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Customising PowerINSPECT

Excel Report

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Introduction

PowerINSPECT Excel reports are based on template files. Template files are, in fact, Excel Workbooks that describe how the information from PowerINSPECT will be arranged on the final report.

A Template File is divided into different Excel sheets. When customising a PowerINSPECT Excel Report, you will have to modify only two of them: The *Template sheet* and the *Header sheet*.

The *Template sheet* describes the look of the final report and is divided by section, each of one describing a specific report part.

The *Header sheet* is used to transfer variables between PowerINSPECT and the Report Generator, this sheet will reflect the variables that are defined in the *PowerINSPECT Variable Property Sheet* as shown in figure 1.

The *Database sheet* is used internally to record data for the Graphics and should not be modified.

Figure 1 the PowerINSPECT Variable Property page

The other sheet (*3D Measure, Guided Point, Edge Point, Surface Point*) are used to   transfer items information between PowerINSPECT and the Report Generator and should not be modified. The *Test Gauss sheet* is used internally to record data for the Gauss Graph and should not be modified.

Before you start.

Creating a new template file.

> **To create a new template file, please have a look to the existing template files. It's easier to modify a template that is almost what you need than to create one from scratch.**
> **Make a copy of this file and copy it to the template directory with a different name.**

Note :   the template directory should be
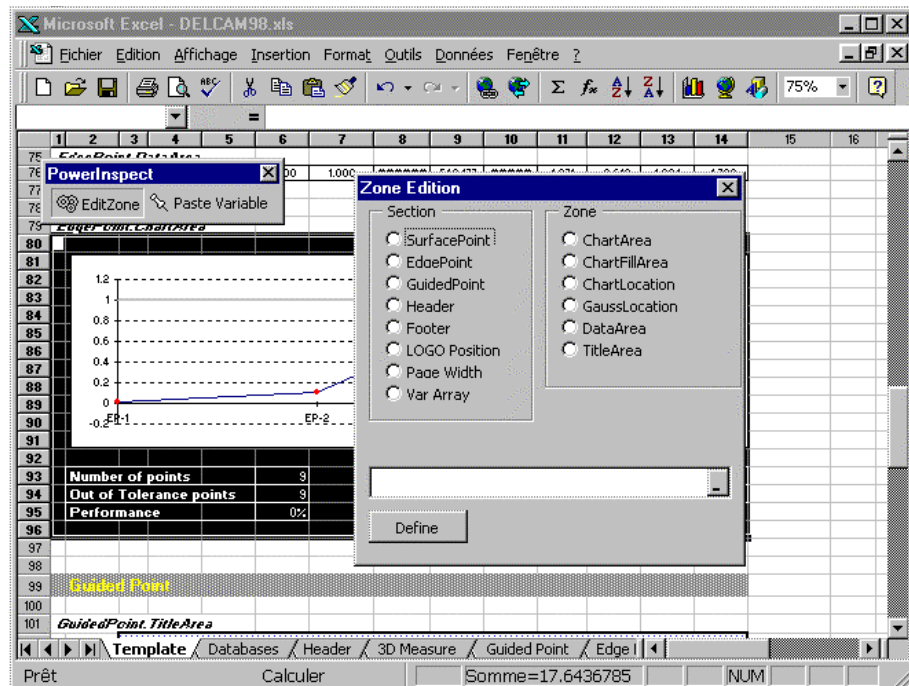   C:\dcam\product\PowerInspect1350\template.

Figure 2 the PowerINSPECT Zone Edition Dialog box

Avoiding problem with hidden documents:

> When PowerINSPECT is creating a report, the PowerINSPECT Report generator load the requested template file and hide it. This template file is loaded as read only.
> Before trying to modify a template, please check that the file is not hidden.
> Go to the menu Window/unhide and select the document you what to unhide.

Some EXCEL prerequisites :

> The PowerINSPECT Excel report mechanism use intensively named cells. Please read the Excel © documentation to understand how to define named cells before starting. For example, to know which cells will be copied to the report, the PowerINSPECT Report Generator will look after a name 'Header'. Then, the PowerINSPECT Report Generator will copy this area to the clipboard and paste it to the final report.

Figure 3 the Excel Name dialog box

Using the Excel Tools to define Named Cells

> To get a list of all used names in the Template Workbook select the command INSERT/NAME/DEFINE into EXCEL. The following dialog box will appear and will show you all the name used by the PowerINSPECT Report Generator.
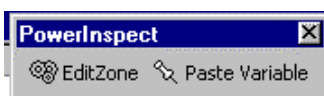
Figure 4 PowerINSPECT Excel ToolBar

Using the PowerINSPECT Tools to manage Named Cells

> The PowerINSPECT Report Generator provide a tool that will help you to define Named Cells in the Template Sheet.
> Click on the *EditZone* Button in the *PowerINSPECT Excel Toolbar* to open the *PowerINSPECT Zone Edition Dialog Box* to define or locate named cells.
>
> When you click select a section and a zone the matching cells in the Excel template will be hilighted.

You can redefine the zone by clicking the button , and then select the new cells. Then, press the *Define* button to save the new value.

Process
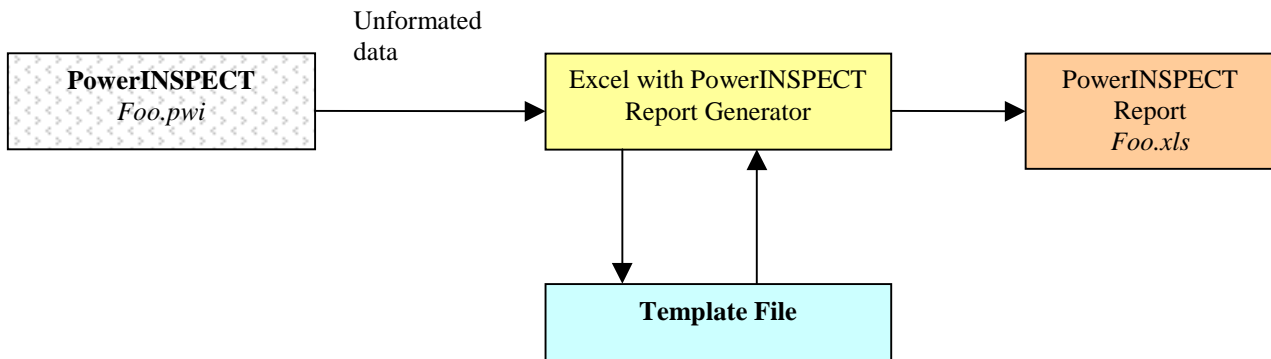
Template File

> a Excel file that contains formatting ruled used by the PowerINSPECT Report Generator to create the final PowerINSPECT Report. The templates files are located in the c:/dcam/product/PowerInspect1350/template directory.

PowerINSPECT Document

> a document created in the PowerINSPECT Main Application that contains the measure sequence and the associated results , the extension of this file is .PWI

PowerINSPECT Report Generator (PRG)

> a Excel Add-in Macro that will create a final report file with the unformatted data sent by PowerINSPECT and the Template File.

Report

> the report is the final PowerINSPECT report created as an Excel File by the PowerINSPECT Generator. This file is located in the same directory as the matching PowerINSPECT Document.
> I.e. if the PowerINSPECT document is c:/dcam/product/powerInspect1350/myfiles/foo1.pwi the report file will be c:/dcam/product/powerInspect1350/myfiles/foo1.xls

How it's working

When you click on the Excel Icon in the PowerINSPECT Application, PowerINSPECT will send *unformatted data* from the current active measure to Excel. The PowerINSPECT Report Generator (PRG) will then open the final report (foo.xls) and create a sheet that will contains the final formatted report for that measure. The name of this sheet will be the measure name (i.e MasterPart or Measure 1). The report will contains one sheet for each measure you have in the PowerINSPECT Document (foo.pwi), and will be located in the same directory as your PowerINSPECT Document.

Then the PRG will open the Template file requested by PowerINSPECT. The PRG will analyse the unformatted data and, for each measure item, the PRG will transfer the unformatted item data to a transient area. The template file will now reflect new formatted information and PRG will transfer the Formatted Data to the final report.

The Template Sheets

The Template sheet

This sheet is divided into several sections, each of one describes a component that will appears in the report.
All the cells will be exactly copied as shown to the PowerINSPECT Excel Report.
You can modify the format of any cells (border, fonts, colour, row height, conditional format, etc…)
Every cell can contain complex formula that will be evaluated before being copied into the PowerINSPECT Excel Report.

Note: Excel requires that every sections have the same number of columns. If you want to insert a column for a given section, you will have to adapt the other sections as well.

The HEADER Section

This section describes the report header and contains the Company logo.

All the displayed information (ie description, part number) can be customised for each report, in this case the cells that contains variable information are linked to a cell which is located in the HEADER.

The Header can contain hard-coded information, like the address of you company, or variable that will be replaced by PowerINSPECT when the final report will be created. (i.e. : part number, name of the controller …). See later in this chapter how to insert variables in the header section.

In order to highlight the area that will be copied to the PowerINSPECT Excel Report, select the Name dialog Box (INSERT/NAME/DEFINE) and then select the Header Variable, you can also use the EditZone PowerINSPECT dialog box, and click on the Header radio button to automatically highlight or modify the header section.

Note: If you want to add some lines to the Header, please verify afterwards that the Header Name refers to the good cell matrix and modify it if necessary.

Zone names

Header :	**Contains the reference of the Cells Matrix that will be copied to the PowerINSPECT Excel report.**
Header.LogoPosition **:**	**Contains the reference of the Cells Matrix that will contains the company logo.**

Variables:

Header.ForcePageBreak :

Contains TRUE if a Page break needs to be inserted after the Header in the PowerINSPECT Excel Report.
This variable can be found in the HEADER Sheet

How to change the LOGO :

- **Delete the current LOGO image.**
- **Copy a new image into the Template Sheet**
- **Name the image 'LOGO'**
- **Select a cell matrix that will contains the logo , and name this range 'Header.LogoPosition' using the Dialog box (INSERT/NAME/DEFINE)**

How to insert Variables into the Header:

- **Find the cells containing the variable to insert into the Header Sheet**
- **Select the Cell and Copy it to the clipboard (CTRL+C)**
- **Select a cell into the header section**
- **Right click on the mouse to get the context menu**
- **Select the Paste Special menu item**
- **Select paste with link.**
- **The formula in the cells should be like =Header!L10C4**

The FOOTER Section

Footer

Note:

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Visa: 28 January 1998

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This section describes the report footer. The footer can contains variables and can be customised in the same way as the *Header Section*.

Zone names:

Footer :   **Contains the reference of the Cells Matrix that will be copied to the PowerINSPECT Excel report.**

The SURFACE POINT Section :

Point Surface

SurfacePoint.TitleArea

Number	Name	Offset	Lo. Tol.	Hi. Tol.	X	Y	Z	dX	dY	dZ	DL
					Surface Points						

SurfacePoint.DataArea

Number	Name	Offset	Lo. Tol.	Hi. Tol.	X	Y	Z	dX	dY	dZ	DL
3017	S32	0.000	-0.300	0.300	2305.960	450.625	1037.365	0.288	-0.017	-0.290	-0.409

SurfacePoint.Chart
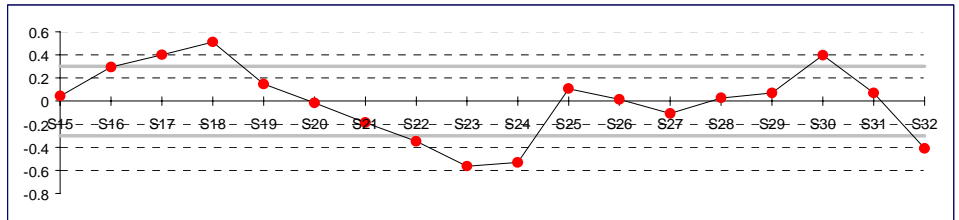
Number of points	9
Out of Tolerance points	4
Performance	56%

Mean	0.031
Std. deviation	0.353

Max. Value	0.510
Min. Value	-0.564
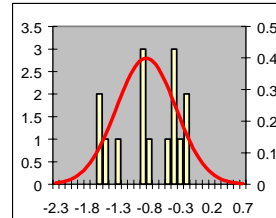
This section describes the look of a Surface point on the report. This section is divided into several areas:

SurfacePoint.TitleArea:

This area contains the cells that will be copied on the top of a Surface point group (just under the group section) and that will be duplicated on the top of every new page. The legend for each columns used to describe a Surface Point on the final report need to be inserted here.

SurfacePoint.DataArea:

This area contains the cells that will be copied for each measured Surface point of the group. Every Surface Point items must be inserted using an Excel Variable.

The Surface Point Excel Variables are:

Name	Comment
SurfacePoint.Number	Point number

SurfacePoint.Name	Point Name
SurfacePoint.IDSurf	ID of the targeted surface
SurfacePoint.Xtheoric	
SurfacePoint.Ytheoric	
SurfacePoint.Ztheoric	
SurfacePoint.Offset	Surface Offset
SurfacePoint.Xnormal	
SurfacePoint.Ynormal	
SurfacePoint.Znormal	
SurfacePoint.ExitDirection	Clearance direction (X+,X- ,Y+,Y-,Z+ or Z-
SurfacePoint.DeltaX	Delta along the X axis
SurfacePoint.DeltaY	Delta along the Y axis
SurfacePoint.DeltaZ	Delta along the Z axis
SurfacePoint.DeltaL	True signed error along the normal direction, with + sign given by the direction of the Exit direction.
SurfacePoint.LowerTol	
SurfacePoint.UpperTol	
SurfacePoint.XCAD	Coordinates of the Original point if a transformation Matrix has been applied to the Cad DATA.
SurfacePoint.YCAD	
SurfacePoint.ZCAD	
SurfacePoint.XTarget	Coodinates of the targeted Point (only used with guided point)
SurfacePoint.YTarget	
SurfacePoint.ZTarget	

Example:
If you want to display in a cell the name of the Surface point simply insert this formula in the cell :

```
=SurfacePoint.Name
```

Note :   you can use Formula to create complex output like :

```
=IF(SurfacePoint.Offset=0,"","offset " &TEXT(SurfacePoint.Offset,"0.00"))
```

or:

```
=IF(ISNUM(SurfacePoint.DeltaL);IF(SurfacePoint.DeltaL)>SurfacePoint.UpperTo
l, SurfacePoint.DeltaL- SurfacePoint.UpperTol,IF(SurfacePoint.DeltaL <
SurfacePoint.LowerTol, SurfacePoint.DeltaL- SurfacePoint.LowerTol,"")),"")
```

SurfacePoint.ChartFillArea

This area should no be changed, and is used by the PowerINSPECT Report Generator to extract the transient data that will be recorded to create the Graphics and the statistical information.

Note: Please, do not modify this section manually since this can damage the graph output.

SurfacePoint.ChartArea:

This area contains the cells that will be copied at the end of a Surface Point Group. This area can contains statistics, error graphs and gauss graph.

The location of the graph inside the Surface Point Chart Area are named :
SurfacePoint.ChartLocationSurface
Point.GaussLocation

The name of the Error Chart must be SurfacePoint_Graphe.
The name of the Gauss Graph must be GrapheGauss.

You can extract statistical information by using Excel Database build-in functions and the PowerINSPECT database name and criteria.

The Excel name for the PowerInpsect Surface point database is SurfacePoint.Database.
PowerINSPECT provide also two filters used to extract statistic for the whole set of point or for only out of tolerances points, they are:
SurfacePoint.AllCriteria (no filter)
SurfacePoint.OutOnlyCriteria (out of tolerances points)

For example:

To insert the mean of the error for the current Surface point group into a cell, use this formula.
```
=DBMEAN(SurfacePoint.Database,"Delta",SurfacePoint.AllCriteria)
```

To insert the number of out of tolerance point into a cell, use this formula:
```
=DBNB(SurfacePoint.Database,4,SurfacePoint.OutOnlyCriteria)
```

Note 1:   the SurfacePoint.ChartLocation and SurfacePoint.GaussLocation must lie inside the SurfacePoint.ChartArea.

Note 2:   The Gauss graph is shared by Surface Point, Edge Points and Guided point. If you don't want to use the Gauss graph in your customised report, remove the GaussLocation named cells but do not remove the Gauss Graph it-self.

Note 3:   The Error graph contains 4 series, one for the abscissa, two for the tolerances (upper and lower) and the last one for the error. You can customise the graph as you like using the standard Excel tools.

The GROUP Section

Group

Group.DataArea

Inspection group 5

this section describes the look of a Group sub-header on the report.

The variables you can add to the Group Area are :

Name	Comments
Group.Number	
Group.Type	
Group.Name	
Group.Comment	

The EDGE POINT Section

Edge Point

EdgePoint.TitleArea

		Points on the Edge									
Number	**Name**	Offset	Lo. Tol.	Hi. Tol.	X	Y	Z	dX	dY	dZ	**DL**

EdgePoint.DataArea

5008	EP-9	0.000	1.000	1.000	2320.096	540.177	1006.034	1.271	-0.613	1.084	-1.780

EdgePoint.Chart
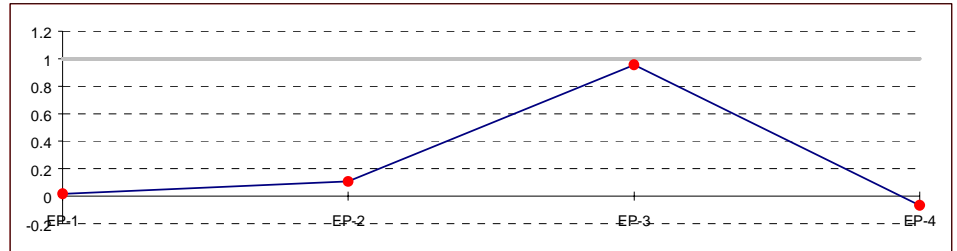
Number of points	9	Mean	-0.297	Max. Value	0.956
Out of Tolerance points	9	Std. deviation	0.764	Min. Value	-1.780
Performance	0%				

this section describes the look of a edge point on the report.
This section acts as the formally described SurfacePoint Section. Please refer to this section for details.

The variable you can used in this section are :

Name	Comments
EdgePoint.Number	
EdgePoint.Type	
EdgePoint.Name	
EdgePoint.IDSurf	
EdgePoint.XTheoric	
EdgePoint.YTheoric	
EdgePoint.ZTheoric	
EdgePoint.Offset	
EdgePoint.XNormal	
EdgePoint.YNormal	
EdgePoint.ZNormal	
EdgePoint.XNormalEdge	
EdgePoint.YNormalEdge	
EdgePoint.ZNormalEdge	
EdgePoint.DeltaX	
EdgePoint.DeltaY	

EdgePoint.DeltaZ
EdgePoint.DeltaL
EdgePoint.LowerTol
EdgePoint.UpperTol
EdgePoint.XCAD
EdgePoint.YCAD
EdgePoint.ZCAD
EdgePoint.NBXCAD
EdgePoint.NBYCAD
EdgePoint.NBZCAD

The GUIDED POINT Section

Guided Points

GuidedPoint.TitleArea

				Points Guidés							
Number	Name	Offset	Lo. Tol.	Hi. Tol.	X	Y	Z	dX	dY	dZ	DL

GuidedPoint.DataArea

Number	Name	Offset	Lo. Tol.	Hi. Tol.	X	Y	Z	dX	dY	dZ	DL
6001	PT2	0.000	-0.200	0.200	550.000	750.000	750.000	-0.002	-0.001	0.002	0.003

GuidedPoint.Chart
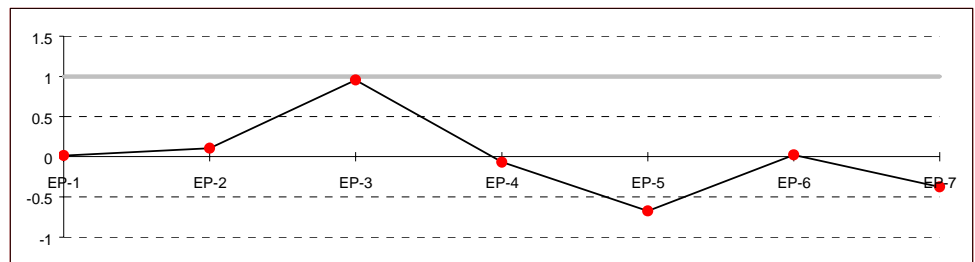
Number of points	9	**Mean**	-0.043	**Max. Value**	0.424
Out of Tolerance points	3	**Std. deviation**	0.260	**Min. Value**	-0.535
Performance	67%				

**This section describes the look of a guided point on the report
This section acts as the formally described SurfacePoint Section. Please
refer to this section for details.**

The variables you can use in this area are :

Name	Comments
GuidedPoint.Number	
GuidedPoint.Type	
GuidedPoint.Name	
GuidedPoint.IDSurf	
GuidedPoint.Xtheoric	
GuidedPoint.Ytheoric	
GuidedPoint.Ztheoric	
GuidedPoint.Offset	
GuidedPoint.XNormal	
GuidedPoint.YNormal	
GuidedPoint.ZNormal	
GuidedPoint.ExitDirection	
GuidedPoint.DeltaX	
GuidedPoint.DeltaY	
GuidedPoint.DeltaZ	
GuidedPoint.DeltaL	
GuidedPoint.LowerTol	
GuidedPoint.UpperTol	
GuidedPoint.XCAD	
GuidedPoint.YCAD	
GuidedPoint.ZCAD	
GuidedPoint.XTarget	
GuidedPoint.YTarget	
GuidedPoint.ZTarget	

the 3D MEASURE Section

3D Measure

Measure.DataArea

Hole b 13	Lo. Tol.	Hi. Tol.		Nominal	Measure	Error	Over

MeasurePT.DataArea

		Lo. Tol.	Hi. Tol.		Nominal	Measure	Error	Over
	X	-1.000	1.000		2610.530	2612.731	2.201	1.201
Centre	Y	-1.000	1.000		-765.150	-766.263	-1.113	-0.113
	Z	-1.000	1.000		1554.630	1555.785	1.155	0.155

MeasureDim.DataArea

Angle	0.000	0.000		0.000	-179.999	-179.999	-179.999

MeasureForme.DataArea

Rectitude	Limit	0.010	**Measured**	0.000	**Min. Value**	0.000
No. of points	3		**Std. Dev.**	0.000	**Max. Value**	0.000

MeasureFooter.DataArea

This section describes the look of a geometric measure on the report.

A 3D Measure in the PowerINSPECT Template is divided into 4 sub-sections.

Measure.DataArea

This sub-section is the common header that will be displayed for each 3D measure. This sub-section contains the name of the measured item and some legend for the following section. This sub-section is copied once at the beginning of the Item description onto the final Excel report.

The variable you can used in this sub-section are :

Name	Sample Value	Comments
Measure.Number	2002	
Measure.Name	Hole b 13	

MeasurePT.DataArea

This sub-section is used to describe a X,Y,Z Co-ordinates as the result of a 3D Measure. For example, this sub-section will be used to display the data of a circle centre or the intersection between two lines.
This sub-section can be copied more than once by the PowerINSPECT generator in the final report according the current item.

The variable you can used in this sub-section are :

Name	Value	Comments
MeasurePT.Number	point	
MeasurePT.Name	Centre	
MeasurePT.UseX	1	1 if the X coordinate need to be displayed 0 otherwise
MeasurePT.UseY	1	
MeasurePT.UseZ	1	
MeasurePT.XTheoric	2610.53	
MeasurePT.YTheoric	-765.15	
MeasurePT.ZTheoric	1554.63	
MeasurePT.XLowerTol	-1	
MeasurePT.YLowerTol	-1	
MeasurePT.ZLowerTol	-1	
MeasurePT.XUpperTol	1	
MeasurePT.YUpperTol	1	
MeasurePT.ZUpperTol	1	
MeasurePT.XMeasured	2612.7313	
MeasurePT.YMeasured	-766.2627	
MeasurePT.ZMeasured	1555.7853	

MeasureDim.DataArea

This sub-section is used to display a dimension or an angle.
This sub-section can be copied more than once by the PowerINSPECT generator in the final report according the current item.

The variables you can use in this sub-section are :

Name	Value	Comments
MeasureDim.Number	angle	
MeasureDim.Name	Angle	
MeasureDim.Theoric	0	
MeasureDim.LowerTol	0	
MeasureDim.UpperTol	0	
MeasureDim.Measured	-179.9988	

MeasureForme.DataArea

This sub-section is used to display a geometrical error like circularity, flatness etc …
This sub-section can be copied more than once by the PowerINSPECT generator in the final report according the current item.

The variable you can used in this sub-section are :

Name	Sample Value	Comments
MeasureForme.Number	forme	
MeasureForme.Name	Rectitude	
MeasureForme.NumberOfPoints	3	
MeasureForme.MaxValue	0	
MeasureForme.MinValue	0	
MeasureForme.Measured	0	
MeasureForme.StdDev	0	
MeasureForme.Mean	0	
MeasureForme.UpperTol	0.01	

MeasureFooter.DataArea

This sub-section is used only once at the end of a 3D Geometric item and contains no data. This will allow you to close the border with a straight line for example.

TroubleShooting

PowerINSPECT cannot create report

Verify that the PowerINSPECT97.xla has been correctly inserted in the Add-in Excel dialog box.

How can I test a Section I have just customised in a Template Workbook

You can test the Template section you've just customised by modifying the sample value in the matching sheet.
For example:
If you want to test the SurfacePoint section in the Header Section with different values, modify the sample values into the sheet SurfacePoint and press F9 to ask excel to update the data.

Note: The excel Automatic calculation has been disabled in PowerINSPECT Template Workbook in order to speed up the PowerINSPECT Report Generator. Don't forget to press F9 to ask Excel to update any cells after modifying the sample values.