

Profiling a Color Setup

Learn in this Article,

- how to create a **Color Setup**,
- how to **carry out a Color Setup** and
- to which **parameters attention needs to be paid** when performing a Color Setup.

1. Profiling a Color Setup in General

Profiling a Substrate means that **Calibration** is carried out, this means the printer prints on the Substrate in a linearly defined state. The **Profiling** is the description of the color gamut of the printer on the Substrate.

In order to profile a Substrate in the Workflow, the following requirements for creating a Color Setup must be met:

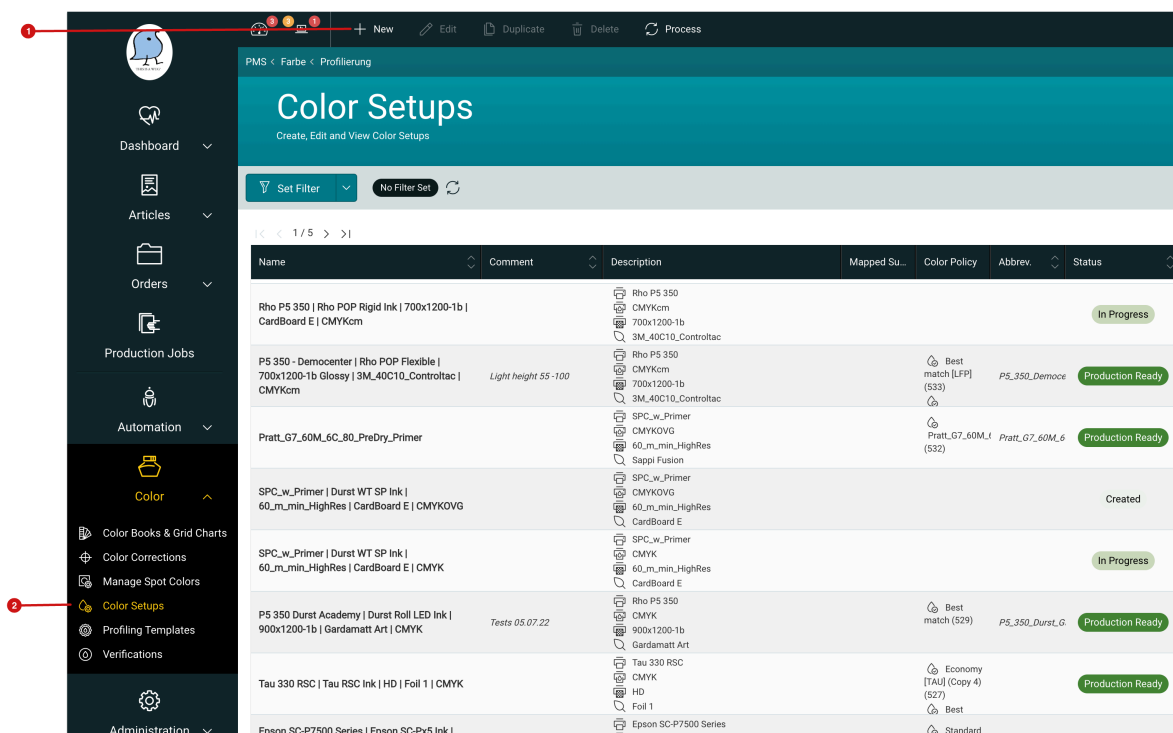
- **Create Inks** that are used in the printing system
- **Configure the Printer** with regard to the **Color Configurations which** should be used
- Create the **Substrate** with the appropriate **Substrate Definitions**

2. Create a Color Setup

Start the creation of the Color Setup and then proceed to work through the various Color Setup steps as described in the following sections.

1. Select the menu item **Color > Color Setup [2]**.
2. Select **+ New [1]** in the action bar, which opens the *Add Color Setup* dialog box.

Figure 1: The list of Color Setups



3. Enter the **Name** [3] and an **abbreviation** [4] for the *Color Setup* in the *Add Color Setup*.
4. Select **Printer, Print Configuration, Substrate, Channel Configuration** as well as device and **Parameter Set** for the Measurement Device [5]. I.e. all parameters that must be selected for the Color Setup must be available.
5. If the print data is to be copied directly to a specific directory after the rendering process, select the corresponding directory in **Destinations** [6].
6. Finish the profiling process by clicking **Save**.

Figure 2: The *Color Setup* dialog

Add Color Setup

Name * Rho P5 350 | Rho POP Rigid Ink | 700x1200-1b | 3M_40C10_C 3

☒ Autogenerate Setup Name from chosen parameters

Abbrev. 4

Comment

Printer Rho P5 350 (2) 5

Print Configuration * 700x1200-1b (95)

Substrate * 3M_40C10_Controller - 3M (138) 5

Channel Configuration * CMYKcm (5)

Measurement Device * Barbieri Spectro LFP qb (auto measurement) (32) [LAN]

Parameter Set * Reflection - Page | D50 | M1 | Auto | Fast (76)

Destinations 6

☒ Create Pre-Linearization 1

☒ Create Linearization 1

☒ Create Ink Limit 1

Cancel Save

3. Perform a Color Setup

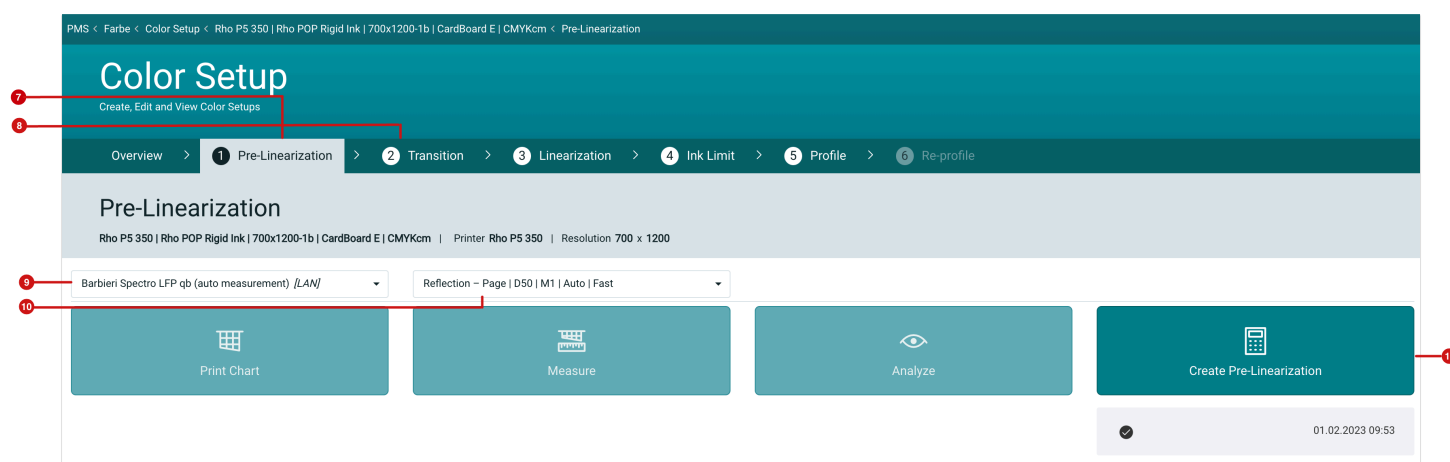
Depending on the selected Printer or Color Configuration, a Color Setup is performed in three to five steps. Each individual step can be divided into two to four substeps. All steps and substeps are to be processed sequentially in order to complete *Calibration* and *Profiling*.

The following description assumes a **CMYKcm Channel Configuration** including pre-linearization so that all five steps may be described.

3.1. Pre-Linearization

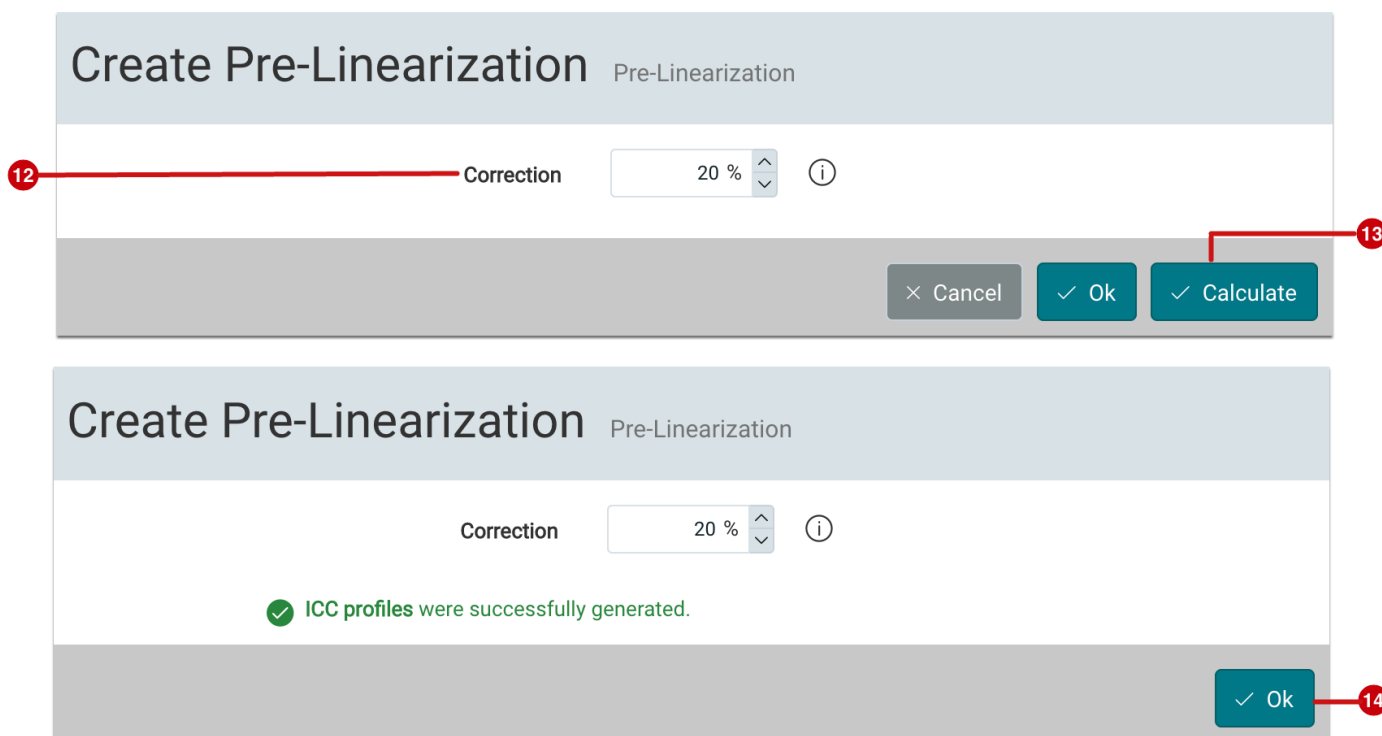
Step 1: Create Pre-Linearization

1. Open the created Color Setup by double-clicking on it. Depending on the selected Channel Configuration and whether or not a Pre-linearization should be applied, the Color Setup must pass through up to five different steps.
2. Select **Prelinearization [7]** and click the **Create Prelinearization [11]** substep.

Figure 3: The *Pre-linearization* dialog**Step 2: Enter Correction values**

1. Enter the percentage value which is to be used for the Pre-linearization in the **Create Pre-Linearization** dialog.
2. Enter the percentage value - between 0% and 40% - in **Correction [12]** and click **Calculate [13]**.
3. The calculation of the Pre-Linearization profile takes a few seconds.
4. To complete the profiling step, click on **Ok [14]**. This opens the next Color Setup step - **Transition** in our example.

Figure 4: The dialog *Create Pre-Linearization* before and after the calculation

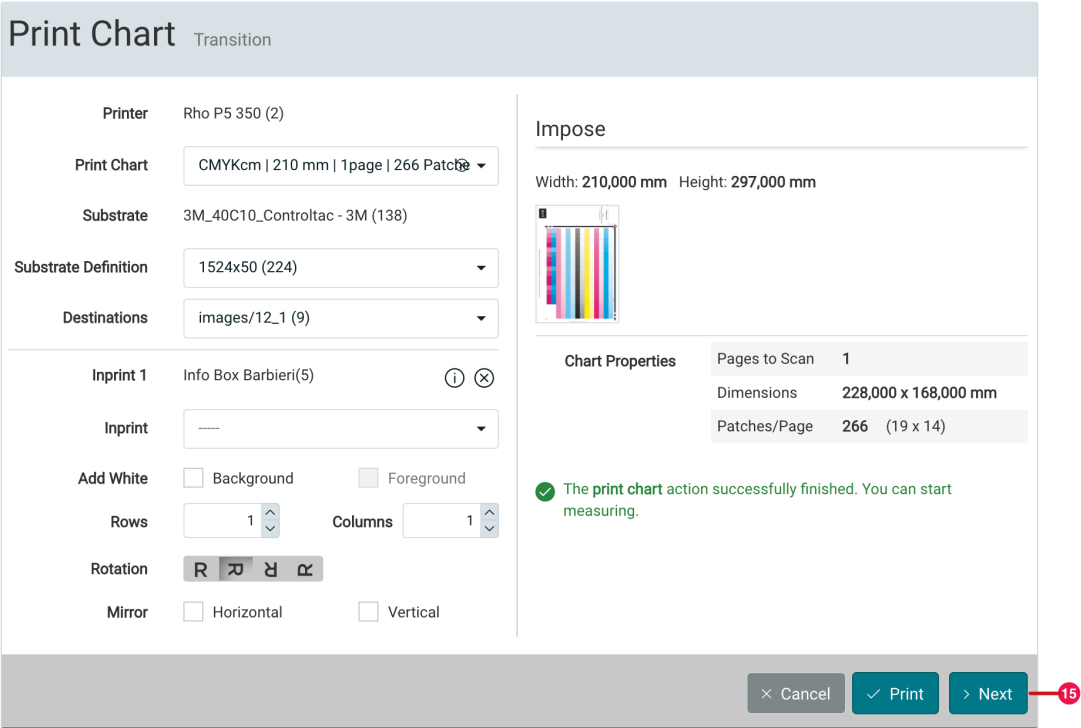


3.2. Transition

Step 1: Create a Transition

1. Select the **Transition [8]** Color Setup step.
2. Check whether the connected **Measurement device [9]** includes the desired **Parameter Set [10]**.
3. Click on **Print Chart**. This opens the Print Chart dialog - select the Print Chart, the Substrate Definition, and the Destination. Click **Next [15]**.

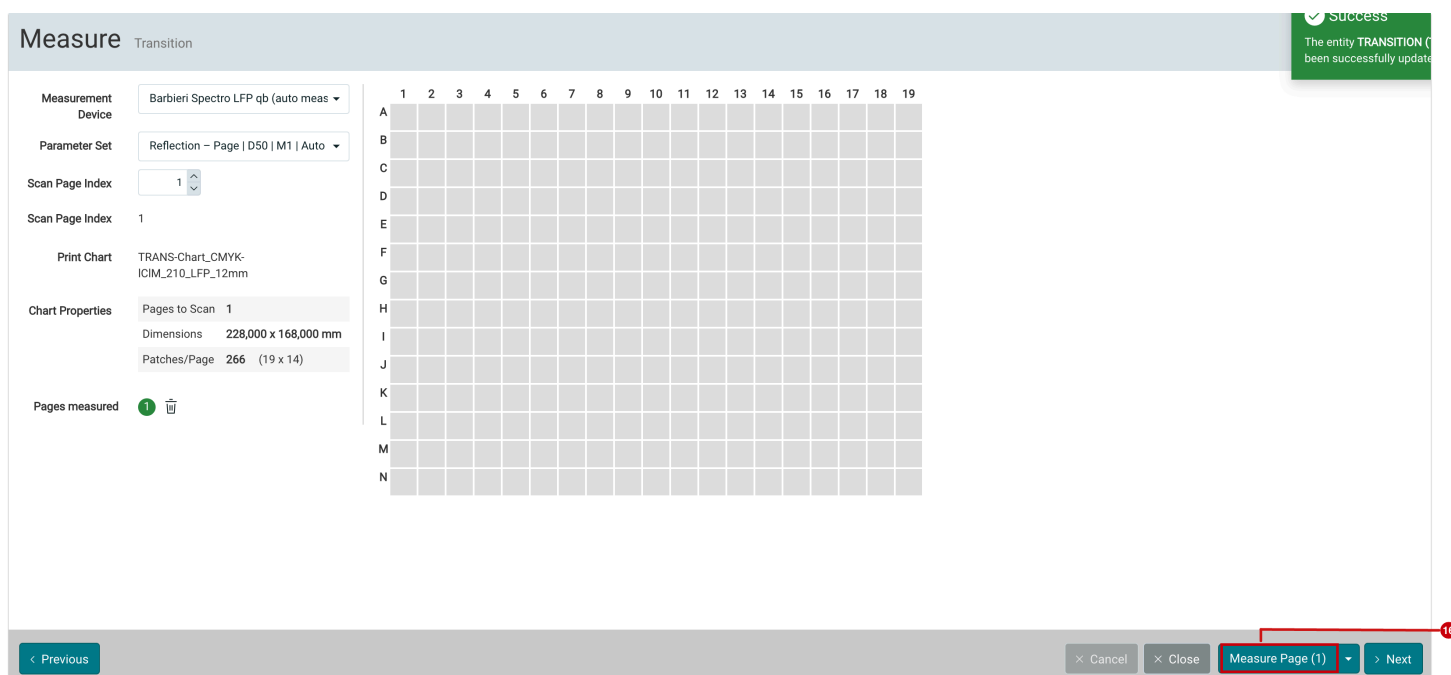
Figure 5: The *Print Chart* dialog after the printing process is complete



Step 2: Measure the Print Chart

- 1. In the next step, calibrate the printed Print Chart with the specified **Measurement Device** and the desired **Parameter Set [16]**.

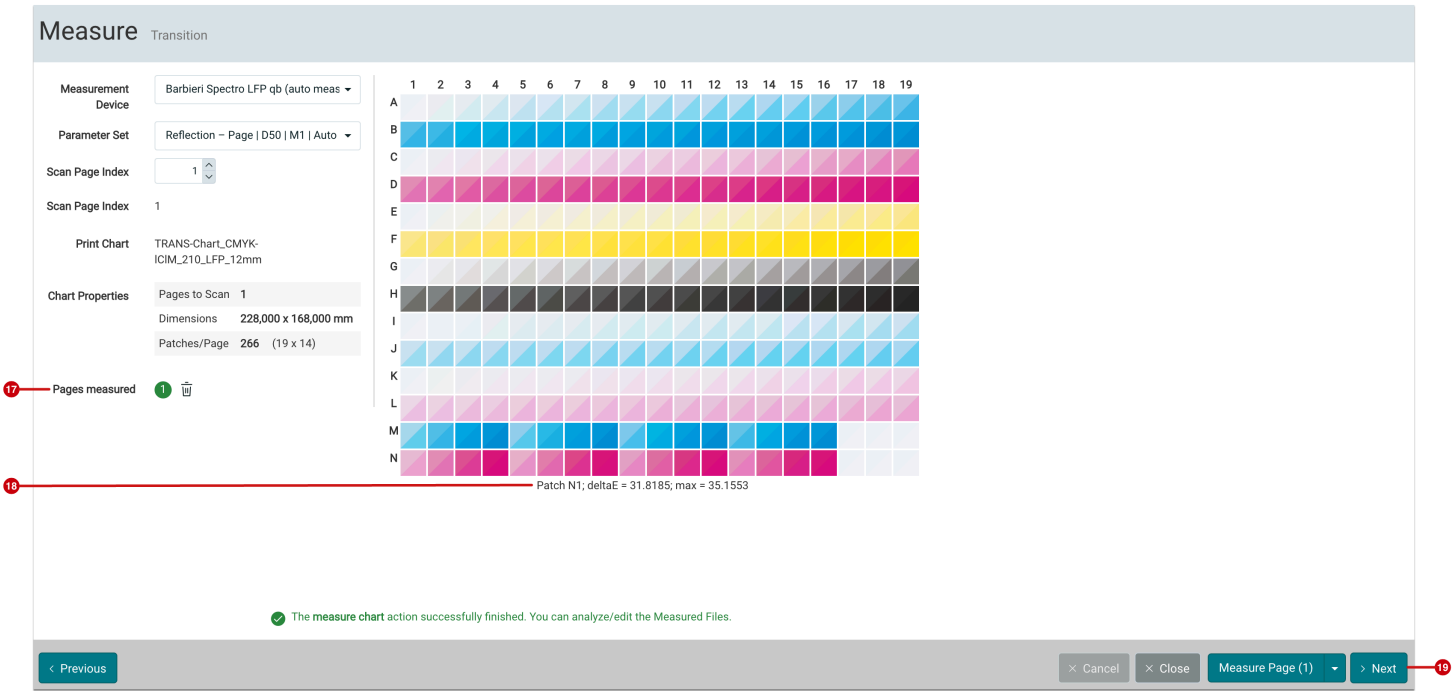
Figure 6: Measure - dialog



Step 3: During and after measuring

1. During measurement, the individual color values are displayed with **delta E values [18]**. Observe the delta E values, because too large delta E values could be an indication that you are using the wrong printout of the Print Chart for measurement.
2. When the measurement is finished, the measurement file is saved. Check whether the measurement has been saved or not by checking the indicator (green dot) on **Pages measured [17]**.
3. If there are more Print Charts to be measured, repeat the last steps.
4. After all Print Charts have been measured, the substep can be completed by clicking **Next [19]**. You are automatically redirected to the next step, **Analysis**.

Figure 7: The *Measure* dialog during the measurement process.



Step 4: Analysis of the measurement data

- 1. In the Analyze substep access the **Measure Results** [20] or the **Data** [21].
- 2. Press **Next** [22] to jump to the next substep, where it is possible to create the *Transition Curves*.

Figure 8: The Analyze dialog with the open Data tab



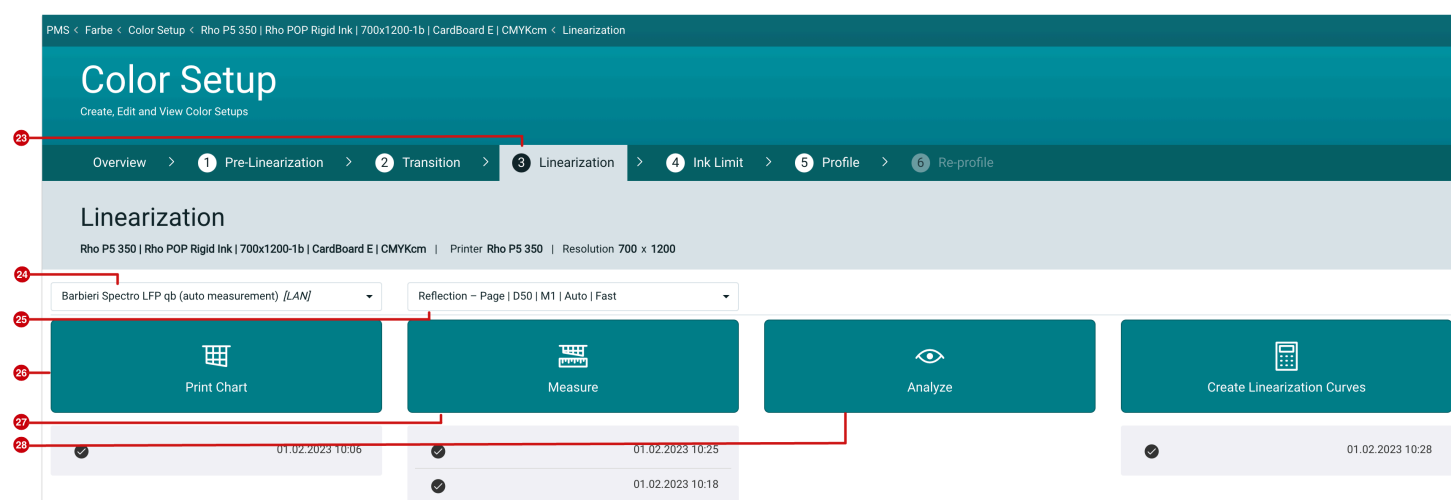
3.3. Linearization

After the Pre-Linearization and the Transition, you need to perform the Linearization. Proceed as follows:

Step 1: Create the Linearization

1. Select the **Linearization [23]** step.
2. Check whether the connected **Measurement Device [24]** including the required **Parameter Set [25]** is selected and available. If you have already checked this in the Pre-linearization Color Setup step, the same configuration and the Measurement Device should already be selected.
3. All substeps are available in this step. Now you have to complete all four substeps.

Figure 9: The *Linearization* area within a Color Setup



Step 2: Print the Print Chart

1. Click on **Print Chart [26]** to open the Print Chart dialog.
2. In the opened *Print Chart* dialog, you can make several settings.
3. Once you have selected all the settings, start the rendering process. To do this, press **Print [30]**.
4. Now print the Print Chart on the selected Substrate at the Printer.
5. Click **Next [31]** to measure the Print Chart and switch to the next step. The *Measure* dialog opens.

Figure 10: The *Print Chart* dialog

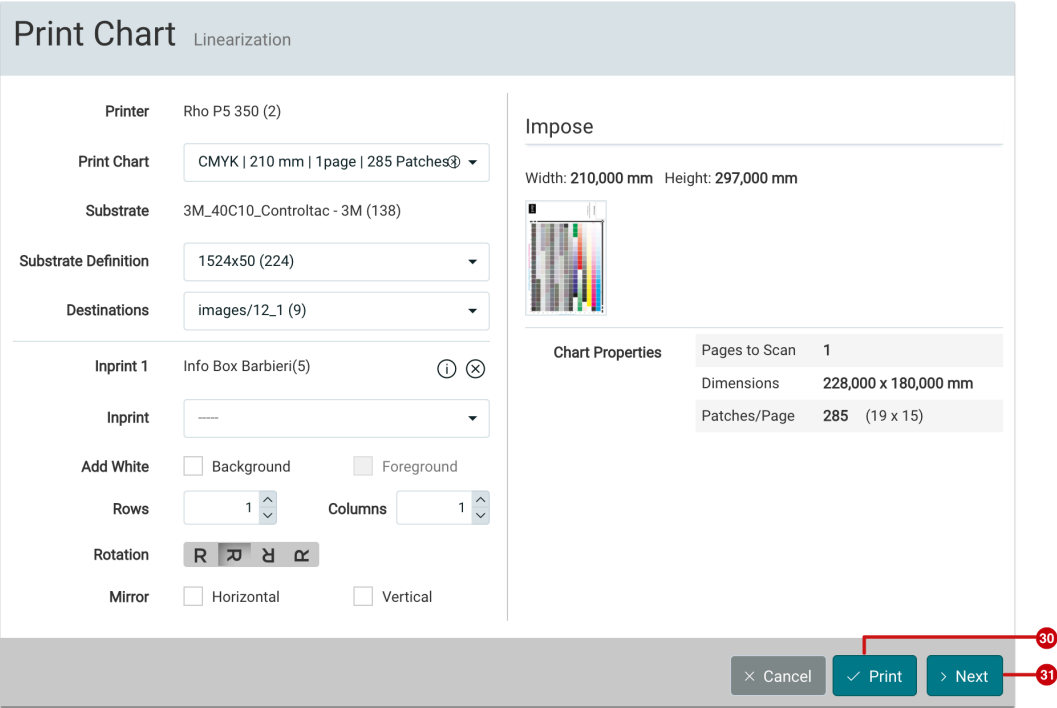
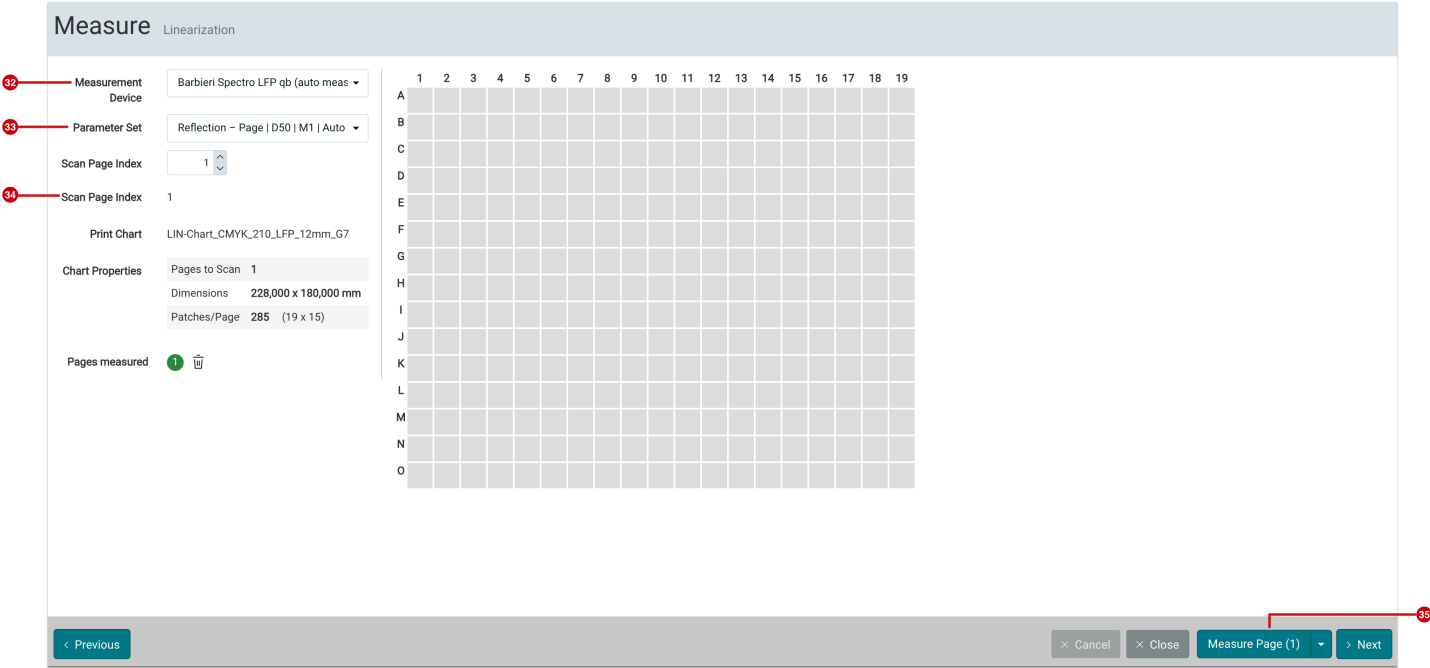


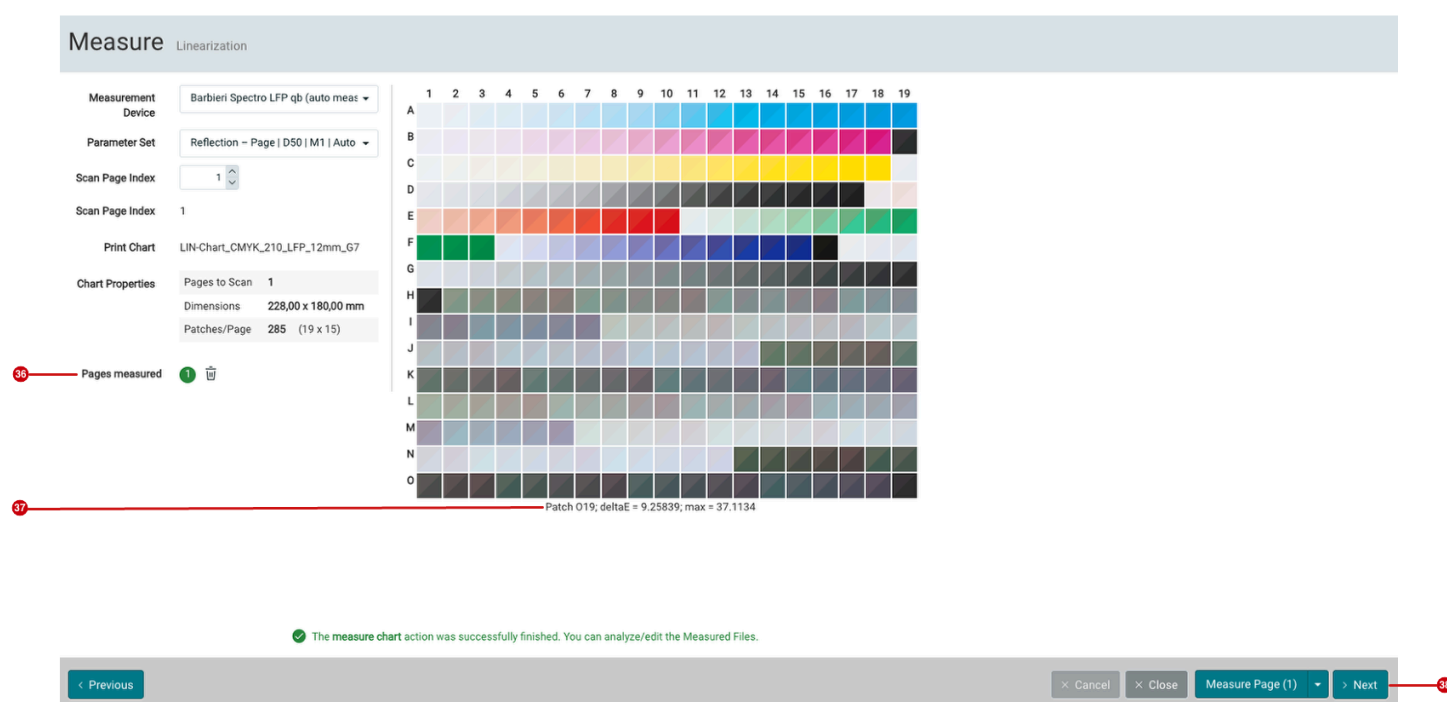
Figure 11: The *Measure* dialog



Step 3: Measure the Print Chart

1. Fix the Print Chart on the measuring table. (According to the manual).
2. The required Measurement Device [32] and the Parameter Set [33] should be automatically and correctly selected.
3. Selected the **Scan Page Index** [34]. In this example, this option is omitted, because the shown Print Chart has only one page.
4. Click on **Measure Page (1)** [35] to start the measuring process. For Measurement Devices that pull in the Print Chart when measuring, you must insert the Print Chart on the area which is provided for this purpose. For all other Measurement Devices, the initialization of the Measurement Device is performed and the measuring process including a possible automatic recognition of the measuring range is started.
5. During the measurement, the individual color values are displayed with the **Delta E values** [37]. Observe the **Delta E values**, because too large values could be an indication of the wrong printout of the Print Chart.
6. When the measurement is finished, the measurement file is saved. The indicator (green dot) in the **Measured pages** [36] option shows whether the measurement has been saved or not.
7. If there are more Print Charts that should be measured, you have to repeat the process in the last step.
8. When all Print Charts have been measured, the substep can be completed by clicking **Next** [38]. After this action, the dialog automatically switches to the next step, which is **Analyze**. You can also manually go to the next step by clicking the **Analyze** [28] button.

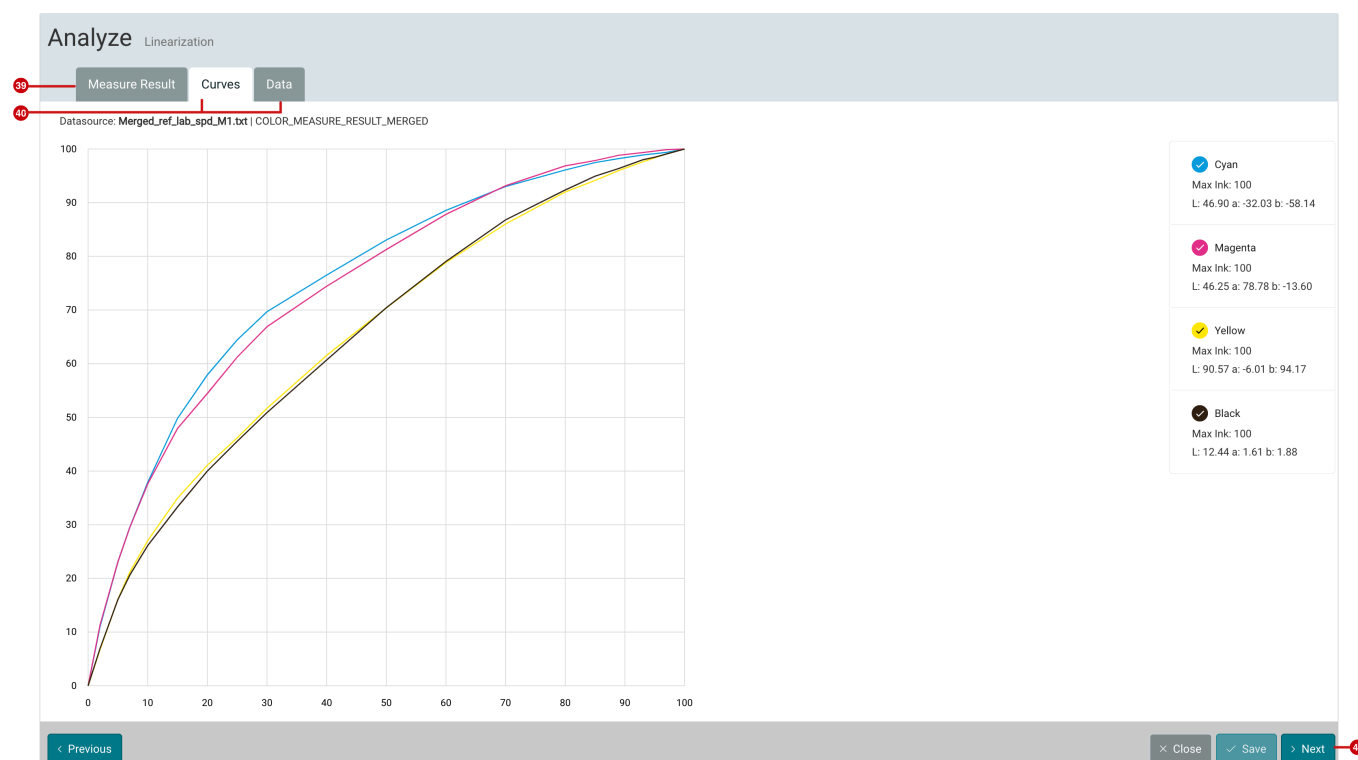
Figure 12: The *Measure* dialog after the measurement process



Step 4: Analysis of the Print Chart

1. In this step you have the possibility to access the **Measure Result** [39] or the **Curves** and measurement **Data** [40] in a separate tab.
2. Press **Next** [41] or the **Create Linearization Curves** [29] button to jump to the next step, the creation of the linearization profile.

Figure 13: The *Curves* tab in the *Analyze* tab



Step 5: Create Linearization Curves

1. In the next substep, you can calculate the Linearization Curves for the profile. To do this, enter the desired **Ink Limit** [43] for the individual colors. You can also let the system calculate the optimal values via the **Auto checkbox** [42]. To calculate the profiles, click **Calculate** [45] in the footer of the dialog.
2. When you have calculated the linearization profiles, click **Ok** [44]. By entering Ok complete the last point of the profiling step **Linearization**.

Figure 14: The *Create Linearization Curves* dialog

Create Linearization Curves Linearization

Linearization Method: L* - Linearization

Ink Limit 100 100 100 100

☐ Auto

Cyan: 100

Magenta: 100

Yellow: 100

Black: 100

< Previous × Cancel ✓ Ok ✓ Calculate

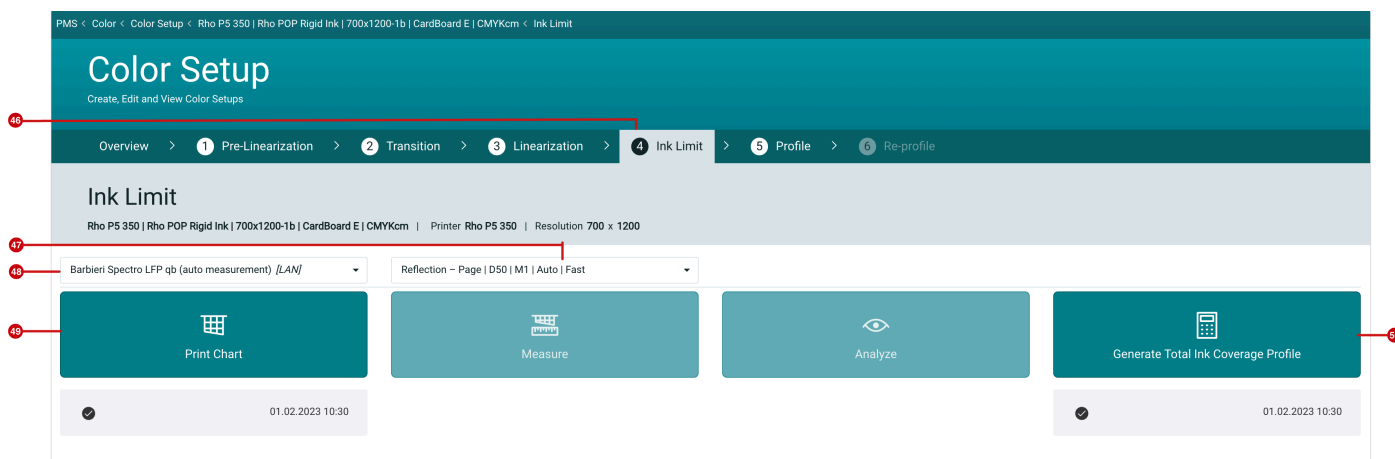
3.4. Ink Limit

Depending on the **printing process** and the used **Substrate**, certain ink application values must not be exceeded, otherwise the drying time will be too long and the ink may smear during further processing.

Step 1: Create Ink Limit

1. Select the profiling step **Ink Limit** [46].
2. Check again whether the connected **Measurement Device** [48] including the desired **Parameter Set** [47] is selected.
3. If you have checked in the profiling step **Linearization**, the same configuration and the respective Measurement Device should already be selected.
4. In this step, only the substeps: **Print the Print Chart** and **Create Ink Limit** are active.

Figure 15: Access the **Ink Limit** area, shown here using the example of a newly created profiling.



Step 2: Print the Print Chart

1. Click on **Print Chart** [49]. This opens the Print Chart dialog.
2. Make all the necessary settings and start the rendering process. To do this, click on **Print** [51] in the footer of the dialog. The rendering process should be finished after a few seconds and ready for printing.
3. Now print the Print Chart at the desired printer on the selected Substrate.
4. In order to create the **Ink Limit** in a further step, switch to the next substep by clicking **Next** [52] or by clicking the Generate Total Ink Coverage Profile [50] button. This opens the Generate Total Ink Coverage Profile dialog (see Figure 19).

Figure 18: The *Print Chart* dialog

Print Chart Ink Limit

Printer: Rho P5 350 (2)

Print Chart: CMYK | 210 mm | 1 page | 112 Patches

Substrate: 3M_40C10_Controltac - 3M (138)

Substrate Definition: 1524x50 (224)

Destinations: images/12_1 (9)

Inprint 1: Info Box Barbieri(5)

Inprint: -----

Add White: ☐ Background ☐ Foreground

Rows: 1 Columns: 1

Rotation: ☒ R ☐ T ☐ B ☐ A

Mirror: ☐ Horizontal ☐ Vertical

Impose

Width: 210,000 mm Height: 617,000 mm

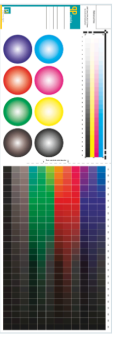


Chart Properties

Pages to Scan	1
Dimensions	229,800 x 32,800 mm
Patches/Page	112 (28 x 4)

Buttons:

Step 3: Generate Total Ink Coverage Profile

1. In the next step, you calculate the Total Ink Coverage Profile for the Color Setup profile.
2. In the Workflow, you have the option of setting the value individually using a **slider [53]** in the Generate Total Ink Coverage Profile dialog. To calculate the profile click on **Calculate [55]** in the footer of the dialog.
3. When you have calculated the Total Ink Coverage Profile, click on **Ok [54]**. By entering **Ok**, complete the last substep in the profiling step **Ink Limit**.

Generate Total Ink Coverage Profile Ink Limit

53 Total Ink Coverage 400

Buttons:

3.5. Profile

In the penultimate step, create the Profile for perfect and stable reproduction of Print Items on Substrates on specific Printers.

Step 1: Create a Profile

1. Select the Color Setup step **Profile** [57].
2. Check whether the connected **Measurement Device** [58] including the desired **Parameter Set** [59] has been or is selected. If you have checked this in the previous steps, the same Parameter Set and Measurement Device should already be selected.

Figure 20: Access the **Profile** area, shown here using the example of a newly created Color Setup.

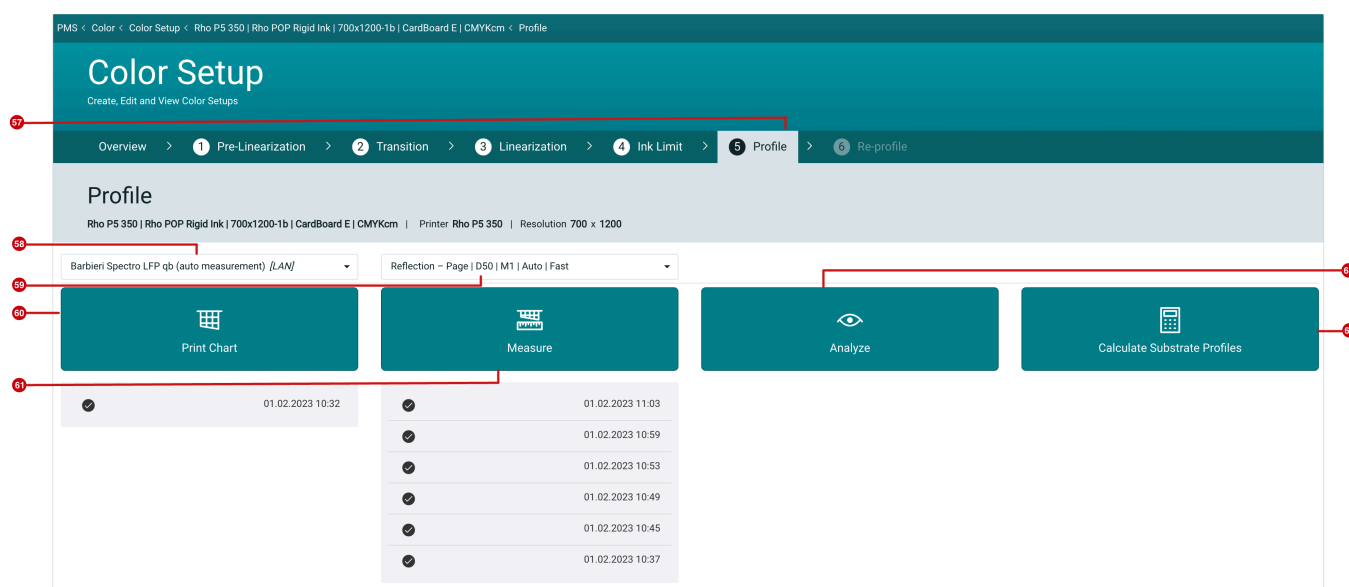


Figure 19: The *Generate Total Ink Coverage Profile* dialog

Step 2: Print the Print Chart

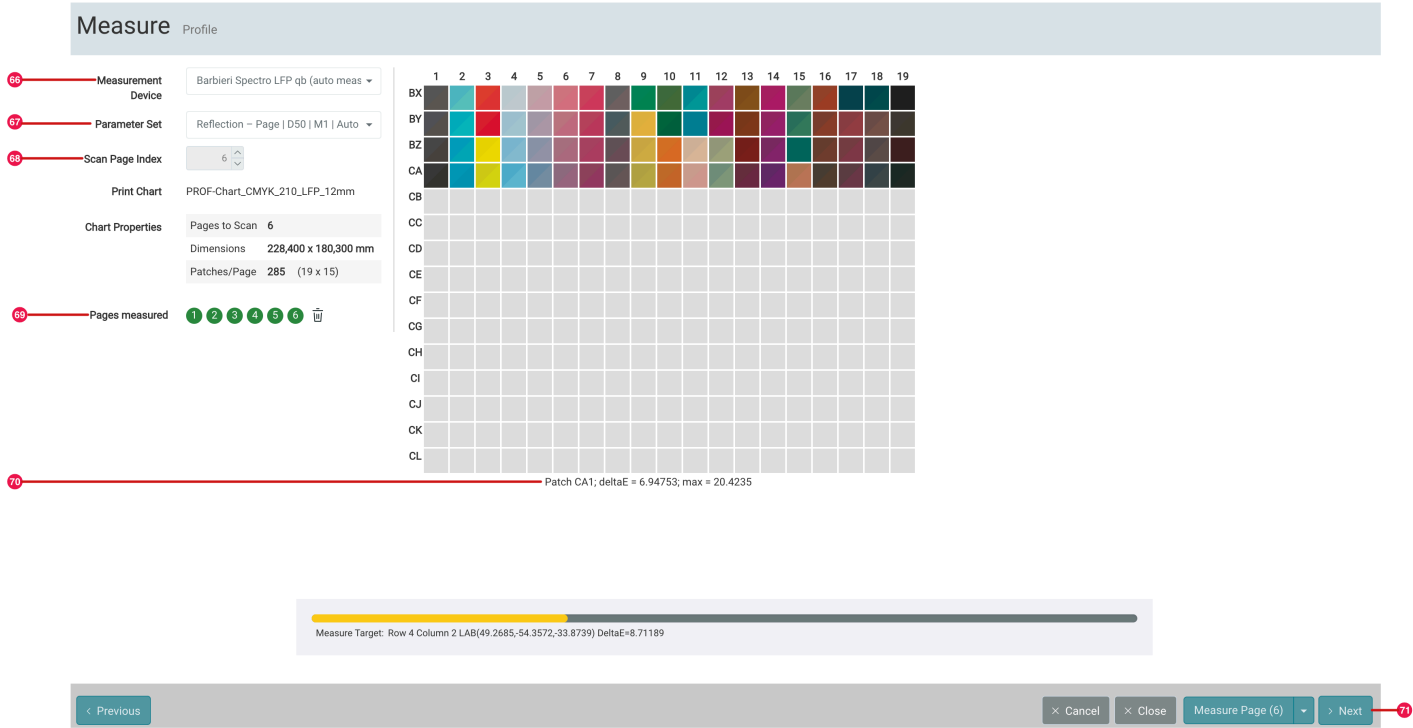
1. Click on the **Print Chart** [60] icon. This opens the Print Chart dialog.
2. When you have selected all settings, the rendering process can start. Click **Print** [64].
3. Now print the Print Chart on the selected Substrate at the Printer.
4. To measure the Print Chart you have to switch to the next step by clicking **Next** [65] or **Measure** [61]. The Print Chart dialog opens.

Figure 21: The *Print Chart* dialog of a *Profile*

Step 3: Measure the Print Chart

1. Fix the Print Chart on the measuring table. (According to the manual).
2. The required **Measurement Device [66]** as well as the **Parameter Set [67]** should be selected correctly automatically.
3. Select the **Scan Page Index [68]** in a further step.
4. During the measurement, the individual color values are displayed with the **Delta E values**. Observe the **Delta E values [70]**, because too large values could be an indication of the wrong printout of the Print Chart.
5. When the measurement is completed, the measurement file is saved. By means of an indicator (green dots), you can see whether the **Pages measured [69]** have really been saved.
6. If there is a problem with the Print Chart, you will have to repeat the procedure in the last step.
7. If you have measured all the Print Charts, complete the substep by clicking **Next [71]**. This action automatically takes you to the next step, Analysis. You can also access the next step by clicking on the **Analyze [62]** button.

Figure 22: The *Measure* dialog



Step 4: Analyze the Measure Result

1. In the profiling step: Analyze you have the option to visually check the **Measure Result [72]** or to access the **Data [73]**.

Figure 23: The *Analyze* dialog with opened *Measure Result* tab



Step 5: Create a Substrate Profile

1. Press **Next** [74] or click the **Calculate Substrate Profiles** [63] button to jump to the next step, the creation of the Substrate Profile.

Before you can finish the actual profiling, you still have to calculate Substrate Profiles. By default, three different standard profiles - **Standard**, **Economy** and **Best Match** - are displayed in the **Profile** panel [75] of the **Calculate Substrate Profiles**.

2. To calculate the Substrate Profiles, you must click on **Calculate all** [77] in the footer of the Calculate Substrate Profiles dialog.
3. By clicking **Ok** [76] in the footer of the dialog, you have completed the last substep in the profiling step.


Figure 24: Section of the *Calculate Substrate Profiles* dialog


Calculate Substrate Profiles

Profile


75

Profile

Profile 1  >

Profile 2  >

+ New

 Delete

Profile Name

Standard [LFP]

Template Substrate

Standard (substrate) [AdditionalColor] ▼

Profiling Template

Gray Axis

Black Point

Spot Color

Template Reseparation

Standard [LFP] ▼

Use all inks to reach the default color gamut with modification in the dark areas. Use more black (K) instead of CMY inks.

< Previous

× Cancel

76

77

✓ Ok

Calculate all ▼

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