

# Operation Manual

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## How to Customize the Generated Report

Software – FanTestic  
and FanTestic Integrity



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# 1 Getting Started



FanTestic is software designed to capture data and calculate results required for the analysis of building energy leakage based on one of a number of published Test Standards.

Once you have test results, you can generate a report in MS Word or export your test readings into MS Excel.

This document describes how to customize the .look of the report that will be generated so you can produce a document with the layout you require to report results to your clients.

To generate a report, FanTestic creates a copy of the template with the report name chosen and then goes through the new document, replacing any of the tags (words surrounded by {}) with specific test results or words, or deleting whole paragraphs starting with certain tags.

For example, the first page has a tag {BuildingPicture} which is replaced by the picture selected in the test as the “Building Image” in the report that is generated.

If a report was generated from the test pictured above, {BuildingPicture} in the report would be



replaced with the image automatically.

For many of the tags that replicate the headers used in the FanTestic UI, translated words will be put into the generated report.

For instance, since {Results} corresponds to a header used in the FanTestic UI, if it has been translated for use in the FanTestic UI, the translated word for “Results” will appear in the generated report.

## 1.1 Perform an air leakage test to get results for a report

You can carry out the building leakage tests using a gauge, fan and door panel and capture the readings on paper to later enter into FanTestic so the software can calculate compliance for you

Alternatively, you can use FanTestic to automatically control your gauge and fan to carry out the test by stepping through the required induced pressure target points and capturing data according to the Test Standard.

You must carry out a building air leakage test and enter results into, or capture the test results using, FanTestic or Integrity software before you can generate a report from the test.

For reference you can look at the following Retrotec guides:

[Air Leakage Testing Procedures Manual](#)

Door Fan Operation Manual: [for 200, 300, 1000-3000 systems](#) [for 300, 5000-6000 systems](#)

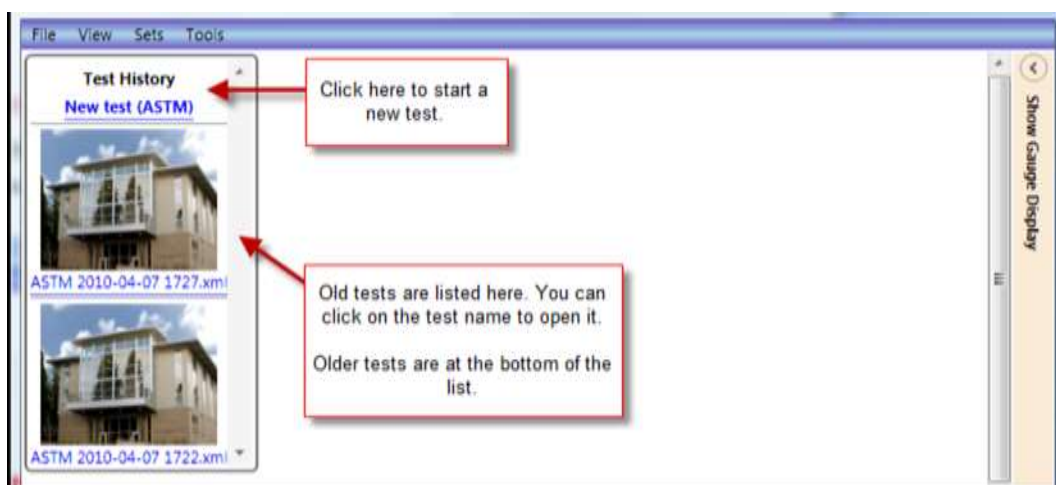
Multiple Fan Testing (Large Buildings): [for 1000-3000 systems](#) [for 5000-6000 systems](#)

## 1.2 Open a test file containing results (.exml or .fxml)

To open a previous test that has already been completed and saved, there are several options:

- The main screen for FanTestic and Integrity can display previously completed tests in the “Test History” pane on the left hand side (with a photo of the building, if it was included when the test file was created). If you have this option turned on (“Test History” → “AutoHide” not enabled), the list will remain open on the left at all times. Click the name of the test file you would like to open.
- Go to menu item “File” → “Open” and a pop-up Windows Explorer window will display all tests in the [MyDocuments]\Retrotec\Tests folder
  - FanTestic tests will have the file extension “.exml”
  - Integrity tests will have the file extension “.fxml”.
- Go to menu item “Test History” → “Show” – the left hand list of all saved tests will appear, the same as the one displayed on the opening screen for FanTestic.

Old tests are listed as a history, below the “New test” option if you have the history list open. You can click on any test name or picture to open that previously saved Test. Older tests are at the bottom of the list.



## 1.3 Create a report from the Test results in MS Word

FanTestic includes a built-in template to generate reports for test results, each template specific to a test standard (such as ASTM). Users can customize the templates, and can have several different templates for each standard if they wish. Before generating a report, FanTestic will ask the user to choose the template from which to generate the report.

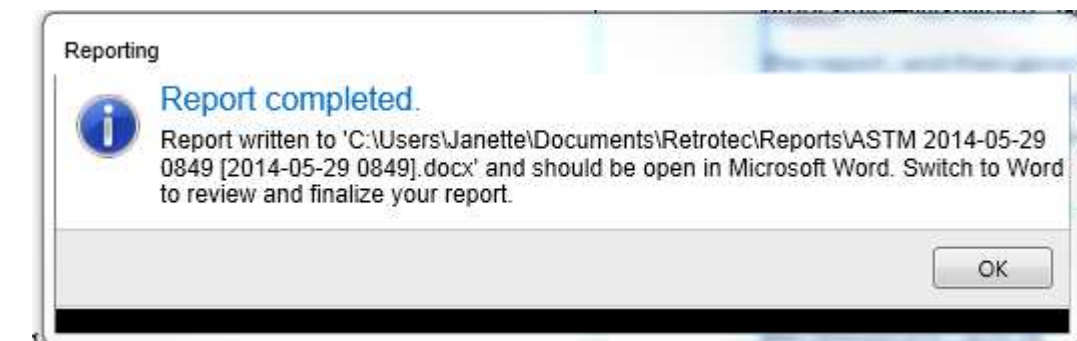
The report generation function is only available if you have a valid, non-expired license for FanTestic. If you do not have such a license, you will be limited to seeing results on the screen.

### 1.3.1 Generate Report

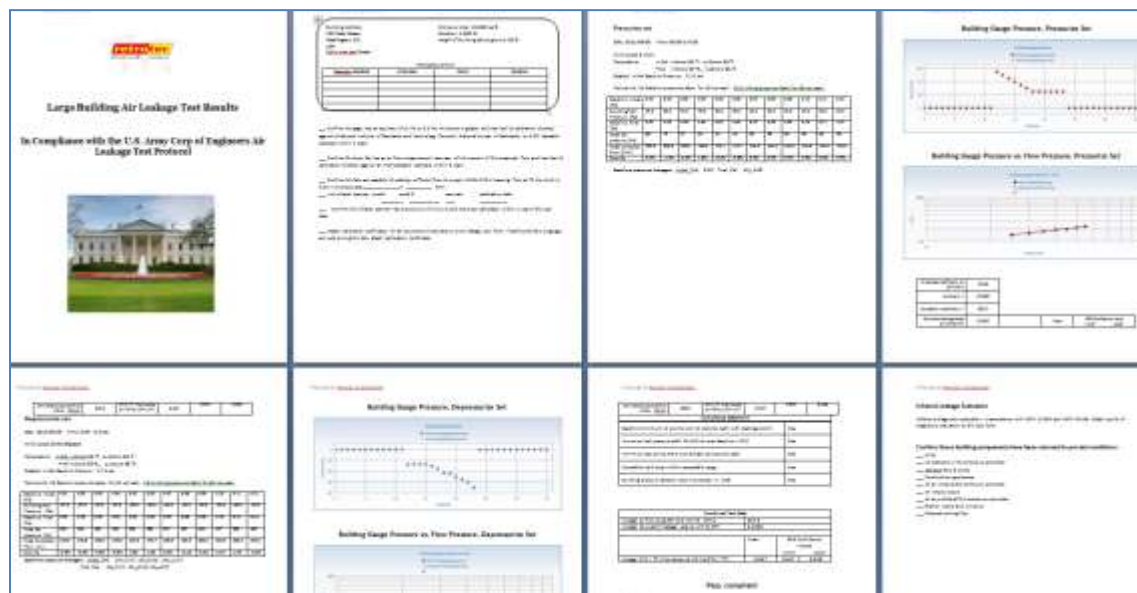
To generate a report, click on “File” → “Generate Report (docx file – MS Word)”.

FanTestic will ask you to choose the template to use for the report, and then generate and automatically open a Word document containing the data and results from your test. The generated report will be saved in your [MyDocuments]\Retrotec\Reports folder with a name based on the name of the test file the report is being generated from and the current date-time.

In the following example, the test file “ASTM 2014-05-29 0849.xml” contains the test results being reported, so the report generated was named “ASTM 2014-05-29 0849 [yyyy-MM-dd]” and put into the [MyDocuments]\Retrotec\Reports folder:

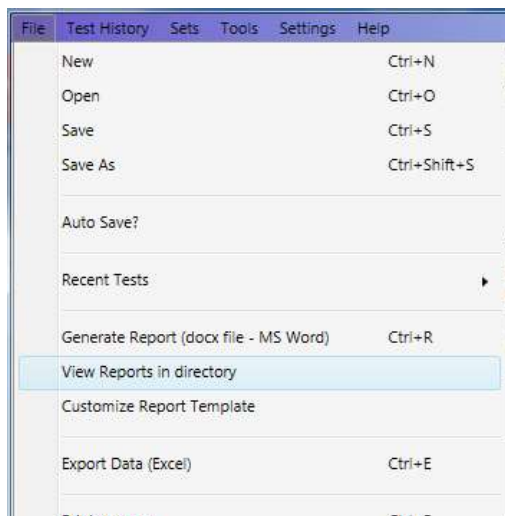


Once the Word document is open, you can edit and print it directly, or create a PDF using the functions of MS Word.



### 1.3.2 View listing of reports

Click on “File” → “View Reports in directory”.



Windows File Explorer will open on your [MyDocuments]\Retrotec\Reports folder.

You can then open any of the report (.docx) files that appear to see the report.

## 1.4 Export Data to MS Excel from FanTestic only

FanTestic includes a template for raw data to be exported to Microsoft Excel, in order to view all readings that went into each averaged test point.

To export data, click “File” → “Export Data (Excel)”. This process takes a few minutes, especially for large files, so allow it to process even if it appears to be frozen.

Once completed, an Excel spreadsheet document will open containing all data readings taken during the test. These will be stored in the same location as the reports ([MyDocuments]\Retrotec\Reports), but will have the file extension .xlsx.

| Time                     | Speed (m/s/hr) | Manual R | Test Parameters |
|--------------------------|----------------|----------|-----------------|
| 27 2011-06-08 8:23:05 AM | 240 141.2587   | 0        | 0               |
| 27 2011-06-08 8:23:11 AM | 240 141.2587   | 0        | 0               |
| 27 2011-06-08 8:23:15 AM | 240 141.2587   | 0        | 0               |
| 27 2011-06-08 8:23:24 AM | 240 141.2587   | 0        | 0               |
| 27 2011-06-08 8:24:00 AM | 240 141.2587   | 0        | 0               |
| 27 2011-06-08 8:24:02 AM | 240 141.2587   | 0        | 0               |
| 27 2011-06-08 8:24:06 AM | 240 141.2587   | 0        | 0               |
| 27 2011-06-08 8:24:23 AM | 240 141.2587   | 0        | 0               |
| 27 2011-06-08 8:24:25 AM | 240 141.2587   | 0        | 0               |
| 27 2011-06-08 8:24:32 AM | 240 141.2587   | 0        | 0               |
| 27 2011-06-08 8:24:39 AM | 240 141.2587   | 0        | 0               |
| 27 2011-06-08 8:24:48 AM | 240 141.2587   | 0        | 0               |
| 27 2011-06-08 8:24:54 AM | 240 141.2587   | 0        | 0               |
| 27 2011-06-08 8:25:04 AM | 240 141.2587   | 0        | 0               |
| 27 2011-06-08 8:25:33 AM | 240 141.2587   | 0        | 0               |

## 2 Customize the way your Report looks

Behind the scenes, reports are generated by copying a template which contains **words surrounded by {}** known as “tags”, and then replacing **tags** in the copied template with the actual test data, reports generated by FanTestic and Integrity are customizable in Microsoft Word by changing the template document.

Change the layout and text surrounding the tags in the template to customize the way the test results are presented.

Some tags are “paragraph deletion markers” and are used to remove whole sections of the template when they are not necessary.

The report generation and template editing functions are only available if you have a valid, non-expired license for FanTestic or Integrity. If you do not have such a license, you will be limited to seeing results on the screen.

### 2.1 Create a customized Template document

To start customizing a template, click on menu item “File” → “Customize Report Template”.



FanTestic will then copy a clean default template for the standard (and language) you are using to a new document called “xxxxxx\_To\_Customize [yyyy-MM-dd hhmm].docx” and open that for you to edit.

Test reports are generated from templates specific to the Test standard being used (ASTM, EN13829EU, EN13829, EN13829FR, EN13829DE, EN13829BE, EN13829SE, CGSB, ATTMA, USACE for FanTestic or NFPA, ISO, ISO2000, NFPA2004 for Integrity).

The templates can also be specific to the language of the report.

For example, ASTM test reports in English are generated using the template called “ASTM-en.docx” which will be located in the [MyDocuments]\Retrotec\Templates folder after you have created at least one report.

If you want to create a language specific template, to match the language you use in the user interface, you can translate the template and call it “ASTM-xx.docx” where xx is replaced with the country identifier.



Some templates are already provided in translation, and if so, they will automatically be chosen for you if you have changed the language to use in FanTestic.

## 2.2 Things not to change

Do not change any of the wording between curly braces: {}. In particular, do not translate these tags to another language.

These are the tags FanTestic used to export results from the test into your report. If they are removed the information will not show up in future reports.

For example, if you remove the tag {BuildingPicture} from the template, the image you select for the building in the test will not show up anymore in the generated report.

If you move or edit the document, check all the tags afterwards to ensure that there are no spaces between the curly brace and the first or last letter of the token within the curly braces.

## 2.3 Change layout and text surrounding tags

Users customize the report output by changing the text in the template file that is used to create the Word document, and as long as the tags remain somewhere in the template, test data will be output to the generated document, replacing those tags.

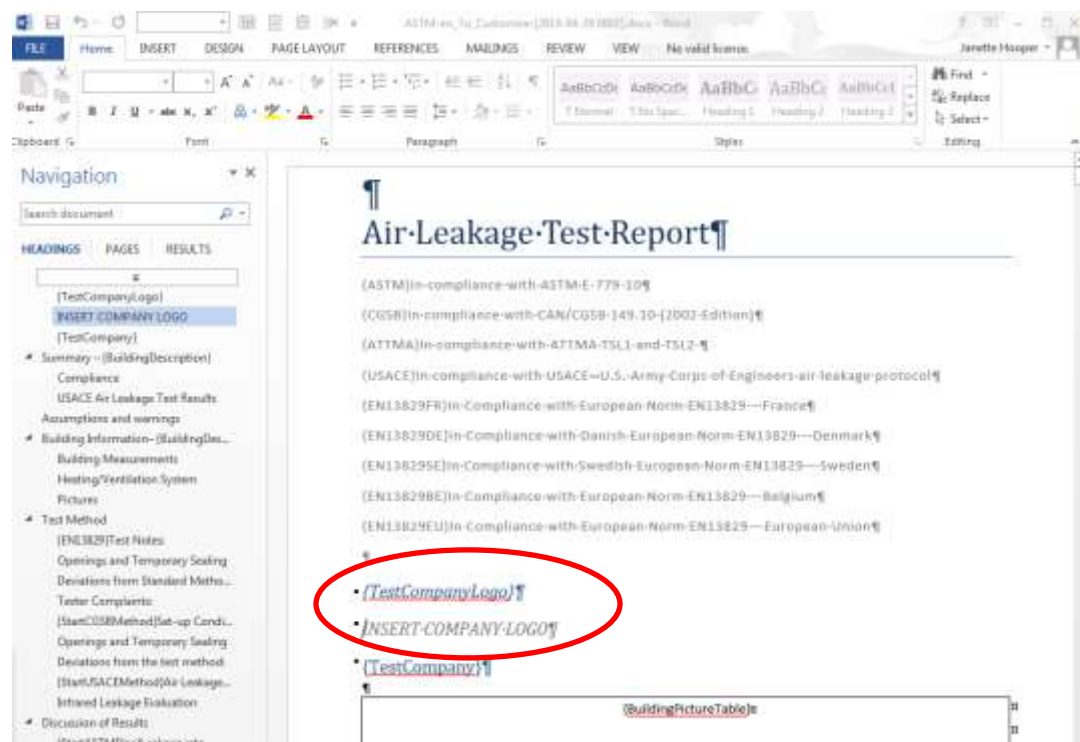
If you are editing an existing template, you will only need to change the layout and text surrounding the existing tags. Be careful not to edit the tags themselves.

If you delete a tag, the test result corresponding to the tag will no longer be put into any reports generated based on the template with the missing tag.

Tags are available for many items in the user interface.

### 2.3.1 Example: Insert your company logo

Edit the report template of interest. On the first page, the tag {TestCompanyLogo} and the grey “INSERT COMPANY LOGO” can be replaced by an image with your company logo.



Just paste the logo into the document and delete the paragraphs with {TestCompanyLogo} and “INSERT COMPANY LOGO”, as shown in the following:



Save the template, and the next report you generate with this saved template will have your company logo on the first page.

### 2.3.2 Insert header or footer

If you would like to customize your report further, you can create a footer that will appear on every page. The default template includes some fields provided by MS Word – one showing the name and location of the document, the page numbers, and the date of creation. These can be updated, and you can add anything else you like into either the header or the footer.



### 2.4 Include or exclude a single paragraph or table

Some of the tags are “paragraph/table deletion marker” tags, and the entire paragraph following the tag will be deleted under certain circumstances.

These tags are used to include or exclude specific paragraphs or tables based on conditions of the test being used to generate the report. See the list of these tags in table in section 3 or 4.

For example, there can be Test standard specific paragraphs:

~~{EN13829SE}~~In Compliance with Swedish European Norm EN13829 – Sweden~~}~~

If the Test standard in use by the test you are using to generate the report is NOT {EN13829SE}, then this entire paragraph (from the start of the curly braces up until the ~~}~~ paragraph end mark) will be deleted.

For a whole table to be retained (or deleted) the tag must be in the first cell of the table.

If the tag is a paragraph deletion tag and is in the first cell of a row, the entire row will be deleted.

If the tag is in an interior cell in a table, it will be treated as either a replacement tag or a single paragraph deletion tag.

## 2.5 Include or exclude a set of paragraphs

FanTestic has some tags that can be used to surround a large set of paragraphs, and delete all the material between the start and end tags. These are used in particular to exclude a data set that does not exist in the test data, or to exclude sections that do not apply to a particular test standard.

For example: if there is only one data set in the test, all the paragraphs between {2-StartSetReport} and {2-EndSetReport} will be removed.

For example: if ASTM is not the test standard in use, all the paragraphs between {StartASTMDisc} and {EndASTMDisc} will be removed.

## 2.6 Use your new template when generating reports

To generate a report, click on “File” → “Generate Report (docx file – MS Word)”.

FanTestic will open a file chooser on the [MyDocuments]\Retrotec\Templates folder, and ask you to choose the template to use for the report. At this point you can choose your newly created template or any of the ones in this folder.

Once a template is chosen, FanTestic will generate and automatically open a Word document containing the data and results from your test.

The generated report will be saved in your [MyDocuments]\Retrotec\Reports folder with the name you choose.

# 3 Tags for FanTestic

Tags are created by putting the token from the table into curly braces.

## 3.1 Text Replacement tokens

If one of these tokens is found inside a report template document, surrounded with curly braces, FanTestic will replace the tag (token inside curly braces) with the value from the test being used to generate the report. The formatting of the value in the output report will be the same as the style of the tag in the template document.

- -n- means a numerical value is required (e.g. # of data set, # of door fan) - see notes for each token for individual explanation.

- -p- means a numerical value for point number is required, points within sets
- For many of the items that are headers, some are the same as used in the FanTestic UI. If the header has been translated for the FanTestic UI, these header tokens can be put into the generated report in translated form (instead of english). User must have the language set in the UI, and should be using a language specific template.

| Replacement Token    | Units Included? | Standard(s) / Application | Token replaced with:  |
|----------------------|-----------------|---------------------------|---|
| Accuracy             | Yes             | EN13829 variants          | % accuracy of measurements entered                                      |
| AirChangesRefPa      | no              | ATTMA                     | reference pressure for air changes                                      |
| AirChangesRefPa      | no              | EN13829 variants          | reference pressure for air changes                                      |
| AirFlow1RefPa        | no              | All                       | Reference pressure for main air flow measurement                        |
| AirFlow2RefPa        | no              | All                       | Reference pressure for secondary air flow measurement, if any           |
| AirSealingNotes      | N/A             | ATTMA                     | air sealing notes   |
| ApplicationVersion   | N/A             | All                       | FanTestic version used  |
| ASTMRefPa1           | no              | ASTM                      | ASTM reference pressure   |
| AvgAirChanges-Result | no              | ASTM                      | used in the infiltration section if heating/cooling cost not calculated |
| AvgCFM75-Low         | no              | USACE                     | average permeability, lower confidence                                  |
| AvgCFM75-Result      | no              | USACE                     | average permeability result   |
| AvgCFM75-Up          | no              | USACE                     | average permeability, upper confidence                                  |
| AvgChanges50-Low     | no              | ATTMA                     | avg ach, lower confidence   |
| AvgChanges50-Low     | no              | EN13829 variants          | avg ach, lower confidence   |
| AvgChanges50-Result  | no              | ATTMA                     | avg ach, /h   |

|                     |    |                  |  |
|---------------------|----|------------------|--|
| AvgChanges50-Result | no | EN13829 variants | avg ach,/h                               |
| AvgChanges50-Unc    | no | ATTMA            | avg ach, uncertainty as %                |
| AvgChanges50-Unc    | no | EN13829 variants | avg ach, uncertainty as %                |
| AvgChanges50-Up     | no | ATTMA            | avg ach, upper confidence                |
| AvgChanges50-Up     | no | EN13829 variants | avg ach, upper confidence                |
| AvgChanges-Result   | no | ASTM             | average air changes per hour             |
| AvgChanges-Unc      | no | ASTM             | average air changes per hour uncertainty |
| AvgEFLA4B-Low       | no | ATTMA            | average secondary EFLA lower confidence  |
| AvgEFLA4B-Low       | no | EN13829 variants | average secondary EFLA lower confidence  |
| AvgEFLA4B-Result    | no | ATTMA            | average secondary EFLA result            |
| AvgEFLA4B-Result    | no | EN13829 variants | average secondary EFLA result            |
| AvgEFLA4B-Unc       | no | ATTMA            | average secondary EFLA, uncertainty as % |
| AvgEFLA4B-Unc       | no | EN13829 variants | average secondary EFLA, uncertainty as % |
| AvgEFLA4B-Up        | no | ATTMA            | average secondary EFLA, upper confidence |
| AvgEFLA4B-Up        | no | EN13829 variants | average secondary EFLA, upper confidence |
| AvgEFLA4-Low        | no | ATTMA            | average primary EFLA lower confidence    |
| AvgEFLA4-Low        | no | EN13829 variants | average primary EFLA lower confidence    |
| AvgEFLA4-Result     | no | ATTMA            | average primary EFLA result              |

|                  |    |                  |  |
|------------------|----|------------------|--|
| AvgEFLA4-Result  | no | EN13829 variants | average primary EFLA result                |
| AvgEFLA4-Unc     | no | ATTMA            | average primary EFLA, uncertainty as %     |
| AvgEFLA4-Unc     | no | EN13829 variants | average primary EFLA, uncertainty as %     |
| AvgEFLA4-Up      | no | ATTMA            | average primary EFLA, upper confidence     |
| AvgEFLA4-Up      | no | EN13829 variants | average primary EFLA, upper confidence     |
| AvgEFLA-Result   | no | ASTM             | avg LBL effective leakage area             |
| AvgEFLA-Unc      | no | ASTM             | uncertainty in avg LBL (%)                 |
| AvgEQLA75-Result | no | USACE            | EQLA result, usually at 75 pa              |
| AvgEQLAInchGap   | no | ASTM             | leakage in square inches                   |
| AvgEQLA-Result   | no | ASTM             | avg equivalent leakage area                |
| AvgEQLA-Result   | no | ATTMA            | EQLA result                                |
| AvgEQLA-Unc      | no | ASTM             | avg EQLA uncertainty                       |
| AvgEQLA-Unc      | no | ATTMA            | EQLA uncertainty                           |
| AvgFlow1-Result  | no | ASTM             | avg ASTM avg flow                          |
| AvgFlow1-Unc     | no | ASTM             | avg ASTM flow uncertainty                  |
| AvgFlow4-Low     | no | ATTMA            | secondary flow, lower confidence           |
| AvgFlow4-Low     | no | EN13829 variants | secondary flow, lower confidence           |
| AvgFlow4-Result  | no | ATTMA            | secondary avg flow result, usually at 4 pa |
| AvgFlow4-Result  | no | EN13829 variants | secondary avg flow result, usually at 4 pa |

|                       |    |                  |  |
|-----------------------|----|------------------|--|
| AvgFlow4-Unc          | no | ATTMA            | secondary flow, uncertainty as %             |
| AvgFlow4-Unc          | no | EN13829 variants | secondary flow, uncertainty as %             |
| AvgFlow4-Up           | no | ATTMA            | secondary flow, upper confidence             |
| AvgFlow4-Up           | no | EN13829 variants | secondary flow, upper confidence             |
| AvgFlow50-Low         | no | ATTMA            | avg flow, lower confidence                   |
| AvgFlow50-Low         | no | EN13829 variants | avg flow, lower confidence                   |
| AvgFlow50-Result      | no | ATTMA            | main average flow result, usually at 50 pa   |
| AvgFlow50-Result      | no | EN13829 variants | main average flow result, usually at 50 pa   |
| AvgFlow50-Unc         | no | ATTMA            | avg flow, uncertainty                        |
| AvgFlow50-Unc         | no | EN13829 variants | avg flow, uncertainty                        |
| AvgFlow50-Up          | no | ATTMA            | avg flow, upper confidence                   |
| AvgFlow50-Up          | no | EN13829 variants | avg flow, upper confidence                   |
| AvgFlow75-Result      | no | USACE            | air flow result, usually at 75 pa            |
| AvgFlowPerArea-Result | no | ASTM             | avg flow per unit floor area, result         |
| AvgFlowPerArea-Unc    | no | ASTM             | avg flow per unit floor area, uncertainty    |
| AvgFlowPerEnv-Result  | no | ASTM             | avg flow per unit envelope area, result      |
| AvgFlowPerEnv-Unc     | no | ASTM             | avg flow per unit envelope area, uncertainty |
| AvgPerm2-Low          | no | EN13829 not FR   | Specific leakage, lower confidence           |
| AvgPerm2-Result       | no | EN13829 not FR   | Specific leakage result                      |
| AvgPerm2-Unc          | no | EN13829 not FR   | Specific leakage, uncertainty as %           |

|                       |     |                  |  |
|-----------------------|-----|------------------|--|
| AvgPerm2-Up           | no  | EN13829 not FR   | Specific leakage, upper confidence     |
| AvgPerm4-Low          | no  | ATTMA            | avg permeability, lower confidence     |
| AvgPerm4-Low          | no  | EN13829 variants | avg permeability, lower confidence     |
| AvgPerm4-Result       | no  | ATTMA            | avg permeability result                |
| AvgPerm4-Result       | no  | EN13829 variants | avg permeability result                |
| AvgPerm4-Unc          | no  | ATTMA            | avg permeability, uncertainty as %     |
| AvgPerm4-Unc          | no  | EN13829 variants | avg permeability, uncertainty as %     |
| AvgPerm4-Up           | no  | ATTMA            | avg permeability, upper confidence     |
| AvgPerm4-Up           | no  | EN13829 variants | avg permeability, upper confidence     |
| AvgPerm-Low           | no  | EN13829 not FR   | Permeability, lower confidence         |
| AvgPerm-Result        | no  | ATTMA            | Permeability result                    |
| AvgPerm-Result        | no  | EN13829 not FR   | Permeability result                    |
| AvgPerm-Unc           | no  | ATTMA            | Permeability uncertainty %             |
| AvgPerm-Unc           | no  | EN13829 not FR   | Permeability, uncertainty as %         |
| AvgPerm-Up            | no  | EN13829 not FR   | Permeability, upper confidence         |
| BuildingAddress       | N/A | All              | Address of building provided           |
| BuildingDescription   | N/A | All              | description of building provided       |
| BuildingElevation     | Yes | All except CGSB  | Elevation of building entered          |
| BuildingEnvelopeNotes | no  | CGSB, ATTMA      | notes on building envelope for testing |
| BuildingHeight        | Yes | All except CGSB  | Height of building above ground        |
| BuildingPicture       | N/A | All              | insert picture of building, if any     |
| BuildingSetupNotes    | N/A | ATTMA            | building/test set up notes             |



|                        |     |       |  |
|------------------------|-----|-------|--|
| BuildingSetupNotes     | N/A | CGSB  | notes on setting up the building for the testing                       |
| BuildingVolume         | Yes | All   | Volume of building   |
| ClimateName            | N/A | ASTM  | Climate location's name  |
| Combined-FlowChart     | N/A | All   | combined flows (depressurize and pressurize tests)                     |
| Combined-PressureChart | N/A | All   | combined pressures (depressurize and pressurize tests)                 |
| CombinedResultsHeader  | N/A | All   | header for summary results – air leakage reduction or combined results |
| CompBiasPts            | N/A | USACE | in compliance on bias points? "Yes" : "No"                             |
| CompCorrSlope          | N/A | USACE | in compliance on correlation and slope? "Yes" : "No"                   |
| CompPressVar           | N/A | USACE | in compliance on pressure variation? "Yes" : "No"                      |
| CompTestPr             | N/A | USACE | in compliance on test pressures? "Yes" : "No"                          |
| CompTestPts            | N/A | USACE | in compliance on test points? "Yes" : "No"                             |
| ConfidenceInterval     | N/A | most  | header for results confidence interval                                 |
| CoolingCost            | no  | ASTM  | cost of cooling (\$)   |
| DeviationsNotes        | N/A | ATTMA | deviations from standard notes   |
| DeviationsNotes        | no  | CGSB  | notes on deviations from standard testing methods                      |
| EFLARefPa              | no  | All   | Reference pressure for EFLA measurement                                |
| EnvelopeAreaTotal      | Yes | All   | Envelope area  |

|  |     |                         |   |
|--|-----|-------------------------|---|
| EQLARefPa                              | no  | All                     | Reference pressure for EQLA measurement   |
| EstimatedAnnualVentilationACH          | no  | ASTM                    | est annual infiltration, ACH  |
| EstimatedAnnualVentilationCFM          | no  | ASTM                    | est annual infiltration, CFM  |
| EstimatedAnnualVentilationCFMPerPerson | no  | ASTM                    | est annual infiltration as CFM/person   |
| EstimatedVentilationCFMPerPerson       | no  | ASTM                    | CFM/Person  |
| FansLastCalibrated                     | no  | CGSB                    | date fans last calibrated – only CGSB has UI for this                             |
| FloorArea                              | Yes | All                     | Area of floor   |
| GaugesLastCalibrated                   | no  | CGSB                    | date gauges last calibrated – only CGSB has UI for this                           |
| HeatingCost                            | no  | ASTM                    | cost of heating (\$)  |
| HeightUnits                            | N/A | all                     | units data to be displayed in for heights   |
| HVACNotes                              | N/A | ATTMA                   | HVAC system testing notes   |
| InputAreaUnits                         | N/A | all                     | units data to be displayed in for area measurements                               |
| LeakageAreaUnits                       | N/A | all                     | units data to be displayed in for leakage areas                                   |
| LeakageConstantUnits                   | N/A | all                     | units data to be displayed in for the constant (intercept C) in the flow equation |
| MinutesPerFullAirChange                | no  | ASTM                    | air change length in minutes  |
| n- ASTMCoefficient -Unc                | N/A | EN13829 variants, ATTMA | intercept C for environmentally corrected data, uncertainty                       |

|                          |     |                               |   |
|--------------------------|-----|-------------------------------|---|
| n-AirChanges-Result      | no  | CGSB                          | data set n air changes per hour   |
| n-AirChanges-Unc         | no  | CGSB                          | data set n air changes per hour uncertainty   |
| n-ASTMCoefficient-Result | N/A | EN13829 variants, ATTMA,USACE | intercept C for environmentally corrected data  |
| n-ASTMHeightTempDiff     | no  | ASTM                          | height times temperature difference in ft and fahrenheit  |
| n-Barometric             | no  | all                           | Barometric pressure for data set n  |
| n-BarometricMethod       | no  | All                           | measure of determining barometric pressure (measured, standard, elevation) for data set n, translated |
| n-BFAvg                  | No  | All                           | Avg bias, final   |
| n-BFNegAvg               | No  | All                           | Avg negative bias, final  |
| n-BFPosAvg               | No  | All                           | Avg positive bias, final  |
| n-BIAvg                  | No  | All                           | Avg bias, initial   |
| n-BINegAvg               | No  | All                           | Avg negative bias, initial  |
| n-BIPosAvg               | No  | All                           | Avg positive bias, initial  |
| n-CalibDate              | N/A | All                           | Calibration date, door fan n  |
| n-CalibK1-p              | N/A | All                           | K1 coefficient, door fan n, range p   |
| n-CalibK2-p              | N/A | All                           | K2 coefficient, door fan n, range p   |
| n-CalibK3-p              | N/A | All                           | K3 coefficient, door fan n, range p   |
| n-CalibK4-p              | N/A | All                           | K4 coefficient, door fan n, range p   |
| n-CalibK-p               | N/A | All                           | K coefficient, door fan n, range p  |
| n-CalibNotes             | N/A | All                           | Calibration notes, door fan n   |
| n-CalibN-p               | N/A | All                           | N coefficient, door fan n, range p  |

|                    |     |                                  |   |
|--------------------|-----|----------------------------------|---|
| n-CalibRange-p     | N/A | All                              | Range name, door fan n, range p                                     |
| n-CalibUnits       | N/A | All                              | Calibration units used, door fan n                                  |
| n-CEnv-Low         | N/A | EN13829 variants,<br>ATTMA       | intercept C for environmentally<br>corrected data, lower confidence |
| n-CEnv-Result      | N/A | EN13829 variants,<br>ATTMA,USACE | intercept C for environmentally<br>corrected data                   |
| n-CEnv-Up          | N/A | EN13829 variants,<br>ATTMA       | intercept C for environmentally<br>corrected data, upper confidence |
| n-CFM75-Low        | no  | USACE                            | data set n permeability, lower<br>confidence                        |
| n-CFM75-Result     | no  | USACE                            | data set n permeability result                                      |
| n-CFM75-Up         | no  | USACE                            | data set n permeability, upper<br>confidence                        |
| n-Changes1-Result  | no  | ASTM                             | data set n air changes per hour                                     |
| n-Changes1-Unc     | no  | ASTM                             | data set n air changes per hour<br>uncertainty                      |
| n-Changes50-Low    | no  | ATTMA                            | data set n ach, lower confidence                                    |
| n-Changes50-Low    | no  | EN13829 variants                 | data set n ach, lower confidence                                    |
| n-Changes50-Result | no  | ATTMA                            | data set n ach, /h  |
| n-Changes50-Result | no  | EN13829 variants                 | data set n ach,/h   |
| n-Changes50-Unc    | no  | ATTMA                            | data set n ach, uncertainty as %                                    |
| n-Changes50-Unc    | no  | EN13829 variants                 | data set n ach, uncertainty as %                                    |
| n-Changes50-Up     | no  | ATTMA                            | data set n ach, upper confidence                                    |
| n-Changes50-Up     | no  | EN13829 variants                 | data set n ach, upper confidence                                    |
| n-CL-Low           | N/A | EN13829 variants,<br>ATTMA       | intercept C for leakage data, lower<br>confidence                   |

|                      |     |                                     |  |
|----------------------|-----|-------------------------------------|--|
| n-CL-Result          | N/A | EN13829 variants, ATTMA             | intercept C for leakage data                   |
| n-CL-Up              | N/A | EN13829 variants, ATTMA             | intercept C for leakage data, upper confidence |
| n-Coefficient-Result | N/A | CGSB                                | intercept C for environmentally corrected data |
| n-Correlation        | no  | EN13829 variants, CGSB, ASTM, USACE | r correlation in percent                       |
| n-Correlation        | no  | ATTMA                               | r correlation in 0-1                           |
| n-EFLA4B-Low         | no  | ATTMA                               | data set n secondary EFLA lower confidence     |
| n-EFLA4B-Low         | no  | EN13829 variants                    | data set n secondary EFLA lower confidence     |
| n-EFLA4B-Result      | no  | ATTMA                               | data set n secondary EFLA result               |
| n-EFLA4B-Result      | no  | EN13829 variants                    | data set n secondary EFLA result               |
| n-EFLA4B-Unc         | no  | ATTMA                               | data set n secondary EFLA, uncertainty as %    |
| n-EFLA4B-Unc         | no  | EN13829 variants                    | data set n secondary EFLA, uncertainty as %    |
| n-EFLA4B-Up          | no  | ATTMA                               | data set n secondary EFLA, upper confidence    |
| n-EFLA4B-Up          | no  | EN13829 variants                    | data set n secondary EFLA, upper confidence    |
| n-EFLA4-Low          | no  | ATTMA                               | data set n primary EFLA lower confidence       |
| n-EFLA4-Low          | no  | EN13829 variants                    | data set n primary EFLA lower confidence       |
| n-EFLA4-Result       | no  | ATTMA                               | data set n primary EFLA result                 |
| n-EFLA4-Result       | no  | EN13829 variants                    | data set n primary EFLA result                 |

|                 |     |                  |   |
|-----------------|-----|------------------|---|
| n-EFLA4-Unc     | no  | ATTMA            | data set n primary EFLA, uncertainty as %   |
| n-EFLA4-Unc     | no  | EN13829 variants | data set n primary EFLA, uncertainty as %   |
| n-EFLA4-Up      | no  | ATTMA            | data set n primary EFLA, upper confidence   |
| n-EFLA4-Up      | no  | EN13829 variants | data set n primary EFLA, upper confidence   |
| n-EFLA-Error    | no  | CGSB             | data set n EFLA error   |
| n-EFLA-Result   | no  | CGSB             | data set n EFLA   |
| n-EQLA75-Result | no  | USACE            | data set n EQLA result, usually at 75 pa  |
| n-EQLA-Error    | no  | CGSB             | data set n EQLA error   |
| n-EQLA-Result   | no  | ATTMA            | data set n EQLA result  |
| n-EQLA-Result   | no  | CGSB             | data set n EQLA   |
| n-EQLA-Unc      | no  | ATTMA            | data set n EQLA uncertainty   |
| n-EquipRow      | No  | All              | puts in Door fan number n, also used as row marker to delete rows for unused fans |
| n-FanFlowType   | No  | none             | header: "Fan flow [units]" or "Fan pressure [Pa]"                                 |
| n-FanFlowUnitp  | N/A | all              | units used for fan flow, data set n, fan pressure line p                          |
| n-FinishTime    | no  | All              | end time for data set n   |
| n-Flow1-Result  | no  | ASTM, CGSB       | data set n avg flow   |
| n-Flow1-Unc     | no  | ASTM, CGSB       | data set n flow uncertainty   |
| n-Flow2-Result  | no  | CGSB             | data set n avg flow   |

|                 |    |                  |   |
|-----------------|----|------------------|---|
| n-Flow2-Unc     | no | CGSB             | data set n flow uncertainty                           |
| n-Flow4-Low     | no | ATTMA            | data set n secondary flow, lower confidence           |
| n-Flow4-Low     | no | EN13829 variants | data set n secondary flow, lower confidence           |
| n-Flow4-Result  | no | ATTMA            | data set n secondary avg flow result, usually at 4 pa |
| n-Flow4-Result  | no | EN13829 variants | data set n secondary avg flow result, usually at 4 pa |
| n-Flow4-Unc     | no | ATTMA            | data set n secondary flow, uncertainty as %           |
| n-Flow4-Unc     | no | EN13829 variants | data set n secondary flow, uncertainty as %           |
| n-Flow4-Up      | no | ATTMA            | data set n secondary flow, upper confidence           |
| n-Flow4-Up      | no | EN13829 variants | data set n secondary flow, upper confidence           |
| n-Flow50-Low    | no | ATTMA            | data set n flow, lower confidence                     |
| n-Flow50-Low    | no | EN13829 variants | data set n flow, lower confidence                     |
| n-Flow50-Result | no | ATTMA            | data set n flow result, usually at 50 pa              |
| n-Flow50-Result | no | EN13829 variants | data set n flow result, usually at 50 pa              |
| n-Flow50-Unc    | no | ATTMA            | data set n flow, uncertainty                          |
| n-Flow50-Unc    | no | EN13829 variants | data set n flow, uncertainty                          |
| n-Flow50-Up     | no | ATTMA            | data set n flow, upper confidence                     |
| n-Flow50-Up     | no | EN13829 variants | data set n flow, upper confidence                     |
| n-Flow75-Result | no | USACE            | data set n air flow result, usually at 75 pa          |

|                       |     |       |   |
|-----------------------|-----|-------|---|
| n-FlowPerArea-Result  | no  | ASTM  | data set n flow per unit floor area, result   |
| n-FlowPerArea-Unc     | no  | ASTM  | data set n flow per unit floor area, uncertainty  |
| n-FlowPerEnv-Result   | no  | ASTM  | data set n flow per unit envelope area, result  |
| n-FlowPerEnv-Unc      | no  | ASTM  | data set n flow per unit envelope area, uncertainty   |
| n-FlowPointCount      | no  | All   | the pressure readings include this many points  |
| n-FlowSecondsPerPoint | no  | all   | at each pressure point collect data for this many seconds (or a minimum of this many readings)                      |
| n-FPLDescription-p    | no  | all   | Fan pressure line data set n, line for particular range p, description of the fan pressure line = fan #, range name |
| n-FPLpRowFF           | no  | all   | Fan flow row for data set n, line for particular range p, fan flow corresponding to fan pressure for this line      |
| n-FPLpRowFP           | no  | all   | Fan pressure row for data set n, line for particular range p  |
| n-FPp-q               | no  | all   | Fan pressure value for data set n, fan pressure line p,   |
| n-FSPp                | No  | All   | Final bias (static) pressure, data set n, point p   |
| n-GaugeModel          | N/A | All   | gauge type, door fan n  |
| n-GaugeSN             | N/A | All   | gauge serial, door fan n  |
| n-GreatestInitialBias | no  | USACE | largest bias reading in initial bias sampling for data set n  |



|                    |     |  |   |
|--------------------|-----|--|---|
| n-ISPP             | No  | All  | Initial bias (static) pressure, data set n, point p |
| n-NLA-Error        | no  | CGSB                                       | data set n NLA error                                |
| n-NLA-Result       | no  | CGSB                                       | data set n NLA                                      |
| n-N-Low            | N/A | EN13829 variants, ATTMA                    | slope lower confidence                              |
| n-N-Result         | N/A | EN13829 variants, ATTMA, USACE, ASTM, CGSB | slope   |
| n-N-Unc            | N/A | ASTM                                       | slope uncertainty                                   |
| n-N-Up             | N/A | EN13829 variants, ATTMA                    | slope, upper confidence                             |
| n-OperatorLocation | no  | All  | Operator inside or outside for data set n           |
| n-Perm2-Low        | no  | EN13829 not FR                             | data set n Specific leakage, lower confidence       |
| n-Perm2-Result     | no  | EN13829 not FR                             | data set n Specific leakage result                  |
| n-Perm2-Unc        | no  | EN13829 not FR                             | data set n Specific leakage, uncertainty as %       |
| n-Perm2-Up         | no  | EN13829 not FR                             | data set n Specific leakage, upper confidence       |
| n-Perm4-Low        | no  | ATTMA                                      | data set n permeability, lower confidence           |
| n-Perm4-Low        | no  | EN13829 variants                           | data set n permeability, lower confidence           |
| n-Perm4-Result     | no  | ATTMA                                      | data set n permeability result                      |
| n-Perm4-Result     | no  | EN13829 variants                           | data set n permeability result                      |
| n-Perm4-Unc        | no  | ATTMA                                      | data set n permeability, uncertainty as %           |

|                      |    |                  |   |
|----------------------|----|------------------|---|
| n-Perm4-Unc          | no | EN13829 variants | data set n permeability, uncertainty as %   |
| n-Perm4-Up           | no | ATTMA            | data set n permeability, upper confidence   |
| n-Perm4-Up           | no | EN13829 variants | data set n permeability, upper confidence   |
| n-Perm-Error         | no | CGSB             | data set n permeability error   |
| n-Perm-Low           | no | EN13829 not FR   | data set n Permeability, lower confidence   |
| n-Perm-Result        | no | CGSB             | data set n permeability   |
| n-Perm-Result        | no | ATTMA            | data set n Permeability result  |
| n-Perm-Result        | no | EN13829 not FR   | data set n Permeability result  |
| n-Perm-Unc           | no | ATTMA            | data set n Permeability uncertainty %   |
| n-Perm-Unc           | no | EN13829 not FR   | data set n Permeability, uncertainty as %   |
| n-Perm-Up            | no | EN13829 not FR   | data set n Permeability, upper confidence   |
| n-Range <sub>p</sub> | no | all              | range name, data set n, fan pressure line p   |
| n-RP <sub>p</sub>    | No | All              | Induced (room) pressure, data set n, point p  |
| n-R <sub>sp</sub>    | No | All              | Range(s) used for this point.<br>Example: {1-Rs3} lists the range(s) used in point #3 of data set 1 |
| n-SampleNotes        | no | All              | sample notes for data set n   |
| n-SLR-Error          | no | CGSB             | data set n SLR error  |
| n-SLR-Result         | no | CGSB             | data set n SLR  |

|                         |    |       |   |
|-------------------------|----|-------|---|
| n-StartDate             | no | All   | start date for data set n   |
| n-StartTime             | no | All   | start time for data set n   |
| n-StaticPointCount      | no | all   | number of bias data points to take  |
| n-StaticSecondsPerPoint | no | All   | in each bias data point take collect data for this many seconds                             |
| n-TempFinalIn           | no | all   | final temperature inside for data set n   |
| n-TempFinalOut          | no | All   | final temperature outside for data set n  |
| n-TempInitialIn         | no | All   | initial temperature inside for data set n   |
| n-TempInitialOut        | no | all   | initial temperature outside for data set n  |
| n-TestDirection         | no | All   | test direction for data set n (in local language)   |
| n-TestingMethod         | no | ATTMA | tsl1 or tsl2 test method  |
| n-TFp                   | No | All   | Total flow, data set n, point p   |
| n-TFPp                  | No | All   | Total fan pressure, data set n, point p, single fan test only                               |
| n-TimePerFlowMeasured   | no | USACE | the actual number of seconds per induced pressure point measurement achieved in the nth set |
| n-TimePerStaticMeasured | no | USACE | the actual number of seconds per static pressure point measurement achieved in the nth set  |
| n-WindDirection         | no | ASTM  | wind direction for data set n   |
| n-WindDirection         | no | ATTMA | wind direction for data set n   |
| n-WindDirection         | no | CGSB  | wind direction for data set n   |
| n-WindDirection         | no | USACE | wind direction for data set n   |

|                          |     |                  |   |
|--------------------------|-----|------------------|---|
| n-WindSpeed              | no  | ASTM             | AverageWindSpeed for data set n                         |
| n-WindSpeed              | no  | ASTM             | AverageWindSpeed for data set n                         |
| n-WindSpeed              | no  | CGSB             | AverageWindSpeed for data set n                         |
| n-WindSpeed              | no  | EN13829 variants | wind speed for data set n                               |
| n-WindSpeed              | no  | USACE            | AverageWindSpeed for data set n                         |
| n-WindVariability        | no  | CGSB             | wind variability for data set n,<br>translated          |
| PermeabilityRefPa        | no  | All              | Reference pressure for permeability<br>measurement      |
| RequiredVentilation24    | no  | ASTM             | required 24 hour ventilation rate                       |
| RequiredVentilation6     | no  | ASTM             | required 6 hour ventilation rate                        |
| RequiredVentilationCFM   | no  | ASTM             | required total ventilation, CFM                         |
| RequiredVentilationHours | no  | ASTM             | required ventilation, hours                             |
| ResultCompliant          | N/A | USACE            | “test compliant” / “test NOT<br>compliant”              |
| ResultPass               | N/A | USACE            | results in a passed test? “Passes” /<br>“Does NOT Pass” |
| Results                  | N/A | all              | header, either “Change” or “Results”                    |
| SummerDesignACH          | no  | ASTM             | Summer design ACH                                       |
| SummerDesignCFM          | no  | ASTM             | Summer design CFM                                       |
| tempUnits                | N/A | all              | units data to be displayed in for<br>temperatures       |
| TestDate                 | N/A | all              | date test was performed                                 |
| TesterNotes              | N/A | ATTMA            | additional notes by tester                              |
| TestFileName             | N/A | All              | name of test exml file                                  |

|                            |     |                          |   |
|----------------------------|-----|--------------------------|---|
| TestNotes                  | N/A | ATTMA, EN13829 variantsl | Overall test notes                                |
| TestOperator               | N/A | All                      | Name of tester                                    |
| TestReportPathFilename     | N/A | all                      | name of report file                               |
| TotalFlowUnits             | N/A | all                      | units data to be displayed in for flows           |
| Uncertainty                | yes | all                      | header for Uncertainty results                    |
| VentilationSufficientOrNot | N/A | ASTM                     | natural ventilation “not sufficient”/”sufficient» |
| VolumeUnits                | N/A | all                      | units data to be displayed in for volumes         |
| WindExposure               | N/A | EN13829 variants         | Beaufort scale name for wind exposure             |
| WinterDesignACH            | no  | ASTM                     | Winter design ACH                                 |
| WinterDesignCFM            | no  | ASTM                     | Winter design CFM                                 |

## 3.2 Paragraph Deletion Tokens

Placed at the beginning of a paragraph inside the report template surrounded by curly braces, FanTestic will delete the entire paragraph with the deletion token at the beginning. The entire paragraph including the token will be deleted if the condition isn’t met.

FanTestic does a pass through the document based on the Standard in use first, and checks for paragraphs marked to be kept based on the Standard.

If the token is in the first cell of a table, the table will be deleted/kept based on the condition as well.

| Deletion Token       | Standard(s) / Application | Notes                             |
|----------------------|---------------------------|-----------------------------------|
| ASTM                 | ASTM                      | keep paragraph if ASTM used       |
| ATTMA                | ATTMA                     | keep paragraph if ATTMA used      |
| BuildingPictureTable | all                       | keep if there is a building image |
| CGSB                 | CGSB                      | keep paragraph if CGSB used       |

|                    |           |  |
|--------------------|-----------|--|
| EN13829BE          | EN13829BE | keep paragraph if EN13829BE used   |
| EN13829DE          | EN13829DE | keep paragraph if EN13829DE used   |
| EN13829EU          | EN13829EU | keep paragraph if EN13829EU used   |
| EN13829FR          | EN13829FR | keep paragraph if EN13829FR used   |
| EN13829SE          | EN13829SE | keep paragraph if EN13829SE used   |
| Equip              | all       | marks equipment table, never deleted, but unused rows within this table are automatically deleted              |
| InfiltrationReport | ASTM      | keep tables with this in first cell if infiltration heat/cool cost is calculated                               |
| n-CalibTable       | all       | keep calibration tables for door fan n if it is used in test   |
| n-FPLpRow          | all       | keep Fan pressure line data set n, line for particular range p if there is data                                |
| n-FPLpRowFF        | all       | Fan flow row for data set n, line for particular range p, fan flow corresponding to fan pressure for this line |
| n-FPLpRowFP        | all       | Fan pressure row for data set n, line for particular range p   |
| n-FSP-All          | any       | indicates need for dump of all readings used for final static pressure averages                                |
| n-ISP-All          | any       | indicates need for dump of all readings used for initial static pressure averages                              |
| NoMechVentilation  | ASTM      | keep if don't need mech ventilation  |
| NotUSACE           | not USACE | keep paragraph for any except USACE (delete for USACE)   |

|                    |       |  |
|--------------------|-------|--|
| n-SetReport        | all   | keep tables with this in first cell if there is an data set number n |
| USACE              | USACE | keep paragraph if USACE used   |
| YesMechVentilation | ASTM  | keep if need mech ventilation  |

### 3.3 Paragraph Set Deletion tokens

FanTestic will delete all the paragraphs between the start and end tokens showing as tags in the template.

If a table token is shown in the list with the start and end tokens, FanTestic will also remove any tables which fall between the start and end tags and have the table token as a tag in the first cell.

| Start and End, table Tokens  | Standard(s) / Application | Notes   |
|--|---------------------------|---|
| n-StartSetReport, n-EndSetReport                                   | all                       | keep paragraphs between these tags if there is an data set number n |
| StartCostReport, EndCostReport                                     | ASTM                      | only ASTM has UI  |
| StartInfiltrationReport, EndInfiltrationReport, InfiltrationReport | ASTM                      | only ASTM has UI  |
| StartASTMDisc, EndASTMDisc   | ASTM                      | keep if ASTM, discussion  |
| StartATTMAMethod, EndATTMAMethod                                   | ATTMA                     | keep if ATTMA, method   |
| StartUSACEMethod, EndUSACEMethod                                   | USACE                     | keep if USACE, method   |
| StartUSACECompliance, EndUSACECompliance, USACECompliance          | USACE                     | keep if USACE, Compliance   |
| StartCGSBMethod, EndCGSBMethod                                     | CGSB                      | keep if CGSB, method  |

### 3.4 Photo Insertion tokens

Replace the tag with the photo.

| Photo Insertion Token   | Standard(s) / Application | Notes                               |
|-------------------------|---------------------------|-------------------------------------|
| BuildingPicture         | All                       | image of building selected for test |
| FanCalibrationImage     | All                       | flow equation CFM                   |
| INSERT_RoomConstruction | All                       | not implemented                     |
| INSERT_RoomPhoto        | All                       | not implemented                     |
| INSERT_RoomSchematic    | All                       | not implemented                     |
| TestCompanyLogo         |                           | not implemented                     |

### 3.5 Chart Insertion tokens

Replace the tag with the chart/graph image generated from the test data.

| Chart Insertion Token  | Standard(s) / Application | Notes  |
|------------------------|---------------------------|--|
| Combined-PressureChart | All                       | pressure chart from results summary          |
| Combined-FlowChart     | All                       | flow vs pressure chart, from results summary |
| n-PressureChart        | All                       | pressure chart for data set n                |
| n-FlowChart            | All                       | flows vs pressure chart for data set n       |

### 3.6 Defined name columns for Excel data dump

The data collected for a test can be exported to an Excel spreadsheet template if the template has columns with the defined names in the following table.

If you have exported a test to Excel, then you will have a spreadsheet template in your [MyDocuments]\Retrotec\Templates folder which contains these defined column names in the Raw Data worksheet. You can modify that worksheet or create another to include other results (see section 3.7).

| Defined Name Column |  |  |
|---------------------|--|--|
| Direction           |  |  |



|              |  |  |
|--------------|--|--|
| Step         |  |  |
| PointFlow    |  | TotalFlow for point in step  |
| PointPrA     |  | AverageRoomPressure for point in step  |
| PointCR      |  | CorrectedRoomPressure for point in step  |
| PointPrB     |  | TotalFanPressure for point in step, only valid if one fan is used                                      |
| RangeUsed    |  | not filled out   |
| PointTarget  |  | “bias0” for before step, “bias1” for after step, otherwise TargetPressure value for point in flow step |
| ReadingGauge |  | GaugeSerialNumber for this reading fan pressure line   |
| ReadingFlow  |  | Flow for this reading fan pressure line  |
| ReadingPrA   |  | RoomPressure for this reading fan pressure line  |
| RangeUsed    |  | “(bias)” or range name for this reading fan pressure line  |
| ReadingPrB   |  | FanPressure for this reading fan pressure line   |
| TimeStamp    |  | datetime for this reading fan pressure line  |

### 3.7 Replacement tokens for results in Excel

Any result from a test can be included in the Excel spreadsheet template by modifying the Excel template to include a defined range name with the same name as the Replacement Token for that result.

Excel defined names cannot start with numbers, and cannot contain dashes.

If the replacement token starts with a digit, put an underscore in front of the replacement token to create the defined name to put into the Excel template document.

If the replacement token includes any dashes, replace these with underscores to create the defined name to put into the Excel template document.

## 4 Tags for Integrity

### 4.1 Text replacement tokens

If one of these tokens is found inside a report template document, surrounded with curly braces, Integrity will replace the tag (token inside curly braces) with the value from the test being used to generate the report. The formatting of the value in the output report will be the same as the style of the tag in the template document.

-n- means a numerical value is required (e.g. # of data set, # of door fan) - see notes for each token for individual explanation.

-p- means a numerical value for point number is required, points within sets

For many of the items that are headers, some are the same as used in the Integrity UI. If the header has been translated for the Integrity UI, these header tokens can be put into the generated report in translated form (instead of english). User must have the language set in the UI, and should be using a language specific template.

| Replacement Token         | Units Included? | Standard(s) / Application | Notes   |
|---------------------------|-----------------|---------------------------|---|
| AgentDesignConcentration  | yes             | All                       | %   |
| AgentInitialConcentration | yes             | All                       | %   |
| AgentMinimumConcentration | yes             | All                       | %   |
| AgentName                 | N/A             | All                       |   |
| AgentQuantity             | no              | All                       | Such as lb, % or cu ft  |
| AgentType                 | no              | All                       | Halocarbon or Inert   |
| AirFlow1RefPa             | no              | All                       | Reference pressure for main air flow measurement, Pa              |
| AirFlow2RefPa             | no              | All                       | Reference pressure for secondary air flow measurement, if any, Pa |

|                                   |     |     |   |
|-----------------------------------|-----|-----|---|
| ApplicationVersion                | N/A | All | FanTestic Integrity version used            |
| BCLAMeasured                      | N/A | All | BCLA ELA is “measured” or “estimated”       |
| BCLAText                          | N/A | All | Below Ceiling Leakage                       |
| BuildingAddress                   | N/A | All | Address of building provided                |
| BuildingDescription               | N/A | All | description of building provided            |
| BuildingElevation                 | No  | All | Elevation of building entered               |
| BuildingElevationCorrectionFactor | no  | ISO |   |
| BuildingEnvelopeNotes             | N/A | all | Notes entered about the enclosure envelope  |
| BuildingFloodedHeight             | no  | All | Height of nozzles                           |
| BuildingHeight                    | No  | All | Height of building off ground               |
| BuildingOperatingPressure         | no  | All |   |
| BuildingProtectedHeight           | no  | All | Minimum Protected Height of equipment       |
| BuildingVolume                    | no  | All | Volume of building                          |
| CalculatedExtendedDischargeRate   | no  | All |   |
| ColumnPressure                    | no  | All |   |
| CustomerInfo                      | N/A | All | Info on customer test is performed for      |
| DischargeRateUnits                | N/A |     | such as lb/min                              |
| DischargeTimeResult               | no  | All | Retention time result in minutes            |
| EFLARefPa                         | no  | ISO | Reference pressure for EFLA measurement, Pa |
| EfLAREfPa                         | no  | all | Such as 4                                   |
| EnclosureDescription              | N/A | All | Fire testing enclosure description          |

|                             |     |     |  |
|-----------------------------|-----|-----|--|
| EnclosurePressureLimit      | no  | All | Always Pa                                    |
| EnvelopeAreaTotal           | Yes | All | Envelope area                                |
| EQLARefPa                   | no  | All | Reference pressure for EQLA measurement      |
| EqLAREfPa                   | no  | All | Such as 10                                   |
| FansLastCalibrated          | N/A | All |  |
| FireBCLANotes               | N/A |     | Notes from BCLA set                          |
| FireTestNotes               | N/A | All | Overall test notes                           |
| FireVentingNotes            | N/A | All | Notes from Venting Test set                  |
| FloorArea                   | no  | All | Area of floor in area units specified        |
| GaugesLastCalibrated        | N/A | All |  |
| HeightUnits                 | N/A |     | such as ft                                   |
| HoldTimeContinualMixing     | no  | All | Same as DischargeTimeResult                  |
| HoldTimeDescendingInterface | no  | All | Same as DischargeTimeResult                  |
| HoldTimeLessGreater         | N/A | All |  |
| ISOText                     |     | ISO | Lower Leakage                                |
| LeakageAreaUnits            | N/A | All | Such as sq in                                |
| LeakageConstantUnits        | N/A | All | Such as CFM/Pan                              |
| LVRNeg                      | no  | All |  |
| LVRNeg                      | no  | All | VentLeakToVolumeRatio negative pressure peak |
| LVRPos                      | no  | All |  |
| LVRPos                      | no  | All | VentLeakToVolumeRatio positive pressure peak |

|                            |     |     |   |
|----------------------------|-----|-----|---|
| LVRUnits                   | N/A |     | Such as sq in/cu ft   |
| MeasurementOrEstimateBCLA  | N/A | All | BCLA values are “measurement” or “estimate”?  |
| MeasurementOrEstimateTotal | N/A | All | Total leakage values are “measurement” or “estimate”?   |
| MeasurementOrEstimateUpper | N/A | All | Upper leaks values are “measurement” or “estimate”?   |
| MinimumRetentionTime       | no  | All | In minutes  |
| MixingDuringHold           |     | All | Yes or No   |
| n-Barometric               | no  | all | Barometric pressure for sample n  |
| n-BarometricMethod         | no  | All | measure of determining barometric pressure (measured, standard, elevation) for direction/sample n |
| n-BFAvg                    | No  | All | Avg bias, final always Pa   |
| n-BIAvg                    | No  | All | Avg bias, initial always Pa   |
| n-BINegAvg                 | No  | All | Always Pa   |
| n-BIPosAvg                 | No  | All | Always Pa   |
| n-CalibDate                | N/A | All | Calibration date, door fan n  |
| n-CalibNotes               | N/A | All | Calibration notes, door fan n   |
| n-CalibUnits               | N/A | All | Calibration units used, door fan n  |
| n-CFp                      | No  | ISO | Total corrected flow, sample n, point p (value in units appropriate to the standard)              |
| NegativePeakLessGreater    |     | All | Add   |
| NegativePeakPassFail       |     | All | Add   |
| n-ERRp                     | No  | ISO | Point error, sample n, point p, in %  |

|                       |    |     |   |
|-----------------------|----|-----|---|
| n-FanFlowUnitx        | no | All | for direction/sample n, FPL x, if direct entry what are the units?  |
| n-FFp-x               | no | All | Fan Flow for direction/sample n, point p on equipment x   |
| n-FinishTime          | no | All | end time for direction/sample n   |
| n-FlowPointCount      | no | ISO | the number of induced pressures   |
| n-FlowSecondsPerPoint | no | ISO | at each induced pressure collect data for this many seconds (or a minimum of this many readings)                                      |
| n-FPLDescription-x    | No | All | For direction/sample n, FPL x: Description of fan/range used, example "Fan #2, Range C4"<br>(Integrity and in English only currently) |
| n-FPp-x               | no | All | Fan Pressure for direction/sample n, point p on equipment x   |
| n-FSPp                | No | ISO | Final bias (static) pressure, direction/sample n, point p   |
| n-ISPP                | No | ISO | Initial bias (static) pressure, direction/sample n, point p   |
| n-OperatorLocation    | no | All | Operator inside or outside for direction/sample n   |
| n-RPp                 | no | All | induced pressure direction/sample n, point p  |
| n-Rsp                 | No | ISO | Range(s) used for direction/sample n, point p<br><br>example: {1-Rs3} lists the range(s) used in point #3 of direction 1              |
| n-StartDate           | no | All | start date for direction/sample n   |
| n-StartTime           | no | All | start time for direction/sample n   |
| n-StaticPointCount    | no | ISO | number of bias data points to take  |

|                         |     |     |  |
|-------------------------|-----|-----|--|
| n-StaticSecondsPerPoint | no  | ISO | in each bias data point take collect data for this many seconds (or a minimum of this many readings) |
| n-TempFinalIn           | no  | all | final temperature inside for sample n  |
| n-TempFinalOut          | no  | All | final temperature outside for sample n   |
| n-TempInitialIn         | no  | All | initial temperature inside for sample n  |
| n-TempInitialOut        | no  | all | initial temperature outside for sample n   |
| n-TestDirection         | no  | All | test direction/sample n (in local language)  |
| n-TFp                   | no  | All | total flow for direction/sample n, point p (only include if more than one equipment or FPL)          |
| n-TFPp                  | No  | All | Total fan pressure, direction n, point p – only valid if one fan being used                          |
| OperatingTemperature    | no  | All |  |
| PeakDischargeTime       | no  | All | Estimated time for agent to discharge before calculating hold time - seconds                         |
| PeakPressureNegative    | no  | All | Based on agent used and enclosure conditions   |
| PeakPressurePositive    | no  | All |  |
| PeakVentType            | no  | All | Damper actuation   |
| PermeabilityRefPa       | no  | ISO | Reference pressure for permeability measurement  |
| PPMaxHumidity           | no  | All | peak pressure UI max humidity value  |
| PPMinHumidity           | no  | All | peak pressure UI min humidity value  |
| QuantUnits              | N/A |     | Quantity units such as lb  |
| RetentionCanCannot      |     |     | TestPasses ? “can” : “cannot”  |

|                           |     |     |   |
|---------------------------|-----|-----|---|
| RetentionELA1             | no  | All | ELA from test #1 (whole room), The non-intentional openings provide {RetentionELA1} |
| RetentionELA2             | no  | All | ELA from test #2 (lower leaks/BCLA)   |
| RetentionELA3             | no  | All | ELA from test #3 (upper leaks)  |
| RetentionGreaterOrLess    |     |     | Test.FireTestPasses ? "greater" : "less"  |
| RetentionK1               | no  | All | K value of whole room test  |
| RetentionLastF            | no  | All | F value of last test done   |
| RetentionN1               | no  | All | N value of whole room test, second set?   |
| RetentionPassesOrFails    |     | All | Test.FireTestPasses ? "PASSES" : "FAILS"  |
| tempUnits                 | N/A |     | Temperature units such as C   |
| TestCompany               | N/A | All | Name of licensed company using the software   |
| TestDate                  | N/A | All |   |
| TestFileName              | N/A | All | name of test fxml file  |
| TestNotes                 | N/A | All | Overall test notes  |
| TestOperator              | N/A | All | Name of tester  |
| TestOperatorCert          | N/A | All | Certification level of tester   |
| TotalEnclosureTestNotes   | N/A | All | Notes from Total Enclosure test set   |
| TotalFlowUnits            | N/A | All | Such as CFM   |
| TotalMeasured             | N/A | All | Total ELA is "measured" or "estimated"  |
| UpperMeasured             | N/A | All | Upper leaks ELA is "measured" or "estimated"  |
| UserExtendedDischargeRate | no  |     | planned rate of discharge   |



|                              |     |      |  |
|------------------------------|-----|------|--|
| VentAdditionalNegative       | no  | All  | Vent area above leakage required for structural integrity                            |
| VentAdditionalPositive       | no  | All  | Vent area above leakage required for structural integrity                            |
| VentAreaRequiredNegative     | no  | All  | Total vent area required for structural integrity.                                   |
| VentAreaRequiredPositive     | no  | All  | Total vent area required for structural integrity                                    |
| VentAreaUnits                | N/A |      | such as sq in  |
| VentAreaUsedNegative         | no  | All  | free vent area during discharge  |
| VentAreaUsedPositive         | no  | All  | free vent area during discharge  |
| VentLeakageMeasuring         | N/A | all  | Total leakage values come from either “measuring” or “estimating”                    |
| VentLeakageMeasuringNegative |     |      | If vent negative dataset entered, values come from either “measuring” or “estimating |
| VentLeakageMeasuringPositive | N/A | all  | If vent positive dataset entered, values come from either “measuring” or “estimating |
| VentMeasuring                | no  | All  | Peak Pressure will be relieved using the leakage of the {VentMeasuring}              |
| VentTesting                  | no  | All  | results were obtained by determining the Total Leakage Area of the {VentTesting}     |
| VentType                     | no  | All  | Damper actuation   |
| Vn-BIAvg                     | no  | All  | Venting data, n=direction number bias initial average                                |
| Vn-CEnv-Result               |     | NFPA | Venting Leakage constant, k for direction n (flow unit per hour per Pa exp n)        |
| Vn-EQLA-Result               |     | NFPA | Leakage area at refP, for direction n  |

|                    |     |      |   |
|--------------------|-----|------|---|
| Vn-FanFlowUnitx    |     | All  | Units used for flow for direction n, equipment FPL x (range name)                             |
| Vn-FFp-x           | no  | All  | Venting Fan Flow for direction n, point p on equipment x                                      |
| Vn-FPLDescriptionx |     | All  | Fan Pressure Line description for flow for direction n, equipment x                           |
| Vn-FPp-x           | no  | All  | Venting Fan Pressure for direction n, point p on equipment x                                  |
| Vn-N-Result        |     | NFPA | Venting Leakage exponent (n) for direction n  |
| Vn-RPp             | no  | All  | Venting induced pressure direction n, point p   |
| Vn-TestDirection   | no  | All  | Venting data, n=direction number, counts up by venting samples taken at each induced pressure |
| Vn-TFp             | no  | All  | Venting total flow for direction n, point p (only include if more than one equipment or FPL)  |
| VolumeUnits        |     |      | such as cu ft   |
| WindExposure       | Yes | All  | Beaufort scale name for wind exposure   |
| WitnessName        | no  | All  | name of witness to the test   |
| WitnessPhone       | no  | All  | phone number for witness to the test  |
| x-DeviceModel      | N/A | All  | device name, door fan x   |
| x-DeviceSN         | N/A | All  | serial of device, door fan x  |
| x-GaugeModel       | N/A | All  | gauge type for equipment x  |
| x-GaugeSN          | N/A | All  | gauge serial for equipment x  |

## 4.2 Paragraph deletion tokens

Placed at the beginning of a paragraph inside the report template surrounded by curly braces, Integrity will delete the entire paragraph with the deletion token at the beginning. The entire paragraph including the token will be deleted if the condition isn't met.

Integrity does a pass through the document based on the Standard in use first, and checks for paragraphs marked to be kept based on the Standard.

If the token is in the first cell of a table, the table will be deleted/kept based on the condition as well.

| Deletion Token  | Standard(s) / Application | Notes   |
|-----------------|---------------------------|---|
| BCLAOnly        |                           | Deleted if NFPA and there is not a BCLA test  |
| DesIntNoBCLA    |                           | keep if descending interface and there is no BCLA/lower leaks data set                                |
| DesIntYesBCLA   |                           | keep if descending interface and there is a BCLA/lower leaks data set                                 |
| ExtDischrg      |                           | Deleted if not extended discharge   |
| ExtDschgNoBCLA  |                           | keep if extended discharge and there is no BCLA/lower leaks data set                                  |
| ExtDschgYesBCLA |                           | keep if extended discharge and there is a BCLA/lower leaks data set                                   |
| FIA             |                           | Deleted if using FSSA or VdS venting equations  |
| FireTestqTable  |                           | For Test Data set q, up to 3 in template (add table for NFPA Upper Leaks, samples/directions 5 and 6) |
| FSSA            |                           | Deleted if using FIA or VdS venting equations   |
| Halo            | All                       | Paragraphs applicable to Halogen only, deleted if any other Agent/Extinguishant is being used         |
| IG              | All                       | Paragraphs applicable to Inert Gas only, deleted if Halogen is being used                             |

|                        |  |  |
|------------------------|--|--|
| ISO                    |  | Deleted if using NFPA  |
| MixingNoBCLA           |  | keep if mixing and there is no BCLA/lower leaks data set                   |
| MixingYesBCLA          |  | keep if mixing and there is a BCLA/lower leaks data set                    |
| NFPA                   |  | Deleted if using ISO   |
| NotBCLA                |  | Deleted if is BCLA   |
| NotDescInt             |  | Deleted if is descending interface   |
| NotExtDischrg          |  | Deleted if is extended discharge   |
| NotMixing              |  | Deleted if is mixing   |
| PeakCalculated         |  | Deleted if Peak Pressure has not been calculated                           |
| VdS                    |  | Deleted if using FSSA or FIA venting equations                             |
| VentAboveLeakNeeded    |  | Deleted if venting above leakage is not needed                             |
| VentAboveLeakNotNeeded |  | Deleted if venting above leakage is needed                                 |
| VentingCalculated      |  | Deleted if Venting has not been calculated                                 |
| VentingTestTableq      |  | For Venting set q, up to two in template                                   |
| Vn-FPLxRow             |  | Whole table row for direction n, equipment x, up to 4 are in table         |
| Vn-FPLxRow             |  | Whole Venting table row for direction n, equipment x, up to 4 are in table |
| Vn-FPLxRowFF           |  | table row for Fan Flow in direction n, equipment x, up to 4 are in table   |

|              |  |  |
|--------------|--|--|
| Vn-FPLxRowFF |  | Venting table row for Fan Flow in direction n, equipment x, up to 4 are in table     |
| Vn-FPLxRowFP |  | table row for Fan Pressure in direction n, equipment x, up to 4 are in table         |
| Vn-FPLxRowFP |  | Venting table row for Fan Pressure in direction n, equipment x, up to 4 are in table |
| x-EquipRow   |  | device x table row   |

### 4.3 Paragraph set deletion tokens

none

### 4.4 Photo insertion tokens

Not implemented yet

### 4.5 Chart insertion tokens

Replace the tag with the chart/graph image generated from the test data.

| Photo Insertion Token      | Standard(s) / Application | Notes  |
|----------------------------|---------------------------|--|
| Combined-PressureChart     | All                       | result summary pressures                       |
| Combined-FlowChart         | All                       | result summary flows vs pressure               |
| FireChart                  | All                       | hold time chart                                |
| FireChartBCLA              | All                       | Included if there are BCLA/lower leaks samples |
| CombinedBCLA-PressureChart |                           | Included if there are BCLA/lower leaks samples |
| CombinedBCLA-FlowChart     |                           | Included if there are BCLA/lower leaks samples |
| FireChartUpperLeaks        |                           | Included if there are upper leaks samples      |

|                                  |  |   |
|----------------------------------|--|---|
| CombinedUpperLeaks-PressureChart |  | Included if there are upper leaks samples |
| CombinedUpperLeaks-FlowChart     |  | Included if there are upper leaks samples |

## 5 Appendix

### 5.1 Installing FanTestic or FanTestic Integrity Video training

The following videos explain the steps to be taken:

- [Webinar for FanTestic Operation including demo of Virtual Gauge software for DM32](#)

The following videos are for older versions of the software but you may find them valuable in general, since many of the steps required to use the software have remained the same.

- [How to enter data from a Manual Test \(ASTM\)](#)
- [How to use FanTestic to capture data automatically \(ASTM\)](#)
- [Graphing and Saving Test Data](#)

For more Retrotec videos and webinars on other topics, visit

<http://www.youtube.com/user/RetrotecEnergy>

#### 5.1.1 Minimum system requirements

Microsoft Windows O/S: XP (SP2 or greater) or newer (Vista/7/8) –current with all updates

Processor: 1 GHz

RAM: 512 MB

Disk space: 600MB (32-bit) or 1.5 GB (64-bit)

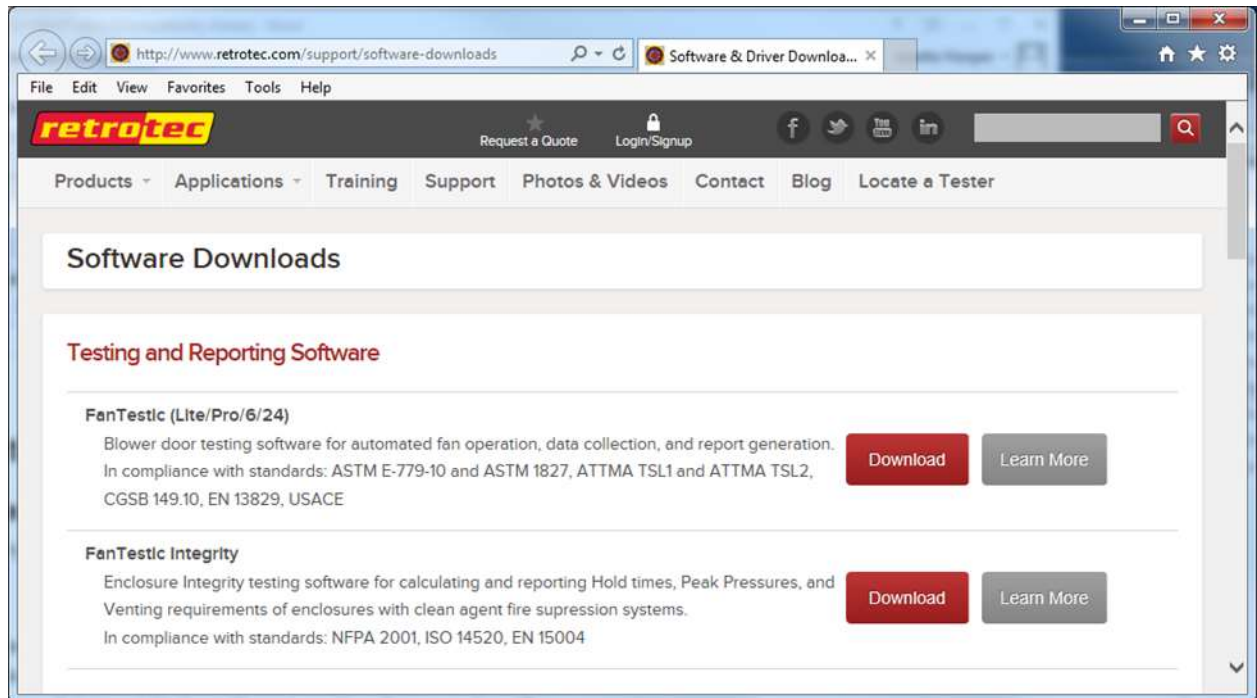
Microsoft Word: 2007/2010+ (or Word 2003 with 2007 support add-in)

Internet connection (for automatic software updates)

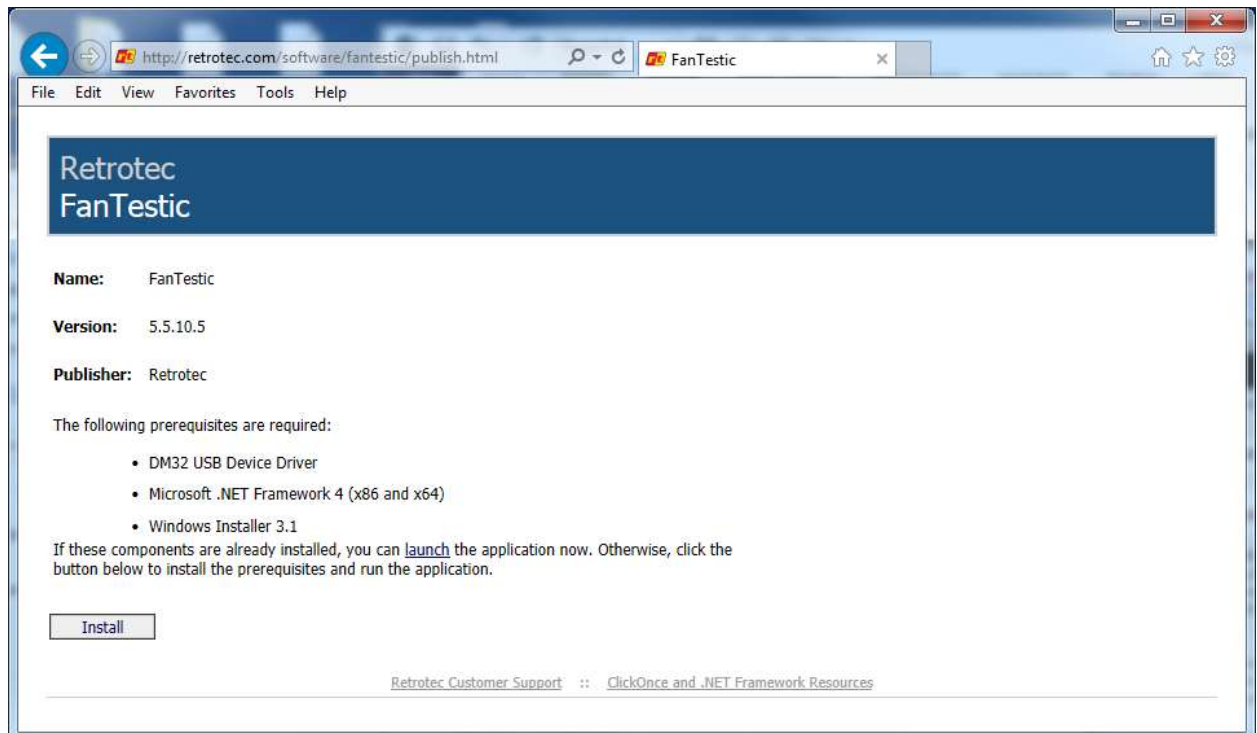
.NET 4.0 framework (will update automatically with the FanTestic installation)

## 5.1.2 Download and install FanTestic

Go to: <http://retrotec.com/support/software-downloads>



When the webpage opens, click on the “Download” button beside “FanTestic (Lite/Pro/6/24)”



Click the “Install” button on the window that opens.

When prompted with “Do you want to run or save setup.exe?” click on the “Run” button.



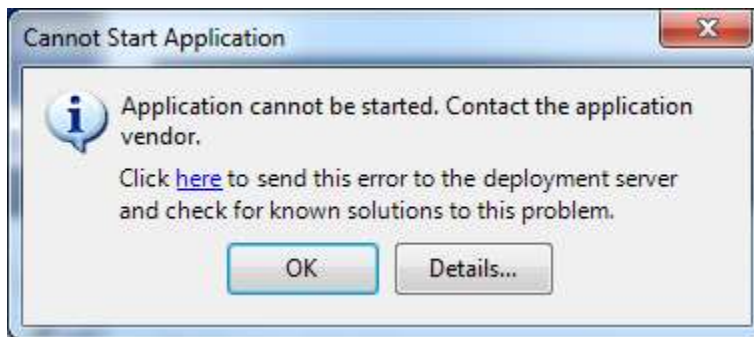
If not prompted, go to the Downloads menu option on your web browser and double-click on the file you have just downloaded (which is called “setup.exe”).

The “Application Install – Security Warning” window will open: click on the “Install” button.

If the User Account Control (UAC) asks for permission, you must give administrator permission for the software to install the DM32 USB driver automatically.

The program will install, and try to start FanTestic for you.

If you have been running a previous version of FanTestic and have been using “Run As Administrator” mode, you will receive the following non-fatal message indicating that the installer cannot launch the software because FanTestic must run in Administrator mode:



Just click ok and launch FanTestic as described in section 5.1.4.

### 5.1.3 DM-2 users install a USB Driver manually

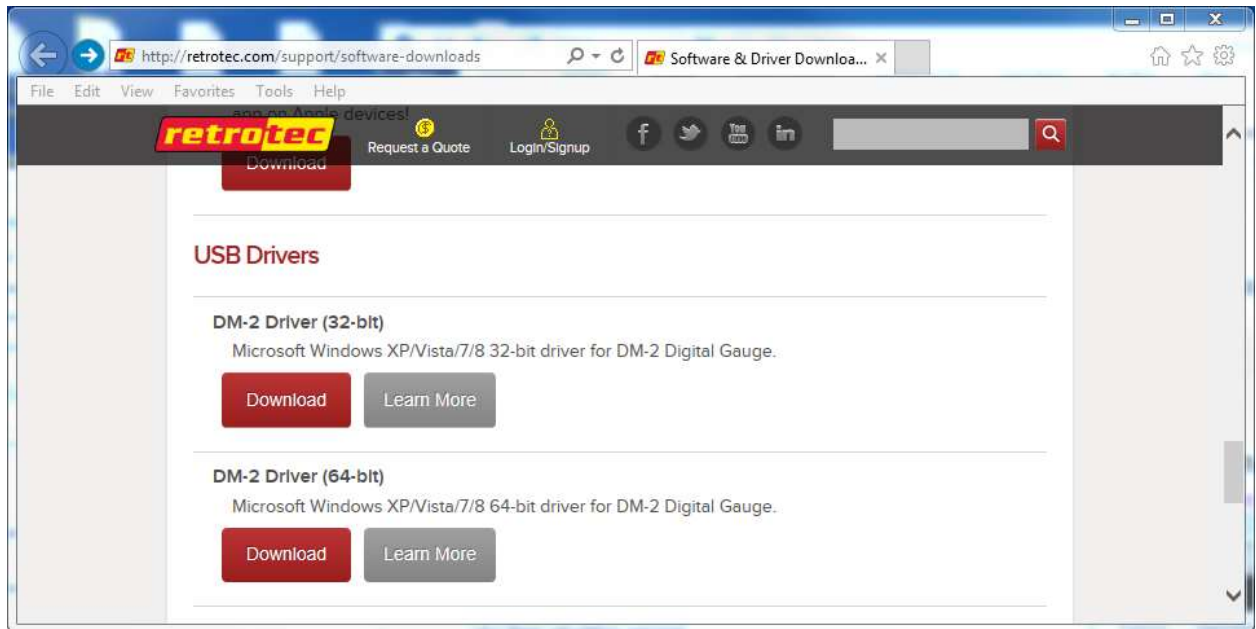
If you want to run automatic tests with a DM-2 gauge, you must download and manually install a driver for the USB port.

DM32 users will have the driver automatically installed when they install FanTestic or the DM32 Software Suite, and should only use USB connection to update the firmware through the DM32 Configurator, not for automatic control of the gauge.

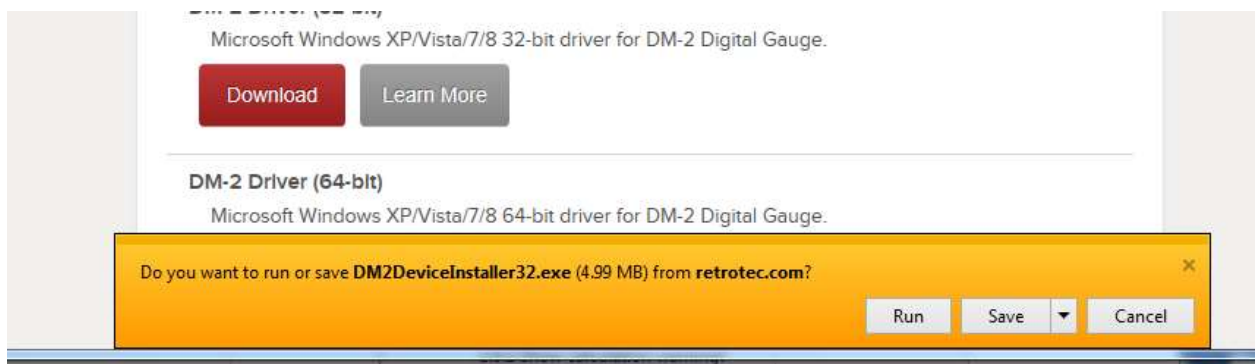
DM32 users should use Ethernet to connect to the gauges for auto-testing, since that will provide the longest cable option and most reliability. WiFi can also be used depending on the distance between the gauge and the computer and the type of building construction.



- a) Go to: <http://retrotec.com/support/software-downloads>



- b) Download by clicking on the “Download button and when prompted to Run or Save, choose “Save”



- c) To install the Retrotec DM2 driver (DM2deviceinstaller32.exe or DM2DeviceInstaller64.exe), do not double click the file when the download has completed. Instead, right click the downloaded “DM2deviceinstaller” file, and select *Run as administrator* to start the installation. This will give permission to install the required system files.

### 5.1.4 Start FanTestic

After installation, click the Start Menu → All Programs → Retrotec → FanTestic.



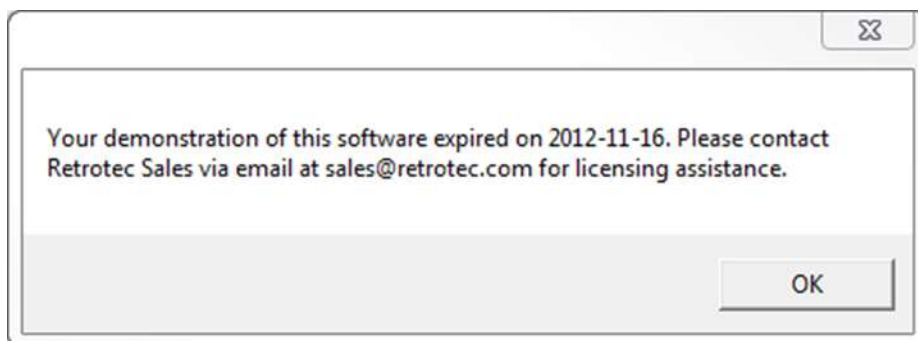
OR use the FanTestic icon on your desktop to start the program. FanTestic will open!



FanTestic will run in demo mode with full functionality for 30 days after you first install. Once the demo version expires, you will not be able to change the test standard being used, generate the MS Word reports or export your test data to MS Excel. You will still be able to enter test data and see the results on-screen, and open tests generated using any of the test standards.

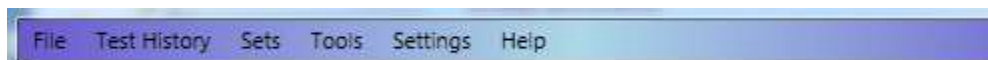
Obtain a license and instructions for activating the software with the license before your demo expires by contacting [sales@retrotec.com](mailto:sales@retrotec.com). The license will be valid for the period of time specified for the license, and with a valid license you will be able to generate the MS Word reports and export your test data to MS Excel.

If your demo or license has expired you will see a dialog window similar to the following when you start FanTestic:

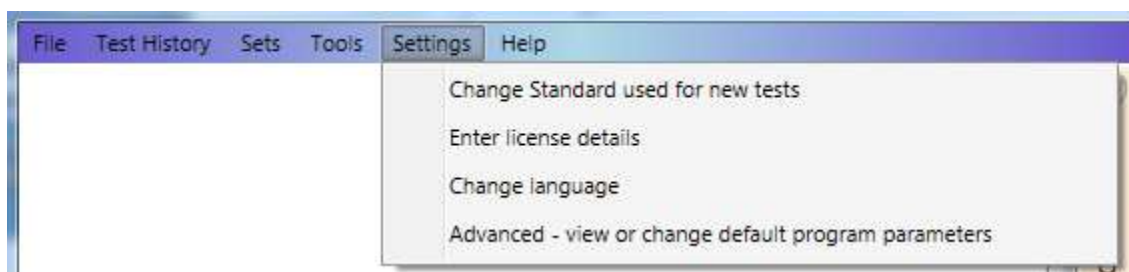


Click "OK" to start the limited version.

The main FanTestic menu bar is at the top, to provide access to functions needed pre and post test.

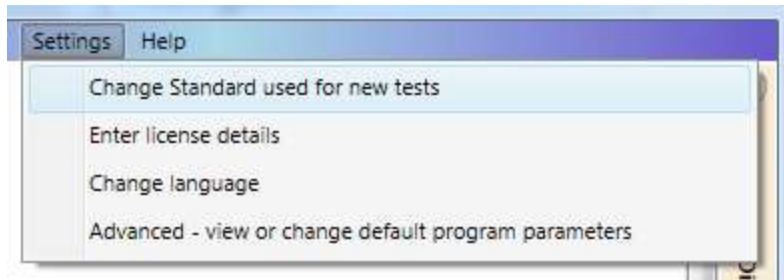


The first time you run FanTestic, you need to make some choices about how you will use FanTestic—access from the "Settings" menu as described in the next sections.

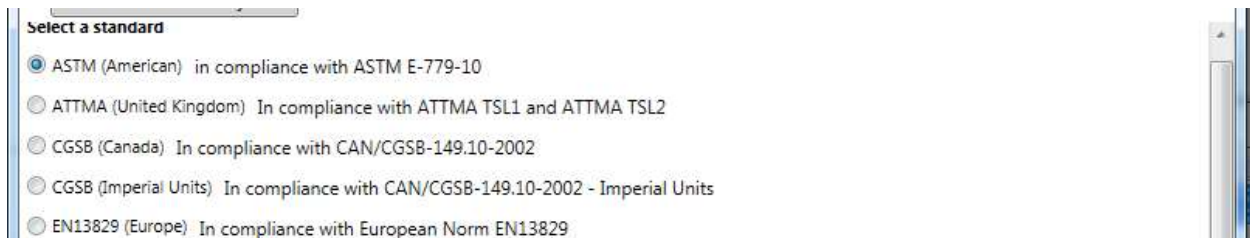


### 5.1.5 Select a test standard to use for new tests

FanTestic is based on national and international standards which specify how the Air Leakage Tests are to be performed to be valid. Choices of test standard are available "Settings" → "Change Standard used for new tests". The number of Test standards available to be chosen in the list depends on the license purchased.



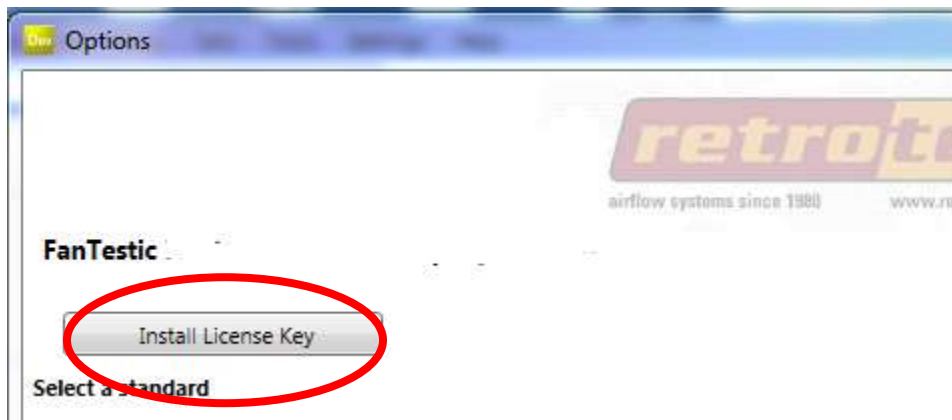
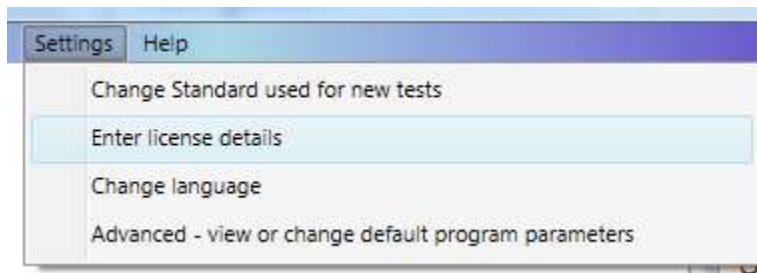
The dialog opens for you to choose the standard by clicking on the button beside the name of the standard:



### 5.1.6 Enter license key when you receive one

Start FanTestic, if not already running.

Once in the program click "Settings" → "Enter license details".



Click on the "Install License Key" button in the dialog window that opens, and a text entry area opens:

Paste in the license key below.

```

===START_KEY===9:}hi%s`wvljk8'4+5'%`kfjalkb8'pqc
(=';9Fcb;9FK;d%fjhudk|%
ilf'kv`a9*FK;9VS;CdkQ`vqlfW`b9*VS;9@];9*@];9C;79*C;9UV;9U;DVQH
9*U;9*UV;9FD;9*FD;9DQ;Cdiv`9*DQ;9P@;Cdiv`9*P@;9PB;Cdiv`9*PB;9
PC;Cdiv`9*PC;9PQ;Cdiv`9*PQ;9*Fcb;===END_KEY===

```

Paste from clipboard Install License k Cancel

Copy the license key from the email you received and paste it into the text entry area that appeared, being sure to include the “===START\_KEY===” and “===END\_KEY===” portion of the key. If selecting from an email, be sure that the email has not inserted any odd items into the string, such as an “mailto” link. The email containing the key that is sent out from Retrotec will be a “Text only” email, not HTML based, in order to try to minimize license corruption. Click on the “Install License” button below the text box.

===START\_KEY===9:}hi%s`wvljk8'4+5'%`kfjalkb8'pqc  
(=';9Fcb;9FK;d%fjhudk|%  
ilf'kv`a9\*FK;9VS;CdkQ`vqlfW`b9\*VS;9@];9\*@];9C;79\*C;9UV;9U;DVQH  
9\*U;9\*UV;9FD;9\*FD;9DQ;Cdiv`9\*DQ;9P@;Cdiv`9\*P@;9PB;Cdiv`9\*PB;9  
PC;Cdiv`9\*PC;9PQ;Cdiv`9\*PQ;9\*Fcb;===END\_KEY===

Paste from clipboard **Install License k** Cancel

Test Standard may be automatically selected based on the license- if not, choose one from the list.

Select a standard

- ☒ ASTM (American) in compliance with ASTM E-779-10
- ☐ ATTMA (United Kingdom) In compliance with ATTMA TSL1 and ATTMA TSL2
- ☐ CGSB (Canada) In compliance with CAN/CGSB-149.10-2002
- ☐ CGSB (Imperial Units) In compliance with CAN/CGSB-149.10-2002 - Imperial Units
- ☐ EN13829 (Europe) In compliance with European Norm EN13829

Next, fill in the user's name and email address (corresponds to the technician doing tests with the software). “Software user's company” will be filled in automatically from the license that was entered:

Software user's company: Retrotec

Software user's name:

Software user's email:

Language to use: English (United States)

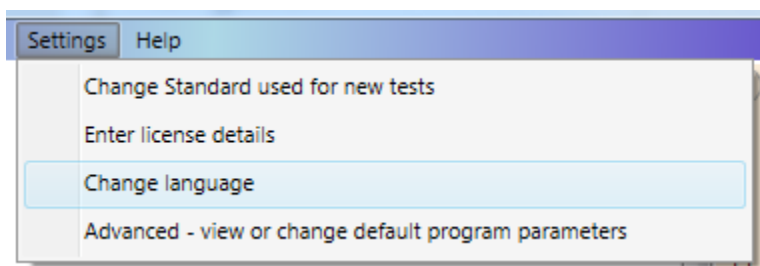
OK Cancel

Then click “OK”.

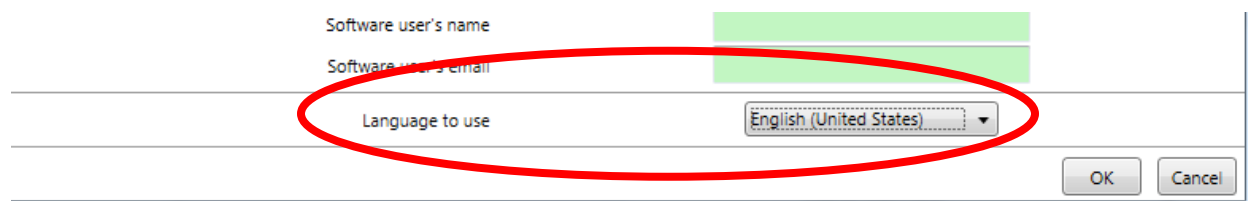
### 5.1.7 Change language to use for user interface and reports

Start FanTestic if it is not already running.

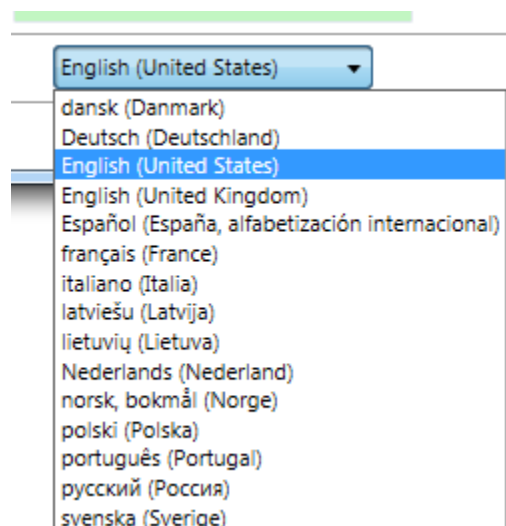
Click on “Settings” → “Advanced - view or change default program parameters”



The Settings dialog will open, and the “Language to use” drop-down is at the bottom:



Choose the language from the language drop-down:

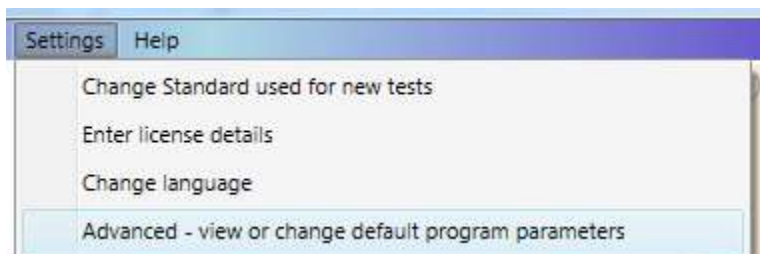


### 5.1.8 Change parameters used for running the program – (advanced operation)

Changes can be made any time, but a new test file must be opened for any changes to take effect. If changes are made to settings, FanTestic will save and close any open test file (user can skip this) and create and open a new Test file.

Start FanTestic if it is not already running.

Click on “Settings” → “Advanced - view or change default program parameters”

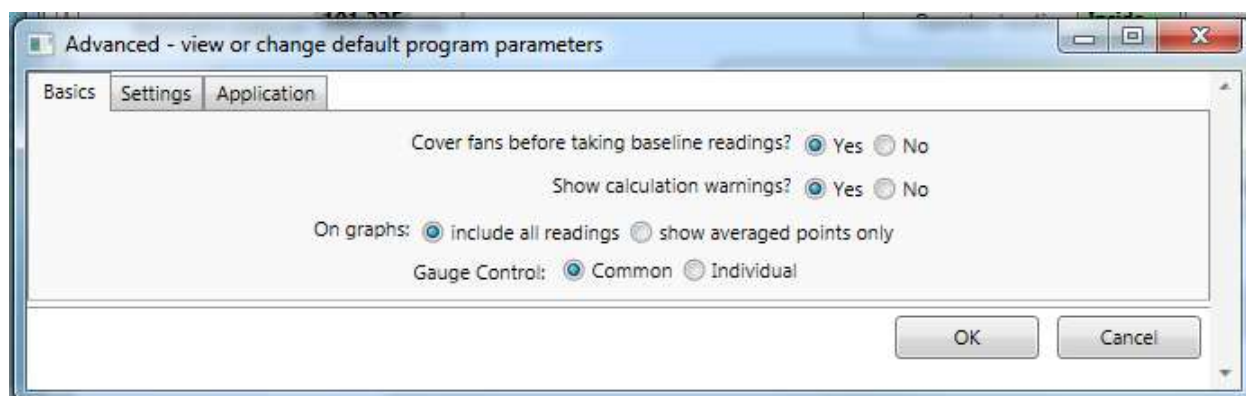


### 5.1.9 Basics tab for items applying to all tests

Start FanTestic if it is not already running.

Click on “Settings” → “Advanced - view or change default program parameters”

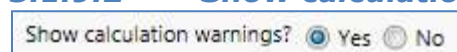
Click on “Basics” tab



#### 5.1.9.1 Cover fans before taking bias readings?

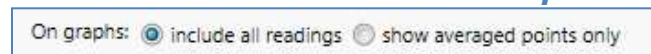
Selecting "Yes" will cause the software to stop after the initial bias pressure readings have been taken in order for the user to uncover the fan(s). Select "No" for a nonstop test in which test pressure will be taken immediately following initial bias pressure readings.

#### 5.1.9.2 Show calculation warning?



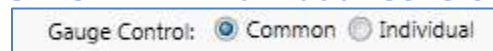
Warnings will appear when the “Calculate” button is clicked if insufficient building information is provided (i.e. no building volume was entered, therefore ACH50 cannot be calculated). Choose Yes to view the calculation warnings.

#### 5.1.9.3 Data to show On Graphs



This selection allows you to choose whether the graphs will show all readings, or only show the single point that is the average of all readings at any particular Test Fan pressure.

#### 5.1.9.4 Individual Control



The Gauge Control function allows a user choose the method that the FanTestic will use to seek a target pressure when multiple fans are being used. The Gauge Control function sets whether a number of fans are controlled with the same signal (from one primary gauge) so all fans run at the same speed or whether each fan is controlled individually and will run at different speeds.

With Gauge Control set to “Common”, all fans will be controlled by the induced pressure reading on the primary gauge, and the non-primary gauges will be set to the speed of the primary fan.

With Gauge Control set to “Individual”, each fan is controlled by the induced pressure on its own gauge. Controlling this way may result in “dueling” fans, where one takes over and runs up to a speed of 100%, while the other fans decrease to 0% speed. If this happens during your test, change to Common Control.



Each gauge must be connected to FanTestic for automatic control, and each gauge must be connected using the yellow speed control cable to its own fan. For details about setting up multiple fan tests, see the [Multiple Fan Testing for Large Buildings Manual](#).

#### *Gauge Control: "Common"*

To control the speed of multiple fans based on the speed of the primary gauge, choose "Common". When attempting to create a pressure, FanTestic will set the target pressure on a single (primary) gauge. FanTestic tells the primary gauge to seek that target pressure, and then reads the %speed from the primary gauge, and tells all other gauges to go to that speed. This effectively turns all fans into one big fan that is controlled by the induced pressure on channel A of the primary gauge.

The first gauge in the list in the Equipment tab is the "primary gauge". The primary gauge can be switched by the user.

#### *Gauge Control: "Individual"*

For each fan to be controlled only by their own gauge, choose "Individual". When attempting to create a pressure, FanTestic will set the target pressure or speed on each of the gauges. FanTestic tells each gauge to seek that pressure target simultaneously. This would be the same as a human operator using the Set Pressure function on each gauge individually.

### 5.1.10 Settings tab for items specific to each test Standard

Start FanTestic if it is not already running.

Click on "Settings" → "Advanced - view or change default program parameters"

Click on "Settings" tab.

The screenshot shows the 'Advanced - view or change default program parameters' dialog box. It has three tabs: 'Basics', 'Settings' (selected), and 'Application'. A 'Reset to Standard Defaults' button is at the top left. The 'Settings' tab contains several input fields for reference pressures and testing parameters.

| Pressure reference for ASTM:                                   |     |
|--|-----|
| Air flow reference pressure #1 (also for Air Changes per Hour) | 50  |
| Air flow reference pressure #2                                 | N/A |
| Flow / unit area reference pressure                            | 50  |
| Effective Leakage Area reference pressure                      | 4   |
| Equivalent Leakage Area (EqLA) reference pressure, $P_{ref}$   | 10  |

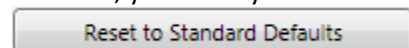
  

|  |  |
|--|--|
| Take 1                                 | bias pressures for 30 s each.                                  |
| Take 6                                 | induced pressures from 10 to 60 Pa, for 10 s each.             |
| Pressure target arrival criteria       | Error must be less than 5 % or 1 Pa in a sample of 12 readings |
| Bias stability required before testing | maximum change of 0.5 Pa/sec tested over 10 Sec                |

At the bottom right are 'OK' and 'Cancel' buttons.

Many of the settings can be changed to accommodate user-defined testing procedures.

However, you usually want to run a test according to the default protocol rules. If so, click the



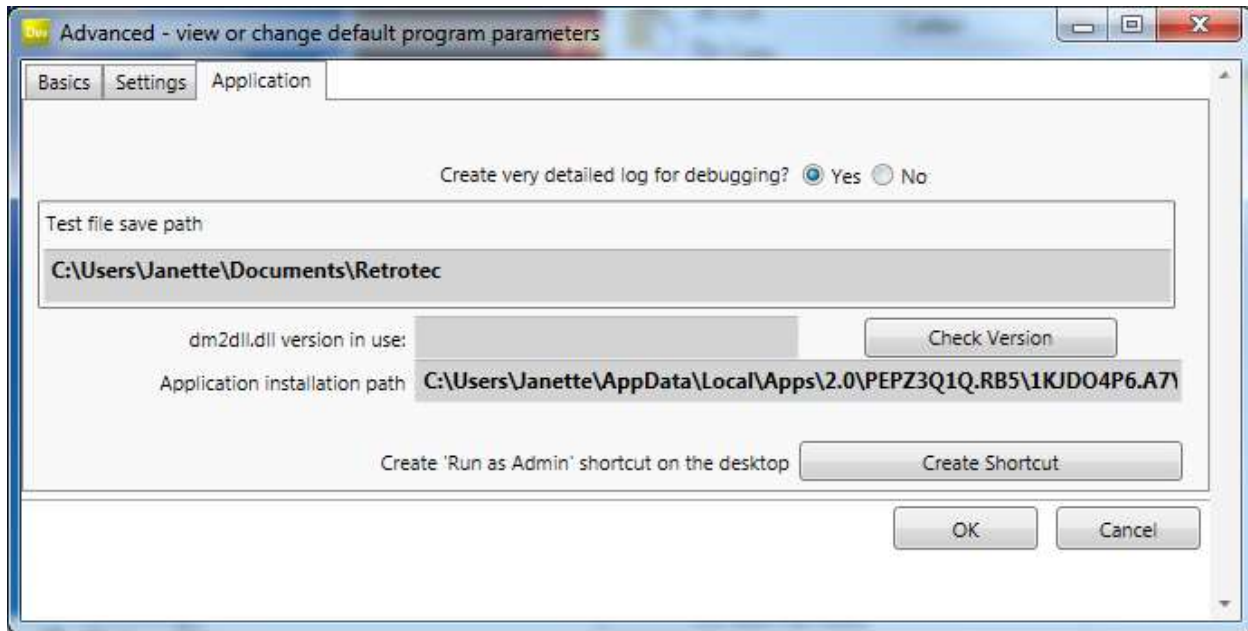
button to run a test according to the default protocol rules.

### 5.1.11 Application tab for items specific to FanTestic behind the scenes

Start FanTestic if it is not already running.

Click on “Settings” → “Advanced - view or change default program parameters”

Click on “Application” tab



### 5.1.12 Automatic Save

Test data can be automatically saved at periodic intervals by turning the Auto Save function on (“File” → “Auto save?”).

Test files are normally saved on your local C: drive under [MyDocuments]\Retrotec\Tests.


If you change the location of the test file to a remote drive, and then remove the remote drive with FanTestic running and AutoSave on, the software will not be able to save the file to the remote drive anymore, and may report an error.

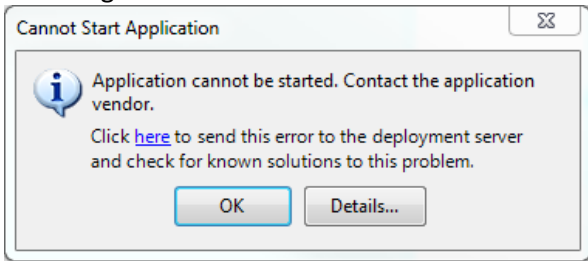
Turn AutoSave Off if you wish to double click to launch test files attached to emails. If you double click on a file with extension .exml attached to an email in MS Outlook with AutoSave on, FanTestic will start up and open the test file, but when AutoSave tries to save to the inaccessible MS Outlook temporary location, FanTestic may report an error.

## 5.2 Troubleshooting

| Problem   | Solution   |
|---|--|
| Tags are left in generated report, which means report generator code cannot find the tag, but the tag appears to be in the template | <ul style="list-style-type: none"> <li>make sure you are using the template in which the tag appears</li> <li>make sure there are no spaces between the curly brace and the first or last letter of the token within the curly braces</li> </ul> |



|   |  |
|---|--|
|   | <ul style="list-style-type: none"> <li>• make sure the token in the tag has the exact capitalization shown in the table</li> </ul>   |
| Cannot generate reports in FanTestic  | <ul style="list-style-type: none"> <li>• Make sure you are using the most recent version of Microsoft Word (2007 or greater)</li> <li>• If you are using an earlier version (2003 or earlier), please download a free compatibility pack <a href="#">here</a> that will allow you to open/edit/save Word 2007 documents.</li> <li>• If this does not fix the problem, contact us.</li> </ul>   |
| Cannot find gauges with DM-2 connected – DM-2-to-computer connection is not functional  | <ul style="list-style-type: none"> <li>• You must download the DM-2 USB driver from Retrotec’s website in order to get the computer to recognize the DM2 gauge. You can access this driver <a href="#">here</a>.</li> <li>• Make sure to first right click “DM2deviceinstaller” exe and select Run as administrator to install it, instead of double-clicking the file.</li> <li>• If the driver is downloaded and functional, unplug the DM-2 from the computer, power it off, turn it back on after 10 seconds, and re-plug it back in.</li> </ul> <p>Try the  button once more.</p> <ul style="list-style-type: none"> <li>• Try plugging the DM-2 into an active powered USB hub (with hub plugged into mains power)</li> </ul> |
| Cannot find gauges using DM-2 with firmware older than version 3.0 (The version is displayed when you turn on the DM-2 gauge, and on the top line when you push [Setup].) | <ul style="list-style-type: none"> <li>• Any DM-2 gauge that is older than Firmware Version 3.0 requires an Active Powered USB HUB, with hub plugged into mains power.</li> </ul>  |
| Find Gauges with DM-2 gauges results in a message containing the phrase “Error 5: Access Denied”  | <ul style="list-style-type: none"> <li>• You must run FanTestic as Administrator</li> <li>• See the document: <a href="#">Solve DM-2 Access Denied Errors</a></li> </ul>   |
| Intermittent DM-2 connection over USB   | <ul style="list-style-type: none"> <li>• Try plugging the DM-2 into an active powered USB hub (with hub plugged into mains power)</li> </ul>   |

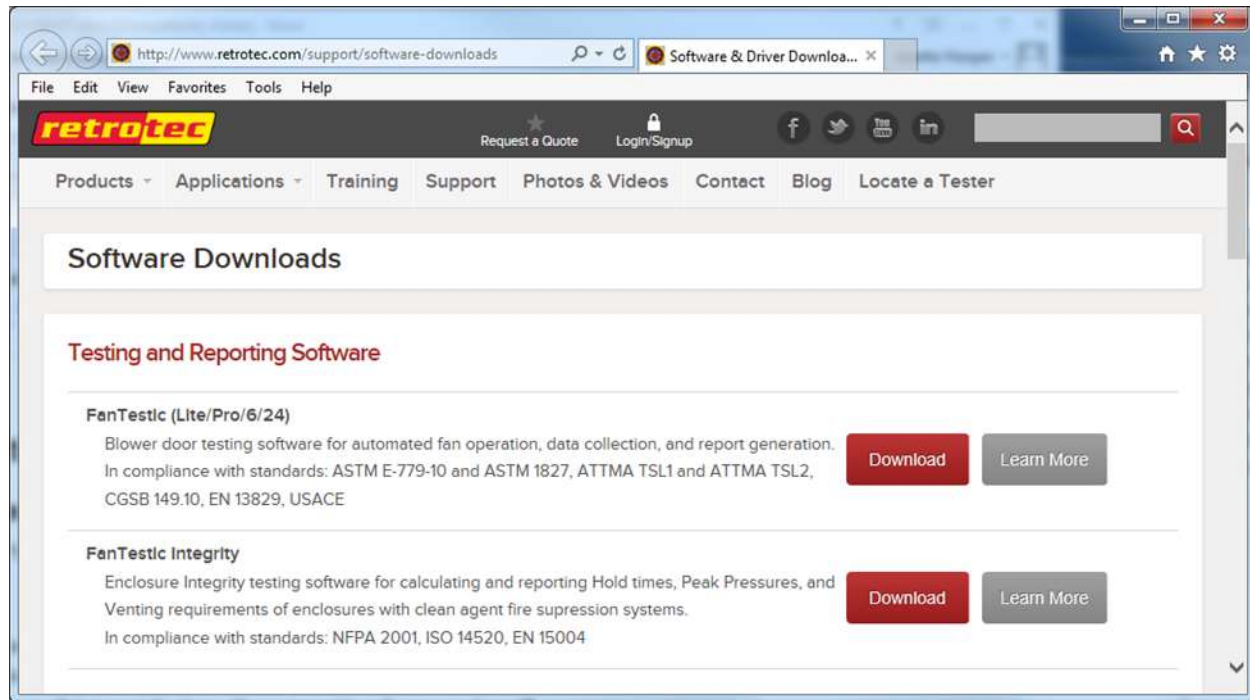
|  |   |
|--|---|
|  | <ul style="list-style-type: none"> <li>Try running both the laptop and the DM-2 from batteries, not plugged into any external power source</li> </ul>   |
| <p>If after doing an update or install, you get the following notification:</p>  <p>This means that you had a previous version of FanTestic that was set up to “Run as Administrator”, likely to allow connection to the DM-2 gauges for automatic control over the USB port.</p> | <ul style="list-style-type: none"> <li>Click ok on the error, delete the old ADMIN shortcut and</li> <li>create a new shortcut as described in the <a href="#">Solve DM-2 Access Denied Errors</a> if you need to control DM-2 gauges</li> <li>use the newly created shortcut if you are not using DM-2 gauges</li> </ul> |
| <p>Unable to find gauges with DM32 connected to USB port of laptop</p>   | <ul style="list-style-type: none"> <li>Try plugging the DM32 into an active powered USB hub (with hub plugged into mains power). Some new laptops do not provide enough power on the USB port.</li> <li>Use the Ethernet port on the DM32 for automatic control instead of the USB</li> </ul>                             |

If you experience a problem that you cannot fix by troubleshooting, make sure you have the latest version of FanTestic software installed, and that your Microsoft Windows has all the service packs and updates installed (including .NET 4).

To install the latest automatically, connect to the internet and restart FanTestic – if there has been an update since your current version, you will be prompted to download the latest updates.

However, if you have been using FanTestic running in Administrator mode, the “Check for Updates” may not work correctly. To be sure you have the latest, you should go to the Retrotec website:

<http://retrotec.com/support/software-downloads:>



Then click on the Download button beside FanTestic. That will open a webpage which will show that latest version. If this version is different than what you have installed, you should use Control Panel to uninstall FanTestic from your computer and proceed to install the new version as described in section 5.1.2.

### 5.3 Contact Tech Support

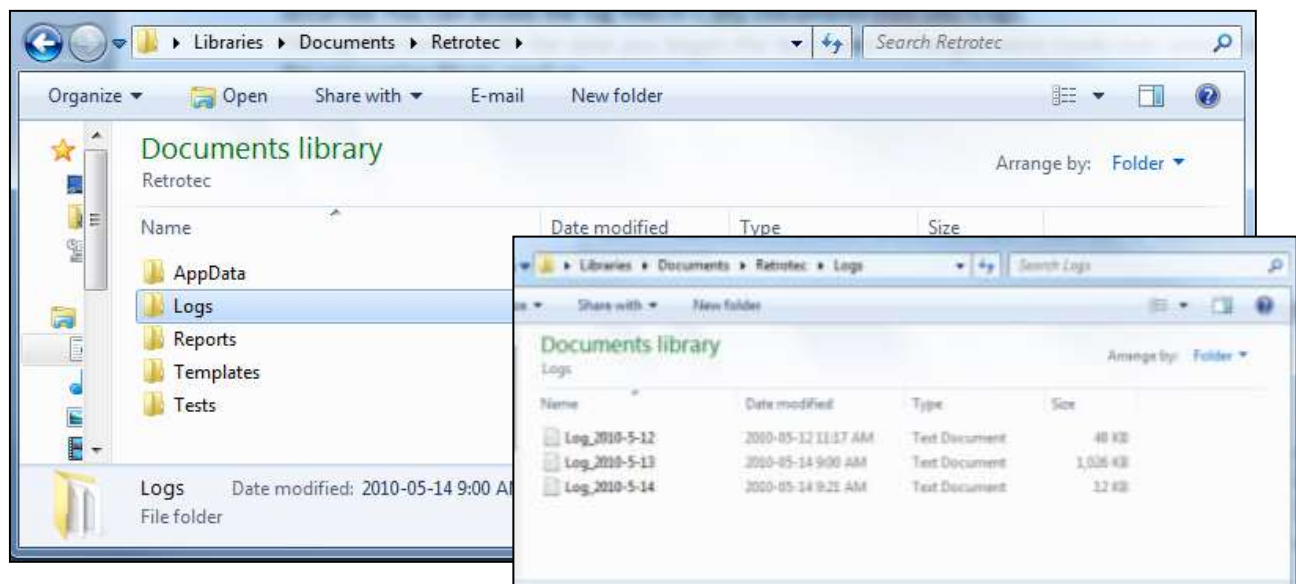
If you are still having problems even after updating to the latest software version and updating your Windows with all patches, follow these steps:

For Technical Support or to send suggestions, create an email to [support@retrotec.com](mailto:support@retrotec.com)

If you have encountered a bug which makes FanTestic crash, create an email to: [bugs@retrotec.com](mailto:bugs@retrotec.com)

In your email, describe the problem and when it occurs, and attach the following:

- The standard are you using ( click "Settings" → "Change Standard" to check)
- Log file from [My Documents]\Retrotec\Logs
- Test file you are using, file extension .xml or .fxml
- Settings.xml file [My Documents]\Retrotec\AppData
- A screenshot of the software running or having the error
- the version of Microsoft Office you are using
- The version of Microsoft Windows you are using



### 5.3.1 The log file

Each test has an associated log file that is saved on your C: drive, in the Retrotec folder. These logs will help Retrotec to determine where the problem occurred. You can access the log files in your local drive, in [My Documents]\Retrotec\Logs.

A new log file is created for each day, named Log\_yyyy-MM-dd.txt. If you leave FanTestic running over the course of multiple days, the log file will have the date of the day when FanTestic was initially started. The correct log file to send will be named with the date you began the test (even if changes were made over several days).

### 5.3.2 The test file

Test files with extension .xml or .fxml can be found in the My Documents\Retrotec\Tests folder, and are saved in the same fashion as log files. The name of the test file usually has the date you began the test. Send the test file with the same name/date as the log file.

### 5.3.3 Settings file

The Settings.xml file is found in your [My Documents]\Retrotec\AppData folder, and contains information troubleshooting personnel can use to diagnose the problem.

### 5.3.4 A screenshot

Screenshots are a way to show our tech support staff what your error looks like on your screen. This will help us, along with the background information (log and .xml files), to determine the best approach to fix the problem.

Current versions of Microsoft Windows include the "Snipping Tool" which can be used to make a screen snip of the window or of an area of a window on the screen. The image will be on the Windows clipboard as if it has been "copied" so you can just "paste" it into an email.

In older versions you may need to create a document and then capture an image of the screen you are currently looking at, by pressing the [Print Scrn] button on your keyboard. In order to attach this image as a file for us to view, you must paste it into a document.

To do this, in the open Microsoft Word or Paint document, right click on your mouse and select Paste (or Edit → Paste). The captured image of your screen should appear in the document. You can now save this document and include it as an attachment when you submit your information to us.