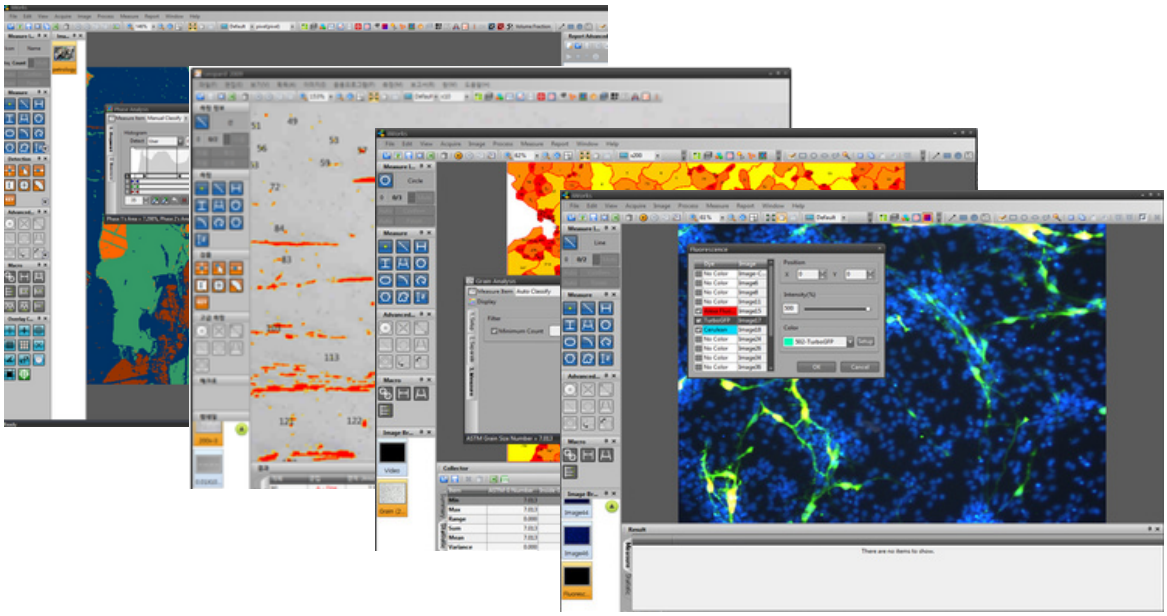
LANOPTIK
Technologies

Plugins of iWorks Software

Instructions



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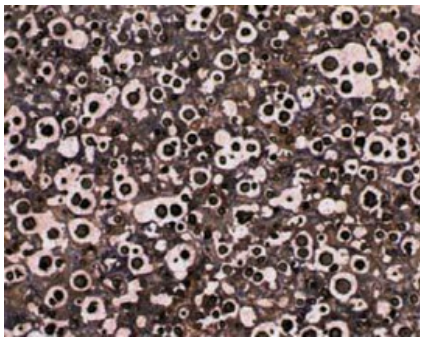
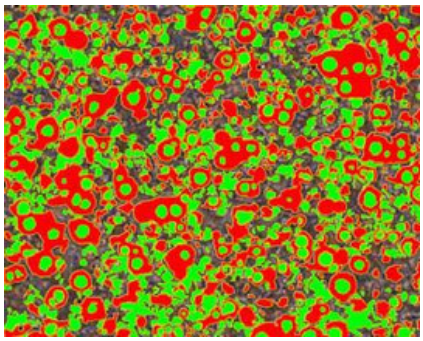
1. Process

A. Phase Analysis

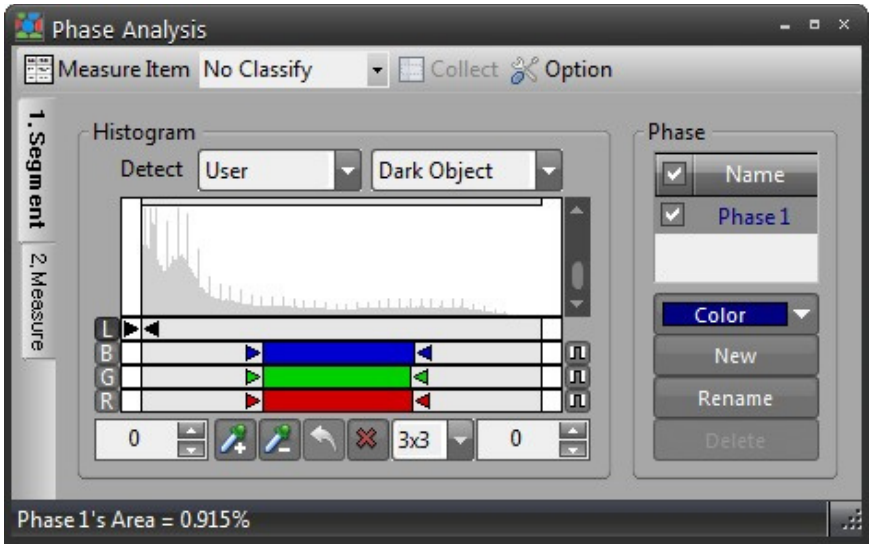
This program analyzes data ratio between sections through section setup in image histogram.



Original Image

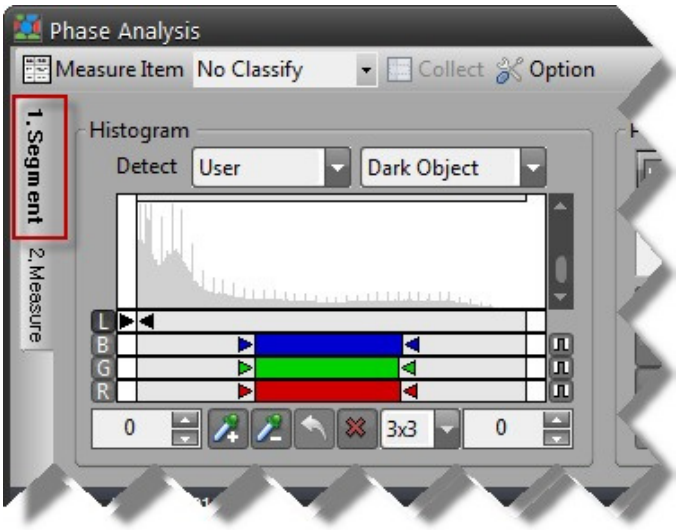


Phase segmentation result



The left tab (1. segmentation, 2. measurement) refers to the operation order.

SEGMENT

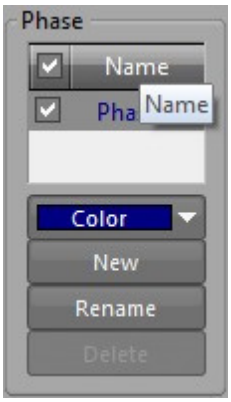


Histogram: Select L, R, G, B color plane and adjust arrow or input value to setup section for segmentation.

Automatically find histogram section with object. Dark object is separated from bright object according to object brightness. Select optimized algorithm according to video to use auto-detection algorithm.

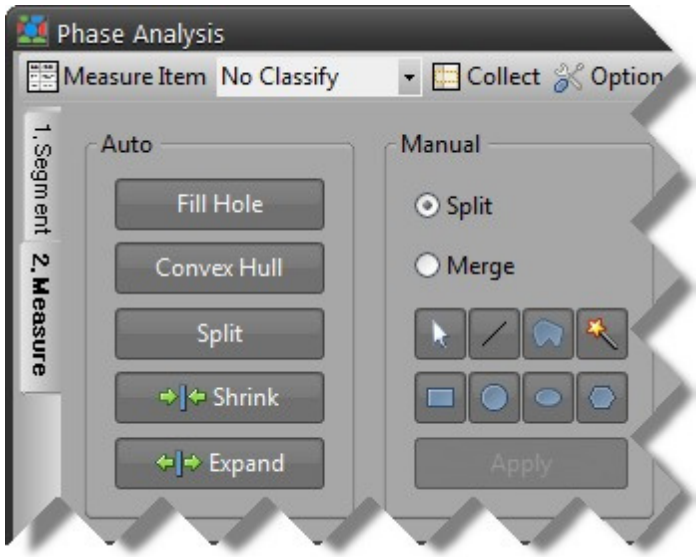
Click subject of segmentation by using mouse to add or delete section. This function can be effectively used during selection of particular color section of color video.

Phase: This tool can form several sections.



- Check option: Mark checked phase as relative color in video.
- Select Option: Adjust selected phase section.
- Color: Select phase color.
- New phase: Add new phase.
- Change name: Change phase name.
- Delete: Delete phase.

MEASUREMENT



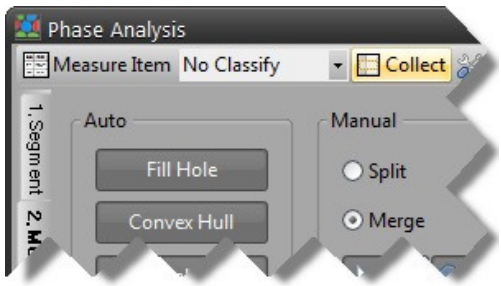
Auto

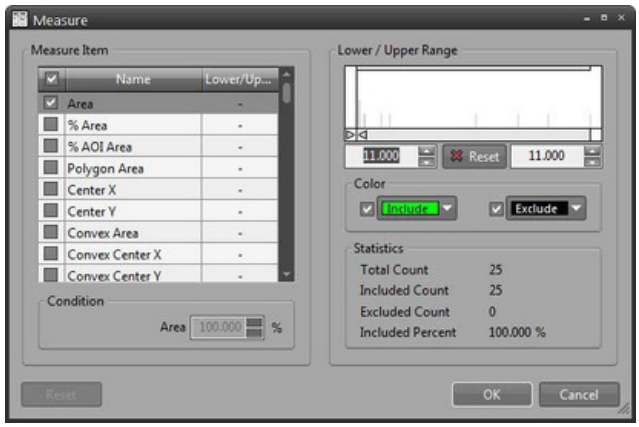
- Fill hole: Fill hole within detected cell.
- Convex: Form convex outer line of detected cell.
- Split: Analyze overlapping cell to achieve auto-split.
- Contract: Reduce size of detected cell.
- Expand: Expand size of detected cell.

Manual

Split/Merge: Use tool to split or merge detected cell.

MEASUREMENT ITEM

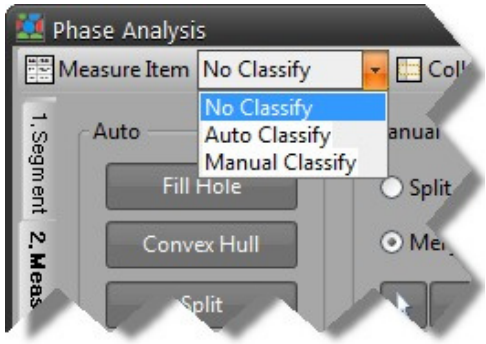




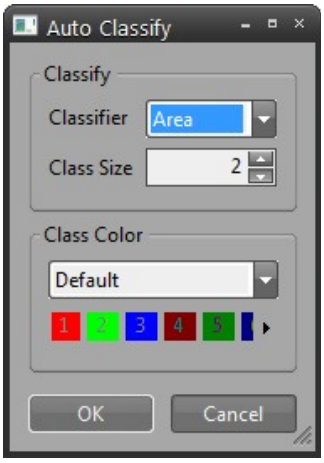
Measurement

Select item for using in measurement result.
Setup minimum value/maximum value and use output value to acquire desired data.

CLASSIFY



Auto Classify



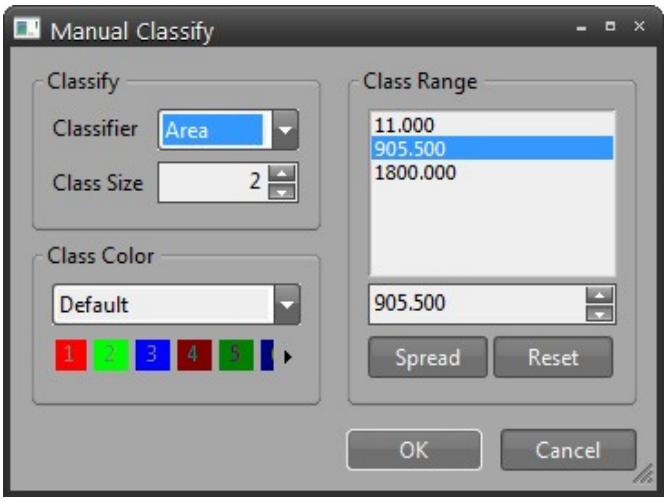
Class

Class standard: Select type of class standard value.
Class size: Setup size to automatically classify measurement values according to class size. Results may be smaller than N units even during size input of N units in case of class condition difficult for auto- classification.

Class Color

Set up color pattern of class.

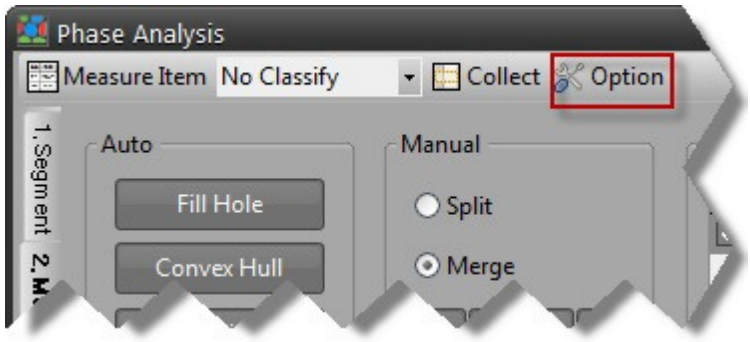
Manual Classify

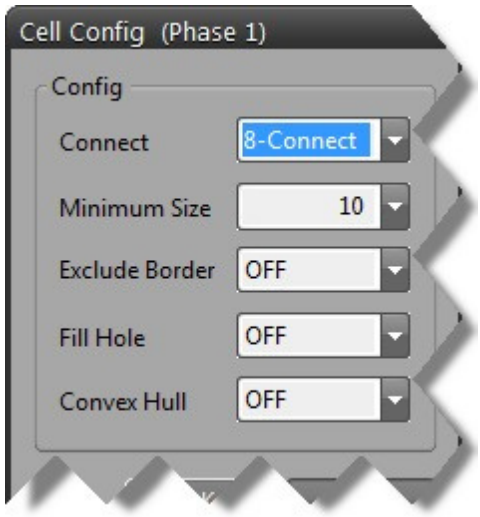


Class Range

Designate cluster range. Relevant range is automatically formed when cluster size is designated.
Value can be manually changed after automatic formation
Alignment: Use initial and final value of each cluster range to achieve even alignment.
Re-setup: Auto-formation is achieved by using data value of measured cluster range.

OPTION





Connection Direction:
4-Connect – Inspect connection between detected cells in 4 direction.
8-Connect – Inspect connection between detected cells in 8 direction.

Fill Hole: Fill hole within detected cell.

Convex: Form convex outer line of detected cell.

Minimum Size: Limit minimum size of detected cell.

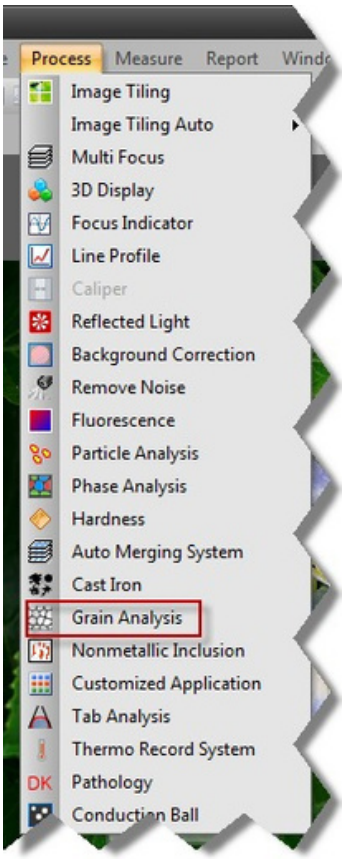
Delete Boundary: Remove cell touching exterior boundary of image.

B. Grain Analysis

This tool program analyzes metal grain under ASTM E112, E930, E1181, E1382 standards.

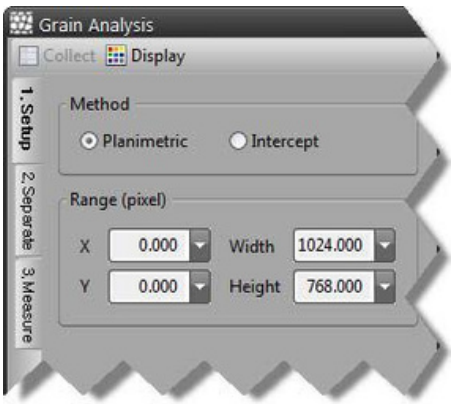
1. EXECUTION

Execute related commands in application program menu or toolbar.



2. SETUP

Set up measurement method and range.



Method

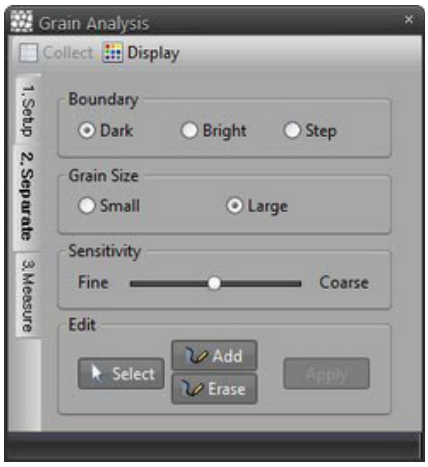
- Planimetric: Analysis method using number and area of grain
- Intercept: Analysis method using information of intersection between grain boundary and user-designated pattern

Range

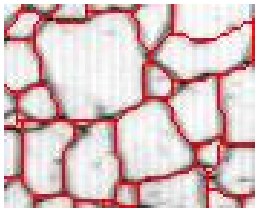
- X: X starting point of analysis area
- Y: Y starting point of analysis area
- Width: width of analysis area
- Height: height of analysis area

3. PLANIMETRIC - SEGMENT

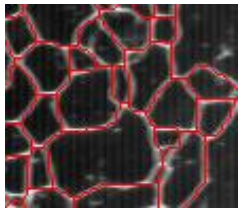
Split option window is shown in case user selects area method in setup (refer to picture below).
Option for splitting grain from background is provided.



Boundary
Black boundary: Selected when boundary form is formed in black line
Bright boundary: Selected when boundary form is formed in bright line
Multistage boundary: Selected when boundary form is not formed in black or bright line



Black Boundary Use

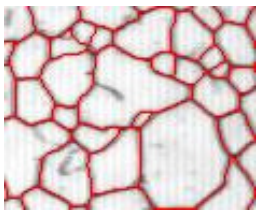


Bright Boundary Use

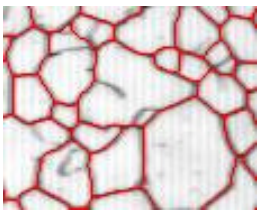
Multistage Boundary Use

Grain Size
Small grain: Selected during small size of grain to achieve precise split
Large grain: Selected during large size of grain to achieve quick split

Sensitivity
More move boundary areas of grain are connected with higher sensitivity.



Sensitive



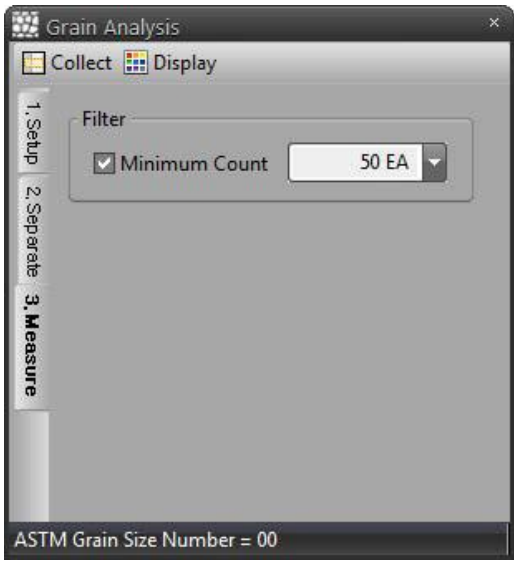
Insensitive

Edit

- Select: tool for selecting edit object
- Add: tool for adding grain boundary
- Remove: tool for removing grain boundary
- Apply: apply changes regarding boundary

4. PLANIMETRIC - MEASUREMENT

Measurement window is shown in case user selects area method in setup (refer to picture below).

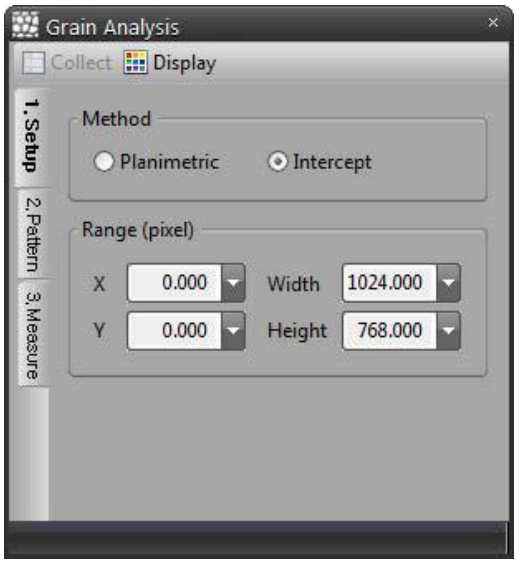


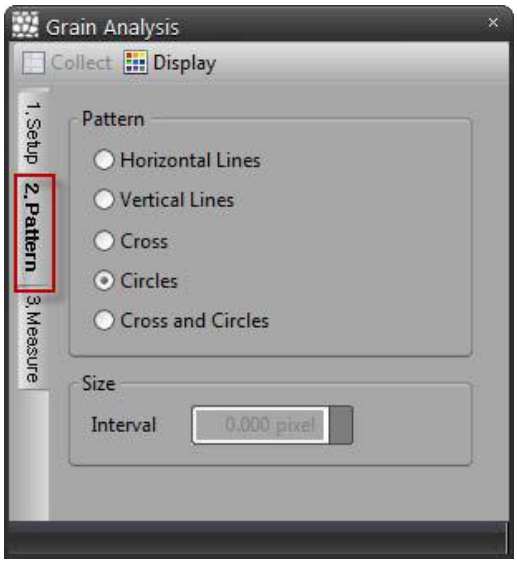
Filter

Minimum No.: Minimum number for measurement is default option. Measurement can be achieved when above minimum default number.

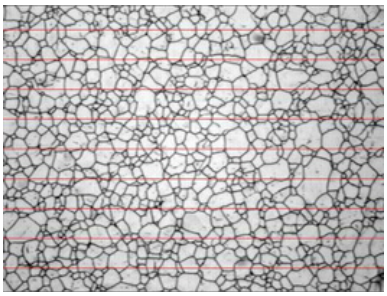
5. INTERCEPT - PATTERN

Intercept option window is shown in case user selects intercept method in setup (refer to picture below). Option for finding intercept point between pattern and grain boundary is provided.

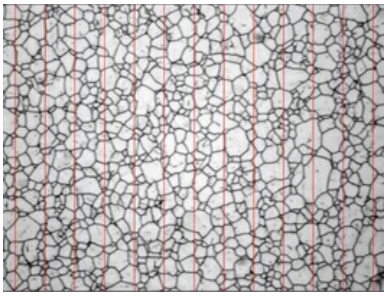




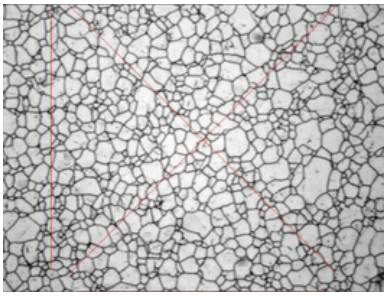
Horizontal line: Form horizontal line shaped pattern.



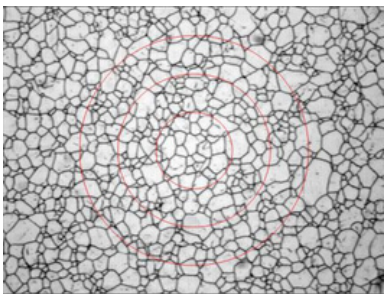
Vertical line: Form vertical line shaped pattern.



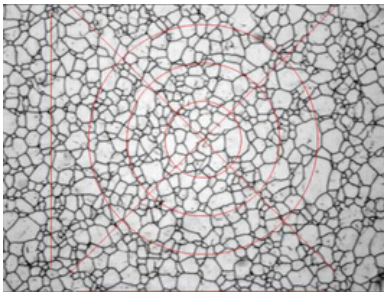
Cross line: Form cross line shaped pattern.



Circle: Form circle shaped pattern.



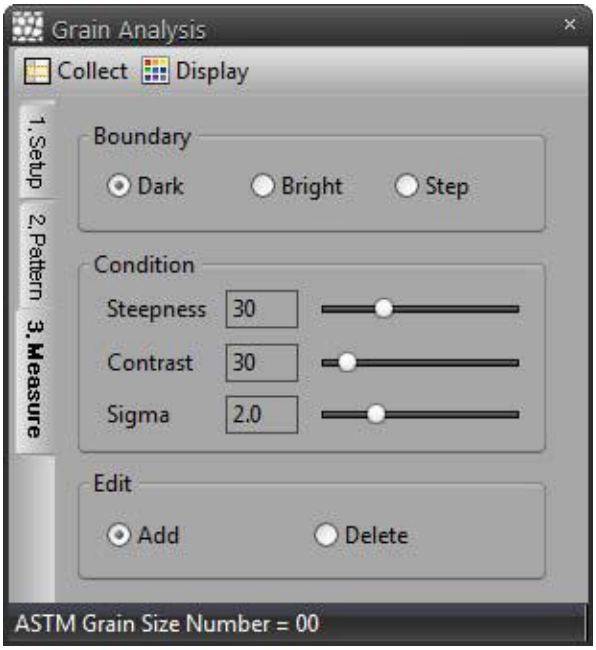
Crossline & Circle: Form cross line & circle shaped pattern.



Crossline & Circle: Form cross line & circle shaped pattern.

6. INTERCEPT - MEASUREMENT

Intercept option window is shown in case user selects intercept method in setup (refer to picture below). Option for finding intercept point between pattern and grain boundary is provided.



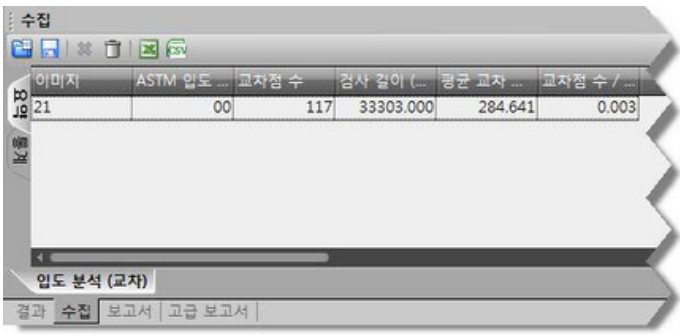
Boundary
Black boundary: Selected when boundary form is formed in black line
Bright boundary: Selected when boundary form is formed in bright line
Multistage boundary: Selected when boundary form is not formed in black or bright line

Condition
Edge intensity: Designate edge distinction standard. (Definite edge is detected with higher value)
Contrast: Designate standard of brightness difference between edge and surrounding area. (Definite edge is detected with higher value)
Sigma: Designate standard for eliminating noise. (Insensitivity to edge increases with increased sigma)

Edit
Add: Form cross point.
Delete: Delete cross point.

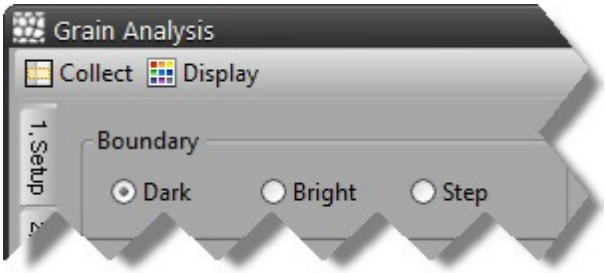
7. COLLECT

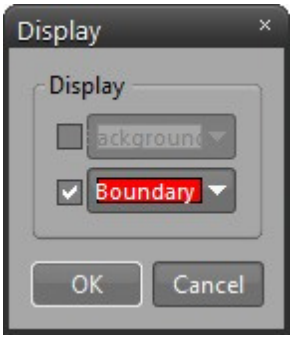
Collect measured data.



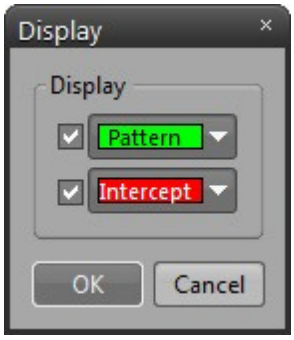
8. DISPLAY

Intercept option window is shown in case user selects intercept method in setup (refer to picture below). Option for finding intercept point between pattern and grain boundary is provided.





Display Planimetric Method



Display Intercept Method

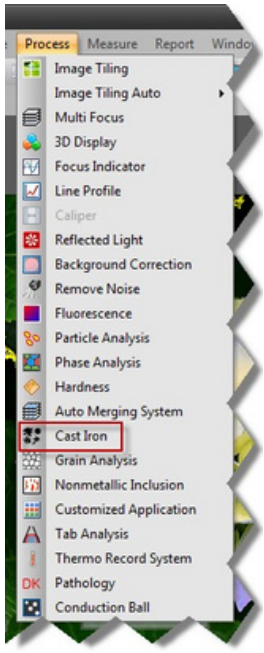
- Pattern: Designate pattern output.
- Cross: Designate output of cross point.

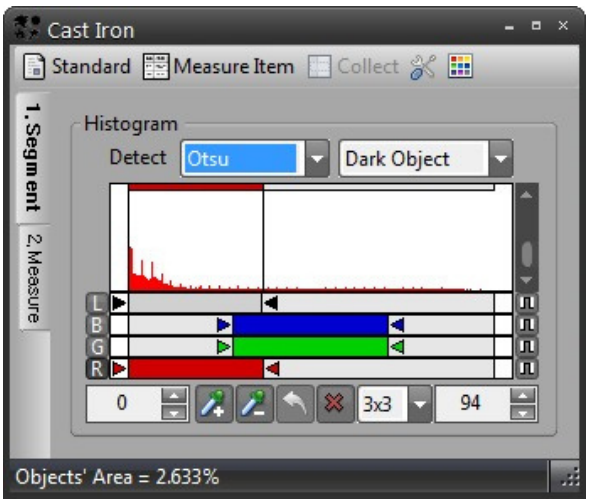
C. Cast Iron Analysis

This program analyzes cast iron under A 247-06, ISO 945-1:2008, JIS G 5502-2001, JIS G 5502:1995, KS D 4302:2006 standards.

1. EXECUTION

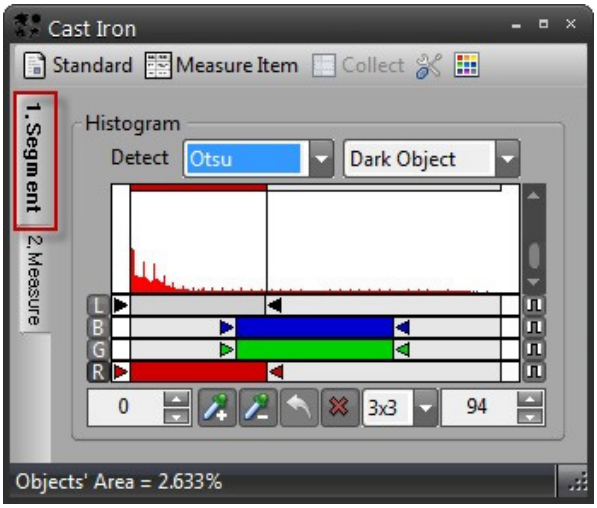
Execute related commands in application program menu or toolbar.





The left tab (1. split, 2. measurement). refers to order of operation

2. SEGMENT

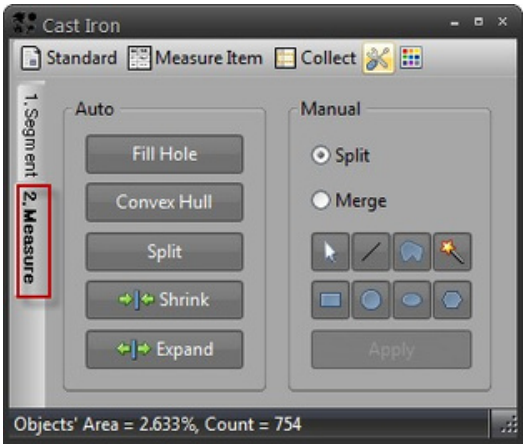


Histogram: Select L, R, G, B color plane and adjust arrow or input value to setup section for segmentation.

Automatically find histogram section with object. Dark object is separated from bright object according to object brightness. Select optimized algorithm according to video to use auto-detection algorithm.

Click subject of segmentation by using mouse to add or delete section. This function can be effectively used during selection of particular color section of color video.

3. MEASUREMENT

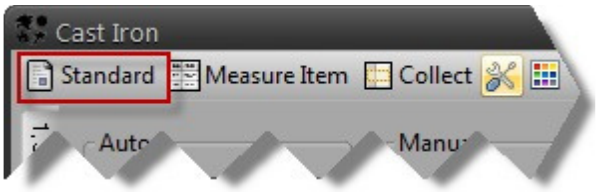


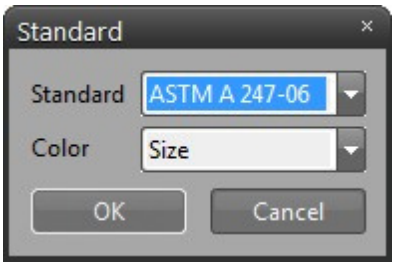
Auto
Fill hole: Fill hole within detected cell.
Convex: Form convex outer line of detected cell. Split: Analyze overlapping cell to achieve auto-split. Contract: Reduce size of detected cell.
Expand: Expand size of detected cell.

Manual
Split / Merge: Use tool to split or merge detected cell.

4. STANDARD

Select standard.





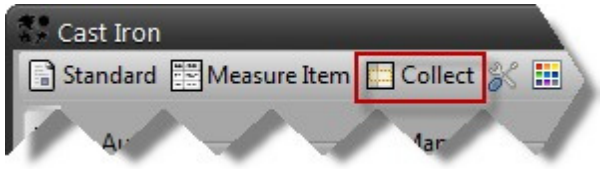
- Standard: select standard that would be used
- Color: designate standard for using color of graphic object

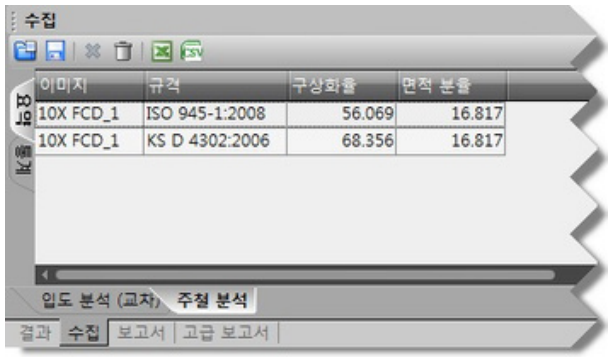
5. MEASUREMENT ITEM

Select measurement item.

6. COLLECT

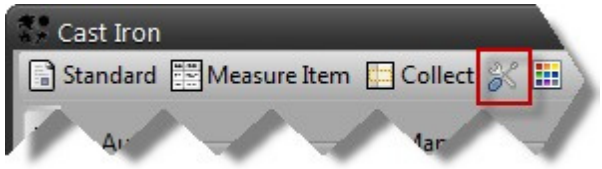
Collect measurement data.





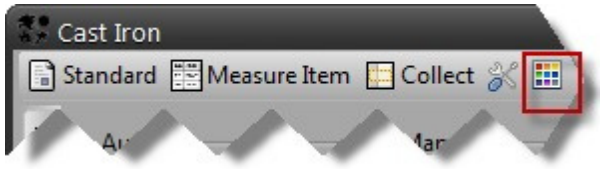
7. SETUP

Refer to ‘phase analysis-setup’.



8. DISPLAY

Set up interior color, boundary line color, hole color, letter color, and display/hiding option of detected cell.

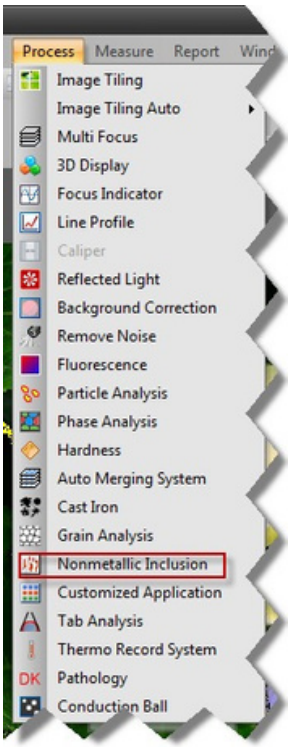


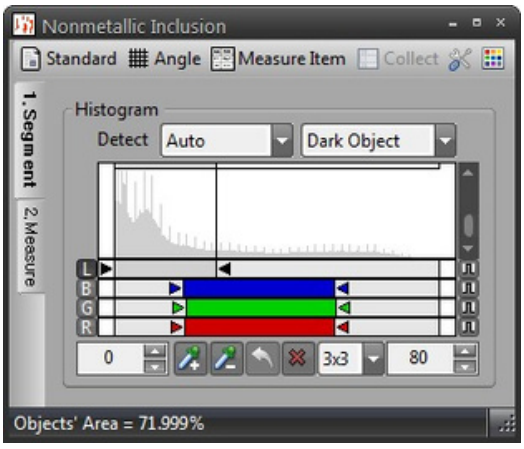
D. Non-metallic Inclusion

This program analyzes nonmetallic substances, such as oxide and sulfide, existing within metal materials.

1. EXECUTION

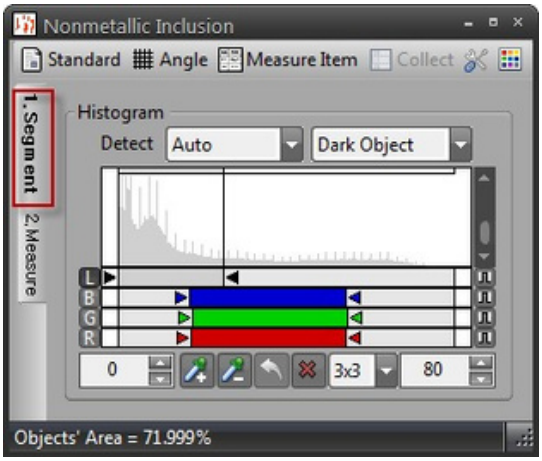
Execute related commands in application program menu or toolbar.





The left tab (1. split, 2. measurement) refers to order of operation.

2. SEGMENT

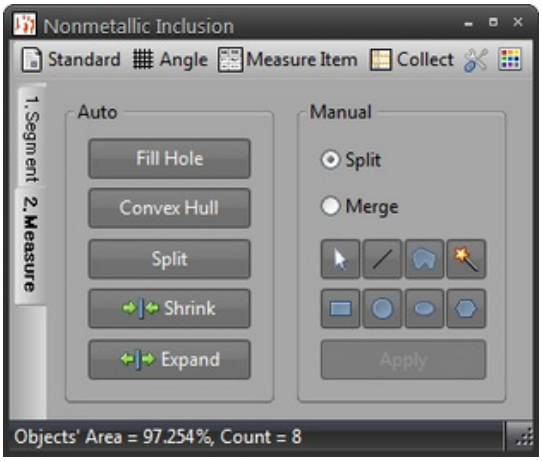


Histogram: Select L, R, G, B color plane and adjust arrow or input value to setup section for segmentation.

Automatically find histogram section with object. Dark object is separated from bright object according to object brightness. Select optimized algorithm according to video to use auto-detection algorithm.

Click subject of segmentation by using mouse to add or delete section. This function can be effectively used during selection of particular color section of color video.

3. MEASUREMENT



Auto

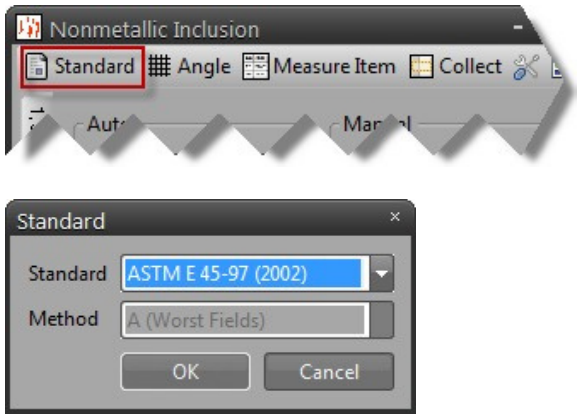
Fill hole: Fill hole within detected cell.
Convex: Form convex outer line of detected cell. Split: Analyze overlapping cell to achieve auto-split. Contract: Reduce size of detected cell.
Expand: Expand size of detected cell.

Manual

Split / Merge: Use tool to split or merge detected cell.

4. STANDARD

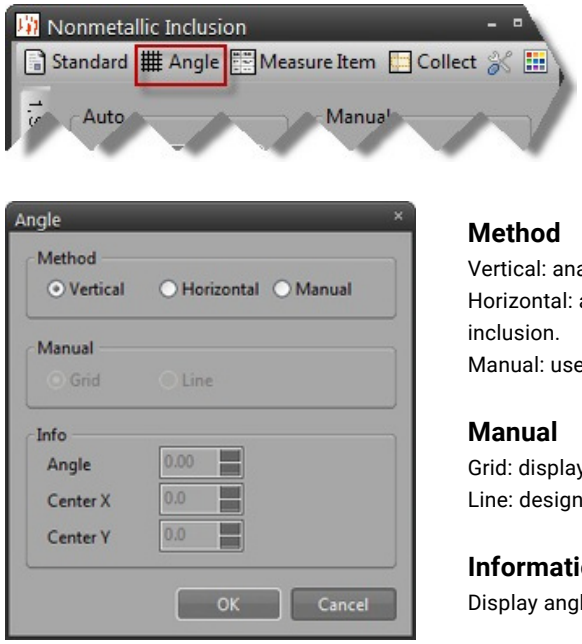
Select standard.



- Standard: select standard
- Report: set up result expression method per standard. (* activated during use of auto-stage)

5. ANGLE

Set up angle of inclusion



Method

Vertical: analysis is achieved by assuming vertical direction of inclusion.
Horizontal: analysis is achieved by assuming horizontal direction of inclusion.
Manual: user designates and analyzes inclusion direction.

Manual

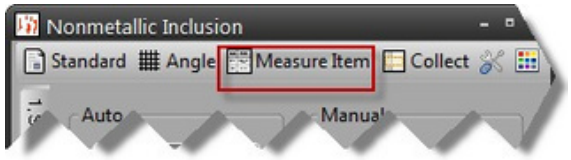
Grid: display grid to revise angle on screen.
Line: designate angle by using line.

Information

Display angle information in case of designating angle by using grid.

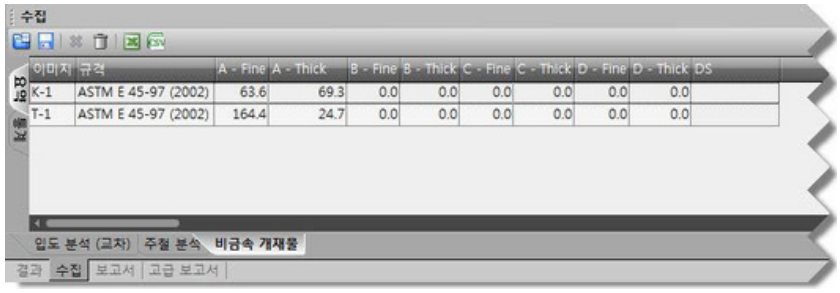
6. MEASUREMENT ITEM

Refer to ‘phase analysis-measurement item’.



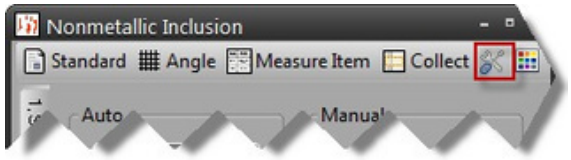
7. COLLECT

Collect measurement data.



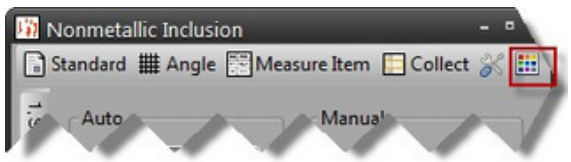
8. SETUP

Refer to ‘phase analysis-setup’.



9. DISPLAY

Refer to ‘phase analysis-setup’.

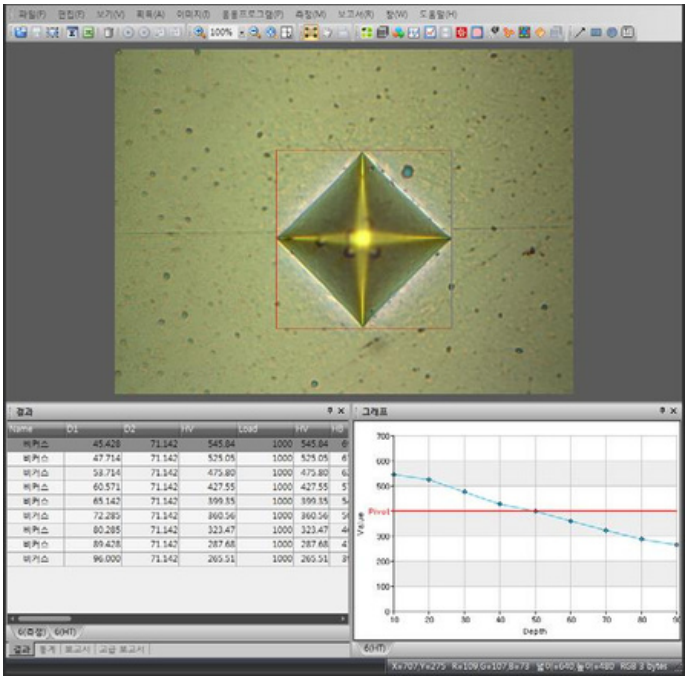


E. Hardness Tester

This program uses Micro Vickers, Vickers, Knoop, Brinell hardness testers to measure penetrator image formed from hardness tester.

1. EXECUTION

Execute the icon of hardness testing in application program toolbar.

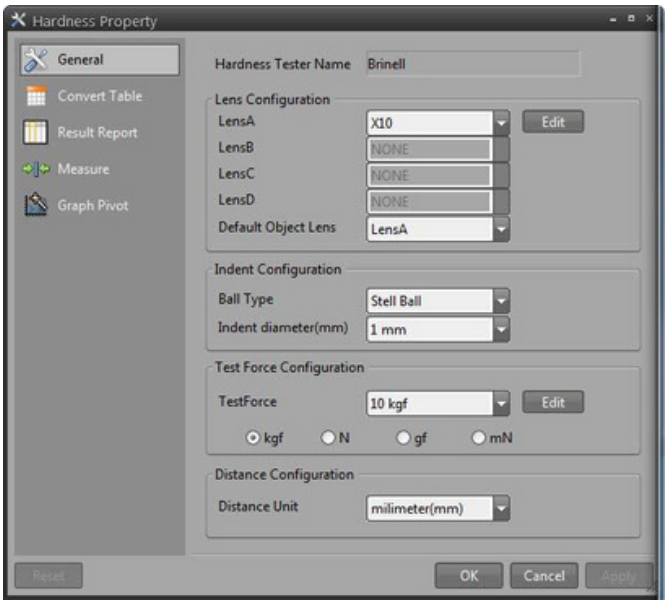


2. SETUP

A. Select hardness tester in setup menu (refer to picture below).

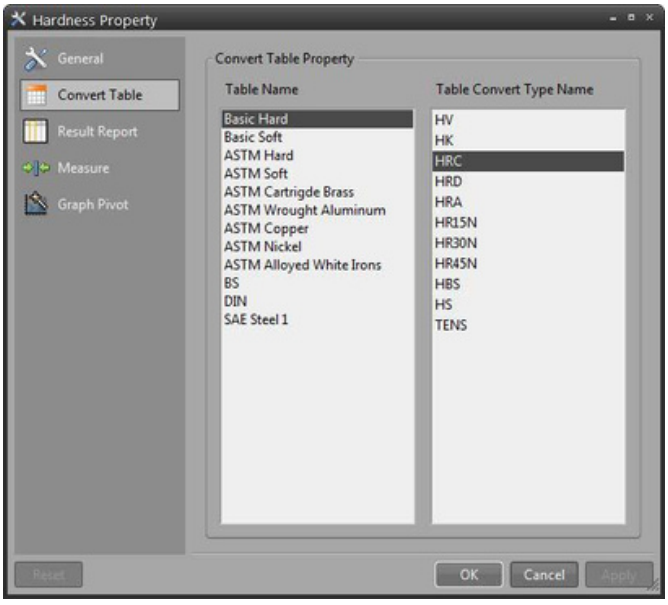
B. Select hardness tester setup (refer to picture below).

C. Default Setup



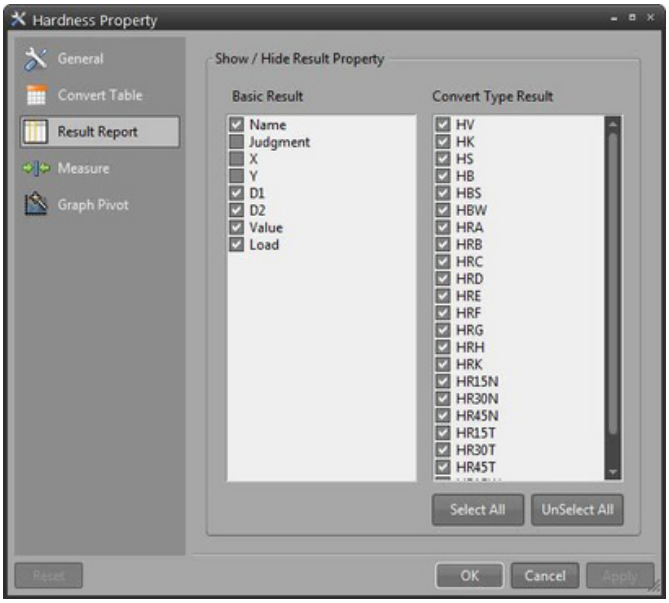
- Hardness tester name: Display name of selected hardness tester.
- Lens setup: Connect calibration item. 4 lens items (A~D) are provided.
- Basic observation lens: Designate initial lens.
- Penetrator setup: Connect penetrator form. 2 penetrator items (A, B) are provided.
- Load setup: Designate initial load and unit.

D. Conversion Table



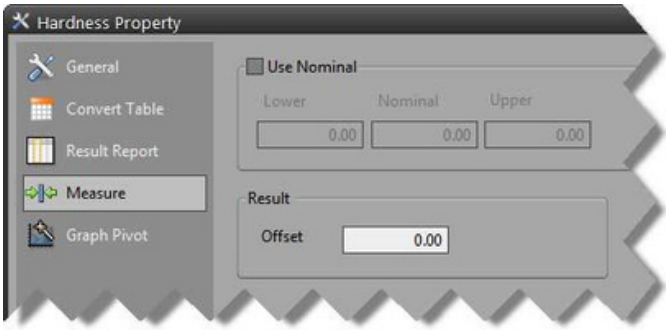
- Table name: Designate default output value.
- Conversion type name: Designate conversion value simultaneously displayed under default output value.

E. Result Report



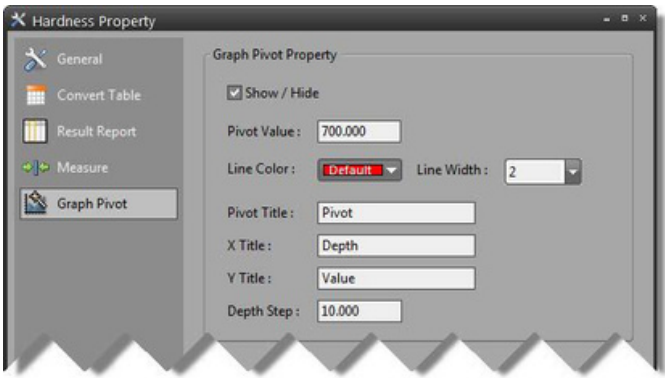
- Basic result: Designate output items on report
- Data conversion result: Designate measurement result value and conversion value on report.

E. Standard Value



In case of standard value use, minimum/maximum value is designated to visually check result decision in report.

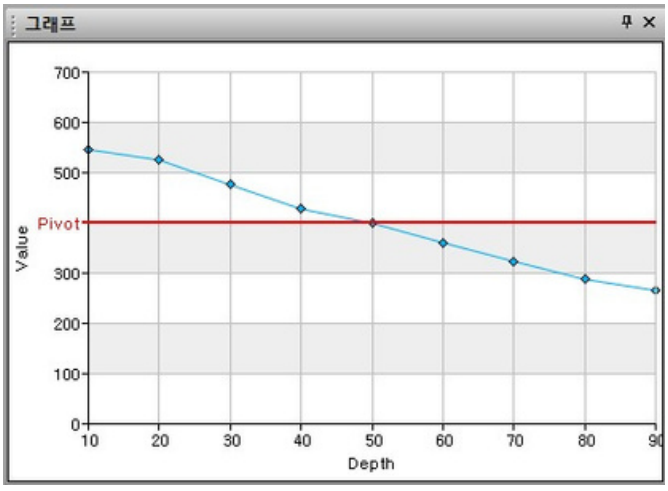
G. Graph



Check carburizing depth through graph.

- Display/Hide: Designate display of standard value (line) on graph.
- Standard value: Designate value of standard line displayed on graph.
- Line color: Designate color of standard line displayed on graph.
- Line thickness: Designate thickness of standard line displayed on graph.
- Standard title: Designate name of standard line displayed on graph.
- X axis title: Designate name of X axis displayed on graph.
- Y axis title: Designate name of Y axis displayed on graph.
- Depth interval: Designate depth interval displayed on graph.

Set up values as shown in the picture above to check carburizing graph as shown below.

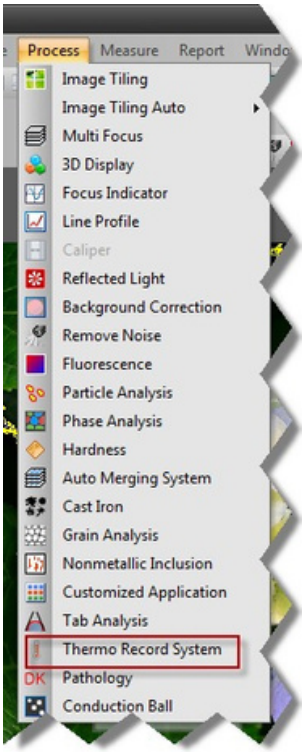


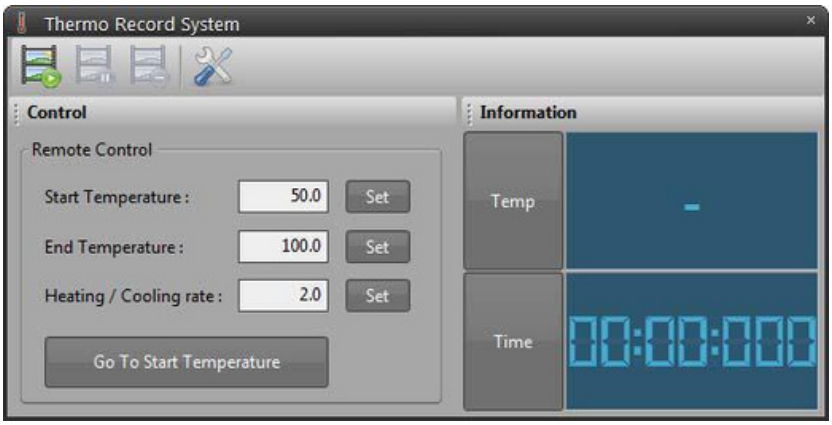
F. Heating Stage System

This program uses hitting stage to record change process according to temperature.

1. EXECUTION

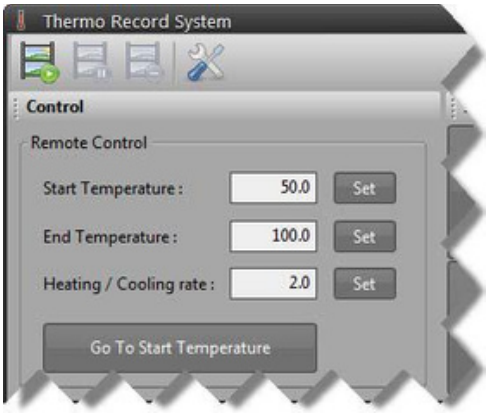
Execute the icon of hardness testing in application program toolbar.





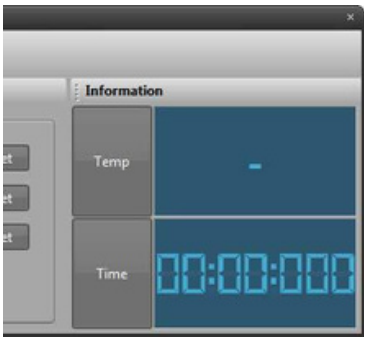
2. CONTROL

Execute the icon of hardness testing in application program toolbar.



- Initial measurement temperature: setup initial temperature
- Final measurement temperature: setup final temperature
- Heating / cooling temperature: setup temperature increase amount
- Move to initial temperature: heat/cool with initial temperature

3. INFORMATION

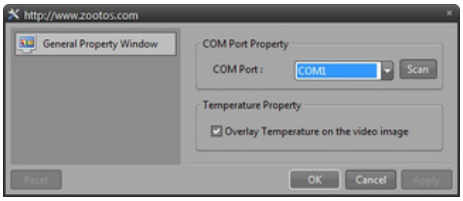


- Temperature: display current temperature
- Time: display heating time

4. MEASUREMENT

- Start measurement: start measurement
- Pause: pause measurement
- End measurement: end measurement

5. CONFIGURATION



Communication port setup

Communication port: setup communication port communicating with stage.

Temperature setup

Display measurement temperature value on video window: display temperature value on video window.

1. Report

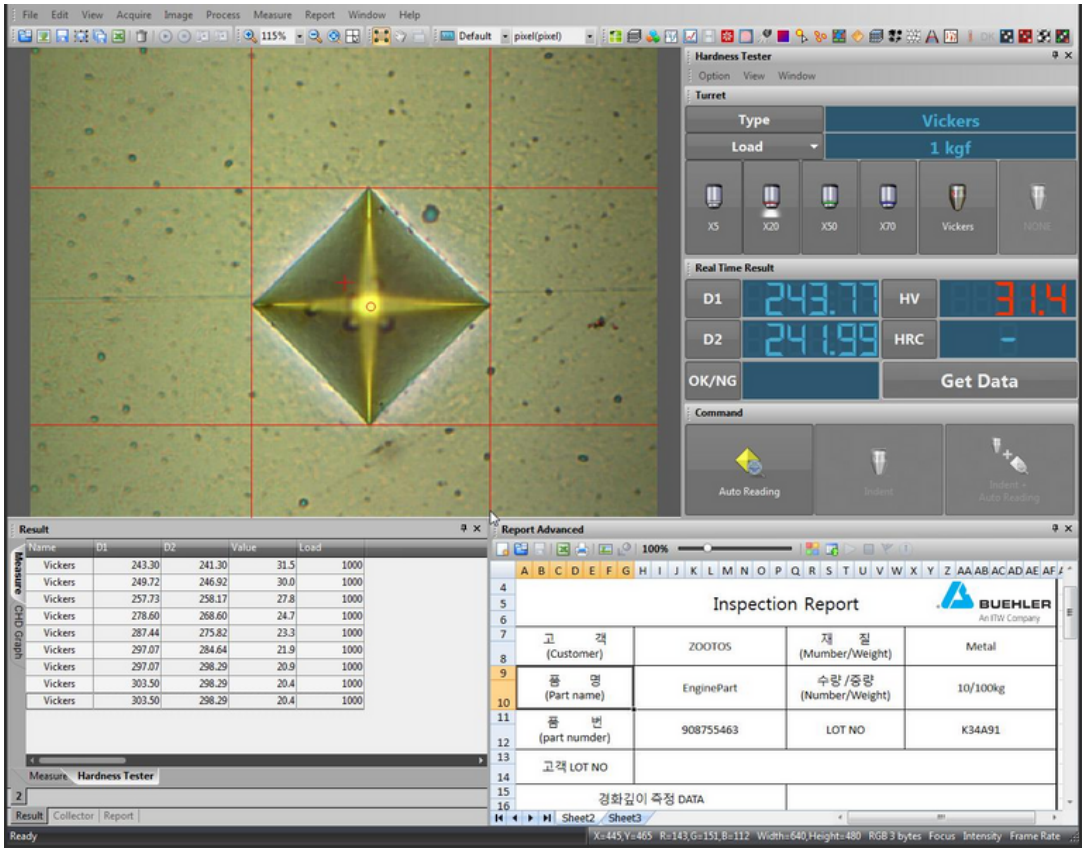
A. Introcution

This program measures defined measurement pattern and achievement record form and creates report to simplify and automate report editing process of adjusting and changing measurement results according to form in case of users executing frequent and complex measurement.

The Report Manager is developed for the users to create the report with various data, graphs and values for measurement results in the required contents and report format. It is especially focused on making the report in the user's selected report format with the specific data in Microsoft Excel at the fastest rate. It is very useful and convenient in re-using the previously made or existing report format of a certain company fast and accurately.

1. WHAT'S SPECIAL?

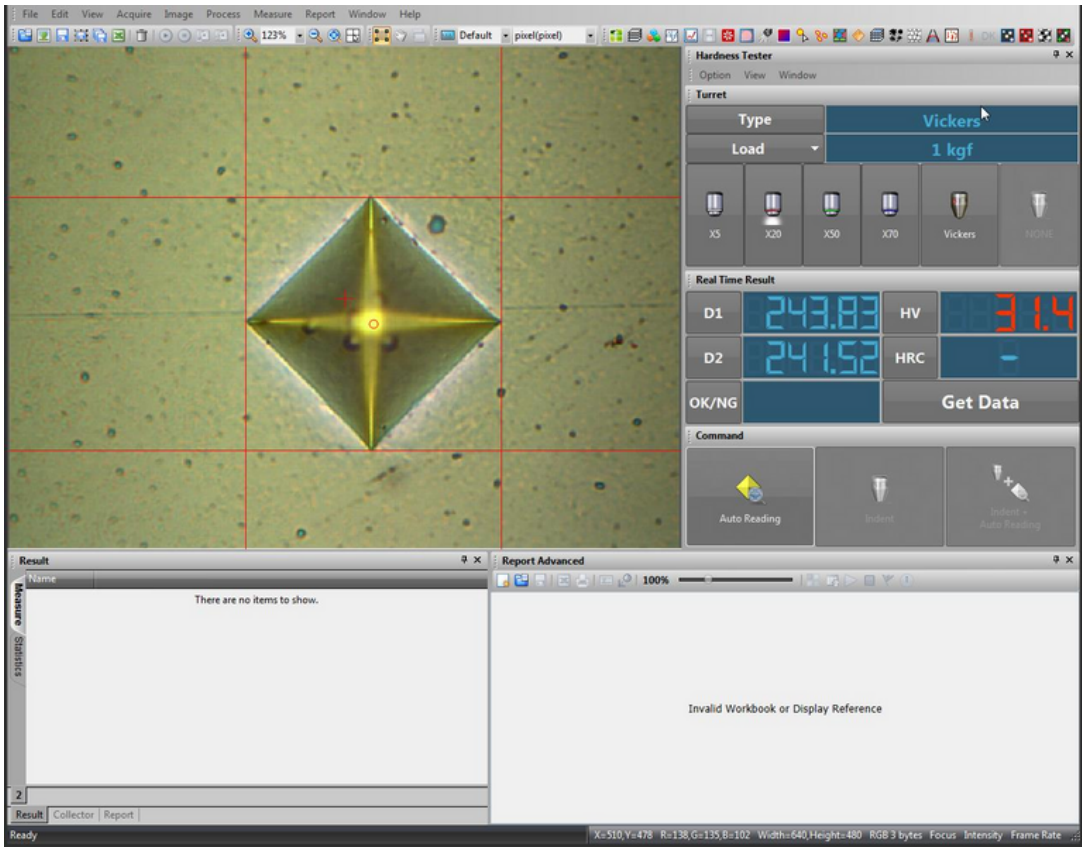
For frequent and complicated measurement, it can be time-taking and hard-working to change and edit the measurement results accordingly to the required report format for every single work done. However, using the Report Manager function, users can keep the report automatically and simply made simultaneously upon the measurement, just by setting up the required format and pattern before performing the measurement using the Report Manager. Users can choose and set up any kinds of formats and patterns to make the required report format with the measurement results and various contents in Microsoft Excel accurate and fast.



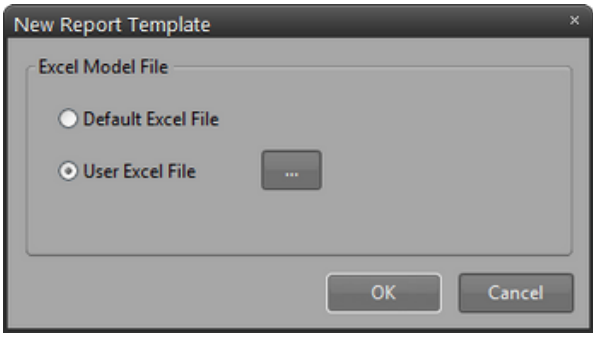
2. HOW TO USE THE REPORT MANAGER

The Report Manager function allows the users to make and re-use the various formats of the report in Microsoft Excel. To take advantage of using the Report Manager function, users must set up the required format and pattern first before the measurement. Once the setup is completed, the measurement results and the required contents are automatically made in the required report format in Microsoft Excel and can be exported to Microsoft Excel.

On the menu bar of the main window, choose Window and then select Report Advanced Window to open the Report Advanced window. Make sure that the Status Bar, Result Window and Measure Window must be selected for the basic windows to be open. (Refer to the picture below)

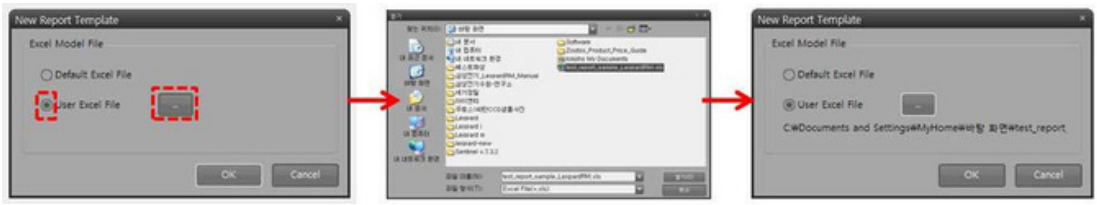


On the application toolbar of the Report Advanced window, choose the New Report Template button to open the New Report Template dialog box. (Refer to the picture below)



B. Operation

1. Make a report template



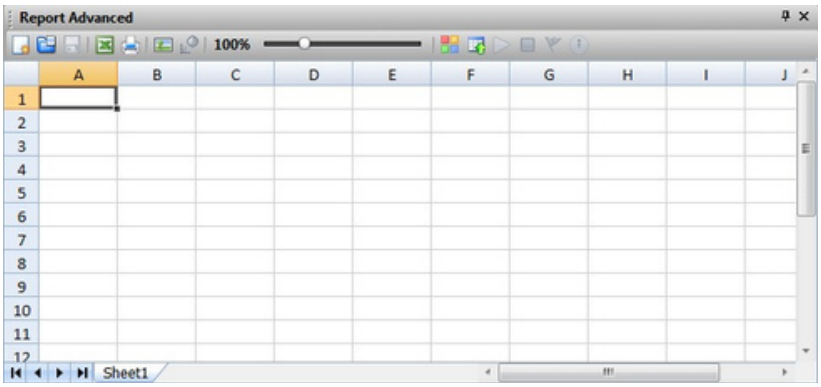
2. Save changes of template.
3. Save report as another name
4. Print report
5. Insert image in report
6. Adjust screen size of report
7. Register/revise/delete measurement pattern
8. Map measurement pattern on template
9. Start auto-measurement
10. Stop auto-measurement
11. Designate starting point of measurement 13. Check measurement information

NEW REPORT TEMPLATE

To use the new report format, use the Default Excel File function and to use the existing (previously saved) report format, use User Excel File function.

Default (New) Excel File: select the Default Excel File and then choose the OK button to create and import a new Excel file to the Report Advanced window. (Refer to the picture below)

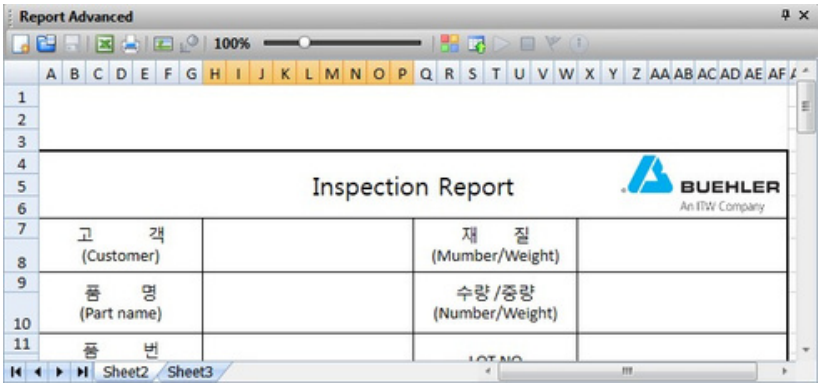
Default excel file



If you want to go back to the New Report Template dialog box, choose the  New report template button on the application toolbar of the Report Advanced window.

User Excel File: select the User Excel File and then choose  the Browse button to open the Open dialog box. In the Open dialog box, users may select the preferred Excel file which are previously made (especially for the report format of a company), and then choose the Open button. In the New Report Template dialog box, choose the Ok button to import the selected Excel file to the Report Advanced window. (Refer to the picture below)

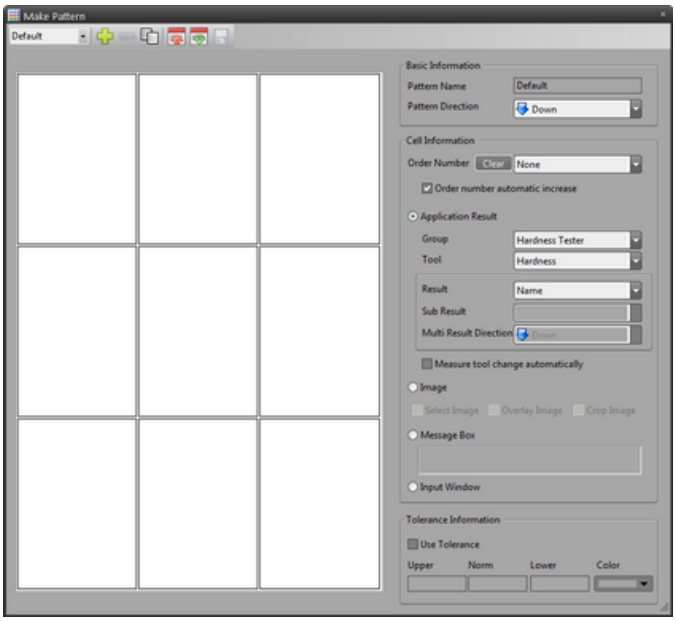
User Excel File



SET UP REPORT MANAGER

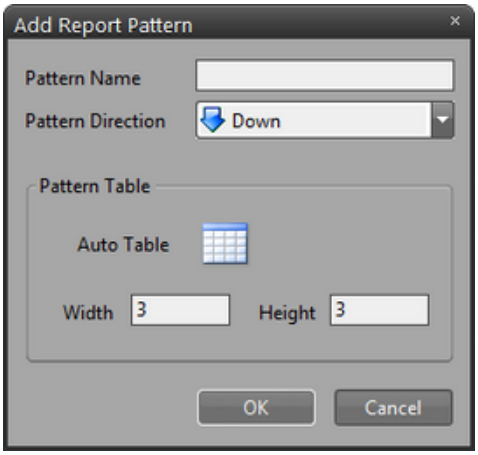
When using the Report Manager function, knowing how to set up the various formats is the most important stage. To make sure the users can know and understand the exact way of use in various formats, descriptions with examples to set up the report format using Report Manager are specified below.

On the application toolbar of the Report Advanced window, choose the Show Pattern Manager button to open the Make Pattern dialog box. (Refer to the picture below)



[Note] Refer to the terms for the understanding of specific explanations; E-cell – single cell in the Microsoft Excel, R-cell – single cell in the report consists of merged E-cells, Pattern – single R– cell or merged R-cells, designating the part for the measurement value to be input in the report. Each cell in the Make Pattern dialog box indicates E-cell in the report.

On the application toolbar of the Make Pattern dialog box, choose the Add to Pattern File button to open the Add Report Pattern dialog box. (Refer to the picture below)

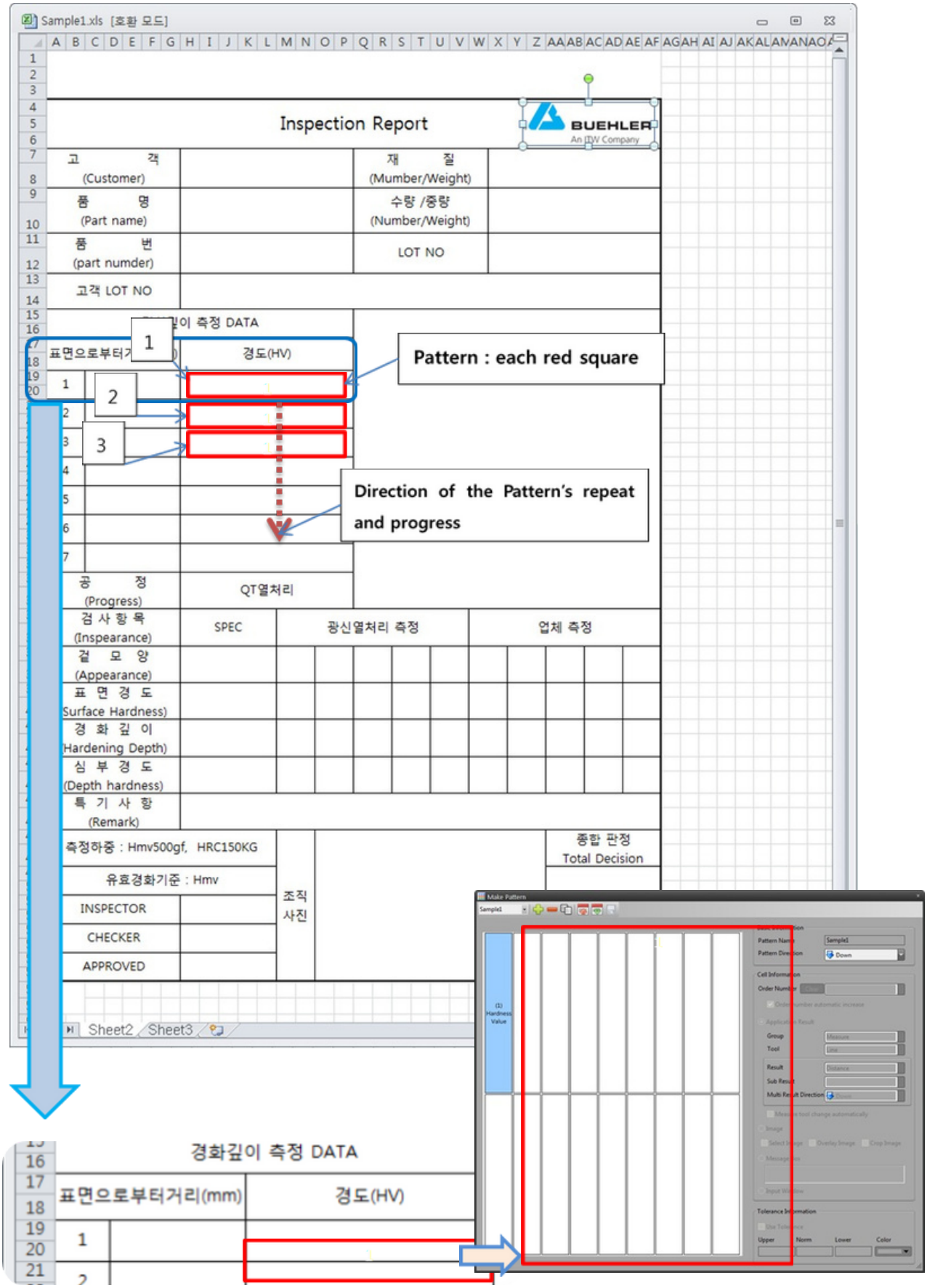


ADD REPORT PATTERN

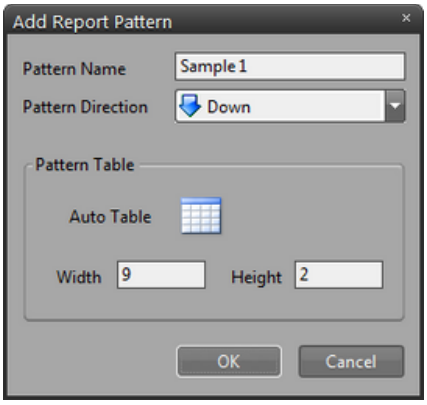
- Pattern Name: name the Pattern name in the edit box.
- Pattern Direction: designate the Pattern direction. Users can select the Down direction or the Right direction to set up the direction of the Pattern's repeat and progress in the report for the measurement value to be input.
- Pattern Table: specify the Width (Row) and the Height (Column) in the edit box to set up the Pattern table to designate the Pattern in the report [Width (Row) and Height (Column) indicates the numbers of the E-cells]. Auto Table is for the use of the set table when not specifying the Width (Row) and the Height (Column). Choose the OK button for the setup to be displayed in the window and the Basic Information group box of the Make Pattern dialog box. (Refer to the picture Sample 1 below)

Sample 1 – Pattern Direction: Down / Pattern Table: 9×2 [Width(row) 9 × Column(height) 2]

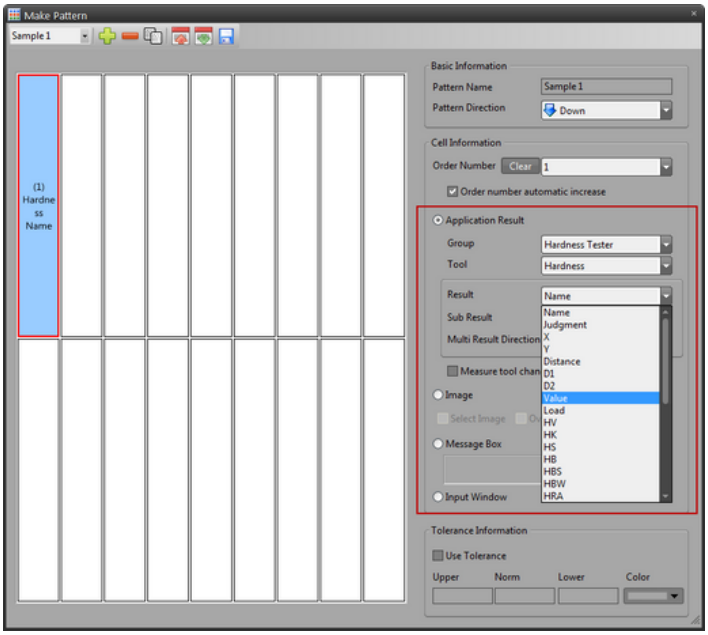
See next page →


Sample1.xls [호환 모드]
Inspection Report
BUEHLER
An ITW Company
고 객 (Customer)
재 질 (Mumber/Weight)
품 명 (Part name)
수량 /중량 (Number/Weight)
품 번 (part numder)
LOT NO
고객 LOT NO
경화깊이 측정 DATA
표면으로부터거리(mm)
경도(HV)
1
2
3
Pattern : each red square
Direction of the Pattern's repeat and progress
공 정 (Progress)
QT열처리
검 사 항 목 (Inspearance)
SPEC
광신열처리 측정
업체 측정
겉 모 양 (Appearance)
표 면 경 도 Surface Hardness)
경 화 깊 이 Hardening Depth)
심 부 경 도 (Depth hardness)
특 기 사 항 (Remark)
측정하중 : Hmv500gf, HRC150KG
유효경화기준 : Hmv
INSPECTOR
CHECKER
APPROVED
조직 사진
종합 판정 Total Decision
Sheet2
Sheet3
Make Pattern
경화깊이 측정 DATA
표면으로부터거리(mm)
경도(HV)

In the above picture Sample 1, the single Pattern consists of merged cells of Microsoft Excel: 9×2 [Width(row) 9 × Column(height) 2]. The direction of the Pattern's repeat and progress is downward. So, for the report of the picture Sample 1, users should specify the contents accordingly in the Add Report Pattern dialog box. (Refer to the picture below)



Select a cell in the window of the Make Pattern dialog box to specify the required contents of each cell in the Cell Information group box. The initial cell in the window of the Make Pattern dialog box (which also indicates the initial cell of E-cells) must be selected for the measurement values to be input in order to start from the initial Pattern of the report and proceed in sequence. (Refer to the picture below)



Cell Information

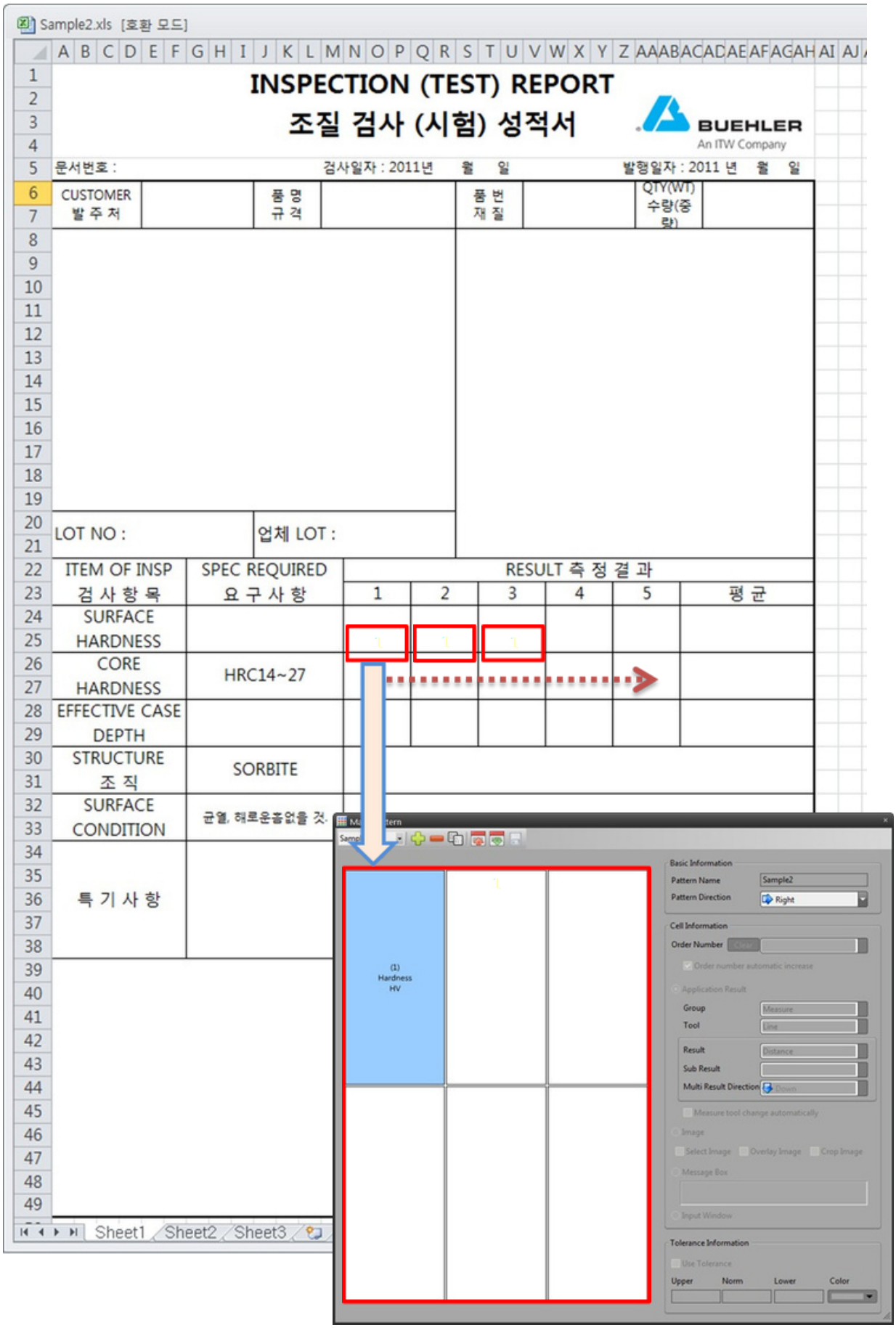
Order Number: users may select the number order of the cell for the result value to be displayed. When check box of the Order Number Automatic Increase is selected, the numbers of the cells in the window will be automatically designated in sequence. To unselect the cell, choose the Clear button.

Application Result:
Group - select Hardness Tester in the Group combo box for hardness testing.
Tool - when Hardness Tester is selected in the Group combo box, Hardness will be automatically selected in the Tool combo box.
Result - users may select item in the Result combo box for the results of the hardness testing to be displayed in each cell. For specific explanation, refer to the examples below

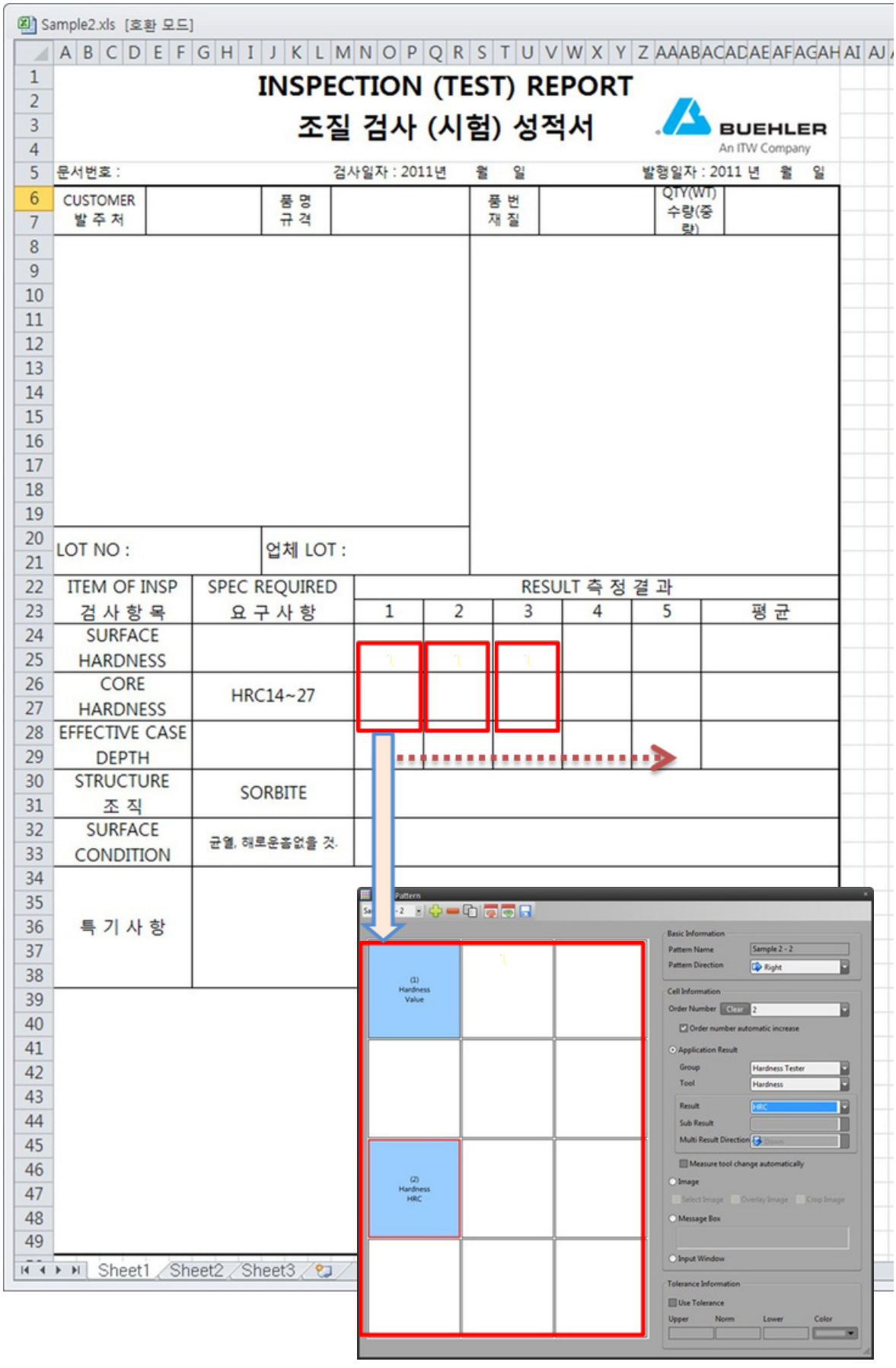
[Important] As explained with the picture Sample 1, for the Pattern in the report to be input in sequence, users must pay attention to selecting the initial cell in the window of the Make Pattern dialog box and specifying the contents accordingly in the Cell Information group box. When making the report with more than one values to be input in sequence, the Pattern must be included with more than one R-cells accordingly and select each initial cell in the window of the Make Pattern dialog box and specify each content accordingly in the Cell Information group box. (Refer to the picture Sample 2 and Sample 2-2 below)

Sample 2.1 – Pattern Direction: Right / Pattern Table: 3×2 [Width(row) 3 × Column(height) 2]

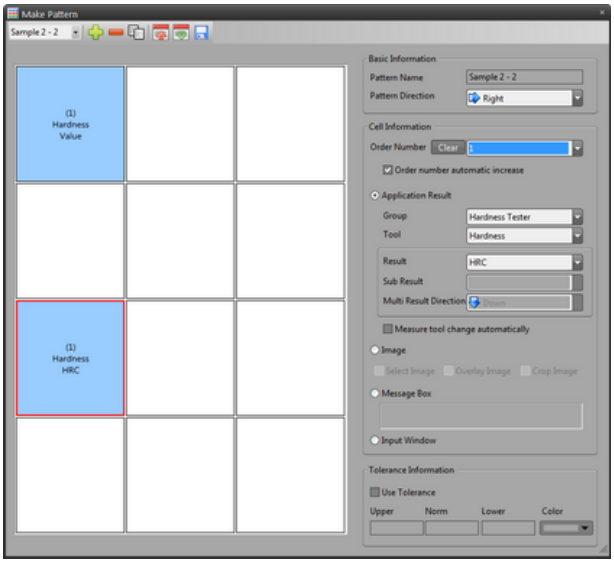
See next page →


Sample2.xls [호환 모드]
INSPECTION (TEST) REPORT
조질 검사 (시험) 성적서
BUEHLER
An ITW Company
문서번호 :
검사일자 : 2011년 월 일
발행일자 : 2011 년 월 일
CUSTOMER 발 주 처
품 명 규 격
품 번 재 질
QTY(WT) 수량(중량)
LOT NO :
업체 LOT :
ITEM OF INSP 검 사 항 목
SPEC REQUIRED 요 구 사 항
RESULT 측 정 결 과
1
2
3
4
5
평 균
SURFACE HARDNESS
CORE HARDNESS
HRC14~27
EFFECTIVE CASE DEPTH
STRUCTURE 조 직
SORBITE
SURFACE CONDITION
균열, 해로운흠없을 것.
특 기 사 항
Sheet1
Sheet2
Sheet3
(1) Hardness HV
Basic Information
Pattern Name
Sample2
Pattern Direction
Right
Cell Information
Order Number
Group
Measure
Tool
Line
Result
Distance
Sub Result
Multi Result Direction
Down
Tolerance Information
Use Tolerance
Upper
Norm
Lower
Color

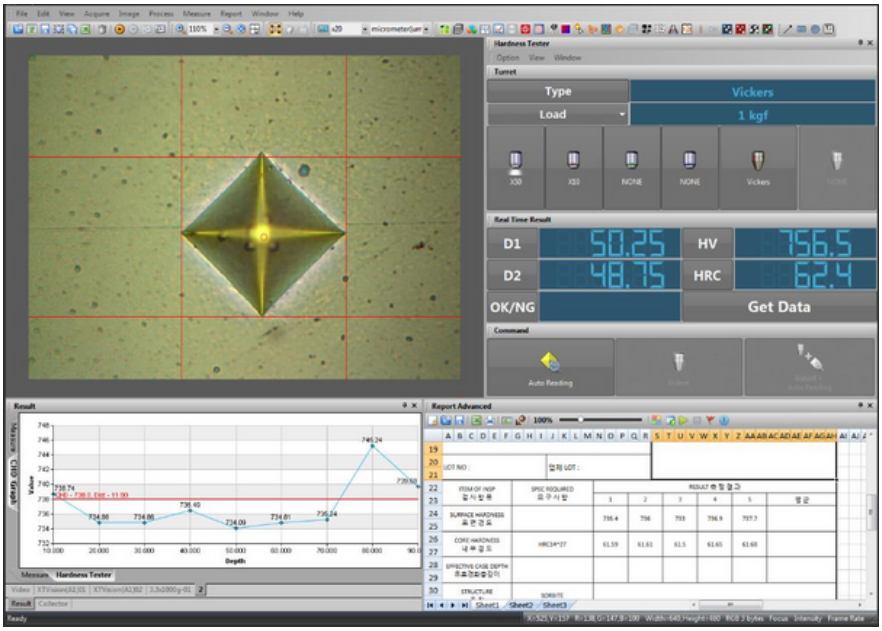
Sample 2-2 – Pattern Direction: Right / Pattern Table: (3×2) + (3×2) = 6×4 [Width(row) 6 × Column(height) 4]



[Note] In the above picture Sample 2-2, two R-cells are included in one Sample for the different values to be input in the each of the R-cell. In this case, users must select each of the initial cell in the window of the Make Pattern dialog box (which also indicates the initial cell of E-cells) and specify each content accordingly in the Cell Information group box for the measurement values to be input in order to start from the each of the initial R-cell and proceed in sequence at the same time. If the users want the different values to be input in each R-cell at the same time, select and change the number order (2) of the other initial cell(E-cell) of the R-cell into number order (1) and specify the same contents in the Cell Information group box. (Refer to the picture below)



In this way, users can adjust the sequences of the measurement results and make various report formats to be imported to the Report Advanced window. (Refer to the picture below)
Picture Sample 2-2 imported to the Report Advanced window after the setup and the measurement.

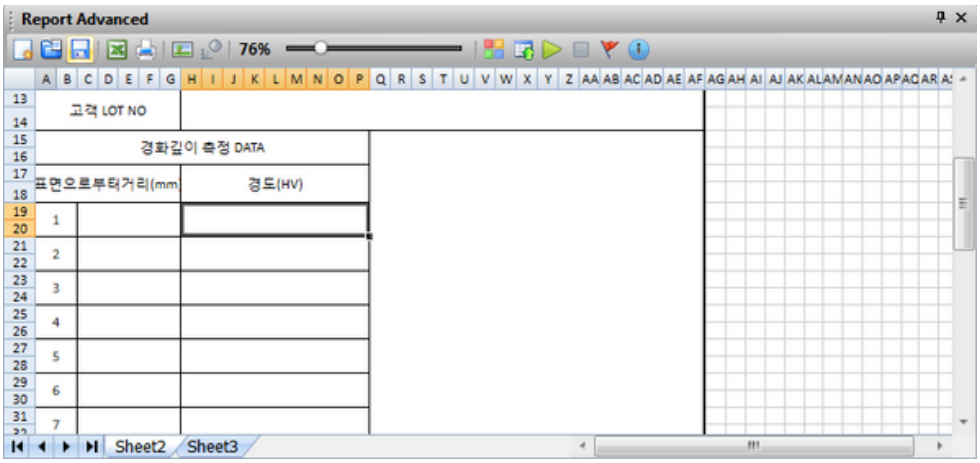


When all the setups in the Make Pattern dialog box are done, choose the  Save a Pattern File button on the application toolbar to save the setups and then choose the X button on the status bar to close the Make Pattern dialog box.

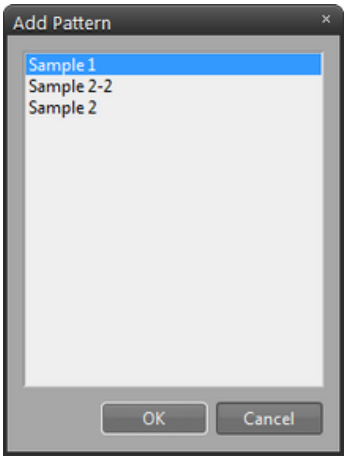
IMPORT TO THE REPORT ADVANCED WINDOW

For all the setups made in the Make Pattern dialog box to be displayed in the Report Advanced window, users must import them to the Report Advanced window and the setup data will be displayed upon measurement.

In the Report Advanced window, choose the starting cell for the setup data to be displayed in sequence. (Refer to the picture below)



On the application toolbar of the Report Advanced window, choose the Pattern Property Apply button to open the Add Pattern dialog box. Choose the previously designated name among the lists in the Add Pattern dialog box and then choose OK button. (Refer to the picture below)

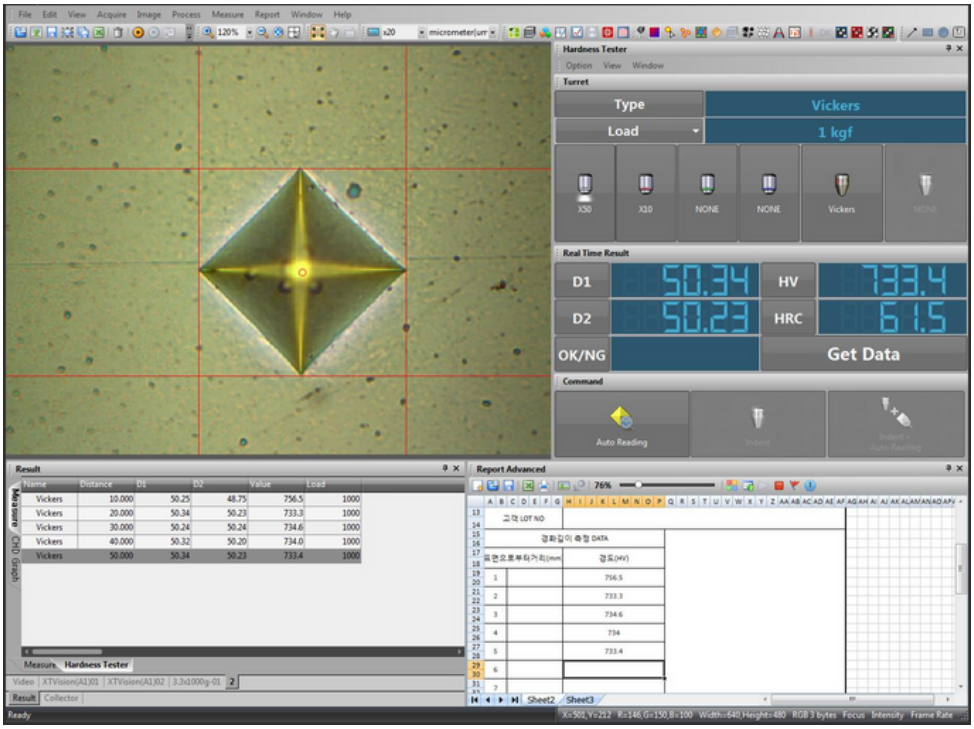


PERFORM THE MEASUREMENT USING THE REPORT MANAGER

After the previous setups, users may start the hardness testing measurement using the Report Manager, displaying the previously setup data in the Report Advanced window upon measurement.

On the application toolbar of the Report Advanced window, choose the Pattern Start button and start the measurement of the indentation on the screen, using either the Auto Reading(auto-measuring) function or the Manual(manual-measuring) function.

After the measurement of the indentation, choose Get Data button in the Real Time Result window for the previously setup data to be displayed in sequence in the Report Advanced window. (Refer to the picture below)

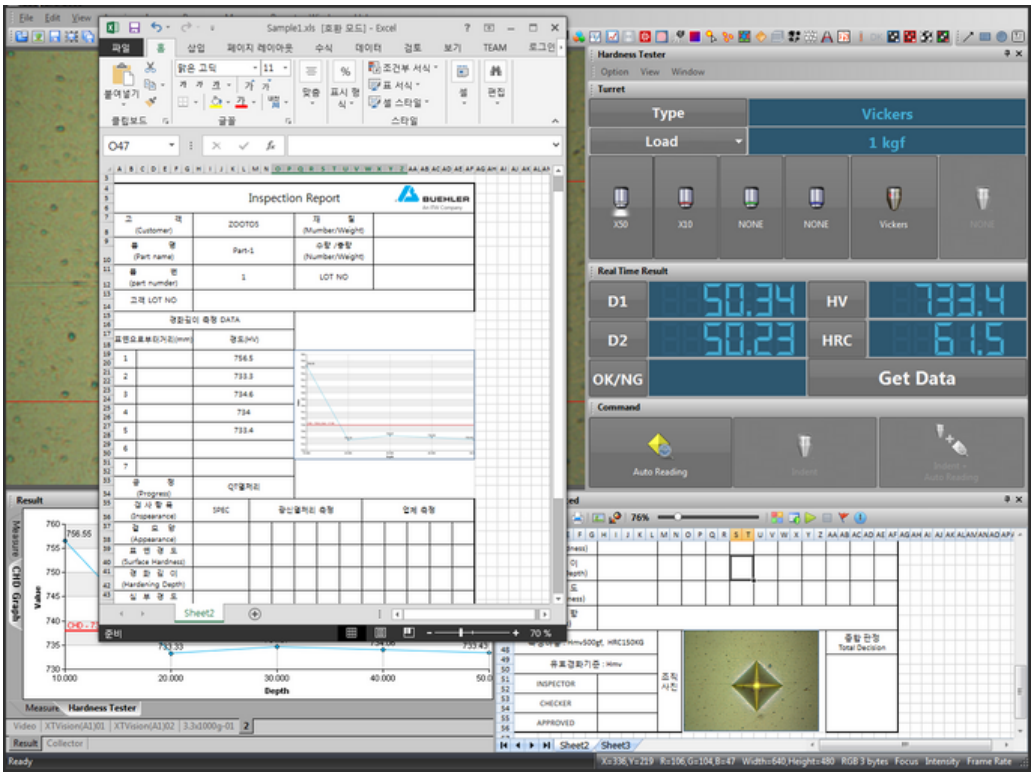


On the application toolbar of the Report Advanced window, choose the Pattern Stop button to finish the Report Manager.

Export to the Excel

When the measurement is done, users can export the report in the Report Advanced window to Microsoft Excel. (If needed, choose the Print an Excel button on the application toolbar of the Report Advanced window to print the report without exporting to the Excel)

On the application toolbar of the Report Advanced window, choose the Export to Excel button to open the Save as dialog box. Name the file in the File Name edit box and then choose the Save button to save the report in Microsoft Excel file. (Refer to the picture below)



TECHNICAL SUPPORT

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Specifications are subject to change without any obligation on the part of the manufacturer.

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