. Select a job from the list.

### Brand colors


This is the list of CxF/X-4-defined spot colors used in the selected job. Select a color if you want to view or extract it.



Click this button to save the selected color definition as a CxF/X-4 file. Specify a folder and a file name.

## Buttons



Click this button to view the spectral curves and metadata for the selected spot color. Editing the data is not possible. Click  to return to the dialog displayed previously.



Click this button to create a *report* for all CxF/X-4 color definitions loaded in this dialog.



Click this button to verify print quality by measuring spot colors against the CxF/X-4 color definitions loaded in this dialog (*certification*).

Related information:

- Print Validation of GBA Jobs (Certification) (page 33)
- Creating Reports (page 23)
- Viewing Spectral Curves and Metadata (page 15)


# Certification



Use this dialog to check print quality by measuring a spot ink characterization chart against the CxF/X-4 color definitions. The application provides an instant pass/fail indication and various charts for assessing the deviations both visually and numerically. Process colors can be checked against the target values defined in the PDF/X output intent or a user-defined ICC profile. The certification results can be saved as a PQX file.

For step-by-step instructions, refer to *Print Validation (Certification)*.

## File

Load CxF/X-4 color definitions if the dialog is empty:

Click  and select a CxF/X-4, QTX file or PDF file.


Use  and  to successively load all files with the currently selected type available in the current folder.

To load a PQX file, click the  button in the bottom right corner.

## Spot color

Use this list to select the spot color to be measured next.

The list is automatically populated with all CxF/X-4 color definitions which were currently loaded when you opened the **Certification** dialog. If the list is empty, load a file as explained above.

Click  if you want to add process colors to the list.




Clicking on one of the color boxes is an alternative to selecting a CxF/X-4 color definition from the list.

The boxes are marked up like in the following example if measurements have been made already for the selected tint value:

- Certification successful (within tolerance limits)
- Certification failed (out of tolerance)



Select the tint value of the spot color to be measured.

If some tint values are not listed or missing on your spot ink characterization chart, click  and select a different set of tint values.



## <Spot Color Name>

### Reflectance Spectrum

Spectral reflectance curves for selected color and tint value.

- X-axis: Wavelength of incident light in nanometers.
- Y-axis: Portion of reflected light (1,0 = 100%)

Target values (reference): ●. Actual values (measurement): ●.

Target values for spot colors are defined by the CxF/X-4 data. Target values for process colors are calculated from the specified ICC profile or PDF output intent, respectively.

### CIE a\*b\* / L\*


Graphical representation of the ● target values and ● actual values calculated from the spectral data:

- Hue (ab) chart
- Lightness (L) chart

### Colorimetric Data

Target and actual values indicated numerically:

- CIE L\*a\*b\* values (lightness, red/green hue, blue/yellow hue)
- CIE L\*C\*h° values (lightness, chromaticity, hue angle)
- Deviation between actual and target color (dE)



A pass/fail icon   indicates whether dE is out of tolerance.

To calculate dE, the program uses the tolerance value and dE formula stored in the CxF/X-4 metadata. A default value of 2.5 dE2000 is used automatically if these values are set to 0 or undefined.

Users can change these values by clicking .

### Metamerism index

The metamerism index (MI) indicates the probability that two samples (reference and measured sample) will show the same color difference under two different illuminants.

ORIS CxF Toolbox calculates three MI values using D50 as a reference illuminant and A, C and F11 as test illuminants. The certification result is indicated as successful  if all of these MI values are within the tolerance limit. Otherwise certification is indicated as failed .

The program uses the tolerance value stored in the CxF/X-4 metadata. If this value is 0 or unavailable, a default tolerance of 3.0 will be used automatically. The tolerance limit is the maximum deviation permitted from a target value of 0 dE.

If the actual MI value was 0, the reference and measured sample would show exactly the same color deviations under both illuminants. A tolerance value of 3.0 means that the two samples are not allowed to differ in metamerism by more than 3.0 delta E.


Users can change the tolerance value by clicking .

**NOTE:** The metamerism index cannot be calculated for process colors because spectral reflectance data is not available in this case. Target

values for process colors are calculated from the specified ICC profile or PDF/X output intent, respectively.


## Measurement



Click this button to start the measuring process. The button changes to .

Perform a white calibration if requested to do so. Then repeatedly select a color/tint value combination and measure the corresponding color patch.



Click this button if you want to stop the measuring process. All measurement results will be discarded. The button changes to .





Click this button to load CGATS and QTX measurement files created with a third-party tool. This useful is important if your measurement device is not supported by ORIS CxF Toolbox.

This opens a *dialog* allowing you to load measurement files and then assign a particular measurement to each CxF/X-4 color definition.

### Target Actual

The two big color boxes serve as a visual aid for assessing the difference between the target color and actual color.




The table underneath the button indicates the following:

- Total number of measurements for all colors and tint values
- Number of measurements remaining to be made
- Number of completed measurements which are successful   
Both delta E and metamerism index are within the tolerance limits
- Number of completed measurements which have failed   
Delta E, metamerism index, or both values are out of tolerance

## Overall Result

### Icon

A big icon indicates the overall certification result when the last measurement has completed:

- |   |            |  |
|---|------------|--|
|  | Successful | All measurement results are successful.      |
|  | Failed     | One or more measurement results have failed. |
|  | Incomplete | There are still measurements to make.        |



Click this button to save the complete set of certification data as a PQX file. This includes all CxF/X-4 color definitions, certification settings (e.g. user-defined tolerances), and the certification results (actual values).

PQX files usually contain the certification data for a particular print job. Load a PQX file to conveniently certify the same job again.

PQX files can be also sent on for print quality evaluation at remote sites.



Click this button to load the certification data stored in a PQX file. This is useful if you want to certify the same job again or to evaluate the results of a certification process performed at a remote site.


See also *Follow-Up Certification with PQX File*.

## Comments

This box allows you to enter a comment which will be saved together with the PQX file. Comments can be entered separately for each CxF/X-4 color definition, but only if the 100% tint value is selected.

## Buttons



Click this button if you want to view the metadata and spectral curves of the selected CxF/X-4 data. The data appears in the main window in the background. Reclick  to redisplay what was shown before.



Click this button to open a *dialog* allowing you to change some of the default certification settings. This includes the tint values to be measured, the dE tolerance value and formula, and the certification of process colors.

Related information:

Print Validation (Certification) (page 25)


System Requirements for ORIS CxF Toolbox (page 5)

## Assign Measurements

**Use this dialog to assign spot color measurements from CGATS or QTX files to the CxF/X-4 color definitions you have loaded. This allows you to use measurement devices which are not supported by ORIS CxF Toolbox.**


For step-by-step instructions, refer to *Measuring with a Third-Party Tool*.

### Measurement file

Click  and select a measurement file with *CGATS* or *QTX* format. Hold the Shift or Ctrl key pressed down to select multiple files.

### Color name

This is the list of all CxF/X-4 color definitions currently loaded in the **Certification** dialog. Select the name of a spot color to which measurement data should be assigned.



The window in the background will display the spectral curves and metadata, but only if  was clicked before opening the **Certification** dialog.

### Measurement

This list is populated with the measurements from all files you have loaded. Select the data that was measured for the selected spot color.



Click this button to assign the selected measurement to the selected CxF/X-4 color definition.

The application checks the measurement against the specifications in the CxF/X-4 data and indicates the result in the background ( or .

### Only display colors without measurement data assigned

Option enabled :

Having assigned a measurement to a CxF/X-4 color definition, the color definition will disappear from the **Color name** list. This allows you to immediately recognize the colors which still lack measurement data


Option disabled :

All CxF/X-4 color definitions are always available in the **Color name** list. This setting allows you to replace measurement data already assigned to a color definition.

### Always overwrite existing measurement data

By default, the application asks you to confirm your action when you replace measurement data already assigned to a color definition. Disable this option to do this without being asked for confirmation.



Click this button if the spectral data and metadata should always be displayed automatically for the currently selected measurement. The data appears in the main window in the background. Reclick  to redisplay what was shown before.

Related information:

Print Validation (Certification) (page 25)

System Requirements for ORIS CxF Toolbox (page 5)

## Certification Parameters

Using this dialog the default certification settings stored in the CxF/X-4 data can be adjusted according to your preferences. You can choose to measure different tint values, certify also process colors, or use different tolerances.

### Apply to all CxF/X-4 definitions

This option is located at the bottom of the dialog, next to the **OK** button.

If enabled, the changes made in this dialog will apply to all CxF/X-4 color definitions loaded in the **Certification** dialog (default setting). Disable this option if the changes should only be applied to the currently selected color definition.

## Measurement Parameters

### Select patches to be certified

Select the set of tint values to be measured for a spot color. Click the check box underneath a tint value to select  or deselect  this patch. Use the **Select all** option to select or deselect all 11 tint values in one go.

Changes are required, for example, if some of the tint values on the spot ink characterization chart are not listed in the **Certification** dialog or if tint values are listed which are not available on the chart.

### Display selected patches only

This option applies to the tint values you have selected, i.e. to the patches with a check mark.

Option enabled :

Only the selected tint values will be available on the list in the **Certification** dialog. The deselected patches are not listed and cannot be measured.

Option disabled :

All tint values continue to be available on the list. The deselected patches can be measured, but the measurements will not have any effect on the certification result.

## Tolerances

These options allow you to add or modify the tolerance values if they are incorrect or missing in the CxF/X-4 data.

### Delta E

Select the *delta E formula* to be used for calculating the average deviation between the target values (defined by the CxF/X-4 data) and the actual values (measurements).

Also enter a tolerance value for this color deviation. Certification is successful ✓ if the actual deviation value is not greater than the tolerance value and fails ✗ otherwise.

ORIS CxF Toolbox automatically uses a default value of 2.5 dE2000 for the certification process if these values are set to 0 or undefined.

### Metamerism index

Enter a tolerance value for the *metamerism index*.

ORIS CxF Toolbox calculates three metamerism index values for every measurement. Certification is successful ✓ if all of these values are within this tolerance. Otherwise certification fails ✗.

ORIS CxF Toolbox automatically uses a default value of 3.0 for the certification process if this value is not defined (0). A value of 3.0 means that the reference and measured sample are not allowed to differ in metamerism by more than 3.0 delta E.

## Process Color Certification

Enable this option (any setting except **Off**) if you also want to verify the print quality of process colors. The process colors *cyan*, *magenta*, *yellow* and *black* will be added to the list of spot colors in the **Certification** dialog and can be measured.

Measurements made for process colors can only be checked against the target values defined by an ICC profile. Select between the following settings:

- **Use ICC profile from PDF**

This setting is only available if a PDF/X file is loaded. Select it to use the ICC profile defining the embedded output intent.

- **Use the following ICC profile**

Select this setting to use your own ICC profile. Click ☰ and select a file.

*NOTE: It is not possible to calculate a metamerism index for process colors because the ICC profile does not include any spectral reflectance data.*

Related information:

Print Validation (Certification) (page 25)

System Requirements for ORIS CxF Toolbox (page 5)

# Certification


**Use this dialog to check print quality by measuring a spot ink characterization chart against the CxF/X-4 color definitions. The application provides an instant pass/fail indication and various charts for assessing the deviations both visually and numerically. The measure-**

ment results can be uploaded to the Global Brand Assurance web server, which provides a wide range of reporting and analysis tools.

For step-by-step instructions, refer to *Print Validation of GBA Jobs (Certification)*.

### Job

This is the GBA print job you have selected in the main window. If this is not the correct job, close the dialog and select another job on the **Global Brand Assurance** tab.

**NOTE:** You cannot use the  button for selecting jobs from the GBA web server. Use this button for loading PDF, CxF/X-4, or QTX files stored locally. This will cause some dialog elements to change (see Certification dialog).

### Spot color

This is the list of spot colors used in the selected job. Select the color to be measured next.



Clicking on one of the color boxes is an alternative to selecting a CxF/X-4 color definition from the list.

The boxes are marked up like in the following example if measurements have been made already for the selected tint value:

- Certification successful (within tolerance limits)
- Certification failed (out of tolerance)



If there are patches with different tint values for the selected spot color, select the tint value to be measured next.

## <Spot Color Name>



### Reflectance Spectrum

Spectral reflectance curves for selected color and tint value.

- X-axis: Wavelength of incident light in nanometers.
- Y-axis: Portion of reflected light (1,0 = 100%)

Target values (reference): . Actual values (measurement): .

### CIE a\*b\* / L\*



Graphical representation of the  target values and  actual values calculated from the spectral data:

- Hue (ab) chart
- Lightness (L) chart

### Colorimetric Data

Target and actual values indicated numerically:



- CIE L\*a\*b\* values (lightness, red/green hue, blue/yellow hue)
- CIE L\*C\*h° values (lightness, chromaticity, hue angle)
- Deviation between actual and target color (dE)

A pass/fail icon   indicates whether dE is out of tolerance.

To calculate dE, the program uses the tolerance value and dE formula stored in the CxF/X-4 metadata. A default value of 2.5 dE2000 is used automatically if these values are set to 0 or undefined.

### Metamerism index

The metamerism index (MI) indicates the probability that two samples (reference and measured sample) will show the same color difference under two different illuminants.


ORIS CxF Toolbox calculates three MI values using D50 as a reference illuminant and A, C and F11 as test illuminants. The certification result is indicated as successful  if all of these MI values are within the tolerance limit. Otherwise certification is indicated as failed .

The program uses the tolerance value stored in the CxF/X-4 metadata. If this value is 0 or unavailable, a default tolerance of 3.0 will be used automatically. The tolerance limit is the maximum deviation permitted from a target value of 0 dE.

If the actual MI value was 0, the reference and measured sample would show exactly the same color deviations under both illuminants. A tolerance value of 3.0 means that the two samples are not allowed to differ in metamerism by more than 3.0 delta E.


## Measurement



Click this button to start the measuring process. The button changes to .

Perform a white calibration if requested to do so. Then repeatedly select a color/tint value combination and measure the corresponding color patch.



Click this button if you want to stop the measuring process. All measurement results will be discarded. The button changes to .



Click this button to load CGATS and QTX measurement files created with a third-party tool. This is useful if your measurement device is not supported by ORIS CxF Toolbox.



This opens a *dialog* allowing you to load measurement files and then assign a particular measurement to each CxF/X-4 color definition.

### Target Actual

The two big color boxes serve as a visual aid for assessing the difference between the target color and actual color.






The table underneath the button indicates the following:

- Total number of measurements for all colors and tint values
- Number of measurements remaining to be made
- Number of completed measurements which are successful   
Both delta E and metamerism index are within the tolerance limits
- Number of completed measurements which have failed   
Delta E, metamerism index, or both values are out of tolerance

## Overall Result

### Icon

A big icon indicates the overall certification result when the last measurement has completed:

-  Successful All measurement results are successful.
-  Failed One or more measurement results have failed.
-  Incomplete There are still measurements to make.




Click this button to upload the measurement results to the GBA web server.

This button is enabled as soon as one measurement has been made. It is disabled after being clicked.

### Comments

This box allows you to enter a comment which will be uploaded to the web server together with the certification result. Comments can be entered separately for each CxF/X-4 color definition, but only if the 100% tint value is selected.



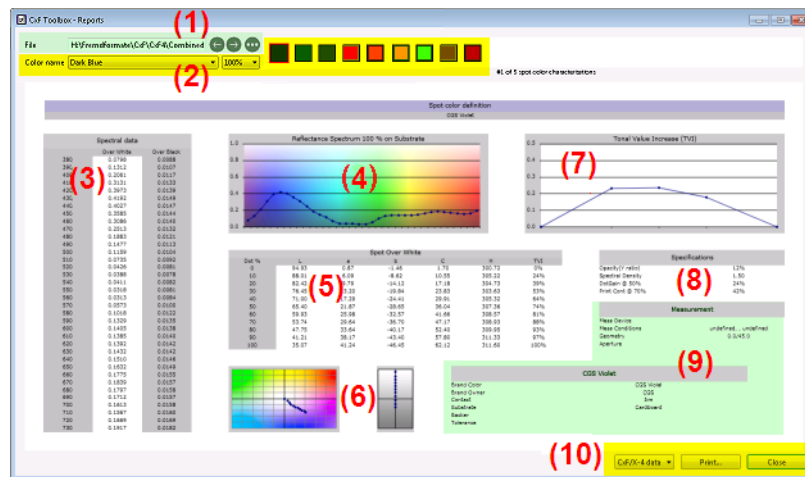
Click this button if you want to view the metadata and spectral curves of the selected CxF/X-4 data. The data appears in the main window in the background. Reclick  to redisplay what was shown before.

## Reports

**This report on CxF/X-4 color definitions includes important data for design, proofing, ink formulation and process control as well as customer tolerances for print quality verification. The data is presented both graphically and numerically.**

For step-by-step instructions, refer to *Creating Reports*.

The figure below shows an example. See below for an explanation of the numbered charts and dialog controls.



### (1) File selection

Load CxF/X-4 color definitions if the dialog is empty:

Click and select a CxF/X-4, QTX file or PDF file. Hold the Shift or Ctrl key pressed down to select multiple files.

Use and to successively load all files with the currently selected type available in the current folder.

### (2) Color and tint selection

Select a CxF/X-4 color definition from the list at the top or by clicking on a color box displayed next to the list.

The list contains the color definitions you have loaded here or that were loaded in ORIS CxF Toolbox before this dialog was opened.

If various tint values are defined for this color, select a tint value from the list .

### (3) Spectral reflectance data measured for selected color and tint value

Left: Wavelength of incident light in nanometers.

Center: Portion of light reflected by color printed on substrate (1,0 = 100%).

Right: Portion of light reflected by color printed on black.

### (4) Spectral reflectance curve for selected color and tint value

Graphical representation of table (3) for color printed on substrate.

X-axis: Wavelength of incident light in nanometers.

Y-axis: Portion of reflected light (1,0 = 100%)

Curve points: Nanometer values listed in table (3)

### (5) Colorimetric data for selected color printed on substrate

For each tint value, calculated from the spectral data:

- CIE L\*a\*b\* values (lightness, red/green hue, blue/yellow hue)
- CIE L\*C\*h° values (lightness, chromaticity, hue angle)

- Tone value increase (TVI) [see *glossary*]  
Size to which a printing dot is expected to increase in the print run.  
Example: A size of 55% is expected for a 50% dot (which means a *dot gain* of 5%).

#### (6) CIE ab and L charts

CIE Lab values of all tint values listed in table (5) plotted as:

- Hue (ab) chart
- Lightness (L) chart

#### (7) Tone value increase chart

X-axis: Original printing dot sizes for all tint values of the spot color.  
Y-axis: Increased dot sizes expected in the print run, as indicated in table (5).

#### (8) Ink Properties

Specifications of ink properties intended for ink suppliers, calculated from spectral data measurements.

**Opacity** Ratio of lightness values of 100% tint printed on substrate and 100% tint printed on black.  
0% means: Ink is invisible when printed on black. 100% means: Ink is completely opaque.

**Spectral Density** Ink density of 100% tint printed on substrate.

**Dot gain at 50%** Dot gain value for a 50% tint, derived from the TVI value in chart (7). See also *glossary*.

**Print contrast at 70%** Ratio of ink densities for 70% and 100% tints calculated as follows:  $(1 - D_{70}/D_{100}) * 100$

0% means: 70% tint has same density as 100% tint.  
100% means: 70% tint is invisible.

#### (9) CxF/X-4 metadata

Information that identifies the spot color and how it was measured, stored in the *metadata* of the CxF/X-4 file.

#### (10) Buttons


To view a large chart with spectral curves for all tint values of the color, select **Spectral data** from the list at the bottom right. Select **CxF/X-4 data** from this list to switch back to the way the report was displayed previously.

Click the **Print** button to print the report with the charts that are currently displayed on the screen.

Related information:

CxF/X-4 Metadata (page 68)  
Preferences (page 72)

# CxF/X-4 Metadata

The metadata information identifies the conditions in which the spot color was created and provides important data for all supply chain partners. Tolerance values for print validation are also included. Click the  buttons to expand the metadata groups if required.

**NOTE:** In the **View CxF/X-4 Data** dialog, all metadata fields are write-protected and cannot be modified.

## Spot color

### Color name

Name by which the spot color is identified by the user.

Used automatically as file name when CxF/X-4 files consisting of a single color definition are created.

Mandatory field, cannot be left empty. Write-protected in bulk-edit mode. Can only be modified when a single color is edited.

### Inventory ID

ID by which the spot ink is identified within a workflow.

Write-protected in bulk-edit mode. Can only be modified when a single color is edited.

### Substrate

User-friendly name of the substrate.

Mandatory field, cannot be left empty.

### Substrate type

Category of substrate, such as coated paper, cardboard or transparent film.

### Print process

Category of printing process used to print the spot ink characterization chart.

### Surface finish

Property of the substrate surface, such as *gloss laminated* or *matt varnished*.

### Creation date

Date and time at which the spot color was created.

This field is always write-protected and cannot be modified.

### Comment

Additional information on this spot color.

### **Brand owner**

Organization or company that is the proprietor of the brand associated with the spot color.

### **Contact**

Brand owner's contact data such as postal address, phone number, etc.

## **Tolerances**

The following is relevant for ORIS CxF Toolbox's **Certification** function. The settings for **Color deviation** and **Metamerism index** are used as tolerance values for certification measurements. Users can change these default values for specific jobs or measurements.

### **Color deviation**

Maximum average delta E value permitted when the reference values are checked against a measured sample.

A default value of 2.5 is set automatically when spot colors are created by measurement or if this value is not defined in the files you are importing.

### **dE formula**

Formula used for calculating color deviations (see also *glossary*).

The dE2000 formula is set by default when spot colors are created by measurement or if no dE formula is defined in the files you are importing.

### **Metamerism index**

The metamerism index indicates the probability that two samples (reference and measured sample) will show the same color difference under two different illuminants. If the metamerism index is zero, the two samples have the same degree of metamerism, i.e. one sample looks as much similar or different under the two illuminants as the other.

A default value of 3.0 is set automatically when spot colors are created by measurement or if this value is not defined in the files you are importing.

For more details, refer to the *glossary*.

### **Gloss**

Gloss level measured in gloss units. 0 means 'no gloss'.

### **Measurement angle**

Geometry of the gloss meter. This is the angle at which the sample is illuminated.

### **Certify**

Set of tint values to be measured for a spot color.

To measure different tint values, click the check boxes to select  or deselect  the values. Use the **Select all** option to select or deselect all 11 tint values in one go.

## Measurement

Information about how color data was measured.

All of these fields are write-protected if they occur in a CxF/X-4 file which was created by measuring or importing measurements with ORIS CxF Toolbox.

### Illumination

Light source that was used for measuring color.

### Angle

Geometry of the measurement device. Relative positions of the light source, sample plane and detector.

There are instruments with a directional geometry (45°/0° or 0°/45°) and a diffuse sphere geometry (d/8° or 8°/d).

### Filter

Filter that was used for measuring.

### Aperture

Aperture size of the measurement device

### Backing

Type of backing or background used when the spot ink characterization chart was measured. Enter `black` or `white`, for example.

### Measurements

This number is only greater than 1 if the data was derived from the average of a series of measurements.

This field is always write-protected and cannot be modified.

## Measurement device

Information about the measurement device from which the color values were derived. This information is usually added automatically when spot colors are created by measurement.

All of these fields are write-protected if they occur in a CxF/X-4 file which was created by measuring or importing measurements with ORIS CxF Toolbox.

### Manufacturer

Name of the manufacturer of the measurement device, e.g. X-Rite

**Model**

Model name of the measurement device

**Calibration date**

Date and time of the last device calibration

**Serial number**

Serial number of the measurement device

## File

This data is added automatically when spot colors are created by measurement.

**Creator**

Name of the person, organization or software that created the file.  
This field is always write-protected and cannot be modified.

**Creation date**

Date and time at which the file was created.  
This field is always write-protected and cannot be modified.

**Comment**

Additional information on the file.

Related information:

- Metamerism index (page 75)
- Editing CxF/X-4 Data (page 11)

## Write CxF/X-4 Data

**Use this dialog to save the spectral data and metadata information in CxF/X-4 format.**

**CxF/X-4 file format**

This option is only relevant if more than one spot color definitions have been selected. In this case you have the following options:

- Create as separate CxF/X-4 file for each color definition (single-color files).
- Create a single CxF/X-4 file which includes all color definitions (combined file).

**CxF/X-4 target directory**

Click **Browse** and select a folder for storing the single-color CxF/X-4 files. The spot color names will be used as file names.

### CxF/X-4 target file

Click **Browse**, select a folder and enter a file name for the combined CxF/X-4 file.

### Save

Click here to create the CxF/X-4 file(s).

## Preferences

Use this dialog to specify user preferences for ORIS CxF Toolbox.



### Logo

This option applies to the company logo displayed in a spot color report.

You can select a different logo file or remove the logo.

### Icon Text

Use this option to hide the explanatory text displayed for icons and buttons.

Example: Option enabled: , option disabled: 

The texts will only remain hidden in the current program session. They will be reappear when you restart the program.

### Available Tools

These are the tools listed in the menu on the left of the main window.

Each tool can be hidden and redisplayed by clicking the respective check boxes. This allows users to customize the menu and remove tools which are not required.

Related information:

Creating Reports (page 23)

Reports (page 65)



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# A

# Glossary

## CGATS

Committee for Graphic Arts Technology Standards

CGATS was formed in 1987 and received ANSI accreditation in 1989. The goal of CGATS is to have the entire scope of technical work for printing, publishing and converting technologies represented in one national standardization and coordination effort, while respecting the established activities of existing accredited standards committees and industry standards developers.

CGATS has defined a standard file format for storing measurement data. CGATS files are tab-delimited text files capturing each measured patch in a tabular format along with a header of metadata pertinent to the measurement condition.

## CxF

*Color Exchange Format*. XML-structured file format created by X-Rite Inc. CxF files allow the seamless, worldwide, digital communication of all commercially significant aspects of color.

See also *CxF1*, *CxF3*, *CxF/X-4*.

## CxF1

*CxF* Version 1.0.

## CxF3

*CxF* Version 3.0.

## CxF/X-4

*CxF/X-4* is defined in *ISO 17972-4* as a subset of the *CxF* Version 3.0 standard for exchanging color information. A *CxF/X-4* file characterizes a particular spot color in conjunction with a print substrate by means of its spectral reflectance data. It also includes a wide range of metadata.

*CxF/X-4* data can be embedded in PDF/X documents to effectively communicate the characteristics of the spot colors used in the file. See also *ISO 32000-2*.

## Delta E Formula

Mathematical formula used for calculating deviations between two colors:

- *dE*
- *dE94*
- *dE2000*
- *dE CMC*

## dE

Numerical value that represents the distance between two colors in the Lab color space. This formula was introduced in 1976 and is therefore also known as *Delta E 1976*.

In many cases, a delta E of 1.0 is the smallest color difference the human eye can see. Unfortunately it's not that simple. Some color differences

greater than 1 are perfectly acceptable, maybe even unnoticeable. Also, the same delta E color difference between two yellows and two blues may not look like the same difference to the eye.

**dE94**

A variant of the *dE* color distance formula published in 1994. It gives more weight to chroma, which comes closer to what the human eye perceives.

**dE2000**

Revision of the *dE94* formula, released in 2000. Unlike delta E 94, which assumes that  $L^*$  correctly reflects the perceived differences in lightness, delta E 2000 varies the weighting of  $L^*$  depending on where in the lightness range the color falls.

This formula uses an equation (l:c:h) which allows the setting of lightness, chroma and hue factors. Most common are the following factors:

- Delta E 2000 1:1:1  
Equal weighting of lightness, chroma and hue. These are the default factors. This formula is usually abbreviated as *Delta E 2000*.
- Delta E 2000 2:1:1  
Lightness has twice the weighting of chroma and hue.

**dE CMC**

Color difference formula adopted by the Colour Measurement Committee of the Society of Dyers and Colourists of Great Britain in 1984. It describes color differences in the CIE LCh color space.

This formula uses an equation (l:c) which allows the setting of lightness and chroma factors. Most common are the following factors:

- dE CMC 1:1  
Equal weighting of lightness and chroma. This formula can detect *perceptible* color differences.
- dE CMC 2:1  
Lightness has twice the weighting of chroma. This formula can detect *acceptable* color differences.

**Dot gain**

Percentage by which a printing dot is expected to increase in the print run. Dot gain is calculated by subtracting the original dot size from the increased dot size (*TVI* value).

Example: A dot size increase from 50% to 55% means a dot gain value of 5% or 0.05.

**GBA**

See *Global Brand Assurance*.

**Global Brand Assurance**

A web-based application located at [globalbrandassurance.com](http://globalbrandassurance.com) which maintains information on print jobs with CxF/X-4-defined brand colors. Applications such as ORIS CxF Toolbox can download the color definitions of a job, measure the colors and upload the result to the web server. There is a wide range of reporting and analysis tools which help you monitor print quality and clearly indicate trends that can affect color.

**ISO 17972**

ISO 17972 defines methods for the use of CxF3 to exchange measurement data and associated metadata within the graphic arts industry and for the exchange of files between graphic arts users. It is a multi-part document where each part is intended to respond to different workflow requirements:

- ISO 17972-1 Graphic technology — Colour data exchange format (CxF/X) — Part 1: Relationship to CxF3 (CxF/X-1)
- ISO 17972-2 Graphic technology — Colour data exchange format (CxF/X) — Part 2: Scanner target data (CxF/X-2)
- ISO 17972-3 Graphic technology — Colour data exchange format (CxF/X) — Part 3: Output target data (CxF/X-3)
- ISO 17972-4 Graphic technology — Colour data exchange format (CxF/X) — Part 4: Spot color characterization data (CxF/X-4)

**ISO 32000-2**

ISO 32000 is the standard for document management using the Portable Document Format (PDF). Part 2 specifies PDF Version 2.0. PDF 2.0 documents can embed CxF/X-4 data, spectral data, opacity and print order information.

**Metamerism index**

*Metamerism* exists if a sample looks different under two different lighting conditions.

The metamerism index indicates the probability that two samples (reference and measured sample) will show the same color difference under two different illuminants. If the metamerism index is zero, the two samples have the same degree of metamerism, i.e. one sample looks as much similar or different under the two illuminants as the other.

The MI is a delta E value calculated from the difference between the following:

- CIE Lab deviation between reference and measured sample viewed under a reference illuminant (e.g. D50)
- CIE Lab deviation between reference and measured sample viewed under a test illuminant (e.g. A, C or F11)

**Output intent**

Embedded ICC profile which specifies the color characteristics of the intended output device associated with the PDF/X file.

**PQX**

XML-structured files developed by the Print Quality eXchange (PQX) Working Group for the transmission of performance data within the print supply chain, allowing brand owners to assess and track relevant production and quality data.

PQX files intend to facilitate the one-way transmission of performance data for one or more printed samples from a single press run between print service providers to relevant stakeholders and brand owners; thus allowing brand owners to assess and track relevant business, production, color and quality data of printed materials of all forms.

Color data is reported using the ISO-compliant CxF format and may include both spectral and non-spectral data.

**QTX**

QTX is a proprietary format from *Datacolor* for the exchange of color-related information in the textile industry. QTX files contain spectral reflectance data and information about the measurement procedure.

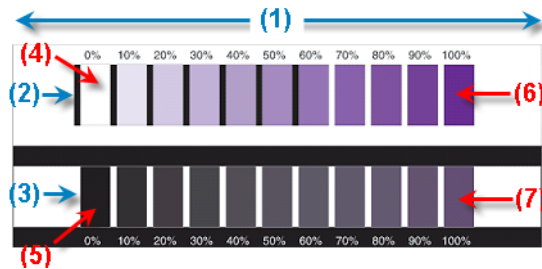
**Spectra reflectance curve**

A plot of color reflectance in the visual and non visual spectrum.

**Spot ink characterization chart**

Test chart for measuring the spectral reflectance of spot colors. Also referred to as *ink step-wedge chart*.

The *CxF/X-4* standard recommends the use of charts with 11 tints of ink printed on substrate and also on black background, as shown in the following figure:



- 1 *Tint ramp*: Solids and tints of spot color printed over white and black backgrounds
- 2 White background (substrate)
- 3 Black background
- 4 Substrate
- 5 Solid black
- 6 Solid spot color printed over white (i.e. over the substrate)
- 7 Solid spot color printed over black

**Tint ramp**

Color patches of a spot color printed on substrate and black with solids and various tonal values, usually increasing in steps of 10%. See also *Spot ink characterization chart*.

**Tone value increase**

Effect produced when ink soaks into the substrate and spreads out, causing the printing dots to become larger than their intended size, which darkens the printed image. This phenomenon is also known as *dot gain*.

Example: A 50% dot may increase to 55% in the print run. This is a dot gain of 5% or 0.05.