

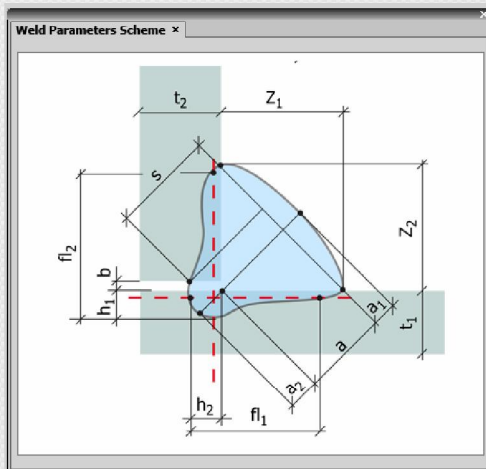


Module 2: Weld Measurement



Features

- Fillet weld measurement
- Setting management
- Custom parameters
- Report generation
- Measurement history



Fillet x

Setting: LIM Weld 001 Show Drawing

Reset Load Setting... Save Setting As...

Parameters

Parameter	Measure	Label	Limits	Min.	Max.
a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
a1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
a2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
s	<input type="checkbox"/>				
b	<input checked="" type="checkbox"/>				
z1	<input checked="" type="checkbox"/>				
z2	<input checked="" type="checkbox"/>				
h1	<input checked="" type="checkbox"/>				
h2	<input checked="" type="checkbox"/>				
fl1	<input checked="" type="checkbox"/>				
fl2	<input checked="" type="checkbox"/>				
t1	<input checked="" type="checkbox"/>				
t2	<input checked="" type="checkbox"/>				
asym	<input type="checkbox"/>				

Custom Parameters

G

Allowed Weld Shap

Mitre

Supporting Lines

For Parameter

h1

h2

fl1 min(t1, t2) / 10 or

fl2 min(t1, t2) / 10 or

Report Template

Default Change...

History... Start Measurement

Welds History x

Date	Path to Image	Setting
Wed 3/24/2016 09:55 AM	C:\Welding\...\sample_08.tif	LIM Weld 001
Wed 3/24/2016 09:50 AM	C:\Welding\...\sample_07.tif	LIM Weld 001
Wed 3/24/2016 09:45 AM	C:\Welding\...\sample_06.tif	LIM Weld 001
Wed 3/24/2016 09:40 AM	C:\Welding\...\sample_05.tif	LIM Weld 001
Wed 3/24/2016 09:35 AM	C:\Welding\...\sample_04.tif	LIM Weld 001
Wed 3/24/2016 09:30 AM	C:\Welding\...\sample_03.tif	LIM Weld 001
Wed 3/24/2016 09:25 AM	C:\Welding\...\sample_02.tif	LIM Weld 001
Wed 3/24/2016 09:20 AM	C:\Welding\...\sample_01.tif	LIM Weld 001

Setting: LIM Weld 001 Show Drawing

Parameters

Parameter	Value	OK / NOK	Min.	Max.
a	6.5			
a1	0.3			
a2	1.0			
s				
b	1.4	NOK		1.2
z1	4.5			
z2	5.0			
h1	1.6			
h2	1.5			
fl1	3.6	OK	3.0	3.9
fl2	3.3	OK	3.3	4.0
t1	3.5			
t2	2.0			
asym	0.11	OK		0.2
G				
shape	Convex	OK		

Result

NOK

Report... Alternative Report... Export to Excel



Measurement Definition

1. Weld parameters selection
2. Label visibility settings (labels displayed in the image or not)
3. Conditions - parameter limits can be set
4. The „Show Drawing“ button to display the geometry (legend)

The screenshot shows the 'Fillet' settings window on the left and the 'Weld Parameters Scheme' drawing window on the right. Red numbers 1-4 and arrows indicate the steps:

- 1. Points to the 'Parameters' table.
- 2. Points to the 'Label' column checkboxes.
- 3. Points to the 'Limits' column checkboxes and input fields.
- 4. Points to the 'Show Drawing' button.

The 'Parameters' table is as follows:

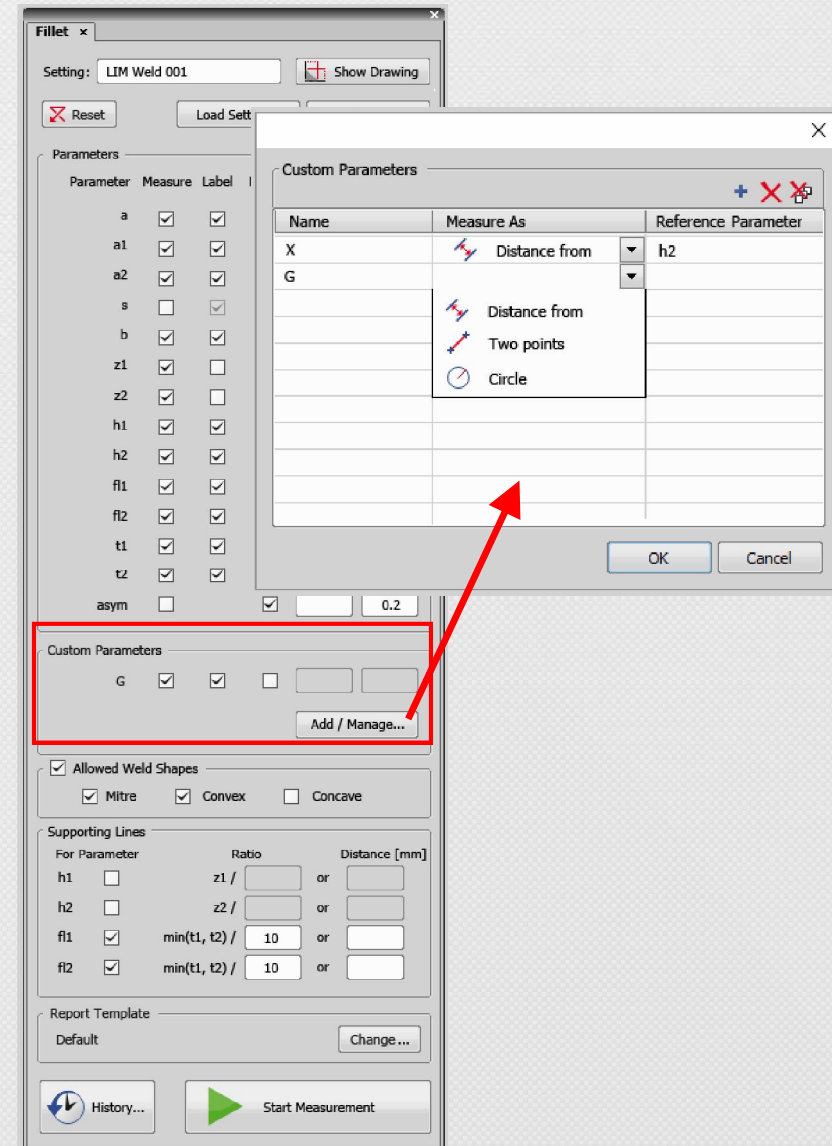
Parameter	Measure	Label	Limits	Min.	Max.
a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
a1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
a2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
s	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
b	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		1.2
z1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
z2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
h1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
h2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
fl1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3.0	3.9
fl2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3.3	4.0
t1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
t2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
asym	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		0.2

The 'Weld Parameters Scheme' drawing shows a cross-section of a weld joint with various parameters labeled: t_2 , z_1 , z_2 , fl_2 , h_1 , b , h_2 , fl_1 , a , a_1 , t_1 , a_2 , and s .



Custom Parameters Management

1. Click “Add / Manage...” to create new, edit or delete existing custom parameters
2. Select measurement method:
 - Distance from
 - Two points
 - Circle
3. Confirm by „OK“





Allowed Weld Shapes

1. „Allowed Weld Shapes“ restriction
2. The following shapes are available:
 - Mitre
 - Convex
 - Concave

Fillet x

Setting: LIM Weld 001 Show Drawing

Reset Load Setting... Save Setting As...

Parameters

Parameter	Measure	Label	Limits	Min.	Max.
a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
a1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
a2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
s	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
b	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		1.2
z1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
z2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
h1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
h2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
f11	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3.0	3.9
f12	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3.3	4.0
t1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
t2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
asym	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		0.2

Custom Parameters

G

Add / Manage...

Allowed Weld Shapes

Mitre Convex Concave

Supporting Lines

For Parameter	Ratio	Distance [mm]
h1	z1 / <input type="checkbox"/>	or <input type="checkbox"/>
h2	z2 / <input type="checkbox"/>	or <input type="checkbox"/>
f11	min(t1, t2) / 10	or <input type="checkbox"/>
f12	min(t1, t2) / 10	or <input type="checkbox"/>

Report Template

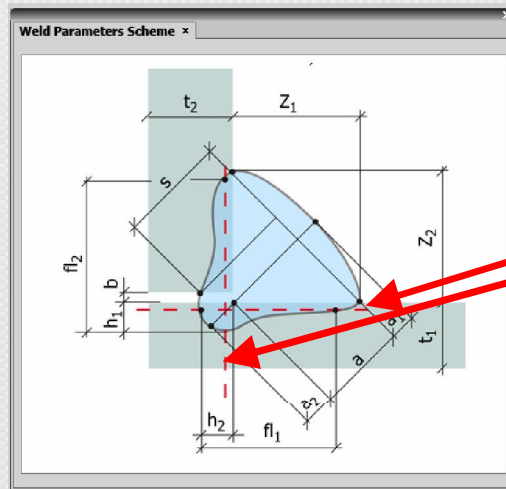
Default Change...

History... Start Measurement



Supporting Lines

1. Supporting (sw generated) lines allow to measure penetrations and fuse legs in requested distances
2. Line distance from surface is defined by either **Material thickness fraction** or **Distance** in metric units



Filet x

Setting: LIM Weld 001 Show Drawing

Reset Load Setting... Save Setting As...

Parameters

Parameter	Measure	Label	Limits	Min.	Max.
a	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
a1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
a2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
s	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
b	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		1.2
z1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
z2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
h1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
h2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
fl1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3.0	3.9
fl2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	3.3	4.0
t1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
t2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
asym	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		0.2

Custom Parameters

G

Add / Manage...

Allowed Weld Shapes

Mitre Convex Concave

Supporting Lines

For Parameter	Ratio	Distance [mm]
h1	<input type="checkbox"/> z1 / <input type="text"/>	or <input type="text"/>
h2	<input type="checkbox"/> z2 / <input type="text"/>	or <input type="text"/>
fl1	<input checked="" type="checkbox"/> min(t1, t2) / <input type="text"/>	or <input type="text"/>
fl2	<input checked="" type="checkbox"/> min(t1, t2) / <input type="text"/>	or <input type="text"/>

Report Template

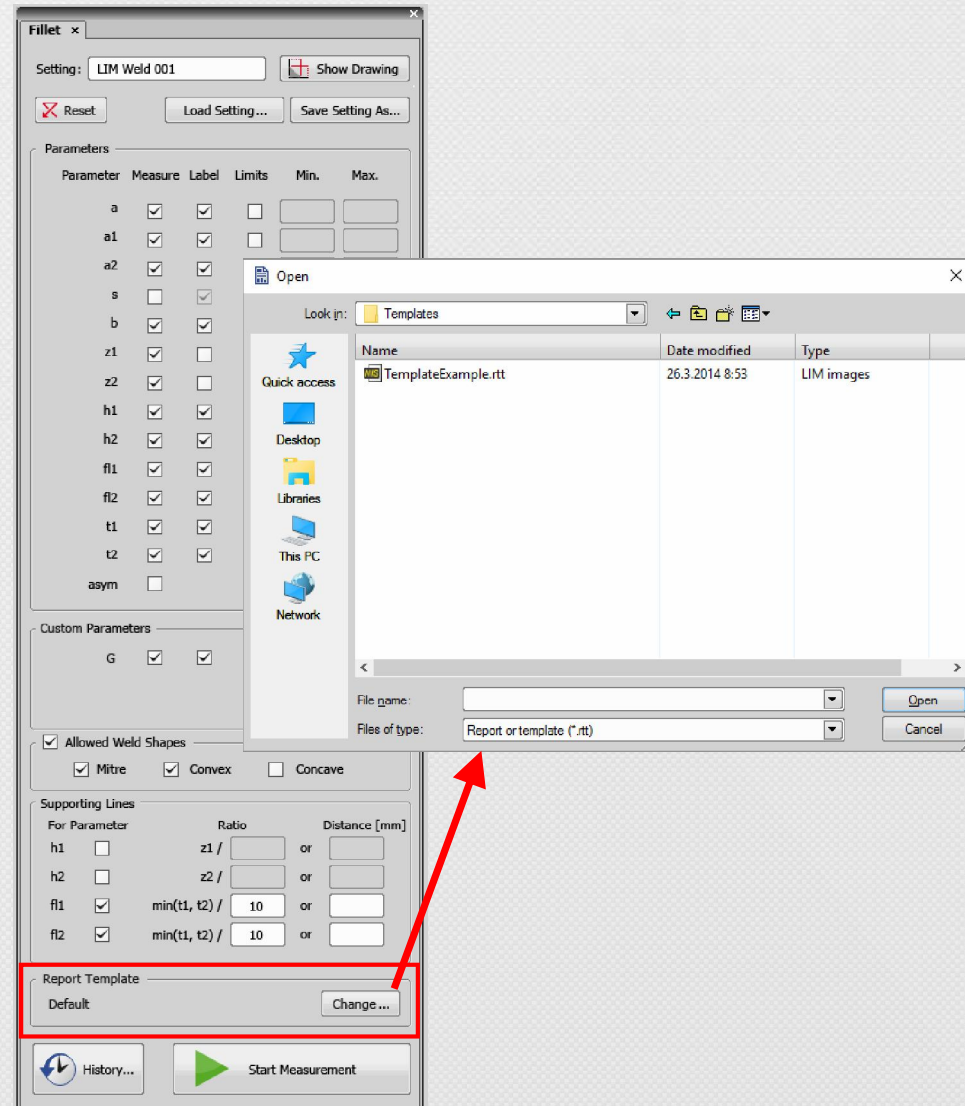
Default Change...

History... Start Measurement



Report Template

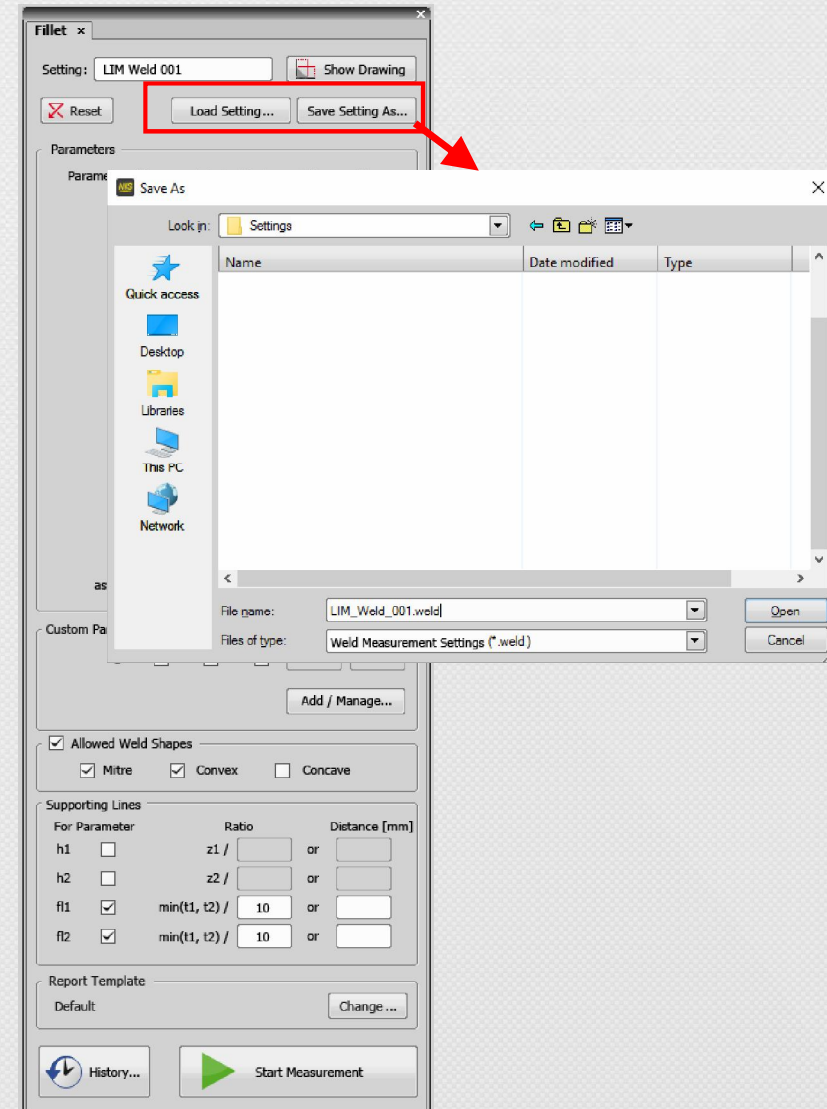
- **Default** – a simple table-like report will be generated after the measurement
- Click „**Change...**“ to select a custom template created in NIS-Elements Report Generator. Such a template can contain header, footer, graphics, etc.





Setting Management

- All the weld measurement settings can be saved to a file.
- All the weld measurement settings can be loaded from the file.
- This allows the user to copy settings to other computers.





Measurement Workflow

Setting: LIM Weld 001

Parameter	Value	OK / NOK	Min.	Max.
a	6.5			
a1	0.3			
a2	1.0			
s				
b	1.4	NOK		1.2
z1	4.5			
z2	5.0			
h1	1.6			
h2	1.5			
f1	3.6	OK	3.0	3.9
f2			3.3	4.0
t1	3.5			
t2	2.0			
asym	0.11	OK		0.2
G				
shape	Convex	OK		

Parameter: Fuse Leg 2 (f2)
Method: two points

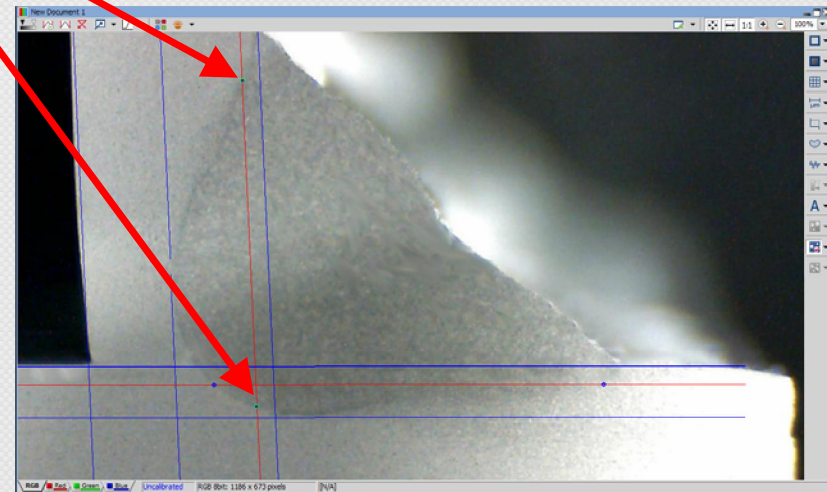
Restart Back Finalize

Result: **NOK**

Report Alternative Report... Export to Excel History... Exit

History... Start Measurement

1. Click „Start Measurement“
2. Measure the parameter highlighted in the table; the next parameter follows automatically after right-click
3. It is possible to move one step back
4. It is possible to finish the measurement before its regular end by the „Finalize“ button

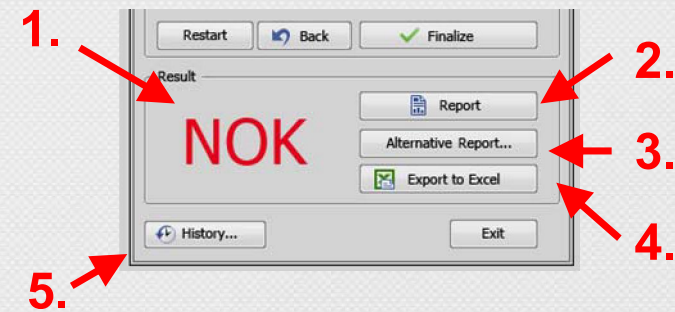


1.

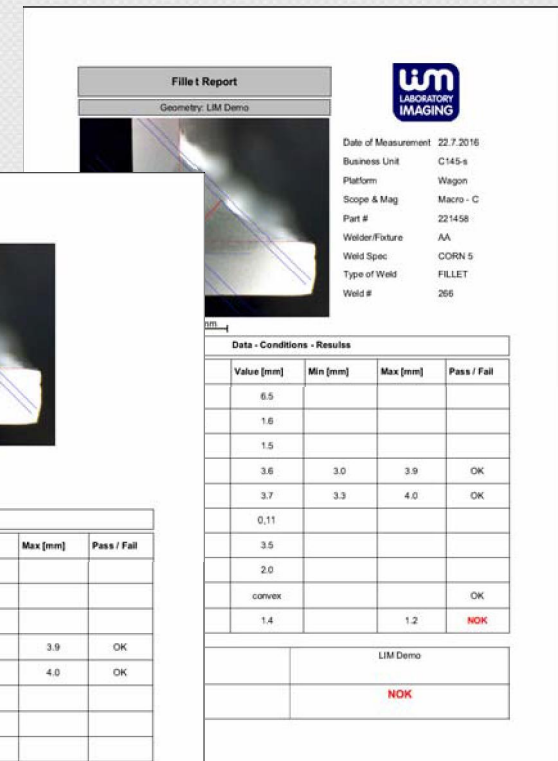


Results - Output

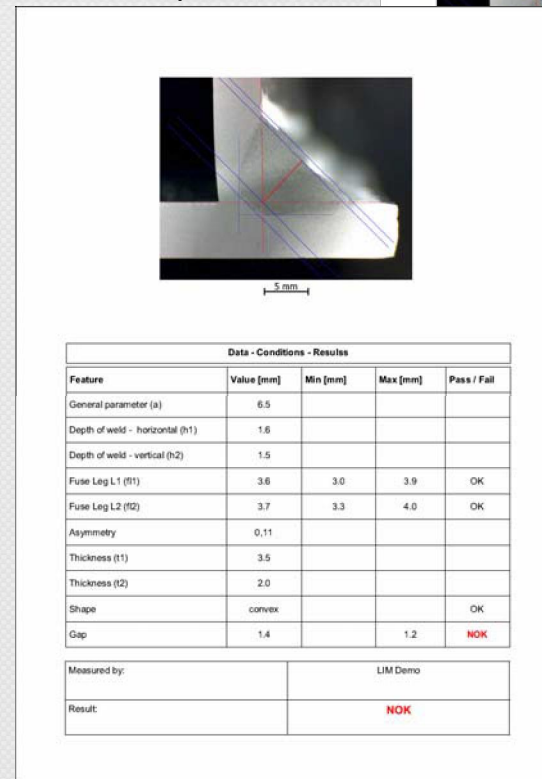
1. OK / NOK is displayed
2. Click „Report“ for the standard report (defined in settings)
3. Click „Alternative Report“ to create a different report using another template from the disk.
4. Click „Export to Excel“ to automatically transfer the measured data into an excel sheet
5. Click „History...“ to browse the history of measurements (see next slide)



Custom Report



Default Report





Measurement History

- Parameters of every finalized measurement is saved to a database including:
 - settings
 - measured data
 - path to image
 - reports
- Measured data of the selected record are displayed on the right
- Double click the path to open the weld image used for measurement

Welds History

Date	Path to Image	Setting
Wed 3/24/2016 09:55 AM	C:\Welding\...\sample_08.tif	LIM Weld 001
Wed 3/24/2016 09:50 AM	C:\Welding\...\sample_07.tif	LIM Weld 001
Wed 3/24/2016 09:45 AM	C:\Welding\...\sample_06.tif	LIM Weld 001
Wed 3/24/2016 09:40 AM	C:\Welding\...\sample_05.tif	LIM Weld 001
Wed 3/24/2016 09:35 AM	C:\Welding\...\sample_04.tif	LIM Weld 001
Wed 3/24/2016 09:30 AM	C:\Welding\...\sample_03.tif	LIM Weld 001
Wed 3/24/2016 09:25 AM	C:\Welding\...\sample_02.tif	LIM Weld 001
Wed 3/24/2016 09:20 AM	C:\Welding\...\sample_01.tif	LIM Weld 001

Setting: LIM Weld 001 Show Drawing

Parameters

Parameter	Value	OK / NOK	Min.	Max.
a	6.5			
a1	0.3			
a2	1.0			
s				
b	1.4	NOK		1.2
z1	4.5			
z2	5.0			
h1	1.6			
h2	1.5			
f11	3.6	OK	3.0	3.9
f12	3.3	OK	3.3	4.0
t1	3.5			
t2	2.0			
asym	0.11	OK		0.2
G				
shape	Convex	OK		

Result

NOK

Report...
Alternative Report...
Export to Excel

