KCC AUTOFINISH
Computer Color Matching System

Improved convenience for metallic / pearl color matching

Powerful AI matching and correction capabilities

Online color matching support

COLOR-NAVI Plus

www.kccworld.co.kr
KCC REFINISH PAINT EVERYWHERE

AUTOFINISH | KCC Paint

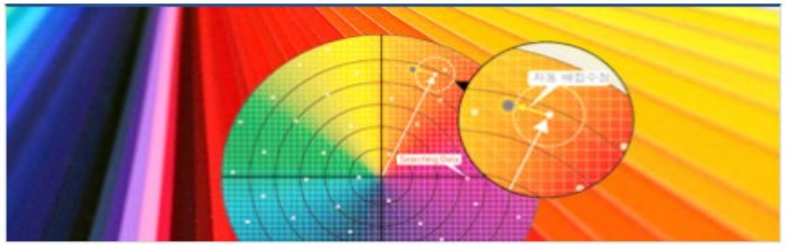
COLOR-NAVI Plus 2024 Manual

About COLOR-NAVI PLUS

Advantages of the COLOR-NAVI System

Unlike traditional color retrieval systems (CCS), the COLOR-NAVI system offers more.
It stores color matching formulas, mix ratios, and unique data for each color in the COLOR-NAVI program.
With its AI-powered functionality, it suggests optimized formulas tailored to user needs, ensuring exceptional accuracy.
Additionally, it features robust simulation capabilities, allowing users to predict color changes in advance.

Why Choose KCC Refinish CCM?



Necessity

The next-generation product enhances traditional CCS with an automatic color mixing feature (batch development), enabling precise color matching even for minor shades.

Economy

Reduces repeated color matching and saves time.
Efficiently manages and stores color-matching results.

Productivity

Facilitates easy creation of accurate color formulas and personalized usage.
Offers a user-friendly process for color matching.

Customer Satisfaction

Delivers reliable color matching solutions with enhanced accuracy and personalized settings.

About COLOR-NAVI PLUS

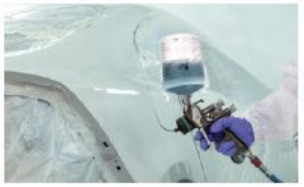
The Simple and Accurate Color Mixing Flow of KCC COLOR-NAVI

Measure the color of the target vehicle or sample using a spectrophotometer.

Compare colors by measuring the sample color book or color chips provided by KCC.

Use stored color (KCC formula or custom formula) and automatically adjust color with the COLOR-NAVI S/W.

Check the KCC COLOR-NAVI recommended formula and confirm the color with a spray-out test.



Paint the vehicle after verifying excellent color matching accuracy.

Vehicle release

KCC COLOR-NAVI Components (※ PC and scale not included)

Portable Spectrophotometer

- Device connection via USB
- USB-C Type (Li-ion battery)
- Touchscreen capability
- Convenient for portability

Minimum PC Requirements

- CPU: Intel®Core™i5-10500 (3.10GHz) or higher
- RAM: 8GB+
- Storage: 256GB SSD + 126GB backup
- OS: Windows 7, 8, 10, 11

COLOR-NAVI S/W

- Similar Color Search
- Automatic Color Mixing (Metallic, Solid)
- RM Color Matching
- Pearl Color Matching

Electronic Scale

- Measurement in 0.01g Units

Contents

Precautions ····· 05

Installation

Checking Components ····· 11

Program Installation ····· 12

Usage

How to Use the Spectrophotometer ····· 14

Solid Color Matching ····· 24

2Coat (Metallic) Color Matching ····· 32

3Coat Color Matching ····· 45

Effect Mode Color Matching ····· 54

Waterborne RM(WT5000) Color Matching ····· 65

Database Management ····· 76

Saving Custom Formulas ····· 79

COLOR-NAVI Add-on ····· 85

Online Color Matching Request ····· 90
(COLOR-NAVI PLUS Only)

Safety Precautions

To ensure the safety of users and prevent property damage, please read carefully and use the product correctly.

⚠ Warning

Do not place the spectrophotometer or batteries near or inside heat-generating appliances (heaters, microwaves, etc.), cooking appliances, or high-pressure environments.

■ This may cause deformation, overheating, explosion, or fire.

■ Battery leakage or damage may occur.

Do not subject the spectrophotometer or batteries to strong impacts, pierce them with sharp objects like pins or nails, or disassemble them.

■ This may result in electric shock, explosion, or fire.

Do not use the product during thunderstorms.

■ The risk of lightning or fire may damage the product or cause electric shock.

If unusual smells, noises, foreign substances, or smoke come from the product or its internal battery, stop using the product immediately and contact a KCC sales representative.

■ This may result in electric shock, explosion, or fire.

Keep the product and batteries away from children, infants, or pets to prevent chewing or biting.

■ This can damage the product or cause explosions.

■ There is a risk of choking due to small parts.

Caution Failure to follow these instructions may result in user injury or property damage.

Do not use the spectrophotometer with lighting or flash functions directly in front of the eyes of people or animals.

■ This may cause vision impairment.

Do not drop the spectrophotometer, charger, or battery, or subject them to heavy impact or place heavy objects on them.

■ The product may be damaged or malfunction.

■ Bending or twisting the product may damage its appearance and internal components.

If the spectrophotometer screen is broken, do not use it in that condition.

■ If the glass or acrylic is broken, it may cause injuries to hands or face. Please contact KCC for repair before use.

Do not modify, disassemble, or repair the product or its accessories on your own.

■ This may result in electric shock.

■ Free repair services will not be provided for products modified, disassembled, or repaired by the user.
Repairs should be carried out by KCC.

Do not paint or attach stickers to the spectrophotometer.

■ Depending on individual constitution, paint or stickers may cause allergic reactions, itching, eczema, or swelling.

Do not place or store the spectrophotometer on a slanted surface.

■ It may fall, resulting in damage or malfunction due to impact.

Do not use the product for purposes other than its intended use.

■ This may cause the product to malfunction.

When connecting a USB cable to the spectrophotometer, ensure the cable does not get caught on arms or nearby objects.

■ This may cause injury.

Do not use or store the spectrophotometer or batteries in areas with extreme temperature changes or high humidity, such as bathrooms.

■ Moisture or liquids can damage the product's components and circuits, leading to malfunctions or electric shock.

■ The product may fail to operate normally, and there is a risk of battery malfunction, burns, or explosion.

■ If the product gets wet, do not turn it on. Dry it with a towel and contact KCC for repair.

Avoid using the product near speakers, large motors, strong magnetic fields, high-voltage lines, or radio towers.

■ Electromagnetic waves may cause the product to malfunction.

Use the spectrophotometer within a temperature range of 10℃ to 40℃(50℉ - 104℉) and do not store it in extremely low or high temperatures.

■ Storing it in high-temperature environments, such as saunas or parked cars in summer, may cause deformation, internal damage, LCD malfunctions, or explosions.

Do not store the spectrophotometer with metal objects such as coins, keys, or necklaces.

■ This may cause deformation or malfunction of the product.

■ If metal contacts the battery charging terminals, there is a risk of fire.

Do not place the spectrophotometer in areas with strong magnetic fields or where magnetic interference is present.

■ Magnetic fields may cause the product to malfunction or the battery to discharge, affecting its use.
■ Magnetic products such as credit cards, phone cards, bankbooks, and tickets may have their data corrupted by the product's magnetic field.

If the spectrophotometer becomes excessively hot, stop using it temporarily.

■ Prolonged contact with heated devices may cause burns, such as red marks or pigmentation.

When cleaning the spectrophotometer, do not spray water or use strong chemicals (benzene, thinner, etc.) or harsh detergents.

■ These can discolor or corrode the product's surface, and there is a risk of fire or electric shock.
■ Clean the product, battery, and charger gently with a cotton swab or soft cloth.
■ Do not clean or allow foreign substances, solvents, or water to enter the spectrophotometer's interior or terminals.
Keep the protective cover on when not in use.

Avoid heavy smoke or fumes.

■ This may damage the product's exterior or cause malfunctions.

Use caution when operating the product in areas with other electronic devices.

■ Most electronic devices emit electromagnetic signals, which may interfere with or be affected by the product's electromagnetic waves.

When connecting cables to the spectrophotometer, insert and connect them in the correct orientation.

■ Forcing or incorrectly inserting cables may damage the ports, connectors, or components.

Always use or store the spectrophotometer in a clean environment and prevent dust or foreign substances from entering the device.

■ Dust or foreign substances may cause malfunctions or pose a risk of fire or electric shock.

Be cautious when using the spectrophotometer while walking or moving.

■ Collisions with obstacles may result in injuries or accidents.

Do not format or overwrite the operating system (OS, e.g., Windows) on the PC where the Color-Navi program is installed.

■ This may disrupt the program due to changes in the installation path or license recognition failure.

■ Previously worked files and personal databases may be deleted and become unusable.

Avoid installing suspicious programs on the PC where the Color-Navi program is installed.

■ Viruses may interfere with or cause errors in the Color-Navi program.

■ Other programs running on the PC's memory may prevent the normal operation of Color-Navi.

Do not lose the Lock-Key for the Color-Navi program.

■ Only one Lock-Key is provided per program license, and the program will not function without it.

■ In case of loss or damage, you must contact KCC, and reissuance will incur a cost.
(Reissuing a Lock-Key is a complicated and costly process, so take care to prevent loss or damage.)

■ If the PC is damaged, upgraded, or replaced, always contact KCC in advance.

1. Installation

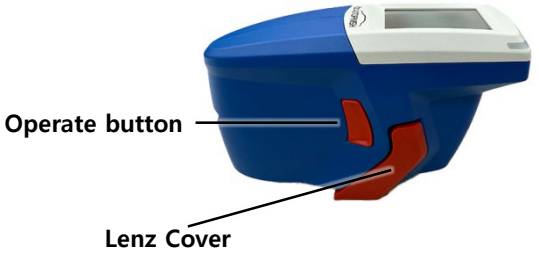
1. Checking Components
2. Installing the Program

Checking Components

The images of the components may differ from the actual products, and some items are subject to change depending on circumstances.

BYK Micro_Tri_effect

1	Power supply plugs
2	Instrument
3	Power supply with proprietary plug for docking station, Safety wrist strap
4	Docking station
5	Combined white and green standard



Calibration tile

Program Installation

A KCC staff member will handle the program installation following the steps outlined below.

☆ Program Installation:

1. Copy the Program to the PC
2. Check the Created Folders After Copying
   - C:/CI_KCC
   - C:/CI_SUMIX
   - C:/CI_CARGO
   - C:/OfficeColorScience

   ※ Create a shortcut for the CI_KCC2.exe file on the desktop → Place it in the C:/OfficeColorScience/CI_KCC folder
3. Connect the Spectrophotometer to the PC
4. Run CDM2.04.06.exe
5. Install USB 3.0 Driver
   - Run setup_bykusbcom 3.0.0.5.exe
6. Install BYK Driver
   - Run Setup.exe, MicroTRIcolor_USB_Bulk_Installation_CD.exe
7. Verify the Spectrophotometer Connection
   - Run SearchBykInst.exe → Located in the C:/Program files(x86)/Bykware folder
   - Launch the spectrophotometer verification program and click the `Search` button to confirm the connection
8. Connect the HASP-Key (Lock-Key)
   - Install the HASP Driver HASPUserSetup.exe
9. Data Backup
   - To prevent loss due to PC failure or viruses, copy the installation folders to the D drive or another location.

   (Folders to Copy: C:/CI_KCC, C:/CI_SUMIX, C:/OfficeColorScience)

2. Usage

1. How to Use the Spectrophotometer
2. Solid Color Matching
3. 2Coat (Metallic) Color Matching
4. 3Coat Color Matching
5. Effect Mode (Candy / Special Color Matching)
6. Waterborne RM(WT5000) Color Matching
7. Database Management
8. Saving Custom Formulas
9. COLOR-NAVI Add-on
10. Online Color Matching Request(COLOR-NAVI PLUS Only)

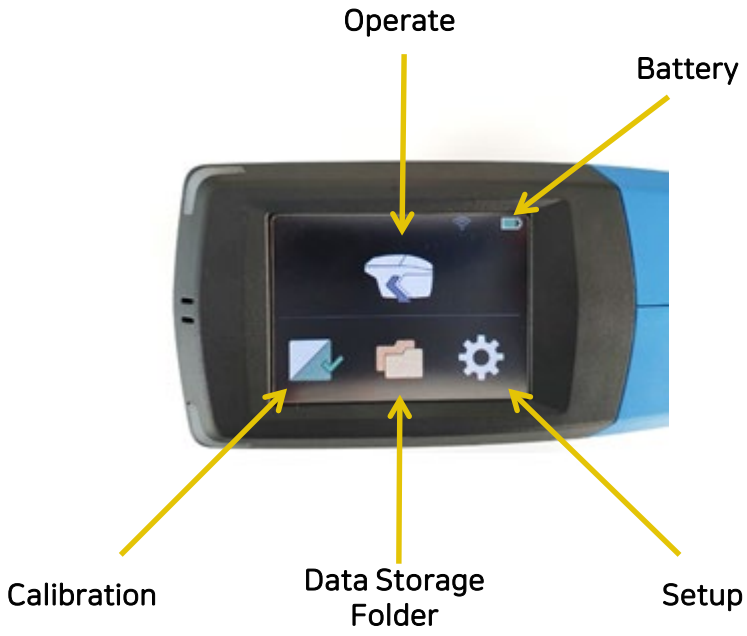
① How to Use the Spectrophotometer

Spectrophotometer Specifications

BYK Micro Tri Effect	
Light Source	1 white power LED * 22 interference filters
Measuring Geometry	45° illumination, 15°, 45°, 105° aspecular viewing
Measuring Area	17mm diameter
Spectral Range	400~700 nm, 10nm resolution
Repeatability Color	0.03ΔE* (20 measurements on white tile)
Reproducibility Color	0.3ΔE* (average on 12 BCRA tiles set at 45°)
Calibration Cycle	White : Monthly
	Green : Weekly
Measuring Time	3 seconds
Operate	Touch screen, Operate button
Measuring Pin	4 pins (3 or more of the 4 pins shall be in contact)
Temperature Range	10-40°C (50-104°F) for operation
	0-60°C (32-140°F) for storage
Relative Humidity	Up to 85%, 35°C (95°F)
Weight	Approx. 550g (1.21 lbs)
Power Supply	Li-Ion battery pack (2900mAh) – charge with USB connection
Interface Device	USB Type C

① How to Use the Spectrophotometer

Spectrophotometer Home Menu

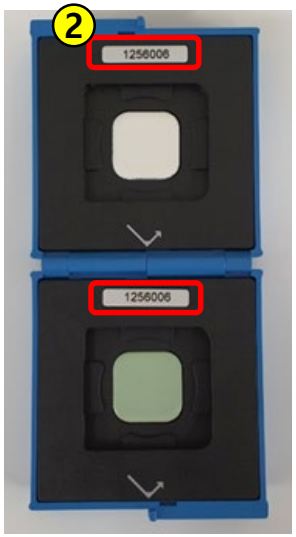


① How to Use the Spectrophotometer

Calibration Instructions

Calibration Status

Completed ✅ Needed: ❌

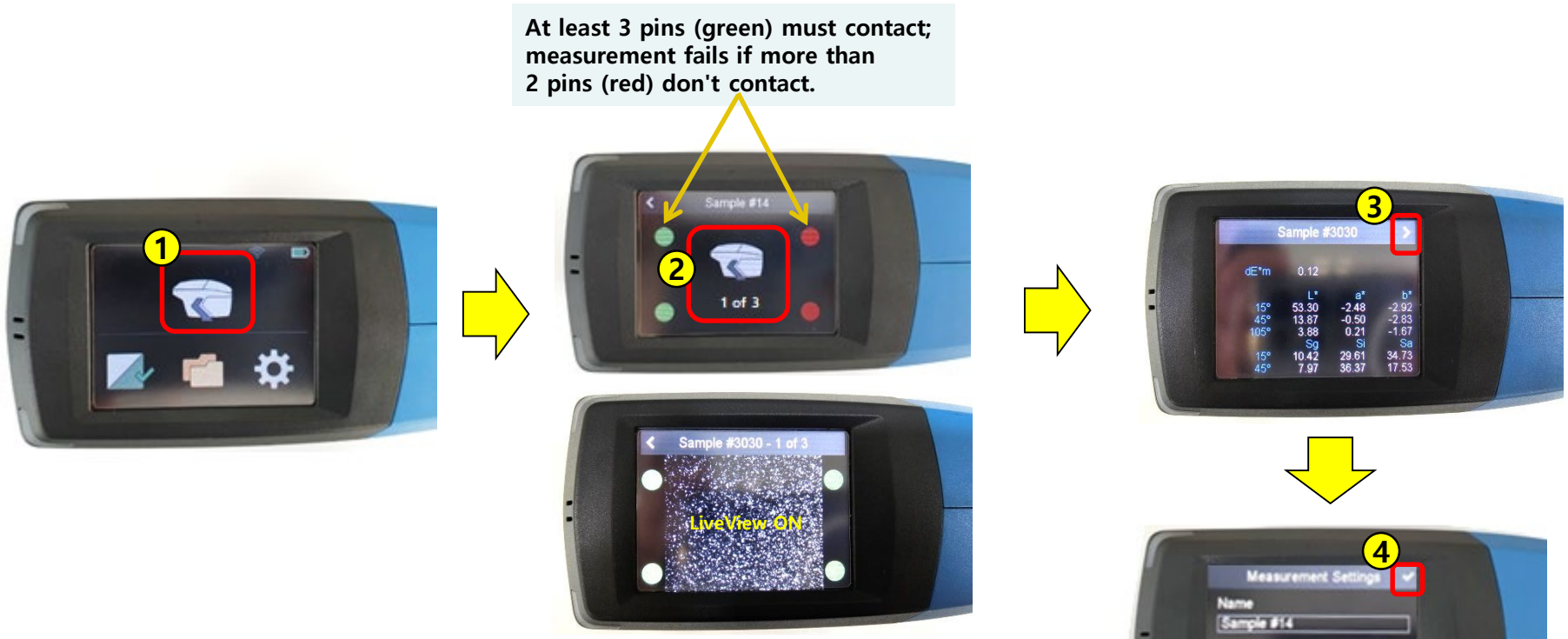


1. **Click the calibration icon** shown in the image.
2. Take out the calibration tile and ensure the serial number on the spectrophotometer matches the tile.
3. Check if the white tile is clean. Place the spectrophotometer on the tile, then click the area indicated in the image or press the **Operate** button on the side.
4. Check if the color tile (green) is clean. Place the spectrophotometer on the tile, then click the area indicated in the image or press the **Operate** button on the side.
5. **Calibration Cycle:**
6. **Color (Green) Tile**: Every 7 days
7. **White Tile**: Every 30 days

Note: If 30 days have not passed since the white tile calibration and only the color tile requires calibration, calibrate only the color tile.

① How to Use the Spectrophotometer

Color Measurement



1. Click the **Operate** button on the side or the spectrophotometer button on the screen.
2. Ensure the pins on the screen are in **green contact** and click the **Operate** button on the side or the spectrophotometer button on the screen.
   - *In spectrophotometer settings, enabling LiveView allows checking the particle image of the measurement area.*
3. Click the **check button** at the top right of the screen or press the **Operate** button on the side.
4. Repeat steps 2-3 **three times** (1 of 3, 2 of 3, 3 of 3). After taking three measurements, click the **check button** at the top right of the screen or press the **Operate** button on the side to save the average value.
   - *For accurate average measurement, measuring the same spot consecutively is not allowed.*

① How to Use the Spectrophotometer

Saving Measurement Data

1. After completing the measurement, click the **name input field** indicated in the image.
2. Enter the desired **save name**.
3. After entering the name, click the **check button** at the top right or press the **Operate** button on the side.
4. Confirm the save name and click the **check button** at the top right or press the **Operate** button on the side to save.

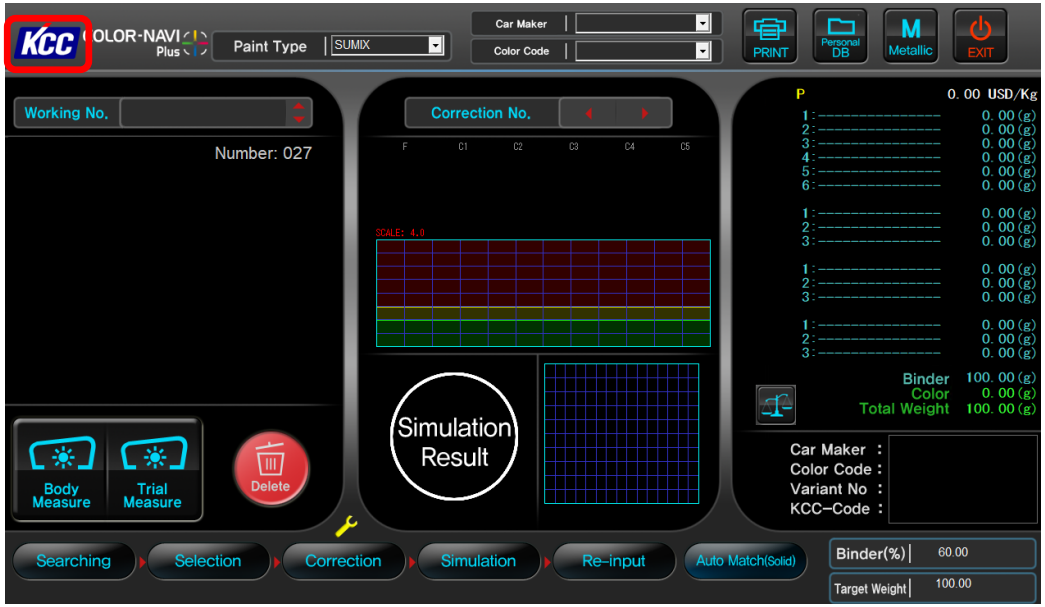
① How to Use the Spectrophotometer

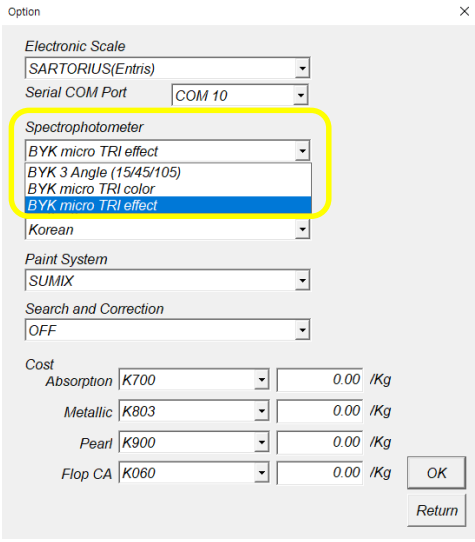
Deleting Data

1. Click the **folder icon** indicated in the image.
2. Select the data to delete by clicking the **checkbox** in front of each item.
3. Click the **trash bin icon** at the top right as shown in the image.

① How to Use the Spectrophotometer

Selecting a Spectrophotometer

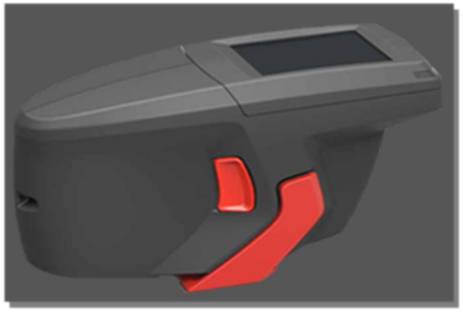




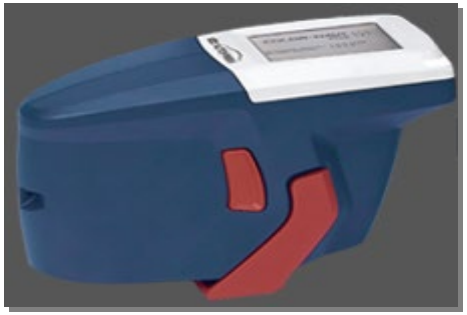
Double-Click the KCC logo to **select** the **spectrophotometer** you are using.

Check the spectrophotometer image below and select the model identical to your device.

BYK 3 Angle(15'/45'/105')



BYK micro TRI color

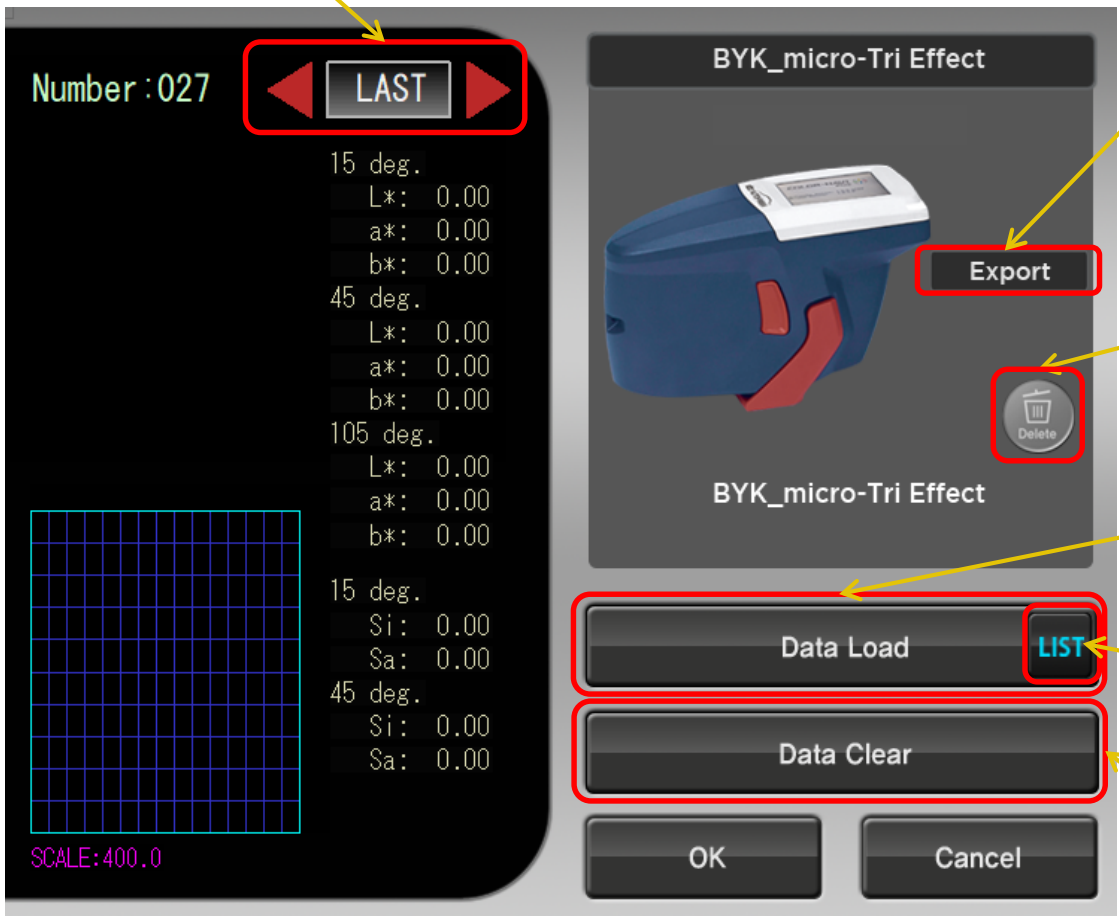


BYK micro TRI effect

① How to Use the Spectrophotometer

Loading and Exporting Data from the Spectrophotometer

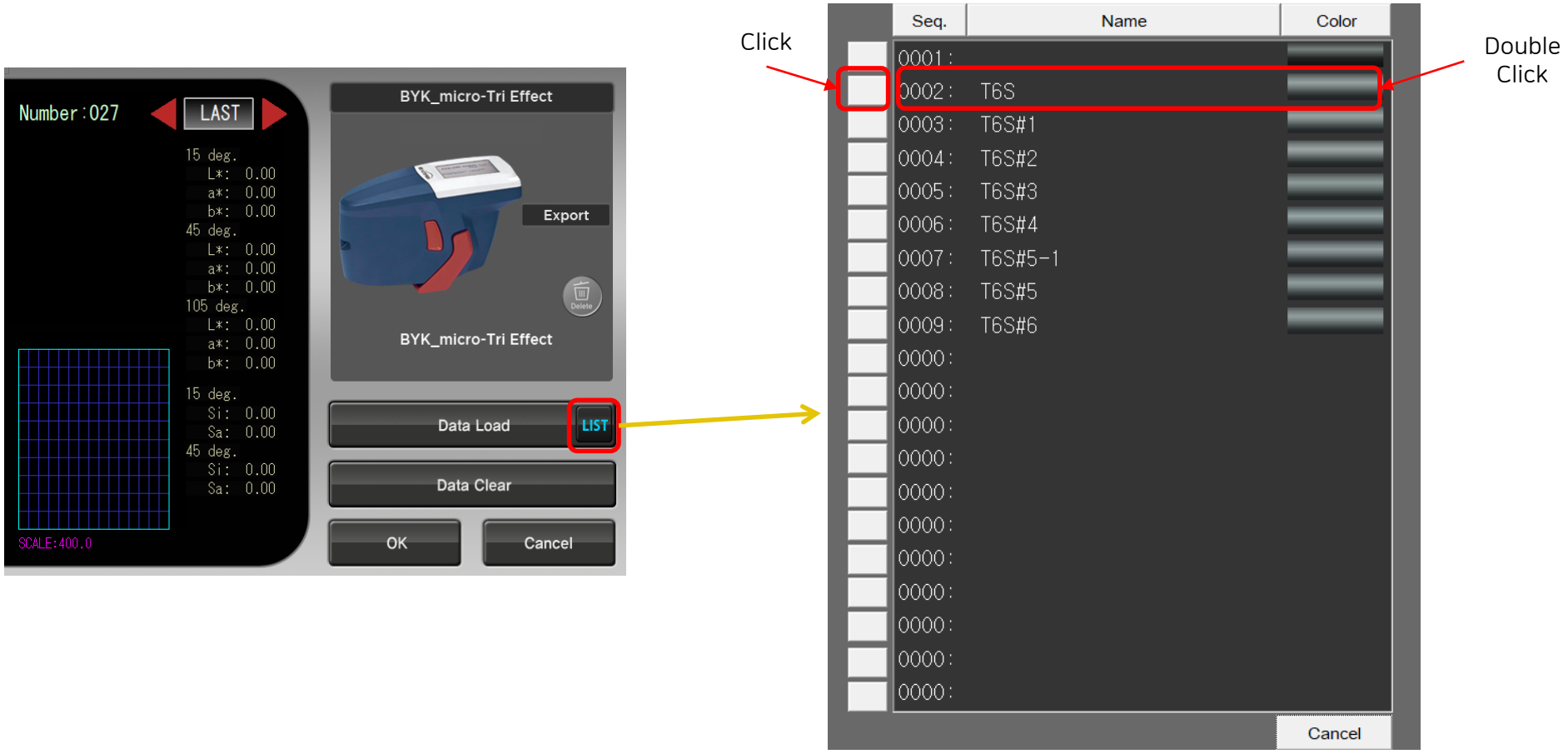
- Use the left and right buttons to select saved data on the spectrophotometer.



- Export : Send measurement data (used for online color matching requests)
- Delete: Delete all data stored on the spectrophotometer.
- Data Load: Load data from the spectrophotometer.
- LIST: View the data list on the spectrophotometer (up to 20 entries).
- Data Clear: Delete loaded measurement data.

① How to Use the Spectrophotometer

LIST: View the data list on the spectrophotometer



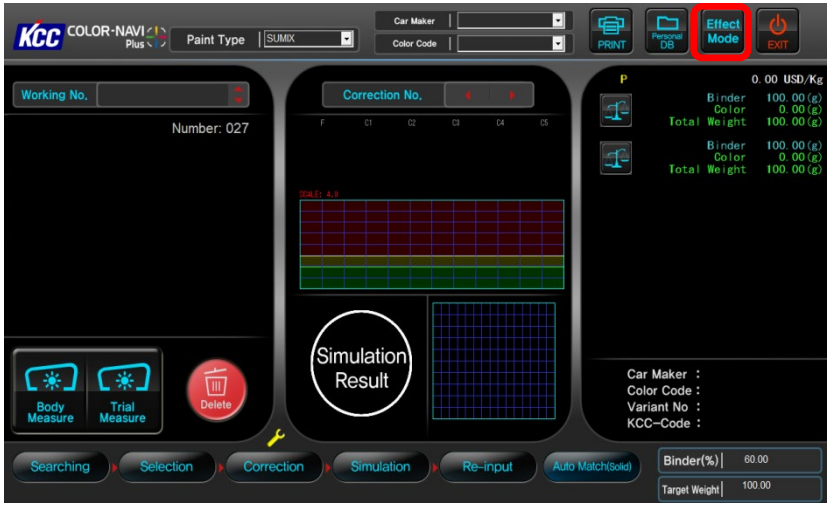
- Click '**LIST**' on the measurement screen to activate the right window, displaying all saved data.
- Click the white button on the left or double-click the color information section to retrieve measurement values.
  (Maximum stored measurements: 20 entries)

⇄ Mode Selection Features (Solid / Metallic / 3Coat / Effect / RM)

Click the buttons to switch between modes.

- M **Metallic** : Used for mixing metallic and solid colors.

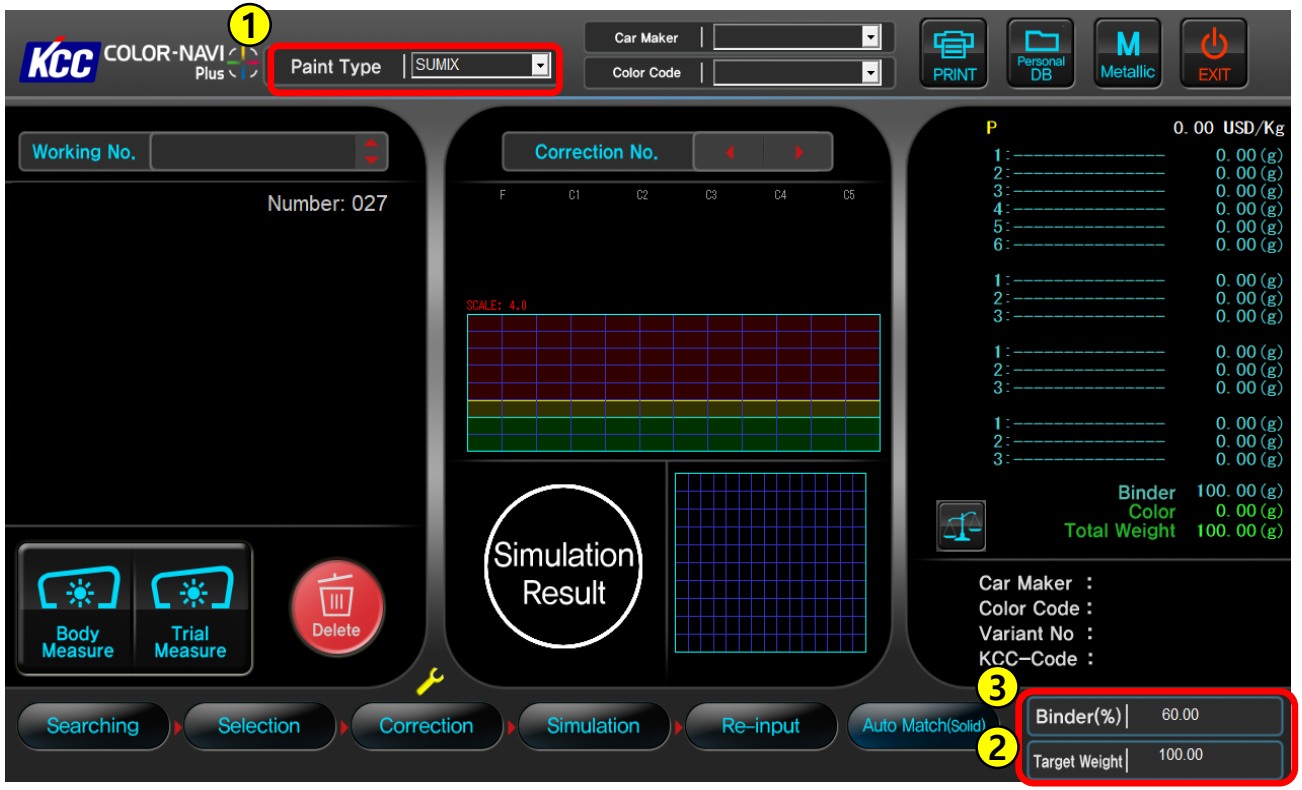
- 3C **3-Coat** : Used for mixing 3Coat colors.



- RM : Used for searching Ready Mixed Product(Factory Pack) similar products and additional color adjustments.

- Effect Mode : Used for mixing candy and special effect colors.

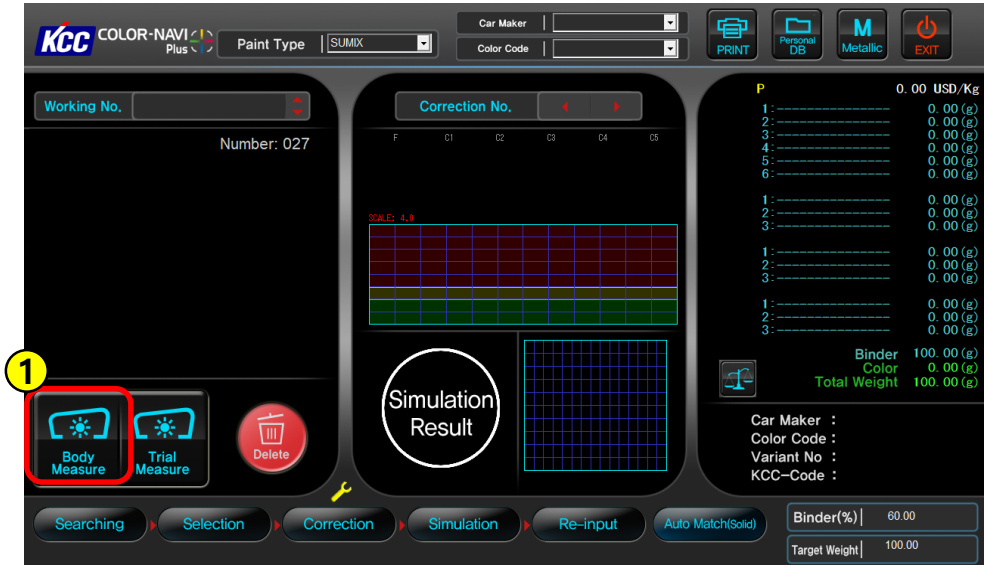
② Solid Color Matching



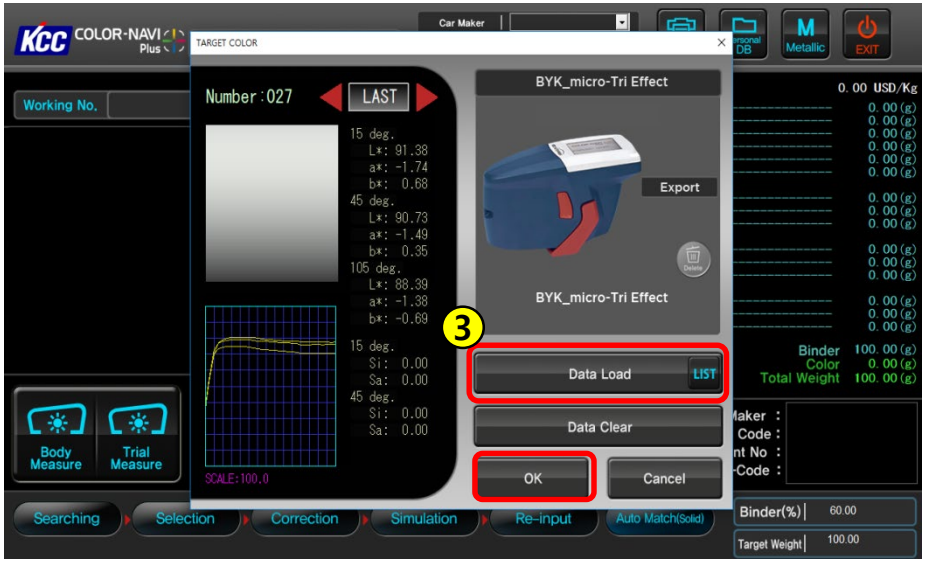
1. Select the paint type to mix: **BAROMATCH**(Solvent-borne) or **SUMIX**(Water-borne)
2. Enter the required paint weight (g).
3. Input the binder ratio in the paint (% by weight).

② Solid Color Matching

Steps for Body Color Measurement

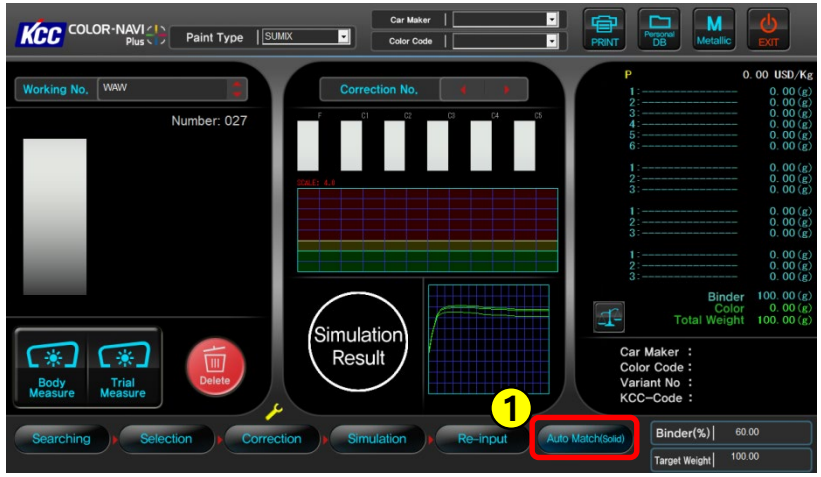


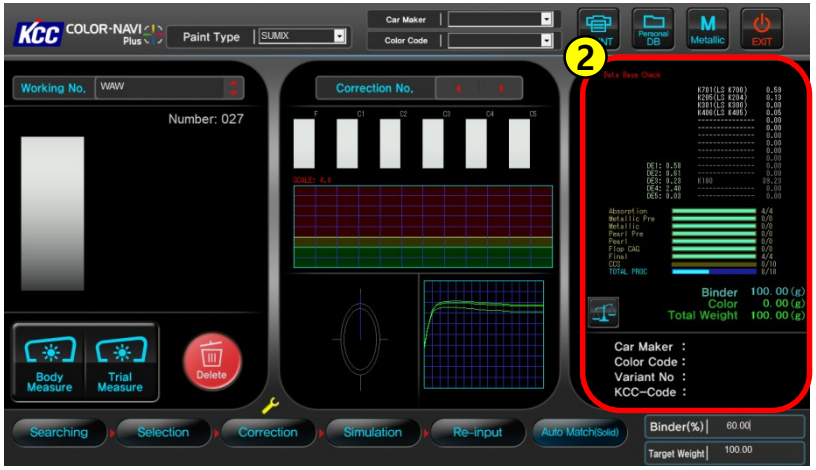
1. Click the **'Body Measure'** button.
2. The spectrophotometer data window opens as follows.
3. Click the **'Data Load'** button.
4. The measurement data will be displayed.
5. Click the **'OK'** button to confirm.



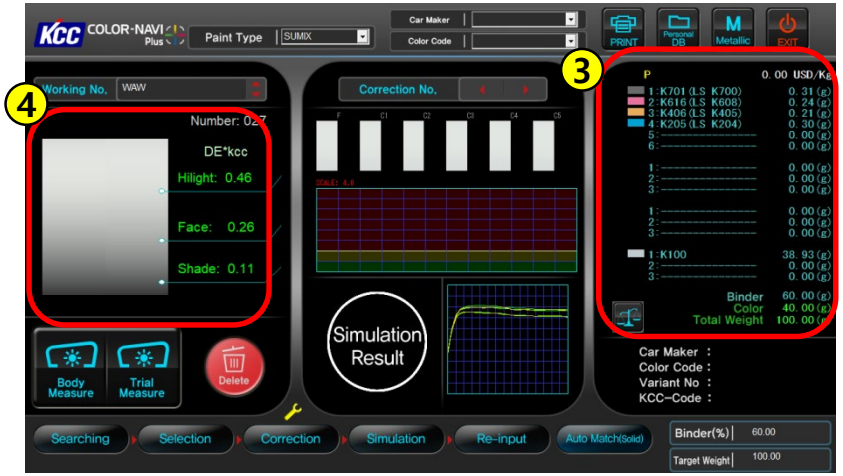
② Solid Color Matching

a. Automatic Mixing on Computer



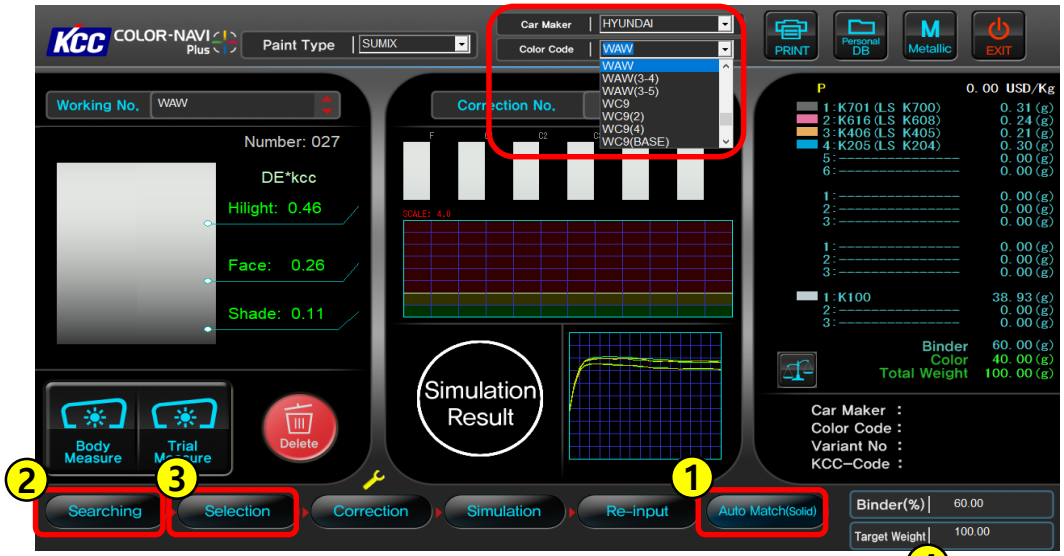


1. Click the '**Auto Match (Solid)**' button.
2. Analyze the measured color values to calculate the formula.
3. The formula is automatically generated.
4. The expected color difference (**ΔE*KCC**) of the new formula is displayed..



② Solid Color Matching

b. Adjusting Color Using Existing Data



① Click the **'Auto Match (Solid)'** button to first perform automatic color matching.

- If vehicle color information is known, select the **Manufacturer** and **Color Code**.
- Confirm the selection by clicking it with the mouse, then verify that it is applied in the lower-right area.
- If color information is not entered, all similar colors will be searched regardless of Car Maker or color code.

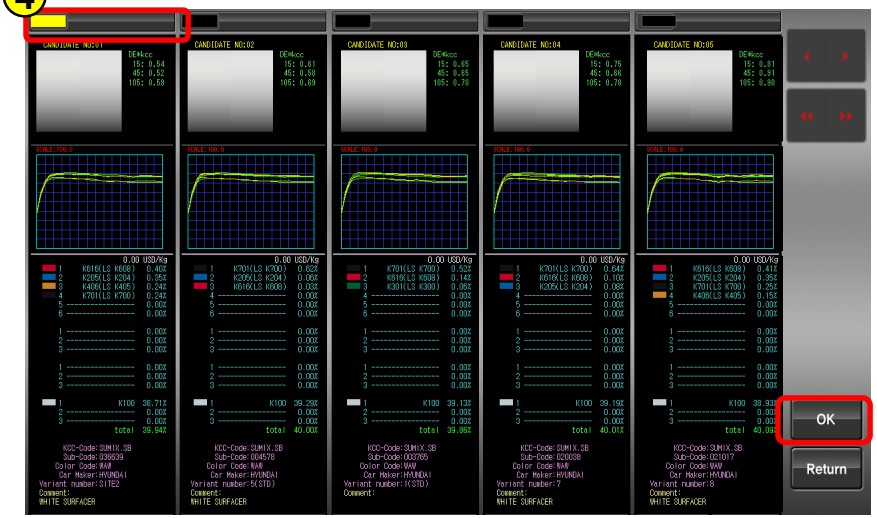
② Click the 'Searching' button..

③ Click the 'Selection' button.

④ A screen like the one on the right will appear.
Select based on :

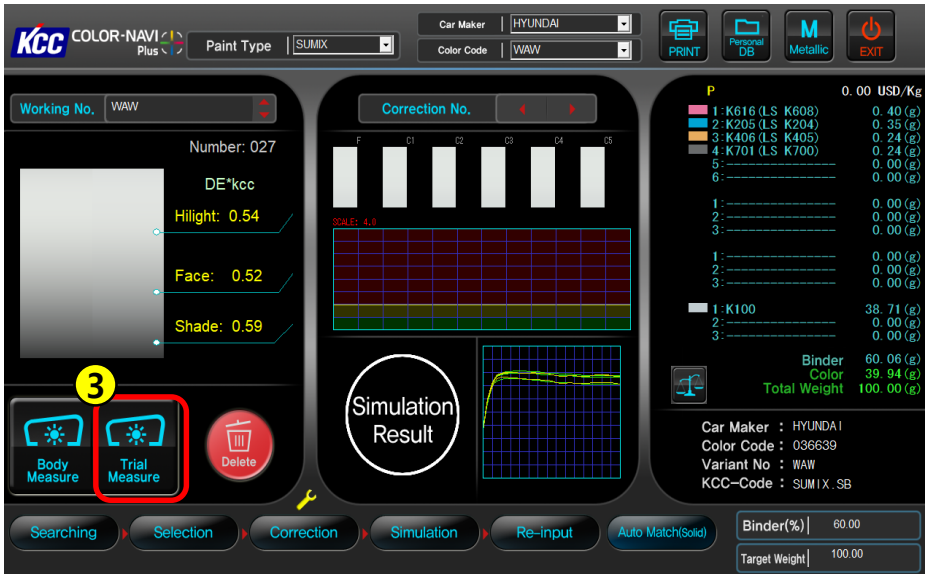
- Small DE(ΔE) values.
- Graphically similar matches or identical color codes.
- Formulas containing required toners.
- Check (click) the yellow box at the top.

⑤ Click the 'OK' button to apply your selection.

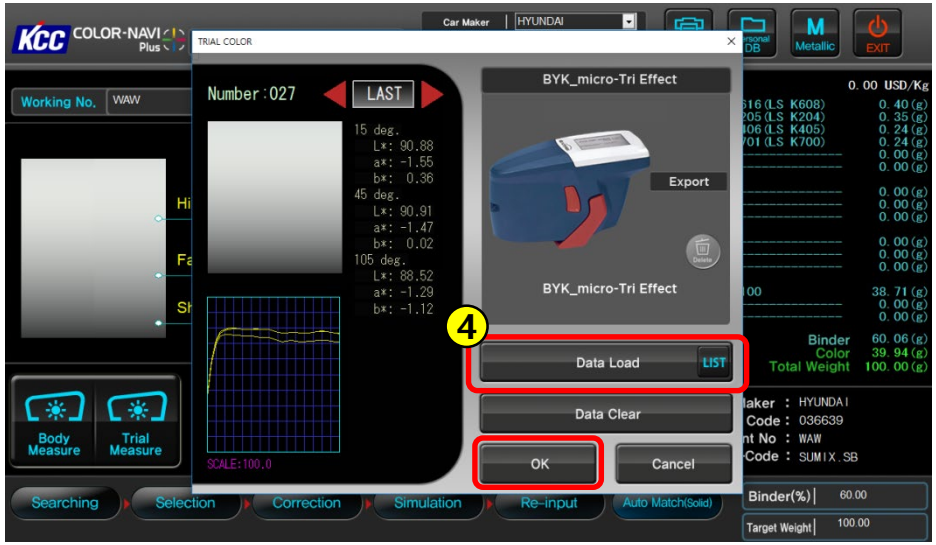


② Solid Color Matching

Measuring Sample Panel Color

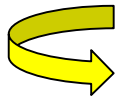


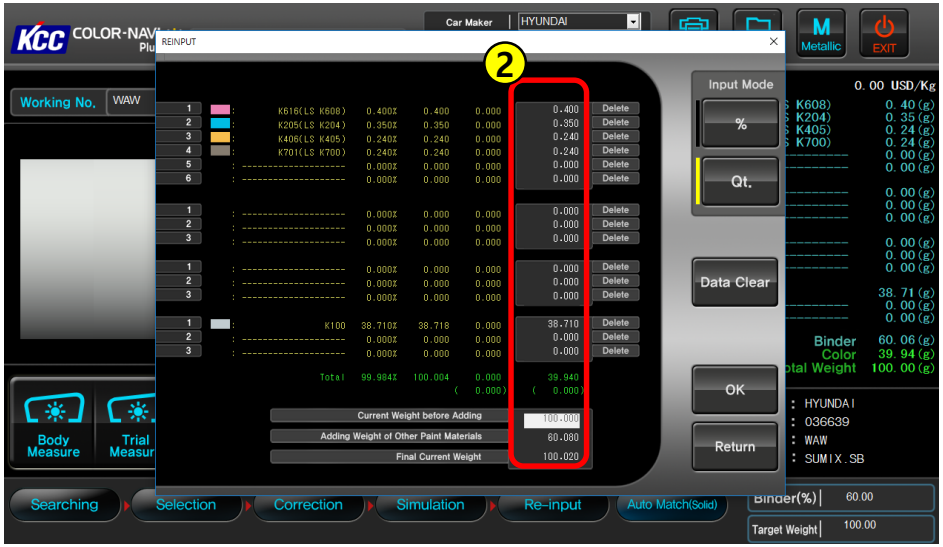
1. Create a sample panel by painting it with either an automatically matched formula or a stored formula.
2. Use the spectrophotometer to measure the painted sample panel.
3. Click the **"Trial Measure"** button.
4. Click the **"Data Load"** button to retrieve the measurement data.
5. The measurement data will appear on the screen.
6. Click the **"OK"** button to confirm.



② Solid Color Matching

Entering the Actual Formula Amounts





1. Click the **"Re-input"** button at the bottom.
2. Input the actual amounts of each toner and binder used.
3. Click the **"OK"** button.

② Solid Color Matching

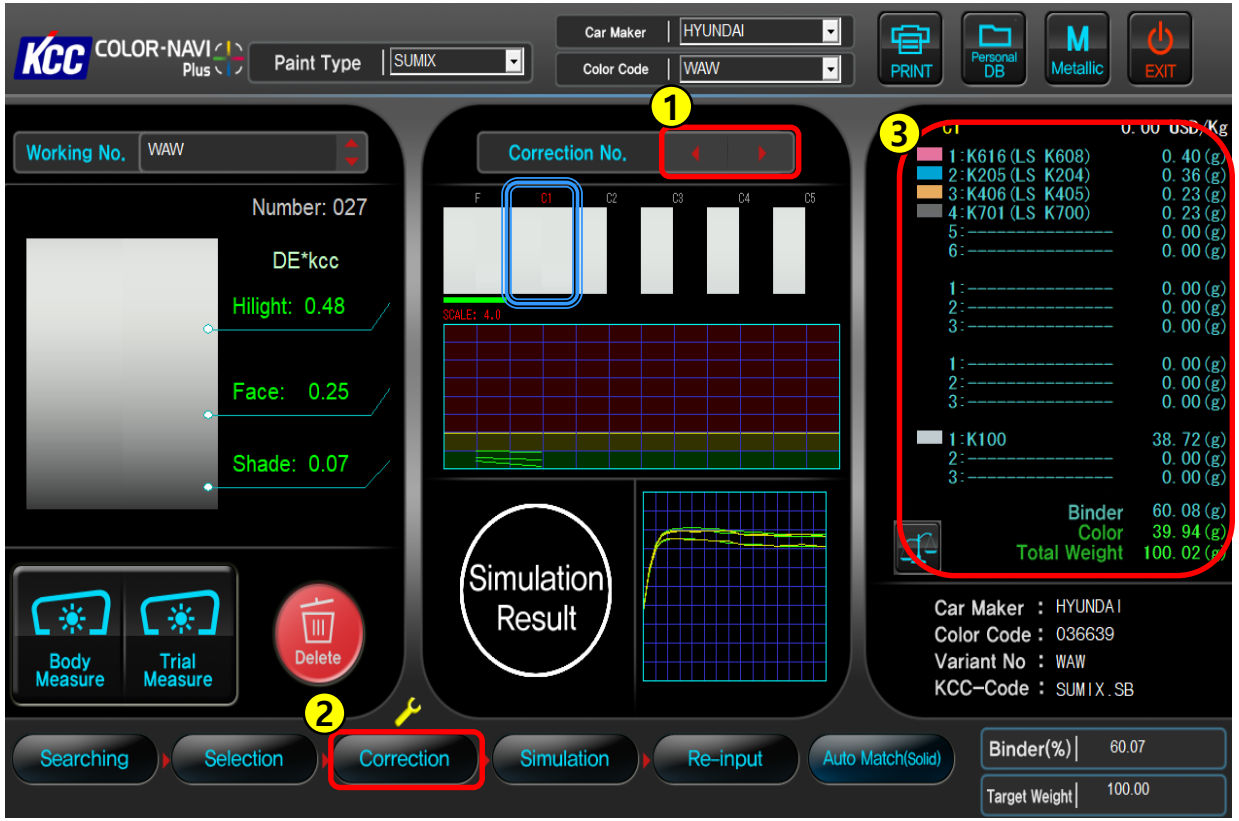
How to Check Color Match

1. Check the color differences (ΔE) for each angle.
   - Solid colors : check the **Face**(45′) color difference value
2. Determine the level of **match acceptability** based on the ΔE(DE*kcc) values.
   - Match Levels:
     - Good: Acceptable match
     - Similar: Moderate match
     - Bad: Poor match
3. Decide whether the formulation can be used based on the result and visual evaluation.
4. Confirm the formulation details of the selected color on the right side.

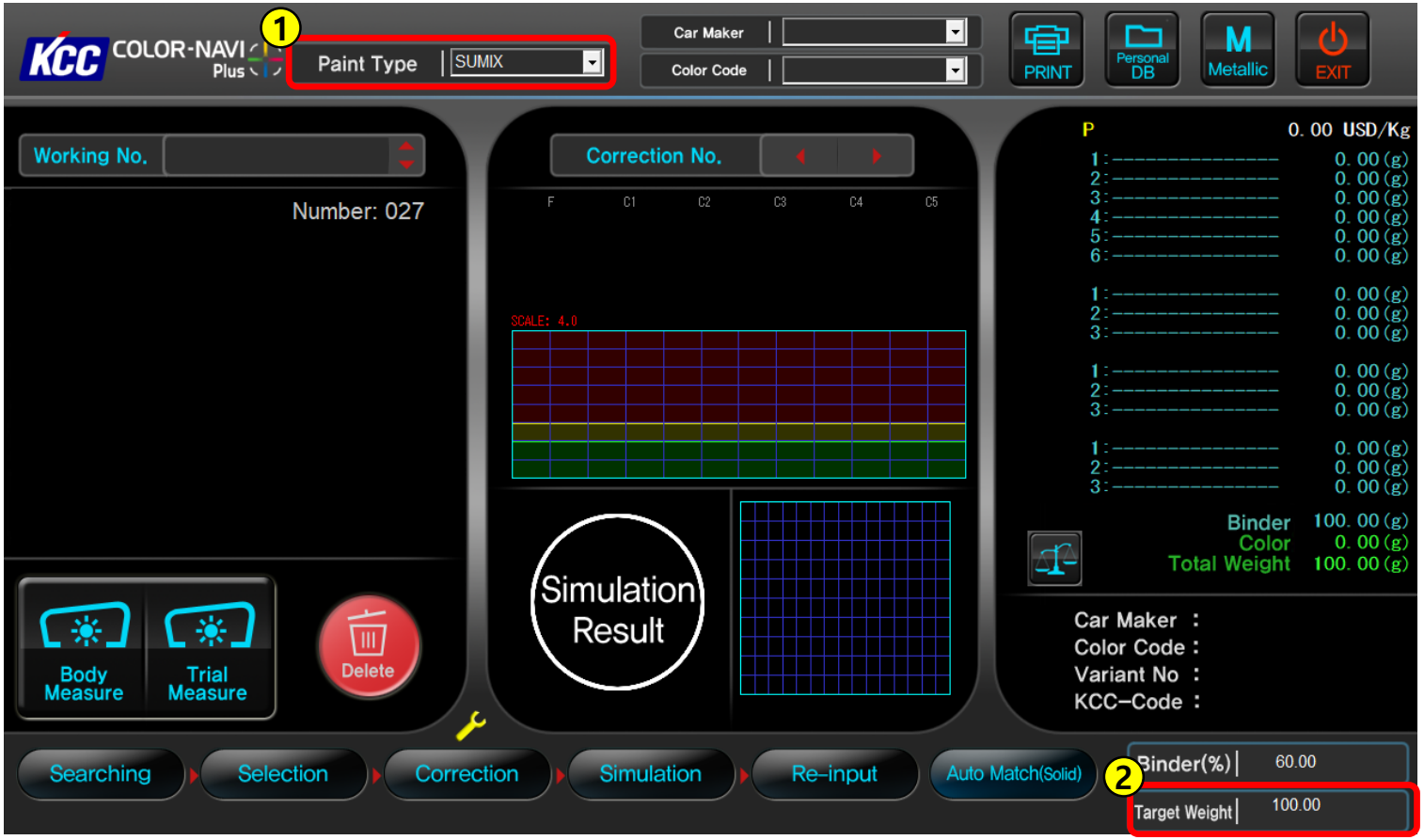
② Solid Color Matching

Additional Color Adjustment Required

1. If additional adjustments are needed, click the **"Left"** or **"Right"** button next to the "Correction No."
   1) Direction for Moving Numbers:
      - Forward(Right): F → C1 → C2 → C3 → C4
      - Backward(Left): Reverse of the above.
   2) The selected correction number is highlighted in red.
2. Click the **"Correction"** button at the bottom.
3. A new formula will appear on the right side.
4. Compare the results with the previous color difference and create a sample panel according to the new formula.



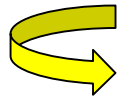
③ 2Coat (Metallic) Color Matching



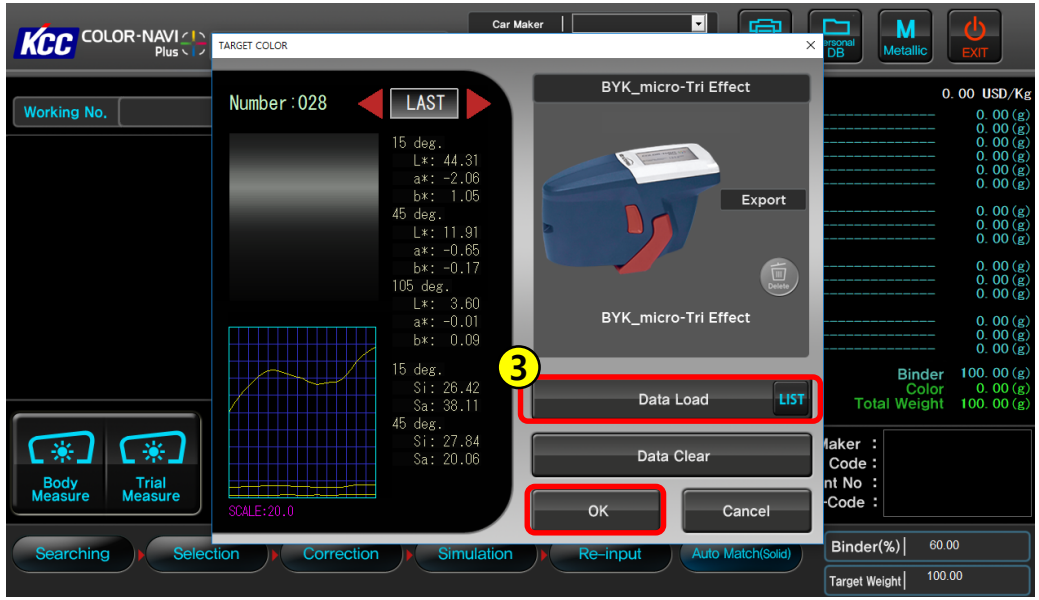
1. Select the paint type to mix: **BAROMATCH**(Solvent-borne) or **SUMIX**(Water-borne)
2. Enter the required paint weight (g).

③ 2Coat (Metallic) Color Matching

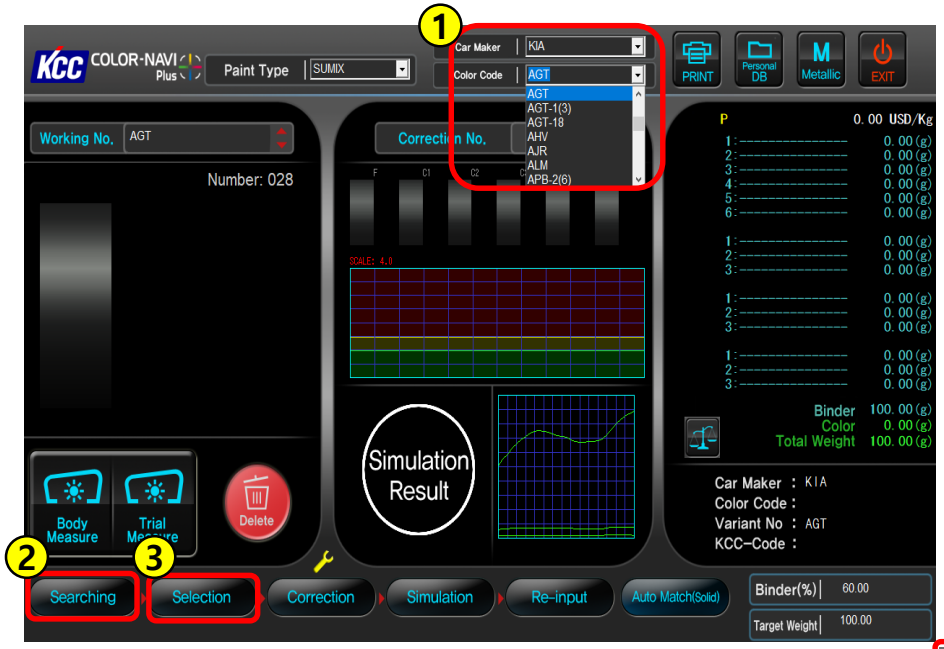
Vehicle Body Color(Target color) 색상) Measurement



1. Click the **'Body Measure'** button.
2. The spectrophotometer data window opens as follows.
3. Click the **'Data Load'** button.
4. The measurement data screen will appear.
5. Click the **'OK'** button to confirm.



③ 2Coat (Metallic) Color Matching



Color Search and Selection

① Select the **Car Maker** and **Color Code**.

- Confirm the selection by clicking it with the mouse

② Click the 'Searching' button..

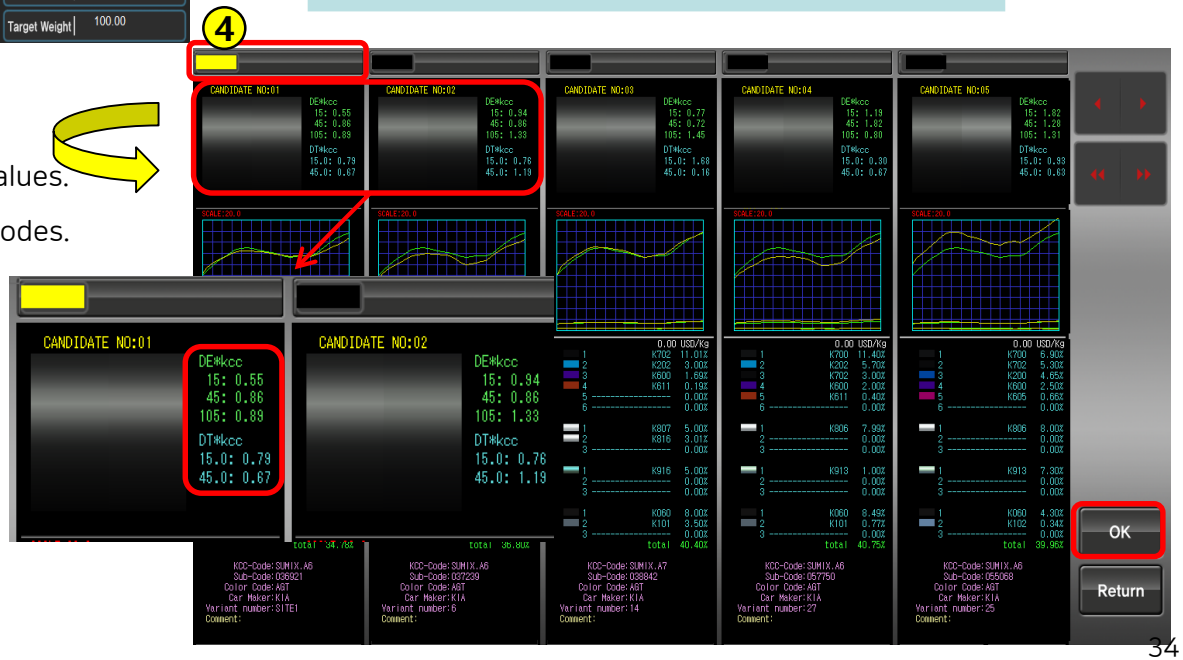
③ Click the 'Selection' button.

※ Selecting formulas with similar graph shapes (yellow line, green line) minimizes metamerism and makes formula adjustment easier.

④ A screen like the one on the right will appear.
Select based on :

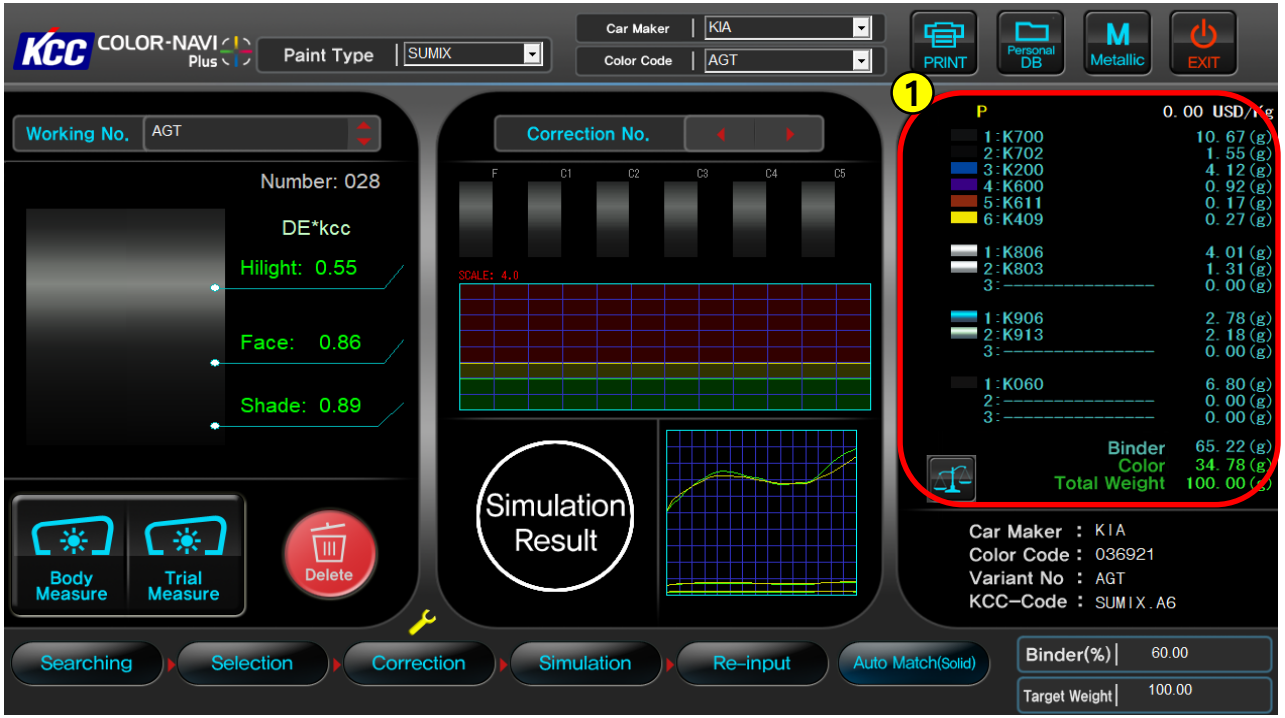
- Small DE*KCC(Color), small DT*KCC(Particle) values.
- Graphically similar matches or identical color codes.
- Formulas containing required toners.
- Check (click) the yellow box at the top.

⑤ Click the 'OK' button to apply your selection.



③ 2Coat (Metallic) Color Matching

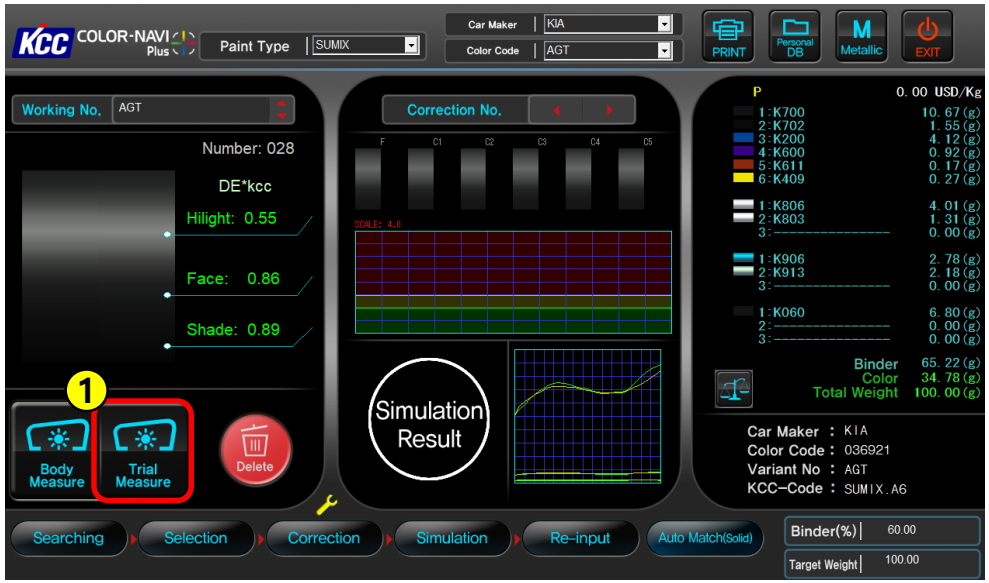
First Test Panel Preparation

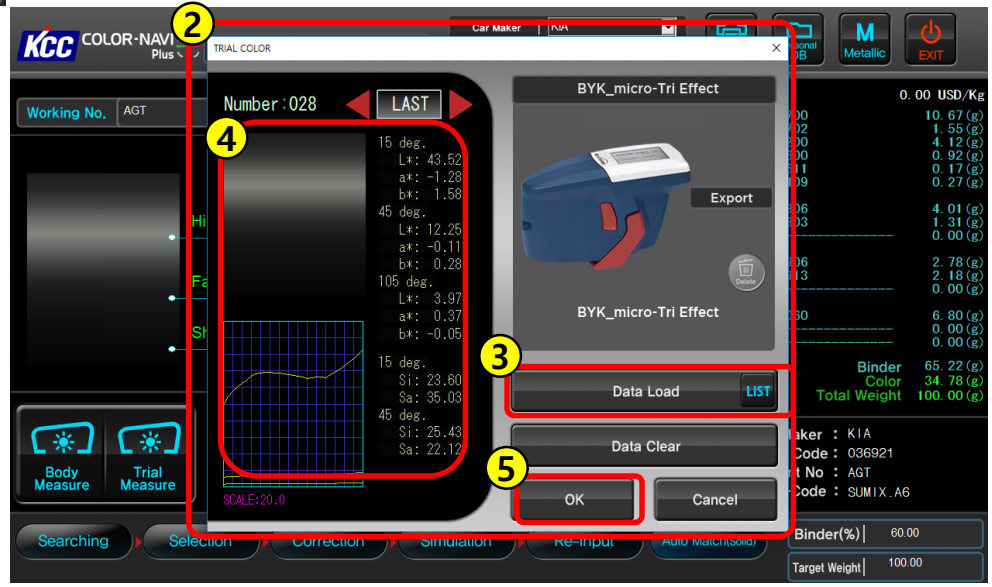


1. Check the color formula.
2. Mix the toners according to the formula.
3. Apply the prepared paint to the test panel.
4. After the color coat dries, apply a clear coat.
5. Dry the test panel(clear coat).
6. Let the dried test panel cool at room temperature for 1-2 minutes.
7. Measure the test panel using the spectrophotometer.

③ 2Coat (Metallic) Color Matching

Test Panel Measurement

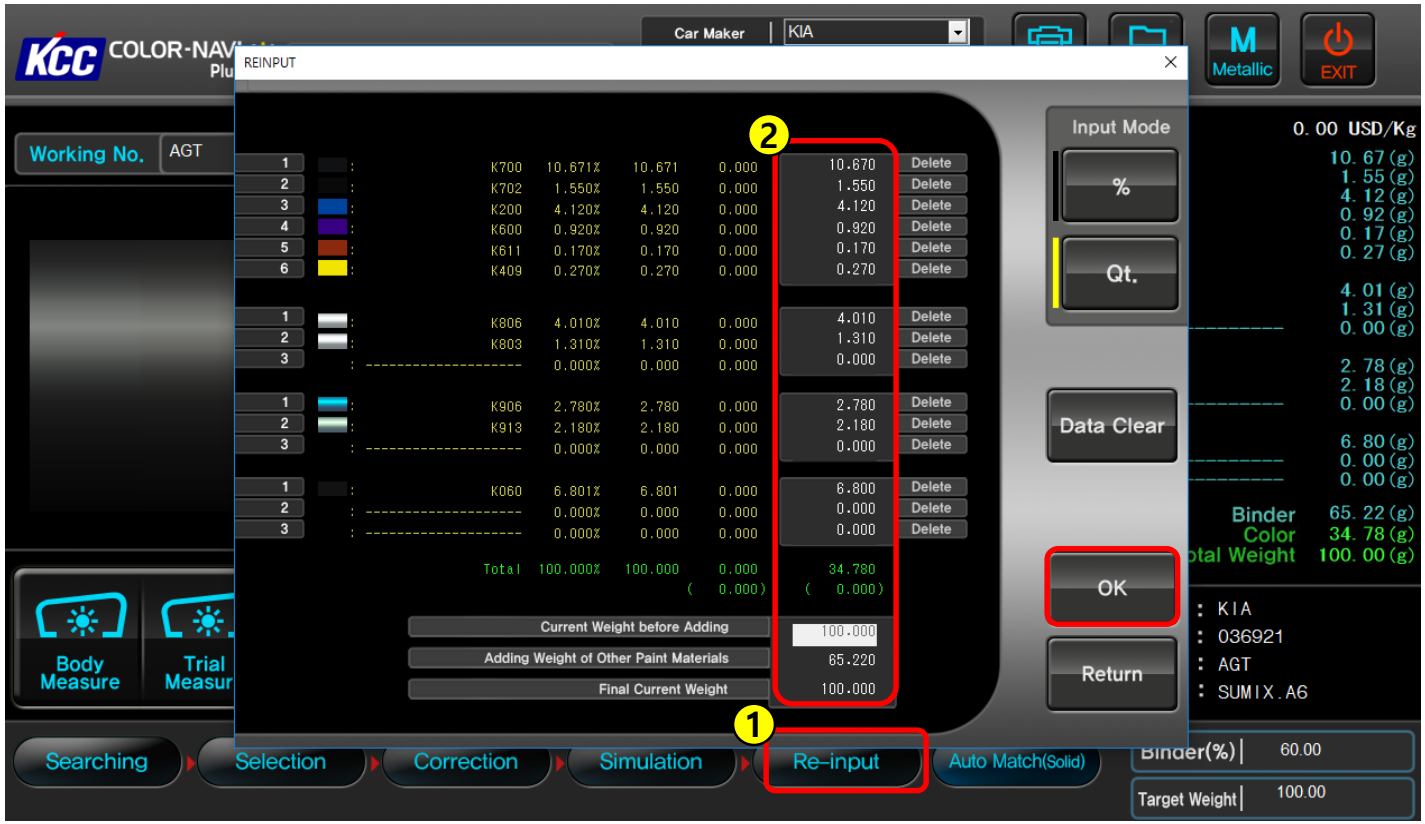




1. Click the "**Trial Measure**" button.
2. The spectrophotometer data window opens as follows.
3. Click the "**Data Load**" button.
4. The measurement results will be displayed on the screen.
5. Click the "**OK**" button.

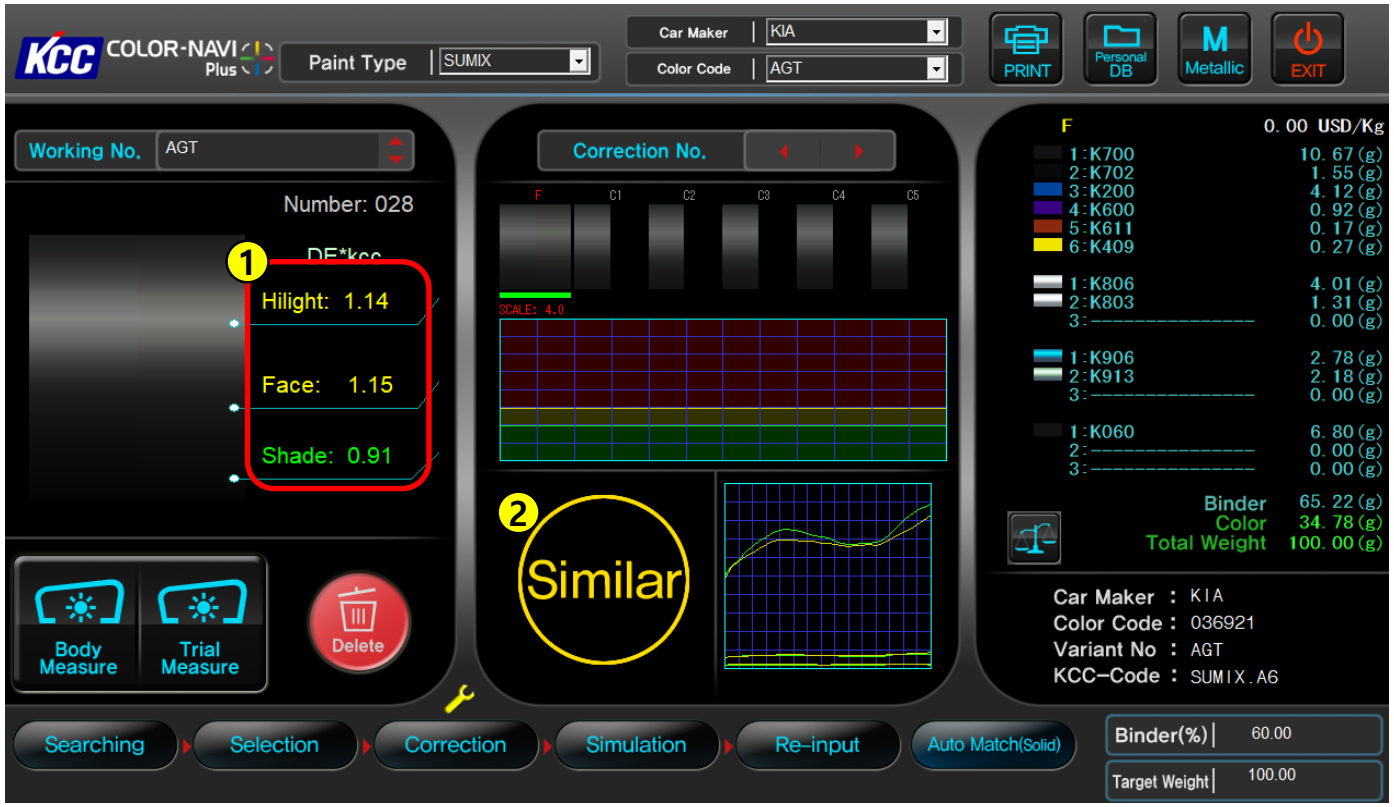
③ 2Coat (Metallic) Color Matching

Enter the actual toners & binder amounts.



1. Click the "**Re-input**" button at the bottom.
2. Enter the actual added amounts for each toner and binder.
3. Click the "**OK**" button to confirm.

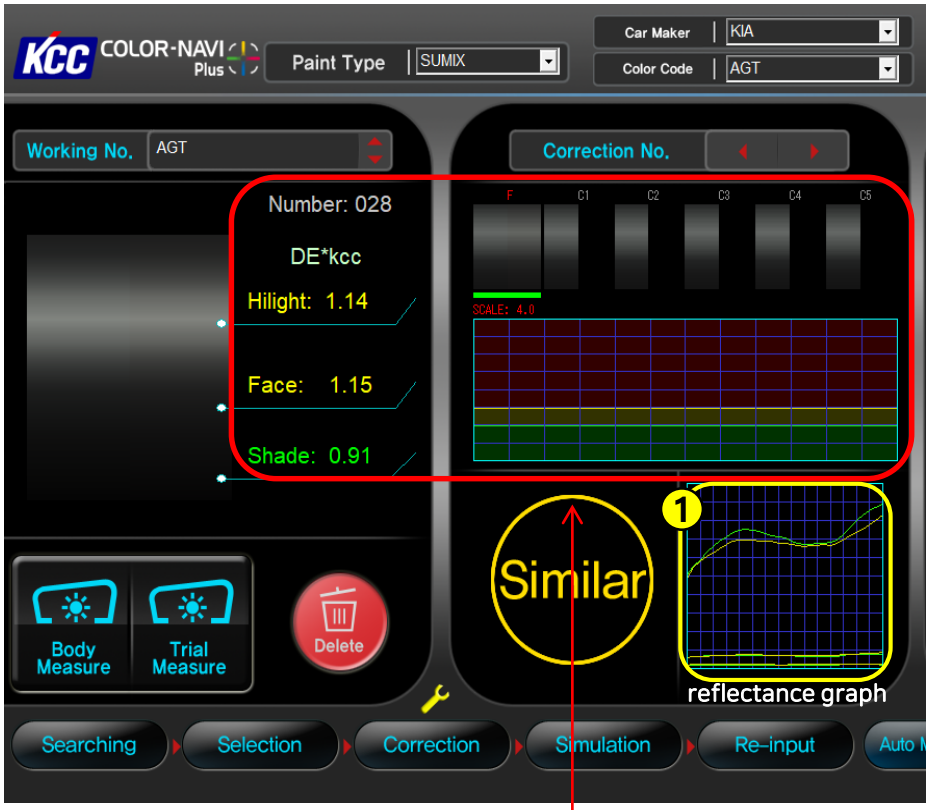
③ 2Coat (Metallic) Color Matching

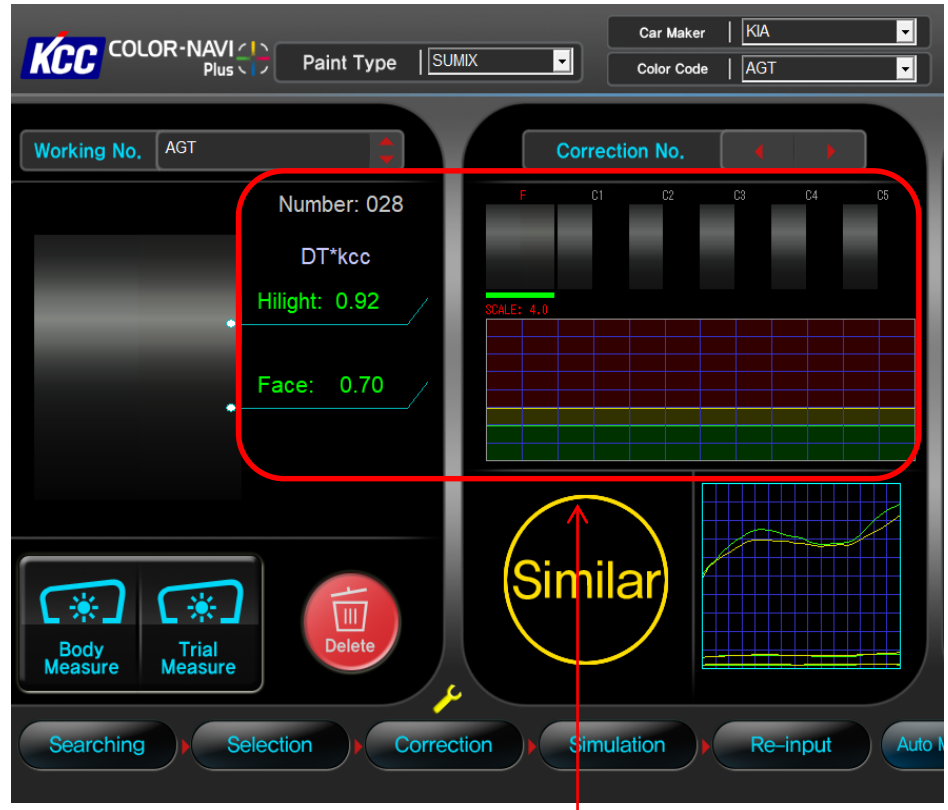


Checking Test Panel Measurement Results

1. Check the color difference (DE*KCC) at each angle : High light(15′), Face(45′), Shade(105′)
2. The color difference is classified into three levels: "**Good**", "**Similar**" and "**Bad**"
3. Based on these results, decide whether to proceed with further adjustments (correction).

③ 2Coat (Metallic) Color Matching

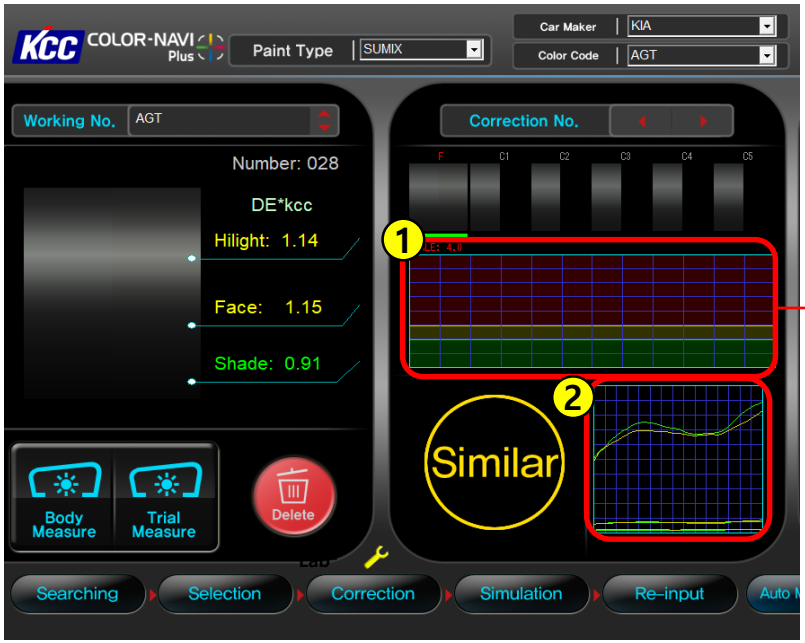


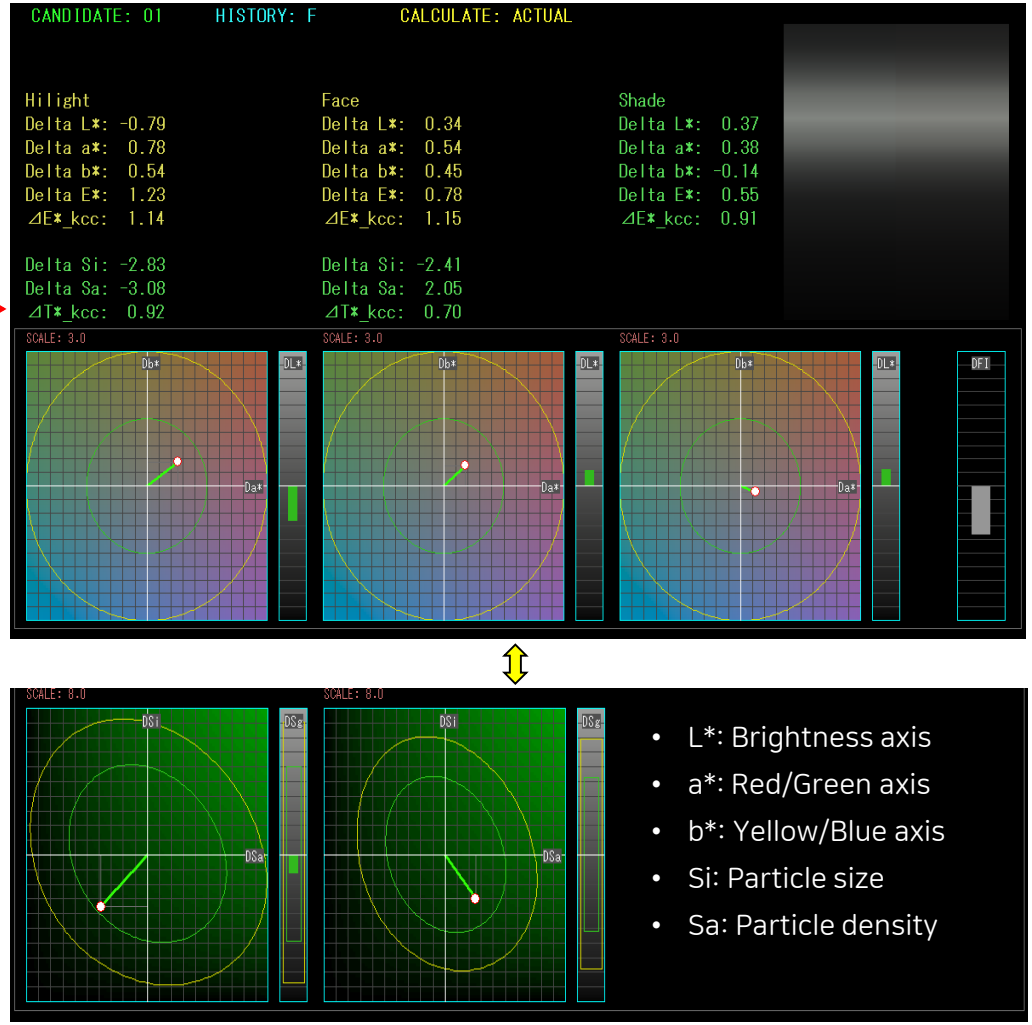


Checking Test Panel Measurement Results

- Click the **reflectance graph** to toggle between color difference (ΔE_KCC) and particle difference (ΔT_KCC).

③ 2Coat (Metallic) Color Matching





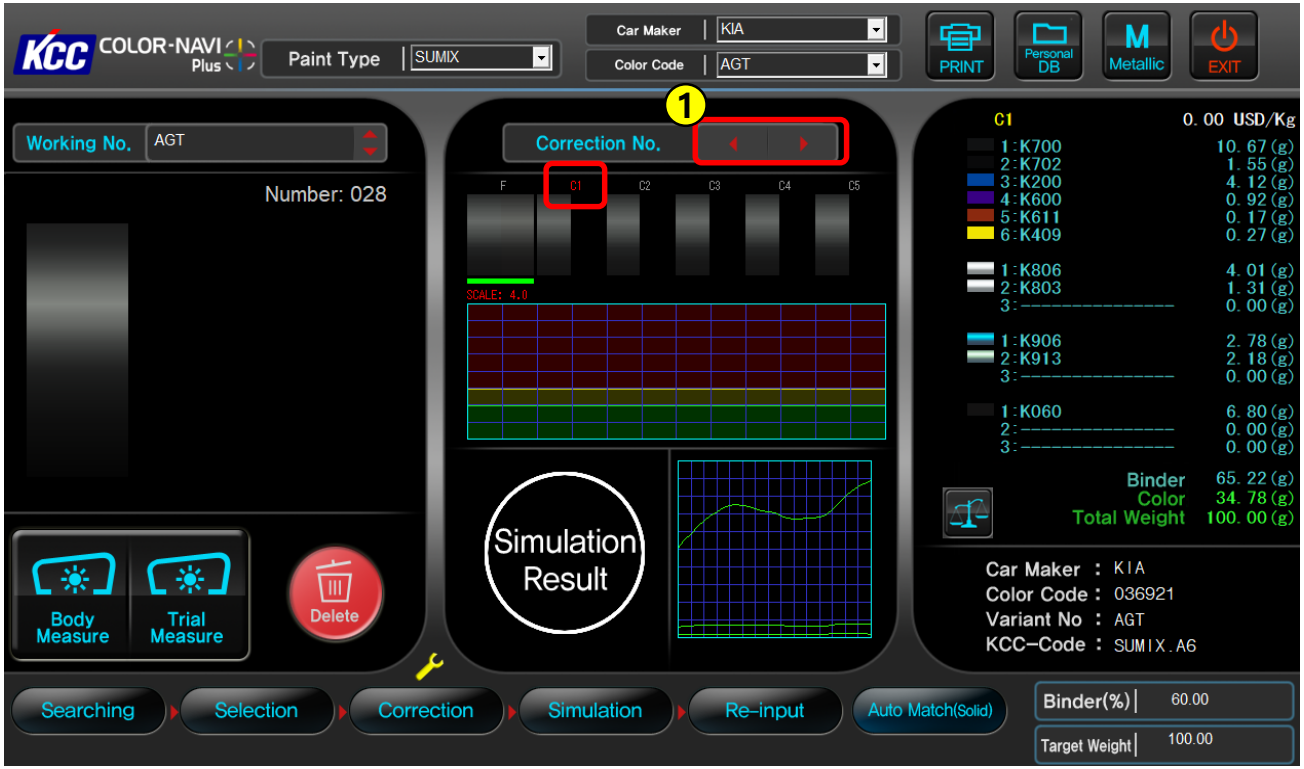
- L*: Brightness axis
- a*: Red/Green axis
- b*: Yellow/Blue axis
- Si: Particle size
- Sa: Particle density

Checking Panel Measurement Results

1. Double-click the progress graph area to display detailed color information on the right, as shown.
2. The reflectance graph at the bottom switches to a color difference graph (ΔE) or particle difference (ΔT) graph.

③ 2Coat (Metallic) Color Matching

Test Panel Color Correction



① If the results are unsatisfactory, use the "Correction Number Move" button at the top to proceed to the next correction.

1) Direction for Moving Numbers:
   - Forward: F → C1 → C2 → C3 → C4
   - Backward: Reverse of the above.

2) The selected correction number is highlighted in red.

③ 2Coat (Metallic) Color Matching

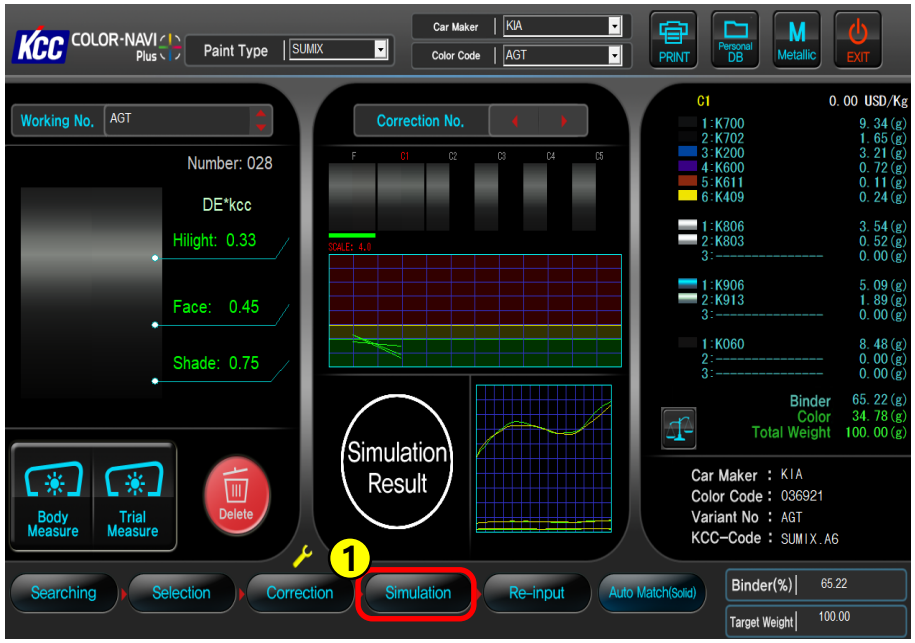
Test Panel Color Correction

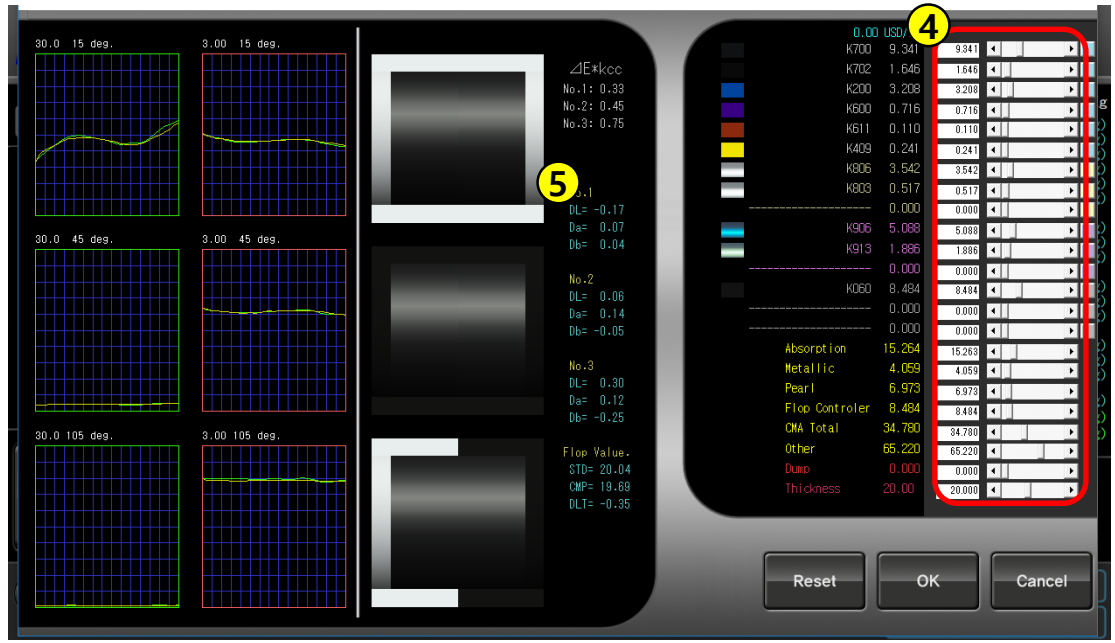
1. Change the correction number from F to C1.
2. Click the "**Correction**" button at the bottom.
   - The program will automatically create an updated correction formula.
3. Use the updated formula to prepare a new test panel.
4. Measure the prepared panel, evaluate the matching level, and:
   - If satisfactory, complete the process.
   - If unsatisfactory, repeat the procedure.

③ 2Coat (Metallic) Color Matching

Color Fine Adjustment Simulation

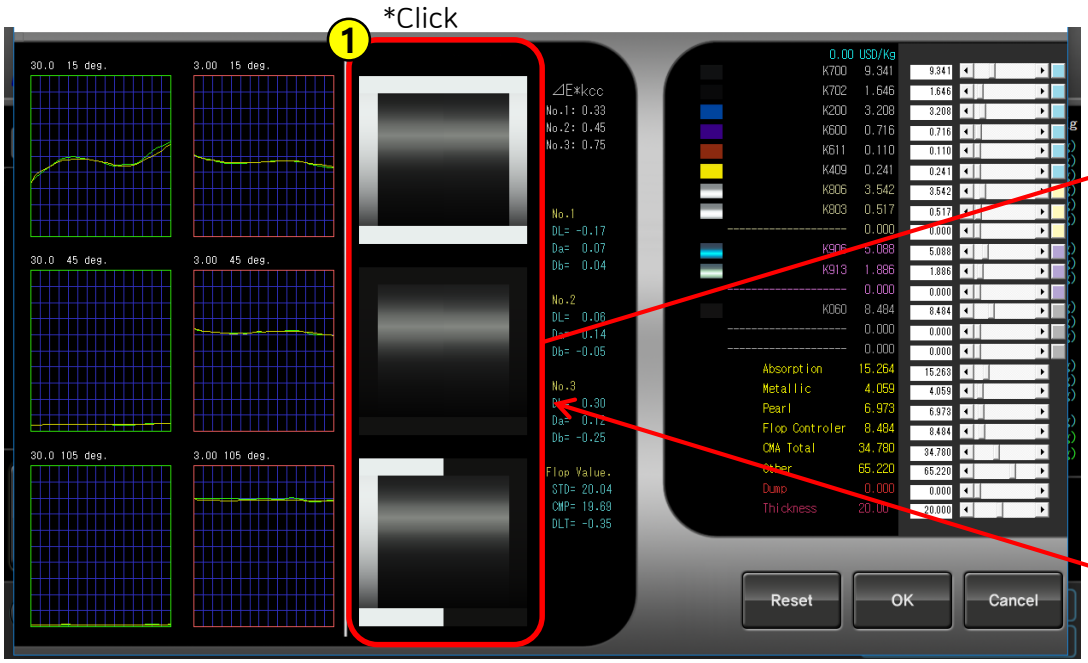
(Tip: When the COLOR-NAVI formula and opinion differ, or if you want to adjust the color at certain angles)

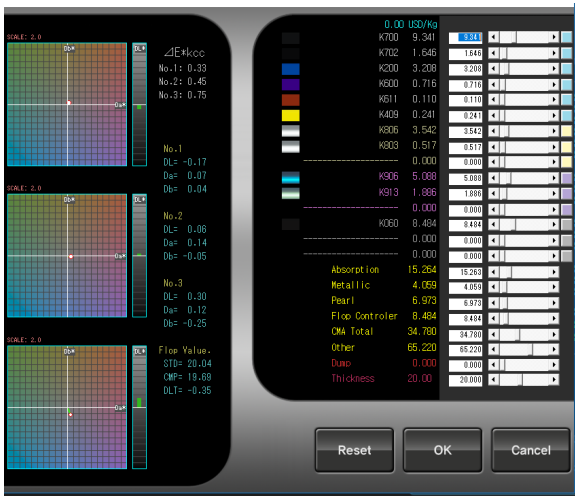




1. Click the "**Simulation**" button at the bottom.
2. The simulation window will open as shown in the image on the right.
3. On the right side of the screen, you can see the toners used in the formula and their mixing ratios.
4. The mixing ratios of each toner can be adjusted by directly entering numbers or using the scroll bar.
5. When the toner amounts are adjusted, you can observe changes in the color difference simulation screen on the left.
   - Verify if the expected result is better than the automatic adjustment formula from Color Navi.
   - If satisfactory, press the "**OK**" button. To readjust, press the "**Reset**" button.
     To use the automatic adjustment formula, press the "**Cancel**" button.

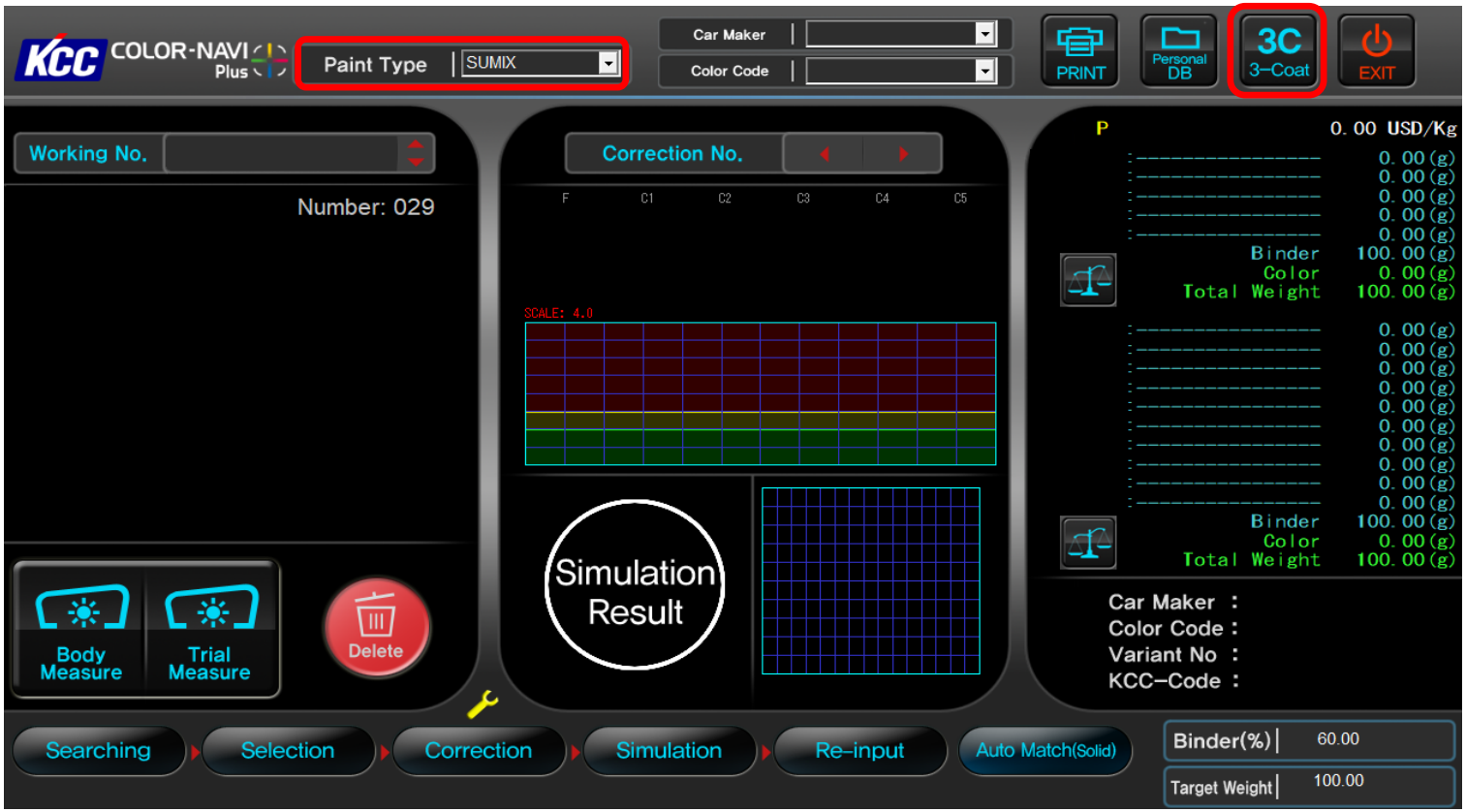
③ 2Coat (Metallic) Color Matching





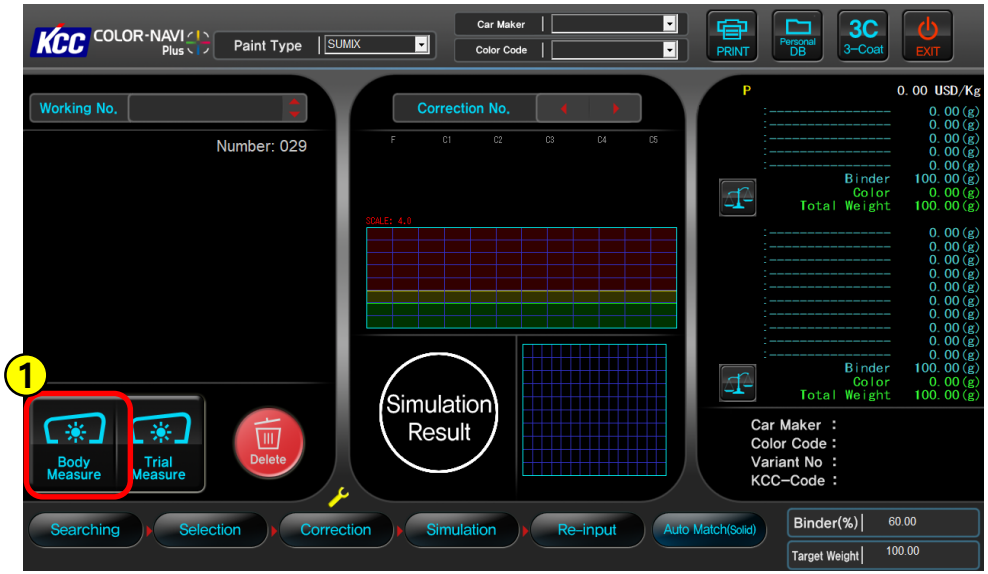
- Toggle Button - Changes the sequence to "Color Image"▶ "Color Graph"▶"Particle Graph".

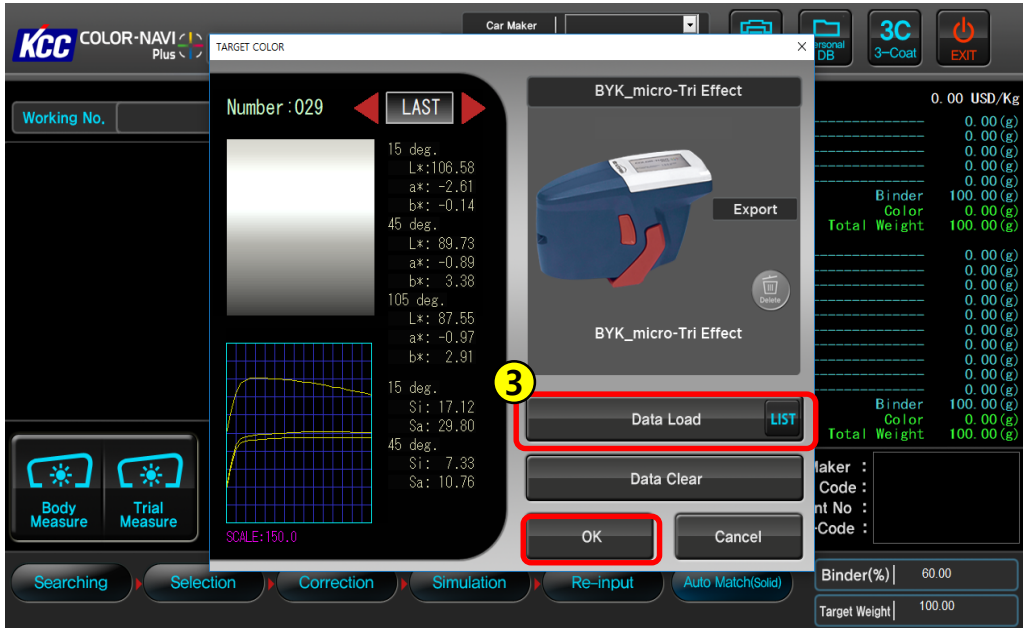
④ 3Coat Color Matching



1. Select the paint type to mix: **BAROMATCH**(Solvent-borne) or **SUMIX**(Water-borne)
2. Click the mode button at the top to switch to "**3C (3-Coat)**"mode.

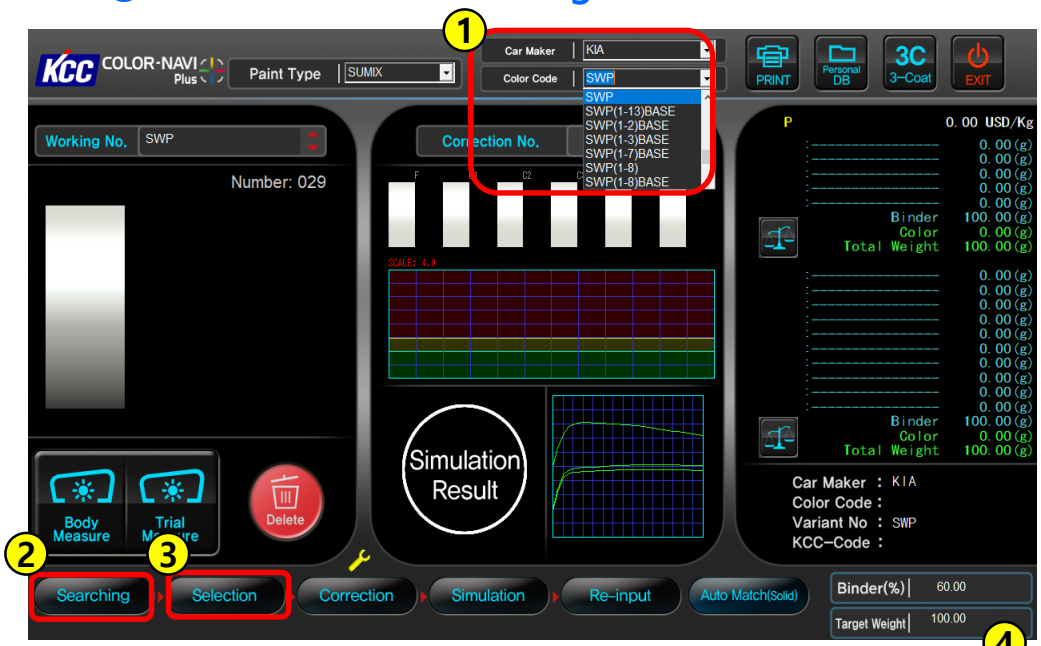
④ 3Coat Color Matching





1. Click the **'Body Measure'** button.
2. The spectrophotometer data window opens as follows.
3. Click the **'Data Load'** button.
4. The measurement results will be displayed on the screen.
5. Click the **'OK'** button to confirm.

④ 3Coat Color Matching



Color Search and Selection

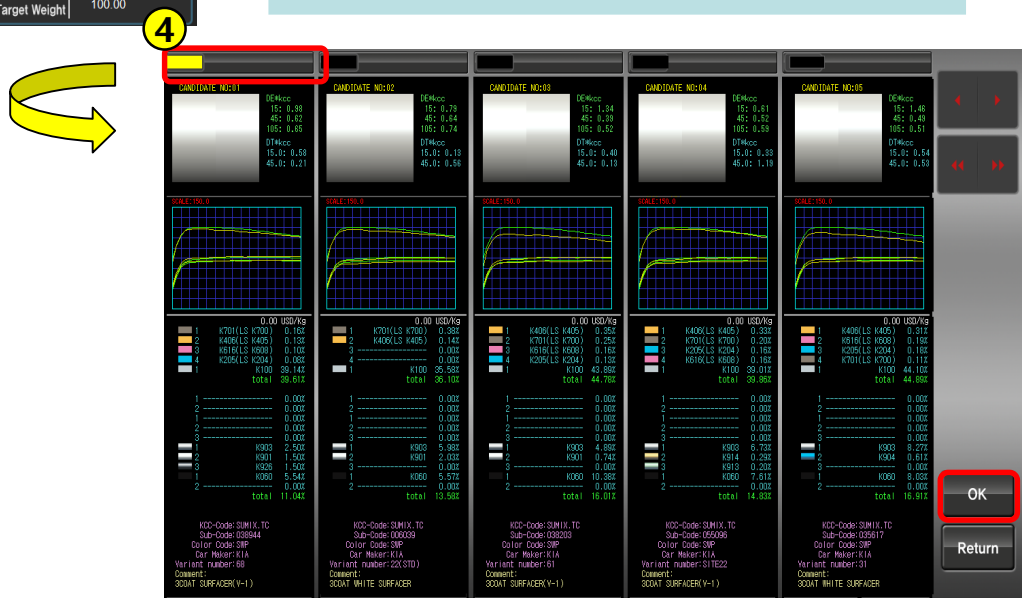
① Select the **Car Maker** and **Color Code**.

- Confirm the selection by clicking it with the mouse

② Click the '**Searching**' button..

③ Click the '**Selection**' button.

※ Selecting formulas with similar graph shapes (yellow line, green line) minimizes metamerism and makes formula adjustment easier.

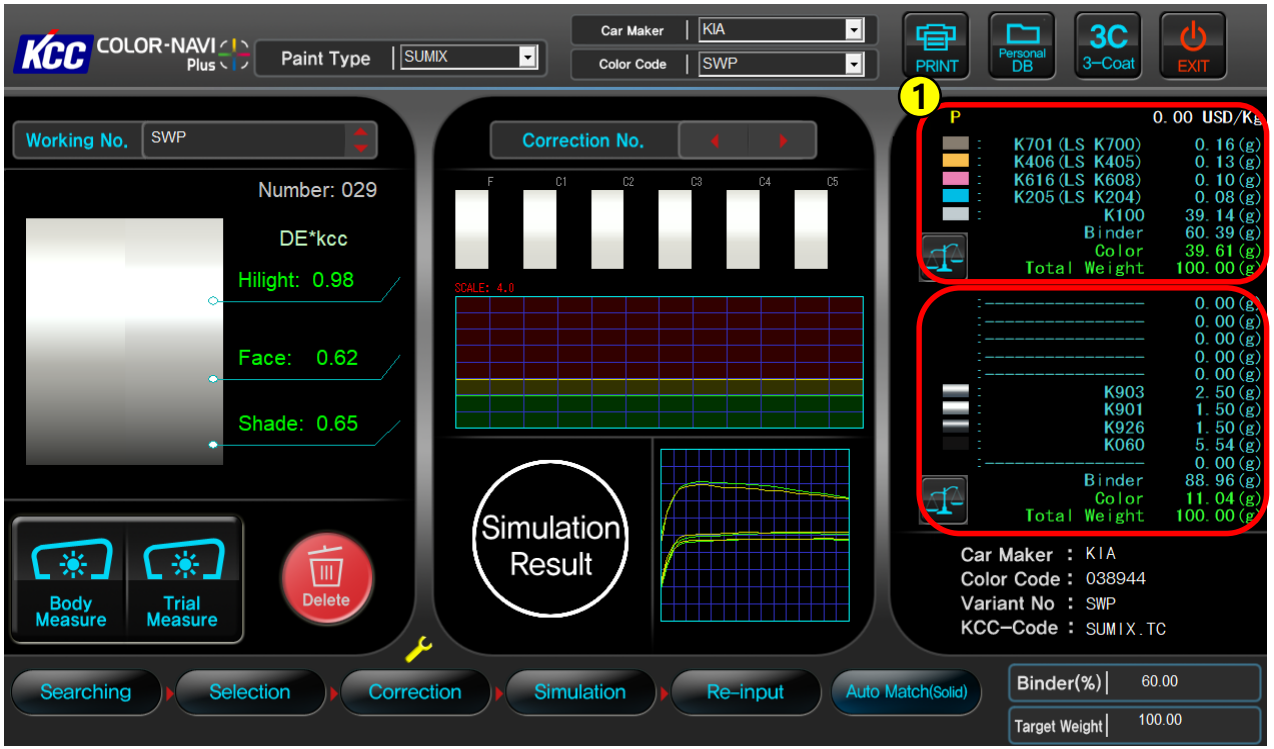


④ A screen like the one on the right will appear.
Select based on :

- Small DE*KCC(Color), small DT*KCC(Particle) values.
- Graphically similar matches or identical color codes.
- Formulas containing required toners.
- Check (click) the yellow box at the top.

⑤ Click the '**OK**' button to apply your selection.

④ 3Coat Color Matching

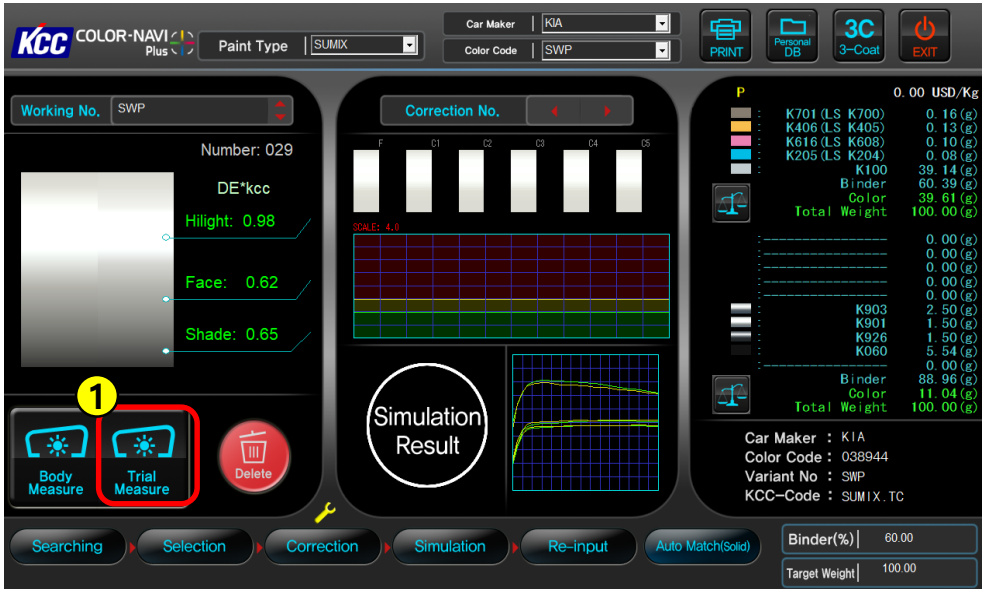


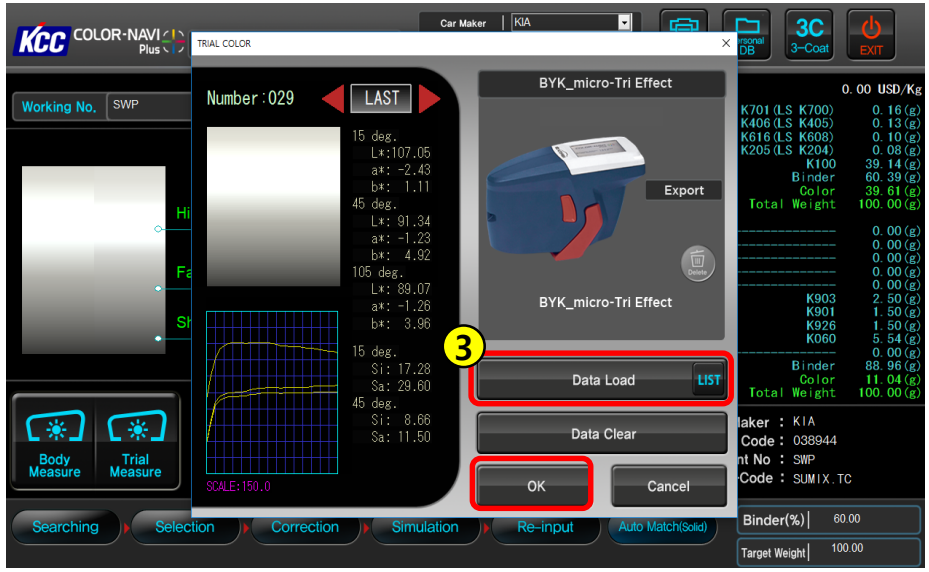
First Test Panel Preparation

1. Check the base coat and pearl coat formula.
2. Mix the toners according to the formula.
3. Apply the prepared paint to the test panel.
   - 3COAT Painting: For SUMIX, apply white primer first, then spray the base coat twice and the pearl coat twice.
     (*Please check the website for specific coating instructions, as the number of coatings may vary depending on the formula.)
4. After the color coat dries, apply a clear coat.
5. Dry the test panel(clear coat).
6. Let the dried test panel cool at room temperature for 1-2 minutes.
7. Measure the test panel using the spectrophotometer.

④ 3Coat Color Matching

Test Panel Measurement

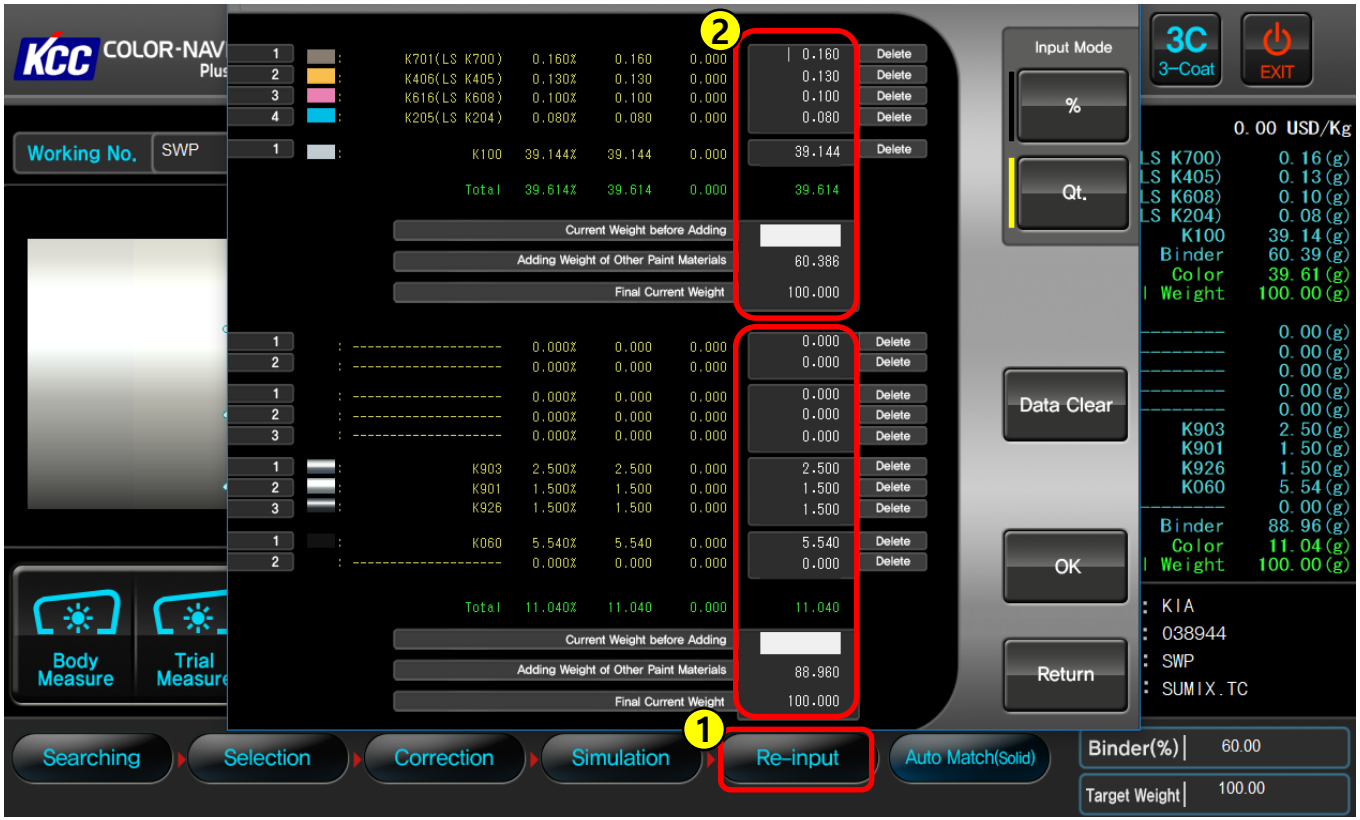




1. Click the "**Trial Measure**" button.
2. The spectrophotometer data window opens as follows.
3. Click the "**Data Load**" button.
4. The measurement results will be displayed on the screen.
5. Click the "**OK**" button.

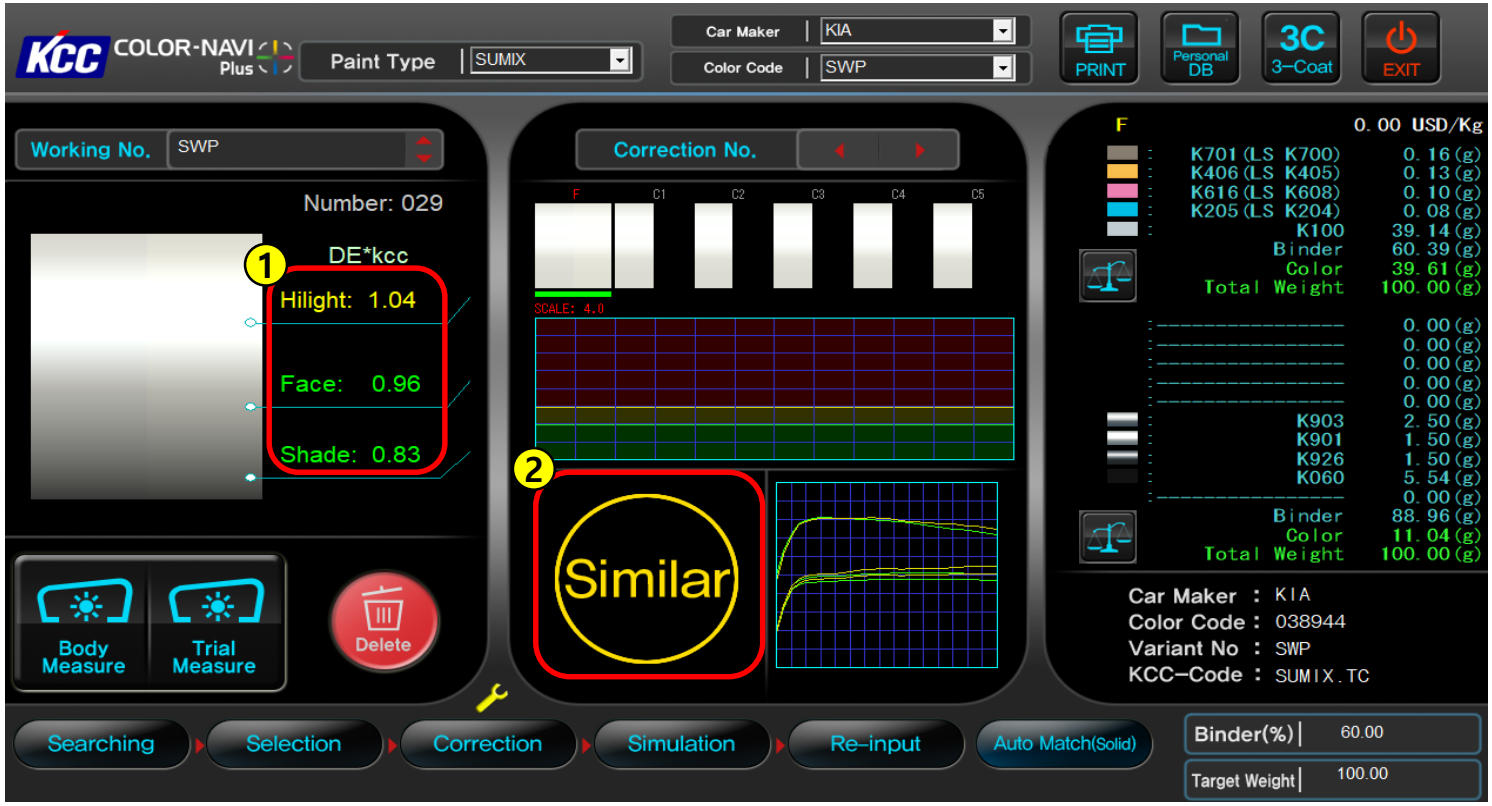
④ 3Coat Color Matching

Enter the actual toners & binder amounts.



1. Click the "**Re-input**" button at the bottom.
2. Enter the actual added amounts for each toner and binder.
3. Click the "**OK**" button to confirm.

④ 3Coat Color Matching

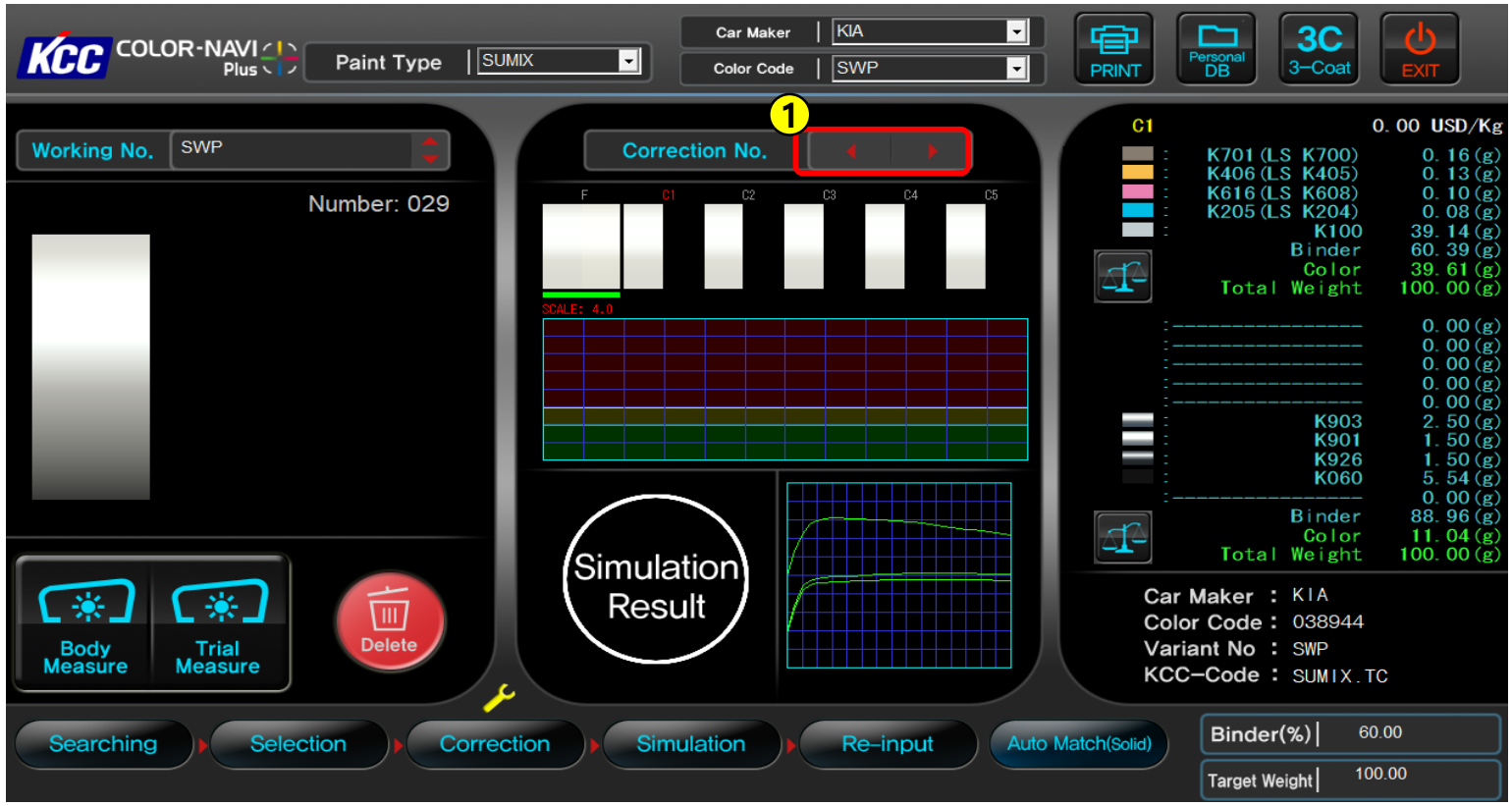


Checking Test Panel Measurement Results

1. Check the color difference (DE) at each angle : High light(15’), Face(45’), Shade(105’)
2. The color difference is classified into three levels: "**Good**", "**Similar**" and "**Bad**"
3. Based on these results, decide whether to proceed with further adjustments (correction).

④ 3Coat Color Matching

Test Panel Color Correction

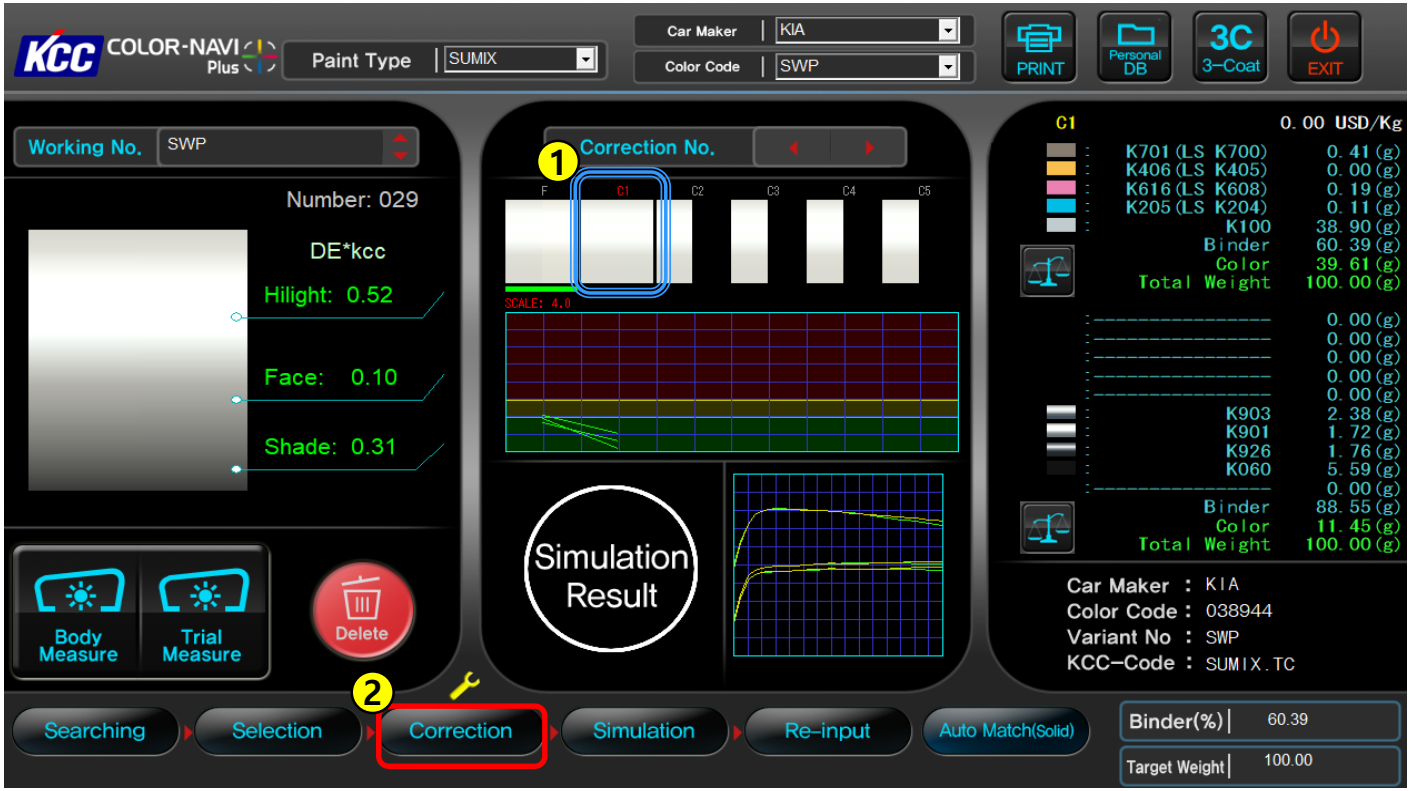


① If the results are unsatisfactory, use the "Correction Number Move" button at the top to proceed to the next correction.

1) Direction for Moving Numbers:
   - Forward: F → C1 → C2 → C3 → C4
   - Backward: Reverse of the above.

④ 3Coat Color Matching

Test Panel Color Correction



1. Change the correction number from F to C1.
2. Click the "**Correction**" button at the bottom.
   - The program will automatically create an updated correction formula.
3. Use the updated formula to prepare a new test panel.
4. Measure the prepared panel, evaluate the matching level, and:
   - If satisfactory, complete the process.
   - If unsatisfactory, repeat the procedure.

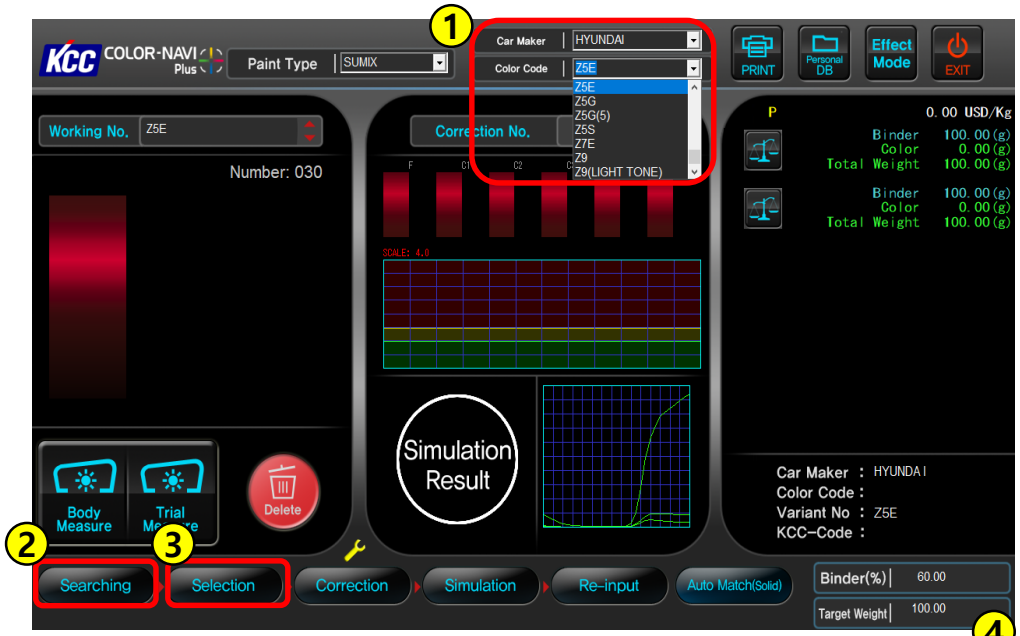
⑤ Effect Mode (Candy colors/Special Effect) Color Matching

1. Select the paint type to mix: **BAROMATCH**(Solvent-borne) or **SUMIX**(Water-borne)
2. Click the mode button at the top to switch to "**Effect Mode**".

⑤ Effect Mode (Candy colors/Special Effect) Color Matching

1. Click the **'Body Measure'** button.
2. The spectrophotometer data window opens as follows.
3. Click the **'Data Load'** button.
4. The measurement results will be displayed on the screen.
5. Click the **'OK'** button to confirm.

⑤ Effect Mode (Candy colors/Special Effect) Color Matching



Color Search and Selection

① Select the **Car Maker** and **Color Code**.

- Confirm the selection by clicking it with the mouse

② Click the '**Searching**' button..

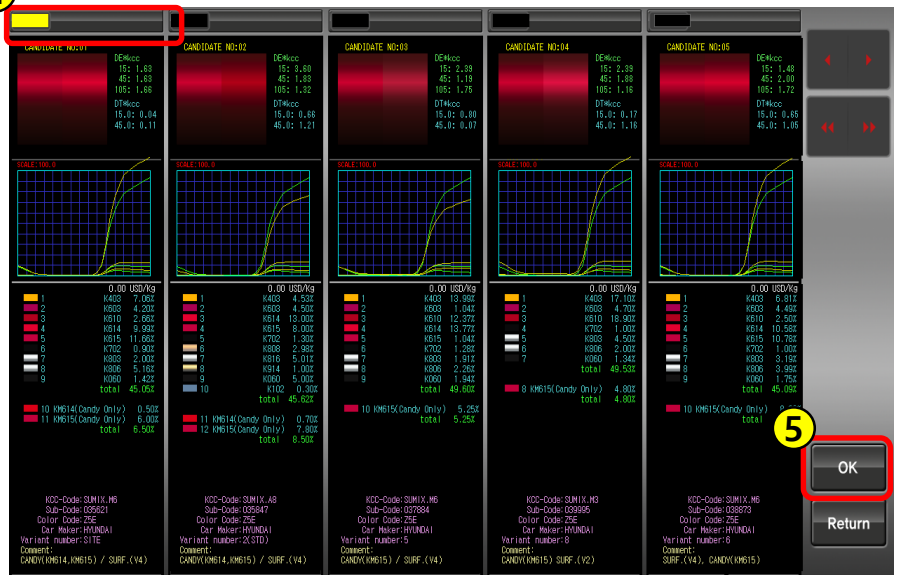
③ Click the '**Selection**' button.

※ Selecting formulas with similar graph shapes (yellow line, green line) minimizes metamerism and makes formula adjustment easier.

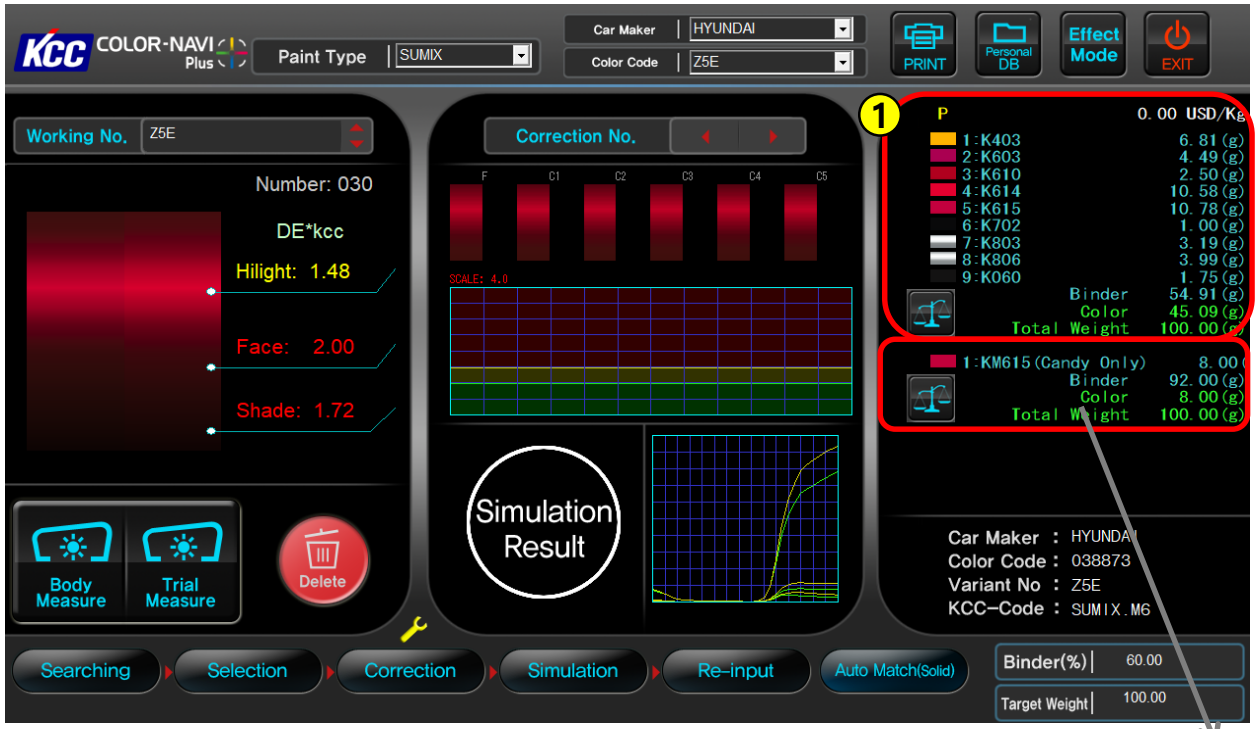
④ A screen like the one on the right will appear.
Select based on :

- Small DE*KCC(Color), small DT*KCC(Particle) values.
- Graphically similar matches or identical color codes.
- Formulas containing required toners.
- Check (click) the yellow box at the top.

⑤ Click the 'OK' button to apply your selection.



⑤ Effect Mode (Candy colors/Special Effect) Color Matching



First Test Panel Preparation

1. Check the base coat formula and top coat formula.
2. Mix the toners according to the formula.
3. Apply the prepared paint to the test panel. (Spray).
   (*Be sure to refer to the formula and notes on the KCC Refinish website.
   The number of coatings may vary depending on the situation.)
4. After the base coat dries, apply the top coat.
5. Then, apply an additional clear coat.
6. Let the dried test panel cool at room temperature for 1-2 minutes.
7. Measure the test panel using the spectrophotometer.

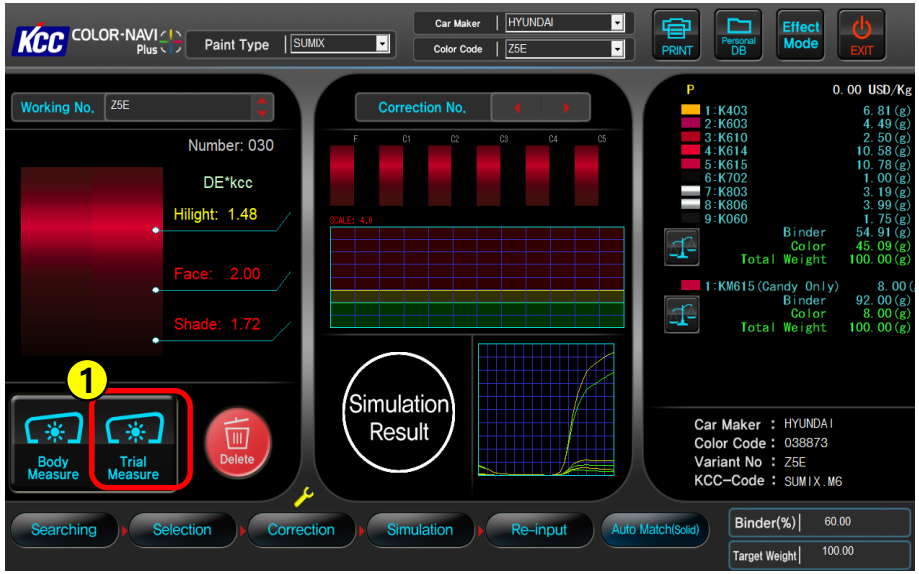
*For Candy Colors

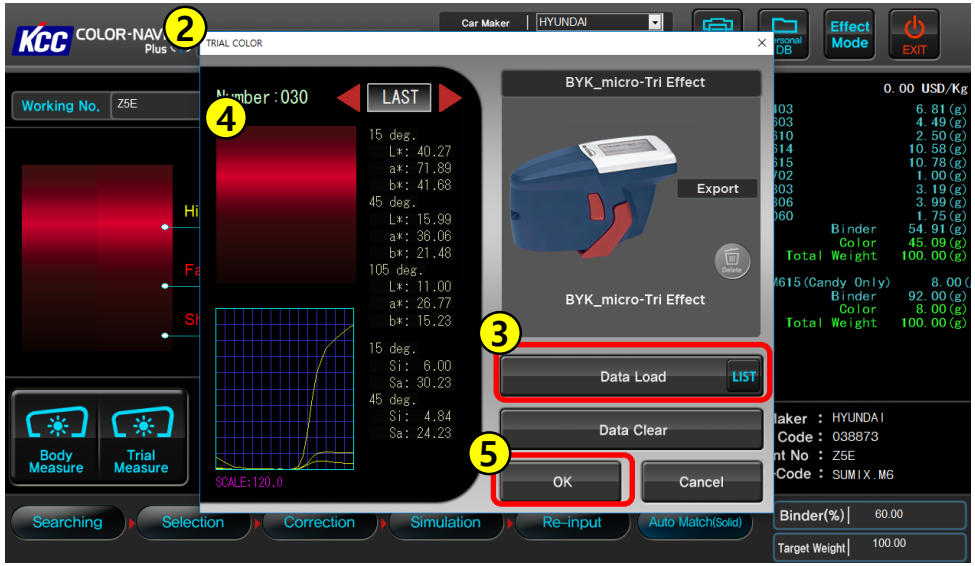
The remaining process is the same as usual, with only step 4. being modified.

Ex) Top Coat: 5300 HS CLEAR 92g + KM615 (Candy Only) 8g

⑤ Effect Mode (Candy colors/Special Effect) Color Matching

Test Panel Measurement





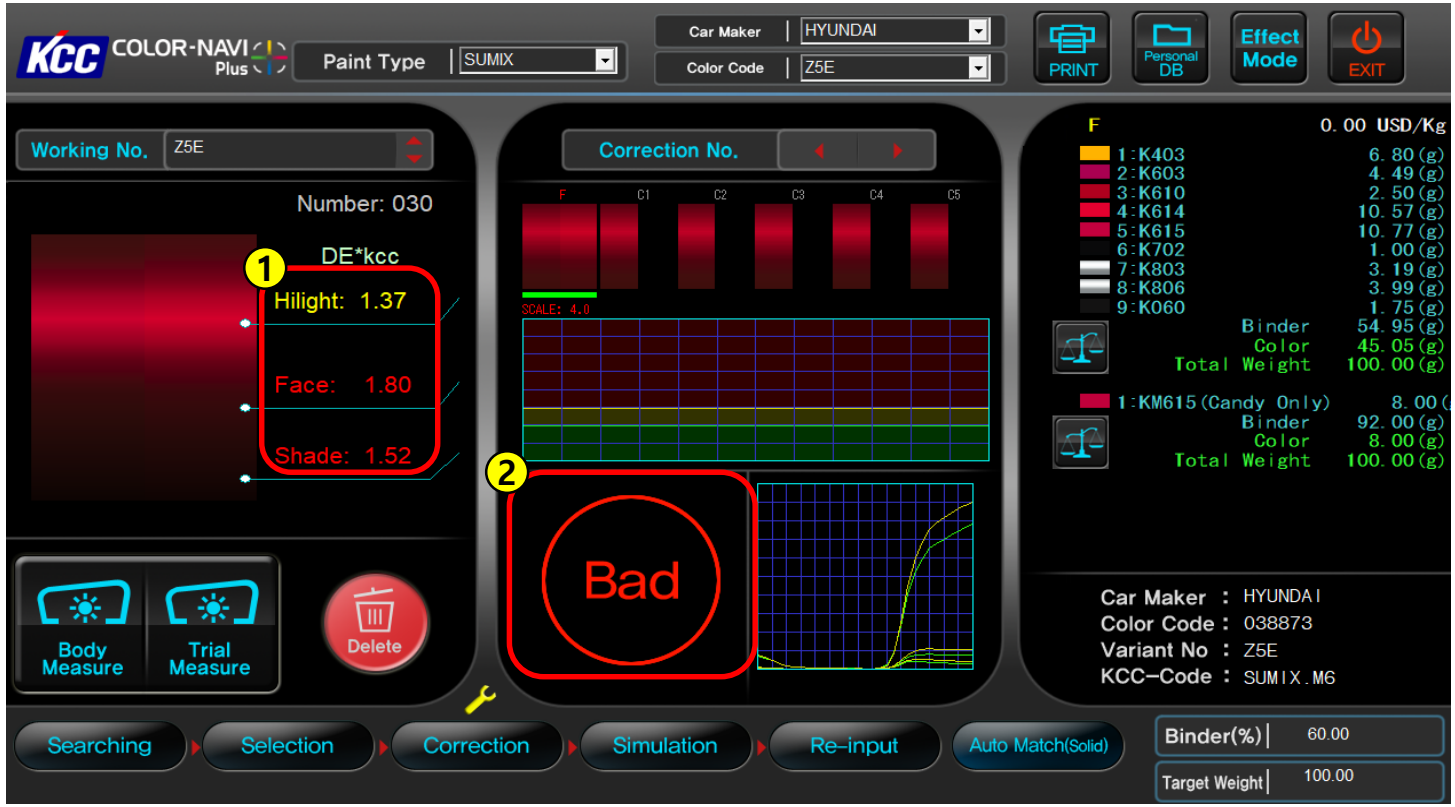
1. Click the "**Trial Measure**" button.
2. The spectrophotometer data window opens as follows.
3. Click the "**Data Load**" button.
4. The measurement results will be displayed on the screen.
5. Click the "**OK**" button.

⑤ Effect Mode (Candy colors/Special Effect) Color Matching

Enter the actual toners & binder amounts.

1. Click the “**Re-input**” button at the bottom of home screen.
2. Click the “**Qt.**” button.
3. Enter the actual resin input amounts in the weight fields(Adding Weight of Other Paint Materials) for Base and Top at the bottom.
4. Input the actual quantities(weight/g) used for each toner.
5. Click the "**OK**" button to confirm.

⑤ Effect Mode (Candy colors/Special Effect) Color Matching

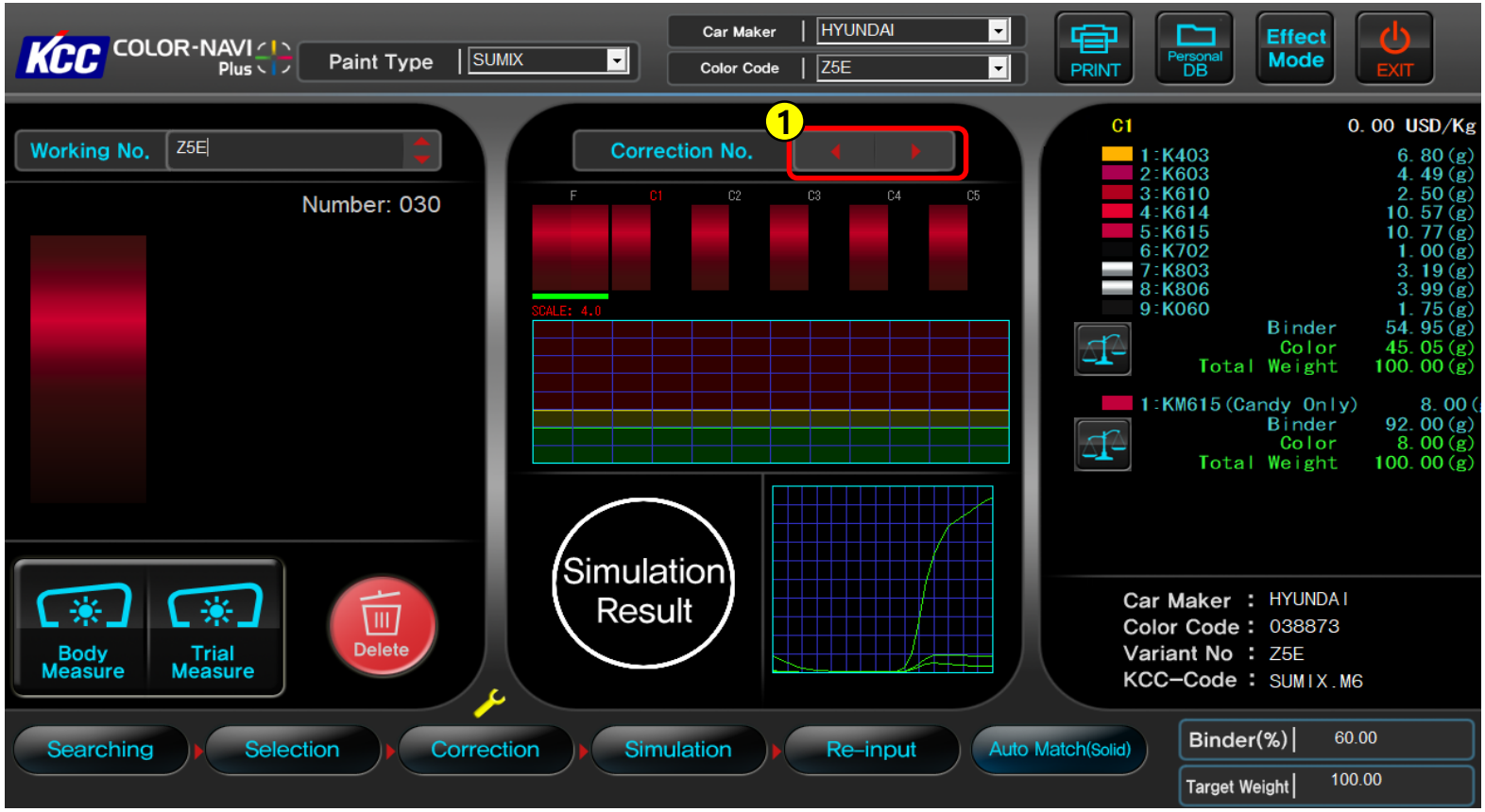


Checking Test Panel Measurement Results

1. Check the color difference (DE) at each angle : High light(15'), Face(45'), Shade(105')
2. The color difference is classified into three levels: "**Good**", "**Similar**" and "**Bad**"
   - Due to the characteristics of high-chroma candy colors, cases where the display shows "Similar" may often appear visually acceptable.
3. Based on the results, decide whether to proceed with further adjustments (correction).

⑤ Effect Mode (Candy colors/Special Effect) Color Matching

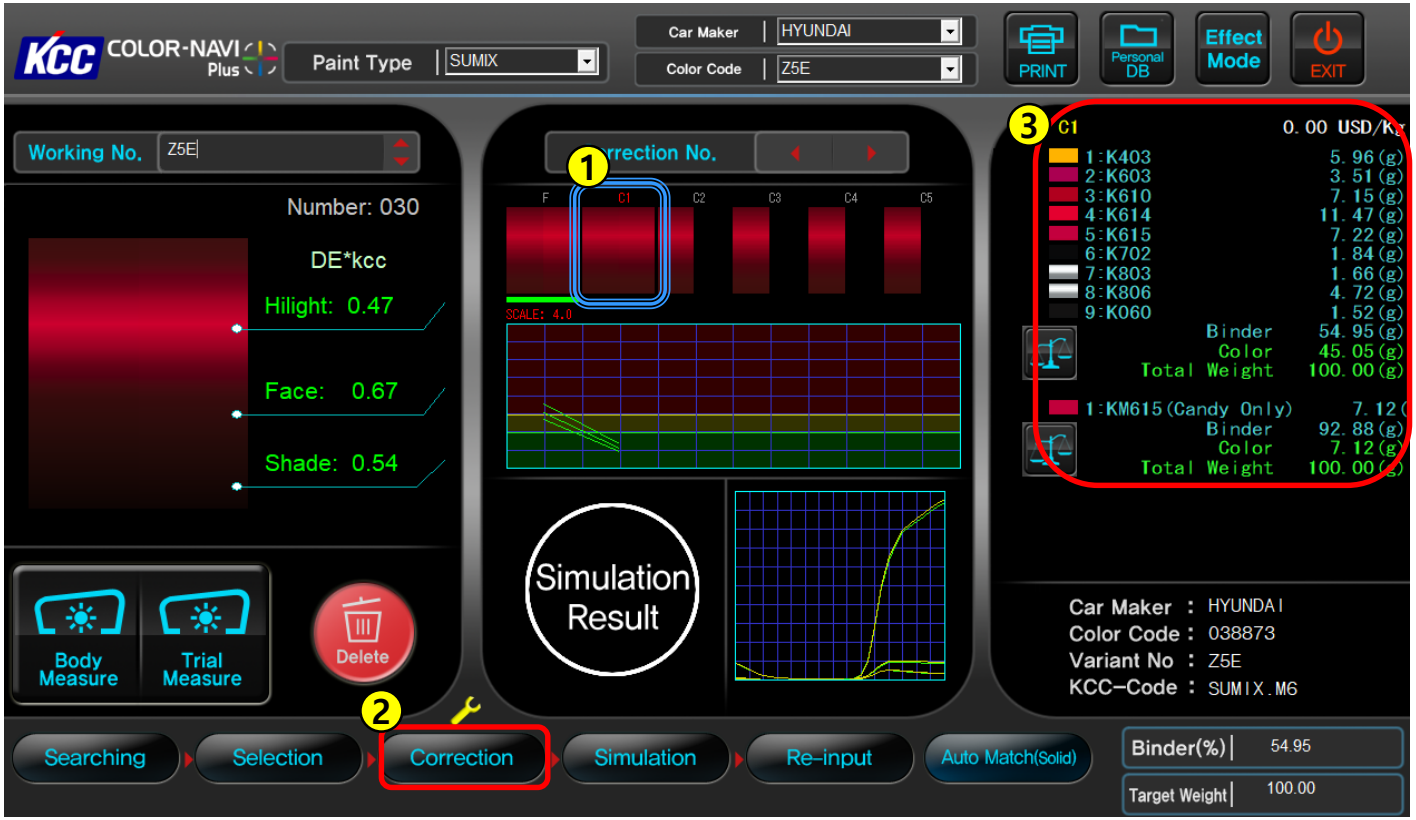
Test Panel Color Correction



① If the results are unsatisfactory, use the "Correction Number Move" button at the top to proceed to the next correction.

1) Direction for Moving Numbers:
   - Forward: F → C1 → C2 → C3 → C4
   - Backward: Reverse of the above.

⑤ Effect Mode (Candy colors/Special Effect) Color Matching



Test Panel Color Correction

1. Change the correction number from F to C1.
2. Click the "**Correction**" button at the bottom.
   - The program will automatically create an updated correction formula.
3. Use the updated formula to prepare a new test panel.
4. Measure the prepared panel, evaluate the matching level, and:
   - If satisfactory, complete the process.
   - If unsatisfactory, repeat the procedure.

⑤ Effect Mode (Candy colors/Special Effect) Color Matching

※ Adjusting the Formula Details

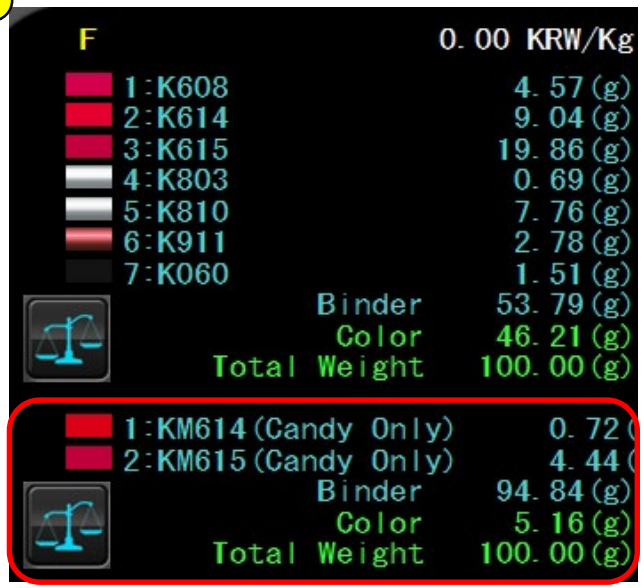
1. Click the button (**B, T**) located to the left of the toner name (①) to select **Basecoat** or **Topcoat**.
2. To change the toner type, click the **Abs.**, **Met.**, **Prl.**, or **FF** buttons (②) to select the desired toner.
   - **Abs.**: Solid toner / **Met.**: Metallic toner / **Prl.**: Pearl toner / **FF**: White, Flip Flop agent

⑤ Effect Mode (Candy colors/Special Effect) Color Matching

Difference Between Candy Colors and Special 3-Coat Formulations

Example of Candy Color Formulation

①



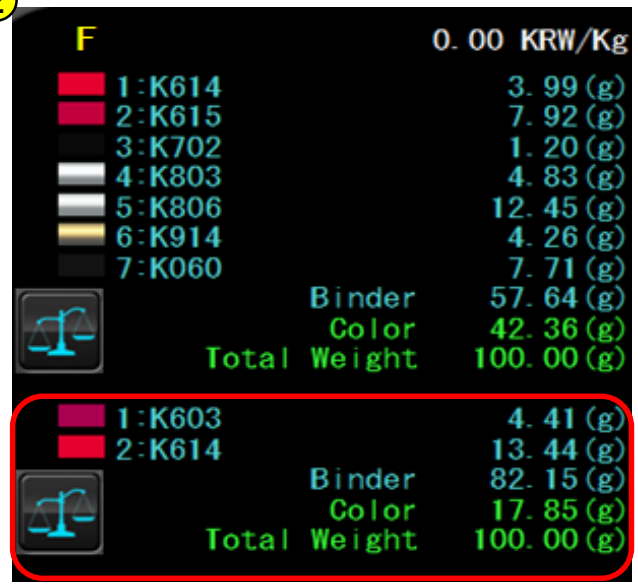
5300HS CLEAR (Binder)	**94.84g**
KM614(Candy Only)	**0.72g**
KM615(Candy Only)	**4.44g**
Total	**100.00g**

① The binder for the topcoat is 5300 HS CLEAR

Only solvent-borne toners are used.
: KM614, KM615 (Candy Only)

Example of Special 3-Coat Formulation

②



K9001(Binder)	**82.15g**
K603	**4.41g**
K614	**13.44g**
Total	**100.00g**

② The binder for the topcoat is K9001,
and all SUMIX toners can be used.

⑥ Waterborne RM(WT5000) Color Matching

Similar Product Search

1. Select SUMIX as the paint type.
2. Press the mode selection button at the top and switch it to 'RM'."

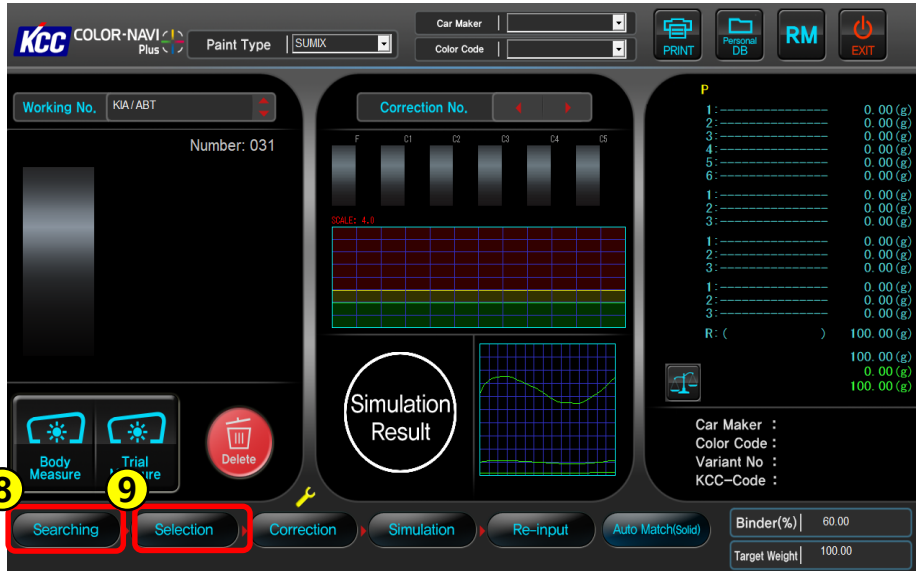
⑥ Waterborne RM(WT5000) Color Matching

Similar Product Search

3. Click the **'Body Measure'** button.

4. The spectrophotometer data window opens as follows.
5. Click the 'Data Load' button.

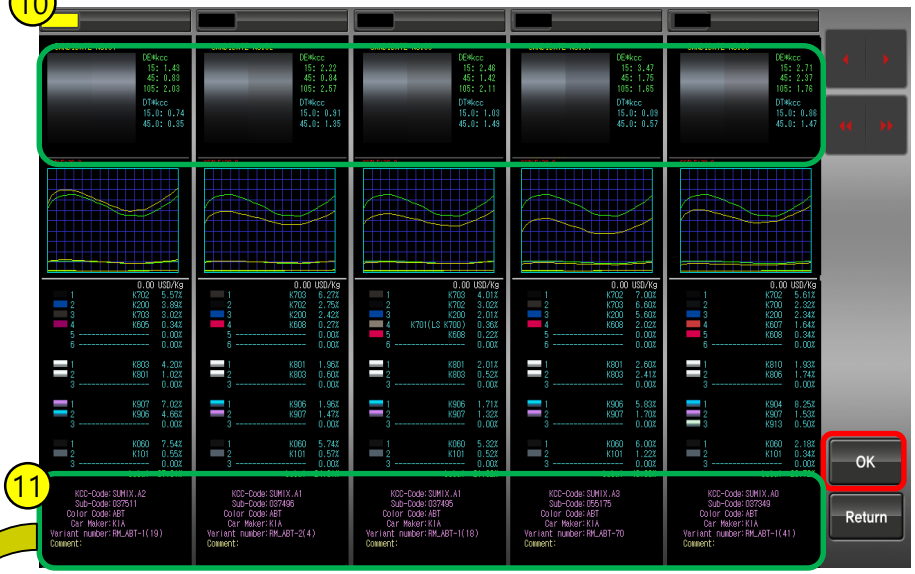
6. The measurement data will be displayed.
7. Click the **'OK'** button to confirm.



8. Click the '**Searching**' button.
9. Click the '**Selection**' button.

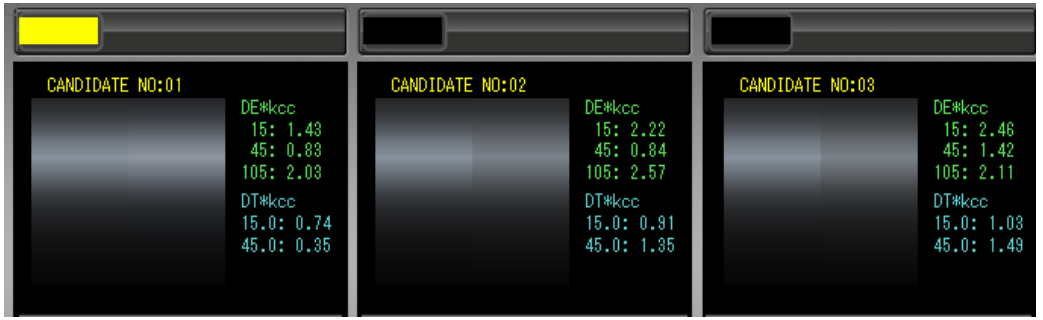
⑥ Waterborne RM(WT5000) Color Matching

Similar Product Search



1) Select the smallest DE*KCC(color difference) value

2) A smaller color difference at 45°(face) and 105°(shade) than at 15°(high light) is more advantageous for additional color adjustments.



10. **'Selection'** window open

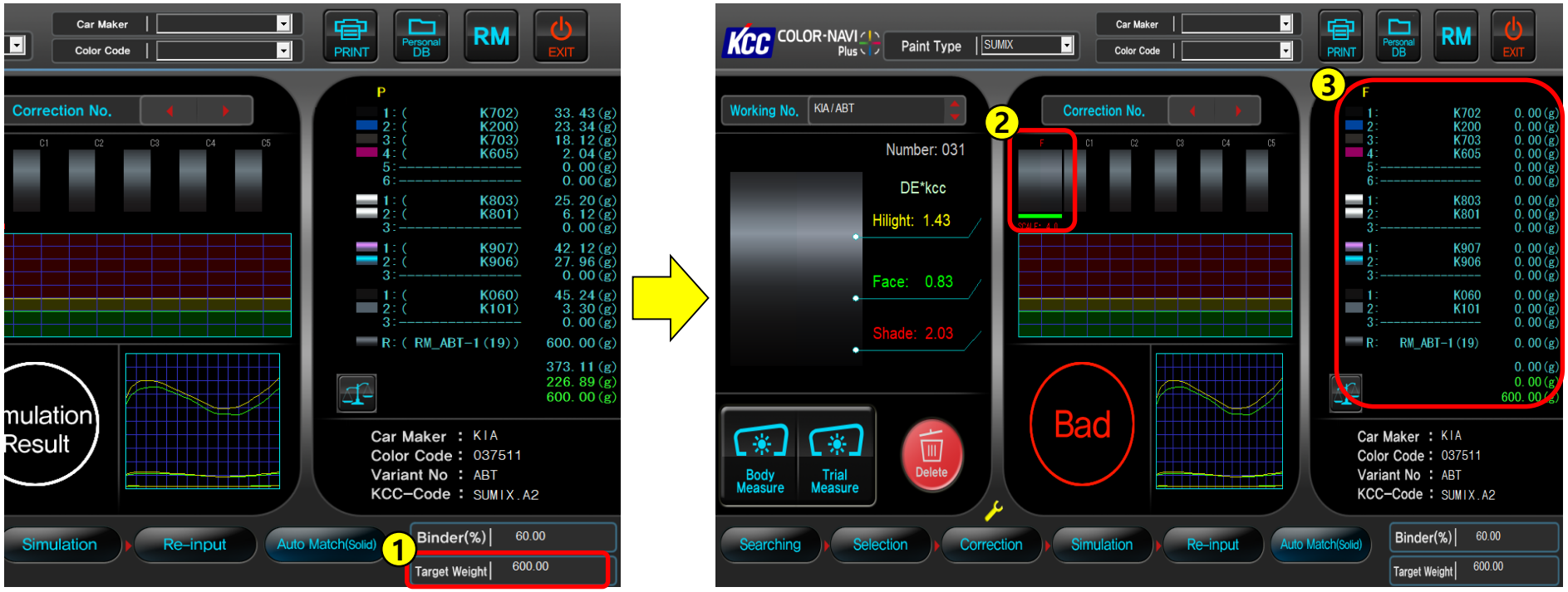
11. Check product information for WT5000(Water-borne RM).
Refer to the variant number. And select the product(color) with the smallest color difference within the same color code.

Example

KCC-Code: SUMIX.A2 Sub-Code: 037511 Color Code: ABT Car Maker: KIA Variant number: RM_ABT-1(19) Comment:	KCC-Code: SUMIX.A1 Sub-Code: 037496 Color Code: ABT Car Maker: KIA Variant number: RM_ABT-2(4) Comment:	KCC-Code: SUMIX.A1 Sub-Code: 037495 Color Code: ABT Car Maker: KIA Variant number: RM_ABT-1(18) Comment:	KCC-Code: SUMIX.A3 Sub-Code: 055175 Color Code: ABT Car Maker: KIA Variant number: RM_ABT-70 Comment:
WT5000-ABT-1(19)	WT5000-ABT-2(4)	WT5000-ABT-1(18)	WT5000-ABT-70

⑥ Waterborne RM(WT5000) Color Matching

RM Additional Tinting (Color Formula Correction)



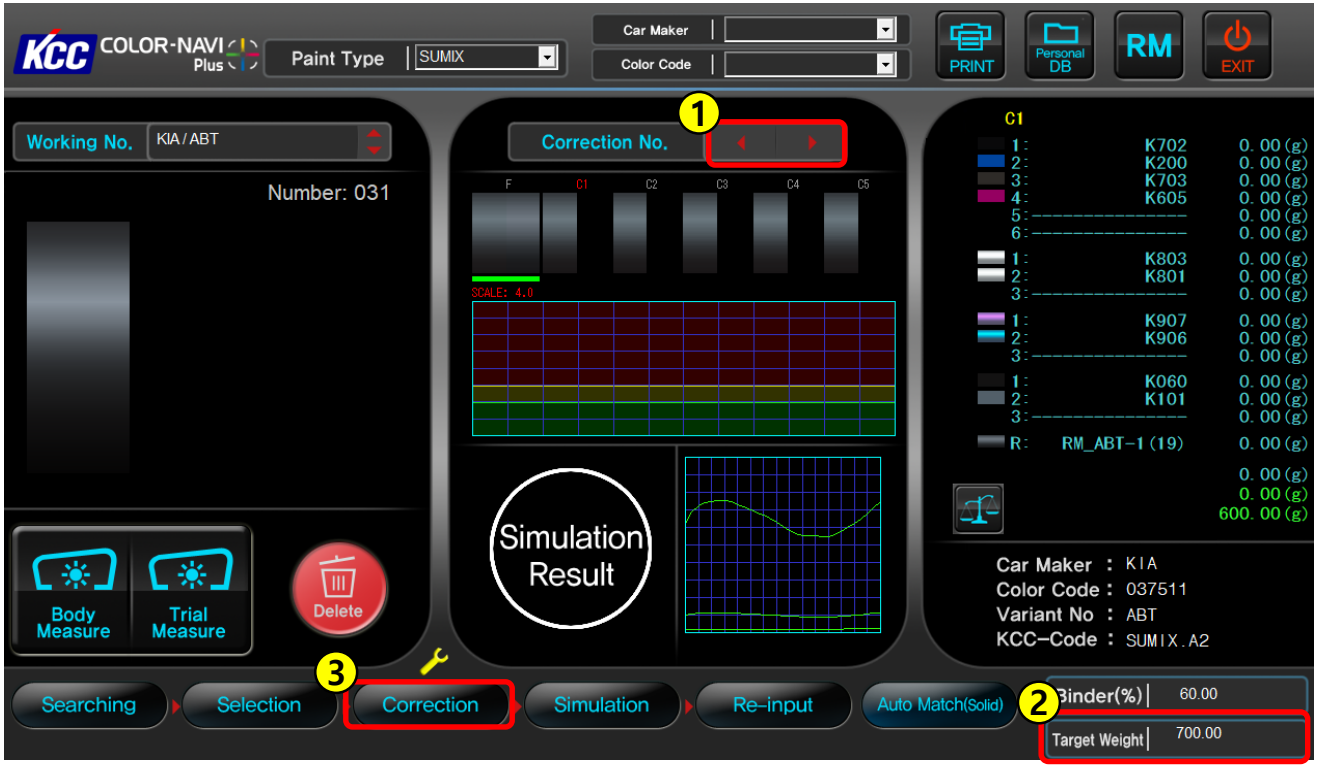
① Enter the total weight of WT5000 paint for the "Target weight". (*Can weight: 92g*)
cf) If measuring the total weight including the WT5000 can is 700g → Enter 608.00 (700g – 92g = 608g)

② Measure the painted test panel using "**F**" with the previously used WT5000.

③ F formulation must not include any additional paint input.

⑥ Waterborne RM(WT5000) Color Matching

RM Additional Tinting (Color Formula Correction)



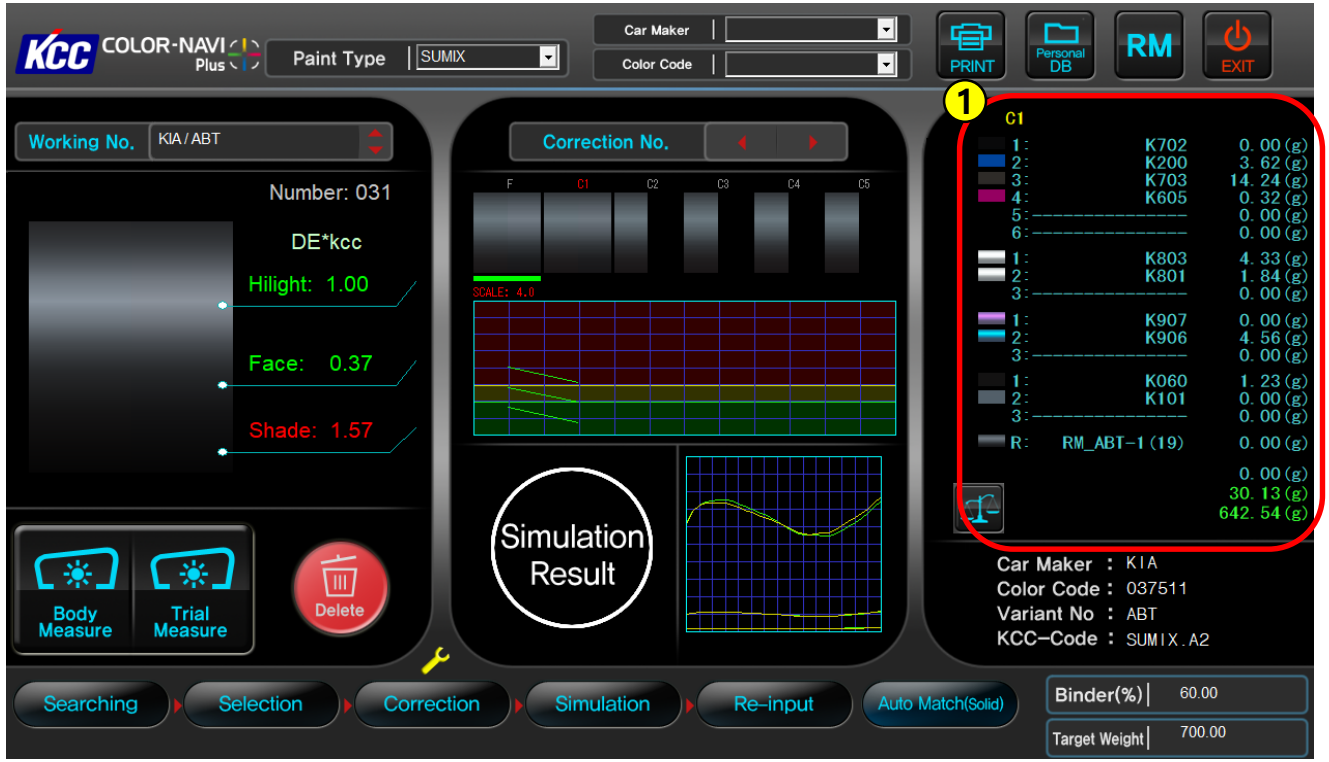
① Use the 'Correction Number Move' button at the top to move the correction number from F to C1.

② After moving to C1, enter the "**Target Weight**" higher than the previously input paint weight.
(Recommended Target Weight = Maximum correction amount of paint, approximately previous paint remaining + 100g.)

③ Press the **"Correction"** button to check the additional amount of paint required.

⑥ Waterborne RM(WT5000) Color Matching

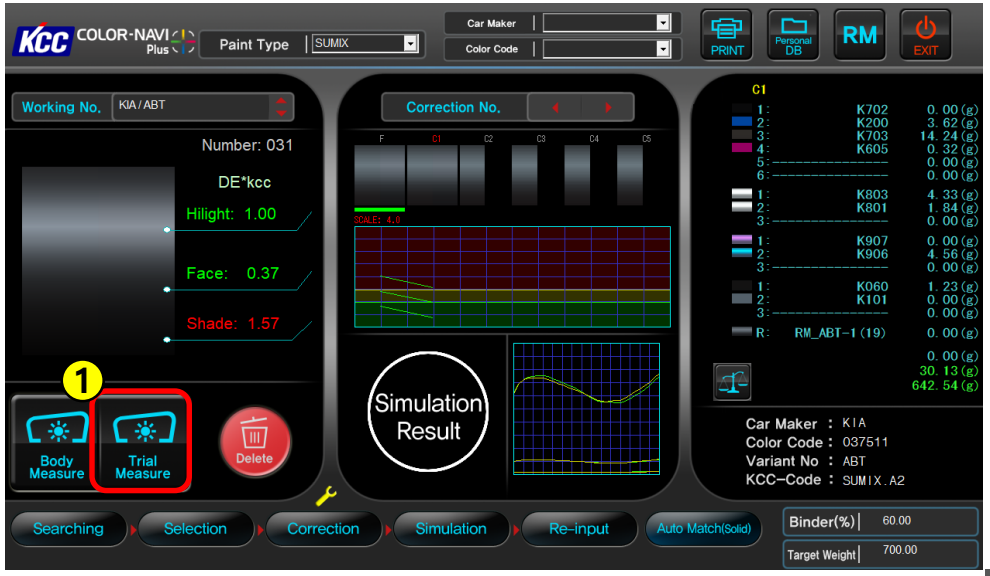
RM Additional Tinting (Color Formula Correction)

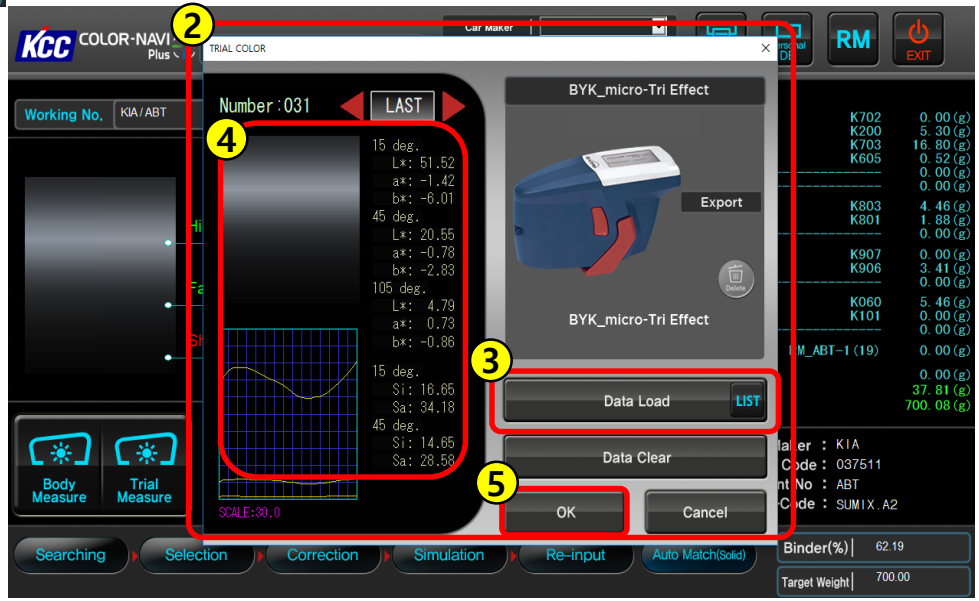


1. After checking the additional amount, add it to the WT5000 paint.
2. Apply the prepared paint to the test panel.
3. After the color coat dries, apply a clear coat.
4. Dry the test panel(clear coat).
5. Let the dried test panel cool at room temperature for 1-2 minutes.
6. Measure the test panel using the spectrophotometer.

⑥ Waterborne RM(WT5000) Color Matching

RM Additional Tinting (Color Formula Correction)

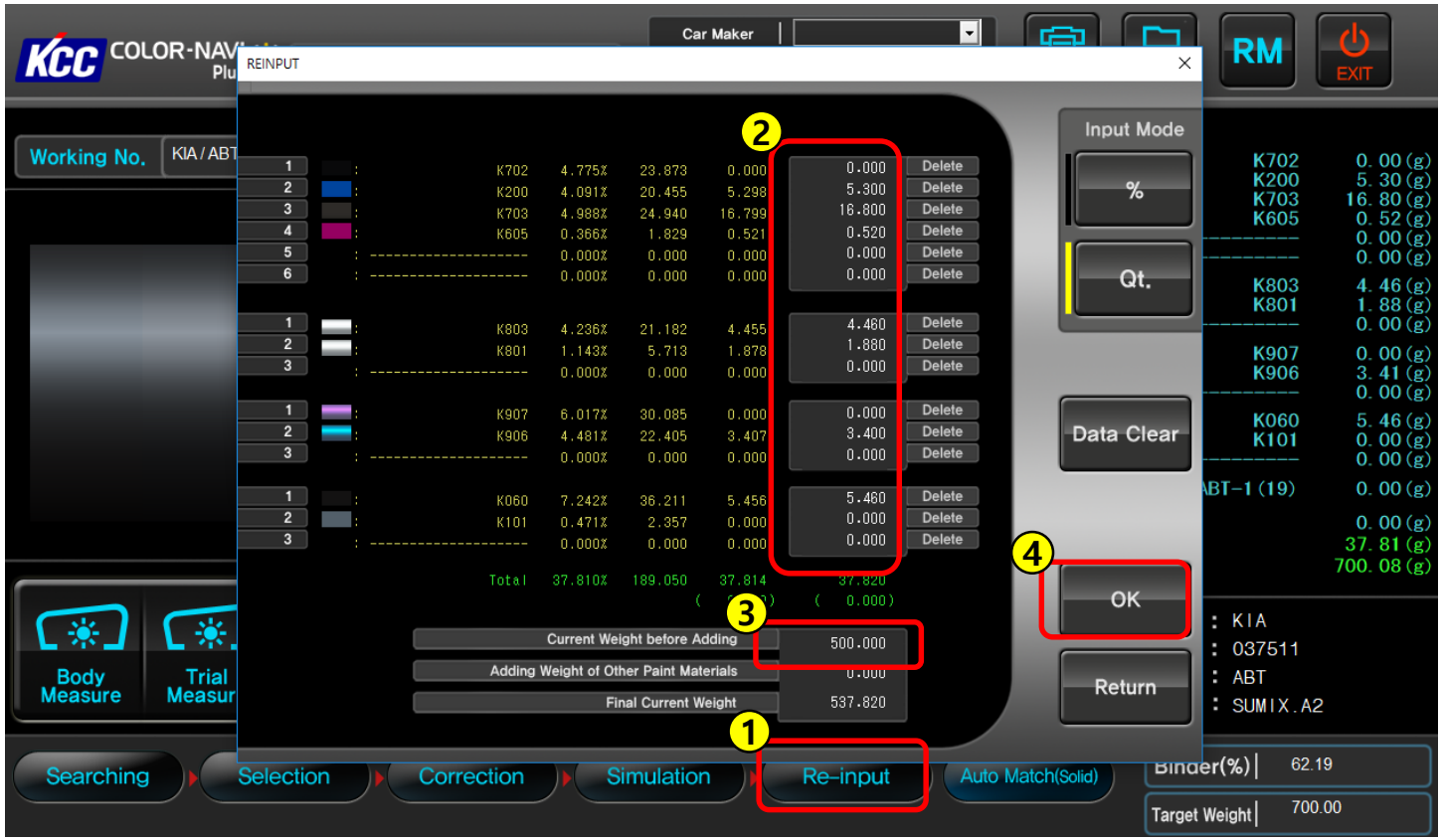




1. Click the "**Trial Measure**" button.
2. The spectrophotometer data window opens as follows.
3. Click the "**Data Load**" button.
4. The measurement results will be displayed on the screen.
5. Click the "**OK**" button.

⑥ Waterborne RM(WT5000) Color Matching

RM Additional Tinting (Color Formula Correction)



① Click the '**Re-input**' button at the bottom.

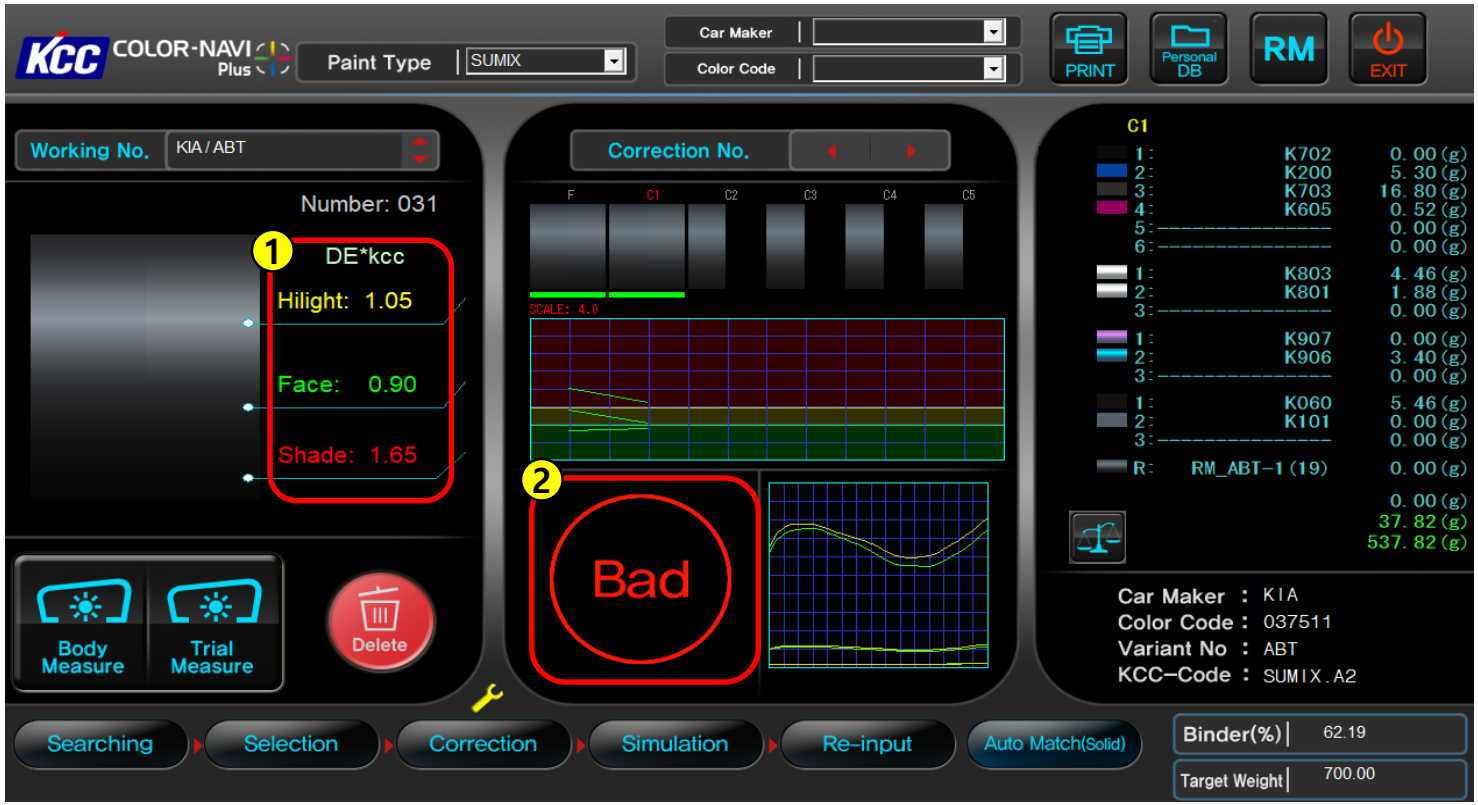
② Enter the actual amounts of each toner added.

③ Enter the remaining paint amount in '**Current Weight before Adding**'
(For example, if 100g out of 600g was used for the F panel , enter 500g.)

④ Click the '**OK**' button.

⑥ Waterborne RM(WT5000) Color Matching

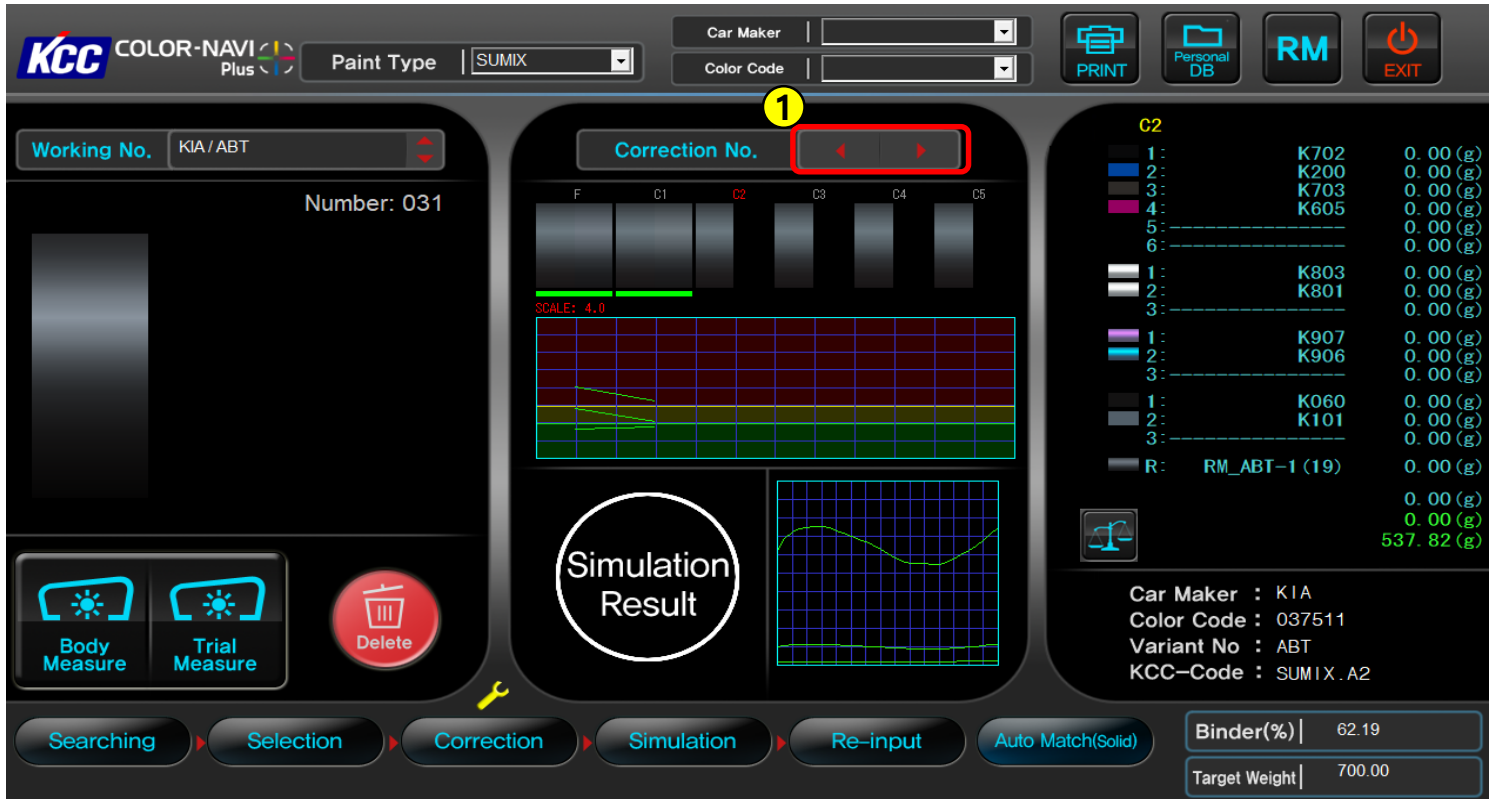
RM Additional Tinting (Color Formula Correction)



1. Check the color difference (DE*KCC) at each angle : High light(15’), Face(45’), Shade(105’)
2. The color difference is classified into three levels: "**Good**“, "**Similar**" and "**Bad**“
3. Based on these results, decide whether to proceed with further adjustments (correction).

⑥ Waterborne RM(WT5000) Color Matching

RM Additional Tinting (Color Formula Correction)

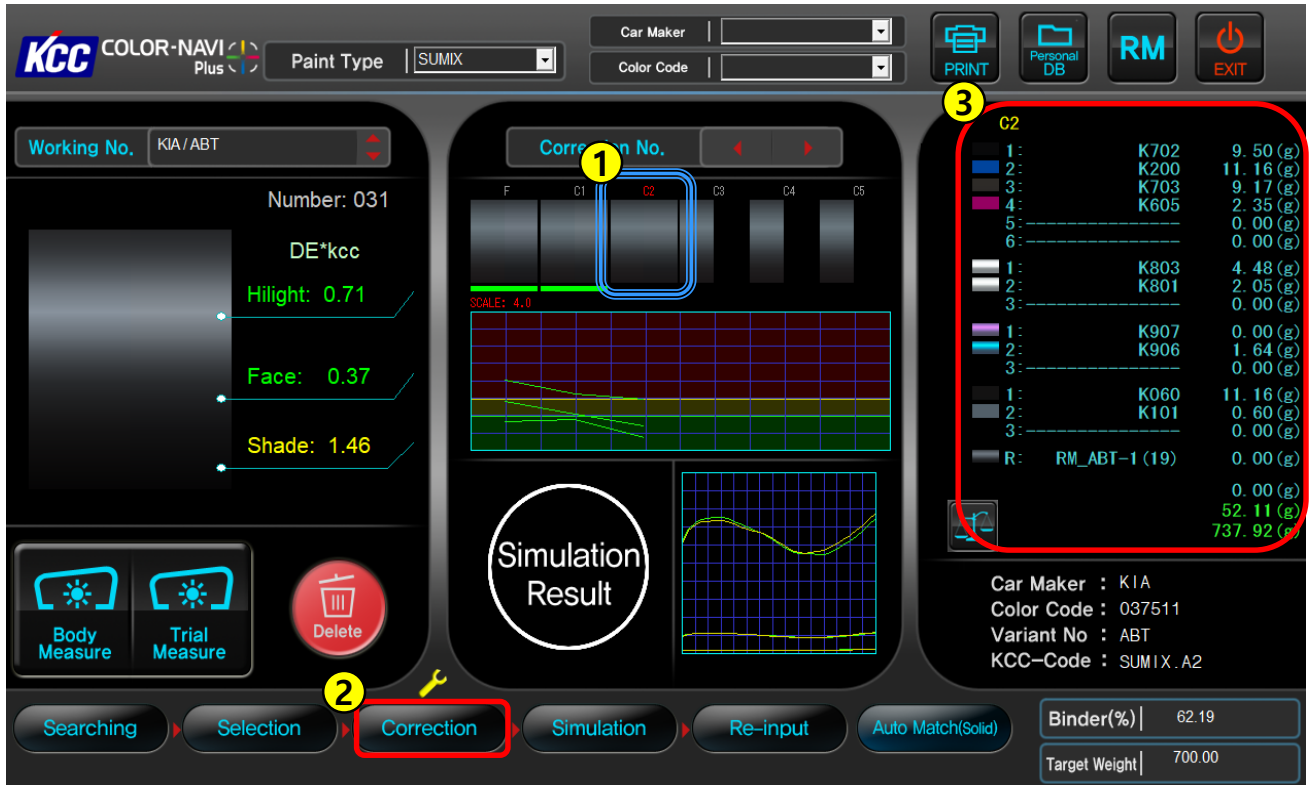


① If the results are unsatisfactory, use the "Correction Number Move" button at the top to proceed to the next correction.

1) Direction for Moving Numbers:
   - Forward: F → C1 → C2 → C3 → C4
   - Backward: Reverse of the above.

⑥ Waterborne RM(WT5000) Color Matching

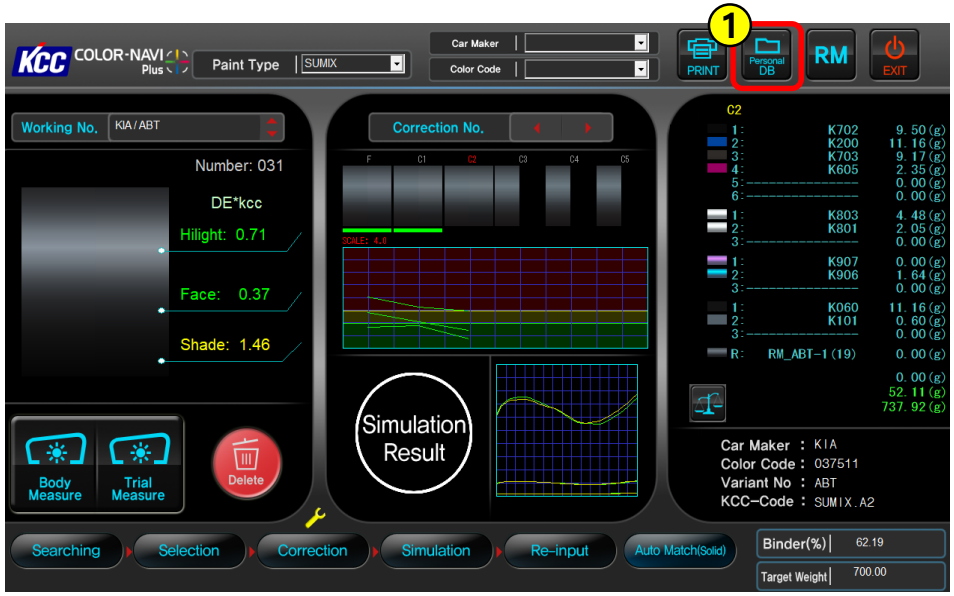
RM Additional Tinting (Color Formula Correction)

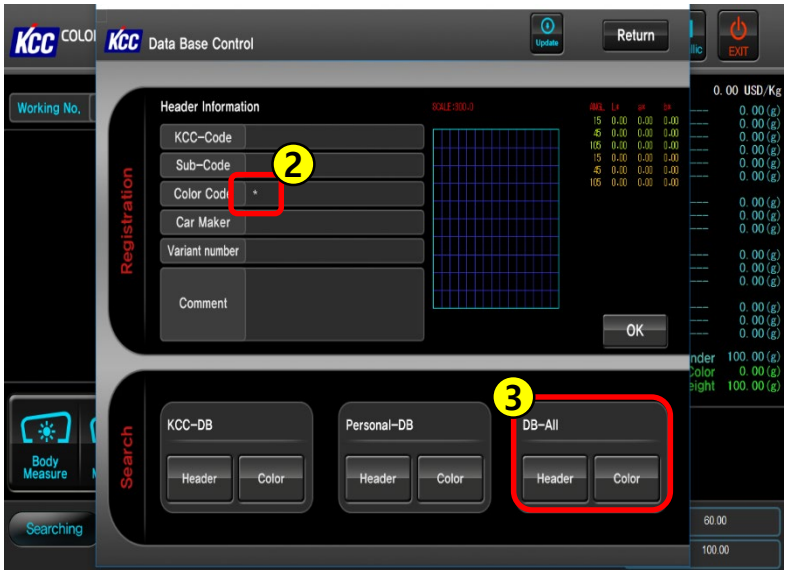


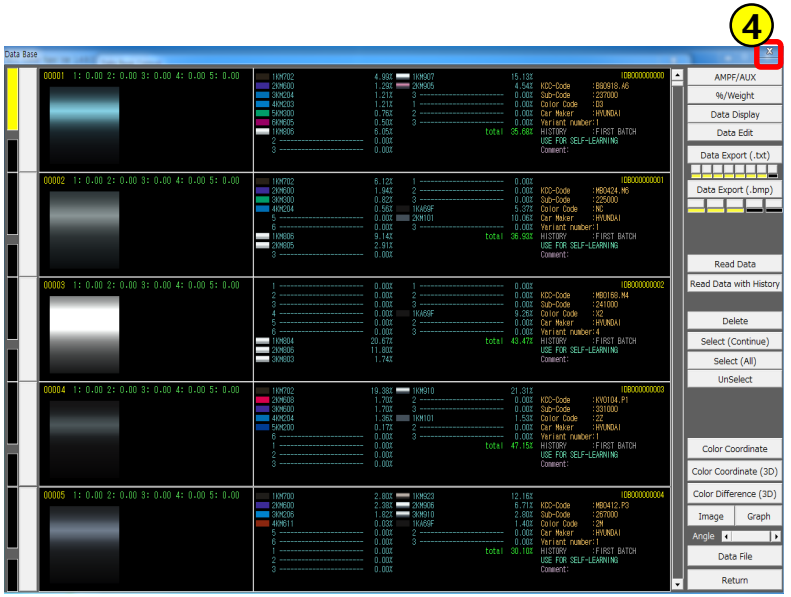
1. Move the correction number from C1 to C2.
2. Click the "**Correction**" button at the bottom.
   - The program will automatically create an updated correction formula.
3. Use the updated formula to prepare a new test panel.
4. Measure the prepared panel, evaluate the matching level, and:
   - If satisfactory, complete the process.
   - If unsatisfactory, repeat the procedure.

⑦ Database Management

Set Color Search Database (DB-All)







① Click the '**Personal DB**' button at the top.

② When the '**Data Base Control**' window opens, enter '*****' in the '**Color Code**' field.

③ In the **"Search"** section, click the **DB-All > 'Header'** button.

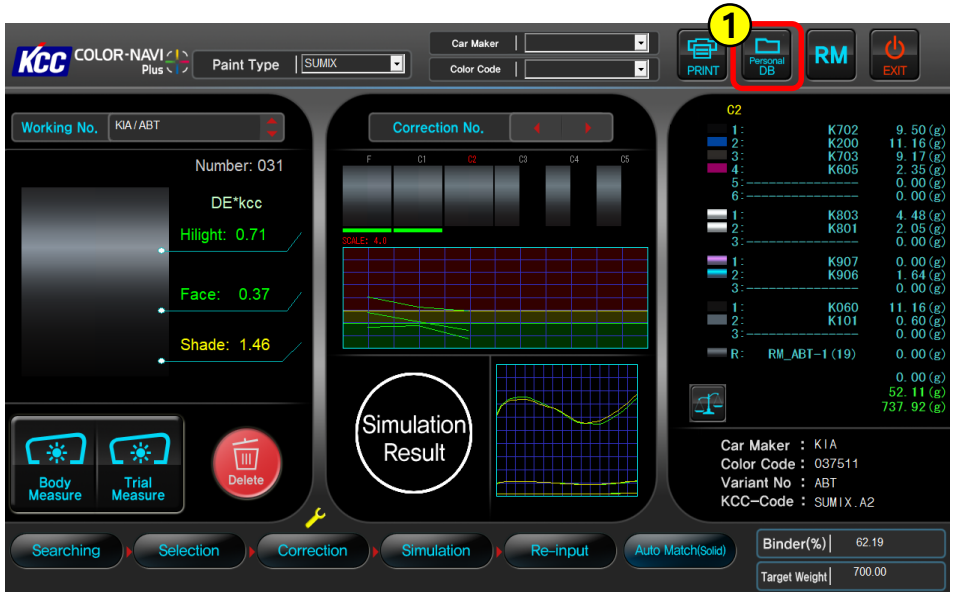
④ When the database window opens as shown, click the **"X"** button in the upper-right corner to close the window.

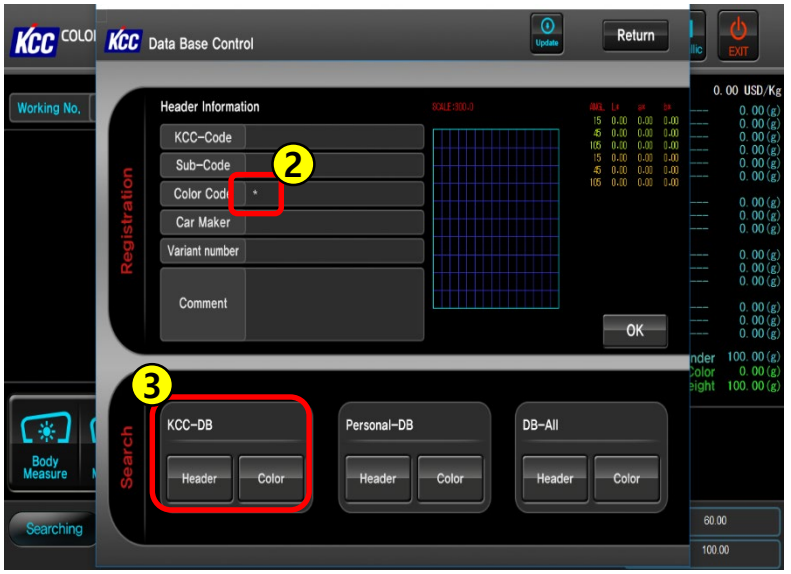
⑤ When performing a color search afterward, formulas will be retrieved from all data stored in both the KCC-DB and Personal-DB.

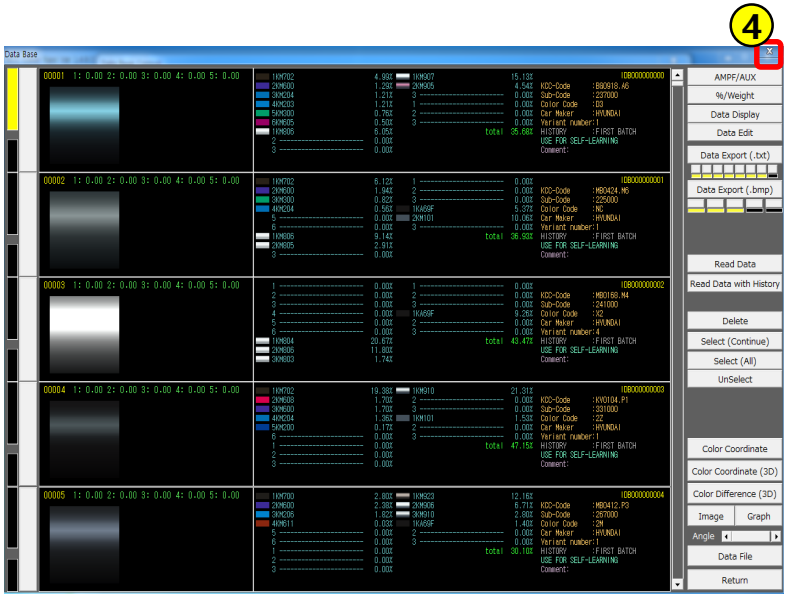
*Note: The default setting is **DB-All** at initial startup.*

⑦ Database Management

Set Color Search Database (KCC-DB)







① Click the '**Personal DB**' button at the top.

② When the '**Data Base Control**' window opens, enter '*****' in the '**Color Code**' field.

③ In the **"Search"** section, click the **KCC-DB > 'Header'** button.

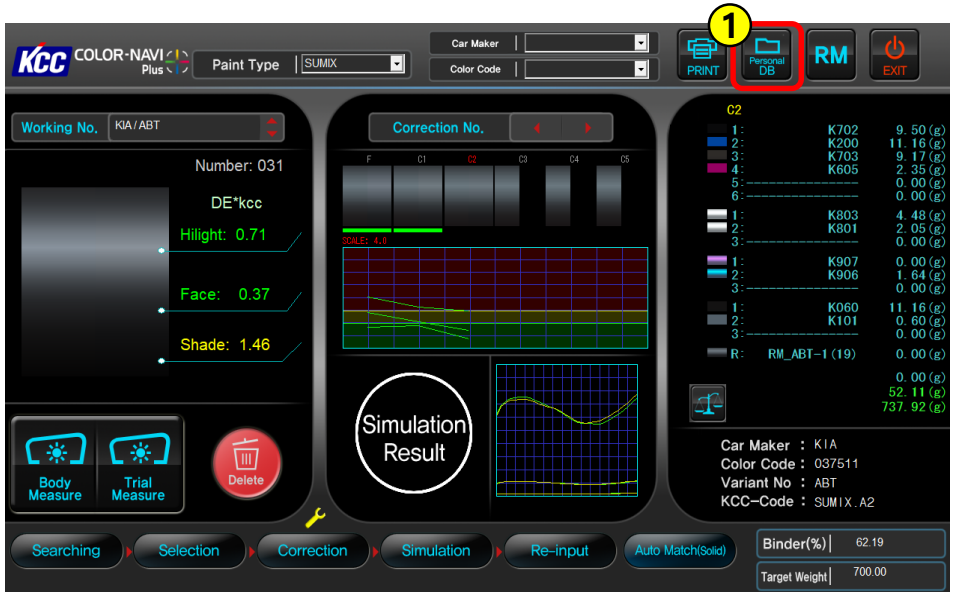
④ When the database window opens as shown, click the **"X"** button in the upper-right corner to close the window.

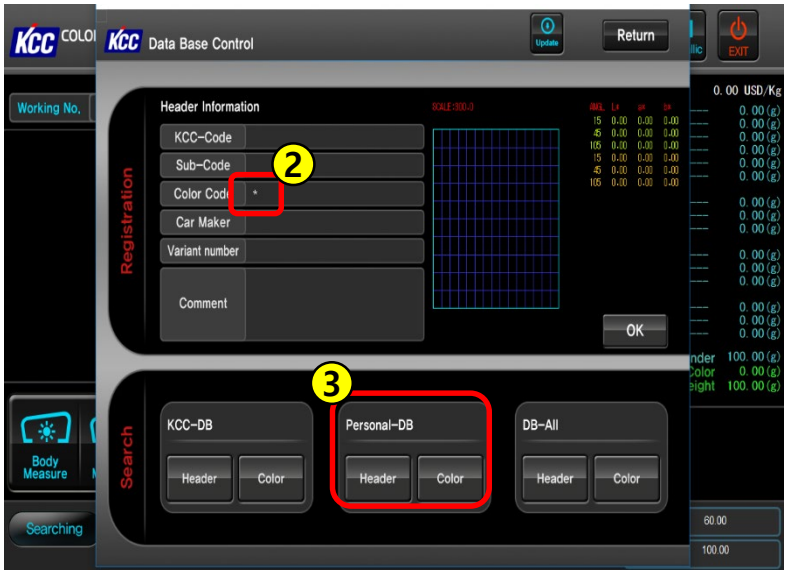
⑤ When performing a color search afterward, formulas will be retrieved only from the data stored in the **KCC-DB**.

*Note: The default setting is **DB-All** at initial startup.*

⑦ Database Management

Set Color Search Database (Personal-DB)





① Click the '**Personal DB**' button at the top.

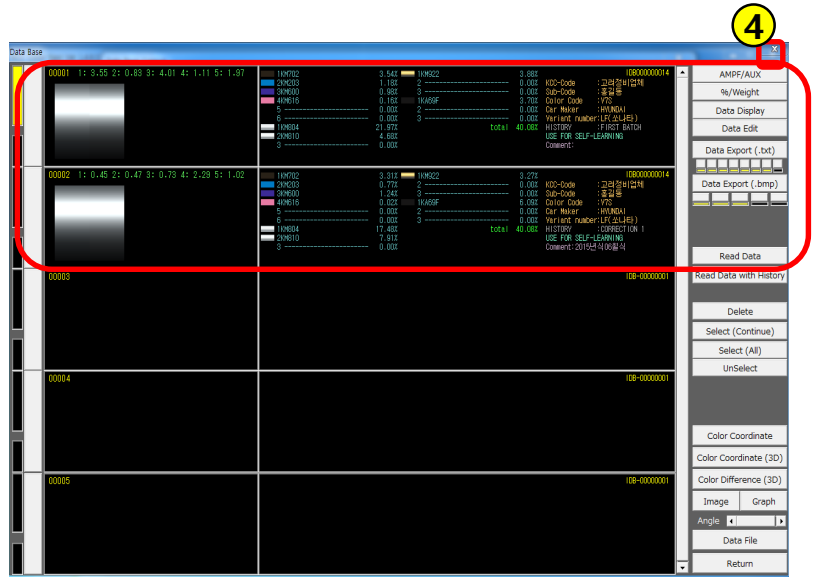
② When the '**Data Base Control**' window opens, enter '*****' in the '**Color Code**' field.

③ In the **"Search"** section, click the **Personal-DB > 'Header'** button.

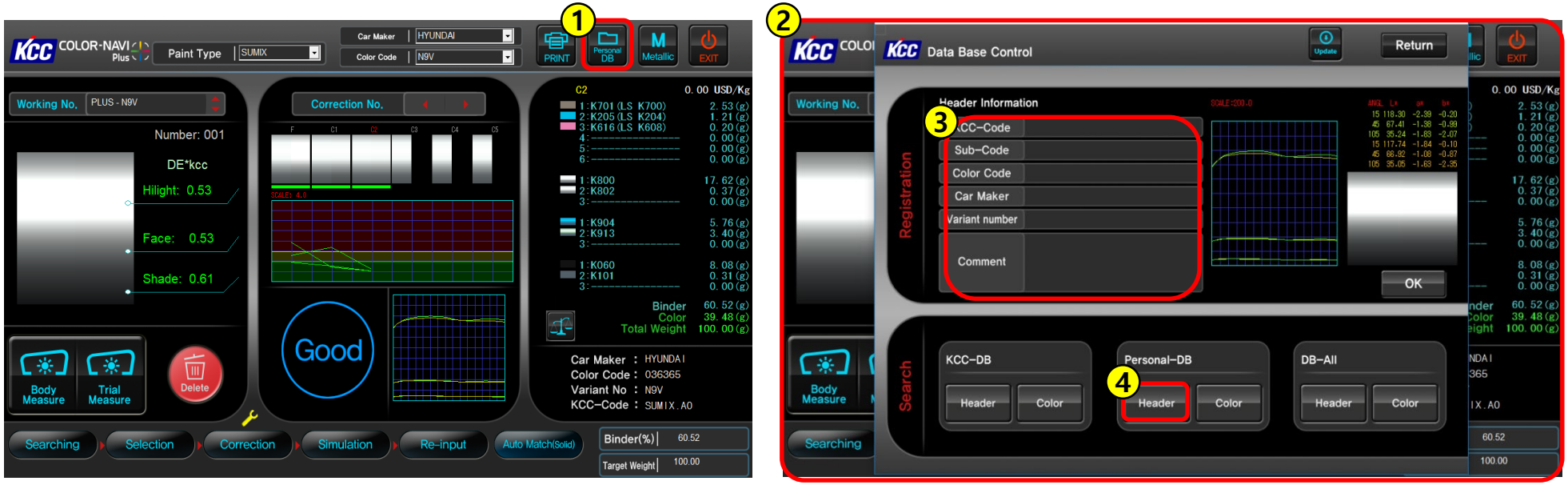
④ When the database window opens as shown, click the **"X"** button in the upper-right corner to close the window.

⑤ When performing a color search afterward, formulas will be retrieved only from the data stored in the **Personal-DB**.

*Note: The default setting is **DB-All** at initial startup.*



⑧ Saving Custom Formulas



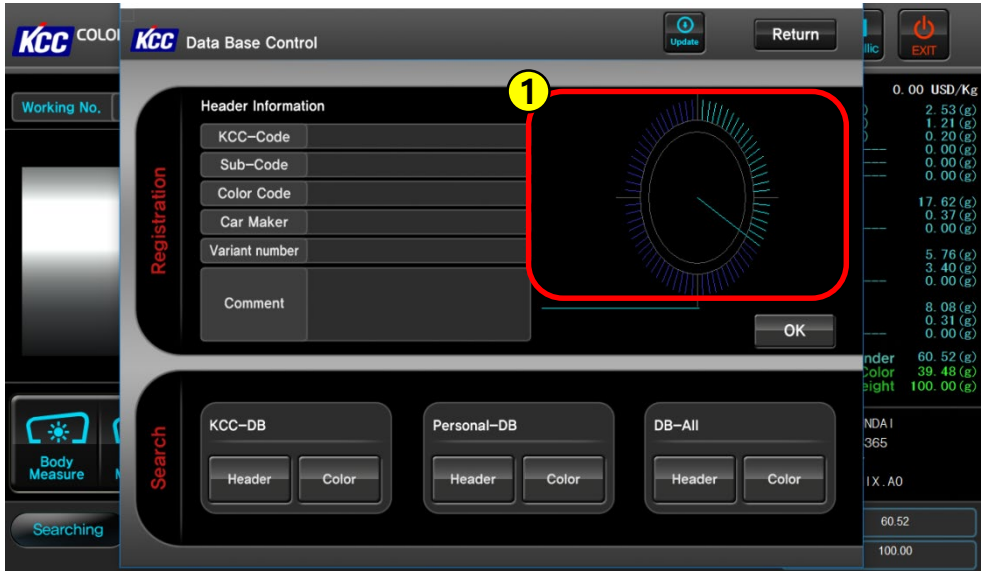
① Click **“Personal DB”** in the upper-right corner of the home screen.

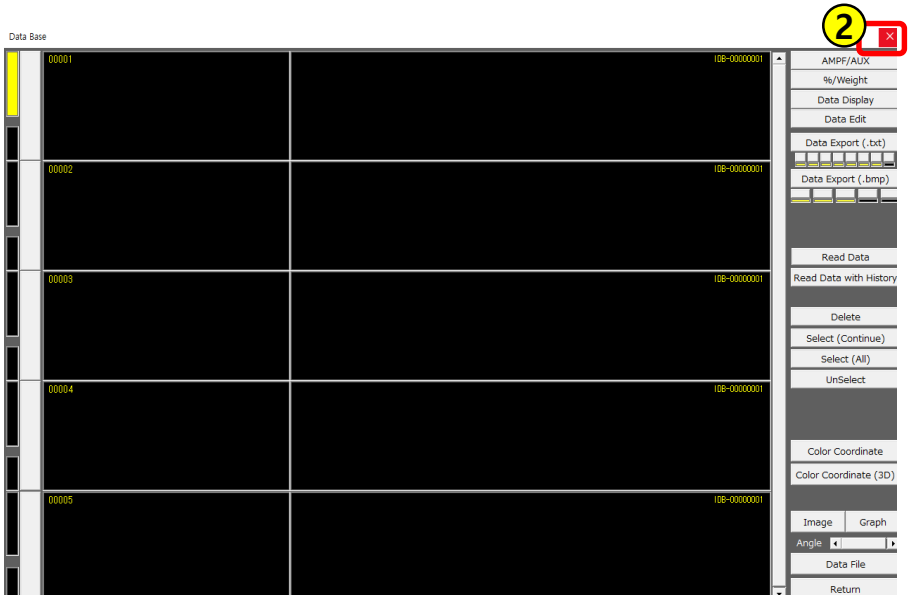
② The **“Data Base Control”** window will open.

③ Before entering a custom formula, make sure to clear all input fields in the **“Registration”** section.

④ Switch to the “Personal DB input mode” by clicking the **“Header”** button under the **Personal-DB** section in **“Search”**.

⑧ Saving Custom Formulas

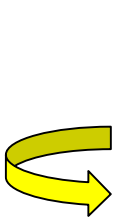




① When you click the **"Header"** button under **Personal-DB**, the clock hand will move as shown above, indicating that the custom formula is being loaded.

② Once the **"Data Base"** window opens as shown, click the **"X"** button in the upper-right corner to close the window.

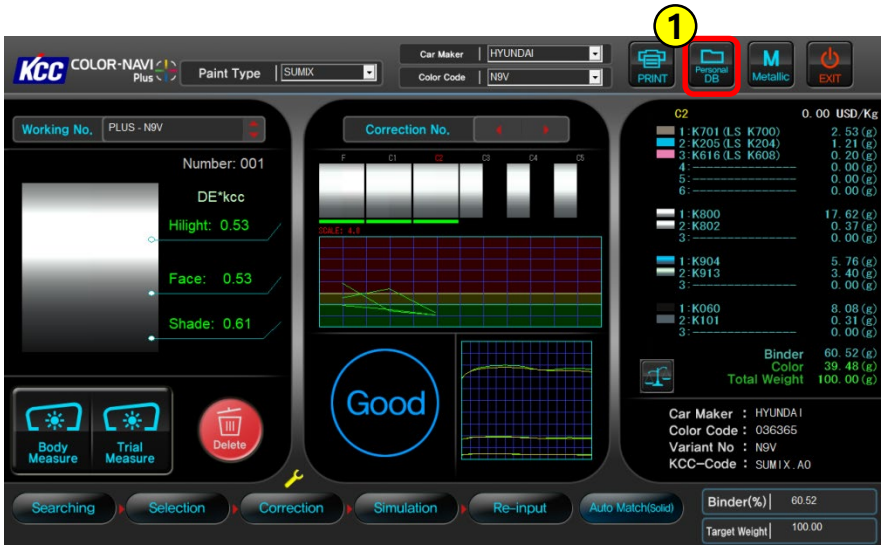
⑧ Saving Custom Formulas

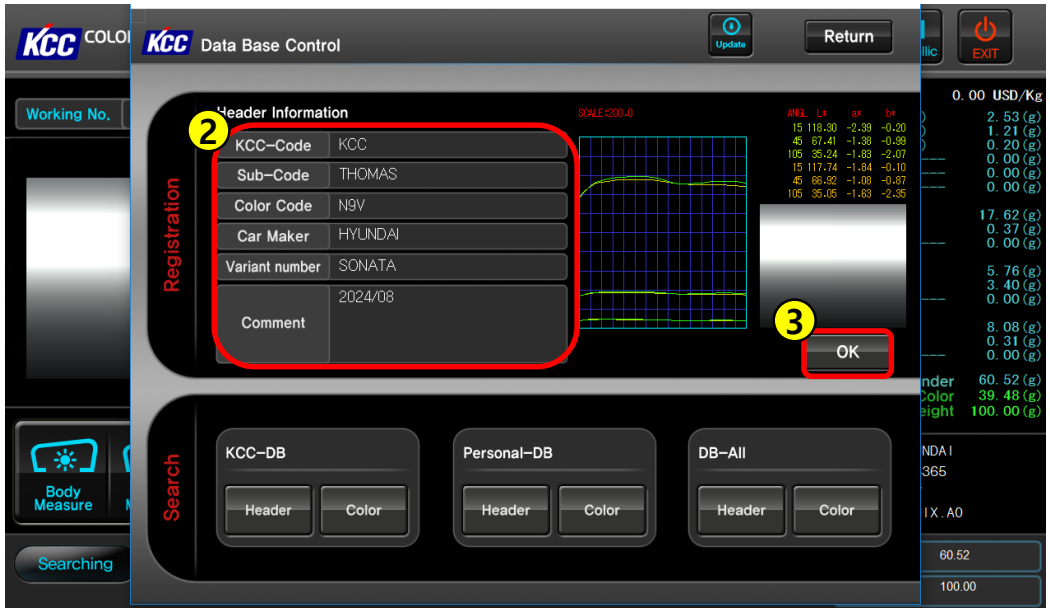


① Click the "**Working No.**"

② Select the number to save from the working number list.

⑧ Saving Custom Formulas



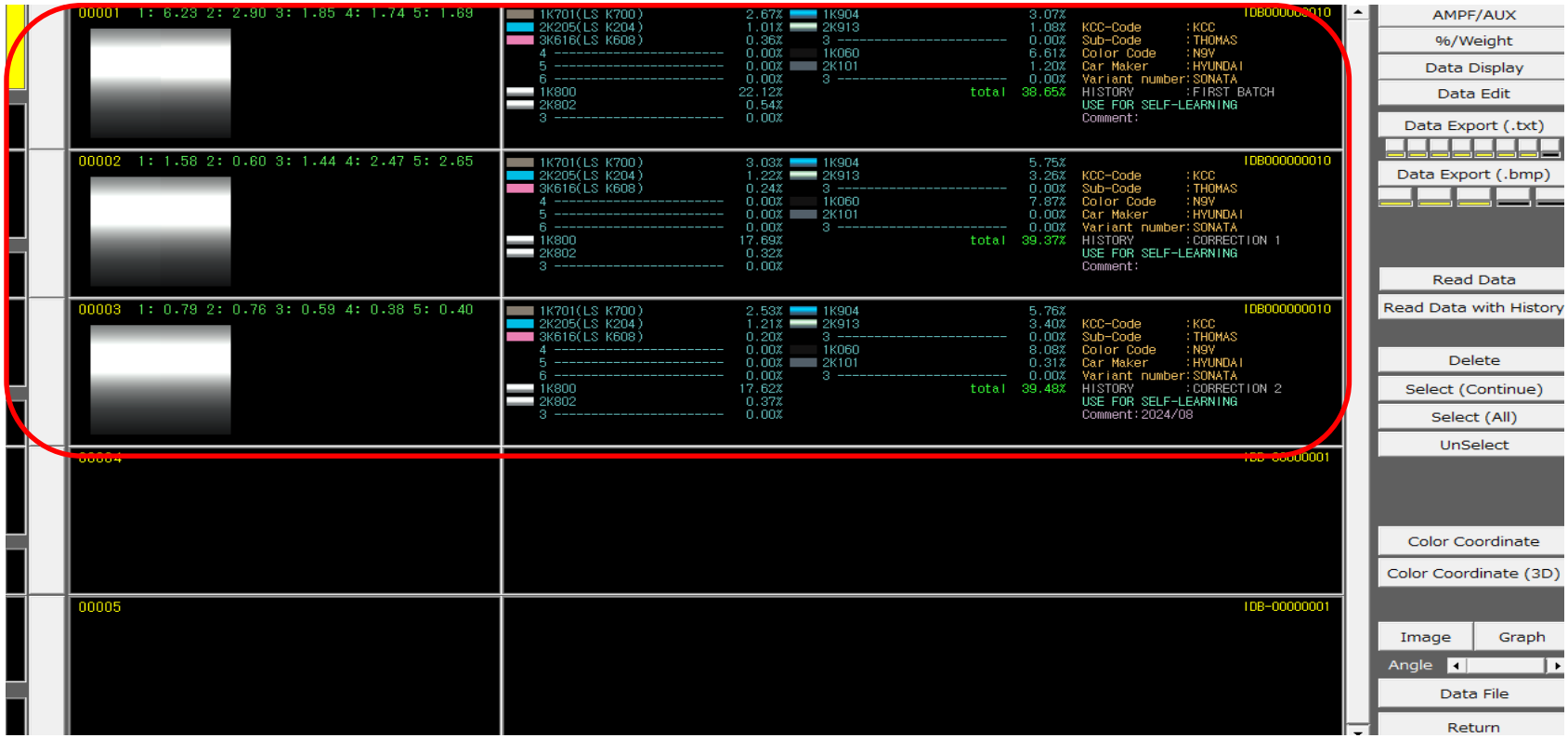


① Click the **"Personal DB"** button at the top.

② Enter the color information in each input field under the **"Registration"** section.
Tip: When registering, set consistent rules for each field to make future searches more convenient.

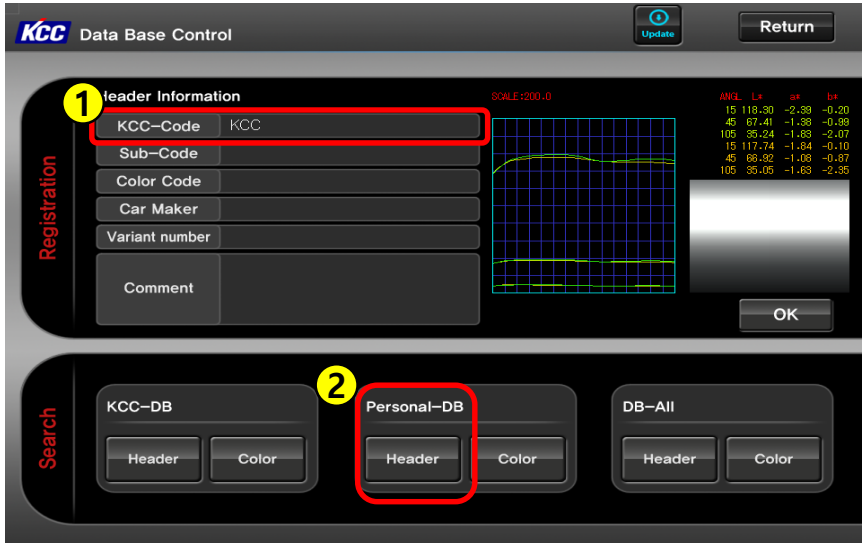
③ After entering each field, click the **"OK"** button.

⑧ Saving Custom Formulas



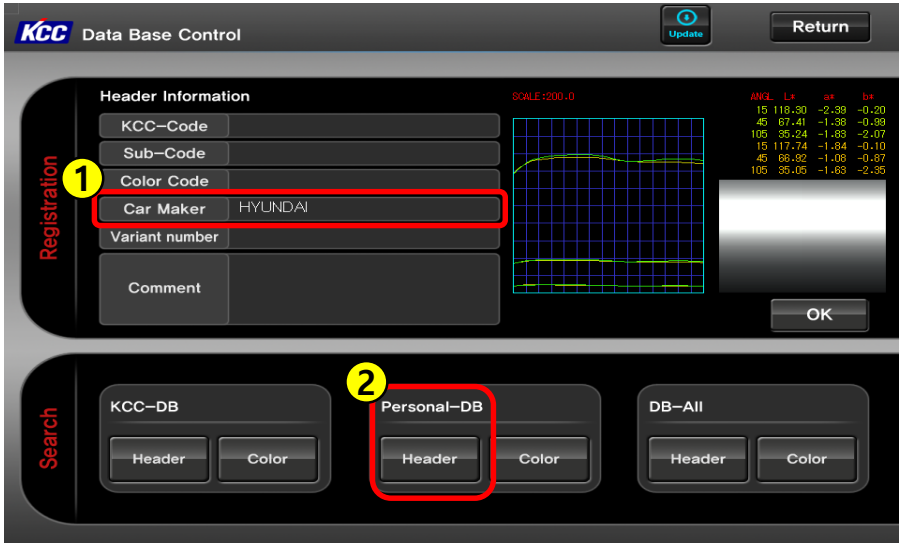
- Once the input is complete, you can confirm that both the intermediate processes and the final formula for the color you worked on have been registered as shown above.

⑧ Saving Custom Formulas



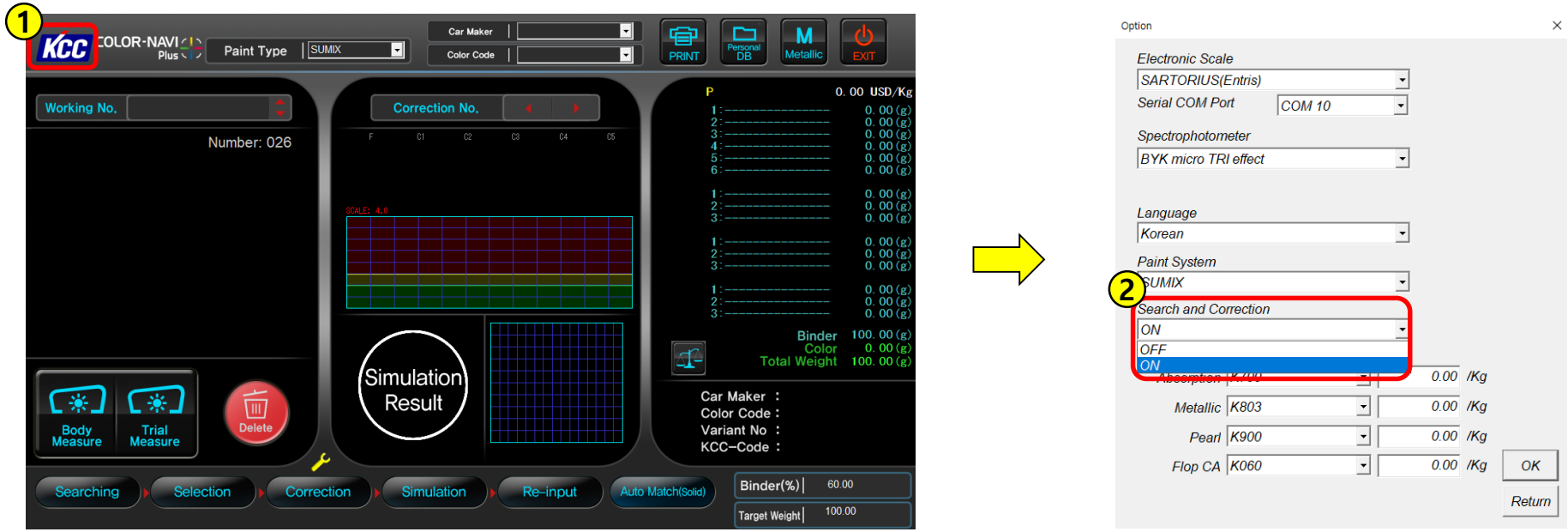
① As shown above, you can search for custom formulas by entering color information such as **"KCC-Code," "Color Code,"** and **"Car Maker"** in the **"Data Base Control"** window.

② After entering the search terms, click **"Header"** under **Personal-DB** in the **"Search"** section



⑨ COLOR-NAVI Add-on

Search and Correction (SAC) Function



① Click the **KCC logo** in the upper-left corner.

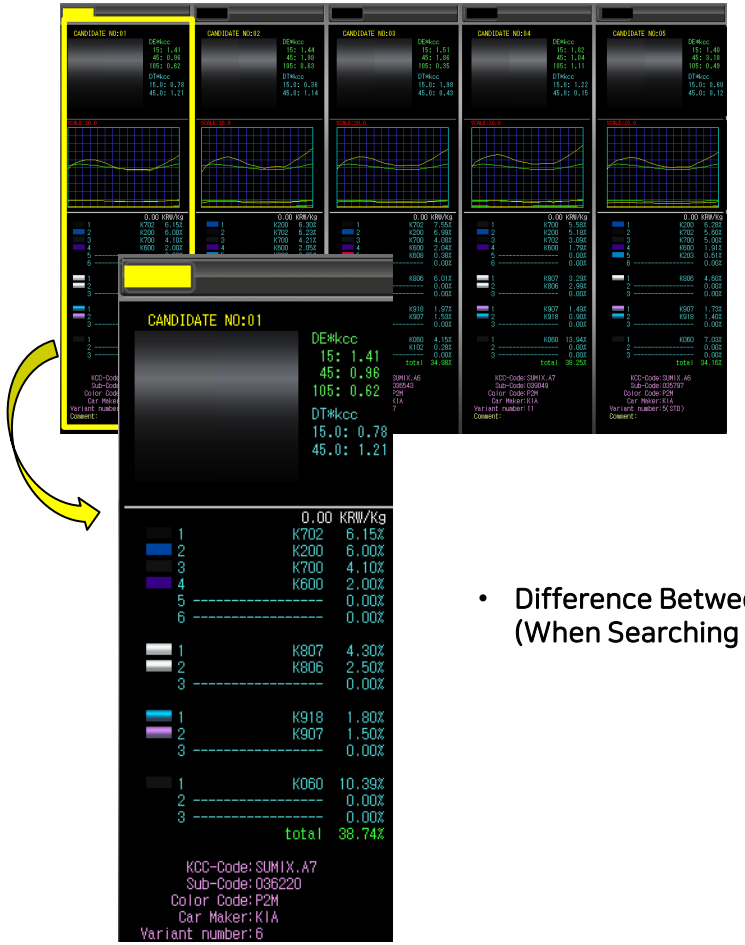
② Change the **Search and Correction (SAC)** settings.

- **OFF (Disable SAC function)**: Searches for similar colors (default, traditional method).
  The user manually decides whether to apply corrections after reviewing similar colors. (Recommended for experienced users)
- **ON (Enable SAC function)**: Searches for similar colors and applies automatic corrections.
  Automatically corrects the top-ranked formulas during similar color searches and provides the top 10 optimized formulas.
  → Enhances work efficiency by simplifying the creation of initial formulas.

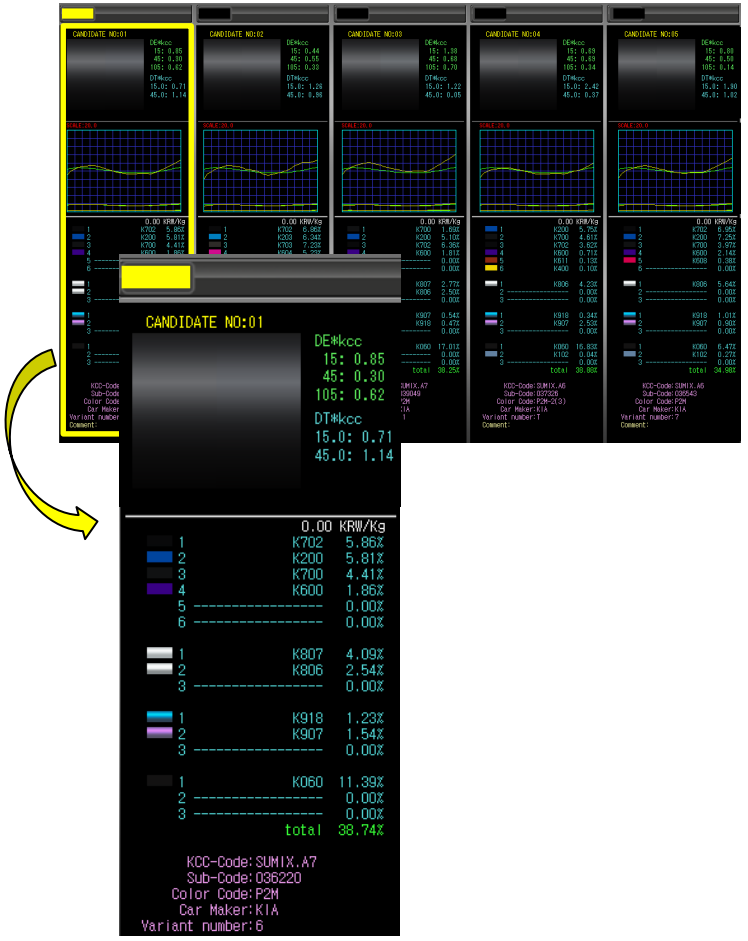
⑨ COLOR-NAVI Add-on

Search and Correction (SAC) Function

Search and Correction **OFF**



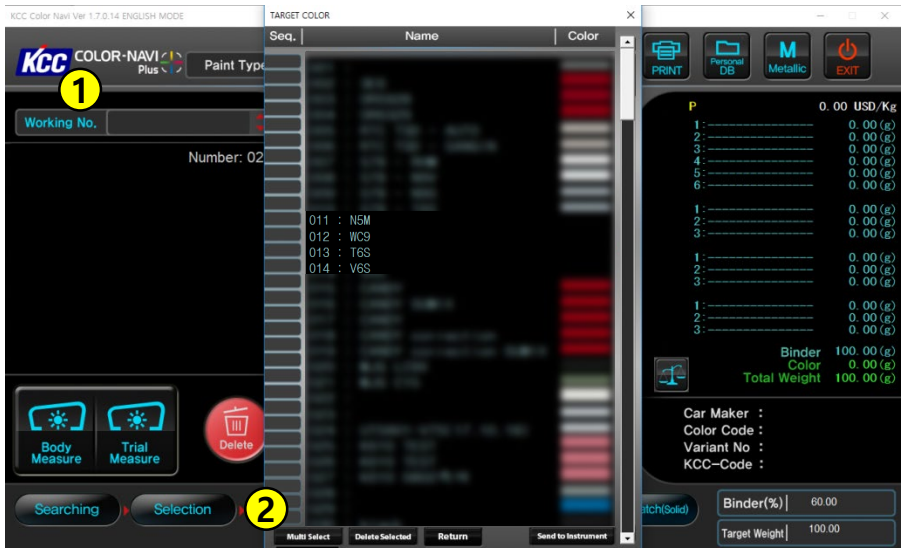
Search and Correction **ON**

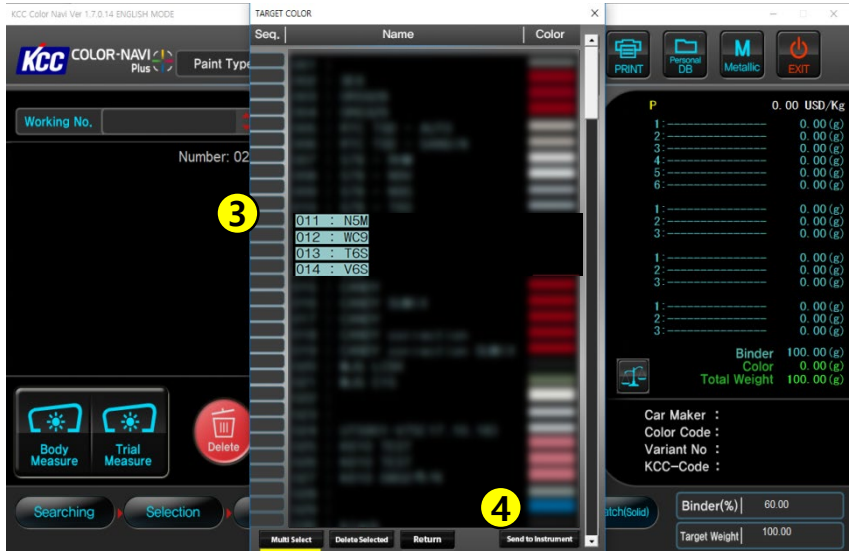


- Difference Between SAC ON/OFF
  (When Searching with the Same Color Values)

⑨ COLOR-NAVI Add-on

Multi-Save Function for Spectrophotometer





① Enter the job name in the **"Working No."** field, then click **"Working No."**
Note: Job names can only contain letters and numbers.

② Click **"Multi Select"** at the bottom.

③ Select the job names to be measured using the spectrophotometer.

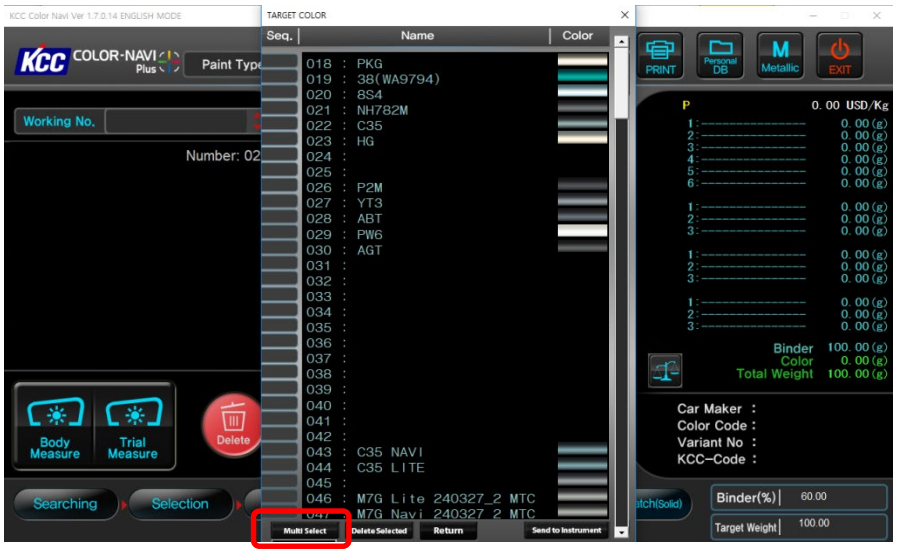
④ Click **"Send to Instrument."**

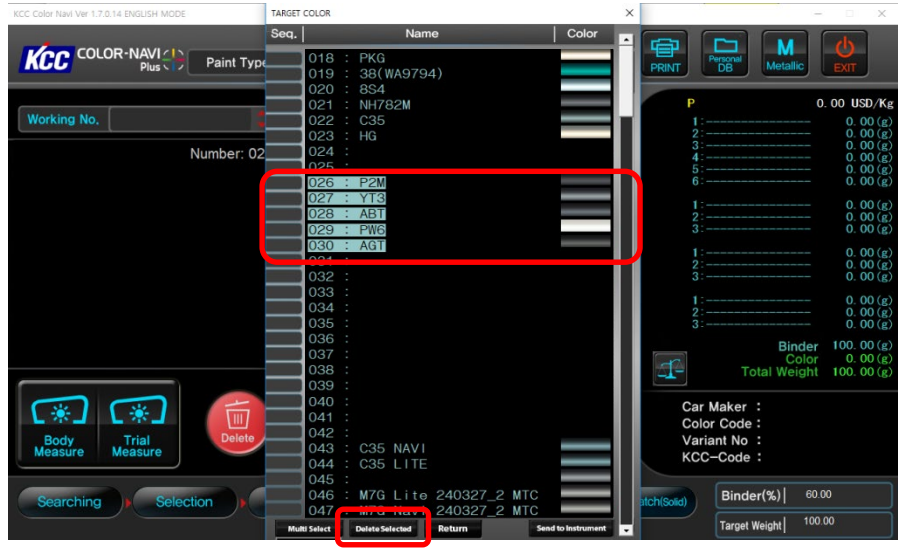
⑤ Confirm the job names sent to the spectrophotometer and proceed with the measurement.

- In the example shown, **Sample #519** is a number generated by the spectrophotometer, while the four items below it are the list of jobs sent from the PC to the spectrophotometer.
- After measurement, click **Vehicle Measurement** in the Color-Navi program to automatically import the measurement values.

⑨ COLOR-NAVI Add-on

Multi-Delete Function for Working Numbers





① Click **"Multi Select"** at the bottom.

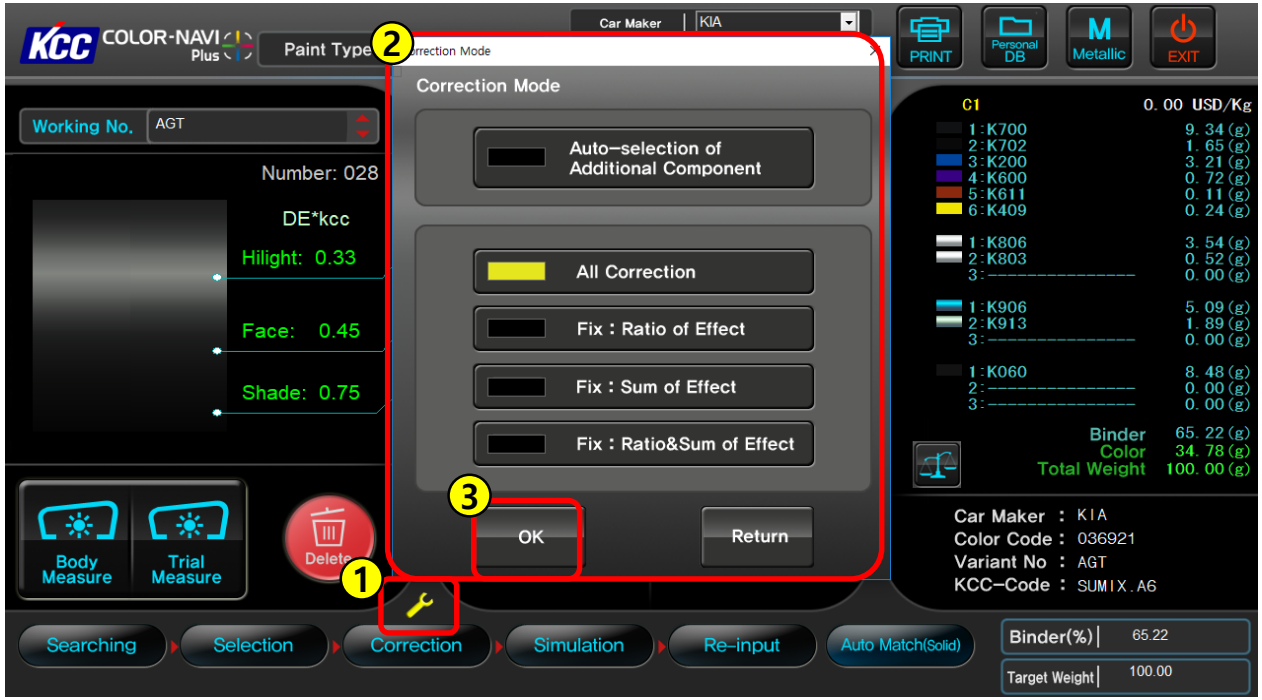
② Click the job names to delete, then click **"Delete Selected"**.

③ Confirm that the selected items have been deleted.

④ Once the deletion is complete, deselect **"Multi Select"**.

⑨ COLOR-NAVI Add-on

Metallic Particle Lock Option for Formula Correction



① Click the 🔧 **"Correction Mode"** button located above **"Correction."**

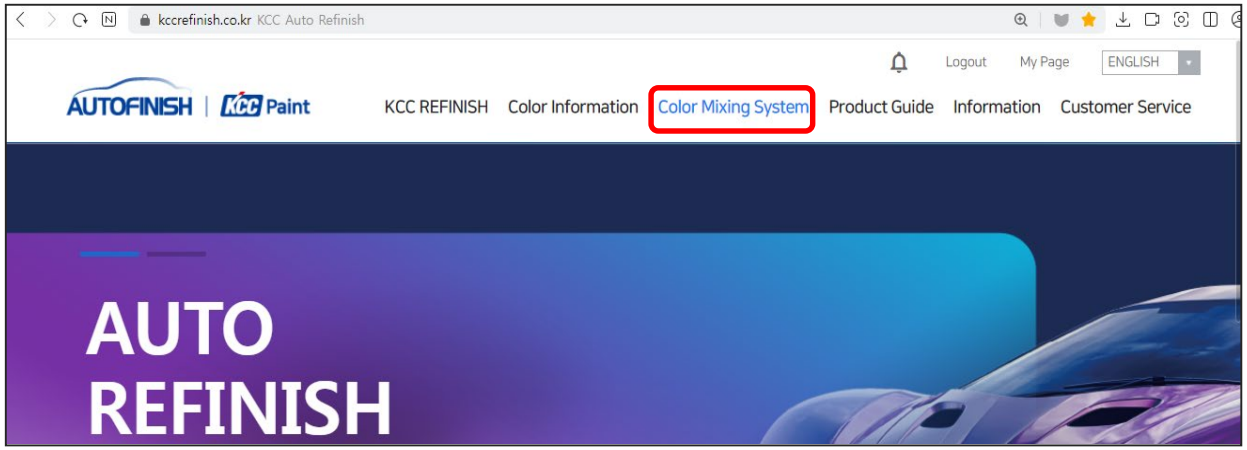
② When the **Correction Mode** window opens, you can configure options to lock the particle size and quantity during automatic correction for metallic/pearl color formulas.
Tip: If the automatically corrected formula's color is satisfactory but you want to adjust the metallic particle size or quantity, select the appropriate options:

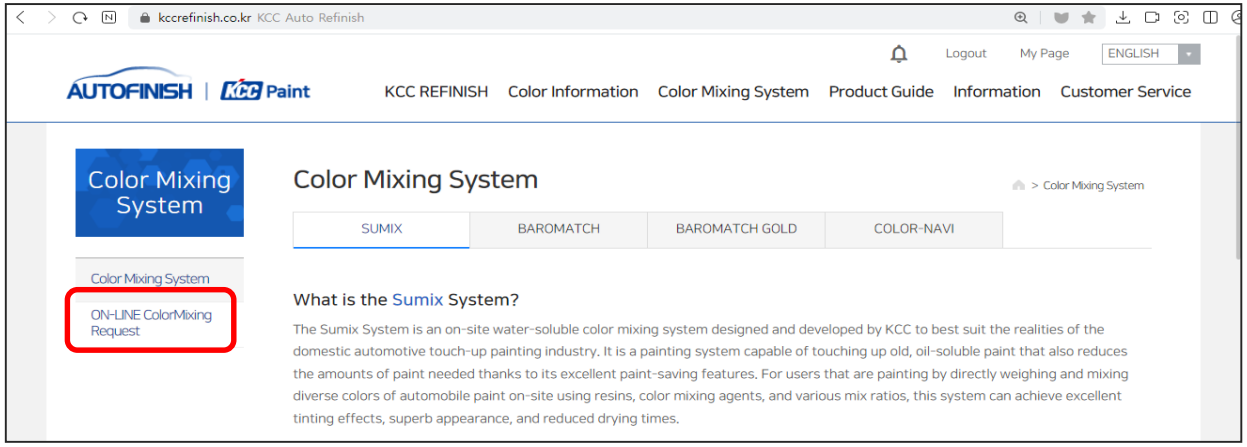
- **Auto-selection of Additional Component** : Allows unlimited addition of toners in the formula for precise color matching.
- **All Correction** : Adjusts color and brightness without considering particle size or quantity.
- **Fix : Ratio if Effect** : Prevents formulas that increase or decrease particle size.
- **Fix : Sum of Effect** : Prevents formulas that increase or decrease the total volume of particles.
- **Fix : Ratio&Sum of Effect** : Fixes the metallic/pearl formula amounts completely.

③ After selecting the desired option, click the **OK** button.

⑩ Online Color Matching Request (COLOR-NAVI PLUS Only)

How to Access the Color Matching Request Page

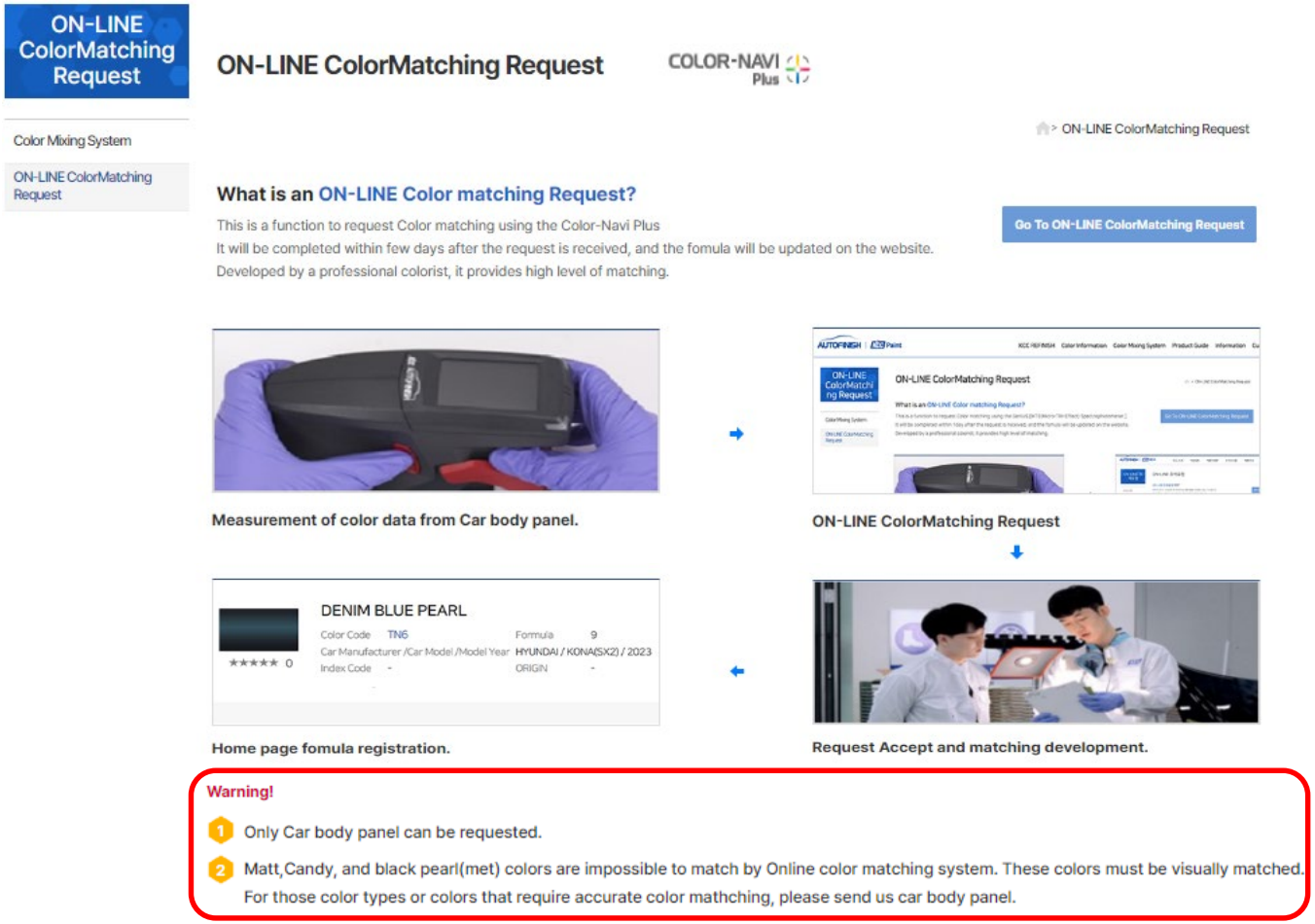




1. Access the **KCC Refinish** website at (www.kccrefinish.com).
2. Click the **Color Mixing System** menu on the homepage.
3. Navigate to **Color Mixing System -> ON-LINE Color Matching Request** tab.

⑩ Online Color Matching Request (COLOR-NAVI PLUS Only)

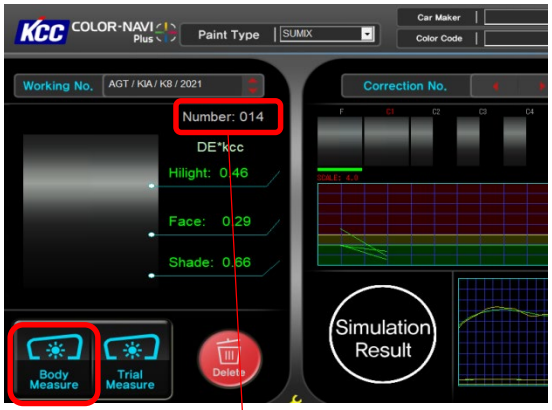
How to Check the Color Matching Request Process



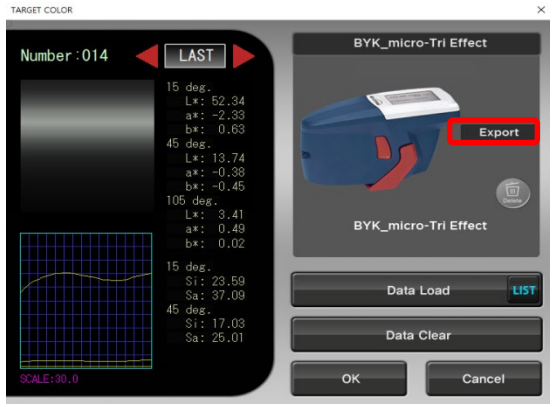
1. Color Mixing System -> ON-LINE Color Matching Request
2. You can view the method and steps for online color matching requests. Please make sure to carefully review and follow the warnings.

⑩ Online Color Matching Request (COLOR-NAVI PLUS Only)

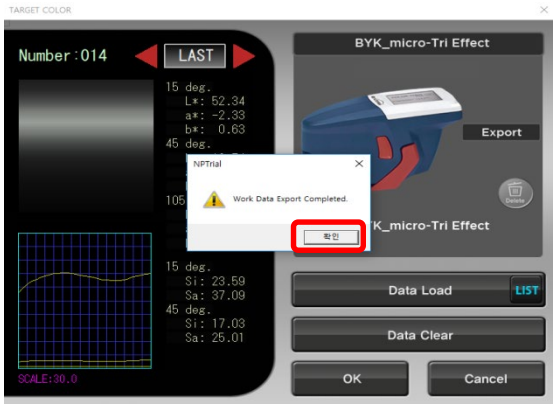
How to Request Color Matching



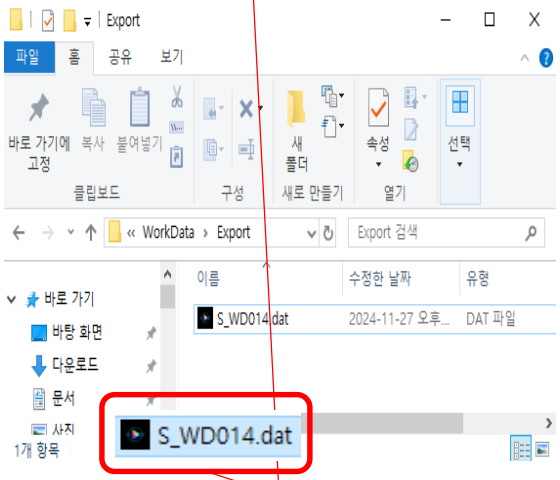
① Click **Body Measure**



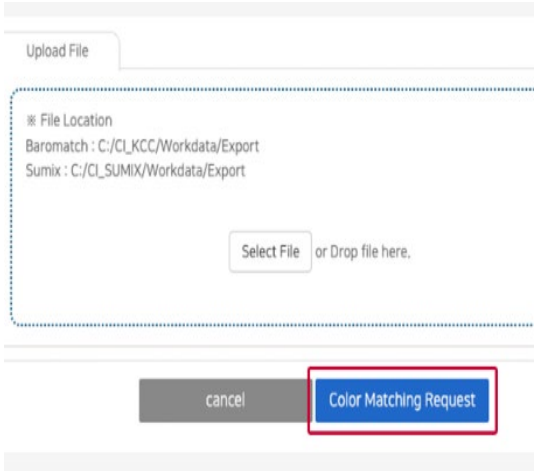
② Click **Export**



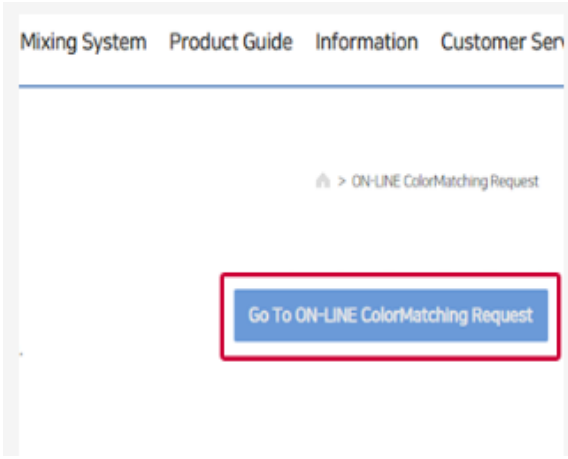
③ Click **OK** to confirm when the export is complete.



Notice: The number in the WorkData file name exported matches the Working Number, so please check it before uploading.
For example: **S_WD001.dat ~ S_WD200.dat**.



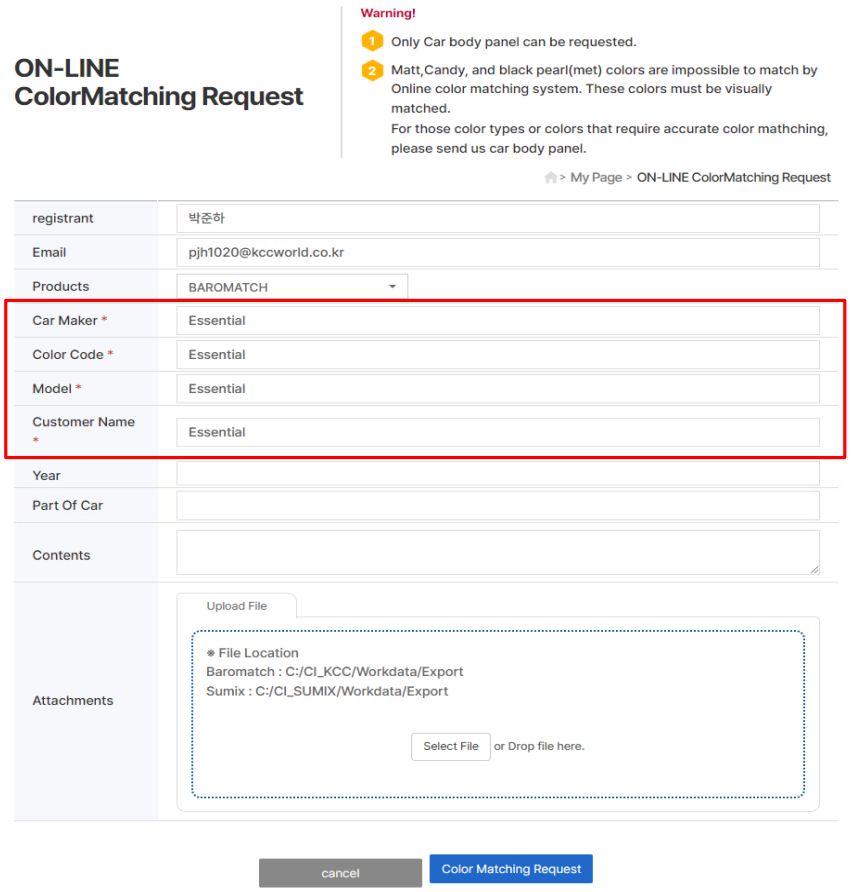
⑤ Upload the color information and data file to the website.



④ Access the Color Matching Request tab on the website.

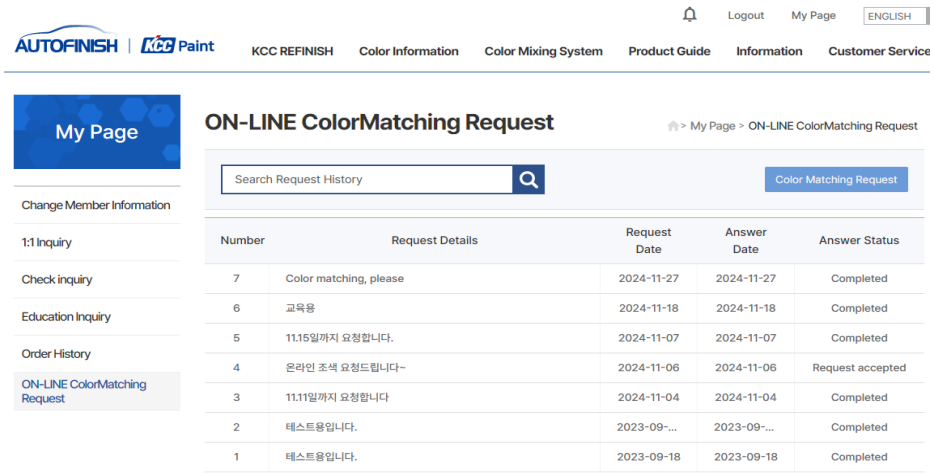
⑩ Online Color Matching Request (COLOR-NAVI PLUS Only)

Color Matching Request Screen



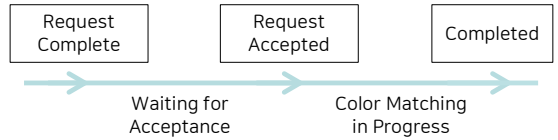
1. Please ensure all required fields are filled in accurately.
2. Include any special notes or requests in the **Contents** field.
3. Before attaching files, check that the attachment matches the requested working number.

My Page - Color Matching Request History



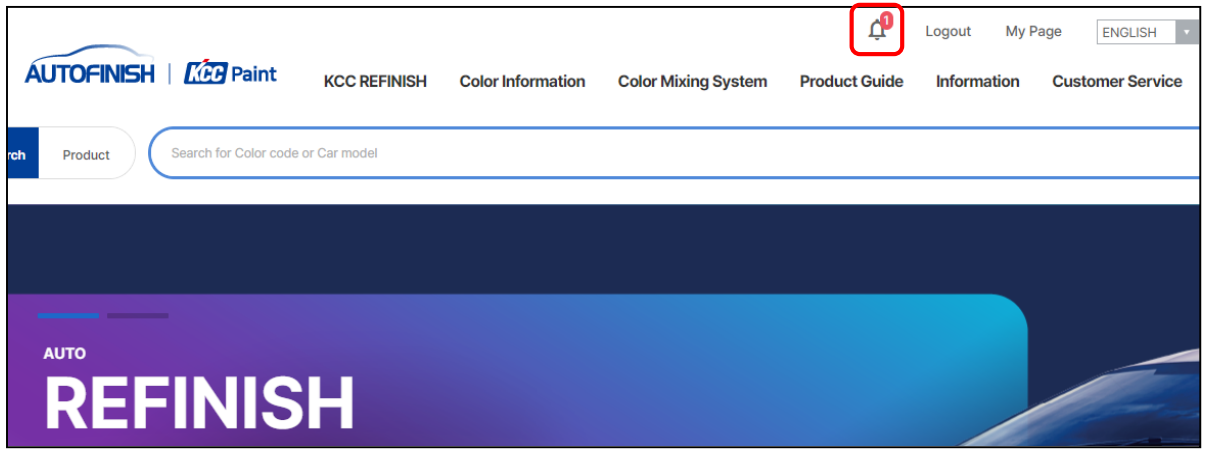
1. This is the **ON-LINE Color Matching Request** tab in **My Page**, showing the list of color matching requests.
2. There are three response statuses:
   - **Request Complete** - The color matching request has been submitted but not yet received.
   - **Request Accepted**- The request has been received and is currently in progress.
   - **Completed** - The color matching process has been completed.

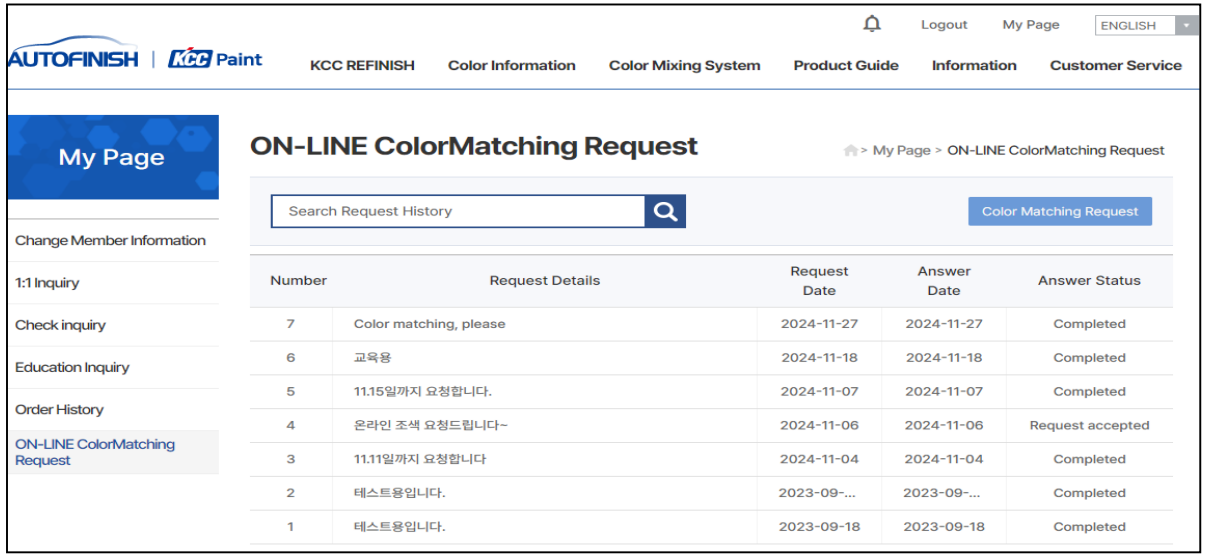
✓ When the request is first submitted, the status will show as **Request Complete**. Once the KCC colorist receives and starts processing the request, the status changes to **Request Accepted**, and after making color formula, it updates to **Completed**.



⑩ Online Color Matching Request (COLOR-NAVI PLUS Only)

Confirm Completion of Color Matching Request





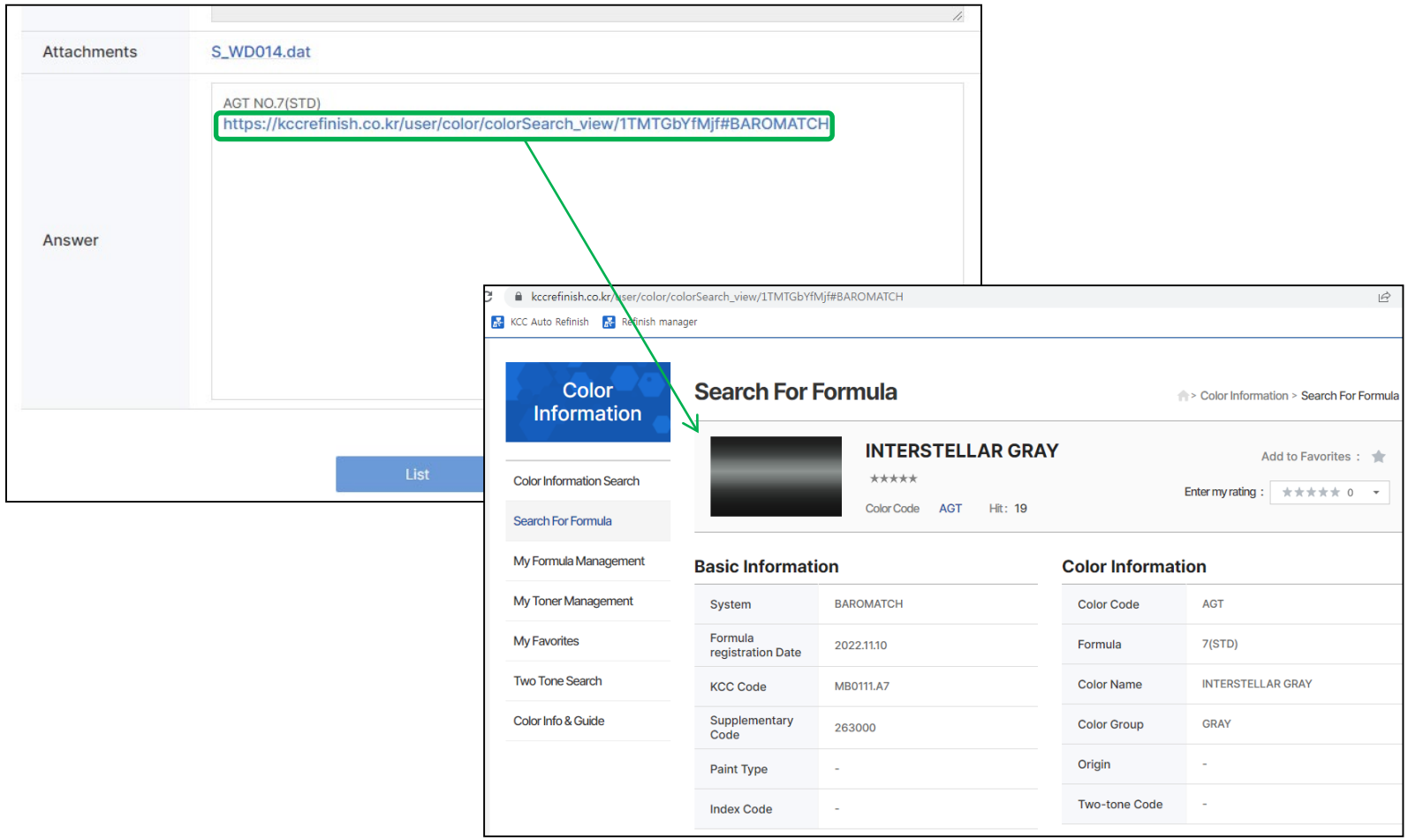
1.When the requested color matching is complete, a notification will appear on the 🔔(bell icon) at the top of the homepage.

2.Click the 🔔(bell icon) to view the list of completed color matching requests.

3.Select the relevant request from the list.

⑩ Online Color Matching Request (COLOR-NAVI PLUS Only)

Confirm Completion of Color Matching Request



1. From the list, click on the requested item and check the **Color Code-Formula Number** at the bottom of the response, then click the address link.
2. After clicking the link, you will be redirected to the corresponding color formula. Verify that the **Color Code** and **Formula Number** match before using it.