

# **ORIS CxF Toolbox**

## **V1.1**

### **User Manual**



CGS Publishing Technologies International

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# 1

# Introduction

Information you should read before starting to work with ORIS CxF Toolbox.

## 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 CxF/X-4 library files are specified. You can also modify the ink laydown order and extract the output intent profile. Missing output intent profiles can be assigned manually.

If a brand color is only available as a printed sample, ORIS CxF Toolbox quickly finds the best matching color definition available in a CxF/X-4 library.

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 validation based on the PDF output intent or a user-selected ICC profile is also supported. The validation results can be saved as a *PQX* file and sent on for evaluation.

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. There are also validation reports.

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.

## Feature Overview

- Measure spectral reflectance of color samples
- Import color data from *CGATS* measurement files
- Import color data from *CxF1*, *CxF2*, *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 (incl. brand owner identification)  
Bulk editing mode for quickly changing multiple colors
- Export CxF/X-4 data to CGATS or ASE format
- Find best matching CxF/X-4 color for a printed sample \*
- 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
- Verify print quality (validation/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 validation results as a PQX file (for evaluation at remote sites)
  - Upload validation results to Global Brand Assurance web server
- Create reports: \*
  - Spectral data, CIE Lab data, TVI aims, opacity, print contrast and other ink properties – all displayed both graphically and numerically
  - Validation reports

**NOTE:** Features with an asterisk (\*) are also included in the Light version. All other features require a license for the Full version of ORIS CxF Toolbox

Related information:

- » Using ORIS CxF Toolbox (page 9)
- » System Requirements (page 7)

# ORIS CxF Designer

ORIS CxF Designer is a plug-in for Adobe Illustrator (Windows or Macintosh) 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.

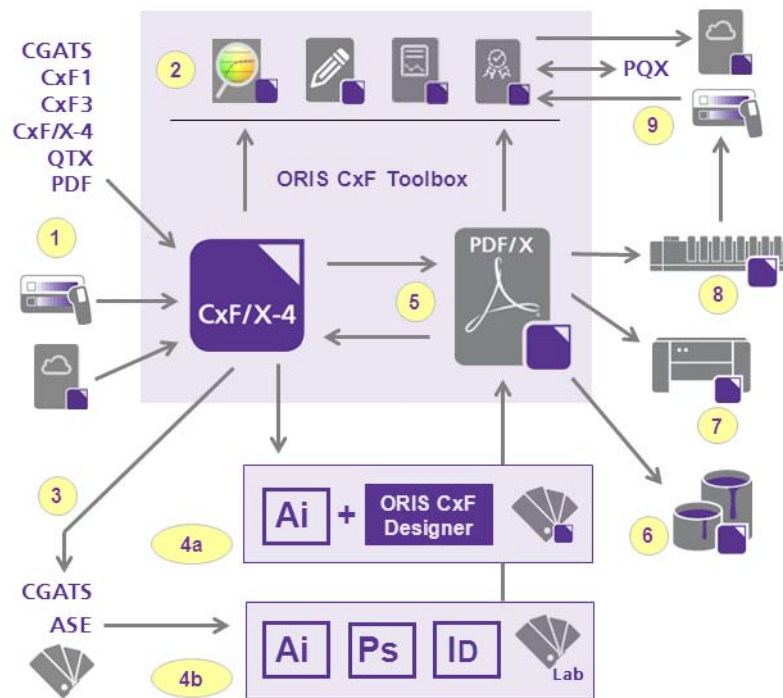
Designers no longer need to wait for the perfect color to be created. What is used on screen can be sent directly with the final PDF file.

**NOTE:** *ORIS CxF Designer is only compatible with Illustrator CS6 and CC2015.2.1 or lower. Development has been discontinued.*

Related information:

- » Using ORIS CxF Designer Plug-in for Adobe Illustrator (page 50)
- » System Requirements (page 7)

# 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 and validation reports
  - Print validation (certification)
- 3** Exporting CxF/X-4 data
- 4a** Page design with Illustrator and ORIS CxF Designer plug-in (only compatible with Illustrator CS6 and CC2015.2.1 or lower):
  - Importing CxF/X-4 data into Illustrator swatch palettes
  - Designing pages using CxF/X-4-defined spot colors
  - Exporting pages with CxF/X-4 data as PDF/X files
- 4b** Page design with Illustrator, Photoshop or InDesign:
  - Loading colors from ASE file into swatch palette
  - Designing pages and exporting them as PDF/X files
  - In ORIS CxF Toolbox, reassigning CxF/X-4 data to colors

- 5 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
- 6 CxF/X-4 data can be used for accurate ink formulation
- 7 Proofing:  
Creating excellent spot color matches from PDF/X file
- 8 Printing:  
All press-critical data included in PDF/X file
- 9 Validation (certification):
  - Measuring print results against CxF/X-4 data
  - Uploading validation results to GBA web server
  - Saving validation results as PQX file
  - Loading PQX file to remeasure same job

Related information:

- » ASE (page 109)
- » CGATS (page 109)
- » CxF1 (page 109)
- » CxF2 (page 109)
- » CxF3 (page 109)
- » CxF/X-4 (page 109)
- » GBA (page 110)
- » PQX (page 111)
- » QTX (page 112)
- » Using ORIS CxF Toolbox (page 9)
- » Importing Brand Colors into Adobe Swatch Palettes (page 48)

# System Requirements

## 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

There are two types of ORIS CxF Toolbox licenses available:

- *Full version* with the complete functionality
- *Light version* with a reduced set of tools

Creating and editing CxF/X-4 data is not possible. For more details, refer to *Feature Overview*.

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.

**NOTE:** *If the software license cannot be activated, please check whether your company's firewall is blocking the license server [www.orislicensing.com](http://www.orislicensing.com). If so, add this URL to the firewall's whitelist.*

## ORIS CxF Designer

### Adobe Illustrator

The plug-in is only compatible with the following Illustrator versions:

- Creative Suite 6
- Creative Cloud 2015.2.1 (V19.2.1) or lower

The plug-in can be used on both Windows and Macintosh platforms.

**NOTE:** *Development of this plug-in has been discontinued. Users of Illustrator CC2015.3 or higher can use ASE format to import spot color names into Illustrator. After completing the artwork, use ORIS CxF Toolbox to reassign the CxF/X-4 data to the spot colors in the PDF file.*

### Adobe Extension Manager

Extension Manager CS6 or CC, depending on your Illustrator installation.

### 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.


Related information:

- » [Feature Overview \(page 2\)](#)
- » [Using ORIS CxF Designer Plug-in for Adobe Illustrator \(page 50\)](#)

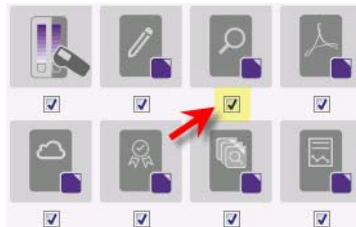
## Selecting Available Tools

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 – Enabling the ‘View’ Tool*

---




# 2


# Using ORIS CxF Toolbox

Step-by-step instructions for using ORIS CxF Toolbox to create, edit, view and manage CxF/X-4 data, to create reports and to verify the print quality of CxF/X-4-defined spot colors.


## 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 color patches.

1. Make sure the measurement device is connected to your computer.
2. Click  on the left.

Color definitions from previous measurements may appear. If they have been saved already, remove them by clicking .

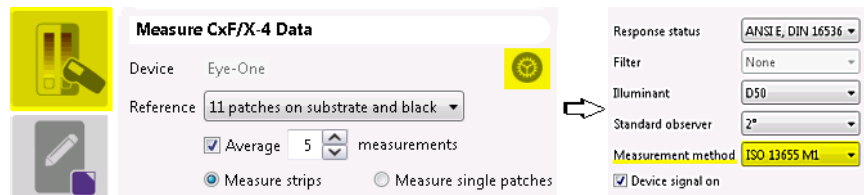


3. Click  to configure your measurement device. Select the measurement method (M0, M1, or M2), for example.
4. Set the options for the measuring process:

- Specify the number of patches on your spot ink chart.
- Use the **Average** option if you want to minimize measuring imprecisions.
- 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.

**NOTE:** For X-Rite eXact, make sure the **Measure single patches** option is enabled, otherwise the application will be unable to detect the device. Strip measurement is not supported for eXact devices.



5. Click to start the measuring process.

X-Rite i1 requires a white calibration. Place the device on the white reference and click **OK** when requested to do so.

6. Perform the measurements. Follow the instructions on the screen.

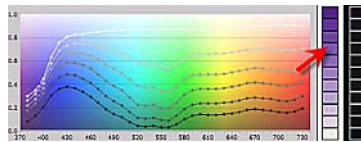
- Click to repeat the last measurement in case of error.
- Click again to remeasure a spot ink chart if **Average** is enabled.
- Click if you want to cancel the measuring process.



7. Click after completing all measurements.

The spectral curve for one of the tints (usually 100%) and the meta-data appears.

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



8. Complete the metadata information.



The following are mandatory fields which cannot be left empty:

- **Color name**
- **Substrate:** Enter the name you want.
- **Substrate type:** Select the closest description.


Measurement device details and various default values are added automatically.

9. To measure additional spot colors, proceed as explained above:

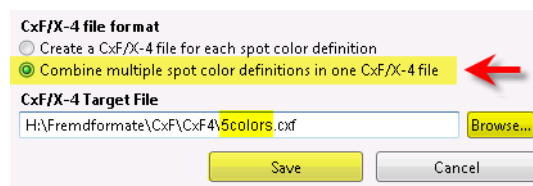
1. Click . You can also use the button at the bottom.
2. Click and measure.

3. Click  and complete the metadata.
  4. Repeat these steps until all colors are measured.
10. Make sure there are only colors you want to include in the CxF/X-4 file. To remove a color, select it and click .



11. Click  to save the color definitions. A dialog appears. Select one of the following options:

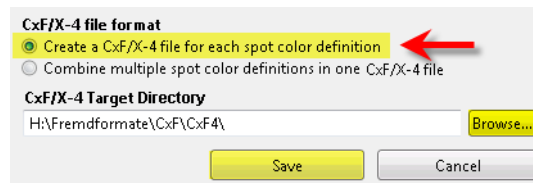
- **Combine multiple spot color definitions in one CxF/X-4 file**  
Select a target directory, enter a file name, then click **Save**.  
This creates a single CxF/X-4 file with all spot colors.





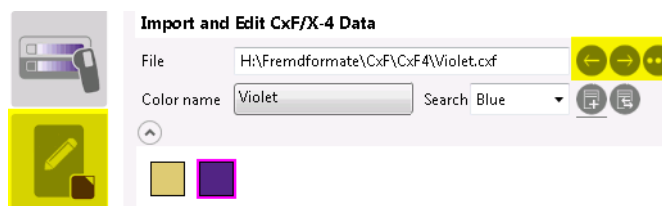
- **Create a CxF/X-4 file for each spot color definition**

Select a target directory, then click **Save**.

Each spot color will be saved as a separate CxF/X-4 file. The color names will be used as file names.



**NOTE:** Click  on the left if you want to open the files you have saved, or to import other files. Otherwise the **File** option and  button will not become available.






Related information:

- » Spot ink characterization chart (page 112)
- » Quickly Measuring Colors with Similar Metadata (page 12)
- » System Requirements (page 6)
- » CxF/X-4 Metadata (page 101)
- » Measure CxF/X-4 Data (page 55)
- » Create CxF/X-4 Data from Measurement (page 58)


# Quickly Measuring Colors with Similar Metadata

You may want to measure a series of spot colors which are printed on the same substrate. These colors share almost the same set of metadata and differ only in color name and one or two other properties. In this case using the bulk-edit mode is the quickest way of creating a CxF/X-4 file from the measurement data.


Read section *Creating CxF/X-4 Data by Measurement* for details which are not covered here such as configuring the measurement device and setting the measuring options.

1. Click  on the left or  at the bottom.
2. Click  and measure the first spot color.



3. Click  and enter the metadata that is specific to this color only, for example:
  - **Color name** (mandatory)
  - **Inventory ID**
  - **Comment** (on spot color)
  - **Brand owner**
  - **Contact**

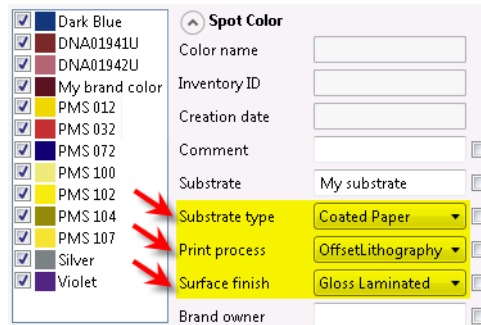
Spot Color			
Color name	My brand color	Creation date	2015-08-14T16:06:47
Inventory ID	0000001	Comment	Used for my brand new product.
Substrate			
Substrate type	---	Brand owner	John Doe
Print process	---	Contact	JDoe Chemicals Inc. Downtown
Surface finish	---		

4. Measure additional spot colors by repeating steps 1–3.
5. Click  to switch to bulk-edit mode.

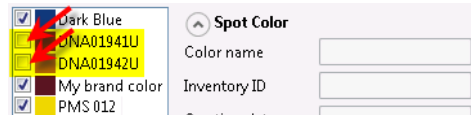



6. Specify the metadata which is identical for all spot colors, for example:
  - **Substrate** (mandatory)
  - **Substrate type** (mandatory)
  - **Print process**

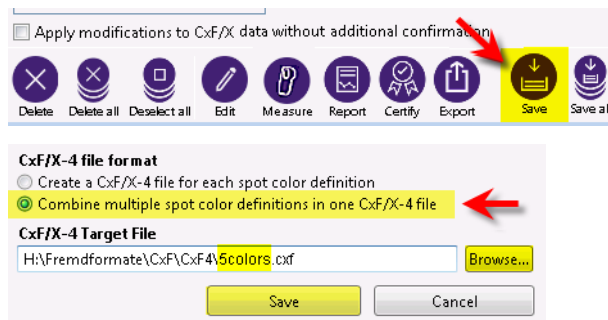
- **Surface finish**
- **Certification**
- **Comment (on file)**



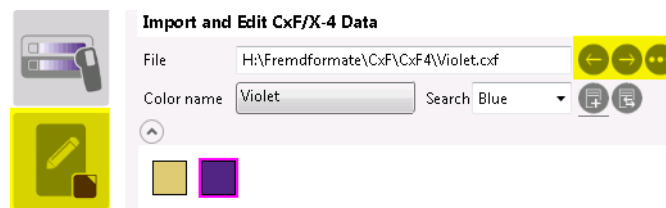
7. If certain colors should not be included in the CxF/X-4 file, deselect them.



8. Click  and save the selected color definitions.



**NOTE:** Click  and then  if you want to open the file you have saved, or to import other files. Otherwise the **File** option and  button will not become available.







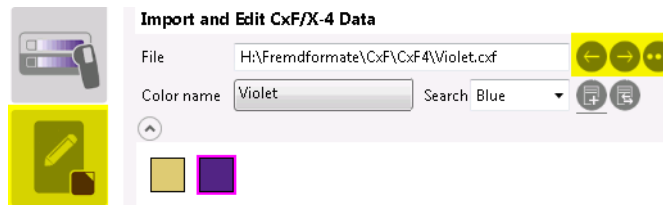
Related information:

- » Creating CxF/X-4 Data by Measurement (page 9)
- » Import and Edit CxF/X-4 Data (page 67)
- » CxF/X-4 Metadata (page 101)

# 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, CxF2, CxF3, CxF/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).

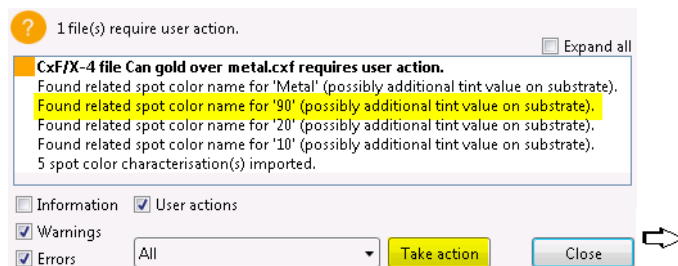


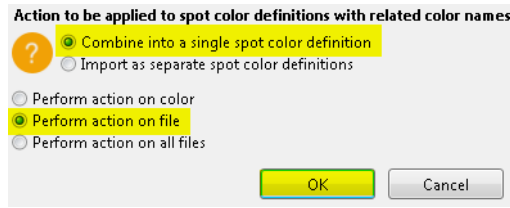
2. If a log window appears, click on the messages to see more details, then close the window.

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:

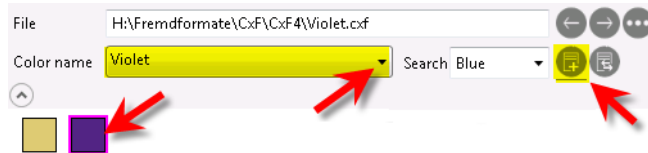
- Spot colors with invalid spectral data. Such definitions can be discarded.
- Spot colors with similar names interpreted as different tint values of the same color. Example: Blue, Blue10, Blue20 ... Blue90. Such colors can be combined into a single color.
- Spot colors with similar names interpreted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



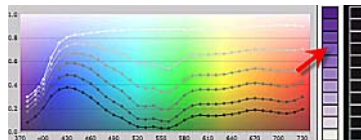


3. If you want to load color data from additional files, click . Now the button is displayed with an underline . The color definitions will no longer be removed from the dialog when additional files are loaded.
4. Select a CxF/X-4 color definition using the **Color name** list or by clicking on the color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

If the color list is long, enter parts of the name into the **Search** box. The color will be selected automatically. If your input matches more than one name, you can select from a list that contains only names that match your input.



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

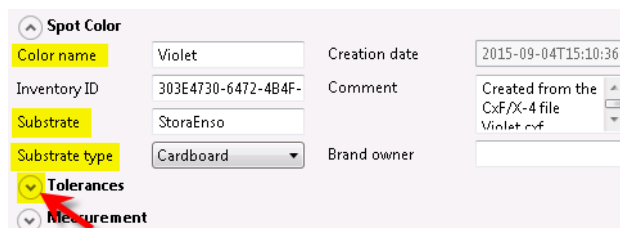


6. Correct or complete the *metadata* fields of the selected color definition.



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.



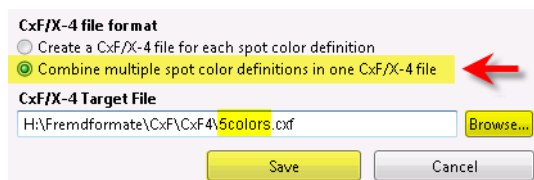
7. Repeat steps 4 and 6 to view and edit additional color data. In bulk-edit mode, you can change multiple color definitions in one go. Click and refer to *Multi-Color Editing and Deleting* for more details.

8. Click  if you want to delete the selected color definition.
9. Click  to save the color definitions in CxF/X-4 format. A dialog appears. Select one of the following options:

- **Combine multiple spot color definitions in one CxF/X-4 file**

Select a target directory, enter a file name, then click **Save**.

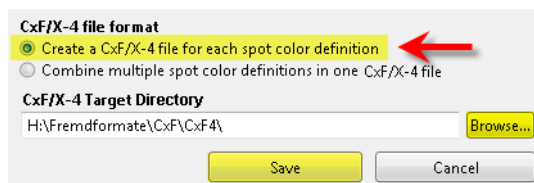
This creates a single CxF/X-4 file with all spot colors.



- **Create a CxF/X-4 file for each spot color definition**

Select a target directory, then click **Save**.

Each spot color will be saved as a separate CxF/X-4 file. The color names will be used as file names.



Related information:

- » [Editing CxF/X-4 Data \(page 16\)](#)
- » [Viewing Spectral Curves and Metadata \(page 20\)](#)
- » [CxF/X-4 Metadata \(page 101\)](#)

## 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 \(page 20\)](#)
- » [CxF/X-4 Metadata \(page 101\)](#)

## 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.

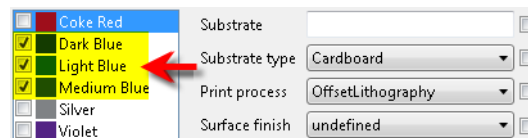
- Open/import  a CxF/X-4, CxF1, CxF2, CxF3, CGATS, QTX or PDF/X file.
- Refer to *Creating CxF/X-4 Data from Files* for more details.



## Multi-Color Editing and Deleting

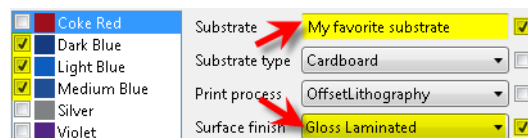
**How to quickly change a set of spot color definitions in one go. In bulk-edit mode, you can change the CxF/X-4 metadata of multiple color definitions, except for the color name and inventory ID. It is also possible to delete multiple color definitions or all in one go.**

1. Open/import  CxF/X-4, CxF1, CxF2, 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 .  
The  button deletes all color definitions, i.e. the dialog will be empty.
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.

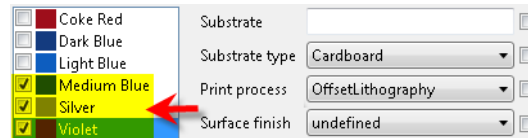
**NOTE:** Metadata fields displayed as empty are either really empty or have 'mixed contents'. The latter means that each of the selected color definitions has different information in this metadata field.

**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.

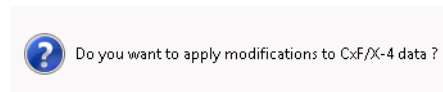
**NOTE:** Some metadata fields such as **Substrate name** and **type** are mandatory and cannot be left empty or undefined. Some tolerances are automatically set to default values.

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

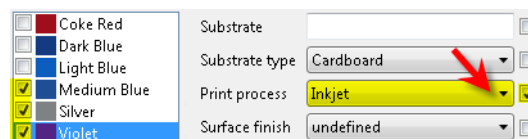


- A question dialog appears when you click on the first check box. Select **Yes** to apply the metadata changes you have just made.

Enable the option **Apply modifications ... without additional confirmation** at the bottom of the window if this question should not be displayed again. Your changes will then always be applied automatically.





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

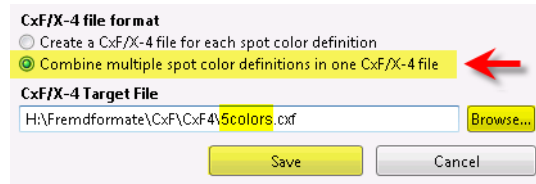


- Repeat the steps above until you have changed all color definitions.
- If you want to save only some of the color definitions, enable the check boxes displayed next to the respective color names (on the left).

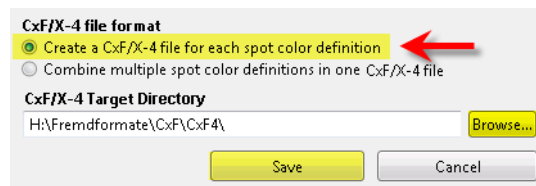


- Click  to save the selected colors as a CxF/X-4 file or click  to save all colors. A dialog with the following options appears:

- **Combine multiple spot color definitions in one Cx F/X-4 file**  
Select a target directory, enter a file name, then click **Save**.  
This creates a single Cx F/X-4 file with all spot colors.



- **Create a Cx F/X-4 file for each spot color definition**  
Select a target directory, then click **Save**.  
Each spot color will be saved as a separate Cx F/X-4 file. The color names will be used as file names.








Related information:

» Cx F/X-4 Metadata (page 101)

## Creating Cx F/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 Cx F/X-4 file. Such library files can be used for conveniently assigning missing Cx F/X-4 data to the spot colors used in a PDF file, for example.

1. Import  color definitions from Cx F/X-4, Cx F1, Cx F2, Cx F3, CGATS, QTX or PDF/X files.  
Refer to *Creating Cx F/X-4 Data from Files* for more details.
2. 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: .
3. Make sure there are only colors you want to include in the Cx F/X-4 file. To remove a color, select it and click .
4. Save  all color definitions to a single Cx F/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 23)
- » Assigning CxF/X-4 Data Automatically (page 24)
- » Multi-Color Editing and Deleting (page 17)

## Example

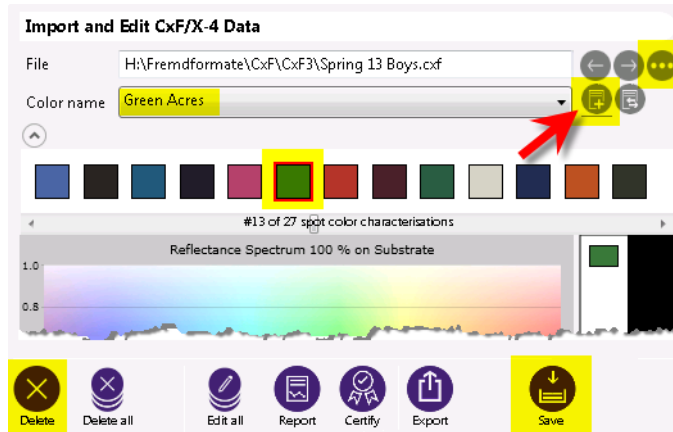


Figure 2-1: Importing and Deleting Color Data

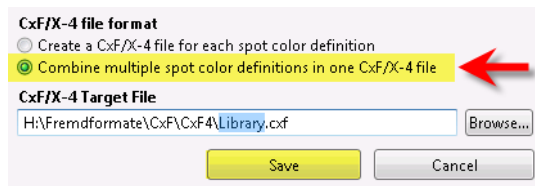








Figure 2-2: Saving all Color Data to a Single File

## 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, CxF2, 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, CxF2, 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).

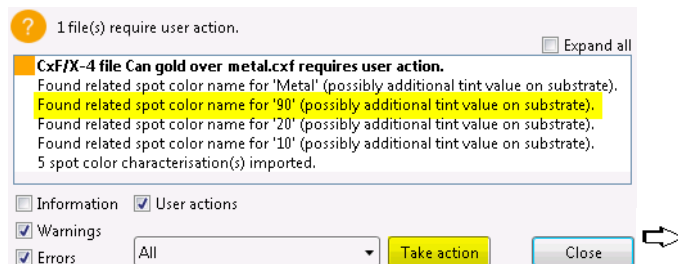


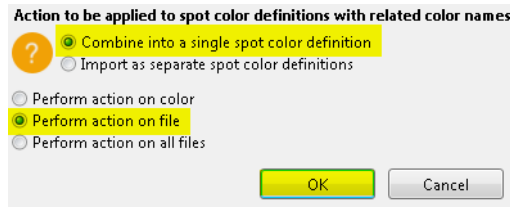
4. If a log window appears, click on the messages to see more details, then close the window.

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.



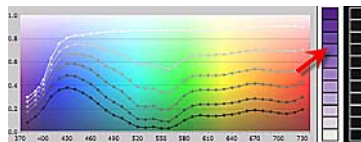


5. Select a CxF/X-4 color definition using the **Color name** list or by clicking on the color box underneath the list. Click the button if the color boxes are not visible.

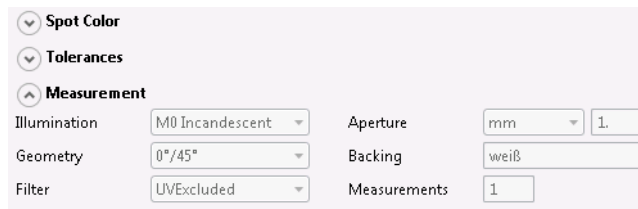
If the color list is long, enter parts of the name into the **Search** box. The color will be selected automatically. If your input matches more than one name, you can select from a list that contains only names that match your input.



6. To inspect 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 \(page 16\)](#)





## Alternatives


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

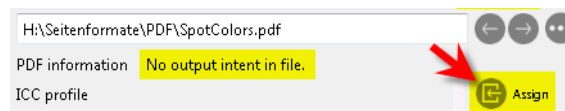
- Click , then . See also *Managing CxF/X-4 Data in PDF Files*.
- Click , then . See also *Print Validation (Certification)*.
- Click , then . See also *Print Validation of GBA Jobs (Certification)*.

# 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

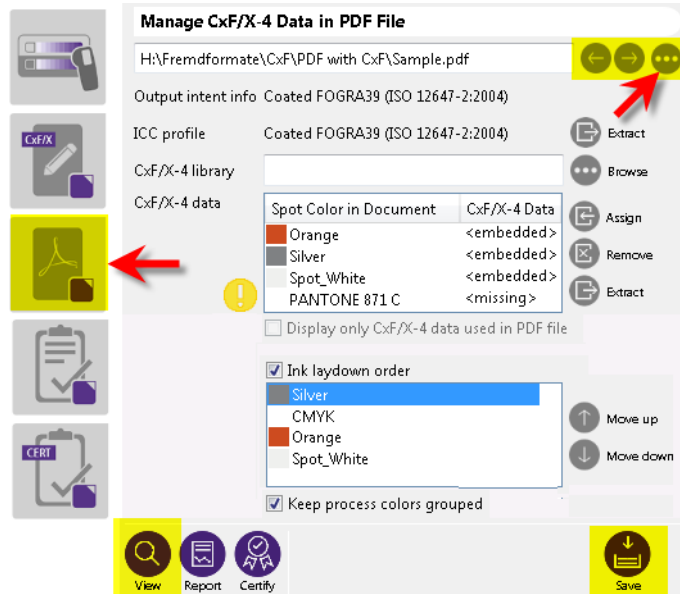


Figure 2-3: Loading and Saving PDF Files

## 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.

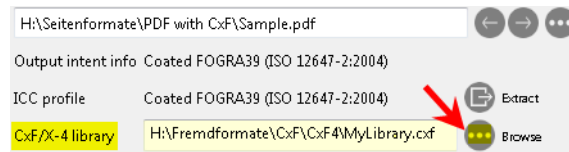
3. To switch this functionality off, delete the path name from the input box.



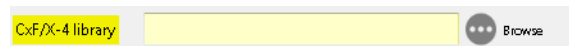
Related information:

» Creating CxF/X-4 Libraries (page 19)

## Example





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





*Figure 2-5: 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.

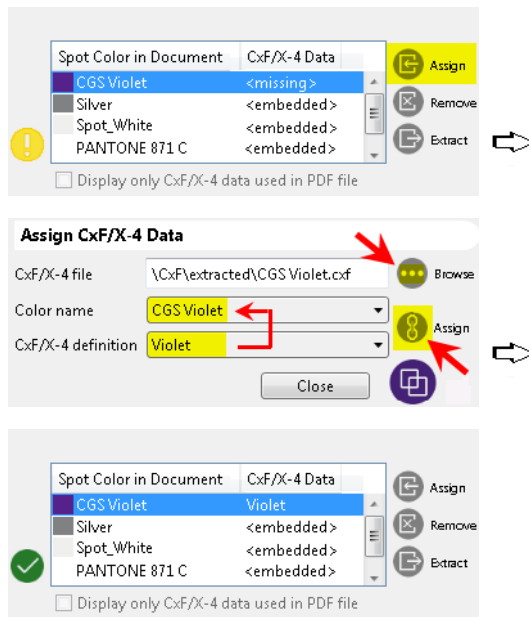
This list contains the color definitions from all CxF/X-4 files you have loaded.

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 2-6: 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 24)

## Example

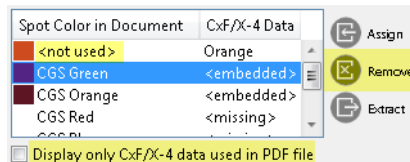



Figure 2-7: Removing CxF/X-4 Data From a Spot Color

## 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 CxF/X-4 Data

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

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

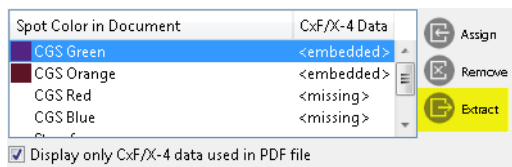



Figure 2-8: Extracting CxF/X-4 Data From PDF File

### 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.

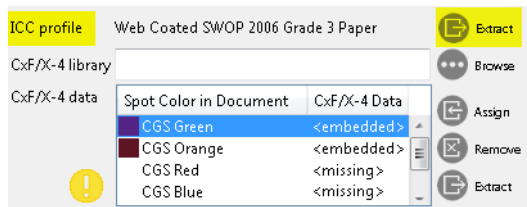




Figure 2-9: Extracting PDF Output Intent Profile

## Changing Ink Laydown Order

ORIS CxF Toolbox allows you to change the information about the order in which CxF/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

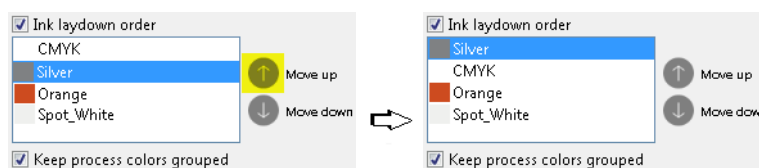


Figure 2-10: Moving a Spot Color to Start of Ink Sequence

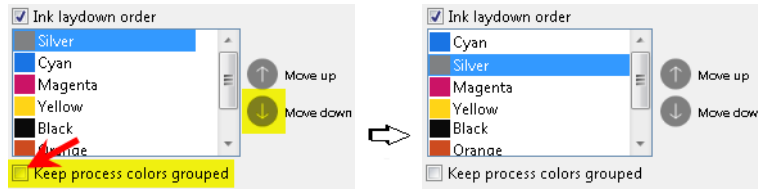


Figure 2-11: Placing a Spot Color Between Process Colors

## 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 validation data can be saved as a PQX file. You can also create validation reports.

Related information:

» [Print Validation of GBA Jobs \(Certification\) \(page 36\)](#)

## Load CxF/X-4 Data

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







### First-time Job Validation

**How to load CxF/X-4 color definitions if a PQX file is not available. This is usually the case when validating 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 validation 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.
  - Drag such files onto the ORIS CxF Toolbox dialog.
  - Use  and  to successively load all files with the currently selected type available in the current folder.

## Example

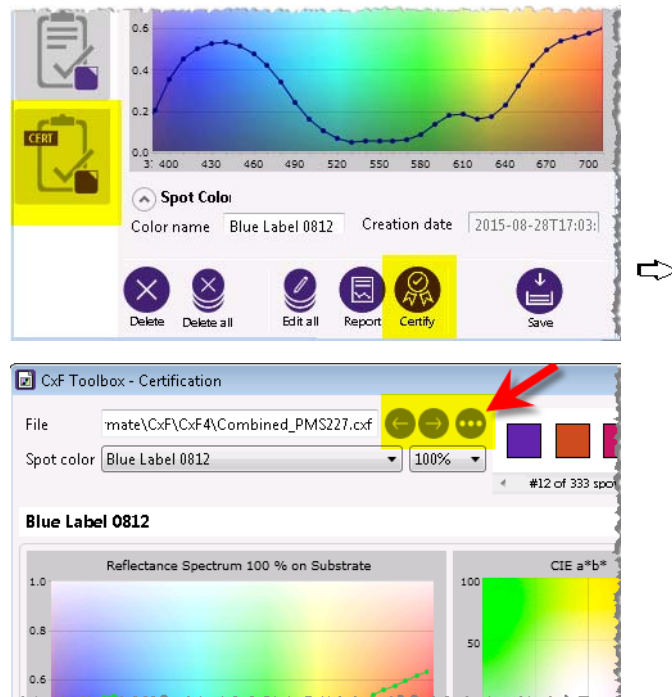






Figure 2-12: Starting Validation Function and Loading Color Data

## Follow-Up Validation with PQX File

The following assumes that you have performed the validation process already and saved the result as a PQX file. To validate the same job again, simply load this PQX file. This will reload the CxF/X-4

color definitions, tolerance values and all other validation 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 validation 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 Validation Results and Create Report (page 36)

## Example

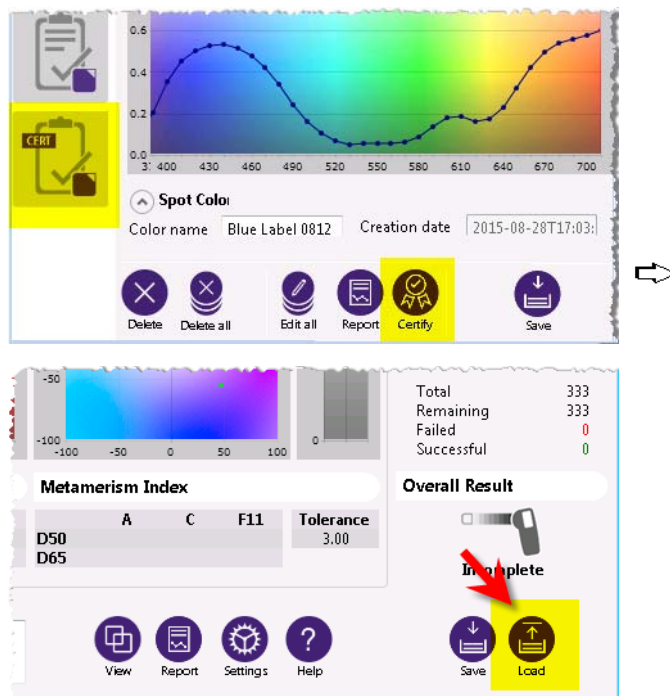



Figure 2-13: Starting Validation Function and Loading PQX File

## Make Validation Settings

The default validation settings stored in the CxF/X-4 data can be adjusted according to your preferences. You can choose to measure

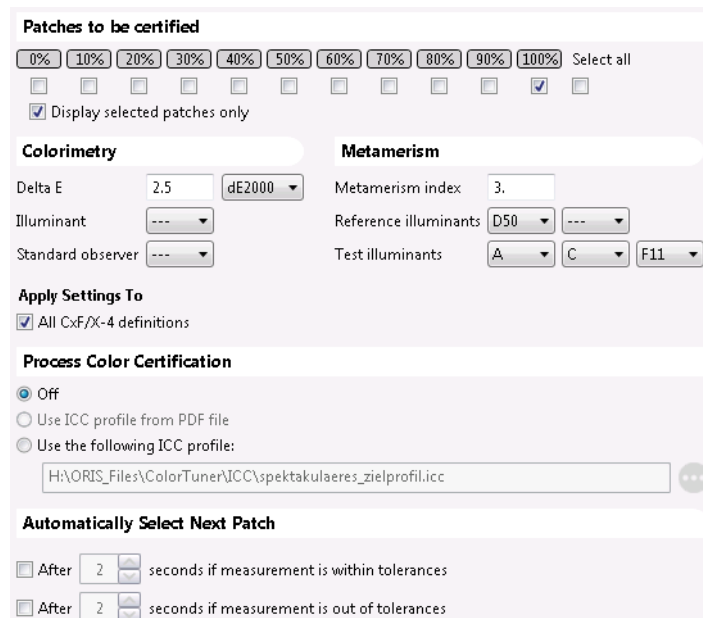
different tint values, validate also process colors, or use different tolerances. This step is usually not required if you have loaded a PQX file.

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*) and the parameters used to calculate them (e.g. the illuminants).
  - Choose to apply these settings to all color definitions (default) or to the selected color definition only.
  - Choose to also validate CMYK process colors.
  - Specify that the next color or tint value should be selected automatically after each measurement.
4. Click **OK** to close the dialog.

Related information:

» Certification Parameters (page 82)

## Example



The screenshot shows the 'Certification Parameters' dialog box with the following settings:

- Patches to be certified:** Tint values 0%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100% are selected. The '100%' checkbox is checked. A 'Select all' button is present.
- Colorimetry:** Delta E is set to 2.5 with a dropdown menu set to 'dE2000'. Illuminant and Standard observer are set to '---'.
- Metamerism:** Metamerism index is set to 3. Reference illuminants are set to 'D50'. Test illuminants are set to 'A', 'C', and 'F11'.
- Apply Settings To:** The checkbox 'All CxF/X-4 definitions' is checked.
- Process Color Certification:** The 'Off' radio button is selected. Other options are 'Use ICC profile from PDF file' and 'Use the following ICC profile:'. The ICC profile path is 'H:\ORIS\_Files\ColorTuner\ICC\spektakulaeres\_zielprofil.icc'.
- Automatically Select Next Patch:** Two checkboxes are present, both with a value of '2' in a spinner box. The first is 'After 2 seconds if measurement is within tolerances' and the second is 'After 2 seconds if measurement is out of tolerances'.

Figure 2-14: Default Validation 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 validation 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, if required, 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 validation result is indicated using a large icon as soon as the last measurement has completed. Validation is *successful*  if all measurement results are successful, otherwise validation has *failed* .

Related information:

- » System Requirements (page 6)
- » Certification (page 77)
- » Certification Parameters (page 82)

## Example

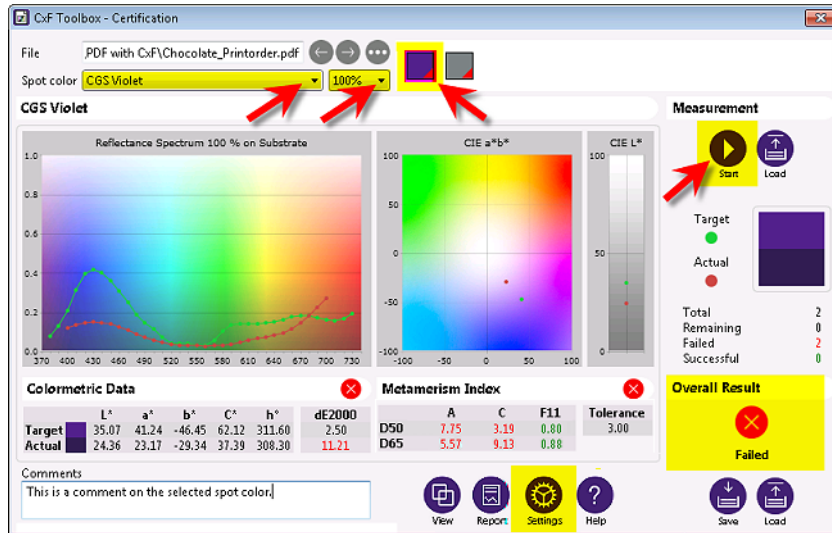


Figure 2-15: Making Validation Measurements

## Measuring with a Third-Party Tool

Validation is also possible if your measurement device is not supported by ORIS Cx:F Toolbox. Measure the spot ink characterization chart with another tool, save the measurements as a CGATS or QTX file and assign them to the Cx:F/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 Cx:F/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 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 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 validation result is indicated using a large icon as soon as the last measurement has completed. Validation is *successful* ✓ if all measurement results are successful, otherwise validation has *failed*



Related information:

» Certification (page 77)

## Example

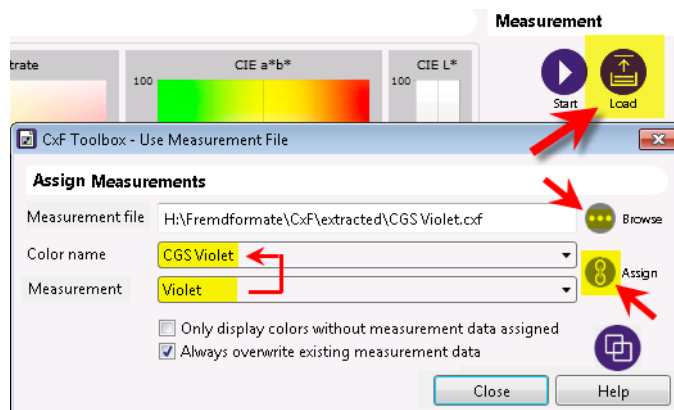


Figure 2-16: Assigning Measurements to CxF/X-4 Color Definitions

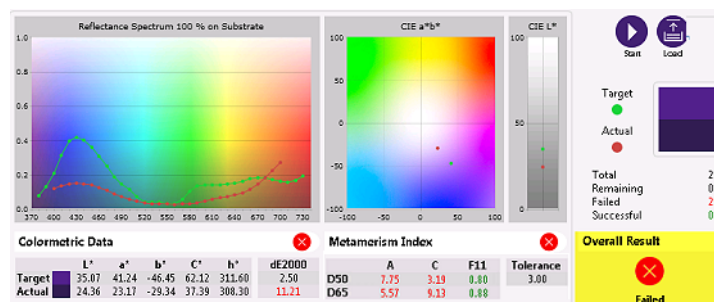




Figure 2-17: Validation Results

## Save Validation Results and Create Report

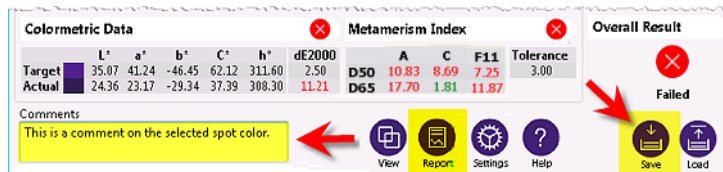
The data currently loaded in the *Certification* dialog can be saved as a PQX file. These files include the complete set of data required for validating a particular job – spot color definitions, target values and tolerances – as well as the measurement data. PQX files can therefore be sent on for print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

When validating 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 validation parameters.

3. *Optional:* Click  if you want to create a report for the validation results.

For more details, refer to *Understanding Validation Reports*.



## 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 validation results can be uploaded to the GBA web server.

Related information:

- » Global Brand Assurance (page 111)
- » Print Validation (Certification) (page 29)

## 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 validation 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.

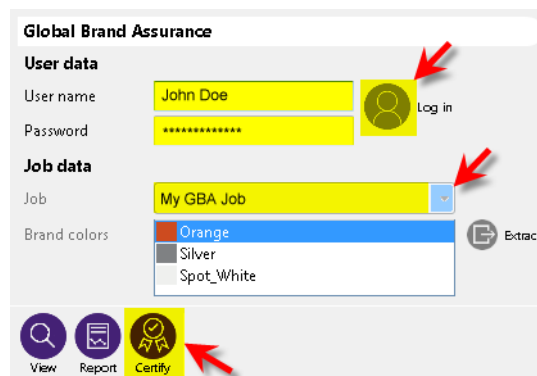





Figure 2-18: Selecting Jobs from GBA Database

**NOTE:** You can specify that the next color or tint value is selected automatically after each validation measurement. To switch this setting on or off, do the following before performing the steps above:

**NOTE:** Click  on the left, load any CxF file, click , click  and use the **Automatically Select Next Patch** options.

Related information:




- » Creating Reports (page 41)
- » Viewing Spectral Curves and Metadata (page 20)




## 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, if required, 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 validation result is indicated using a large icon as soon as the last measurement has completed. Validation is *successful*  if all measurement results are successful, otherwise validation has *failed*

.

Related information:

- » System Requirements (page 6)
- » Certification (page 85)

## Example

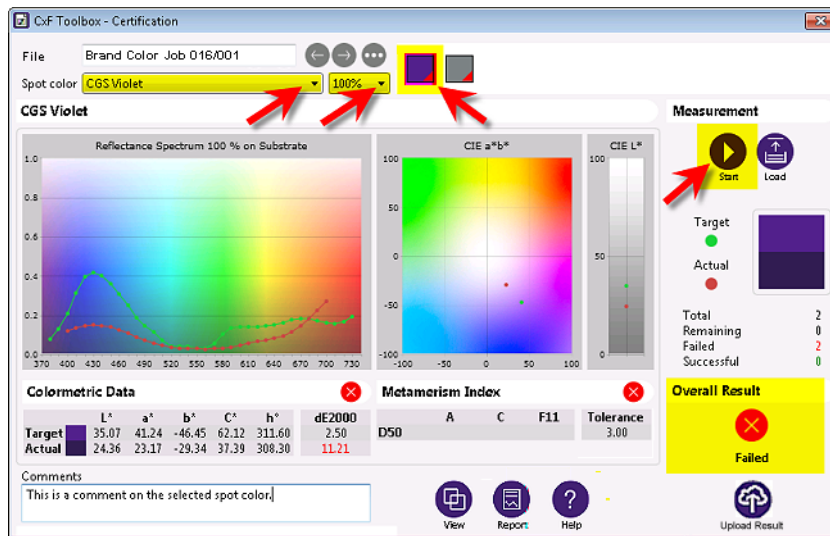










Figure 2-19: Making Validation Measurements for a GBA Job

## Measuring with a Third-Party Tool

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

Related information:

» Certification (page 85)

### Example

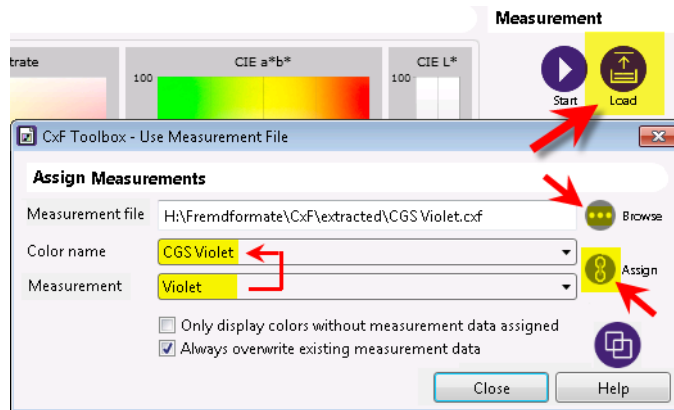


Figure 2-20: Assigning Measurements to CxF/X-4 Color Definitions

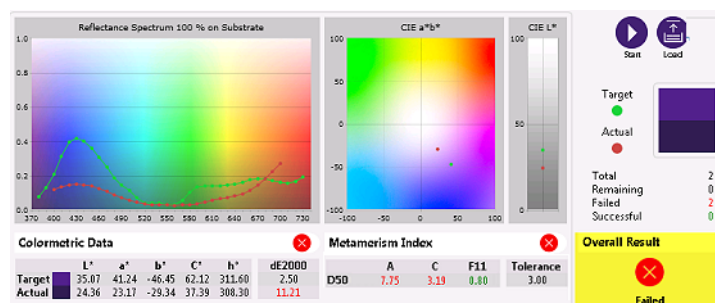


Figure 2-21: Validation Results

## Upload Results to GBA Server and Create Report

Click to upload the measurement results to the Global Brand Assurance web server. Click if you want to create a validation report.



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.

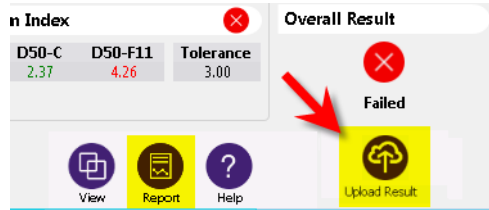


Figure 2-22: Uploading Validation Results to GBA Web Server

Related information:

- » GBA (page 110)
- » Understanding Validation Reports (page 92)

## Creating Reports


You can create reports for the spot colors you have loaded. A report provides important information for design, proofing, ink formulation and process control. Spectral reflectance data and colorimetric data is presented both graphically and numerically. Validation reports allow you to precisely compare your measurements with the target values defined by the CxF/X-4 data.

Related information:

- » Reports (page 89)
- » Preferences (page 106)



## Creating Reports for CxF/X-4 Colors

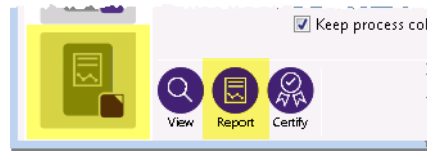
Click  or . Load CxF/X-4 data before or after doing so.




1. To change the default logo displayed in every report, click  and select another image file.
2. Load CxF/X-4 data by measuring colors, importing data or loading PDF files.

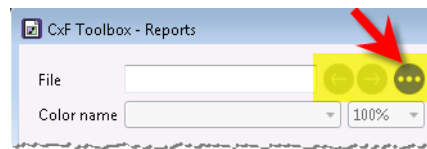
Proceed as explained in the following sections:

- *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*
3. Open the **Reports** dialog:

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



4. Load CxF/X-4 data (only required if step 2 was not taken):
  - 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.





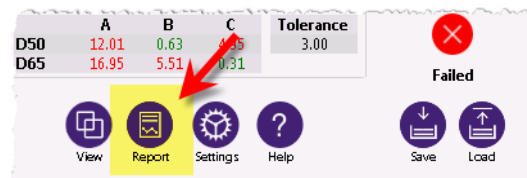
Related information:

- » Preferences (page 106)
- » Understanding Reports on CxF/X-4 Colors (page 89)

## Creating Validation Reports

Click  after making validation measurements.

1. To change the default logo displayed in every report, click  and select another image file.
2. Make validation measurements or load validation results (PQX file).  
Proceed as explained in the following sections:
  - *Print Validation (Certification)*
  - *Print Validation of GBA Jobs (Certification)*
3. Click the  button to open the **Reports** dialog.



*Figure 2-23: Creating a Validation Report*

Related information:

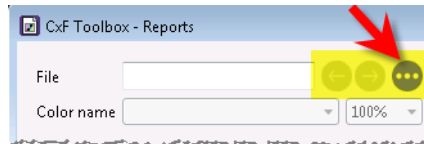
- » PQX (page 111)

- » Preferences (page 106)
- » Understanding Validation Reports (page 92)

## Alternative

Reports for saved validation results can also be created by loading a PQX file in the **Reports** dialog itself.

Make sure to load a *single* file only. Validation results are not displayed if you load multiple PQX files – or one PQX file together with CxF/X-4, QTX or PDF files.



## Using Reports

Select the spot color and tint value the data of which should appear in the report. The spectral reflectance chart can be enlarged and viewed in detail. The current view can be printed.

1. 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.
  2. If various tint values are defined for this color, select a tint value from the list .
  3. Use the list at the bottom to switch between different report types:
    - Report on CxF/X-4 colors
    - Large chart with spectral curves for all tint values
    - Validation report (only possible if measurements were made for the selected color)
  4. Click the **Print** button to print the report with the charts that are currently displayed on the screen.
  5. Refer to the *Reports* section if you need help with understanding the various charts and tables.
-

## Example

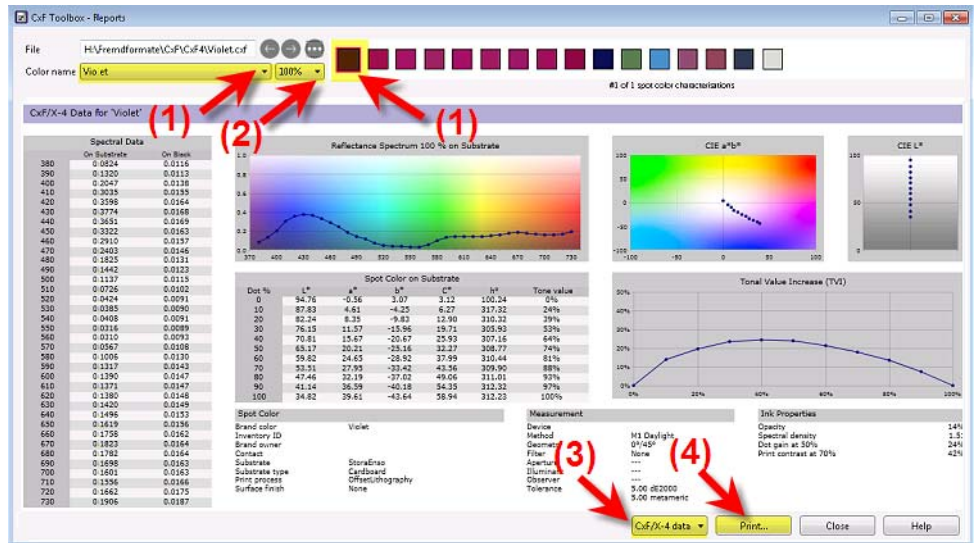


Figure 2-24: Using a CxF/X-4 Report

# Finding Best Matching CxF/X-4 Color for a Printed Sample

If a brand color is only available as a printed sample, you can quickly find the CxF/X-4-defined color which is most similar to it. Load a CxF/X-4 library, measure the sample and ORIS CxF Toolbox will automatically select the best match. This color can be easily added to a new CxF/X-4 library, which can then be used as target values for validation measurements, for example.

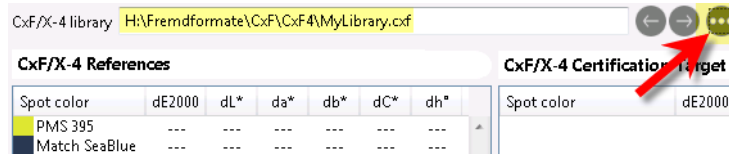
## Measure Printed Samples

Load a CxF/X-4 library file and measure the printed sample. The CxF/X-4 color in this file that is most similar to the measurement will be highlighted automatically. You can easily find alternatives to the best match because the colors are sorted by dE and it is indicated whether they are out of tolerance. Spectral curves, Lab charts, colorimetric data and metamerism indexes allow the color deviations to be inspected precisely.

1. Select the  tool.
2. Load a collection of spot color definitions (CxF/X-4 library):

- Click and select a CxF/X-4 file. Hold the Shift or Ctrl key pressed down to select multiple files.
- Use and to successively load all CxF/X-4 files available in the current folder.
- Drag a CxF/X-4 file onto the ORIS CxF Toolbox dialog.

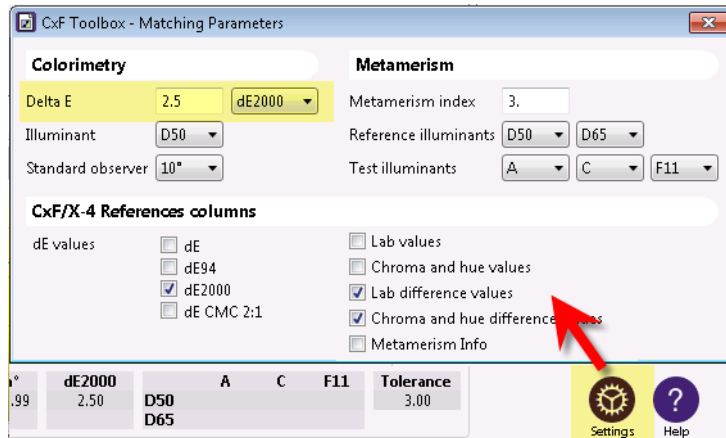
The colors in this file will be listed under **CxF/X-4 References**.



3. *Optional:* Click to modify the default settings for this function.

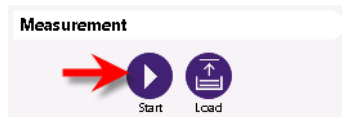
Use the **Colorimetry** options to change the delta E tolerance and the formula for calculating color differences.

The options under **CxF/X-4 References Columns** allow you to add more information to the spot color list. The delta E formulas selected there will *not* be used for calculating color differences.



4. Click and measure the printed sample.

Or click to load a measurement file if you have used a measurement device which is not connected or not supported.

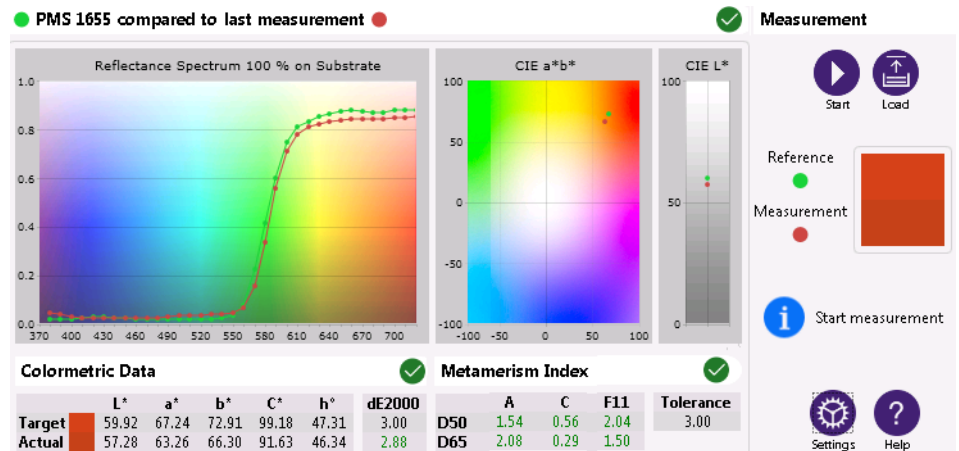


The CxF/X-4 library colors are compared with the measurement and sorted by delta E. The best matching color with the lowest delta E value is selected automatically and appears at the top of the list. You can click the column headers to sort the list differently.


Delta E values are *green* if the color differences are within the tolerance limits, otherwise *red*.

Spot color	dE2000	dL*	da*	db*	dC*	dh*
PMS 1655	2.88	2.64	3.99	6.61	7.55	0.97
PMS 172	2.98	3.16	3.32	3.51	4.83	0.01
PMS 1665	4.36	-3.65	-4.18	3.04	-0.54	3.22
PMS 1505 Fade	6.96	5.10	-11.30	1.69	-6.07	6.27

- To compare the color deviations in detail, take a look at the various charts and tables. The two large color boxes on the right allow you to assess the color difference visually.



- Measure additional samples.


It is advisable to add  the matching CxF/X-4 colors to the list of **CxF/X-4 Certification Targets**.

Related information:

- » Spectral reflectance curve (page 112)
- » Metamerism index (page 111)
- » Creating CxF/X-4 Libraries (page 19)
- » Match measurement with CxF/X-4 data (page 95)
- » Matching Parameters (page 99)

## Create Validation Targets

When measuring printed samples to find the best matching CxF/X-4 color definition, it is advisable to collect these CxF/X-4 colors in a separate library file. The colors can then be used as *certification targets* for print validation measurements or exported to ASE format and then imported into Adobe swatch palettes.

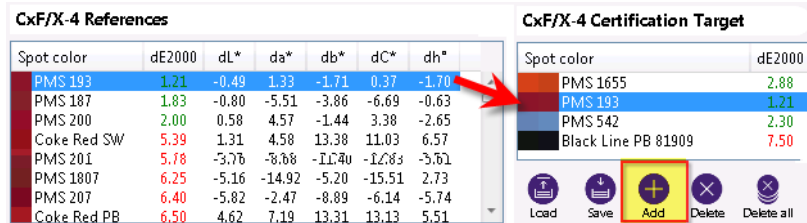
- The spot colors that are found to be best matches in the CxF/X-4 library file will be added to a new CxF/X-4 file by default. If they should be added to an existing CxF/X-4 file, click  and select this file.

CxF/X-4 References							CxF/X-4 Certification Targets	
Spot color	dE2000	dL*	da*	db*	dC*	dh°	Spot color	dE2000
PMS 193	---	---	---	---	---	---		
PMS 201	---	---	---	---	---	---		
PMS 1807	---	---	---	---	---	---		
PMS 207	---	---	---	---	---	---		
Coke Red PB	---	---	---	---	---	---		

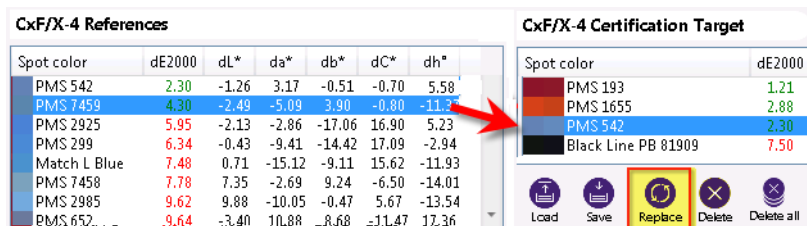
Buttons: Load, Save, Add, Delete, Delete all

- Having measured a printed sample, the best matching CxF/X-4 color is selected automatically. If you do not want to use it, select another color from the list of **CxF/X-4 References** (e.g. the second best).

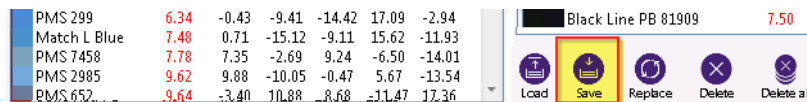
3. Click **+** to add the selected color to the list of **CxF/X-4 Certification Targets** on the right.
4. Measure **▶** additional samples and add **+** the matching CxF/X-4 colors to the list. Repeat this until all printed samples have been measured.



5. The CxF/X-4 data you have matched to a measurement can be replaced as follows:
  1. Select the color in the list of **CxF/X-4 Certification Targets** (right).  
The best matching CxF/X-4 color is selected automatically on the left.
  2. Select a different color in the list of **CxF/X-4 References** (left).
  3. Click the **↻** button.



6. When finished, click **↓** to save the list of **CxF/X-4 Certification Targets** as a CxF/X-4 file.



The new CxF/X-4 file can be used as follows:

- **Validation:**  
Load the CxF/X-4 file to easily measure the spot colors against the CxF/X-4 definitions. See *Print Validation (Certification)* for more details.
- **Color exchange with Adobe CS:**  
Export the CxF/X-4 file to ASE format. See *Using ASE Files for Data Exchange with any Adobe CS Application* for more details.

Related information:

- » [Print Validation \(Certification\)](#) (page 29)
- » [Match measurement with CxF/X-4 data](#) (page 95)

# Importing Brand Colors into Adobe Swatch Palettes




CxF/X-4 color definitions created with ORIS CxF Toolbox can be imported into the swatch palettes of any Adobe CS application. For Adobe Illustrator, we recommend to use the ORIS CxF Designer plug-in. For InDesign and Photoshop, use Adobe Swatch Exchange (\*.ase) files.

Related information:

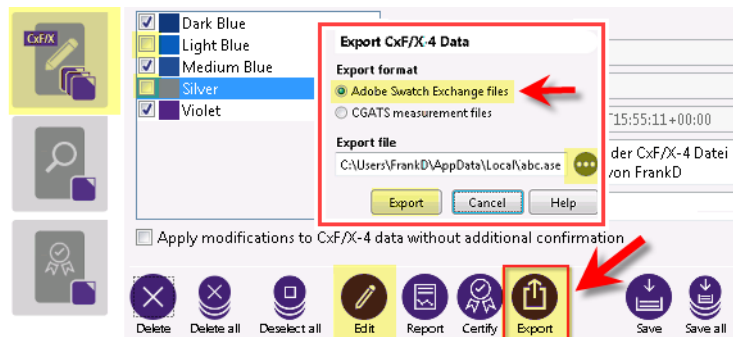
- » CxF/X-4 Workflow (page 5)
- » ASE (page 109)

## Using ASE Files for Data Exchange with any Adobe CS Application

The spot color definitions loaded in ORIS CxF Toolbox can be exported as Adobe Swatch Exchange (ASE) files and then imported into the swatch palette of Adobe Illustrator, InDesign or Photoshop. This allows designers to use colorimetric brand colors for their artwork. Before printing the final PDF/X files it is important to reassign the CxF/X-4 data to the spot colors using ORIS CxF Toolbox.

1. In ORIS CxF Toolbox, select the  tool.
2. Create or open a CxF/X-4 file or color library.
3. *Optional:* Click  to switch to bulk-edit mode and deselect the colors that are not required.
4. Click  and save the color definitions as an ASE file.

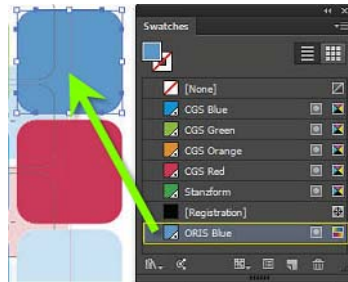
To do so, select **Adobe Swatch Exchange files**, specify a folder and file name, then click **Export**.



5. In the Adobe application, import the colors from the ASE file into your swatch palette.



6. Apply the spot colors to your artwork by dragging the imported swatches to the elements.
7. When finished, save the artwork as a PDF/X file.





Related information:


- » CxF/X-4 Workflow (page 5)
- » ASE (page 109)
- » Creating CxF/X-4 Libraries (page 19)
- » Creating CxF/X-4 Data from Files (page 14)
- » Assigning CxF/X-4 Data Automatically (page 24)

## Reassign CxF/X-4 Data to PDF/X File

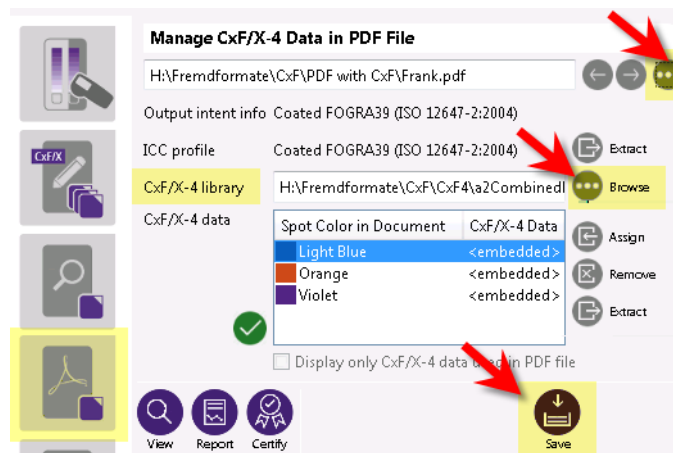
**ASE files do not contain any CxF/X-4 data. It is therefore important to reassign the missing CxF/X-4 data before printing the PDF/X file. This can be done easily using ORIS CxF Toolbox.**

1. Select the  tool.
2. Open the PDF/X file as explained under *Managing CxF/X-4 Data in PDF Files*.
3. Click  next to **CxF/X-4 library** and select the file from which the ASE file had been created.

The CxF/X-4 data found in the selected file is assigned automatically to the corresponding spot colors in the PDF/X file.

4. Click  to save the modified PDF/X file.

This file is now ready for print.



## Using ORIS CxF Designer Plug-in for Adobe Illustrator

Use the ORIS CxF Designer plug-in to import CxF/X-4-defined spot colors into the swatch palette of Adobe Illustrator. This allows designers to use colorimetric brand colors for their artwork. ORIS CxF Designer automatically exports the full CxF/X-4 metadata to the PDF/X file when the final artwork is saved in this format. The file is then immediately ready for print.

ORIS CxF Designer is only compatible with Adobe Illustrator CS6 and CC2015.2.1 or lower. Development of this plug-in has been discontinued. Users of Illustrator CC2015.3 or higher can use ASE format to import spot color names into Illustrator.

Related information:

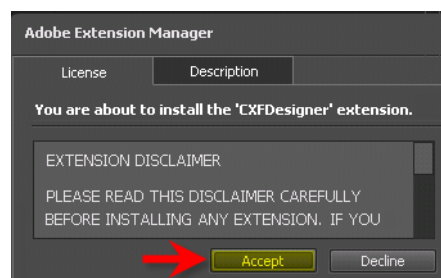
- » CxF/X-4 Workflow (page 5)
- » ORIS CxF Designer (page 4)
- » System Requirements (page 6)

### Install ORIS CxF Designer Plug-in

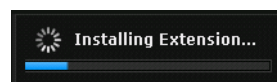
The ORIS CxF Designer plug-in is provided as an extension for Adobe Illustrator. There are two different plug-in installation files, one for Creative Suite and one Creative Cloud. Both can be used on Windows and Macintosh platforms.

1. Double-click the plug-in installation file ( \* . zxp).

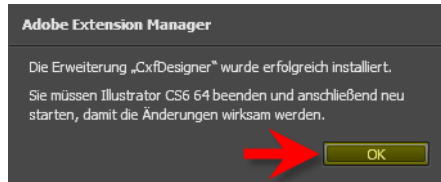
Extension Manager launches automatically and a disclaimer appears.



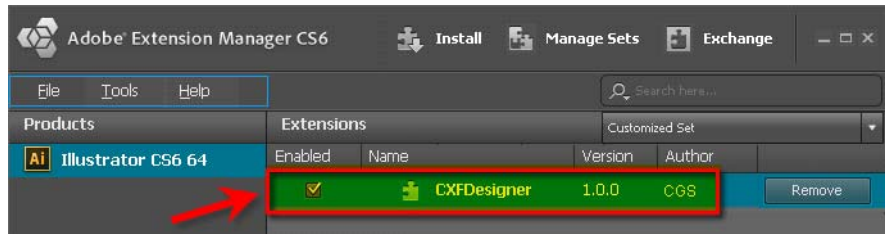
2. Click **Accept**. The installation process starts automatically.



3. A message appears if Adobe Illustrator is running. Exit and restart Illustrator, then click **OK**.



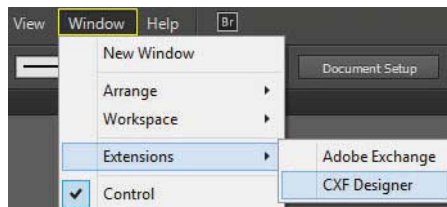
The new extension appears automatically in Extension Manager and is enabled.



## Import CxF/X-4 Data into Illustrator

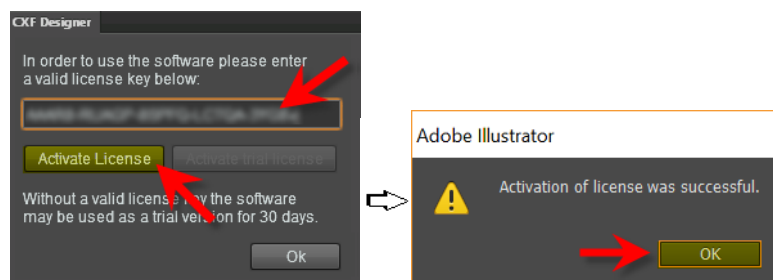
Make sure you have a direct Internet connection to the license server. License activation is not possible if you connect to the Internet via a proxy server. The license cannot be used via Remote Desktop connections.


1. Select the Illustrator command **Window > Extensions > CxF Designer** to open the ORIS CxF Designer plug-in window.

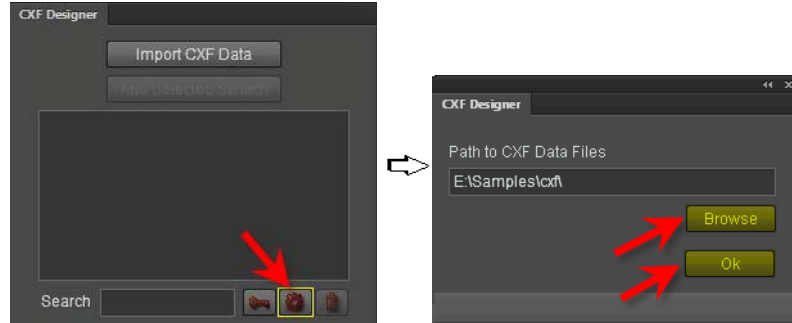


2. Do the following when using the plug-in for the first time:
  1. Enter the license code you have received from CGS.
  2. Click **Activate License**.
  3. Click **OK** on the success prompt.

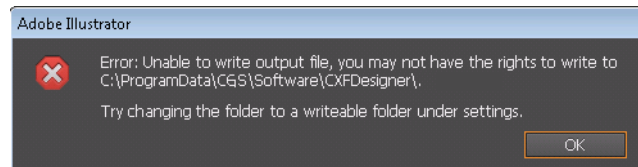
Without a valid license, the program can be activated as a trial version which will be functional for 30 days.



3. Specify a working folder to which you have write access. The CxF/X-4 files you are importing will be stored there.
  1. Click the  button.
  2. Click **Browse** and select a folder.
  3. Click **OK**.



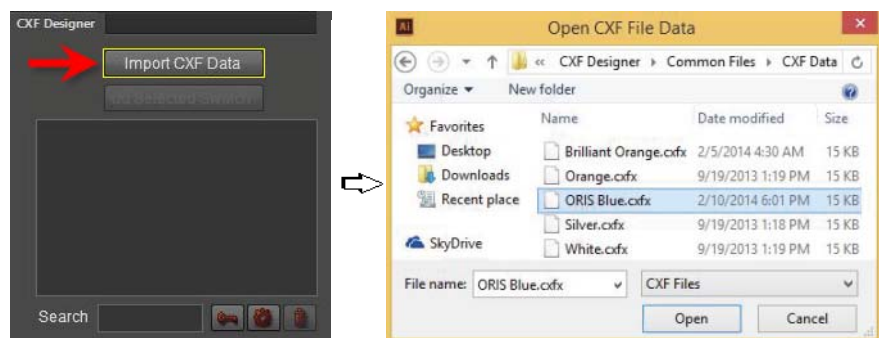
If you leave the default setting, importing usually fails owing to insufficient access rights. The following error message would appear in the next step:



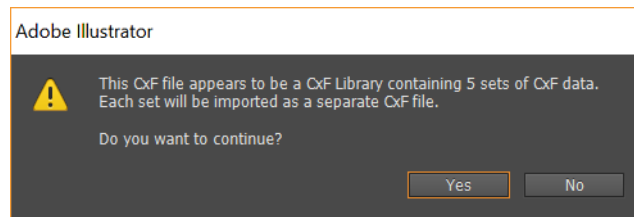
4. Open a design artwork file in Adobe Illustrator.



5. Click the **Import CxF Data** button in the plug-in window and browse to a CxF/X-4 file.

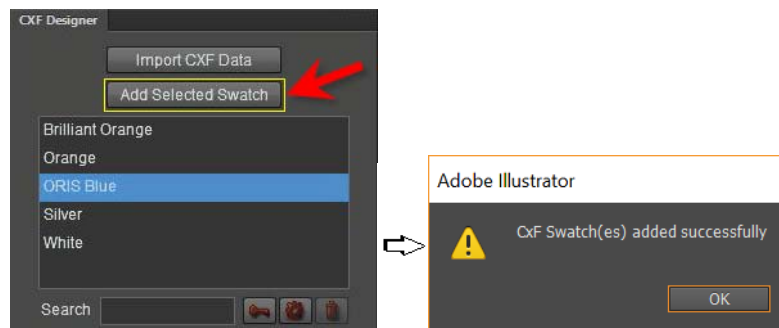


6. A message appears if the selected file contains more than one color definition. Click **Yes** to import each color as a separate CxF/X-4 file.

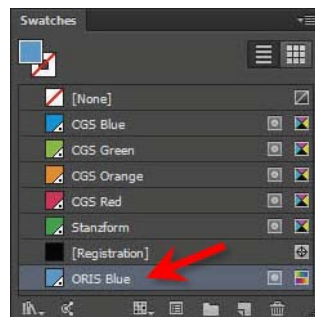


The imported CxF/X-4 color definitions are listed in the plug-in window.

7. Do the following to add color definitions as swatches to the Illustrator palette:
  1. Click on a color definition in the plug-in window. Shift-click or Ctrl-click to select multiple colors.
  2. Click the **Add Selected Swatch** button.
  3. Click **OK** on the success prompt.

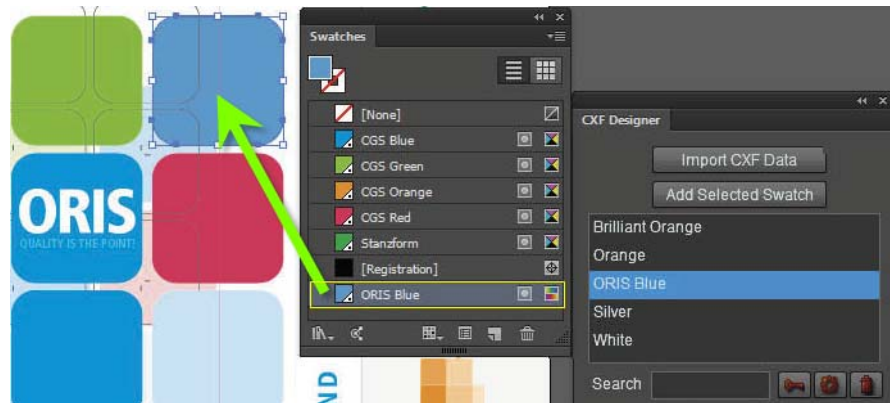


The CxF/X-4-defined colors are now available for use from the Illustrator **Swatches** palette.

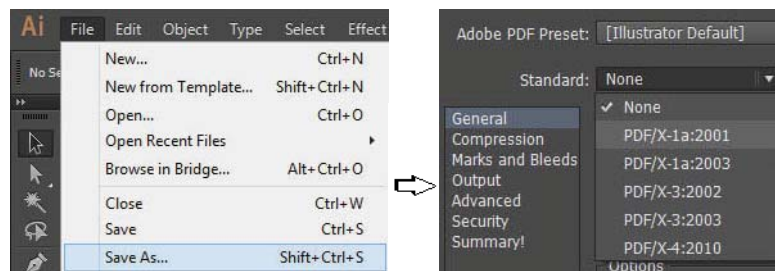


## Use CxF/X-4 Swatches and Save as PDF/X

1. Designate art elements in a PDF file to utilize CxF/X-4-defined color swatches in the same way any other Illustrator swatch is used. Click the CxF/X-4 swatch and drag it to the art element.



2. When design is complete and all art elements have been designated with CxF/X-4 swatches as appropriate, save the artwork as a PDF/X file.



---

# 3

# Parameter Reference

Explanation of the options and parameters provided by the user interface.

## 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 color patches 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. The button changes to .

If the **Average** option is enabled, click  to measure a spot ink chart again. Do this until the number of measurements that should be averaged has been performed. (You can click  at any time if you decide to average less measurements than specified under **Average**.)



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. The button changes to .



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.



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

Related information:

- » [Spot ink characterization chart \(page 112\)](#)
- » [Creating CxF/X-4 Data by Measurement \(page 9\)](#)
- » [System Requirements \(page 6\)](#)

## 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

Standard light source expected to be used for viewing samples of the printed color.

The illuminant selected here determines the white point used for calculating the measurement data.



### Standard observer

Standardized angle of the average human eye at which samples of the printed color are expected to be viewed. This angle determines the field of view and thus the way a person perceives color.

### Measurement method

Light source to be used for illuminating the printed samples during the measurement.

ISO 13655 measurement methods:

- M0** Traditional non-standardized tungsten light with an undefined UV content
- M1** Normal daylight (D50) with a defined UV content
- M2** Non-polarized light without any UV content (UV-cut filter)

***NOTE:** 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 9)
- » Measure CxF/X-4 Data (page 55)


## Create CxF/X-4 Data from Measurement

**Use this dialog to edit and save the CxF/X-4 data you have obtained by measuring spot colors. You can view the spectral curves, add or correct the CxF/X-4 metadata and rename or delete color definitions. Finally save the spot color definitions as CxF/X-4 files.**

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

### File

These options are currently unavailable.

***NOTE:** To open or import files, click the  button on the left. The **File** options will become available and the measurement data disappears. Reclick this button to return to your measurement data.*

### 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 colors you have measured in the current ORIS CxF Toolbox session.

Alternatively, click on a color box displayed under the list.

### Search

Use this option to quickly find a specific spot color if many colors are loaded.



Enter the first few letters of any part of the color name. This will select the first spot color the name of which is matched by these characters.

If your input matches multiple colors, click on the small arrow to select a color from the list. This list contains only colors with names that contain the characters you have entered.



These buttons are unavailable when measurement data is being edited.



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

This is the metadata information stored for the selected CxF/X-4 color definition. Measurement device details and various default values have been added automatically. Complete the information which is missing.

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

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

## 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.

See also *Quickly Measuring Colors with Similar Metadata*.



Click this button to display the *Measure CxF/X-4 Data* tab which allows you to create additional CxF/X-4 data by measuring spot colors.

Clicking the  button on the left has the same effect.



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 (*validation*).



Click this button to export all spot colors as *CGATS* or Adobe Swatch Exchange (*ASE*) files. Using ASE files you can load the spot colors into the swatch palettes of Adobe design applications.

**NOTE:** *ASE files do not contain any CxF/X-4 data. Having designed a page in an Adobe CS application, make sure to open the resulting PDF/X file in ORIS CxF Toolbox and reassign the CxF/X-4 data to the spot colors.*



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:


- » CxF/X-4 (page 109)
- » Creating CxF/X-4 Data by Measurement (page 9)
- » Quickly Measuring Colors with Similar Metadata (page 12)
- » Assigning CxF/X-4 Data Automatically (page 24)
- » CxF/X-4 Metadata (page 101)
- » Measure CxF/X-4 Data (page 55)



## 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/CxF2/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.

### Search

Use this option to quickly find a specific spot color if many colors are loaded.

Enter the first few letters of any part of the color name. This will select the first spot color the name of which is matched by these characters.

If your input matches multiple colors, click on the small arrow to select a color from the list. This list contains only colors with names that contain the characters you have entered.



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

This is the 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.

See also *Quickly Measuring Colors with Similar Metadata*.



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 (*validation*).



Click this button to export all spot colors as *CGATS* or Adobe Swatch Exchange (*ASE*) files. Using ASE files you can load the spot colors into the swatch palettes of Adobe design applications.

**NOTE:** *ASE files do not contain any CxF/X-4 data. Having designed a page in an Adobe CS application, make sure to open the resulting PDF/X file in ORIS CxF Toolbox and reassign the CxF/X-4 data to the spot colors.*



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:

» ASE (page 109)

- » CGATS (page 109)
- » CxF1 (page 109)
- » CxF2 (page 109)
- » CxF3 (page 109)
- » CxF/X-4 (page 109)
- » QTX (page 112)
- » Creating CxF/X-4 Data from Files (page 14)
- » Editing CxF/X-4 Data (page 16)
- » Creating CxF/X-4 Libraries (page 19)
- » Creating Reports (page 41)
- » Print Validation (Certification) (page 29)
- » Import and Edit CxF/X-4 Data (page 67)
- » CxF/X-4 Metadata (page 101)

## 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.

Message details:


- To see more details, click on a status message or enable the **Expand all** option underneath this list
- If *spectral data with invalid values* are reported, hover the cursor over the message details to see the spectral curves displayed in the main window.
- 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 \(page 14\)](#)

## 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
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 14)
- » Log (page 63)

## 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 14)
- » Log (page 63)

## Export CxF/X-4 Data

Use this dialog to convert the spot color definitions to a different file format.

The following file formats can be selected:

- Adobe Swatch Exchange (ASE) files  
Click , select a folder and enter a file name, then click the **Export** button.  
All spot color definitions will be written to a single file (\*.ase). Use this file to load the colors into the swatch palette of an Adobe application. *ASE files do not contain any CxF/X-4 data. Having designed a page in an Adobe CS application, make sure to open the resulting PDF/X file in ORIS CxF Toolbox and reassign the CxF/X-4 data to the spot colors.*
- CGATS measurement files  
Click , select a folder, then click the **Export** button.  
A separate file (\*.txt) for every spot color definition will be created in the specified folder.

Related information:


- » CxF/X-4 Workflow (page 5)
- » Using ASE Files for Data Exchange with any Adobe CS Application (page 48)
- » Assigning CxF/X-4 Data Automatically (page 24)



## 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/CxF2/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. Enable the option **Apply modifications ... without additional confirmation** if this question should not be displayed again.*

## 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.

## Options

### Apply modifications ... without additional confirmation

If this option is enabled, all of your changes will be applied automatically. The application will no longer ask you whether your changes should be applied when you select or deselect spot colors in the list on the left.

## 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



Click this button to display the *Measure CxF/X-4 Data* tab which allows you to create additional CxF/X-4 data by measuring spot colors.

Clicking the

This button is only available if the color definitions being listed were created by measuring spot colors in the current ORIS CxF Toolbox session.



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 (*validation*).



Click this button to export the selected spot colors as *CGATS* or *Adobe Swatch Exchange (ASE)* files. Using ASE files you can load the spot colors into the swatch palettes of Adobe design applications.

**NOTE:** *ASE files do not contain any CxF/X-4 data. Having designed a page in an Adobe CS application, make sure to open the resulting PDF/X file in ORIS CxF Toolbox and reassign the CxF/X-4 data to the spot colors.*



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:


- » ASE (page 109)
- » CGATS (page 109)
- » CxF1 (page 109)
- » CxF2 (page 109)
- » CxF3 (page 109)
- » CxF/X-4 (page 109)
- » QTX (page 112)
- » Import and Edit CxF/X-4 Data (page 60)
- » CxF/X-4 Metadata (page 101)



## View CxF/X-4 Data

**Use this dialog to inspect the spectral reflectance curves and meta-data information for spot colors defined in CxF1, CxF2, 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.



### Search

Use this option to quickly find a specific spot color if many colors are loaded.

Enter the first few letters of any part of the color name. This will select the first spot color the name of which is matched by these characters.

If your input matches multiple colors, click on the small arrow to select a color from the list. This list contains only colors with names that contain the characters you have entered.



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 (*validation*).



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 23)
- » Viewing Spectral Curves and Metadata (page 20)
- » Creating Reports (page 41)
- » Print Validation (Certification) (page 29)

## 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 24)

# 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 (*validation*).

Related information:

- » Print Validation of GBA Jobs (Certification) (page 36)
- » Creating Reports (page 41)
- » Viewing Spectral Curves and Metadata (page 20)


# 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 validation results can be saved as a PQX file and displayed as a report.

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 or to specify that the next color should be selected automatically after each measurement.



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:

 Validation successful (within tolerance limits)

 Validation failed (out of tolerance)



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

Click  and select a different set of tint values if some tint values are not listed or missing on your spot ink characterization chart. You can

also specify that the next tint value should be selected automatically after each measurement.

## <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 ● target and ● actual values calculated from spectral data:

- Hue (a\*b\*)
- Lightness (L\*)

### Colorimetric Data

● Target and ● actual values indicated numerically:

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

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 deviation under two different illuminants.

ORIS CxF Toolbox calculates up to six MI values using one or two *reference illuminants* (D50 by default) and up to three *test illuminants* (A, C and F11 by default). Validation is successful ✓ if all of these MI values are within the tolerance limit. Otherwise validation fails ✗.

The tolerance limit is the maximum deviation permitted from a target value of 0 dE. A value of 0 means that the reference and measured sample must show exactly the same color deviations under both illuminants. A value of 3.0 means that the samples are not allowed to differ in metamerism by more than 3.0 delta E.


The program uses the tolerance value stored in the CxF/X-4 meta-data. If this value is 0 or unavailable, a default tolerance of 3.0 will be used automatically.

Click  if you want to change the tolerance value or to select different reference and test illuminants.

**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 validation 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 validation data as a PQX file. This includes all CxF/X-4 color definitions, validation settings (e.g. user-defined tolerances), and the validation results (actual values).

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

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



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


See also *Follow-Up Validation 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 create a report for the validation results.



Click this button to open a *dialog* allowing you make various settings for the validation process. You can override some of the default settings like tint values to be measured or tolerances for delta E and



metamerism index. It is also possible to include process colors in the validation process.

Related information:


- » Print Validation (Certification) (page 29)
- » Creating Reports (page 41)
- » System Requirements (page 6)

## 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 29)
- » Creating Reports (page 41)
- » System Requirements (page 6)

## Certification Parameters

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

### Patches to be Certified

0% 10% 20% ...

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 validation result.

## Colorimetry

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

### 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. Validation 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 validation process if these values are set to 0 or undefined.

### Illuminant

Standard light source expected to be used for viewing samples of the printed color.

This option affects the way the measurement data is converted to CIE Lab. Different illuminants will produce different delta E values in the printer validation process.

### Standard observer

Standardized angle of the average human eye at which samples of the printed color are expected to be viewed. This angle determines the field of view and thus the way a person perceives color.



This option affects the way the measurement data is converted to CIE Lab. Different observation angles will produce different delta E values in the printer validation process.

## Metamerism

### Metamerism index

Enter a tolerance value for the *metamerism index* (MI) if this value is incorrect or missing in the CxF/X-4 metadata.

The tolerance limit is the maximum deviation permitted from a target value of 0 dE. A value of 0 means that the reference and measured sample must show exactly the same color deviations under both illuminants. A value of 3.0 means that the samples are not allowed to differ in metamerism by more than 3.0 delta E.

ORIS CxF Toolbox calculates up to six metamerism index values for every measurement, depending on the number of selected reference and test illuminants. Validation is successful  if all of these MI values are within the tolerance limit. Otherwise validation fails .


A default value of 3.0 is used for the validation process if this value is not defined, i.e., if the tolerance is 0.

### Reference/Test illuminants

Select the lighting conditions to be used for calculating the metamerism index (MI) values. You can use one or two *reference illuminants* and up to three *test illuminants*.

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)

The selected illuminants will be used for all subsequent validation measurements until different illuminants are selected here – or until a PQX file with different illuminant settings is loaded . Reference and test illuminants are not stored in the metadata of a CxF/X-4 file.

**NOTE:** You can disable the validation of the metamerism index by selecting the setting --- for either all reference illuminants or all test illuminants. In this case there will only be a colorimetric validation (delta E).

## Apply Settings to

This option determines the scope of the following options:


- **Patches to be Certified**
- **Colorimetry** (all options in this group)
- **Metamerism index**

If enabled, the settings made with these options will apply to all CxF/X-4 color definitions loaded in the **Certification** dialog (default setting). If disabled, the changes will only be applied to the currently selected color definition.

## Process Color Certification

Use this option 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.



- **Off**

Functionality disabled. Only spot colors will be validated.

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

## Automatically Select Next Patch

Enable these options if the next spot color or tonal value should always be selected automatically after a measurement has completed. This allows you to quickly make all measurements one after the other without having to select anything. This can save time when many spot colors are loaded.

If this option is enabled, you can specify the number of seconds during which the current measurement results should be visible before the next spot color or tonal value is selected automatically. You can make this setting separately for measurements that are within tolerances  and for out-of-tolerance measurements .

If this option is disabled, the color patches remains selected after the measurement and can thus be remeasured conveniently.

*NOTE: This setting applies to the current user and cannot be stored in a PQX file. The setting is saved when you exit ORIS CxF Toolbox and reapplied automatically when you restart the application.*

Related information:

- » Print Validation (Certification) (page 29)
- » Creating Reports (page 41)
- » System Requirements (page 6)


# 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 measurement 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 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:

- Validation successful (within tolerance limits)
- Validation 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): ●.

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 ● target and ● actual values calculated from spectral data:

- Hue (a\*b\*)
- Lightness (L\*)

### Colorimetric Data

● Target and ● actual values indicated numerically:

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



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 deviation 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. Validation is successful  if all of these MI values are within the tolerance limit. Otherwise validation fails .

The tolerance limit is the maximum deviation permitted from a target value of 0 dE. A value of 0 means that the reference and measured sample must show exactly the same color deviations under both illuminants. A value of 3.0 means that the samples are not allowed to differ in metamerism by more than 3.0 delta E.

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.


## 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 validation 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 validation result. 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 create a report for the validation results.

Related information:

- » Print Validation of GBA Jobs (Certification) (page 36)
- » Creating Reports (page 41)
- » System Requirements (page 6)



# Reports

A report provides important data for design, proofing, ink formulation and process control. The data is presented both graphically and numerically. There are reports on CxF/X-4 color definitions and also validation reports. The latter allow you to precisely compare your measurements with the target values defined by the CxF/X-4 data.

Related information:

» Creating Reports (page 41)

## Understanding Reports on CxF/X-4 Colors

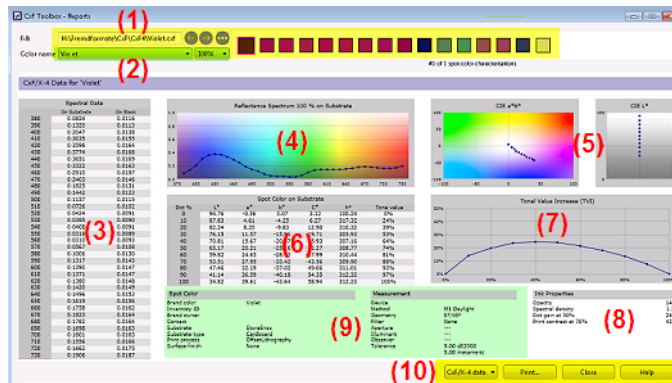


Figure 3-1: Example of CxF/X-4 Color Report

### Explanation of Figures

#### (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 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) CIE a\*b\* and L\* charts**

CIE Lab values of all tint values listed in table (6) plotted as:

- Hue (a\*b\*) chart
- Lightness (L\*) chart

**(6) Colorimetric data for selected color printed on substrate**

For each tint value, calculated from the spectral data:

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

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%).

**(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 (6).

**(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. 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**

The button on the left allows you to switch between the following:

- **CxF/X-4 data**  
Report on CxF/X-4 colors.
- **Spectral data**  
Spectral curves for all tint values of selected CxF/X-4 color printed on substrate. Large chart that fills the entire window area.
- **Certification**  
Validation report.  
Setting only available if validation measurements were made for selected CxF/X-4 colors

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

Related information:

- » Tone value increase (page 112)
- » CxF/X-4 (page 109)
- » Creating Reports for CxF/X-4 Colors (page 41)
- » Creating Validation Reports (page 42)
- » CxF/X-4 Metadata (page 101)

## Understanding Validation Reports

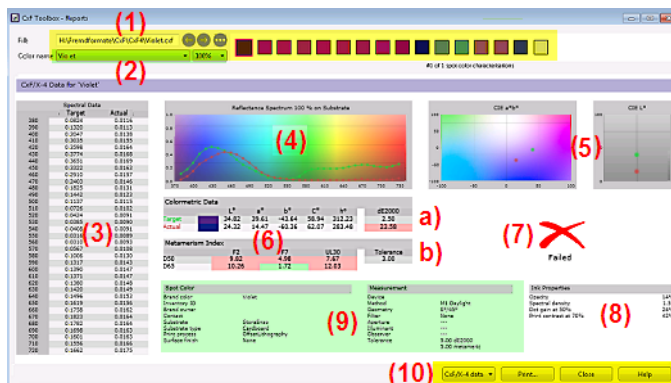





Figure 3-2: Example of Validation Report

## Explanation of Figures

### (1) File selection


Click  to load validation results saved as a PQX file.

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

*NOTE: Validation results are only displayed if you load a single PQX file. If you select multiple files and PQX files are among them, the report will include the CxF/X-4 color definitions stored in these PQX files, but validation results will be ignored. The report will therefore be as explained in section Understanding Reports on CxF/X-4 Colors.*



### (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.



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

The spectral data and colorimetric data for the selected color and tint value will appear in the dialog.

### (3) Spectral reflectance data for target and actual values

- Left: Wavelength of incident light in nanometers.
- Center: Portion of reflected light defined by CxF/X-4 data ( target values).
- Right: Portion of reflected light that was measured ( actual values).



### (4) Spectral reflectance curves for target and actual values

- X-axis: Wavelength of incident light in nanometers.
- Y-axis: Portion of reflected light (1,0 = 100%)
- Curves for CxF/X-4 data ( target values) and measurement ()
- Curve points: Nanometer values listed in table (3)



### (5) CIE Lab charts

Colorimetric values of table (6a) plotted as:

- Hue ( $a^*b^*$ ) chart
- Lightness ( $L^*$ ) chart

Two points:  CxF/X-4 data;  measurement

### (6a) Colorimetric data

For  CxF/X-4 data and  measurement, calculated from spectral data:

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

Validation result:

- Color deviation with pass/fail indication (red/green background)

- Tolerance value

#### (6b) Metamerism index (MI)

Calculated from the deviations between ● CxF/X-4 color and ● measured color viewed under different illuminants:

- MI values with pass/fail indication (red/green background)
- Tolerance value
- MI validation is successful if all MI values are within this tolerance limit (green)

#### (7) Overall pass/fail indication

The icon indicates the overall validation result:

✓ passed:

All validation results are OK (both the dE value and all MI values)

✗ failed:

At least one validation result is not OK (delta E, one or more MI values, or both)

#### (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. 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

The button on the left allows you to switch between the following:

- **CxF/X-4 data**  
Report on CxF/X-4 colors.

- **Spectral data**  
Spectral curves for all tint values of selected CxF/X-4 color printed on substrate. Large chart that fills the entire window area.
- **Certification**  
Validation report.  
Setting only available if validation measurements were made for selected CxF/X-4 colors

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

Related information:

- » Metamerism index (page 111)
- » PQX (page 111)
- » QTX (page 112)
- » CxF/X-4 (page 109)
- » Creating Reports for CxF/X-4 Colors (page 41)
- » Creating Validation Reports (page 42)
- » CxF/X-4 Metadata (page 101)




## Match measurement with CxF/X-4 data

**Use this dialog to quickly find the CxF/X-4-defined spot color which is as similar as possible to the color of a printed sample. Load a CxF/X-4 library and measure the sample. The best matching color will be highlighted and can be saved as a new CxF/X-4 file.**

For step-by-step instructions, refer to *Finding Best Matching CxF/X-4 Color for a Printed Sample*.

### CxF/X-4 Library

Use this option to load the CxF/X-4 library containing your collection of spot color definitions. Your measurements will be compared with these CxF/X-4 colors.

Click  and select a CxF/X-4 file. Hold the Shift or Ctrl key pressed down to select multiple files. Using  and  you can successively load all CxF/X-4 files available in the current folder (only one at a time).


Alternative, drag a CxF/X-4 file onto the ORIS CxF Toolbox dialog.

## CxF/X-4 References

This is the list of color definitions stored in the CxF/X-4 library you have loaded.


When a printed sample is measured, color difference values are displayed and the list is sorted by delta E. The CxF/X-4 color definition which comes closest to the measurement result is selected automatically and moves to the top of the list.

The sorting order can be changed by clicking any of the column headers. The delta E values are set in *green* type if the color deviations are within the tolerance limits, otherwise in *red*.

The best matching color can be added to the list of **CxF/X-4 Certification Targets** by clicking the  button. You can also select a different color if you prefer to use the second best match, for example.



## CxF/X-4 Certification Targets

### Spot color

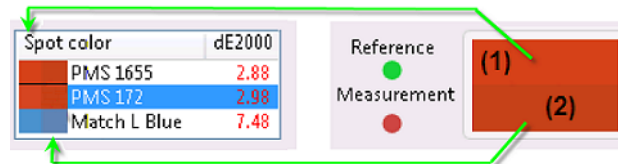
This is the list of CxF/X-4 color definitions you have copied from the list of **CxF/X-4 References** (library file) by clicking the  button. These colors can be saved as a separate CxF/X-4 file.

When you select a color in this list, the CxF/X-4 color that best matches the measurement data will be selected automatically on the left. To select no colors, click anywhere on the white space under the list.

Each list entry consist of the following data:

- **Reference** : CxF/X-4 data from library file (1)
- **Measurement** : Data from printed sample (2)  
(not available for colors in a CxF/X-4 file that has been loaded)

Two color boxes displayed next to each spot color name allow you to visually assess the color difference between (1) and (2). Larger boxes for the selected spot color are displayed further down below.



Click this button if you want to load an existing CxF/X-4 file in order to append the best matching CxF/X-4 color definitions to this file. If no file is loaded, the CxF/X-4 definitions will be saved to a new CxF/X-4 file.

**NOTE:** All spot colors you have added to this list will be removed when you load a CxF/X-4 file.



Click this button to save the colors collected in the list of **CxF/X-4 Certification Targets** as a CxF/X-4 file.

The colors can then be used as *certification targets* for print validation measurements or exported to ASE format and then imported into Adobe swatch palettes.




Click this button after measuring a printed sample to copy the selected CxF/X-4 color from the list of **CxF/X-4 References** (left) to the list of **CxF/X-4 Certification Targets** (right). The closest match is selected automatically.

**NOTE:** A CxF/X-4 color cannot be added if it exists already in the list of **CxF/X-4 Certification Targets**.



Use this button to replace the CxF/X-4 data that has been matched to the selected measurement.

First select the measurement in the list of **CxF/X-4 Certification Targets** (right), then select a CxF/X-4 color definition in the list of **CxF/X-4 References** (left), finally click .



Click this button to remove the selected spot color from the list of **CxF/X-4 Certification Targets**.





Click this button to remove all spot colors from the list of **CxF/X-4 Certification Targets**.

## Measurement



Click this button to start measuring your printed samples. You may be requested to perform a white calibration, depending on the measurement device.



The button changes to  and the  icon becomes unavailable.

The CxF/X-4 color definition which comes closest to the measurement result is selected automatically and moves to the top of the list.

Follow the instructions displayed next to the  icon.



Click this button to stop measuring.

The button changes to  and the  icon becomes available.



Click this button to load a measurement file instead of measuring. This is required if the printed sample has been measured using a device



which is not connected to your computer or not supported by ORIS CxF Toolbox.

You can load measurement files with *CGATS* and *QTX* format. If a QTX file contains multiple measurements, only the first will be used.

### Reference ●

This box represents the color of the CxF/X-4 spot color definition selected in the list of **CxF/X-4 References**.

### Measurement ●

This box represents one of the following:

- The color of the printed sample that has just been measured.
- The color of the measurement made for the spot color selected in the list of **CxF/X-4 Certification Targets**

## <Spot color> compared to (last) measurement (for ...)

These charts and tables allow you to precisely compare the difference between the color selected in the list of **CxF/X-4 References** ● and the color measured for the printed sample ● (last measurement or measurement made for the color selected in the list of **CxF/X-4 Certification Targets**).

### Reflectance Spectrum

Spectral reflectance data measured on 100% substrate:

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

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

Graphical representation of values calculated from spectral data:


- Hue (a\*b\*)
- Lightness (L\*)

### Colorimetric Data

Numeric values calculated from spectral data:



- CIE L\*a\*b\* (lightness, red/green hue, blue/yellow hue)
- CIE L\*C\*h° (lightness, chromaticity, hue angle)
- Deviation between CxF/X-4 color and measurement (delta E); tolerance value

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


Click  if you want to change the tolerance value or to select a different delta E formula.

### Metamerism index

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

ORIS CxF Toolbox calculates up to six MI values using one or two *reference illuminants* (D50 by default) and up to three *test illuminants* (A, C and F11 by default). Validation is successful  if all of these MI values are within the tolerance limit. Otherwise validation fails .

The tolerance limit is the maximum deviation permitted from a target value of 0 dE. A value of 0 means that the reference and measured sample must show exactly the same color deviations under both illuminants. A value of 3.0 means that the samples are not allowed to differ in metamerism by more than 3.0 delta E.

Click  if you want to change the tolerance value or to select different reference and test illuminants.

## Buttons



Click this button to modify the default settings for this function.

You can change the formula for calculating color differences and add more information to the list of CxF/X-4 spot colors, for example.

Related information:

- » ASE (page 109)
- » CxF/X-4 (page 109)
- » Metamerism index (page 111)
- » Spectral reflectance curve (page 112)
- » Finding Best Matching CxF/X-4 Color for a Printed Sample (page 44)
- » Creating CxF/X-4 Libraries (page 19)
- » Print Validation (Certification) (page 29)
- » Using ASE Files for Data Exchange with any Adobe CS Application (page 48)
- » System Requirements (page 6)



## Matching Parameters

**Use this dialog to modify the default settings ORIS CxF Toolbox uses for automatically finding the CxF/X-4 color definition which is as similar as possible to the measurement made for a printed sample.**

## Colorimetry

### Delta E

Select the *delta E formula* to be used for calculating the average deviation between the CxF/X-4 spot color definition selected in the library file and the measurement made for the printed sample. Default is *dE2000*.

Also enter a tolerance value for this color deviation. A pass/fail icon   will indicate if the CxF/X-4 color is similar enough or out of tolerance.

### Illuminant

Standard light source expected to be used for viewing samples of the printed color.

This option affects the way the measurement data is converted to CIE Lab. Different illuminants will produce different delta E values in the printer validation process.

### Standard observer

Standardized angle of the average human eye at which samples of the printed color are expected to be viewed. This angle determines the field of view and thus the way a person perceives color.



This option affects the way the measurement data is converted to CIE Lab. Different observation angles will produce different delta E values in the printer validation process.

## Metamerism

### Metamerism index

Enter a tolerance value for the *metamerism index* (MI) calculated for the difference between the CxF/X-4 spot color definition selected in the library file and the measurement made for the printed sample.

The tolerance limit is the maximum deviation permitted from a target value of 0 dE. A value of 0 means that the reference and measured sample must show exactly the same color deviations under both illuminants. A value of 3.0 means that the samples are not allowed to differ in metamerism by more than 3.0 delta E.

ORIS CxF Toolbox calculates up to six metamerism index values for every measurement, depending on the number of selected reference and test illuminants. Validation is successful  if all of these MI values are within the tolerance limit. Otherwise validation fails .

### Reference/Test illuminants

Select the lighting conditions to be used for calculating the metamerism index (MI) values. You can use one or two *reference illuminants* and up to three *test illuminants*.

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)

**NOTE:** You can disable the validation of the metamerism index by selecting the setting --- for either all reference illuminants or all test illuminants. In this case there will only be a colorimetric validation (delta E).

## CxF/X-4 Reference Columns

Use these options to select the color information to be displayed in the list of **CxF/X-4 References**. You can hide and display various types of data.

Spot color	L*	a*	b*	C*	h°	dE2000	dE	dL*	da*	db*	D50-A	D50-C
PMS 349	36.85	-41.05	16.85	44.37	157.69	3.25	4.74	-3.50	3.19	0.23	1.60	0.77
PMS 3415	38.84	-53.30	13.22	54.91	166.07	4.06	9.79	-1.51	-9.06	-3.40	3.31	1.15
PMS 356	41.30	-53.81	26.71	60.07	153.60	4.66	13.94	0.94	-9.57	10.09	1.70	0.25
PMS 348	44.01	-61.84	15.67	63.80	165.78	6.52	18.00	3.66	-17.60	-0.95	2.38	0.74

Figure 3-3: List of CxF/X-4 References (Spot Color Library)

### dE values

The deviation between the CxF/X-4 spot color in the library file and the measurement can be calculated according to various dE formulas. Select the formulas to be shown in the list:

*dE – dE94 – dE2000 – dE CMC*

**NOTE:** The dE formulas selected here have no effect on how ORIS CxF Toolbox determines the best matching CxF/X-4 color. This calculation is always done using the formula selected under **Colorimetry** (dE2000 by default).

### Lab values

Lightness (L\*) and hue (a\*, b\*) values for CxF/X-4 color

### Chroma and hue values

Chromaticity (C\*) and hue angle (h°) for CxF/X-4 color

### Lab difference values

Difference in lightness (dL\*) and hue (da\*, db\*) between CxF/X-4 color and measurement

### Chroma and hue difference values

Difference in chromaticity (dC\*) and hue angle (dh°) between CxF/X-4 color and measurement


### Metamerism info

Metamerism index values calculated for the selected *reference illuminants* and *test illuminants*.

Related information:

» Finding Best Matching CxF/X-4 Color for a Printed Sample (page 44)

## 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 printer validation (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.
- 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.

## Illuminant

Standard light source expected to be used for viewing samples of the printed color.

This option affects the way the measurement data is converted to CIE Lab. Different illuminants will produce different delta E values in the printer validation process.

## Standard observer

Standardized angle of the average human eye at which samples of the printed color are expected to be viewed. This angle determines the field of view and thus the way a person perceives color.

This option affects the way the measurement data is converted to CIE Lab. Different observation angles will produce different delta E values in the printer validation process.

## Metamerism index

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

### Method

Light source that was used for illuminating the printed samples during the measurement.

ISO 13655 measurement methods:

- M** Traditional non-standardized tungsten light with an undefined UV content
- 0**
- M** Normal daylight (D50) with a defined UV content
- 1**
- M** Non-polarized light without any UV content (UV-cut filter)
- 2**

### Geometry

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

There are instruments with a directional geometry ( $45^\circ/0^\circ$  or  $0^\circ/45^\circ$ ) and a diffuse sphere geometry ( $d/8^\circ$  or  $8^\circ/d$ ).

### 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

### **Serial number**

Serial number of the measurement device

### **Calibration date**

Date and time of the last device calibration

## **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 111)
- » Editing CxF/X-4 Data (page 16)



# 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


Decide what to do when saving more than one spot color definition. There are the following options:

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

## CxF/X-4 target directory

Click  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 , 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.

**NOTE:** In the ORIS CxF Toolbox Light version, some tools are unavailable and cannot be enabled. You need a Full version to be able to use these tools.

The Light version includes only the tools which are marked up with a yellow frame in the following figure:



Related information:

- » [Creating Reports \(page 41\)](#)
- » [Reports \(page 89\)](#)

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# A

# Glossary

## ASE

Adobe Swatch Exchange (\*.ase) files are used for exchanging color data between Adobe CS applications. Photoshop, Illustrator and InDesign can create and open ASE files. When you open an ASE file, the colors are loaded into the application's swatch palette.

## 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*, *CxF2*, *CxF3*, *CxF/X-4*.

## CxF1

*CxF* Version 1.0.

## CxF2

*CxF* Version 2.0.

## 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 (MI) indicates the probability that two samples (reference and measured sample) will show the same color deviation 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 do 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.

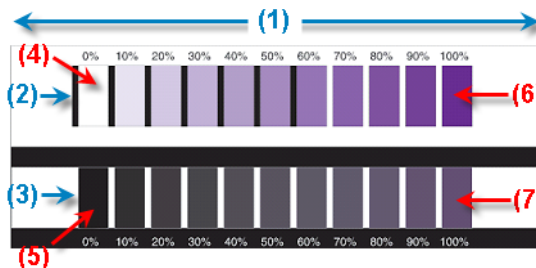
**Spectral reflectance curve**

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.