

Grading Tools

Users Manual



Terms and Conditions

※Before using this software program, please read through all the terms and conditions written below. By using the software program we regard that you have read and understood the following information.

1. License

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2. Warranty of use

It is not possible for us to insure against any accidents that could happen when users use the software program, and as such, we regard your use of the software as agreement that there have been no problems, unless you stop using the software while still using the demonstration version.

Install ■ Close Adobe Illustrator before you start install.

Double click "Installer" ("Setup.exe" on Windows) icon in the downloaded folder.

Click "Start" as the installer launched (It may take a few minutes to launch).
The install program will automatically detect a suitable disk where Adobe Illustrator would be installed in. If the disk is not right, click "Change Disk". Then click "Continue".

A list of all Adobe Illustrator versions installed in your disk will be shown. Select the right version to install the plugin and click "Install".

[Manual Install]

Example: Install to CC2018 64bit for Windows

- 1) Close Adobe Illustrator.
- 2) Find "Grading Tools.aip" in following location:
Downloaded folder / Plug-ins /
Grading Tools CC_64 / Grading Tools.aip
- 3) Copy&paste the file to following location:
Program Files / Adobe / Adobe Illustrator CC2018 / Plug-ins
(Mac : Applications / Adobe Illustrator CC2018 / Plug-ins)
- 4) Find "GradingTools.ini" in following location:
Downloaded folder / Prefs / Grading Tools.ini
- 5) Copy&paste the file to following location:
Documents / Adobe / Illustrator / Prefs
(Mac: User / Documents / Adobe / Illustrator / Prefs)

Macintosh

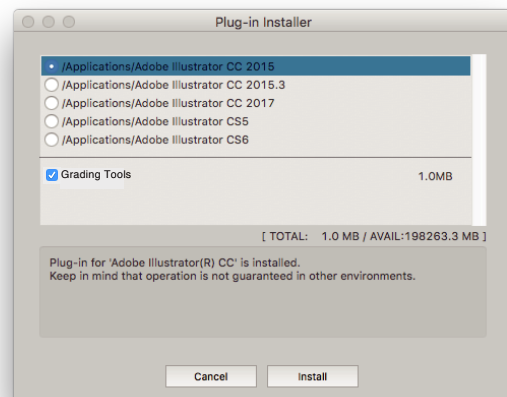
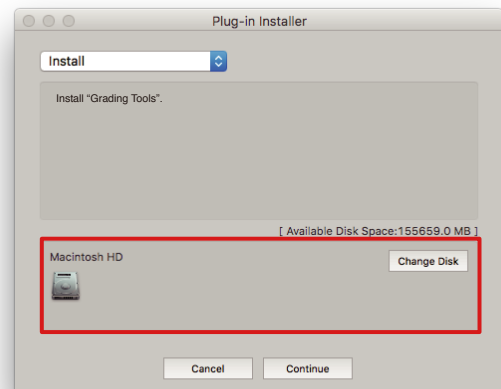


Installer

Windows



Setup.exe



SegmentTools.aip



Prefs



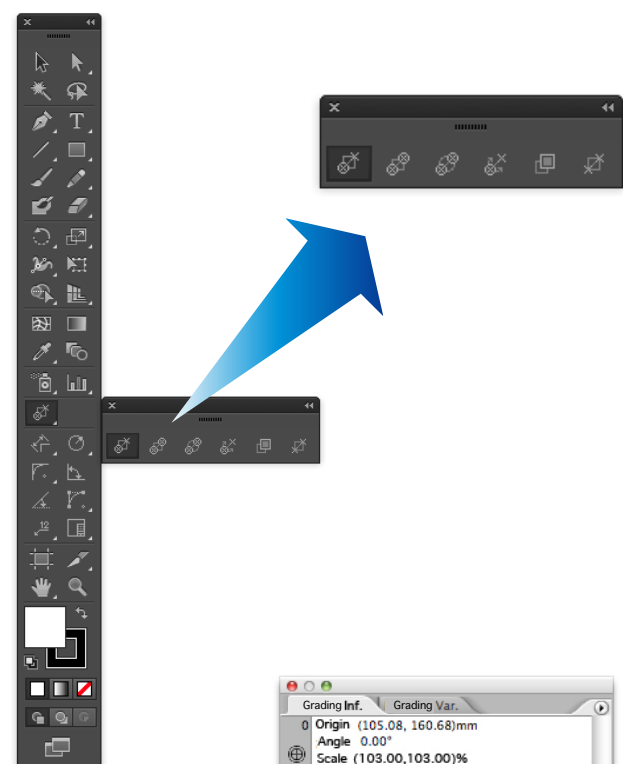
GradingTools.ini

* Where is Prefs Folder?

Macintosh: user / documents / Adobe / Illustrator / Prefs
Windows: Documents / Adobe / Illustrator / Prefs

The data surrounded with ■ needs to be installed.

Configuration of Grading Tools



Grading Inf.			
Grading Var.			
0	Origin	(105.08, 160.68)mm	
	Angle	0.00°	
	Scale	(103.00,103.00)%	
1	OD	566.51mm	OL 924.17mm
4	GD	570.00mm	GL 927.59mm
	Rev.	100.62%	Sleeve Length
5	OD	507.25mm	OL 1312.61mm
	GD	515.00mm	GL 1314.19mm
	Rev.	101.53%	Sleeve Width
6	OD	515.00mm	OL 549.75mm
	GD	515.00mm	GL 552.00mm
	Rev.	100.41%	Armhole Length
7	OD	308.56mm	OL 309.16mm
	GD	310.00mm	GL 310.60mm
	Rev.	100.47%	Sleeve Opening Width

Grading Inf. palette

Grading Var.	
Sleeve Length	40
Sleeve Width	50
Sleeve Opening Width	60
Armhole Length	515

Grading Var. palette

Grading Tools is composed of the "6 Grading Tools" that are stored in the Illustrator toolbox, and the "Grading Information palette" and the "Grading Variable palette" in the window menu/Grading Tools .

"6 Grading Tools"

Grading Tools is composed of:

- The distance revision tool
- The length revision tool
- The arc revision tool
- The angle revision tool
- The point revision tool
- The measurement tool

Generally grading and revision are performed using these tools individually, however, using these tools in combination, based on the situation, enables handling of complex grading and revision.

"Grading Information palette"

Abbreviated as the Grading Inf. palette. As well as the basic grading settings (origin, angle, and scale), it works in coordination with the four revision tools, and it is possible to perform detailed settings for each revision tool. These detailed settings are called the handle information of each tool, abbreviated as "handle".

In addition, it is possible to freely save sets (pre-sets) of handle information that is necessary for grading. By setting the preset names of grading as sizes, for example M size, L size, etc., it is possible to manage the grading information and deploy various sizes at one time.

"Grading Variable palette"

Abbreviated as Grading Var. palette, it is mostly used to set most variables. It is possible to set the dimensions of numeric values such as dress length, body width, sleeve length, armholes, etc., that change with each grading. In addition, it is possible to set expressions as well as numerical values.

As well as the four arithmetic functions, addition (+), subtraction (-), multiplication (x), and division (/), various complex functions can also be used. This means that it is possible to control every revision value that varies complexly in coordination with variables.

Explanation of Each Grading Tools Vol. 1

* In order to turn every tool on, the target object (or group) must be selected, and then any of the Grading Tools selected.

Distance revision (grading) tool

The distance revision tool is for revising the distance between two points to the desired distance. As in [Figure 01], drag from peak A toward peak B to select line segment AB. To set the value for line segment AB, double-click the distance revision handle in the coordinated "Grading Inf. palette", and then enter the setting value.

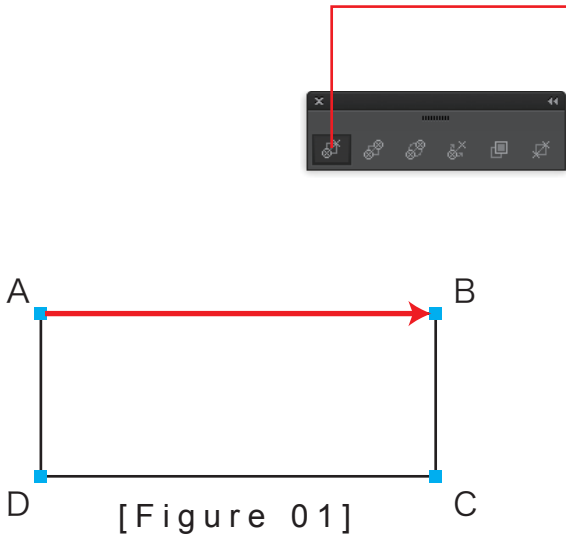
As this tool is primarily for revising the distance from peak to peak, it is preferable to use two peaks. But even if there is only one peak, it is possible to revise distance as that peak will be moved using the set distance.

In addition, when the desired distance is set for line segment AB, and point B is moved, in order to move point C the same distance in the same direction, while holding down the option key, either click point C or select it using the marker. At that time, if you select another point in the same way while holding down the option key, it is possible to move multiple points.

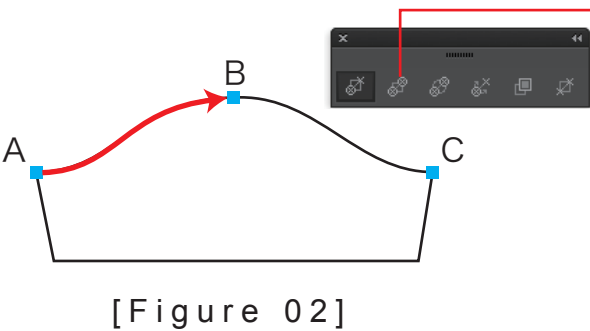
Length revision (grading) tool

The length revision tool is for revising curves to the desired length. As in [Figure 02], drag from peak A to peak B to select line segment AB. To set the length for line segment AB, double-click the length revision handle in the coordinated "Grading Inf. palette", and then enter the setting value.

Length revision is only enabled for curves. In that regard, in the revision rule only the length of the handle of the Bezier curve is adjusted using the tools in Illustrator, and the length of the curve to the specified dimension is revised without moving the angle of the handle.

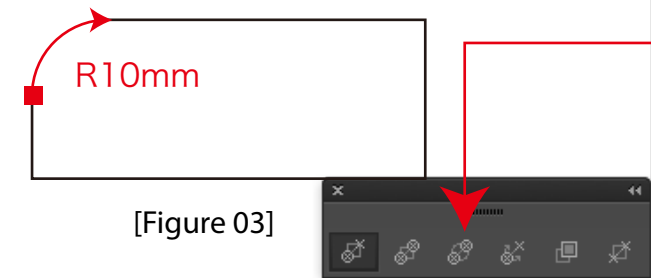


[Figure 01]



[Figure 02]

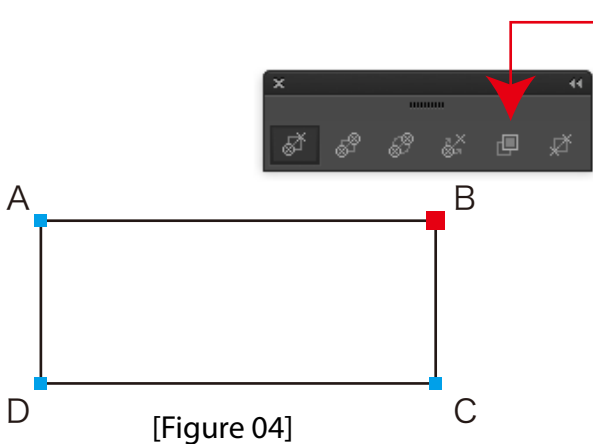
Explanation of Each Grading Tools Vol. 2



[Figure 03]

■ Arc revision tool

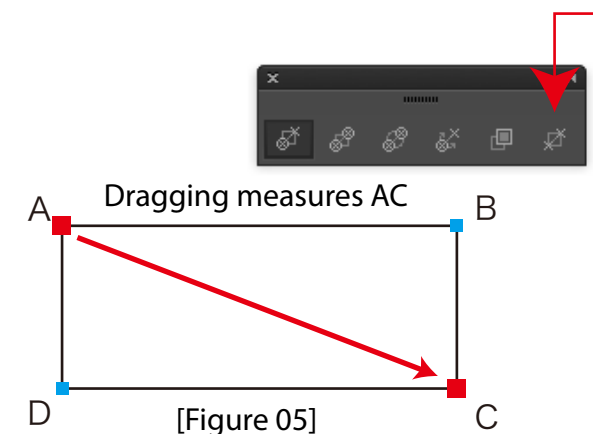
The arc revision tool is for revising the sizes (radii) of selected arcs. As in [Figure 03], select arcs by dragging. At that time, you must select an arc (part of a circle), free-form curves are not supported. In addition, be careful with small arcs with radii of one millimeter or less, as they may become free-form curves by error.



[Figure 04]

■ Point revision tool

The point revision tool is for revising the locations of user defined points. As in [Figure 04], select peak B. Accurate movement of peak B on the X axis (lateral direction) and the Y axis (longitudinal direction) is possible from the current position or the position after scale. In addition, when peak B is selected, in order to move point C the same distance in the same direction, while holding down the option key, either click point C or select it using the marker. At that time, if you select another point in the same way while holding down the option key, it is possible to move multiple points.



[Figure 05]

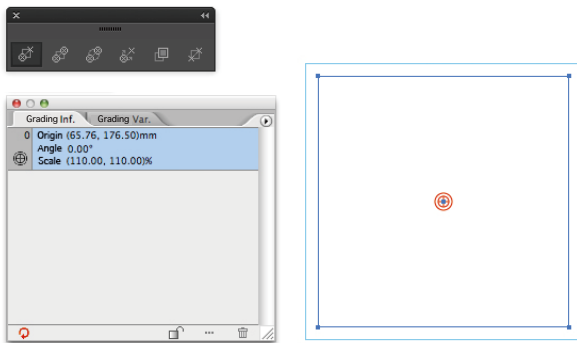
■ Measurement tool

The measurement tool is for measuring distance, length, and angles. Of course it can be used simply for measuring, however, in order to enable other revision tools to use the distance, length, or angle measured using the tool, values are recorded in "Grading Var." immediately after measuring. Generally the tool is used for measuring the distances and lengths from peak to peak,, and angles, however, unlike other tools measurement not involving peaks is possible. However, in that case only distances and angles can be measured, length cannot be measured.

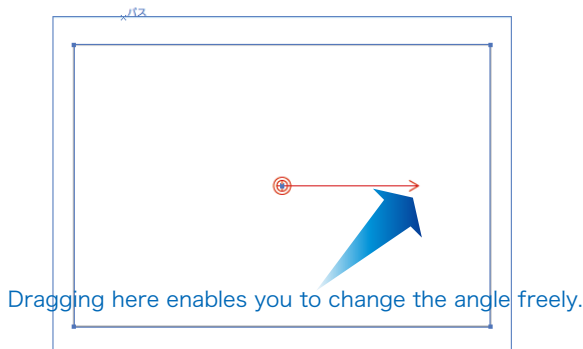
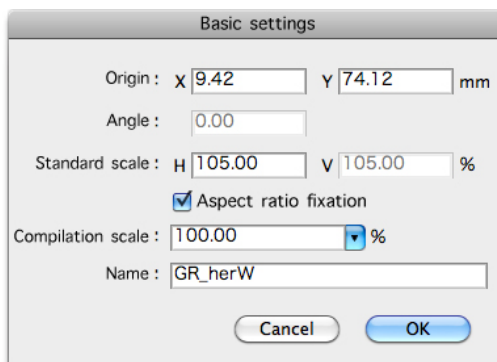
Grading Var.	
Distance A	62.12
Angle A	-22.40
Length A	81.10

Measurement data is recorded in "Grading Var."

Explanation of Grading Inf. Palette Vol. 1



[Figure 01]



[Figure 02]

* The lists of information displayed in palettes are called "handles" or "handle information". Double-clicking handle information displays the setting window for that handle.

Basic settings

These basic settings are for Grading Tools and each information list. The following settings can be made in basic settings.

- Origin

The origin. This origin is the most important reference point when performing grading or revision using Grading Tools. The position of the Origin uses the standard reference position of Illustrator, and is described using the absolute position for the [X-axis and Y-axis positions]. These can be set using numeric values, or to move them intuitively, as in [Figure 01], drag and move the origin mark displayed on the object. At this time, when you move over each peak or line segment the cursor changes. In addition, if it will not move, check that the lock button on the palette has been released.

- Angle

This is enabled when the standard scale is not set to 100% (same size), and aspect ratio fixation checkbox is not checked. The angle can be set using numeric values, however, as in [Figure 02] it can be changed intuitively by dragging the head of the arrow. At this time the length of the arrow has no meaning.

- Standard scale

The standard scale can be set. To change the scale of the aspect ratio, remove the check from aspect ratio fixation, and set the desired scale values for H (horizontal) and V (vertical). The final setting content of the standard scale is applied the next time this software is used.

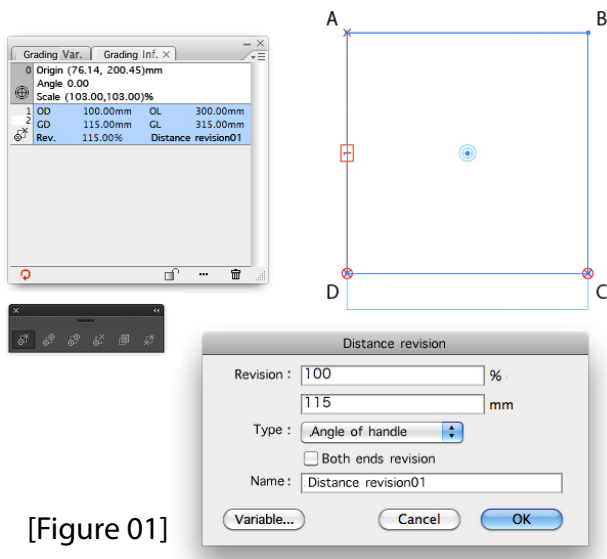
- Compilation scale

Use this when you want to change the scale of the drawing. For example, when drawing at a scale of [1/10], set the value as 10%.

- Name

It is possible to set a name for the currently selected object (or group).

Explanation of Grading Inf. Palette Vol. 2



[Figure 01]

* The symbols in the handle information list indicate the following

OD=Original distance

OL=Original length

GD=Distance after grading

GL=Length after grading

Distance revision handle information

In [Figure 01], the distance revision tool of Grading Tools has been applied to line segments AD, and point C has been grouped using the option button.

At this time, if the distance revision handle information displayed in the list in Grading Inf. is clicked, a distance revision handle setting dialog in which the various settings for distance revision can be set is displayed.

The diagram is a simple square, with each side 100 mm long, and the standard scale set to 100% (same size).

- Revision

Set the distance after applying the Standard scale (100% in Figure 01), using %. In addition, it is also possible to apply the variables set in Grading Var. here.

- mm

After applying the Standard scale (100% in Figure 01), set the distance using mm. In addition, it is also possible to apply the variables set in Grading Var. here.

- Type

Set the direction to move for distance revision. Generally, the "Angle of handle" specified in the distance revision tool is used, however, it is also possible to select "Horizontal direction", "Vertical direction", "Grading direction", etc.

In addition, it is also possible to use the angle values entered in Grading Var in the measurement tool.

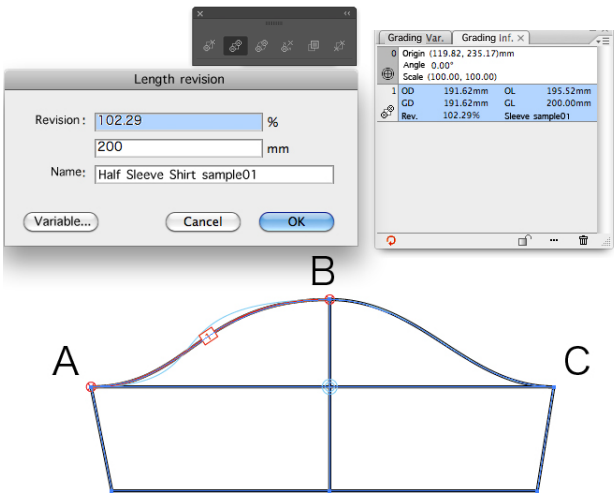
- Both ends revision

It is possible to move both end points in the direction selected for type above, allocating both ends directions. The ratio to allocate is the same as the distance from the origin.

- Name

It is possible to set the handle name of the currently set distance revision.

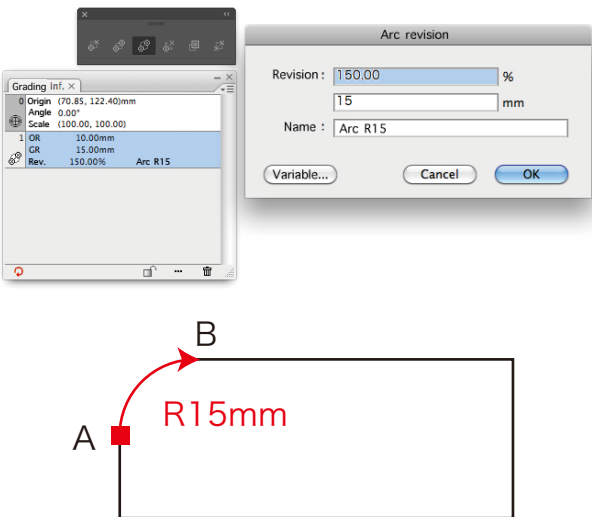
Explanation of Grading Inf. Palette Vol. 3



[Figure 01]

* The symbols in the handle information list indicate the following

- OD=Original distance
- OL=Original length
- GD=Distance after grading
- GL=Length after grading



[Figure 02]

Length revision handle information

[Figure 01] shows the Grading Tools length revision tool applied to line segments AB.

At this time, if the length revision handle information displayed in the list in Grading Inf. is clicked, a length revision handle setting dialog in which the various settings for distance revision can be set is displayed. The diagram is set to the standard scale of 100% (same size).

- Revision

After applying the standard scale (100% in Figure 01), set the length using %. In addition, it is also possible to apply the variables set in Grading Var. here.

- mm

After applying the standard scale (100% in Figure 01), set the length using mm. In addition, it is also possible to apply the variables set in Grading Var. here.

- Name

It is possible to set the handle name of the currently set length revision.

Arc revision handle information

[Figure 02] shows the Grading Tools arc revision tool applied to the peaks A and B.

- Revision

After applying the standard scale (150% in Figure 02), set the length using %. In addition, it is also possible to apply the variables set in Grading Var. here.

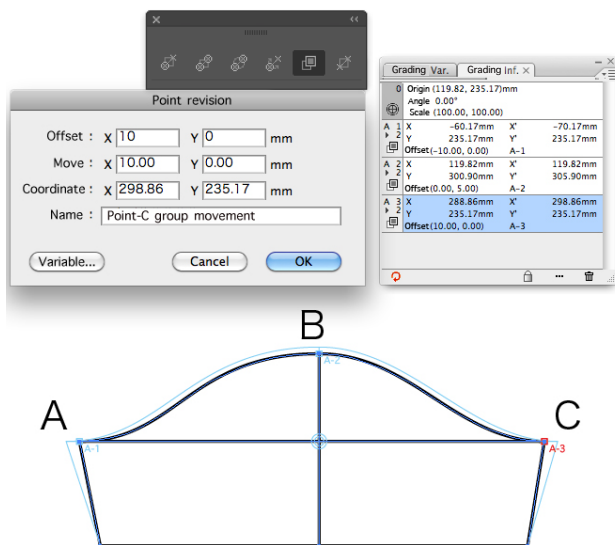
- mm

After applying the standard scale (150% in Figure 02), set the length using mm. In addition, it is also possible to apply the variables set in Grading Var. here.

- Name

It is possible to set the handle name of the currently set arc revision.

Explanation of Grading Inf. Palette Vol. 4



[Figure 02]

Point revision handle information

[Figure 02] shows the Grading Tools point revision tool applied to the peaks A, B, and C. The diagram is set to the standard scale of 100% (same size).

- Offset

Set the movement amounts for the X-axis direction and the Y-axis direction after applying the standard scale.

- Move

Set the movement amounts for the X-axis direction and the Y-axis direction before applying the standard scale,.

- Coordinate

Set the Illustrator absolute coordinate values for the X-axis direction and the Y-axis direction.

- Name

It is possible to set the handle name of the point revision.

Measurement tool handle information

[Figure 01] shows the Grading Tools measurement tool applied to line segments AB. At this time, if the measurement tool handle information displayed in the list in Grading Inf. is clicked, the various setting dialogs are displayed. The diagram is set to the standard scale of 100% (same size).

- Distance

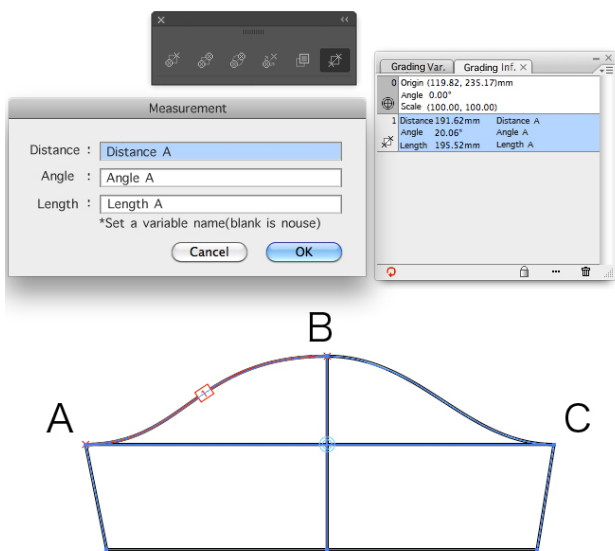
Measure the distance after applying the Standard scale (100% in Figure 01), and enter a name. By default, a name like "Distance A" is automatically inserted. In addition, this measured distance is automatically passed to Grading Var.

- Angle

After applying the Standard scale (100% in Figure 01), measure the angle, and enter a name. By default, a name like "Angle A" is automatically inserted. In addition, this measured angle is automatically passed to Grading Var.

- Length

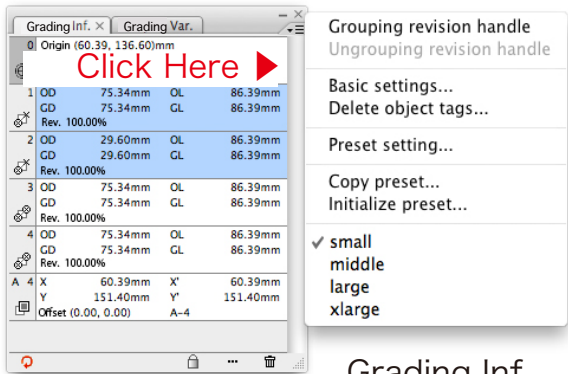
After applying the Standard scale (100% in Figure 01), measure the length, and enter a name. By default, a name like "Length A" is automatically inserted. In addition, this measured length is automatically passed to Grading Var.



[Figure 01]

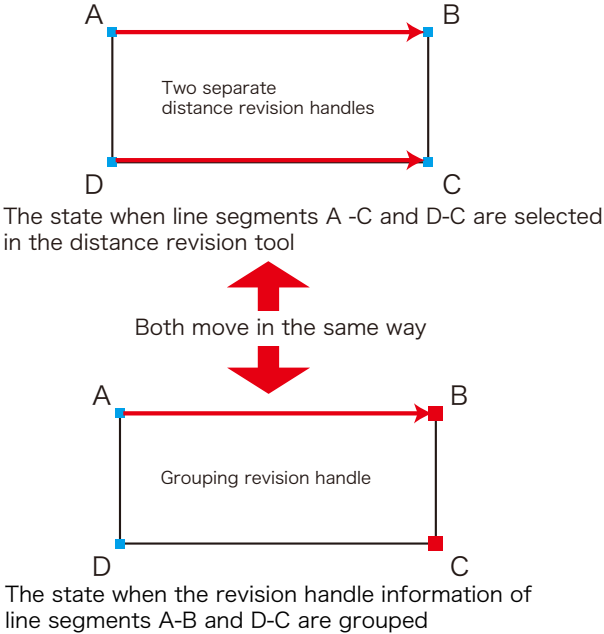
Measurement tool handle information

Explanation of Grading Inf. Palette Vol. 5



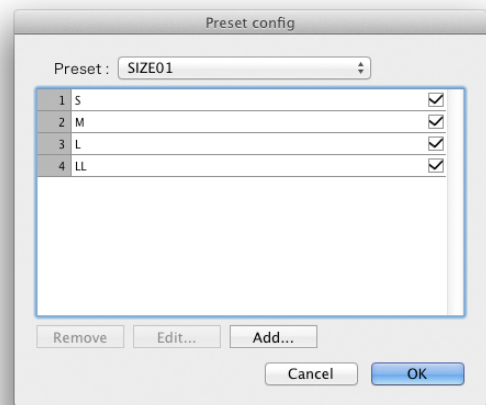
Grading Inf. [Figure 01]

Grouping revision handle▼ [Figure 02]




* This is exactly the same state as when distance revision is applied to line segment A-B, and then option selection is used for peak C.

Preset setting▼ [Figure 03]



■ Grading Info. menu

[Figure 01] is the menu of Grading Inf. To display the menu, click the button  in the upper-right of the Grading Inf. palette.

- Grouping revision handle

It is possible to group separate revision handles. However, this is only enabled when the direction and amount of movement in the revisions is the same. First, select multiple sets of revision handle information in the palette while pressing the Shift key, then select Grouping revision handle from the menu. * Refer to [Figure 02]

- Ungrouping revision handle

Releases the grouping of revision handles and returns them to separate revision handles. However, in some cases, even if grouping is released handles may not return to their original state.

- Basic settings

These grading settings are the basic settings for Grading Tools and each revision handle information list. The Origin, Angle, Standard scale, etc. can be set here. In addition, palette grading settings and revision handle information can be set directly or by double-clicking them.

- Delete object tags

Deletes all of the various revision handle information lists. However, even after deletion new basic settings will be applied.

- Preset setting

Sets the preset settings. * Refer to [Figure 03] From preset settings it is possible to create names for presets for sizes, etc., and turn them on and off by checking the name of each preset as necessary. Preset settings can be saved with multiple names, and it is possible to switch between them as necessary. As each set of preset information is maintained based on the preset ID indicated using a number, even if a preset name is changed, no information will be lost.

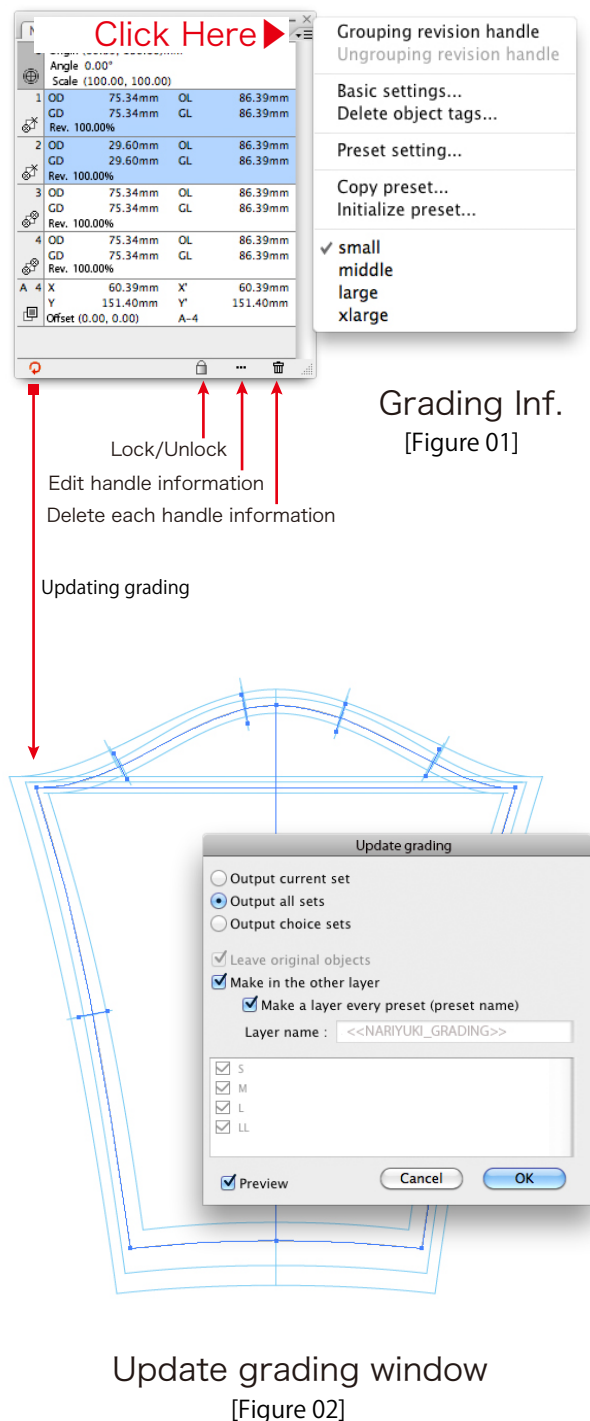
- Copy preset

Copies the currently selected preset.

- Initialize preset

Initializes each setting value of the currently selected preset.

Explanation of Grading Inf. Palette Vol. 6



■ Explanation of each button

[Figure 01] is the various buttons on the lower section of Grading Inf.

- Lock button

Enables locking and unlocking of revision handles. When using locking, this is used to apply a different revision to the same peak when another handle interferes.

- Edit

Performs editing of handle information. Select the target handle information list and then press the Edit button.

- Delete

Deletes only the currently selected revision handle information.

■ Updating grading

This button is for applying grading to single objects after setting each revision handle information. Pressing this button displays the Update grading dialog shown in [Figure 02].

- Output current set

Selecting this enables output of only the currently selected set.

- Output all sets

Enables output of all sets set in Save as.

- Output choice sets

Selecting this enables free selection of each set in the lower section of the dialog, as in [Figure 02].

- Leave original objects

Leaves the original objects to which revision is applied.

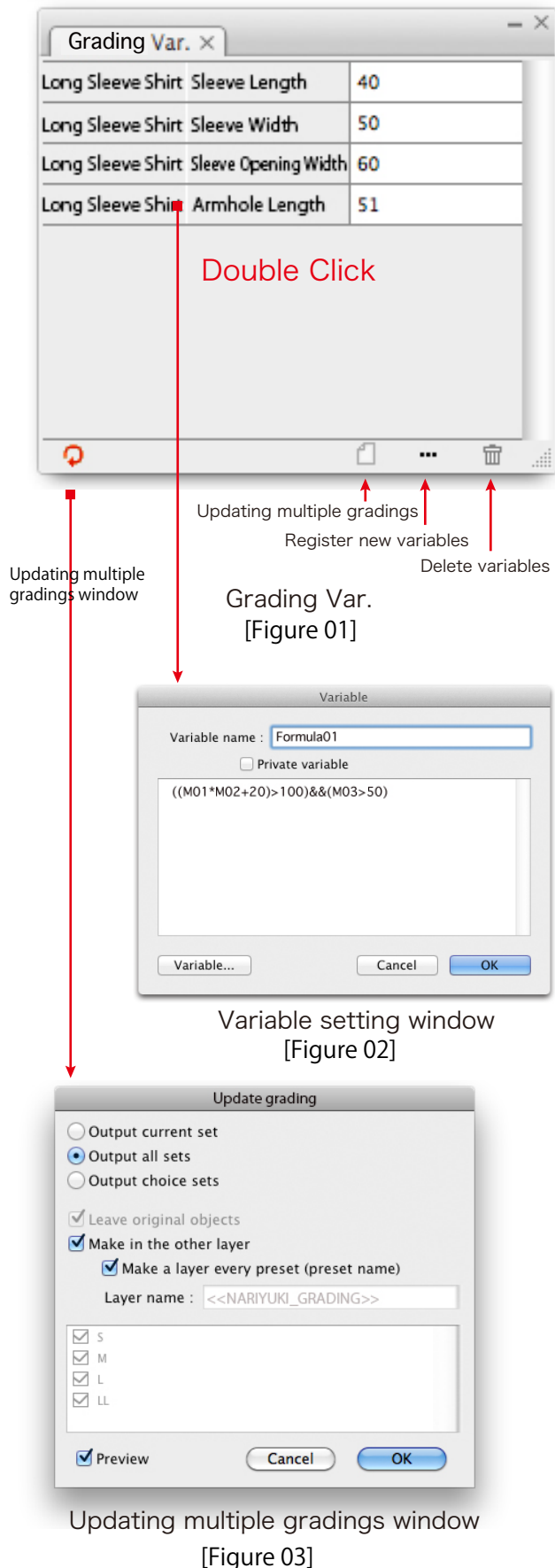
- Make in the other layer

Selecting this enables shifting of output grading to another layer. To change the name of a layer, enter the desired name in "Layer name".

- Make a layer every preset (preset name)

Makes the names of each layer the same as each set, and outputs them.

Grading Var. Palette Explanation Vol. 1



■How to use the Grading Val. palette

[Figure 01] is the Grading Var. window. Grading Var. is the abbreviation of Grading Variable, and it is used to handle variables. As these variables can be allocated to each setting of handle information in Grading Inf., by changing numeric values and expressions it is possible to change the setting values of multiple objects simultaneously.

Another function Grading Var. provides is the export of gradings to multiple objects.

- When exporting the grading for a single object, use the Update grading button of Grading Inf.
- When exporting the grading for multiple objects, use the Update grading button of Grading Var.

■Each button of the Grading Val. palette

- Register new variable

New variables can be registered.

- Edit variables

Variables can be edited.

- Delete variables

The selected variable list can be deleted.

■Variable setting window

- Variable name

Variable names can be entered.

- Private variable

When only using individual objects, checking this means that object can only be used when its Grading Tools are on.

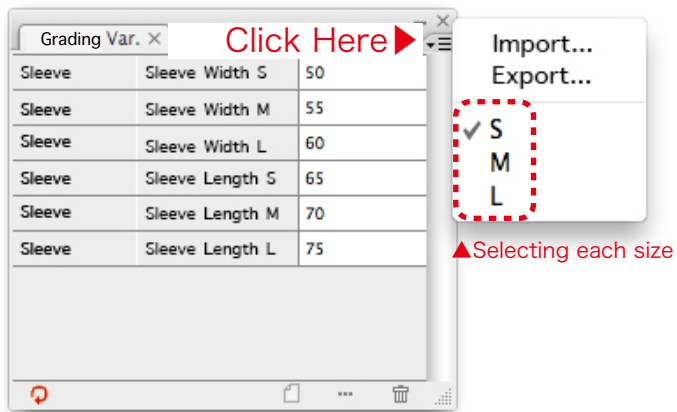
- Variable entry area

As shown in [Figure 02], it is possible to enter complicated expressions, but single numeric values can also be used.

■Updating multiple gradings

* When using this, select the target objects using the selection tool in Illustrator, and then press this button.

Grading Var. Palette Explanation Vol. 2



Grading Var.
[Figure 01]

	Object name	Variable name	P.C.	Variable value
	A	B	C	D
1	Sleeve	Sleeve Width S	0	50
2	Sleeve	Sleeve Width M	0	55
3	Sleeve	Sleeve Width L	0	60
4	Sleeve	Sleeve Length S	0	65
5	Sleeve	Sleeve Length M	0	70
6	Sleeve	Sleeve Length L	0	75

CSV file opened using Excel
[Figure 02]

■How to use the Grading Val. palette menu

[Figure 01] is the Grading Var. menu window. As shown in the figure, the menu is displayed by clicking the ▼ mark.

■CSV import and export functions

- Import

Importing of CSV files enables overwriting of the values of all corresponding variables in a single action.

Select the target CSV file using "Import".

* The formatting of CSV files is:

Character code: Shift-JIS format

Linefeed: CR+LF

It is recommended to output a file in advance using the export function, and then edit that file using a text editor or Excel.

At that time, object names and variable names are necessary, so please avoid changing anything other than the variable values.

- Export

Enables the export of currently displayed variable information to a CSV file.

[Figure 02] shows an output CSV file opened using Excel.

Items are in the order of "Object name", "Variable name", "P.C. *", and "Variable value".

* P.C. is used to determine if a private check is applied (1) or not (0), so normally do not change the value.

■Selecting each size

The check next to each size (preset) is for checking or changing what is selected for the "current set", but be careful as it has absolutely nothing to do with *CSV file import and export.

Grading Var. Palette Explanation Vol. 3

* Operations and functions that can be used in Var. palette

Operators

The following four numeric operators can be used. As in normal expressions, "(" has the highest priority, then "+" and "-", and then "*" and "/".

Operator	Example	Meaning
*	M01 * M02	Multiply
/	M01 / M02	Divide
+	M01 + M02	Add
-	M01 - M02	Subtract

The following seven comparative and logical operators can be used. When using comparative and logical operators at the same time, ensure that "(" is used, and the order of calculation is clear. An example is given below.

((M01 * M02 + 20) > 100) && (M03 > 50)

Operator	Example	Meaning
>	M01 > M02	>
<	M01 < M02	<
>=	M01 >= M02	≧
<=	M01 <= M02	≦
==	M01 == M02	=
&&	(M01 > 10) && (M01 < 20)	And
	(M01 > 10) (M01 < 20)	Or

The following string operator can be used.

Operator	Example	Meaning
&	"[" & getlines(U20, 2, 1) & "]"	Combination of strings

Arithmetic functions

The following arithmetic functions can be performed. All results are calculated with double precision of the floating point. For example, if

round(M04*10)/10

is used, the result will be rounded off to one decimal place.

Function	Example	Meaning
sin	sin(3.142/180*45)	Sine function
cos	cos(3.142/180*45)	Cosine function
tan	tan(3.142/180*10)	Tangent function
asin	asin(M02 / M01)	Inverse sine function
acos	acos(M02 / M01)	Inverse cosine function
atan	atan(M01)	Inverse tangent function
sinh	asin(M01)	Hyperbolic sine function
cosh	acos(M01)	Hyperbolic cosine function
tanh	atan(M02 / M01)	Hyperbolic tangent function
round	round(M04*10)/10	Round off
trunc	trunc(M04*10)/10	Round down
sqr	sqr(M04)	Square
sqrt	sqrt(M04)	Square root
max	max(M01, 32000)	Maximum (2 terms)
min	min(M01, 0)	Minimum (2 terms)
pow	pow(M01, 2)	Power (2 terms)
abs	abs(M01)	Absolute value

String functions

The following string functions can be performed.

Function	Meaning
strpos (String, search string)	Determines the position of the specified string.
substr(String, start position, number of characters)	Extracts the string in the specified range.
strcmp (String 1, string 2)	Performs comparison of strings. When String 1 < String 2, -1 is returned When String 1 = String 2, 0 is returned When String 1 > String 2, 1 is returned
length (String) or strlen (String)	Returns the length of the specified string. Both have the same meaning.
countlines (String)	Counts the number of lines of the string. "r" and CR (0x0D) can be used for linefeeds. Example show(countlines(U20))
getlines (String, starting line, number of lines)	Obtains the specified number of lines from the starting line (1) of the string. Example show("(" & getlines(U20, 2, 1) & ")")

Macros

Replaced with the environmental variable in grading information during execution.

Macros	Meaning
%%LENGTH%%	Used in the length revision handle. This variable is replaced with the length of the current path. (Mainly used internally)
%%DISTANCE%%	Used in the distance revision handle. Replaces the distance with the distance of the current line segment. (Mainly used internally)
%%GR_SCALE_H%%	Replaces the standard scale with the current standard scale (Horizontal direction).
%%GR_SCALE_V%%	Replaces the standard scale with the current standard scale (Vertical direction).
%%GR_ORIGIN_H%%	Replaces the grading point (X-axis) with the current grading point.
%%GR_ORIGIN_V%%	Replaces the grading point (Y-axis) with the current grading point.
%%GR_ANGLE%%	Replaces the grading angle with the current grading angle.
%%PRESET_IDX%%	Replaces preset numbers with the current preset numbers (1 - 20).
%%PRESET_NAME%%	Replaces the name with the name of the current preset.

Control Statements

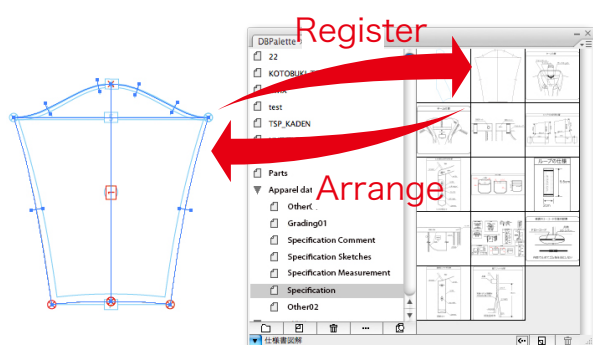
IF statements can be used.

Control Statement	Meaning
if (conditional expression 1)	When conditional expression 1 is "true", Expression 1 is executed.
else if (conditional expression 2) {expression 2}	When an conditional expression 1 is not met, when conditional expression 2 is "true", [expression 2] is executed.
else if (conditional expression 3) {expression 3}	when conditional expression 3 is "true", [expression 3] is executed.
else if (conditional expression 4) {expression 4}	
... else {Expression n}	When none of the above conditions apply, [expression n] will be executed. It is possible to omit after "else". Also, only one "else" can be set. However, as many "else if" as desired can be used.

Example

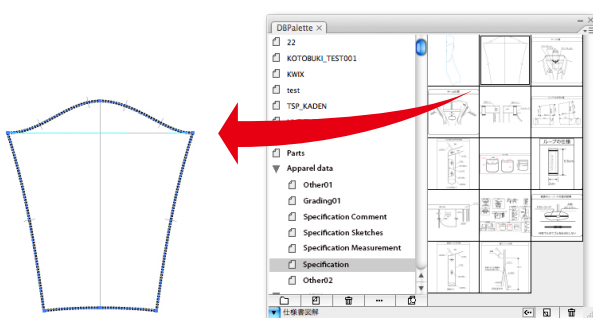
```
if (%%PRESET_IDX%% == 1) {50} else if
(%%PRESET_IDX%% == 2) {100} else {150}
```

Coordination with DB Palette (Building a grading database)



Register with DB Palette
[Figure 01]

Drag to the target object while holding down the option key



Copying grading information
in coordination with DB Palette

[Figure 02]

■ Coordination with DB Palette

[Figure 01] is a window showing when an object with grading settings in GradingTools is registered with DB Palette.

Normally, objects registered with DB Palette can be registered and arranged in the same way as other objects that do not have grading settings.

In that case, to make or update grading settings, if any Grading Tools are turned on when the object is selected using the Illustrator selection tool, the grading handle will be displayed.

■ Copying grading information (DB Palette coordination)

[Figure 02] shows the method for registering an object with grading settings in Grading Tools with DB Palette, and then copying (moving) the grading information.

Drag an object registered with DB Palette that retains grading information to another object that has had other grading information copied to it.

In that case, as dragging while holding down the option key will display the target object outlined in black as in [Figure 02], if dragging is performed in that state the grading information of the target object will be overwritten with the grading information of the source.

To confirm this, if any Grading Tools are turned on when the object is selected using the Illustrator selection tool, the grading handle will be displayed.

However, it is a condition that the number of peaks of the original object and the object that is the target of copying of grading information is the same.

If the number of peaks is different and each revision handle is not aligned, directly correct the handles in Grading Tools.

Advisory notes

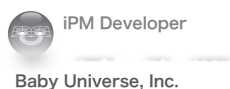
■ Advisory notes

1. Handling grouped objects

It is possible to perform revision and apply grading to grouped objects using Grading Tools, however, caution is necessary as if grouping is released after it has been set, all of the set handle information will be lost.

2. Handling seam allowance and notch marks

It is possible to perform revision and apply grading in Grading Tools to grouped objects that have seam allowances or notch marks, however, caution is necessary as depending on how revision is performed, the consistency of seam allowances and notch marks may not be able to be maintained. In such cases, users are recommended to apply seam allowances or notch marks after performing revision in Grading Tools.



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