



3D Surface Profiler Quick Start Guide

- Batch Analysis/Recommendation -

Introduction

Thank you for your purchase of the VK-X3000 Series 3D Surface Profiler.

First, we will introduce basic operation.

You can understand basic operation using a common object such as a coin.

This manual describes the operation methods to perform analysis tasks effectively;

The batch analysis tool is useful for conducting measurements across several similar samples.

In addition, the recommendation function can be used to differentiate surfaces based on their surface texture.

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Chapter 1

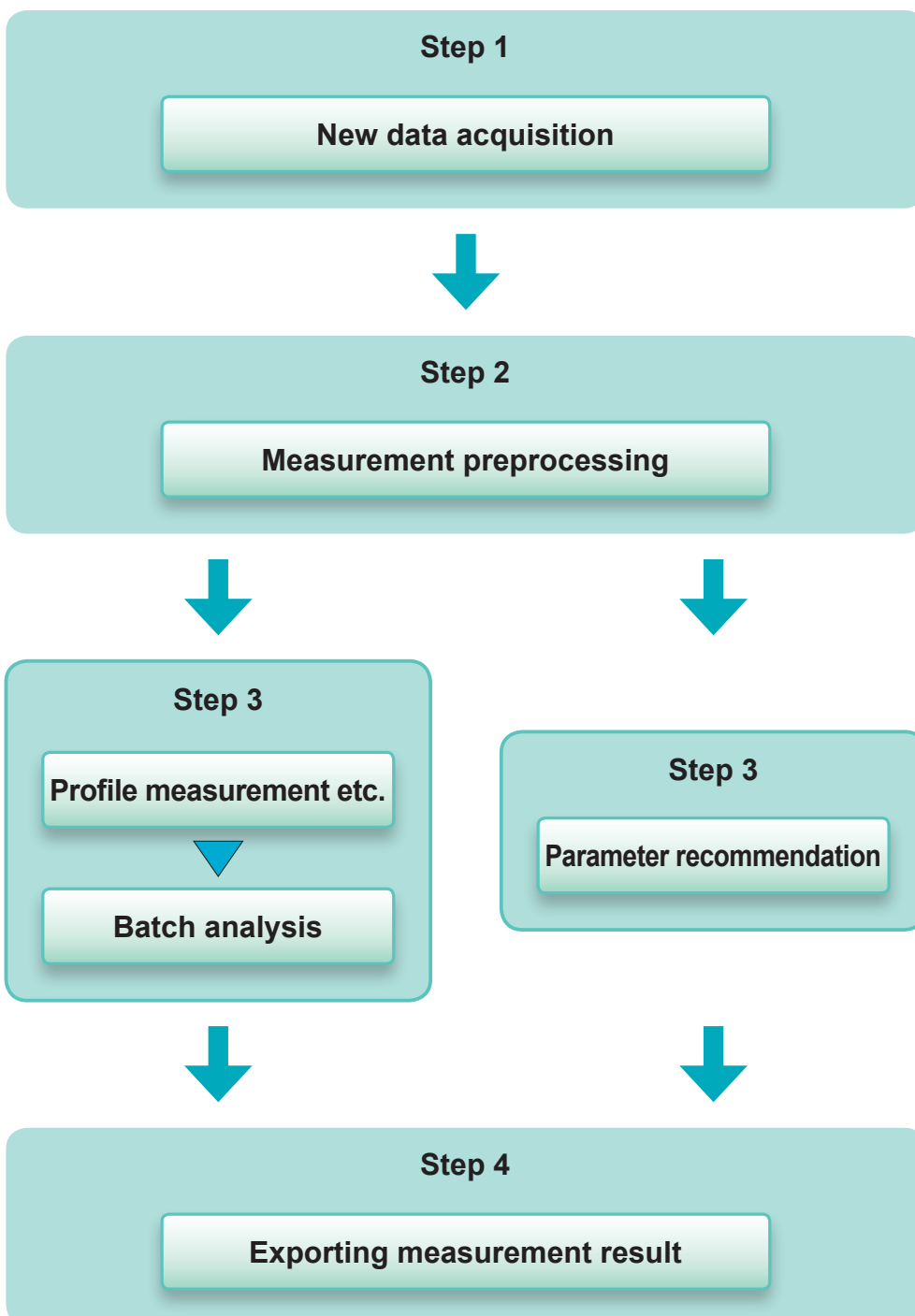
Before Starting Operation



The operation flow of the VK-X3000 Series is as follows.

- Step 1: New data acquisition → Obtain a 3D image by measuring a sample
 Step 2: Measurement preprocessing → Remove the tilt and noise of the obtained 3D image
 Step 3: Use the measurement function → Measure preprocessed data using various functions
 Step 4: Export measurement result → Output a measurement result to a report or Excel

This manual describes batch analysis and parameter recommendation in Step 3.



● New data acquisition

Measure an object and obtain a 3D image including color information.

For details, see "Quick Start Guide: Gathering New Data using Focus Variation/White Light Interferometer", and "Quick Start Guide: Gathering New Data using Laser Confocal".



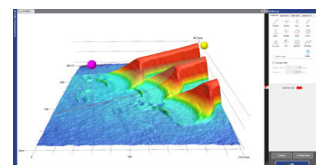
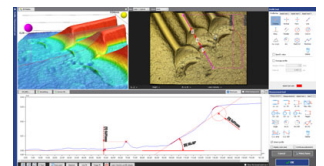
● Measurement preprocessing

For details, see "Quick Start Guide: Image Processing".

● Using the measurement function

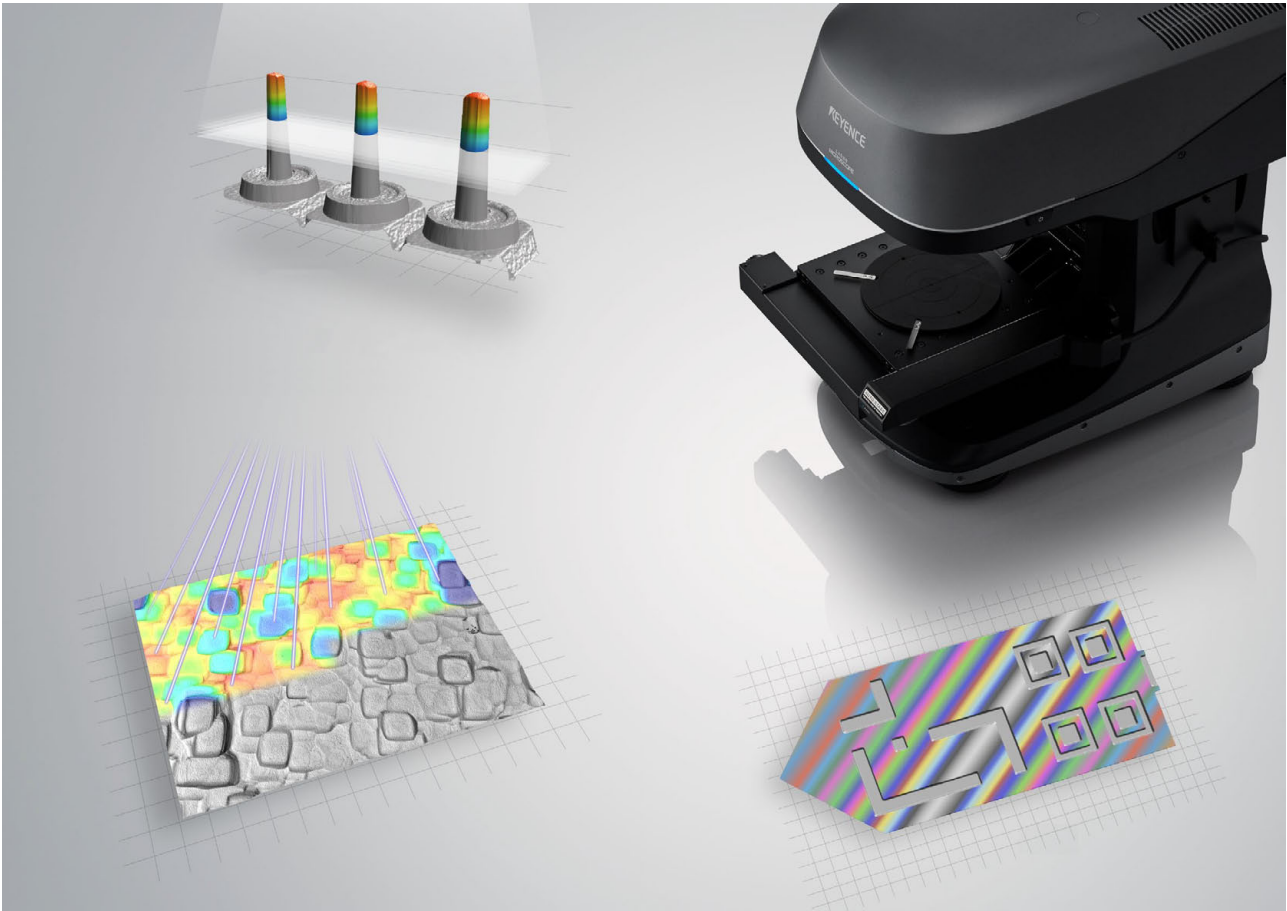
Perform various measurements from an obtained 3D image.

- Cross section shape measurement
- Roughness measurement
- Comparison of two types of data
- Film thickness measurement



Chapter 2

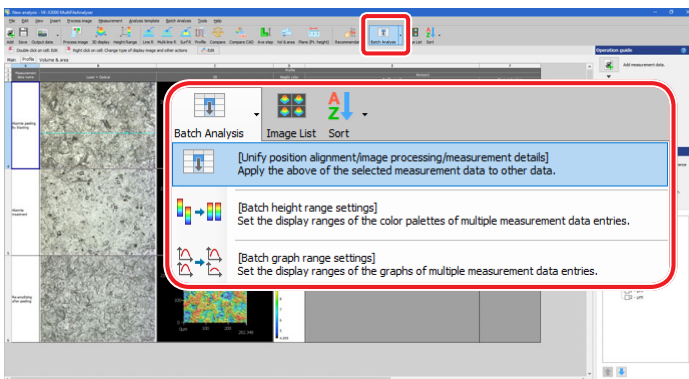
Batch Analysis



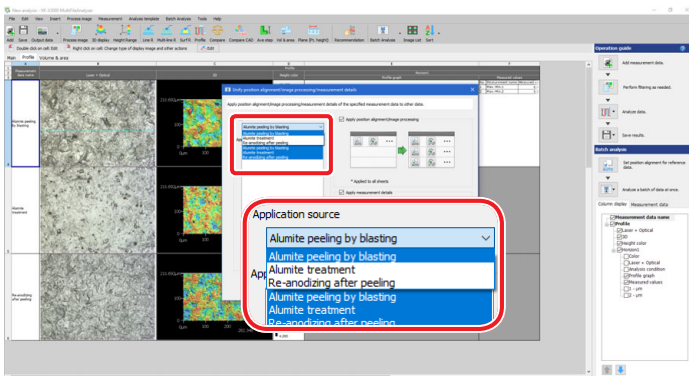
2-1 Unifying Position Alignment/Image Processing/Masurement Details

This applies the position alignment, image processing, and measurement details for arbitrary measurement data at a time to multiple data. It is useful to repeat the same image processing or analysis contents for tasks that are performed repeatedly or the same contents of evaluation (changes-with-time etc.).

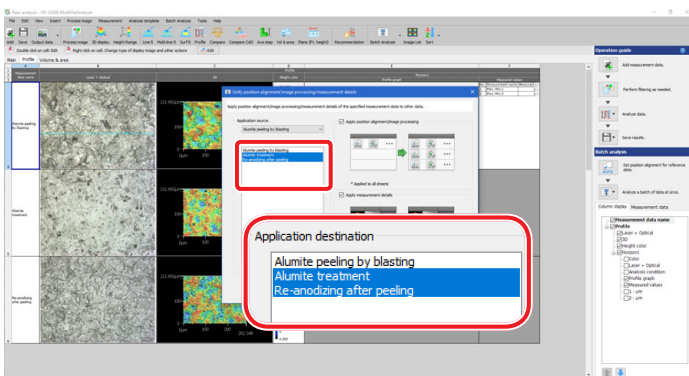
1. Click [Unify position alignment/image processing/measurement details] from the [Batch Analysis] button on the toolbar. Alternatively, select [Unify position alignment/image processing/measurement details] from the [Batch Analysis] menu.



2. Specify the measurement data as a setting source in the [Application source] box on the left side of the screen.



3. Select the measurement data to apply the settings in the [Application destination] box on the left side of the screen. Note that selecting data is not required if the settings are applied all measurement data.



- **About data to be prepared**
Use obtained data with measurement preprocessing and without the preprocessing.

- **Open the [Unify position alignment/image processing/measurement details] dialog box with another method.**

Click the [Batch Analysis] button on the toolbar and the [Analyze a batch of data at once.] button in "Batch Analysis" on the right side of the screen, and select [Unify position alignment/image processing/measurement details].

- Select from the right-click menu of the cell.

- **Select multiple data**

Click while pressing Ctrl to select multiple data.

Click while pressing Shift to select a range.

- **Apply the same settings when another measurement data is added next**

Select the [Apply to subsequent measurement data] checkbox.

2-1 Unifying Position Alignment/Image Processing/Masurement Details

- **[Apply position alignment/ image processing] checkbox**

Selecting this checkbox applies the position alignment and the image processing.

- **[Apply measurement details] checkbox**

Selecting this checkbox applies the measurement details.

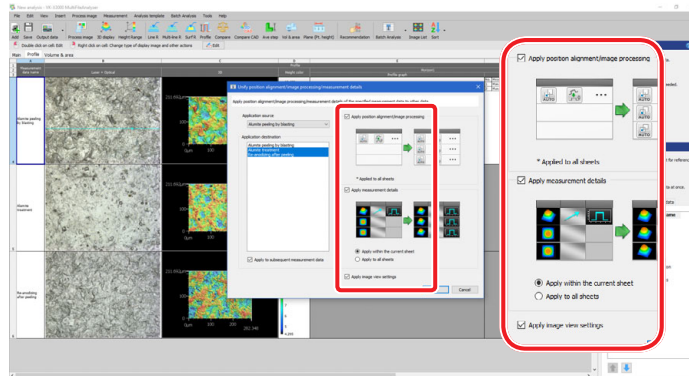
- **[Apply within the current sheet] radio button**

Applies measurement contents to the measurement of the selected grid sheet.

- **[Apply to all sheets] radio button**

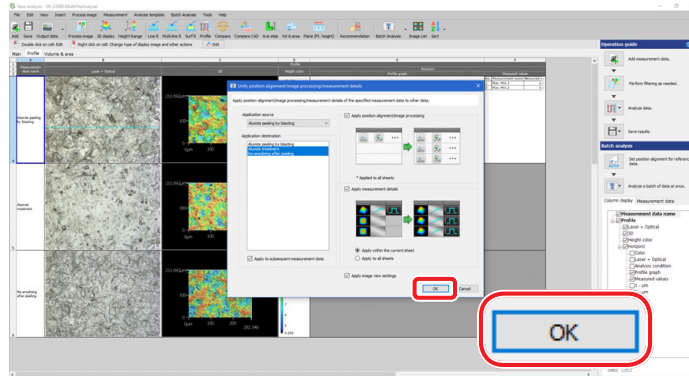
Applies measurement contents of all grid sheets in the measurement data of the application source.

4. Select the checkbox of the processing to apply on the right side of the screen.



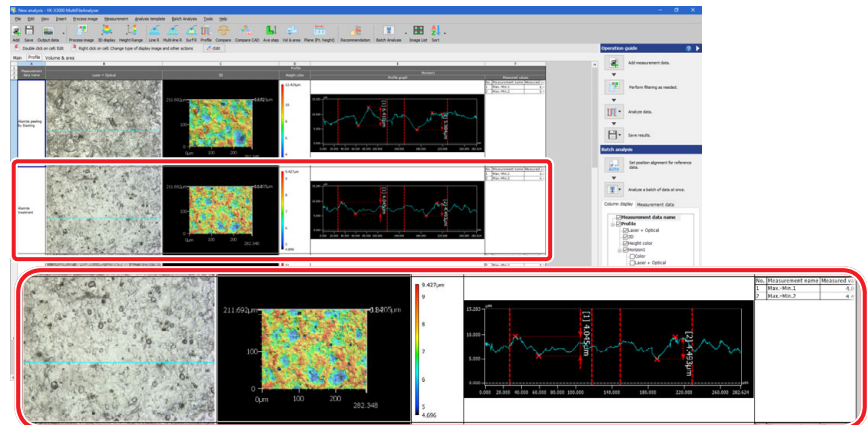
5. Click the [OK] button.

Image processing and measurements are performed with the set contents.



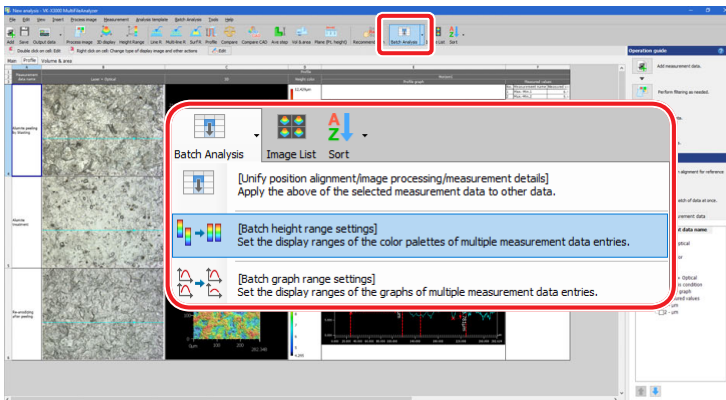
6. Check the result.

Check that the measurement results are displayed on the grid sheet with settings applied.

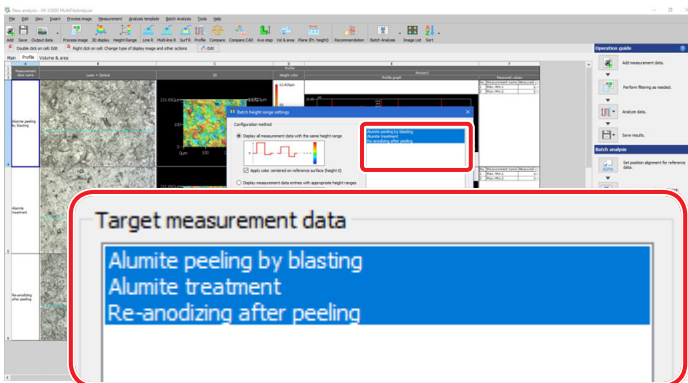


Batch height range setting is the function to set the height images display of multiple measurement data in batch, or apply the height image settings set for arbitrary measurement data to other measurement data.

1. Click [Batch height range settings] from the [Batch Analysis] button on the toolbar. Alternatively, select [Batch height range settings] from the [Batch Analysis] menu.



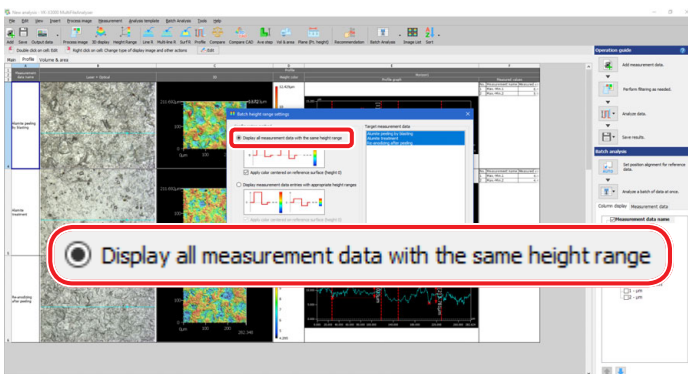
2. Click data to be targeted from the target measurement data on the right side of the screen to select.



3. Select the configuration method.

Click any of the radio buttons for the configuration method on the left side of the screen.

In this case, select the [Display all measurement data with the same height range] radio button.



- **About data to be prepared**

Data used doesn't require pre-processing.

- **Other display procedures to display the [Batch height range settings] dialog box**

Click the [Batch Analysis] button on the toolbar and the [Analyze a batch of data at once.] button in "Batch Analysis" on the right side of the screen, and select [Batch height range settings].

- Right-click the main image or reference image to select.

- **[Display all measurement data with the same height range] radio button**

Sets the maximum value for upper limit value and lower limit value from the entire measurement data.

- When selecting the [Apply color centered on reference surface (height 0)] checkbox, the upper and lower limits are therefore set by the greater value of either the maximum or minimum value of the measurement data.

- **[Display measurement data entries with appropriate height ranges] radio button**

Automatically sets the upper limit value and lower limit value based on the maximum value and minimum value for each measurement data.

- When selecting the [Apply color centered on reference surface (height 0)] checkbox, the upper and lower limits are therefore set by the greater value of either the maximum or minimum value of the measurement data.

- **[Match to specified measurement data] radio button**

Sets using the height display settings of the specified measurement data.

- Specify the measurement data as a setting source in the [Target measurement data] box. By default, the selected measurement data name is displayed.

- **[Set and change color palette] button**

The color palette setting window appears.

Select the color palette to change, and click the [OK] button.

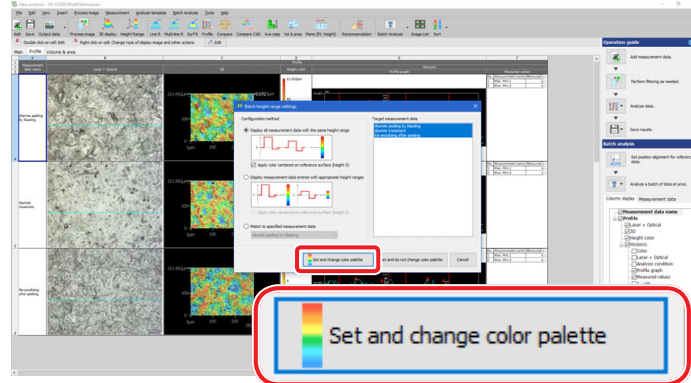
The height range color palette can be changed before applying the settings.

- **[Set and do not change color palette] button**

The settings are applied on the grid sheet.

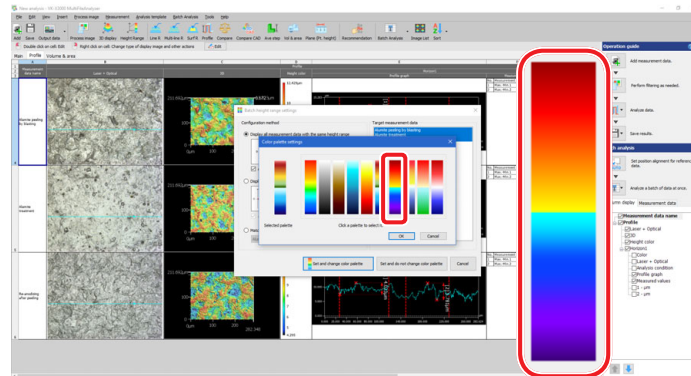
4. Click the [Set and change color palette] button or [Set and do not change color palette] button.

In this example, click the [Set and change color palette] button.



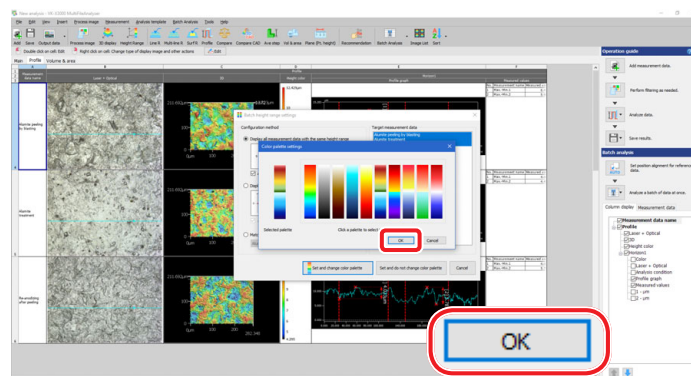
5. Click an arbitrary color palette.

In this case, select the fourth color palette from the right side.



6. Confirm the color palette settings.

Clicking the [OK] button applies the height range settings with the selected color palette.

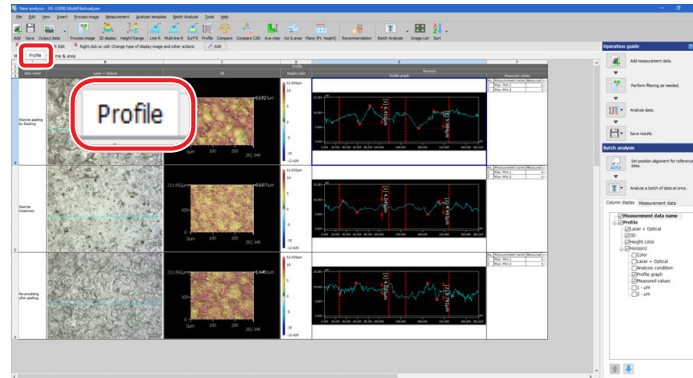


The batch graph range settings are effective for analysis functions where graphs (profile measurements etc.) are displayed.

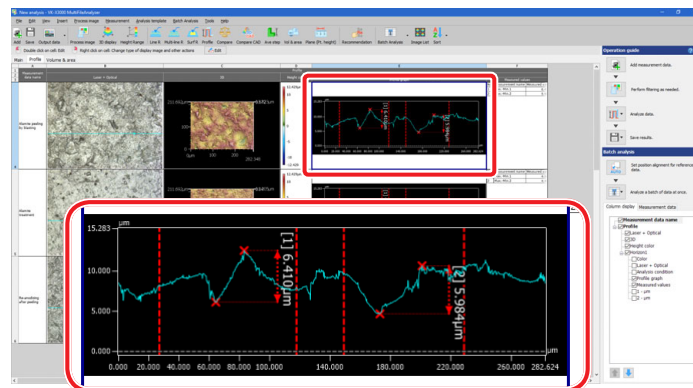
- **About data to be prepared**
Use multiple data of which various analyses (profile measurement etc.) have been done.

The batch graph range settings configure the display format for multiple measurement data (each graph scale etc.) to be unified together. Graph display settings set for arbitrary measurement data can be applied to other measurement data.

1. Select the grid sheet on which the profile graph is displayed.

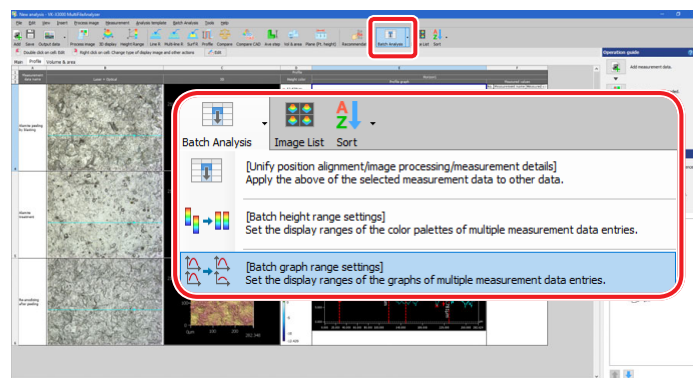


2. Click the cell of profile graph.



- **Another procedure to display the [Batch graph range settings] dialog box**
- Click the [Batch Analysis] button on the toolbar and the [Batch Analysis] button in "Analyze a batch of data at once" on the right side of the screen, and select [Batch graph range settings].
- Select from the right-click menu of the profile graph.

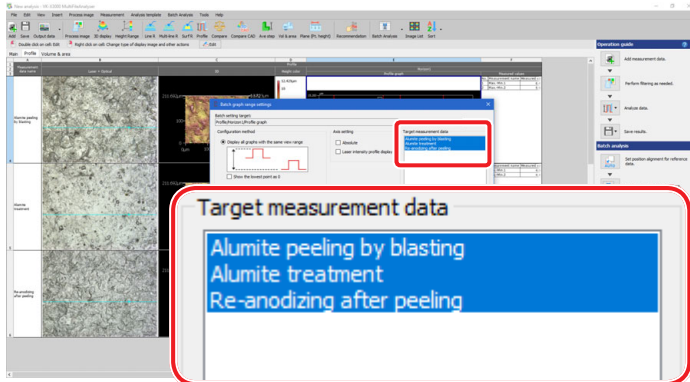
3. Click [Batch graph range settings] from the [Batch Analysis] button on the toolbar. Alternatively, select [Batch graph range settings] from the [Batch Analysis] menu.



4. Select the target measurement data.

Click data to be targeted from the target measurement data on the right side of the screen to select.

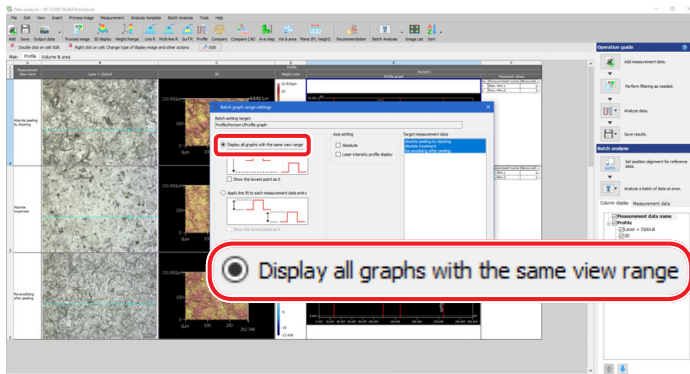
Item names of the selected profile graph are displayed on [Batch setting target].



5. Select the configuration method.

Click any of the radio buttons for the configuration method on the left side of the screen.

In this case, select the [Display all graphs with the same view range] radio button.

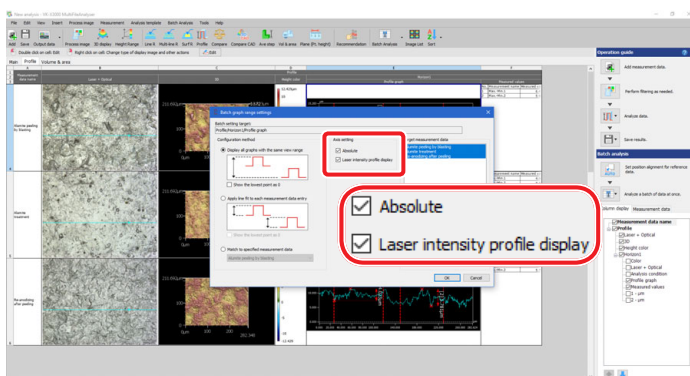


6. Perform the advanced settings as required.

Selecting the [Absolute] checkbox makes the aspect ratio of the profile graph be equal horizontally and vertically.

Selecting the [Laser intensity profile display] checkbox adds the laser intensity profile to the profile graph.

In this case, select the [Absolute] checkbox and the [Laser intensity profile display] checkbox.



- [Display all graphs with the same view range] radio button

Sets the maximum value for upper limit value and lower limit value from the entire measurement data.

- Selecting the [Show the lowest point as 0] checkbox sets the axis value so that the minimum value of the entire measurement data is displayed as 0.

- [Apply line fit to each measurement data entry] radio button

Automatically sets the graph display based on the maximum value and minimum value for each measurement data.

- Selecting the [Show the lowest point as 0] checkbox sets the axis value so that the minimum value of the measurement data is displayed as 0.

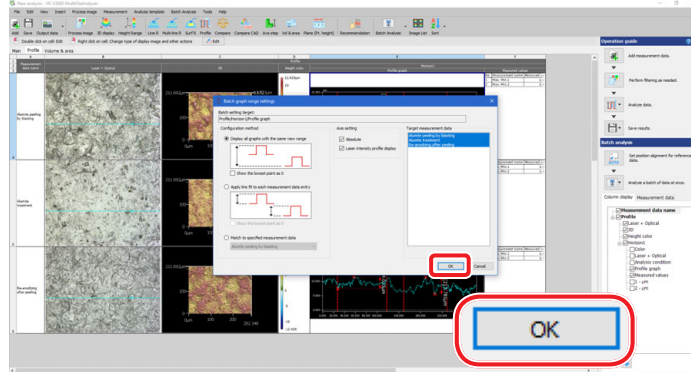
- [Match to specified measurement data] radio button

Sets the graph display settings of the specified measurement data.

- Specify the measurement data as a setting source in the [Target measurement data] box. By default, the selected measurement data name is displayed.

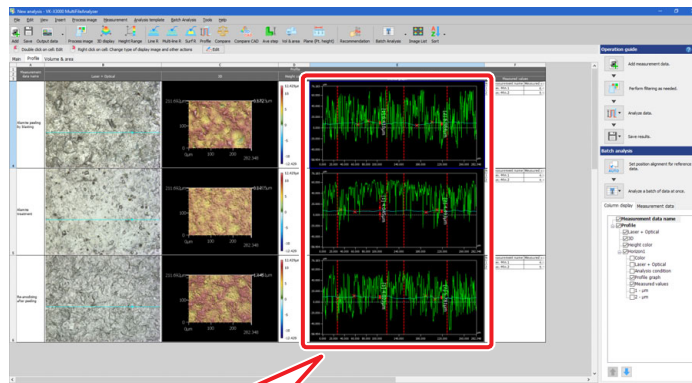
7. Confirm the graph display settings.

When clicking the [OK] button, the profile graph to which the set contents are applied appears on the grid sheet.

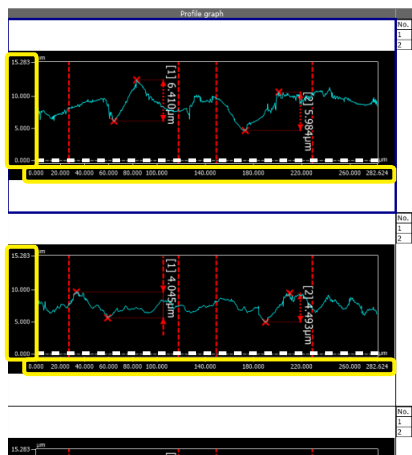


8. Check the result.

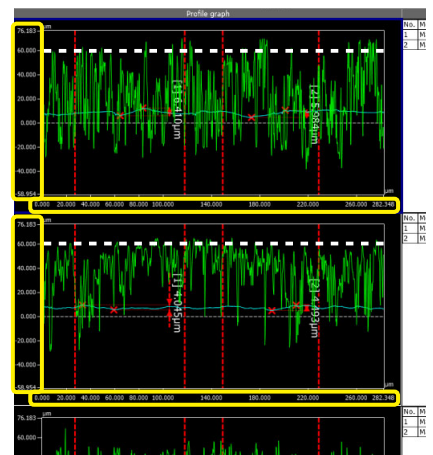
Check that the profile graph to which the set contents are applied is displayed on the grid sheet.



● Before change



● After change



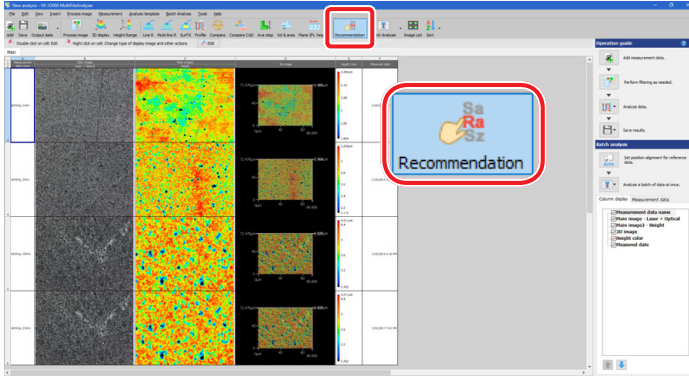
Although the graph scales are not unified before the change, the scales of both vertical and horizontal axes are unified after performing the batch range settings. This can be useful when you want to compare multiple graphs (results).

MEMO

The parameter recommendation is the function to compare 2 sample groups quantitatively using multiple parameters and displays the degree of difference.

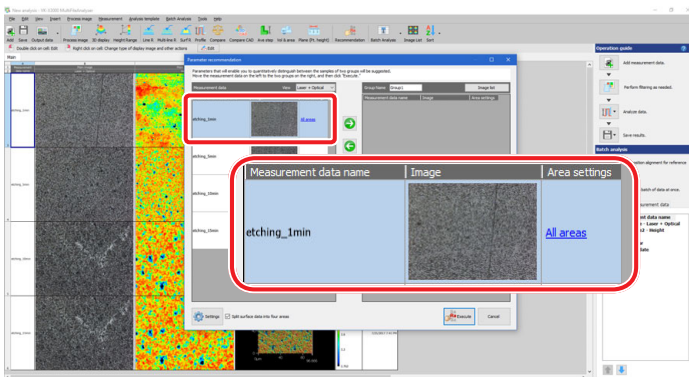
Multiple measurement data to be compared are needed.

1. Click the [Recommendation] button on the toolbar. Alternatively, select [Parameter recommendation] from the [Tools] menu.



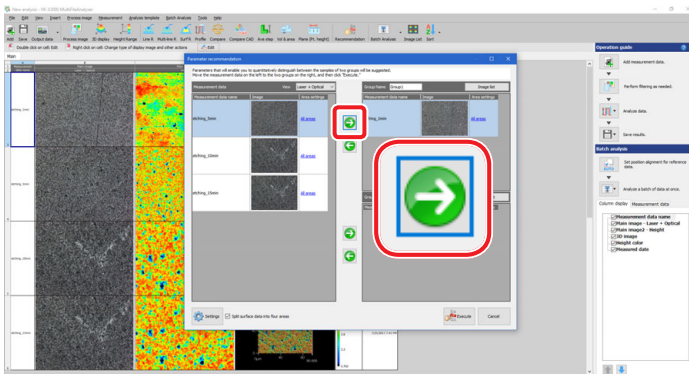
2. Select the measurement data to be compared in the first group.

In this case, select the first measurement data.



3. Assign the measurement data to the first group.

Click the arrow button (right), and distribute measurement data to be compared to the first group.



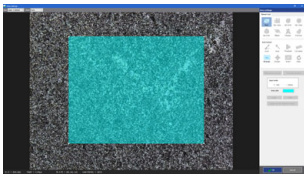
- **Select multiple data**

Click while pressing Ctrl to select multiple data.

Click while pressing Shift to select a range.

- **Area Settings**

Clicking [All areas] in the area settings field displays the [Area settings] window.

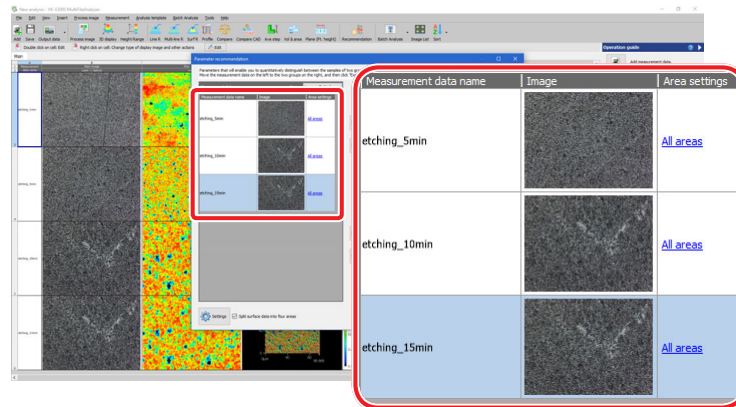


Use the element tool to limit the target area to be measured.

By default, the screen is divided into four sections for measurement.

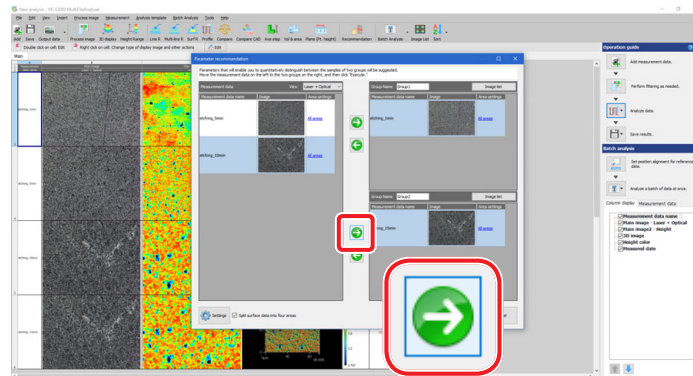
4. Select the measurement data to be compared in the second group.

In this case, select the fourth measurement data.

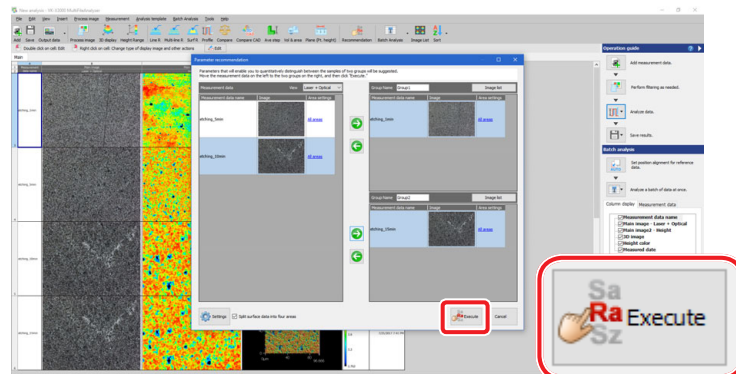


5. Assign the measurement data to the second group.

Click the arrow button (right), and distribute measurement data to be compared to the second group.

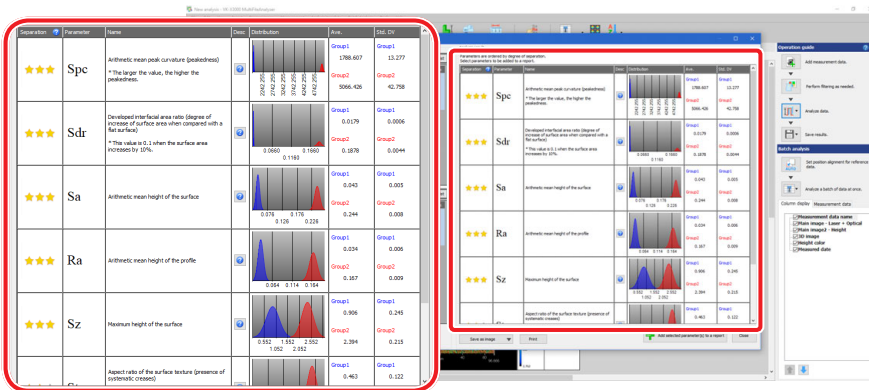


6. Click the [Execute] button.



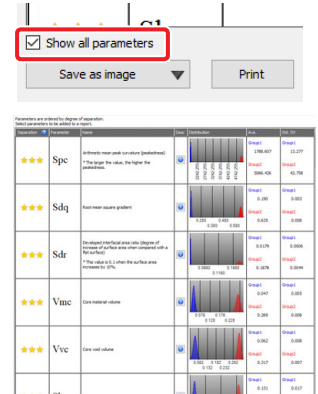
7. Check the result.

Confirm all analysis results displayed in the [Result] dialog box.



- [Show all parameters] checkbox

By default of the parameter recommendation, seven parameters are displayed. Selecting the [Show all parameters] checkbox displays all the analysis results of surface roughness parameters.



8. Select the roughness parameter you want to add to the measurement items.

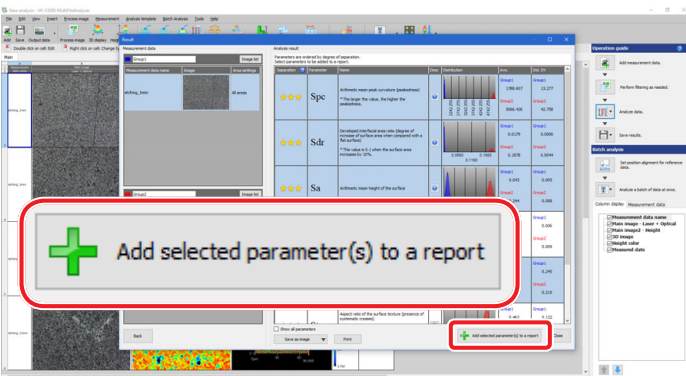
Click the parameter row. Each time you click, the selection switches.

In addition, multiple parameters can be selected.



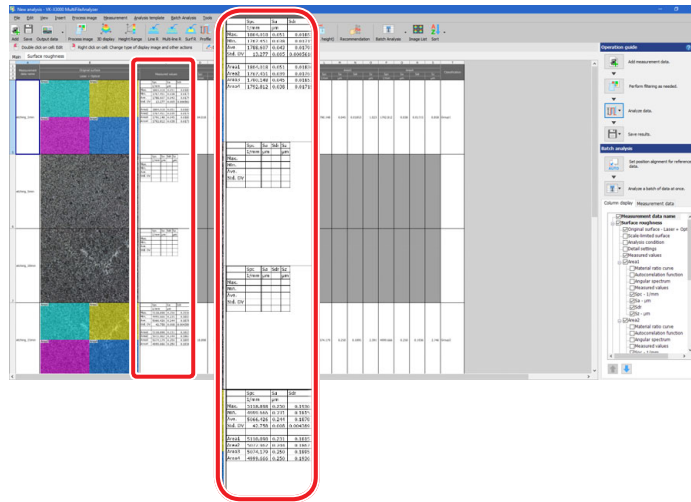
9. Click the [Add selected parameter(s) to a report] button.

According to the parameters, grid sheets of [Line roughness] and [Surface roughness] are added, and the results are displayed.

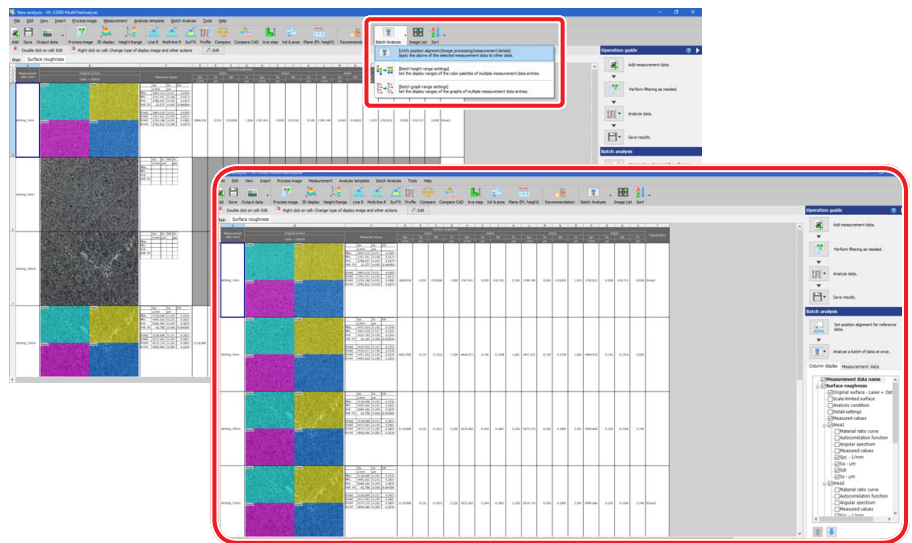


10. Check the result.

Check that the parameters are added.



11. If you want to apply the same analysis results to other measurement data, use "Batch Analysis".



Specifications are subject to change without notice.

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