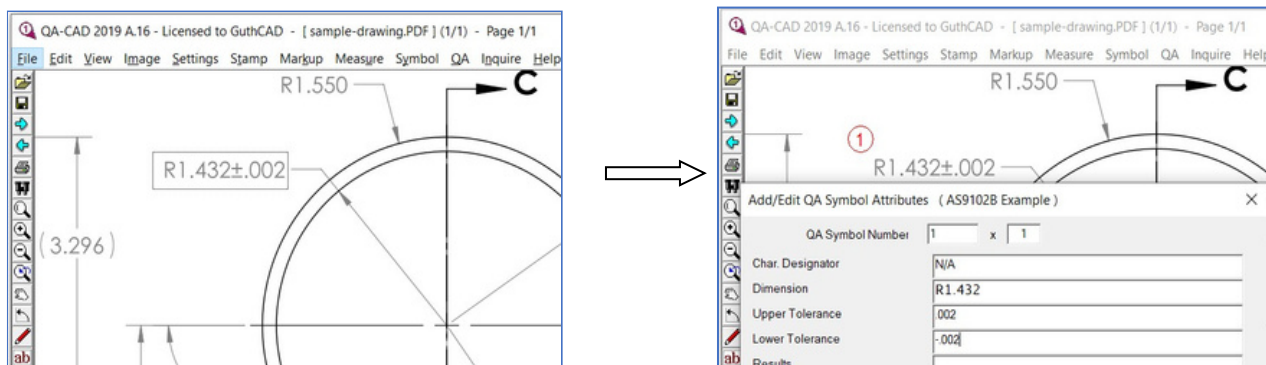# QA-CAD Software Installation and Beginners' Guide Vol.9.10: how to create a FAI report from PDF/CAD drawings in QA-CAD

Image 1. Select and capture dimension and tolerance by OCR Image 2.OCR ouput captured dimension in Dimension field

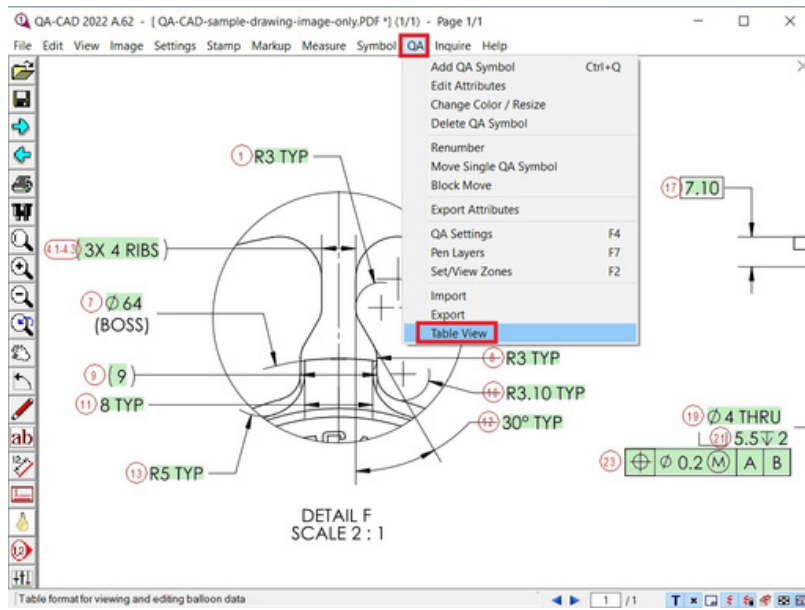**Click the below link to download the latest QA-CAD software.**
http://www.iqmsolutions.co.in/digiverse-auto-ballooning

Table of Contents

New feature introduction: inspection table view

Select QA > Table View.

Then you can view the inspection table inside the QA-CAD. You can directly type and correct dimension, upper and lower tolerances in the inspection table. If you click the balloon number in the inspection table, The software auto-focus on the selected balloon number in the drawing. This helps for check purpose.
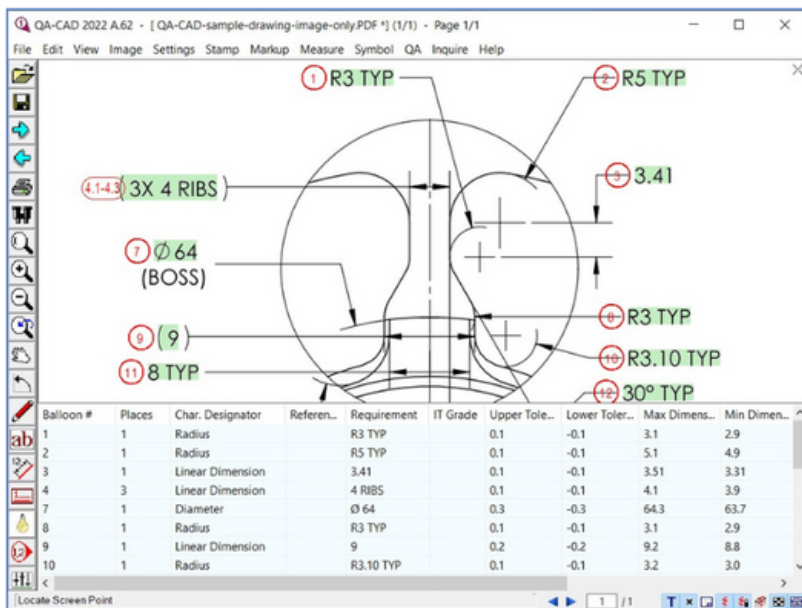
Open a drawing file

Step 1: First, Open your PDF drawing file in QA-CAD. Select File > Open
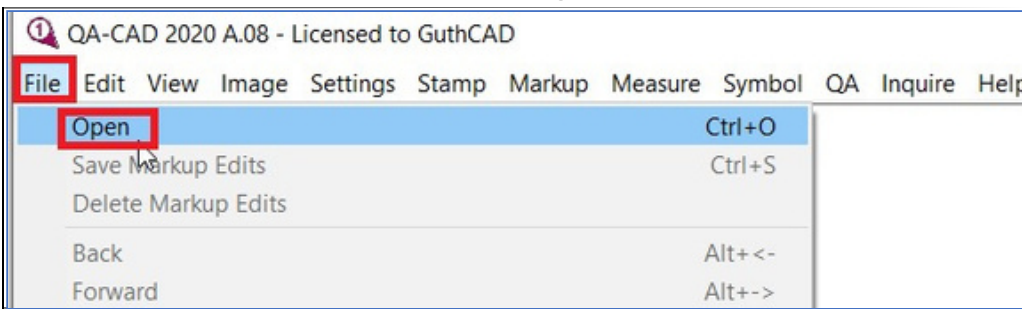
Step 2: Select your PDF drawing file (or CAD file). Then press Open button.

Step 3: Next, click 'QA' from top menu and select 'QA Settings'.

Set up your tolerance configuration

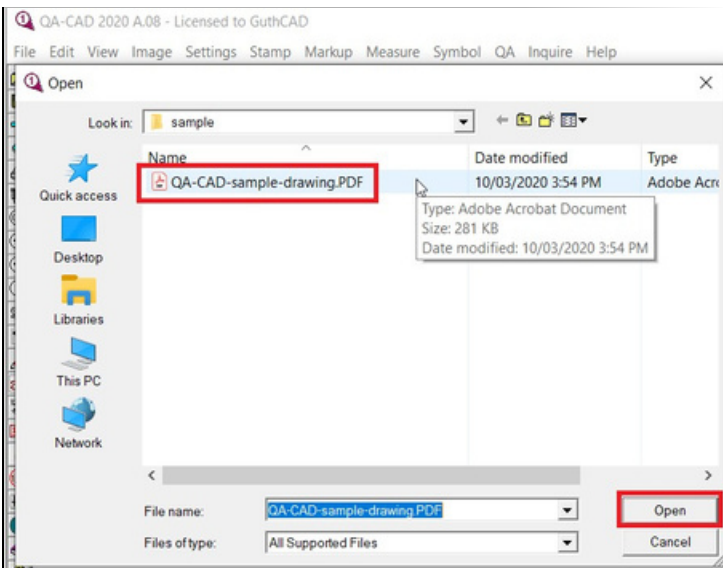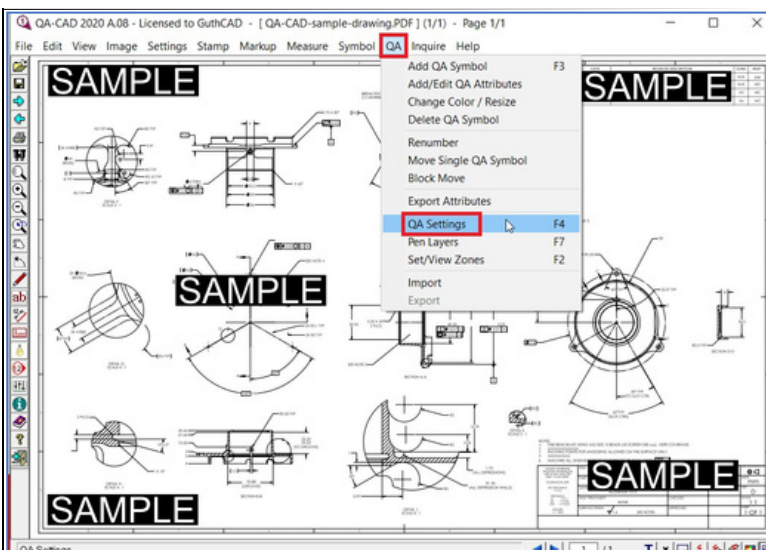Step 4: Then 'QA Settings' window open and select Attributes tab. QA-CAD can capture dimension and its specified tolerance together from your drawing if the dimension and the tolerance are drawn together (for example: '.174 ±0.02'). However, if tolerance is unspecified in your drawing (for example: '.174'), QA-CAD can enter tolerance automatically based on dimension in the drawing. In QA-CAD, there are three automatic tolerance entry methods in case of unspecified tolerance (You can set up a maximum of 5 tolerance settings).

Method 1: Select tolerance standard from a built-in QA-CAD tolerance table database.

or

General tolerance according to: ISO 2768-mH

Tolerance
class

DIN ISO 2768-m

If you find tolerance requirement like the above images in your drawing, you need to tick one of the Tolerance settings and select required tolerance standard in its Tolerance from drop-down menu (for example: you can select 2768-m, which is ISO 2768 General tolerances and its medium(m) tolerance class designation). Then press the OK button and proceed to Step 5.
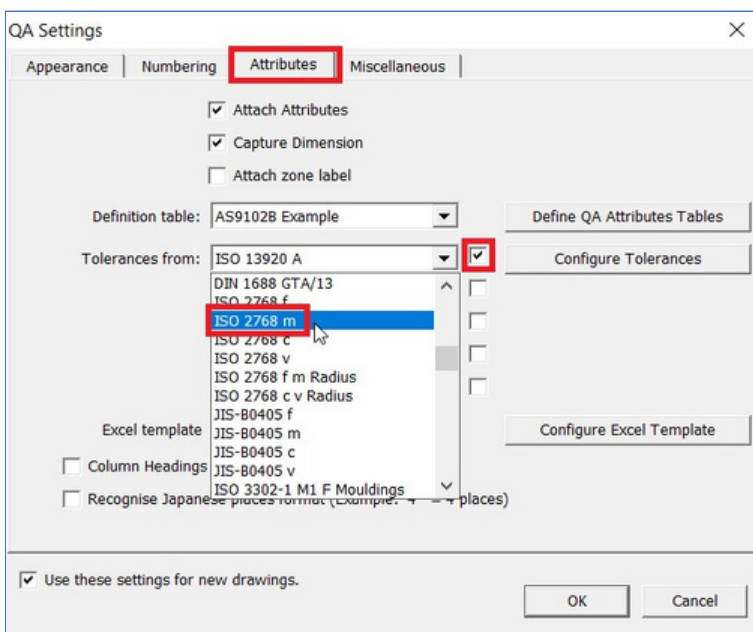
(another example: If your drawing requires ISO 13920, select 13920 in Tolerance from drop-down menu. QA-CAD has the built-in tolerance tables for a wide number of standards. If you cannot find your required tolerance standard, please contact us. Maybe we can add it in QA-CAD.)

Allowable deviations on untoleranced
dimensions for welding constructions:
EN ISO 13920

Method 2: Set up and use your Default Tolerance.

If you see the below tolerance requirement in your drawing, you need to set up your default tolerance, click Attributes tab and press the configure tolerances button.
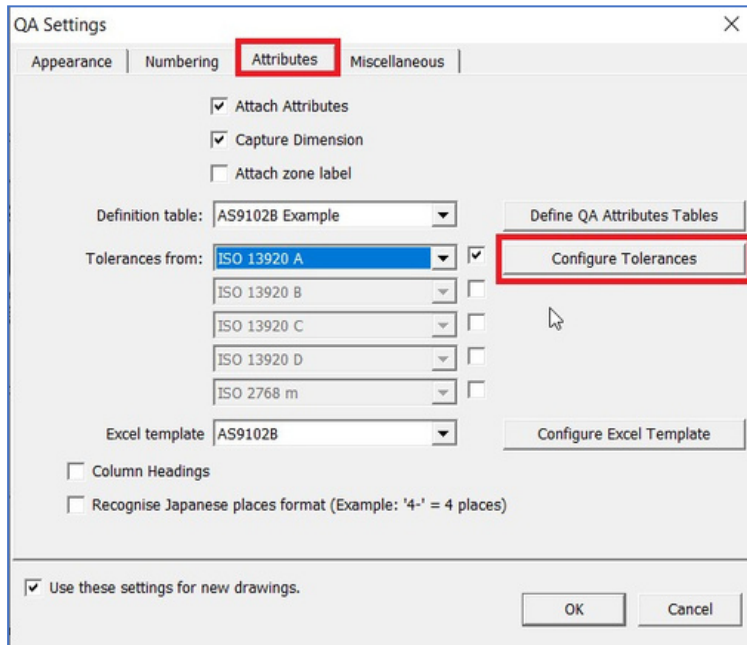
UNLESS OTHERWISE
SPECIFIED DIMENSIONS
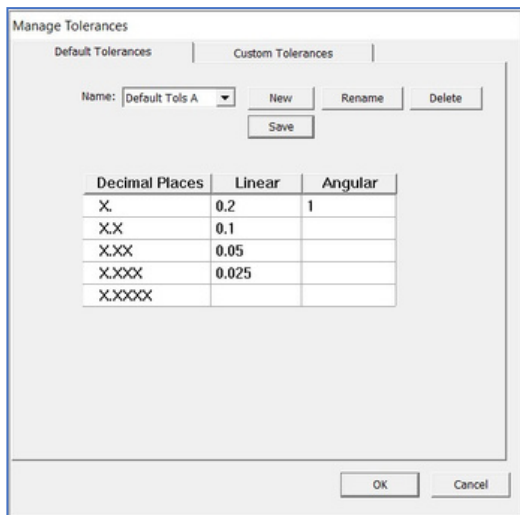ARE IN MM AND PER
ANSI Y14.5M-2009.

TOLERANCES ARE:

NO DECIMALS:
+/-0.2

DECIMALS:
.X   +/-0.1
.XX   +/-0.05
.XXX   +/-0.025

ANGLES:
+/-1 DEG

QA Settings

Appearance | Numbering | **Attributes** | Miscellaneous

☑ Attach Attributes
☑ Capture Dimension
☐ Attach zone label

Definition table: AS9102B Example ▼   Define QA Attributes Tables

Tolerances from: ISO 13920 A ▼ ☑   Configure Tolerances

ISO 13920 B ▼ ☐
ISO 13920 C ▼ ☐
ISO 13920 D ▼ ☐
ISO 2768 m ▼ ☐

Excel template AS9102B ▼   Configure Excel Template

☐ Column Headings

☐ Recognise Japanese places format (Example: '4-' = 4 places)

☑ Use these settings for new drawings.   OK   Cancel

Then Manage Tolerances window opens. Click the Default Tolerance tab. Type required linear/angular tolerance depends on decimal places (for example: if decimals are +/-0.1 for .X, type 0.1 as a Linear tolerance for Decimal Places X.X). Once you complete to set up your required tolerances, press the Save button.

Manage Tolerances

Default Tolerances | Custom Tolerances

Name: Default Tols A ▼   New   Rename   Delete

Save

| Decimal Places	Linear	Angular
X.	0.2	1
X.X	0.1	
X.XX	0.05	
X.XXX	0.025	
X.XXXX		

OK   Cancel

Then 'OK, Default Tols A saved' window opens. Press OK button. Then the QA settings window opens. Tick one of the tolerance settings and select Default Tols A in its dropdown menu. Proceed to Step 5.
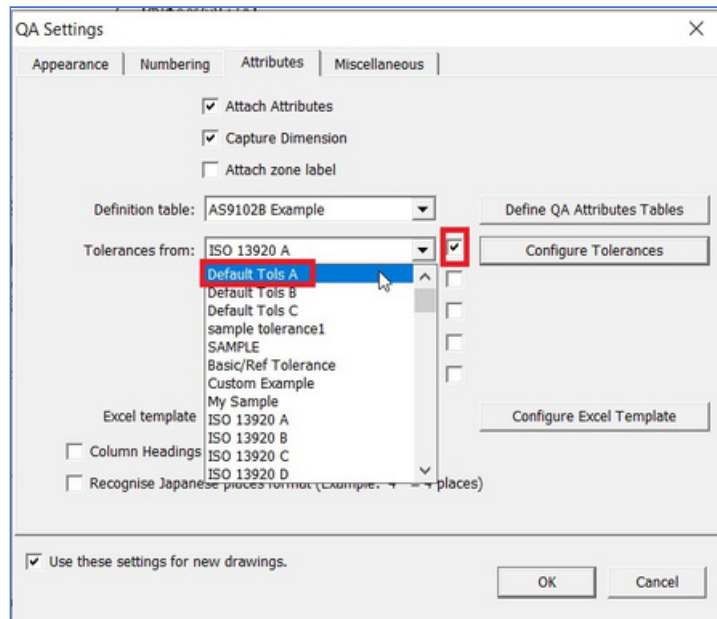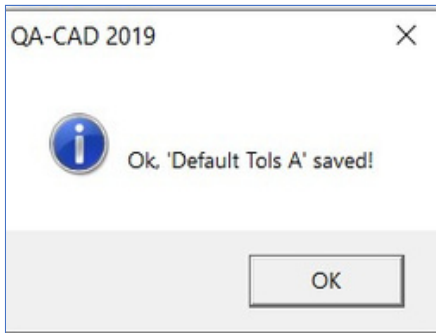

Method 3: Set up and use your Custom Tolerance.

If you see the below tolerance requirement table in your drawing, you need to set up your custom tolerance, click Attributes tab and press the configure tolerances button.
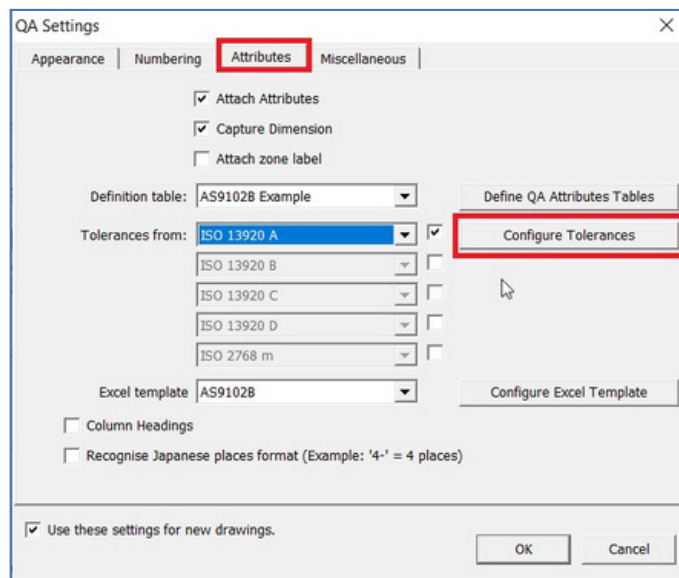
Then Manage Tolerances window opens. Click Custom Tolerances Tab. Input the whole tolerance requirement table (for example: if OVER 3, UP TO 6 is 0.1, type 3 in Above column and type 6 in Up to column. Then type -0.1 as a lower tolerance and type 0.1 as an upper tolerance). Please note that the largest 'Up to' cell needs to be blank when we create and save a custom tolerance set. Once you complete to input your required tolerance table, press Save button.
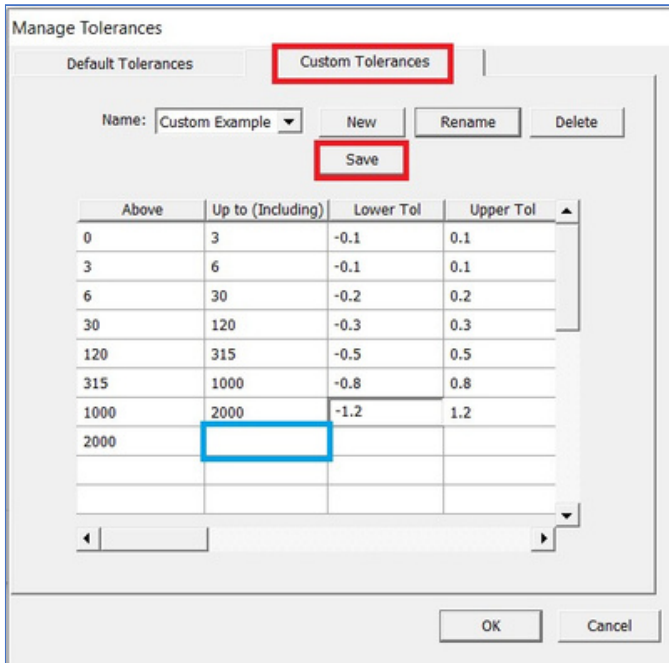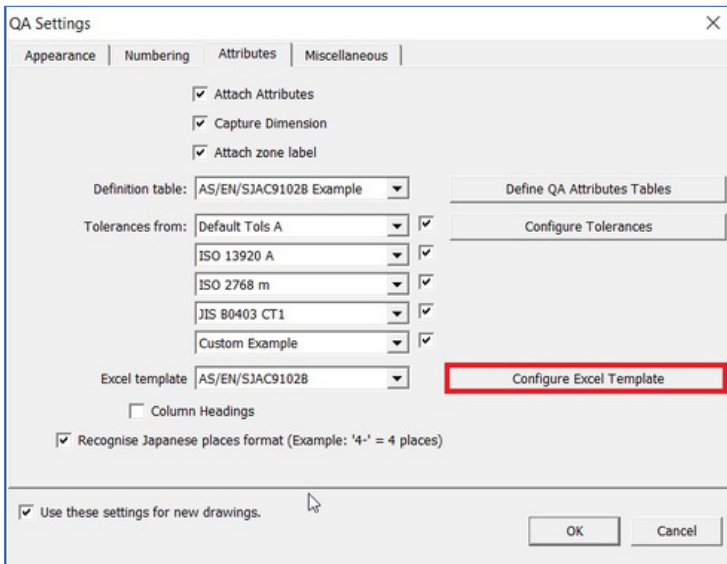

Then 'OK, Custom Example saved' window opens. Press OK button. Then the QA settings window opens. Tick one of the tolerance settings and select Custom Example in the its dropdown menu. Proceed to Step 5 (If you tick the second tolerance tick box from the top, you can configure 2nd tolerance settings. You can set up a maximum of 5 tolerance settings in case of unspecified tolerance).

Set up your EXCEL template (AS/EN/SJAC9102, PPAP or your inspection report template)

Step 5: Tick 'Attach Attributes', 'Capture Dimension', and 'Attach zone label'. Select 'AS/EN/SJAC9102B Example' in Definition table and ''AS/EN/SJAC9102B' in Excel Template (If you want to output to our built-in PPAP Dimensional Test Results form, select PPAP example in Definition table and EXCEL template).

Press OK and proceed to Step 6. However, if you want to output to your EXCEL template file directly, open your EXCEL Template and check start cell and columns.

Start Cell: A8. Column A is Balloon No. Column B is Dimension. Column C is Upper Tolerance. Column D is Lower Tolerance in this example EXCEL file.)

Go back to the QA settings window in QA-CAD. Press the Configure EXCEL template button.

Then the Manage Excel templates window opens. Press the New button.
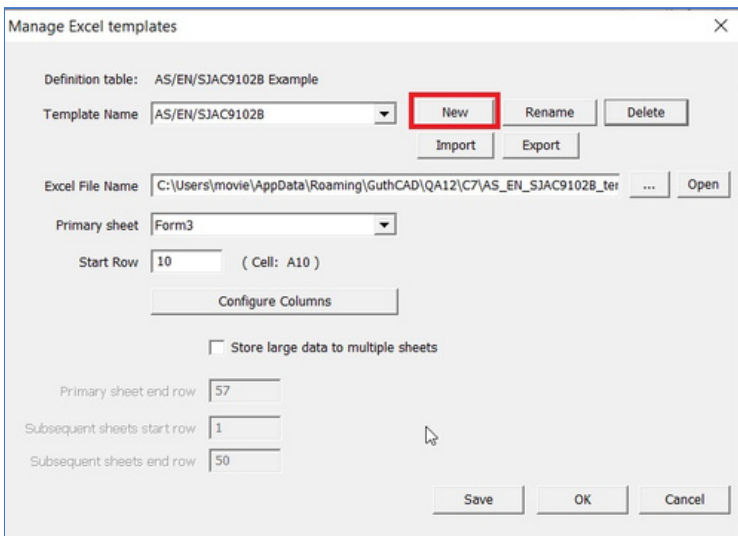
Then select Copy from current EXCEL template and type the template name in New Table Field (typed 'MY SAMPLE' in this below example). Then press the OK button.
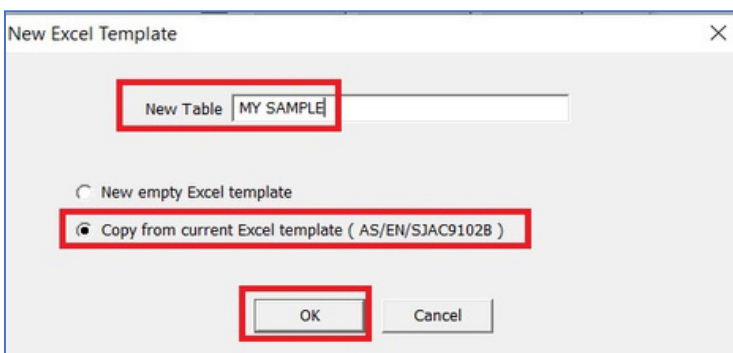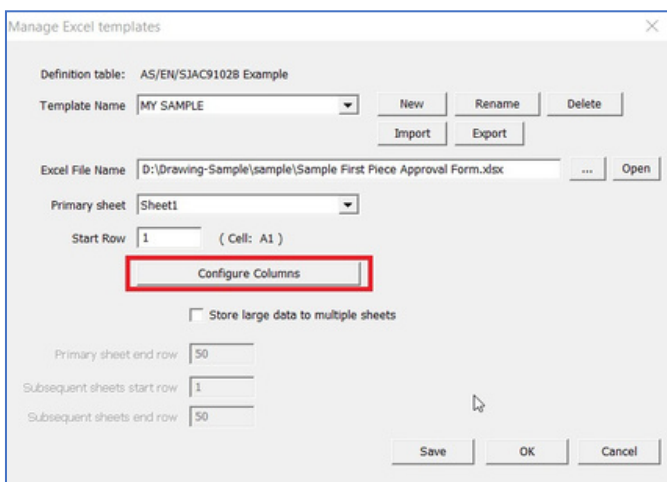
Go back to the Manage Excel templates window and click the '…' button next to the Excel File Name input Field (the red rectangle in the below image)
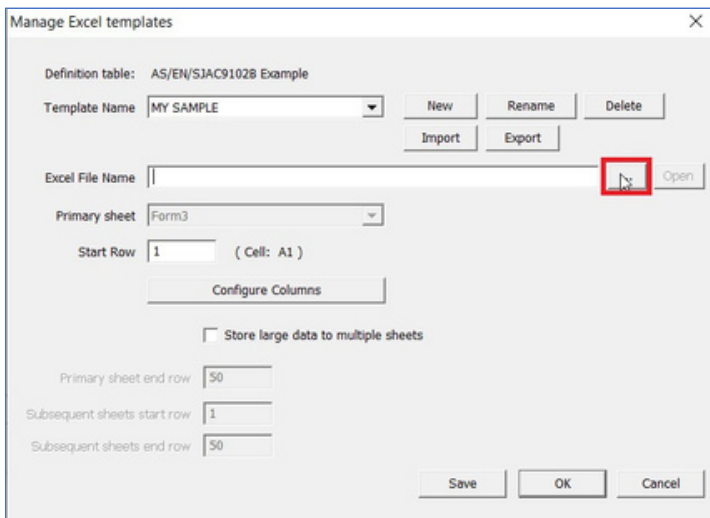

Then select your EXCEL template file ('SampleFirstPieceApprovalForm.xlsx' was selected in the below example image). Press the Open button.
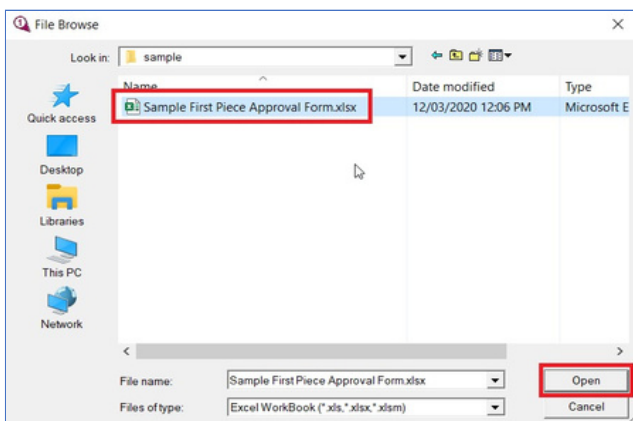
Press the Configure Columns button in the Manage Excel templates window.

The Configure sheet window opens. In this window, you can set which data is output to which column in an EXCEL template. For example: you can select or change that QA-CAD outputs dimension to Column B.
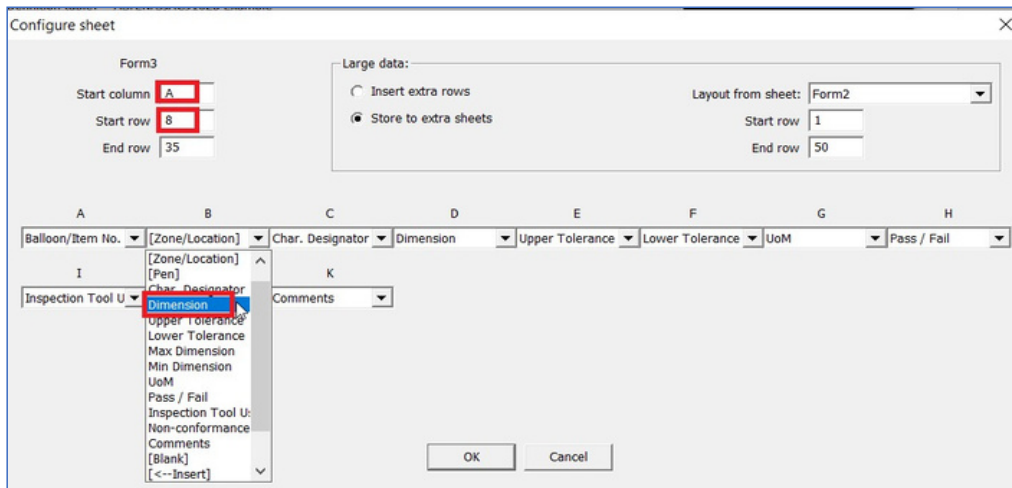
Type A in the Start Column and type 8 in the Start Row. Then change Column B to select Dimension in the dropdown menu. (Previously we checked the EXCEL template output cell requirement at page8. Start Cell is A8. Column A is Balloon No. Column C is Dimension. Column C is Upper Tolerance. Column D is Lower Tolerance).

Also change Column C to Upper Tolerance.
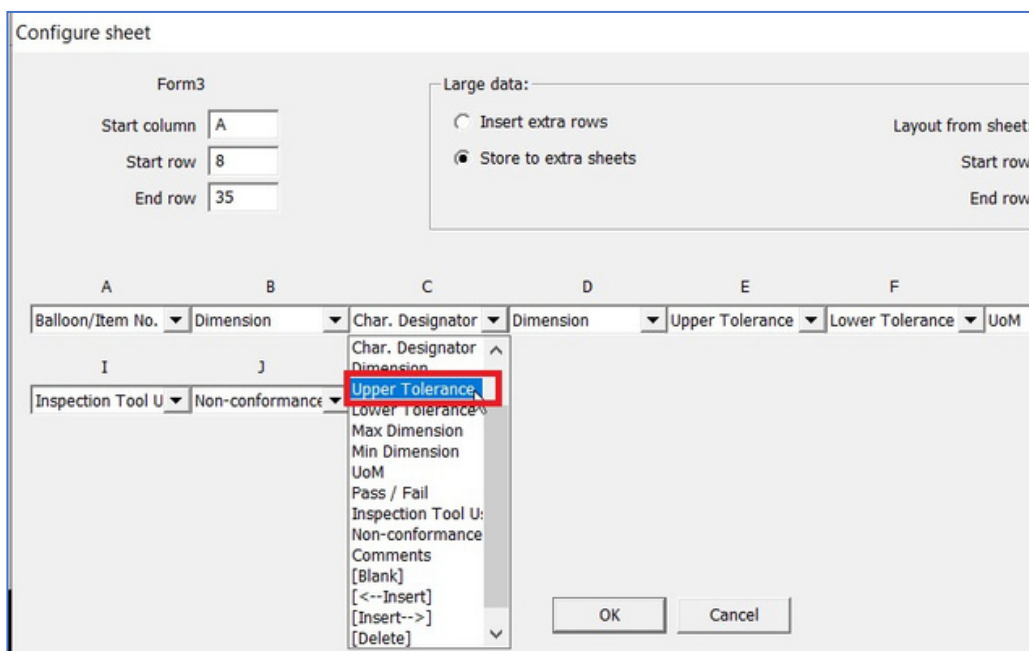
By the way, as you see from the above image, you can change or edit output attributes data. You can also insert another column, delete this column or make this column blank. if you select Max Dimension here, you can output maximum dimension (dimension plus upper tolerance). If you select Min Dimension here, you can output minimum dimension (dimension plus lower tolerance).

Then change Column D to Lower Tolerance.

Delete the rest of the columns (From column F to column K).

Then press the OK button (In the below example, QA-CAD outputs balloon number to column A, dimension to column B, upper tolerance to column C and lower tolerance to column D in a selected EXCEL template).

Then QA Settings window opens. Select 'MY SAMPLE' in the EXCEL template, press the OK button, and proceed to step 6.
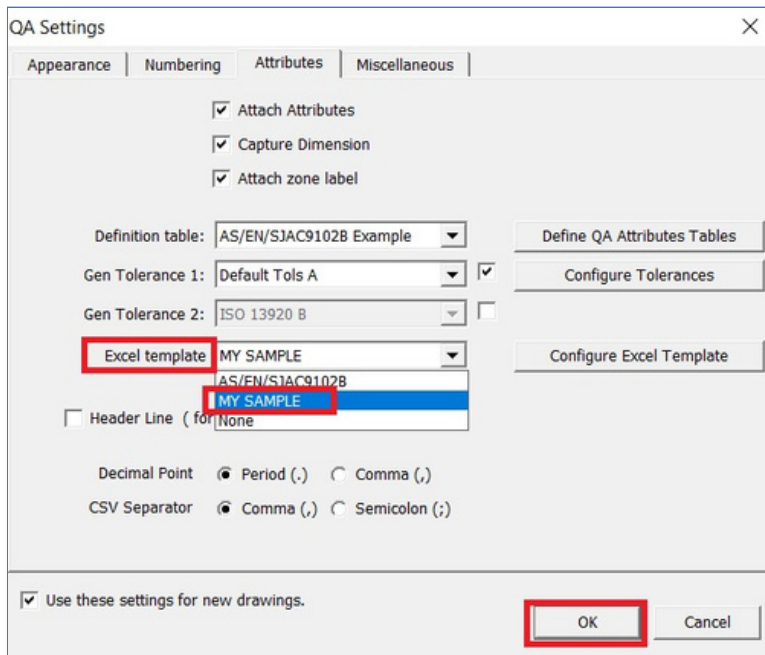

(This customize EXCEL template is very easy example. If you need to output

maximum/minimum dimesons or output all dimension and upper/lower tolerances into a single cell, click the Define QA Attributes Tables button.
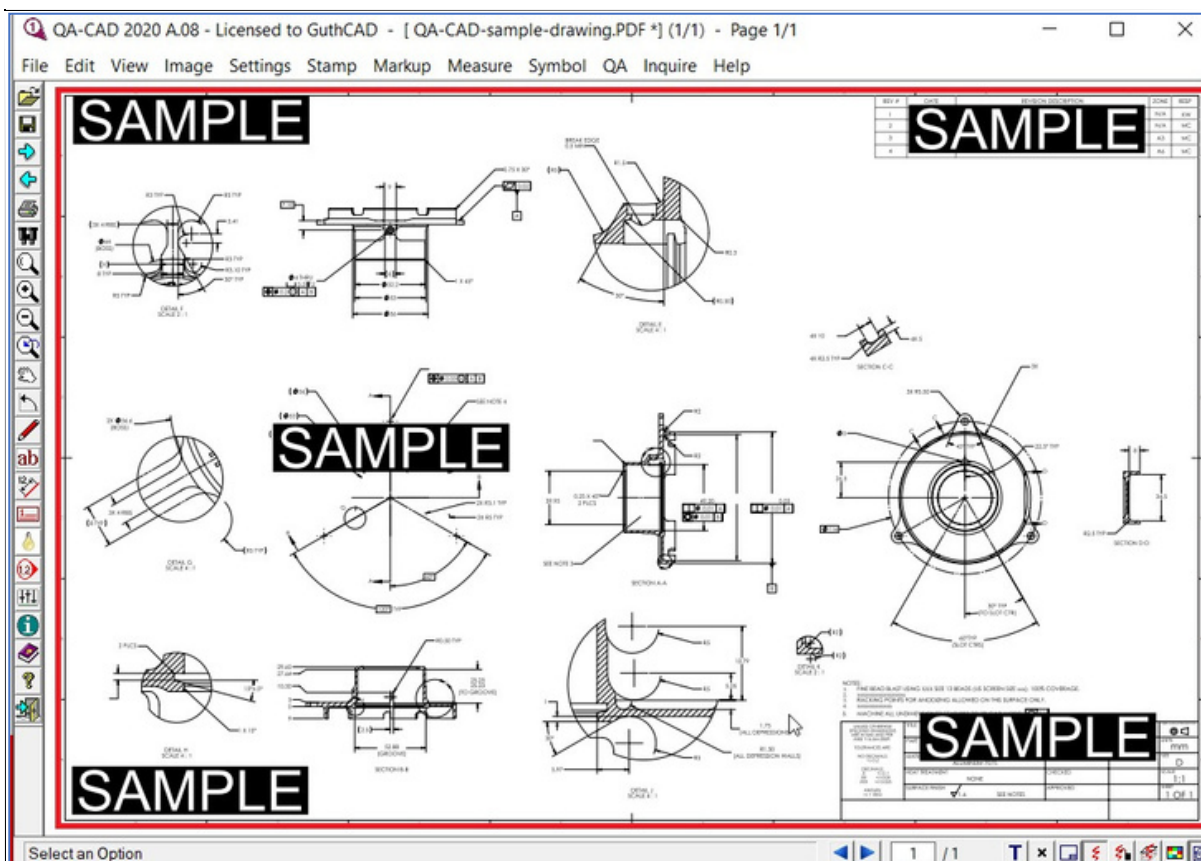
Set up reference zone

Step 6: Select QA > Set/View Zones (If you do not need to reference location, proceed to step 11).
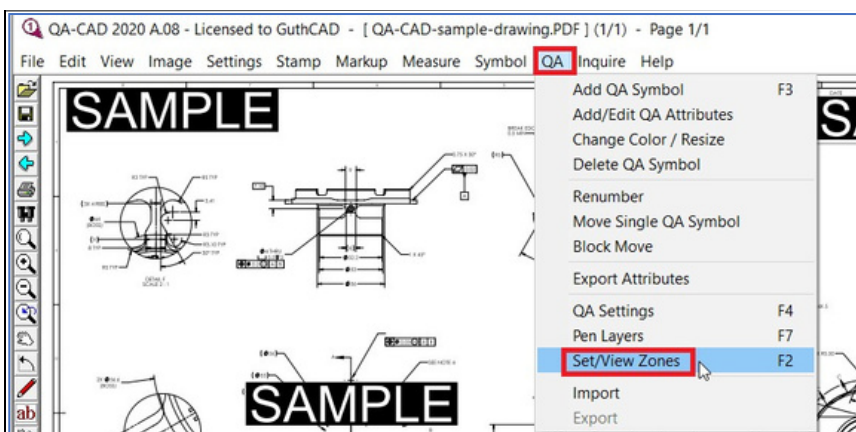
Step 7: A Reference Zones window opens. Press 'Get coordinates from drawing'.
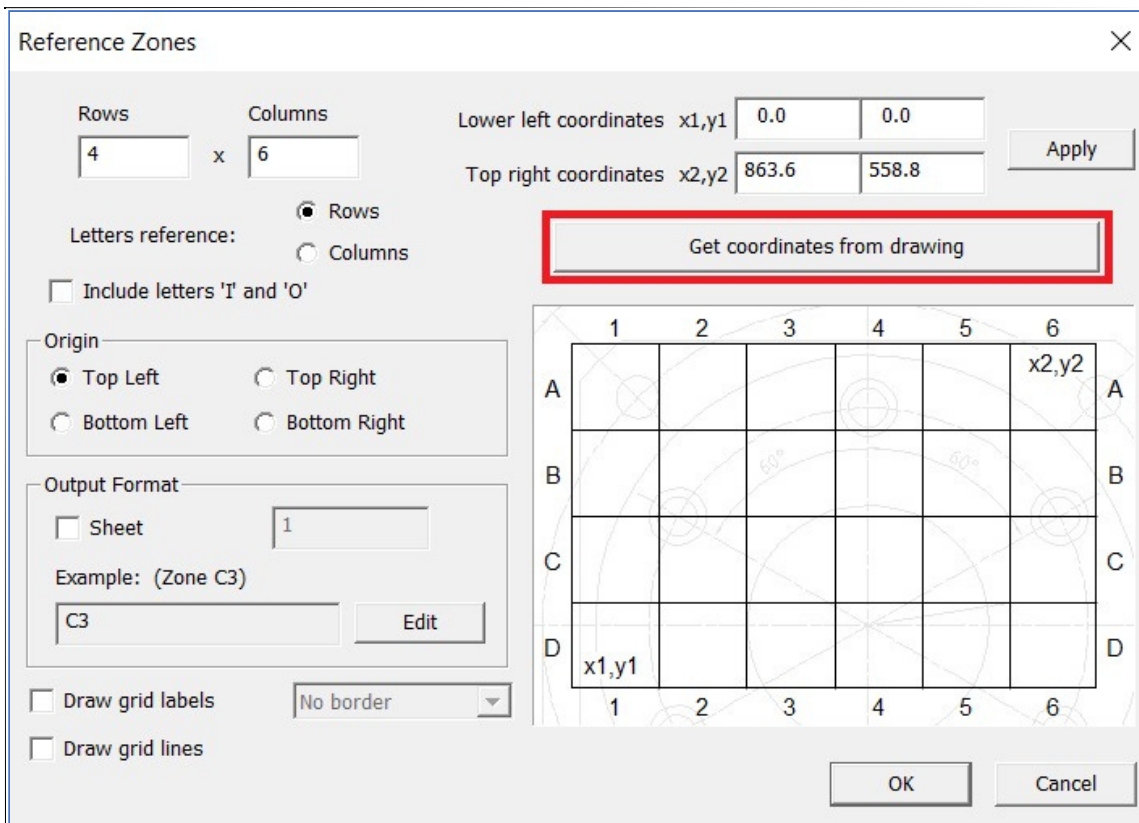
Step 8: Select whole edge of the drawing from left top to right bottom (actually you select edges with black line in QA-CAD. The red lines in the below image are for your reference.) Then left click once.

Step 9: Go back to Reference Zones window. Change Rows, Columns, Letters reference and Origin depends on your drawing (In this same drawing, Rows: 6, Columns:8, Origin is Bottom Right). Adjust x1, y1, x2, y2 and press Apply until the grid lines align with the drawing zone (In this same drawing, x1: 8, y1:7, x2:855, y2:550). Then press OK.
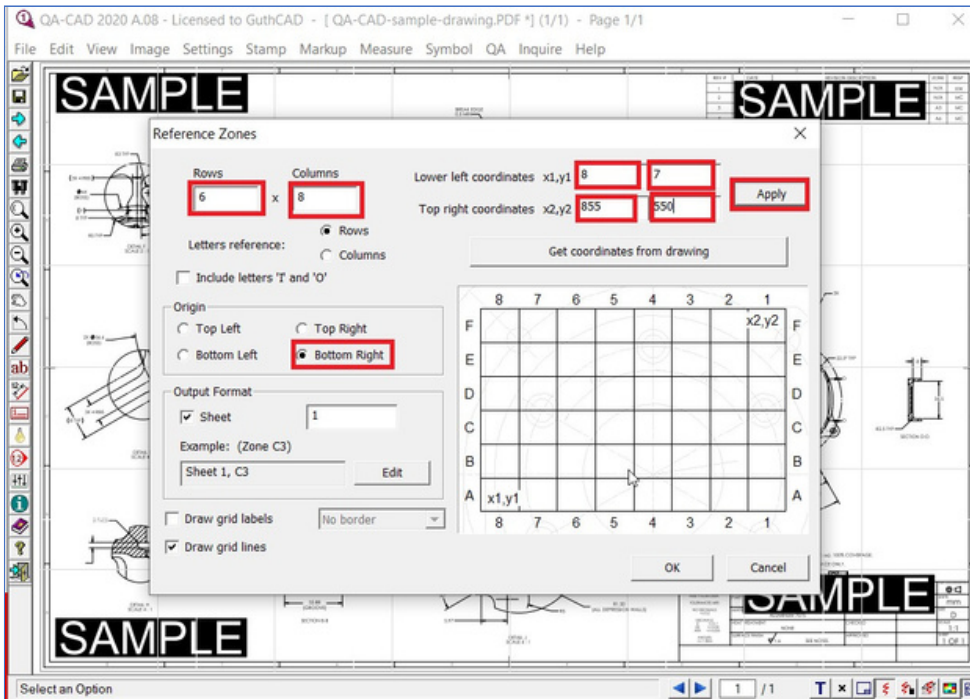
Step 10: You can zoom in the software screen by rolling up the mouse wheel if the letters in the drawing are too small or you can zoom out the software screen by rolling down the mouse wheel if the letters in the drawing are too large. Alternatively Press 'Zoom In' button (the red rectangle in the below image) or press 'Zoom Out' button. Then move a mouse pointer to the drawing. When you left click, you can zoom in your drawing.
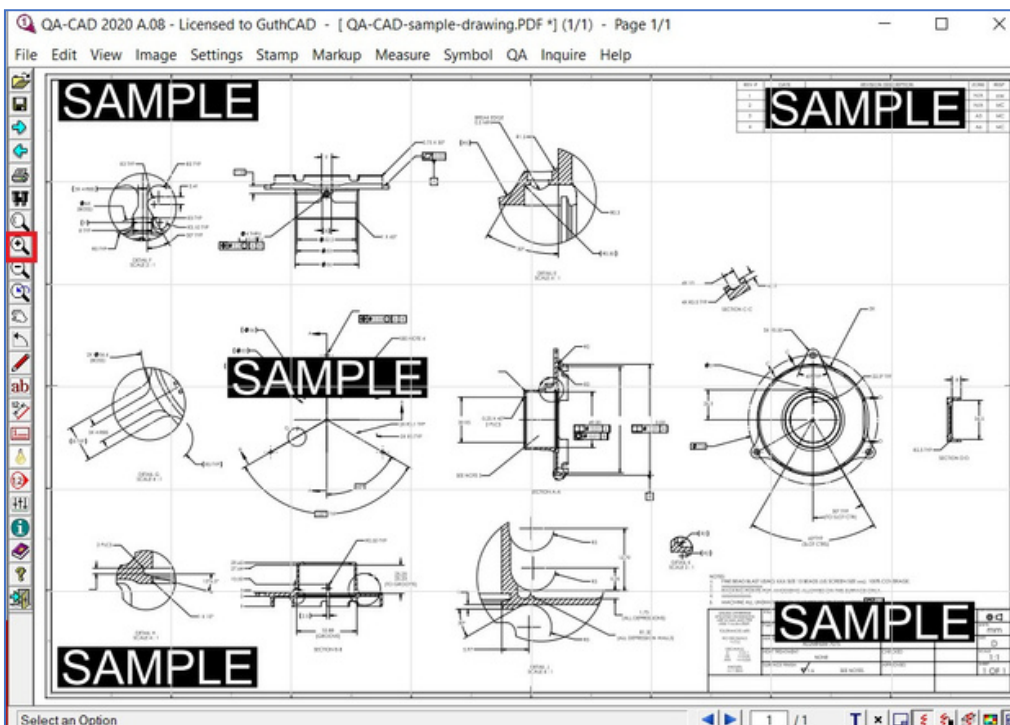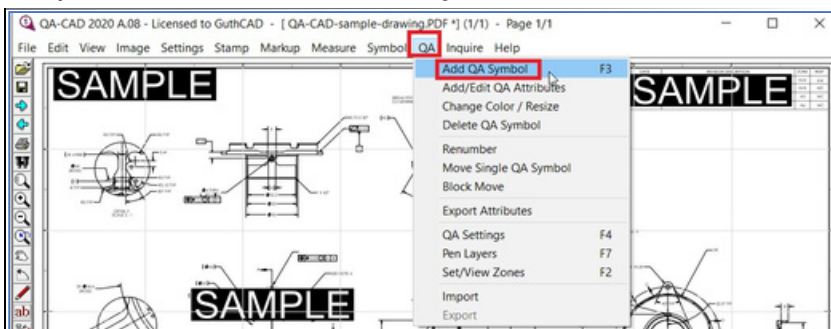
Then press left-click and hold it. The mouse pointer appearance changes to hand symbol. Then you can move the drawing (up or down, left or right).
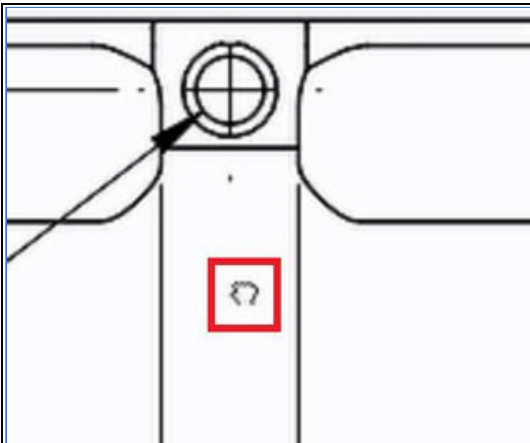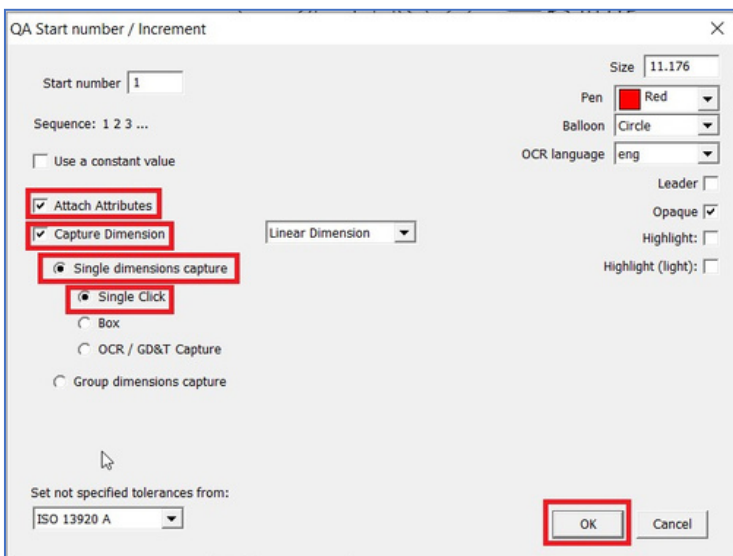

How to extract individual dimension, tolerance, and notes from text-selectable PDF or AutoCAD files

Step 12. Now click 'Add QA symbols' from QA menu.

Step 13: Tick Attach Attributes and Capture Dimension Value. Select 'Single dimension capture' and 'Single Click' as a capture method (If you want to do auto ballooning, proceed to page21). Press the OK button.

Step 14: Your mouse pointer changes and looks like a circle with a plus sign on the software (as you can see the circle inside the red rectangle in the below image). In this mode, you can draw balloons on the drawing. Move the circle to where you would like to place a balloon and left-click once. Then the circle is placed.
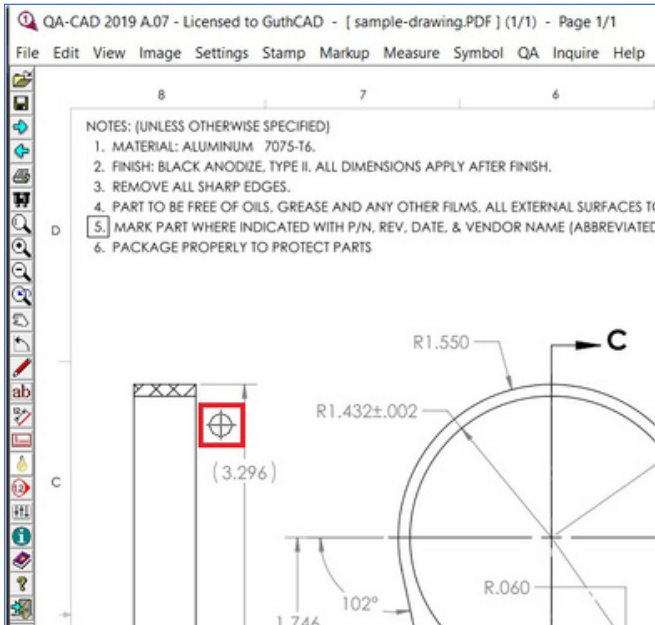
Step 15: You can move the plus sign to a dimension value (or text) you would like to capture (in this example, the plus sign moved towards 3.296). Left-click twice. The target value is captured and displayed in Dimension field on Add/Edit QA Symbol Attribute window. Press OK button (complete one balloon and its attributes setting).

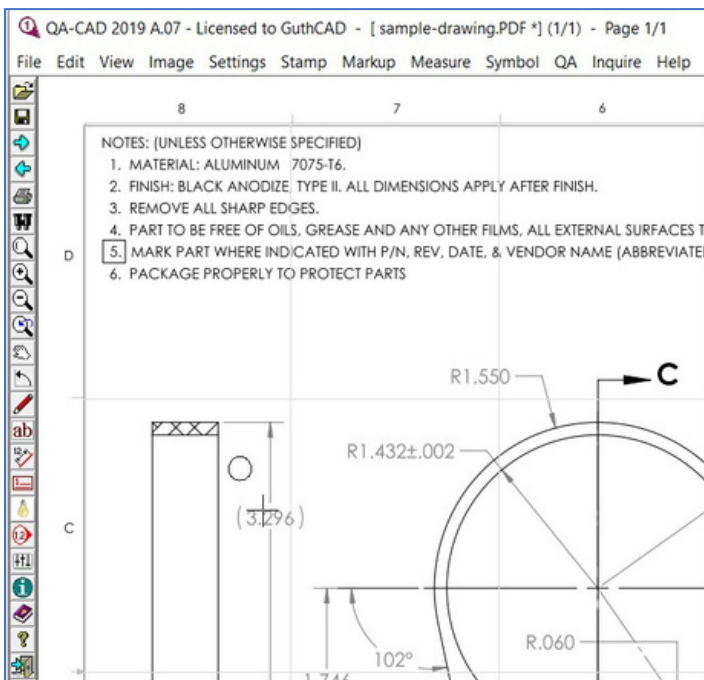Image 15-1. Move the plus sign to a dimension value (or text) you want to capture. Left-click once.

Image 15-2. The red ballon is displayed. Left-click once again.
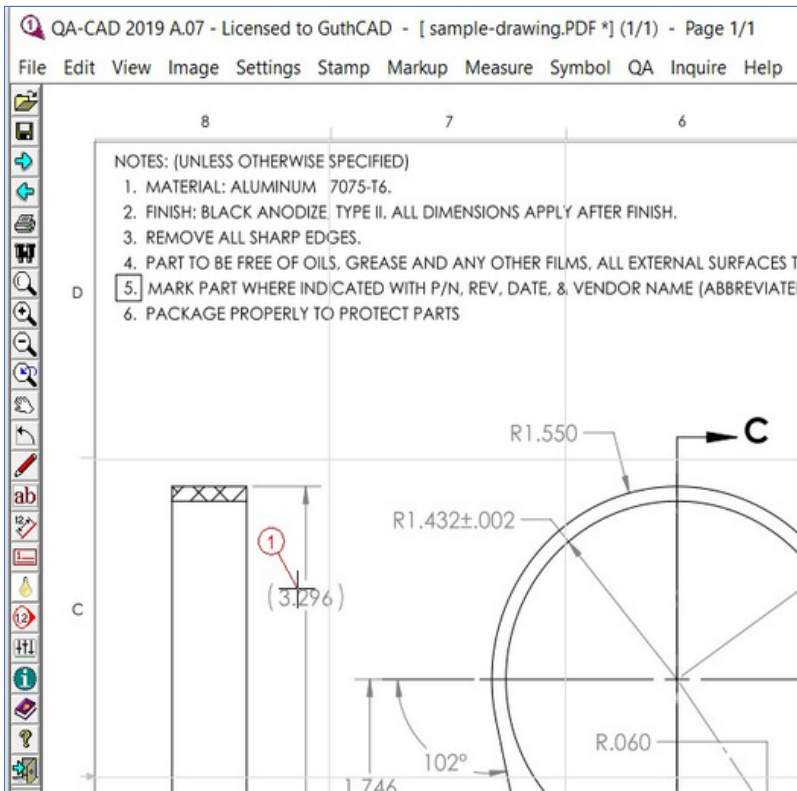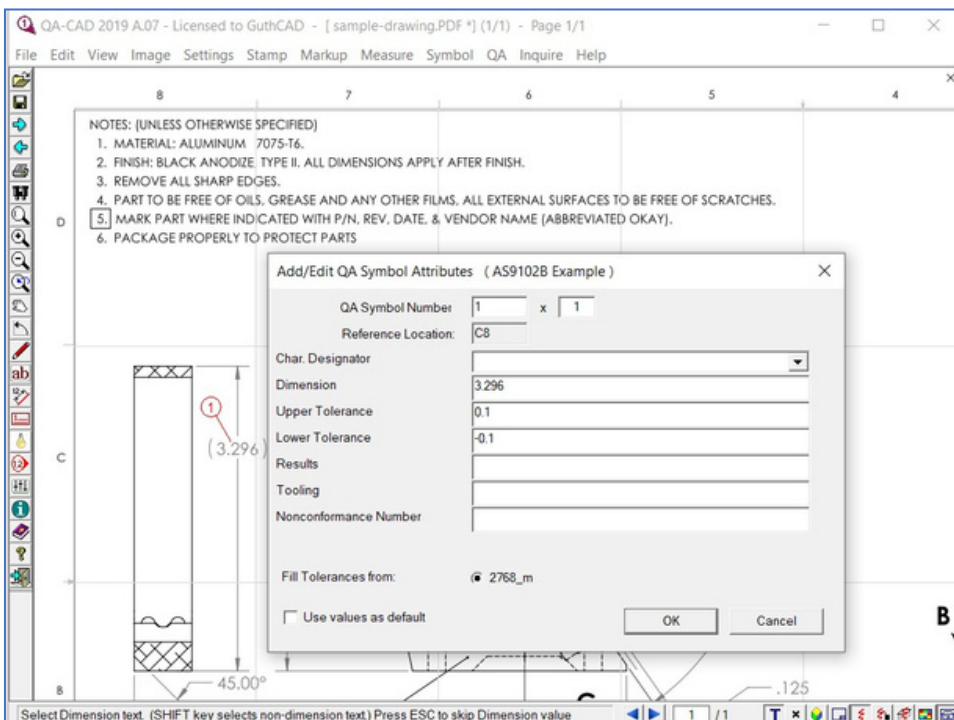

Image 15-3. The target value is captured and displayed in Dimension field on Add/Edit QA Symbol Attribute window. Press OK button. The upper and lower tolerances are automatically entered by your tolerance settings. (In the below image, the Upper and Lower Tolerances were filled from 2768_m, one of QA-CAD's ISO standard tolerance tables).

[Select File > Save Markup Edits to save the work ballooned drawing.]

With the single click method, you can extract both horizontal PDF text and vertical PDF text, if your drawing is text-selectable PDF file or AutoCAD file.

When use the Box method? capturing a dimension with a "deviation" tolerance format or angular PDF text from text-selectable PDF

Image15-4. Click Add QA symbol from the QA menu. Select 'Sngle dimension capture' and 'Box'. Then press the OK button in the QAStart Number window.
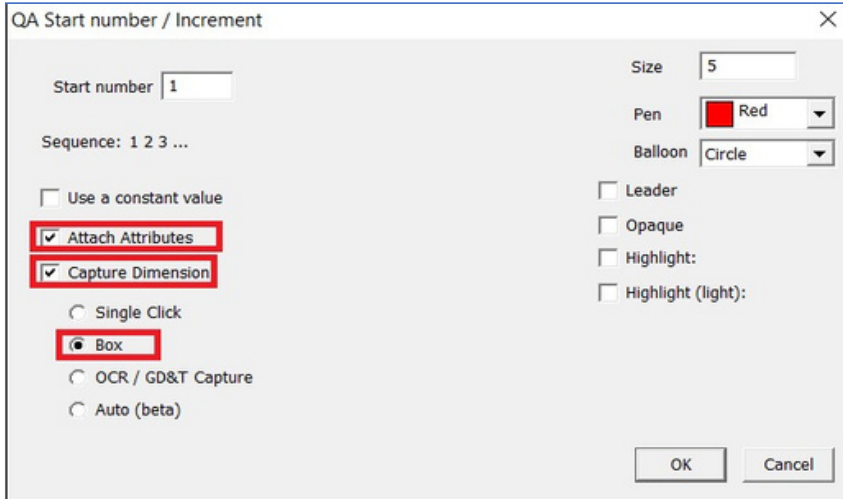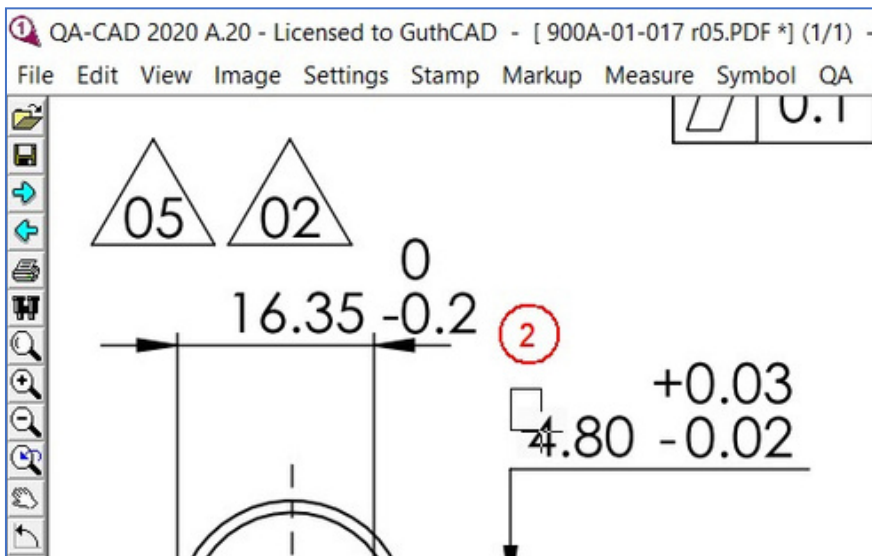

Image 15-5.Same as the single-click method. Place a balloon first. Then press the left-click button and hold it to cover dimension, upper tolerance, and lower tolerance by drawing the rectangle.
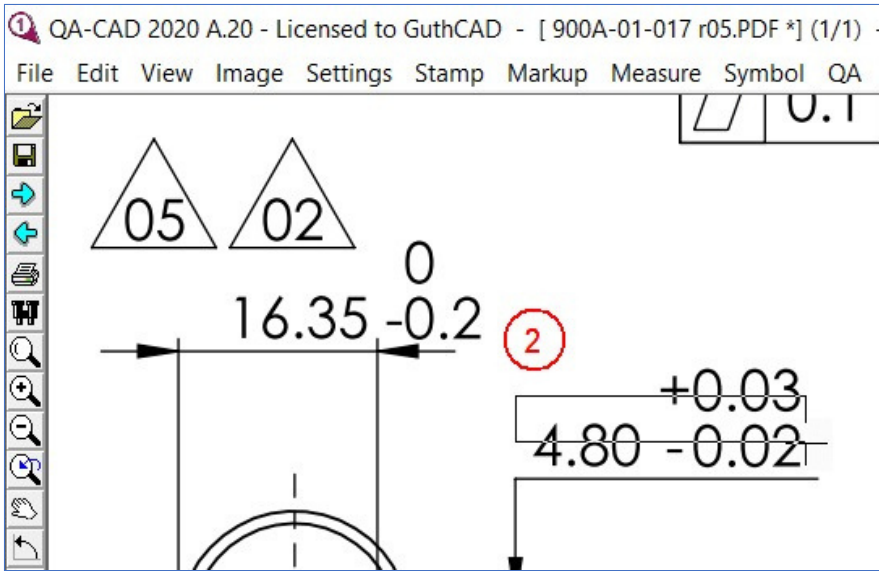
Image 15-6. Left-click again. Then the dimension, the upper tolerance, and the lower tolerance are extracted from the PDF and inserted into each data field automatically.
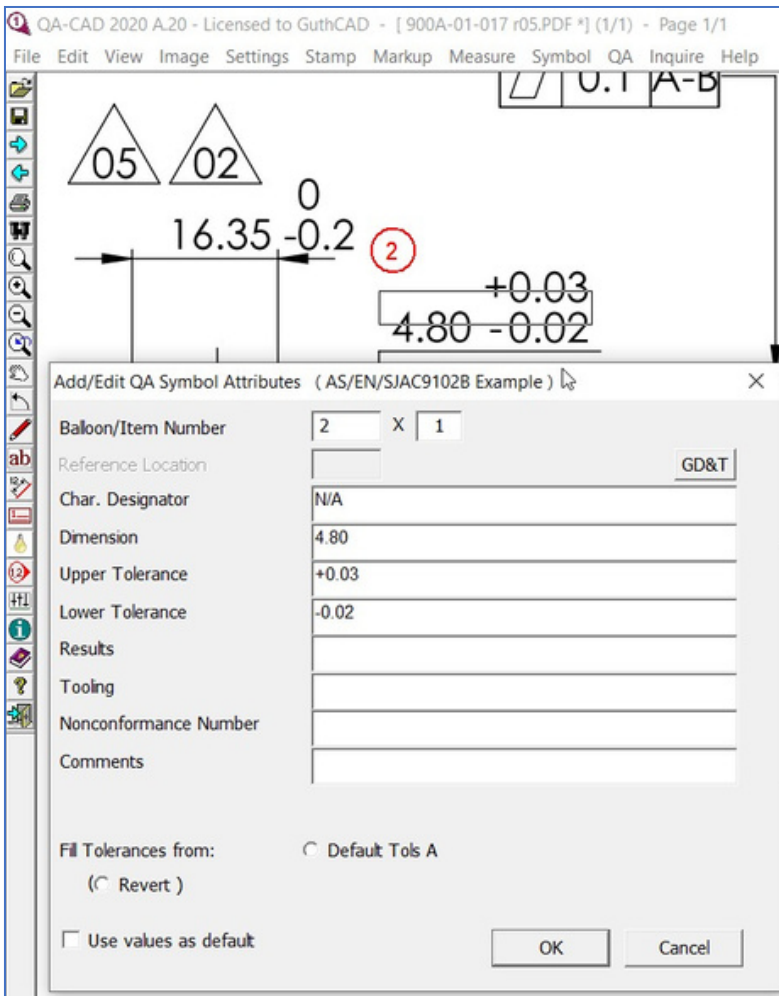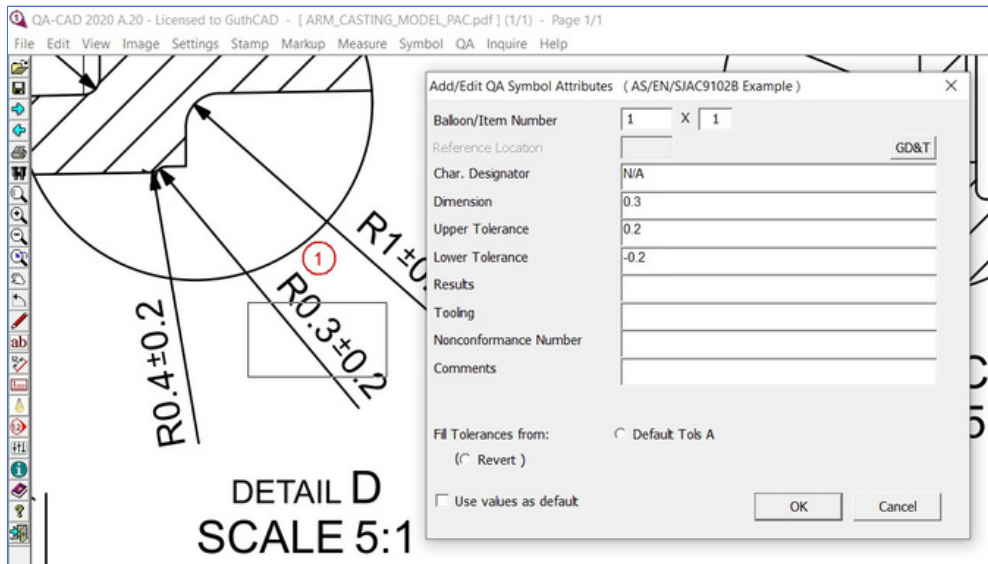
Image 15-7. For angular PDF text, you need to do the same box method operation.

[Select File > Save Markup Edits to save the work ballooned drawing.]
proceed to Step 24.

How to do auto ballooning PDF, raster image files, or DWG / DXF (How to use Group dimension capture feature)

Image 15-8. Click Add QA symbol from the QA menu. Select 'Group dimensions capture' and 'Detect GD&T Callouts'. Then select 'Linear Dimension' and press the OK button (With the Linear Dimension mode,QA-CAD can capture limits of size (maximum and minimum limits).
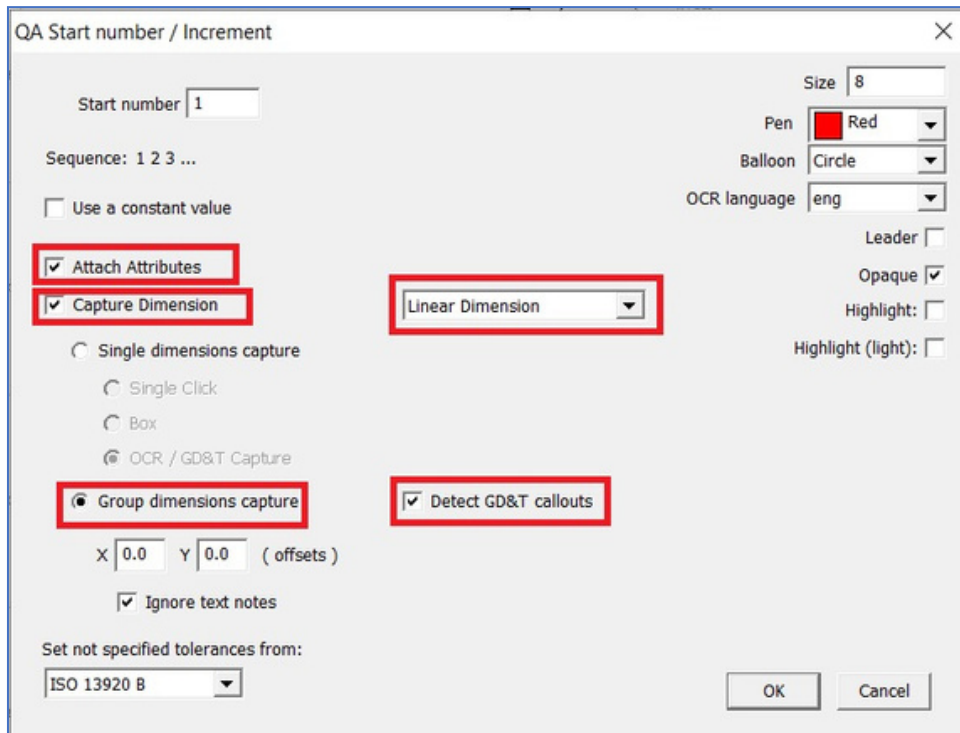
（If you use an image-only PDF or image file, Group dimensions capture (OCR) is displayed. Proceed to Image 15-13 on page24 in this case.）

Image 15-9. Move a mouse pointer to the left top of the capture target group (R2, R0.35-0.25, R2, ⌀40.05-39.95, 0.25 x 45°, ⌀49.22-49.20, ⌀94.02-93.98 and ⌀98 g6 in the below image example).
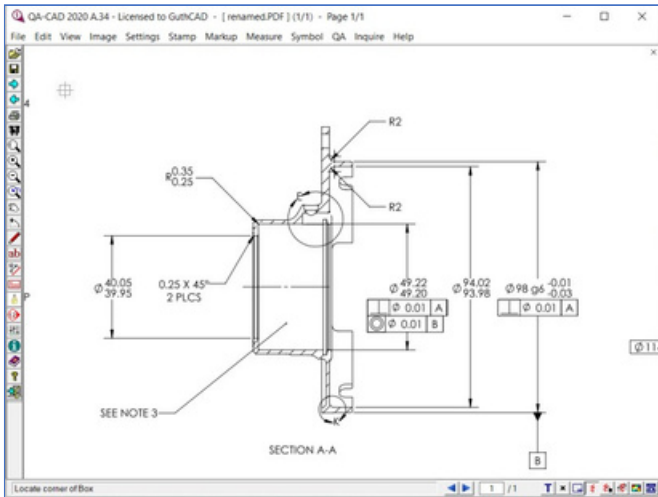

Image 15-10. Press the left-click button and hold it. Then you can enclose the capture targets by drawing the rectangle.
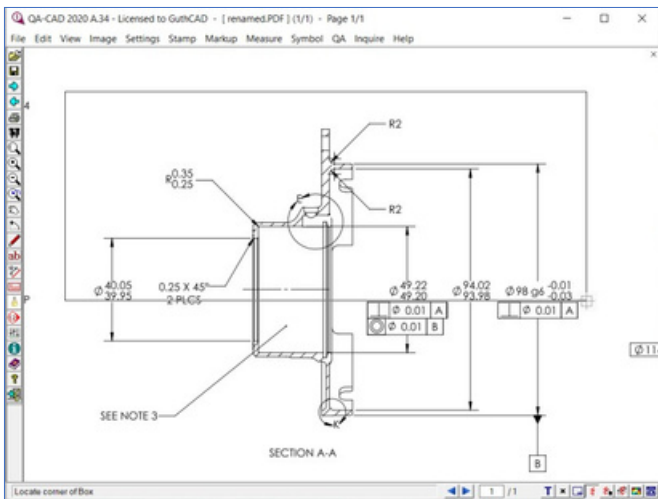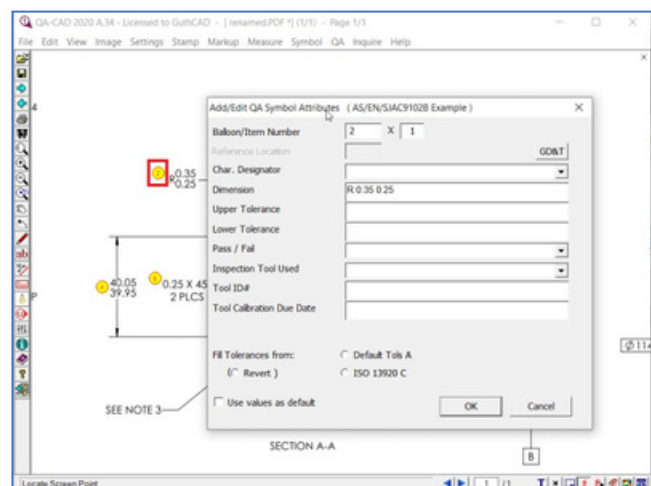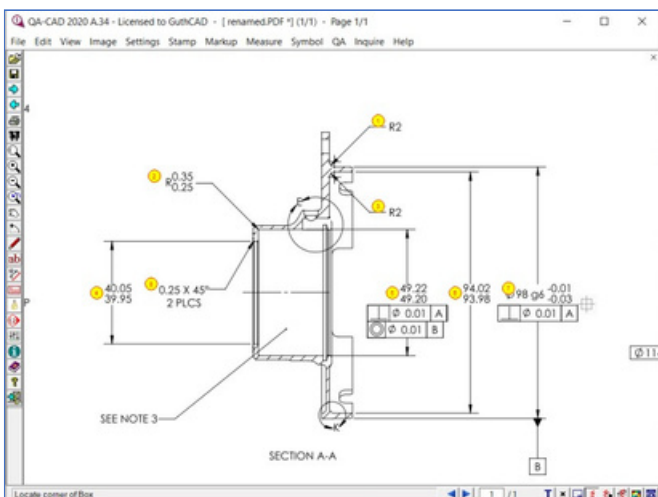

Image 15-11. Once you complete to enclose the targets by the rectangle, double click. Then QA-CAD instantly draws automated balloons to all selected targets. At the same time, QA-CAD extract dimensions, tolerances, GD&T features control frame, or notes from the drawing. With just a few button operations, QA-CAD can balloon specific page areas.

[Select File > Save Markup Edits to save the work ballooned drawing.] If you click one of the

balloons, you can confirm what information balloon stores such as dimension, upper tolerance, lower tolerance, notes, and GD&T features control frame.

Image 15-12. If you need to capture ordinate dimension, select 'Ordinate Dimension' and do auto ballooning.
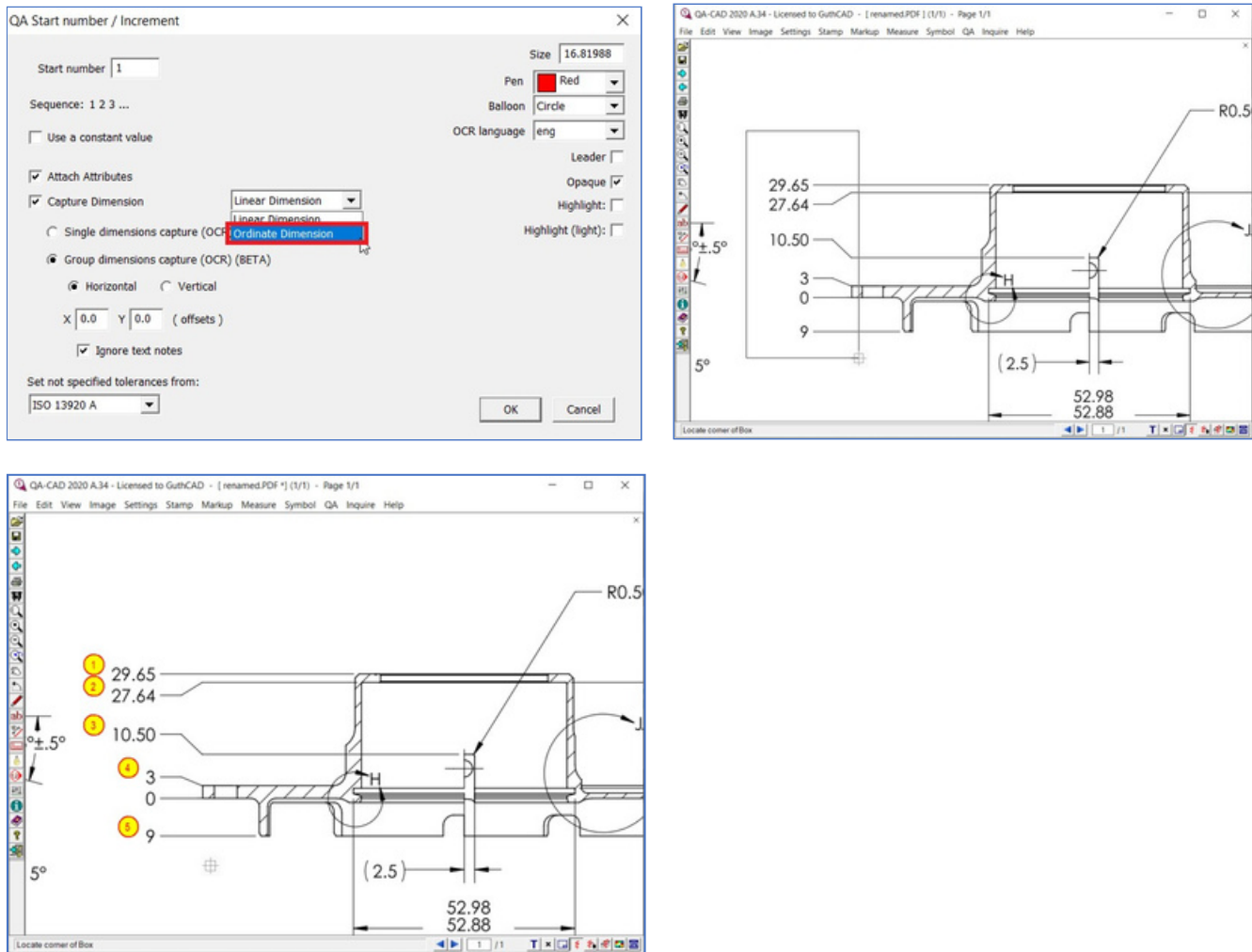
If you have unnecessary balloons, select 'Delete QA symbol' from QA menu and click the unnecessary balloons to delete. If you need to fix deleted balloon number(s) in the balloon number sequence, select 'Renumber' from QA menu. The balloon number sequence will be fixed (example [1,2,4,5,7,8,10] --> [1,2,3,4,5,6,7]).
proceed to Step 24.

Image 15-13. If you use image-only PDF or image files, you can see 'Group dimensions capture (OCR) (BETA)' in the QA Srart number window. Select 'Group dimensions capture(OCR)'.
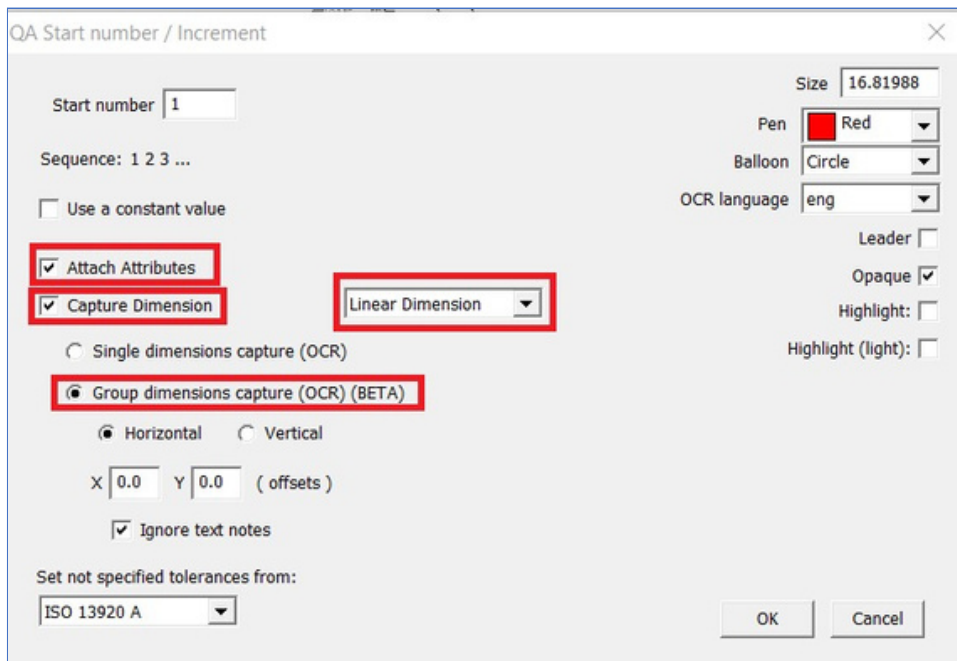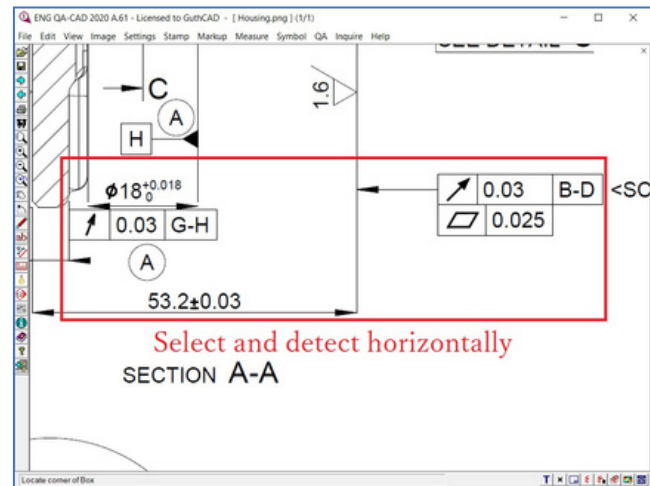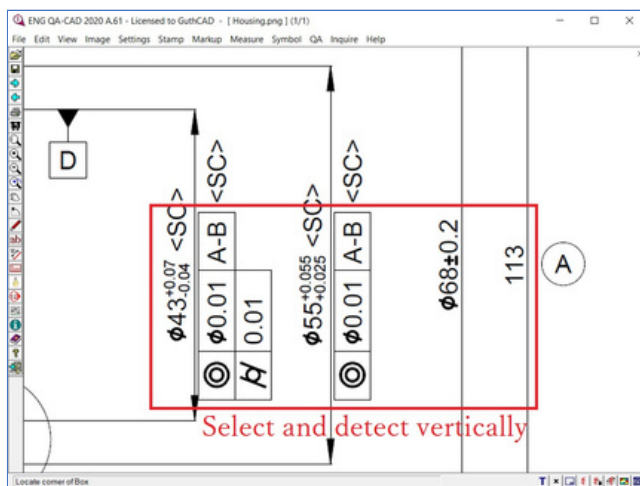

Image 15-14, 15-15. Then select Horizontal or Vertical as the OCR capture direction. If you select 'Horizontal', our OCR program detects targets only horizontally. If you select 'Vertical, our OCR detects targets only vertically. Please note that our OCR program can not detect horizontally and vertically at the same time.

After you select 'Horizontal' or 'Vertical', press the OK button.

Image 15-16. Now it is time to select targets (dimensions, tolerances, and GD&T feature control frames). Please note that we should avoid to selecting and including the CAD model in the OCR selection rectangle. If you include the CAD
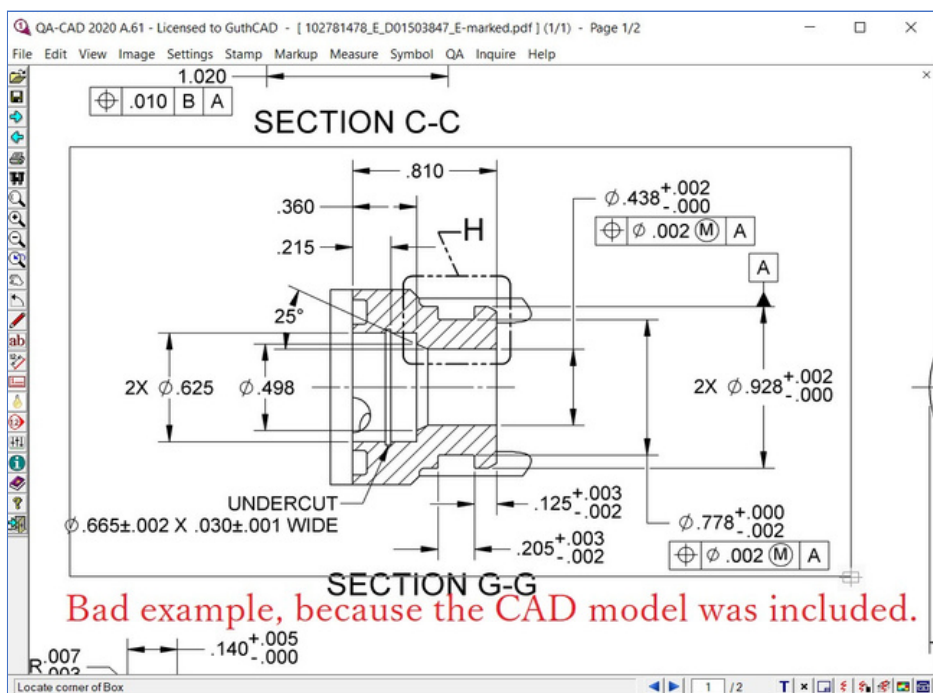

Image 15-17. To avoid selecting the CAD model, divide the targets into 3 or 4 groups (for example: upper part, right part and left part). Select each group individually without including the CAD model as much as possible, as you can see from the below example image.
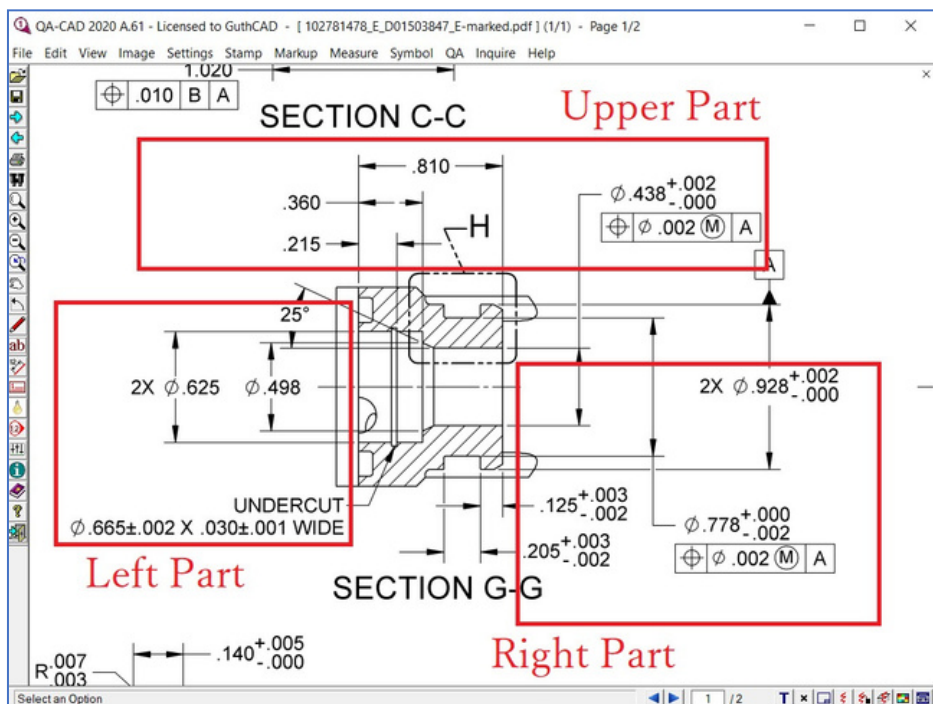
Image 15-18. Let's capture the Upper Part. Move a mouse pointer to the left top of the capture target group (.810, .360, .215, ∅.438 +.002 -.000, GD&T features control frame in the below image example). Press the left-click button and hold it. Then you can enclose the capture targets by drawing the rectangle.
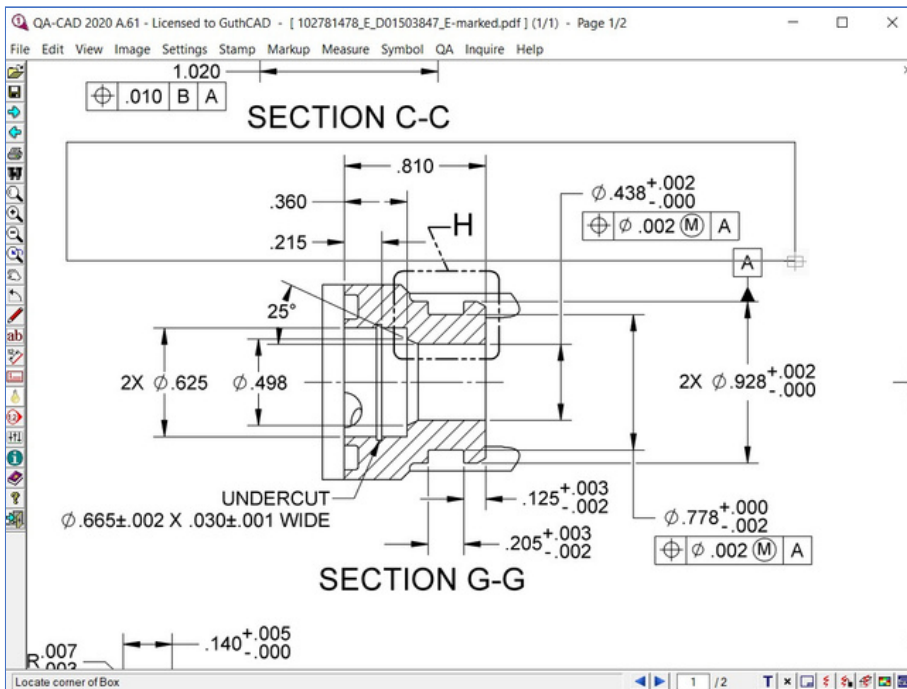

Image 15-19. Once you complete enclosing the targets by the rectangle, left click. Then QA-CAD instantly draws automated balloons to all selected targets. At the same time, QA-CAD extract dimensions, tolerances, GD&T features control frames from the drawing. (You can also undo last auto-balloon with [Ctrl-Z], but only if you do straight after the operation.)

26
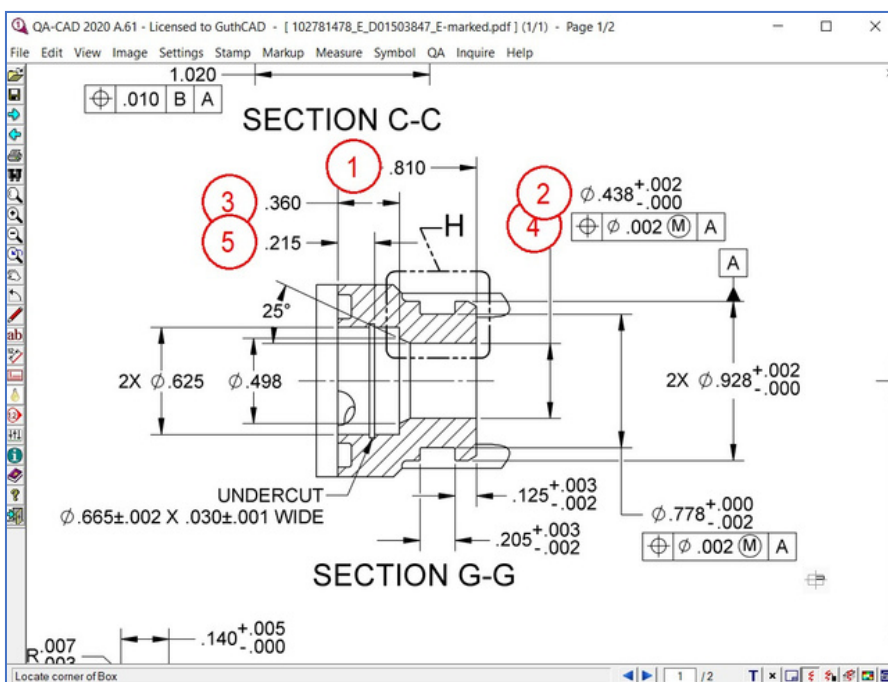
Image 15-20. Now let's do the Right Part. We need the exactly same operation. Move a mouse pointer to the left top of the capture target group. Press the left-click button and hold it. Then you can enclose the capture targets by drawing the rectangle.
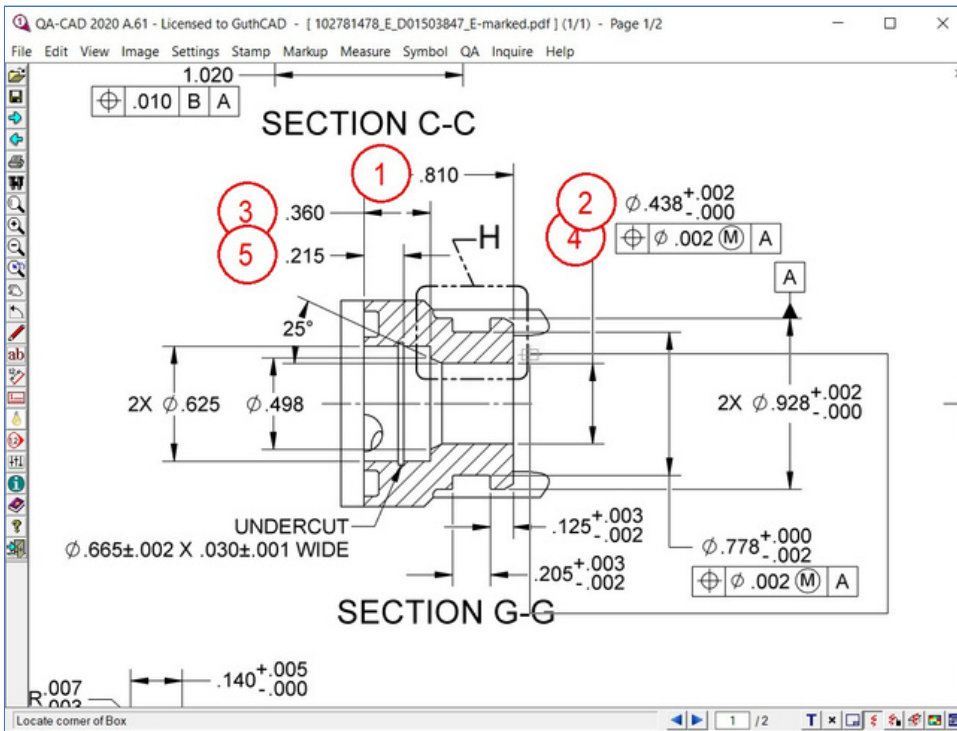

Image 15-21. Once you complete enclosing the targets by the rectangle, left click. Then QA-CAD instantly draws automated balloons to all selected targets, as you can see from the below left image. Now you can select the Left Part by drawing the rectangle and create the balloons on the Left Part with using the exactly same operation.
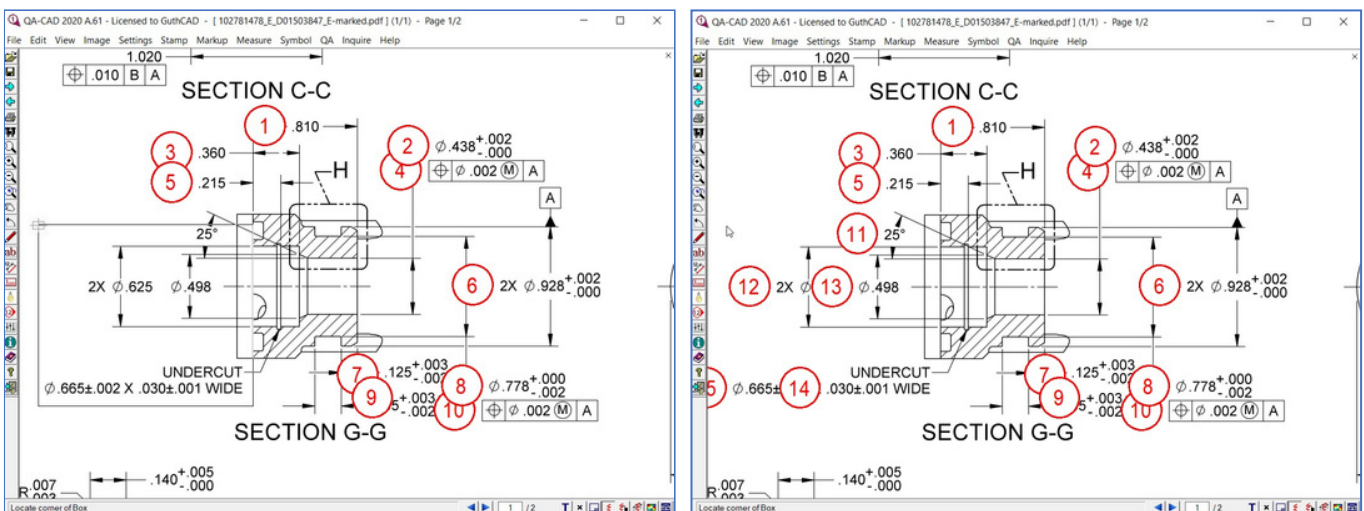
Image 15-22. If you double-click a balloon, you can check what dimension and tolerance (or GD&T) the balloon stores.
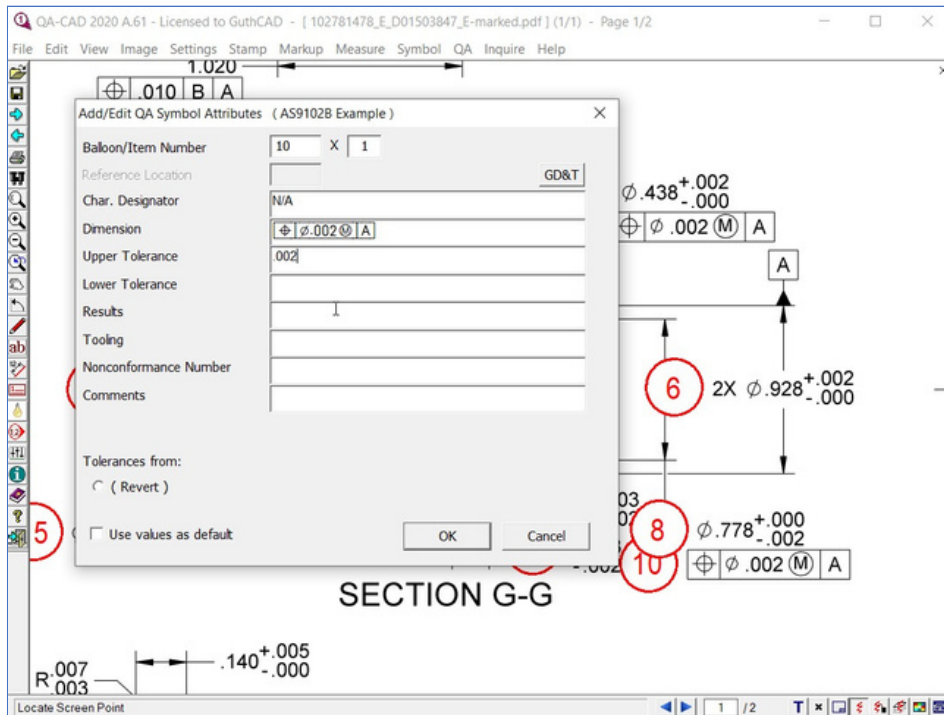

Image 15-23. If you find un-ballooned target(s) after using the 'Group dimensions capture (OCR) (BETA)' feature, please make sure of re-capturing by the Single dimension capture (OCR) method. Or if you find wrong OCR results(wrong dimension / tolerance, GD&T), please select 'Delete QA Symbol' from the QA menu and click a balloon that stores the wrong result to delete it. Then re-capture by the Single dimension capture (OCR) method.
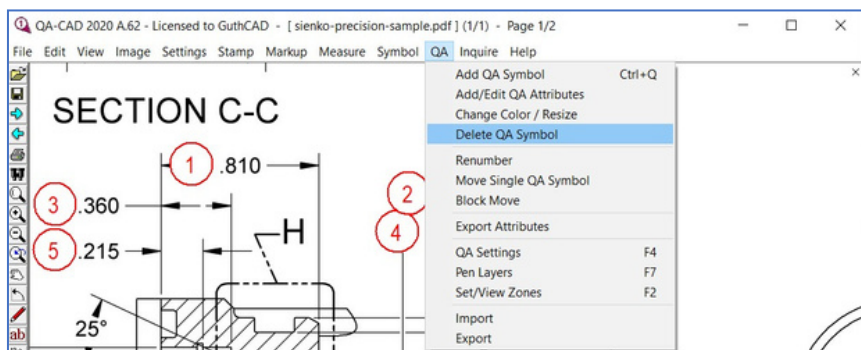
Please remember that you can not re-capture the un-ballooned target(s) or wrong OCR results by using 'Group dimensions capture (OCR) (BETA)', once you did auto ballooning by 'Group dimensions capture (OCR) (BETA)'. You need to use the Single dimension capture (OCR) method.

Please refer to page 29 for how to use the Single dimension capture (OCR) method. If you need to fix deleted balloon number(s) in the balloon number sequence, select 'Renumber' from QA menu. The balloon number sequence will be fixed (example [1,2,4,5,7,8,10] --> [1,2,3,4,5,6,7]).

How to capture individual dimension, tolerance, notes and GD&T features control frame from image only PDF or image files (TIFF, JPEG, etc.) with OCR method (single dimensions capture method)

Step 16: Now click 'Add QA symbols' from QA menu.
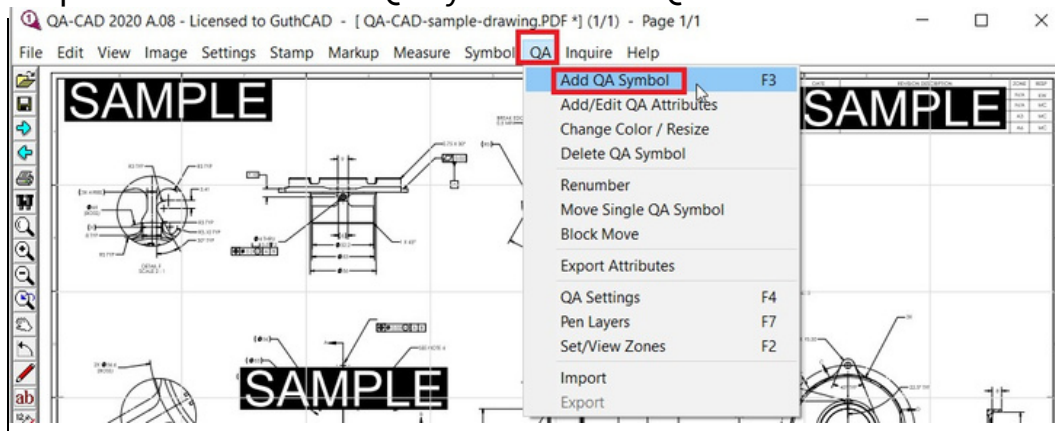
Step 17: Tick Attach Attributes and Capture Dimension. Select 'Single dimension capture (OCR)'. Then press OK button. The default OCR language setting is eng (English). You can choose deu (German), fra(French), jpn(Japanese). You can add other languages.
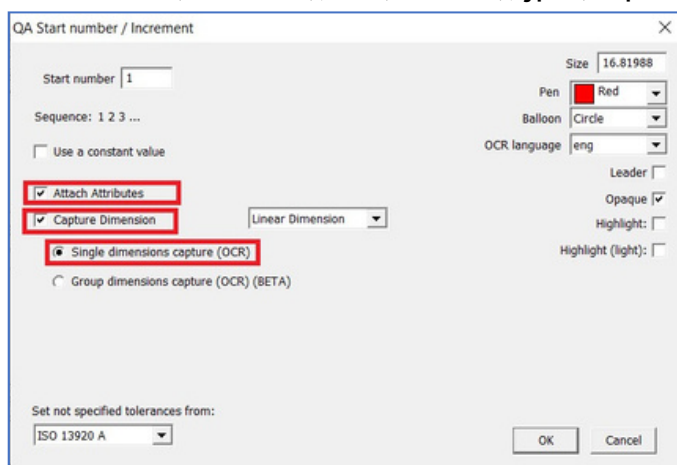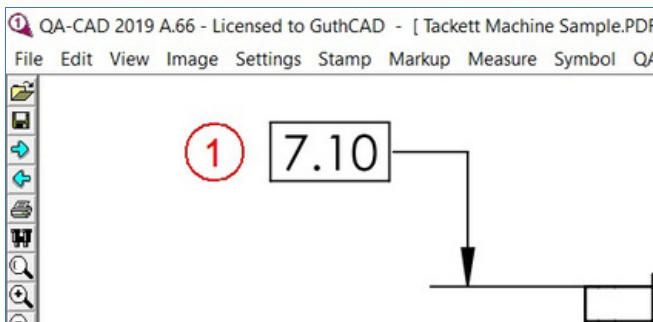

If you open text-selectable PDFs (PDF files with native text), you can see the below window. Tick Attach Attributes and Capture Dimension. Select 'Single dimension capture (OCR)' and 'OCR/GD&T Capture'. Then press OK button.
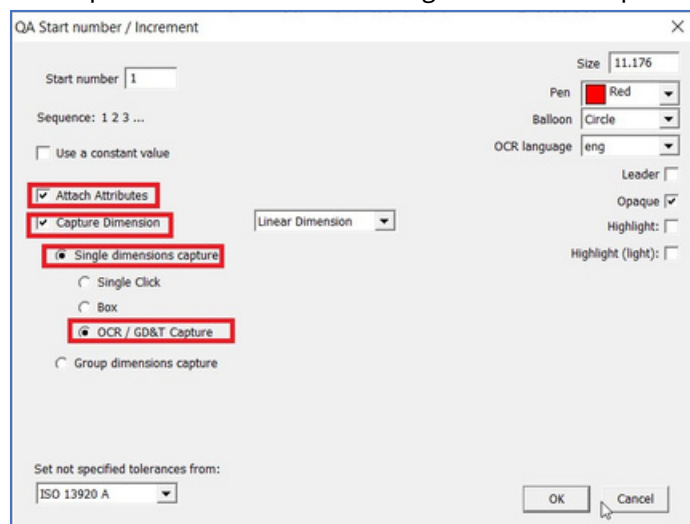
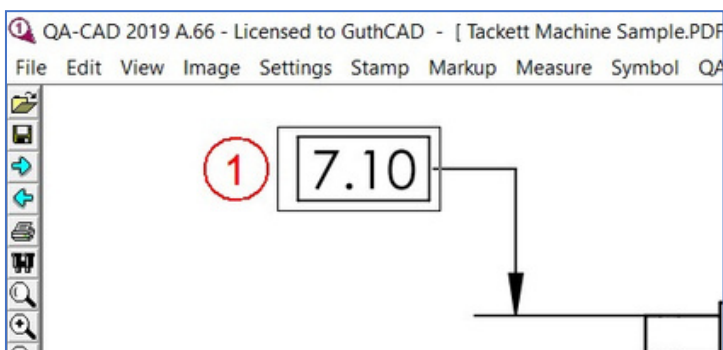Step 18: Move a mouse pointer to where you want to place a balloon (bubble) and left-click.
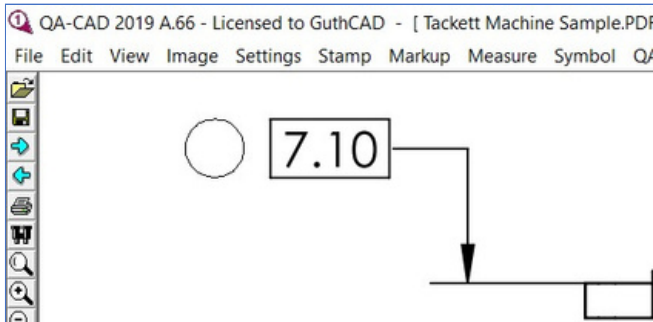
Then the red balloon is placed.

Step 19: Move the plus sign close to your OCR target. Press a left-click button and hold it. Now you can draw a rectangle to enclose target (7.10 is the target in the below image).
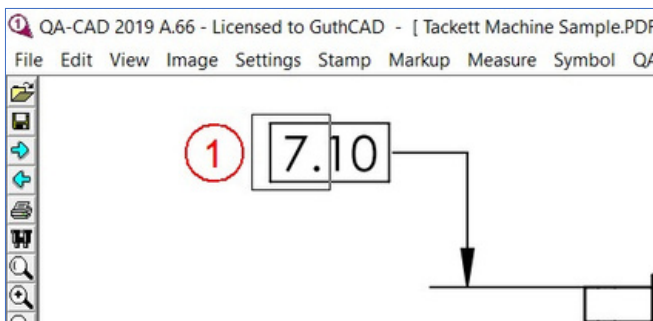

Once you complete to draw the rectangle, left click twice.

Step 20: After that, 'Add/ Edit QA symbol attributes' window opens. You can see the dimension you selected in Step 13 is inserted in the attributes table. The upper and lower tolerances are automatically entered by your tolerance settings. (In the below image, the Upper and Lower Tolerances were filled from Default Tols A set).
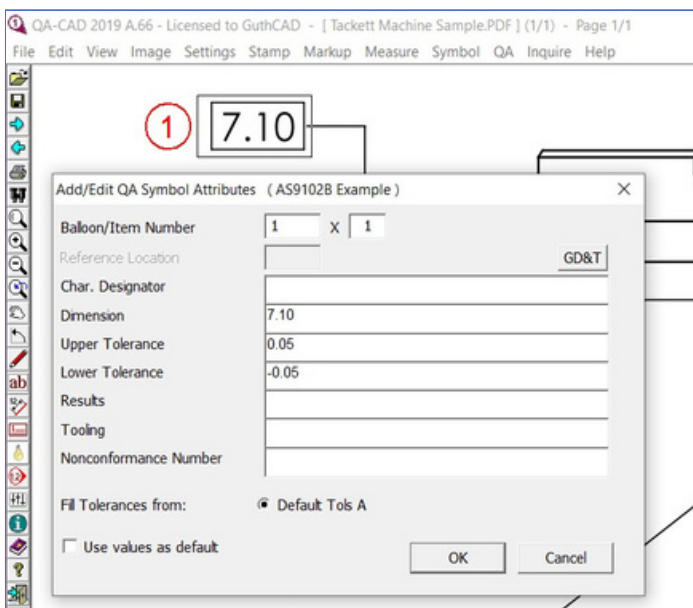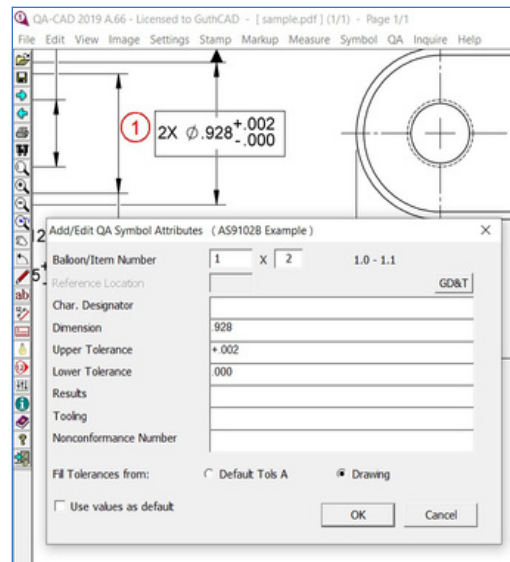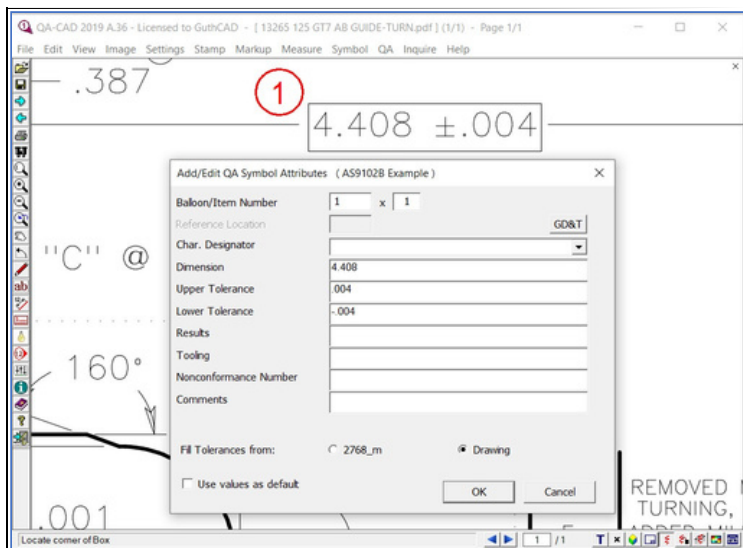

Step 21: Then place another balloon and repeat the same step to capture dimension or text note.
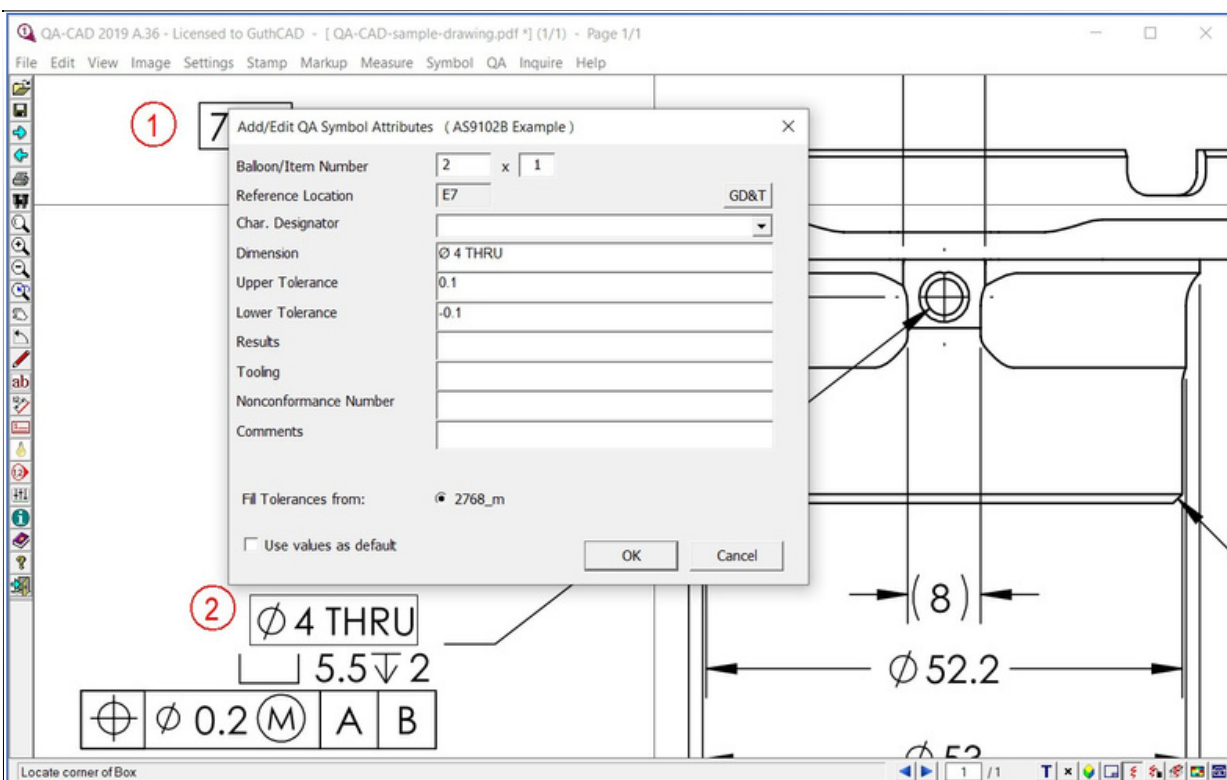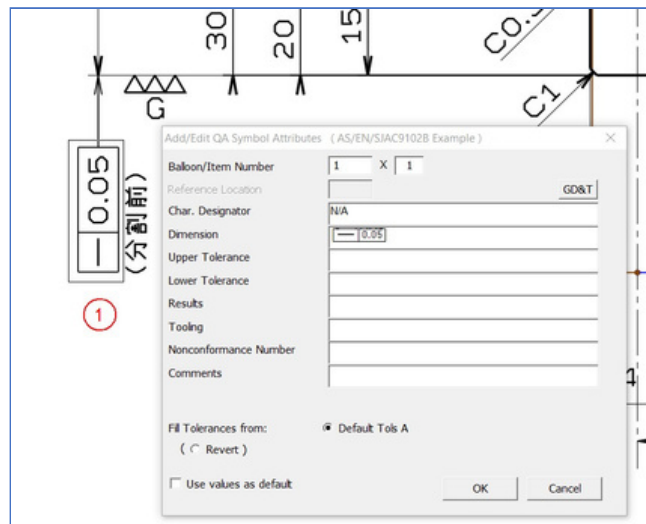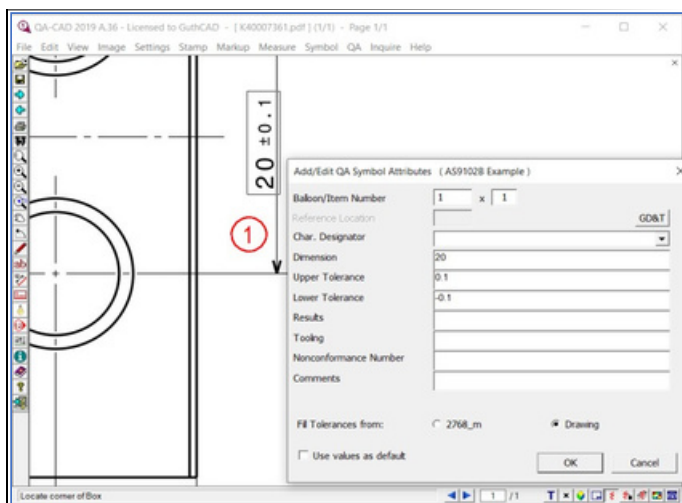

[Select File > Save Markup Edits to save the work ballooned drawing.]
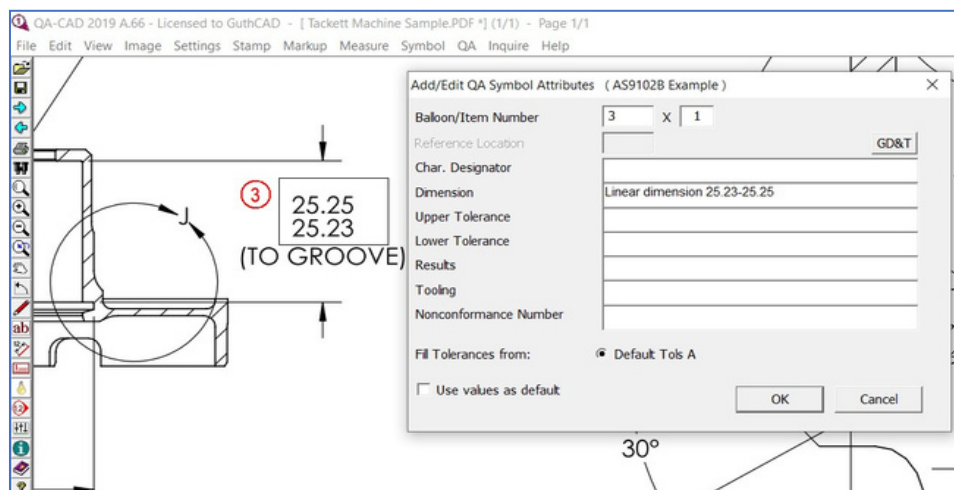
Tips: If you would like to capture dimension and tolerance, capture them together.


Tips: You can capture dimension, tolerance, note or GD&T vertically in QA-CAD.

You can also capture max/ min dimension limits, diameter limits and radius limits.

Step 22: When you capture the GD&T features control frame or the composite GD&T feature control frame, select the whole rectangle of the GD&T features control frame as you can see from the below image(To capture counterbore and dep use the OCR method like GD&T).
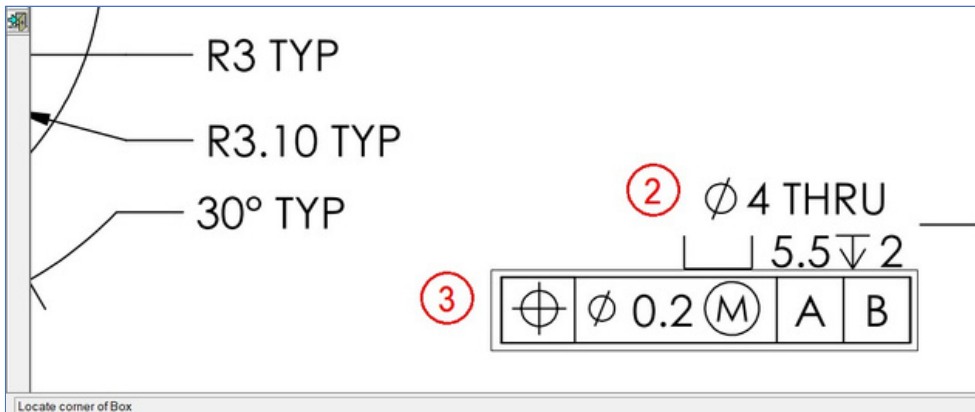

Double left-click, once you complete to draw the rectangle as you can see from the above image.

The captured GD&T control frame was inserted in dimension field (You can also select Ture Position in Character designator field).
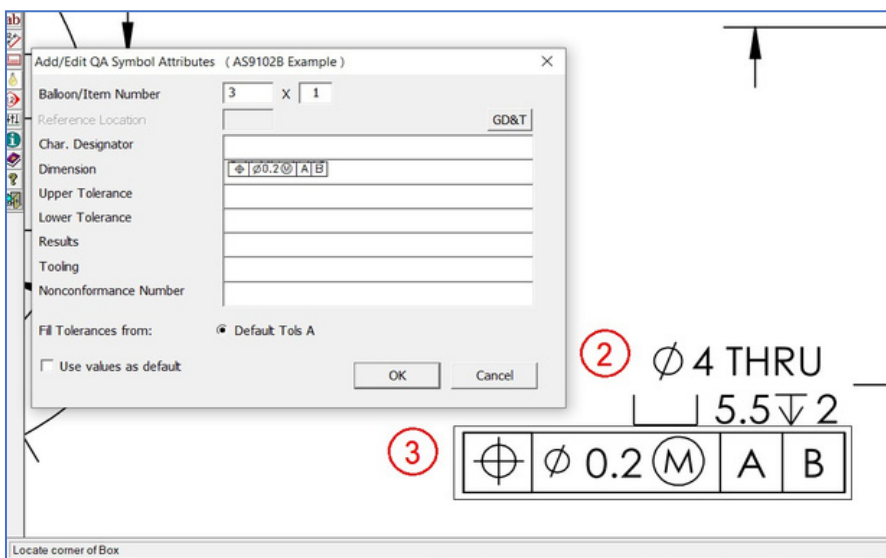
(If you cannot capture GD&T, check Font Settings if our GD&T font file, GuthCAD-GDT.ttf, has been installed in your PC. If not find the font, re-install QA-CAD and reboot your PC.)

Step 23: If the OCR result is not correct, press the Cancel button and do the OCR operation again.
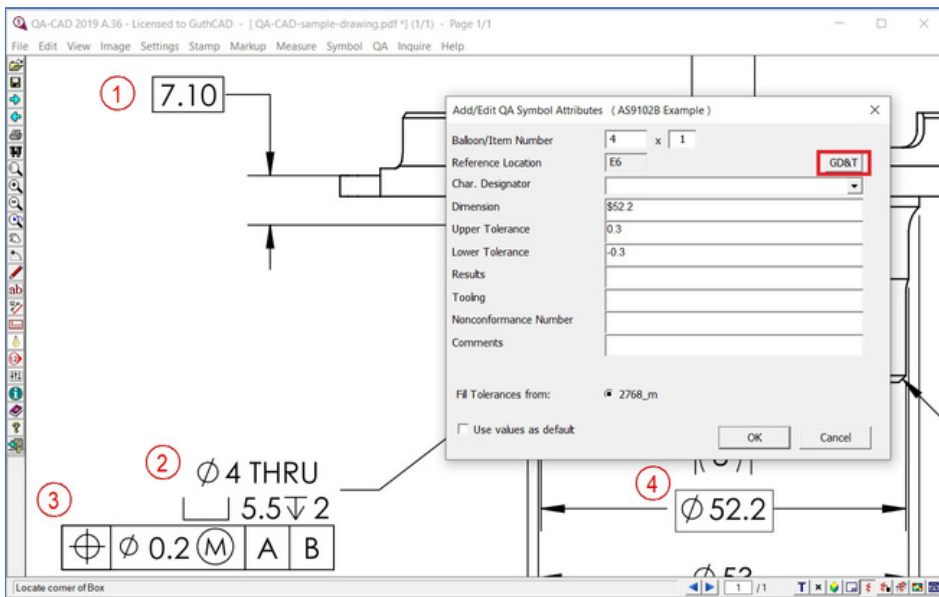

#The software screen zoom rate affects the OCR accuracy. Zooming in or out by rolling the middle mouse wheel button can produce more accurate OCR results. You might need to test and find the best available screen zoom rate depends on your target drawing.

Or alternatively press the GD&T input button (if the result is dimension, tolerance or text note, you can directly correct by typing your PC keyboard).
GD&T Data input window opens. Press a correct symbol button or type correct numbers from keyboard (The above OCR result, $52.2, was not correct. So $ was replaced by ⌀). Then press OK button. Furthermore, you can type welds and material surface symbols in this software keyboard.
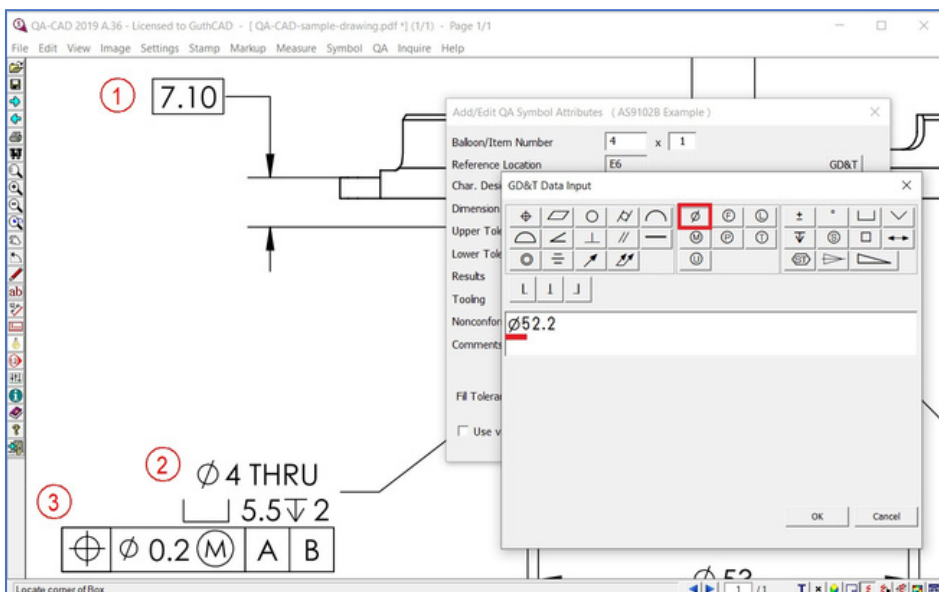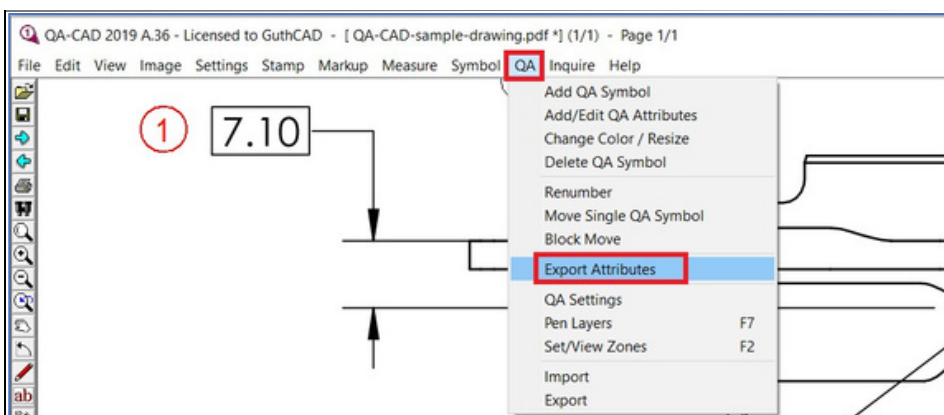
Step 24. Keep repeating this operation until you finish placing all required balloons on the drawing.
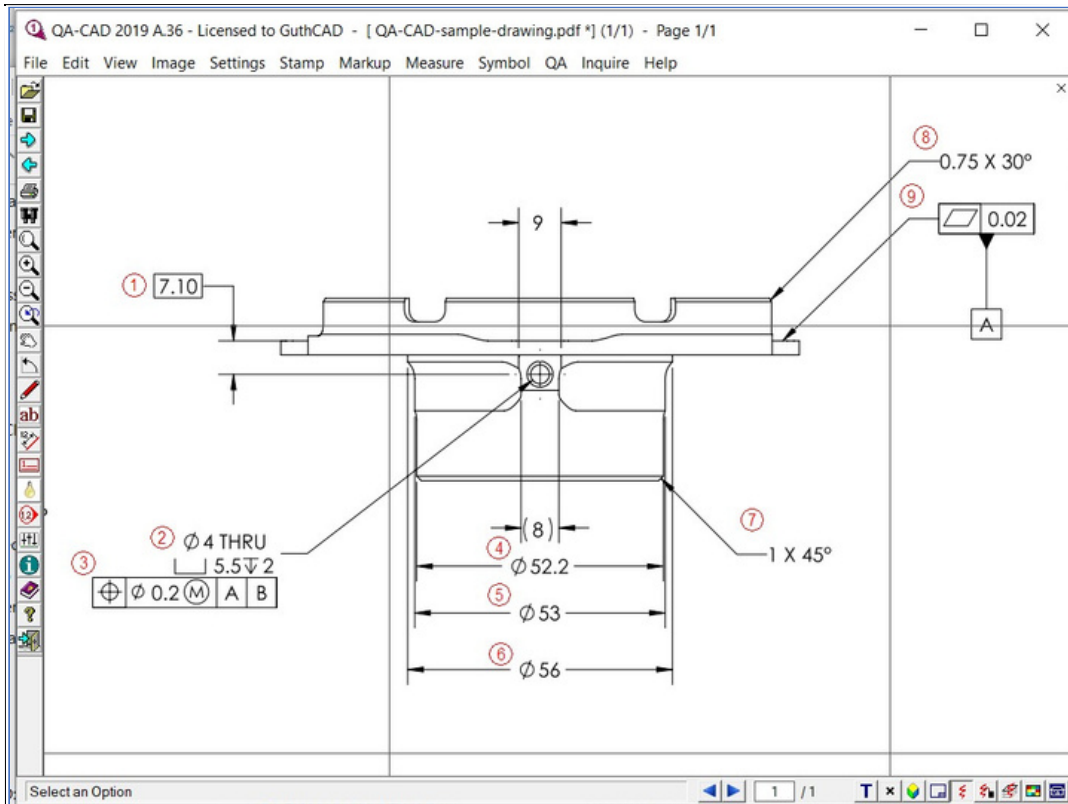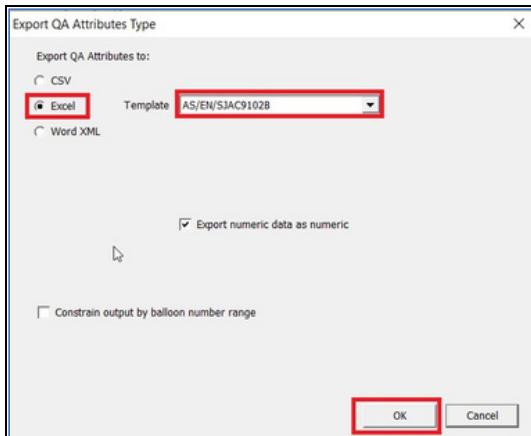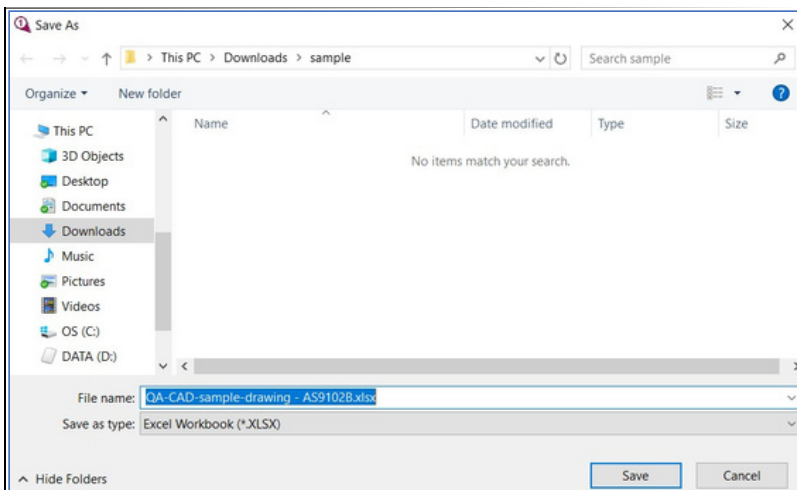

Output captured data to EXCEL template

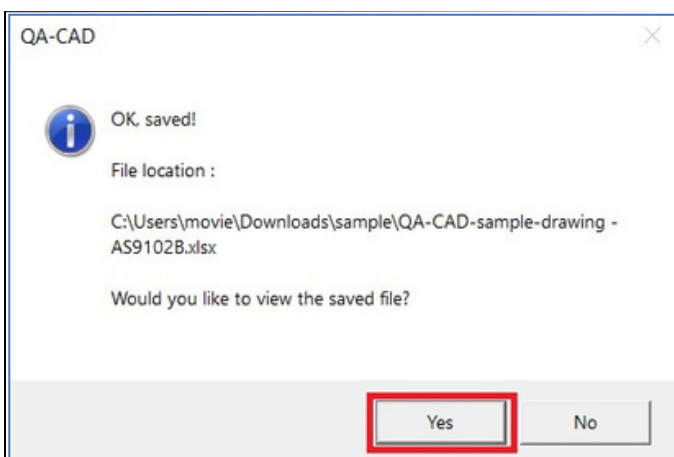Step 25. Now choose 'export attributes' from QA menu.

Then select AS9102B EXCEL template file and press OK button (If you selected PPAP or your EXCEL template in Step5, select your designated EXCEL template here. Also you can select AS9102B Word template file here if you like).

Type your new EXCEL file name and press Save button.


Then press Yes button here.

Step 26. As you can see, all values in the balloons are exported to the AS9102 Rev. B Form3 template.


Save the ballooning data without changing an original drawing (to save the work ballooned drawing).

Step 27. Select File > Save Markup Edits to save the work ballooned drawing (This operation generates a CVM file which stores all overlaid balloons and markup information. The original drawing is untouched). When you re-open the ballooned drawing, select the drawing file, not the CVM file.
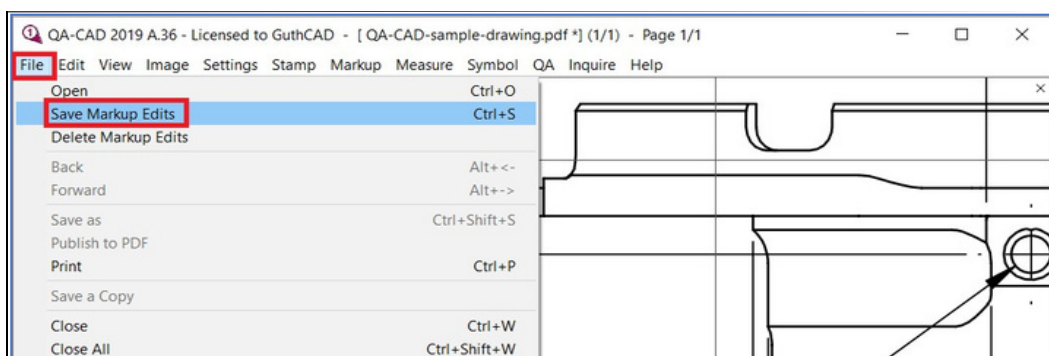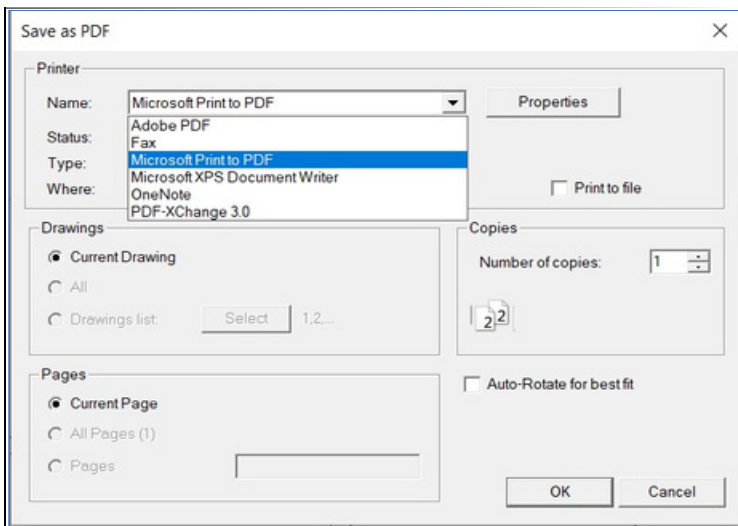
Publish the ballooned drawing to PDF (to save the delivery ballooned drawing.)
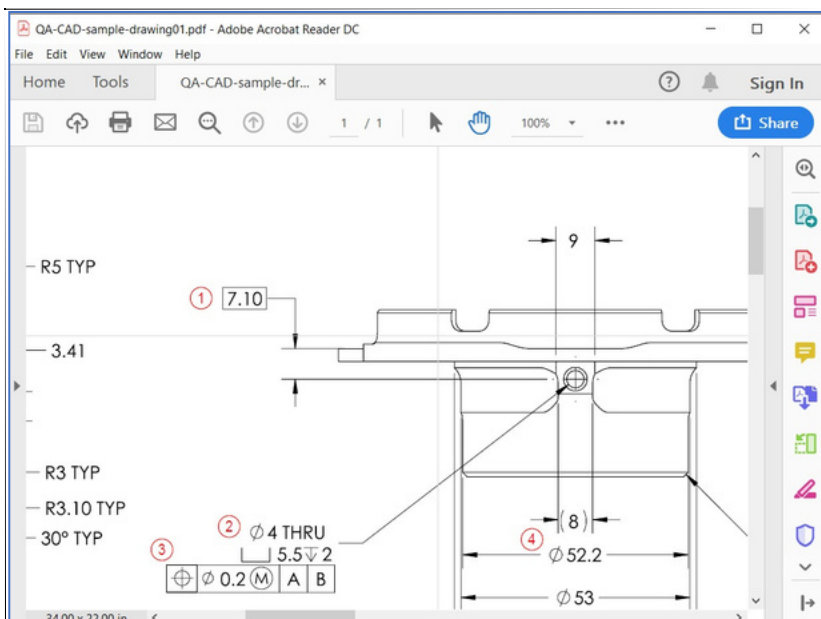
Step 28. You can also publish the ballooned drawing to PDF. Select File >> Publish to PDF
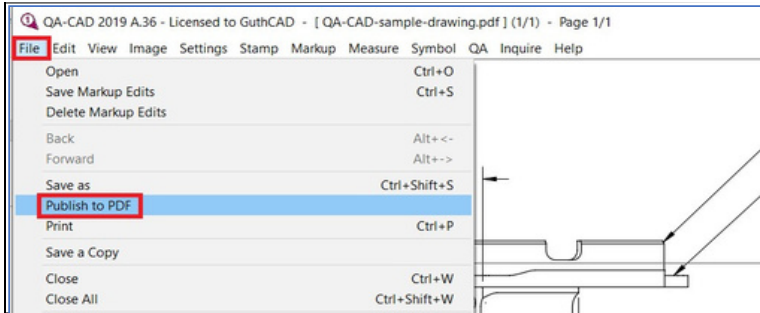
Select PDF printer program (e.g. 'PDF-Xchange 3.0', 'Microsoft prints to PDF', 'Adobe PDF', or your favourite PDF printer program) and proceed PDF output.


Once you publish to PDF, you can see the ballooned PDF in your PDF reader software.

How to enter a new balloon that was missed and the following balloons will change automatically

If you find that you have missed drawing balloon(s) after you drew several balloons (for example: 1,2,3,4,5,6) on the drawing. Select the Add QA symbol from QA menu. Then type a Start number (for example: 4.1 in the sample image). Select the Increment sub-point and press the OK button.
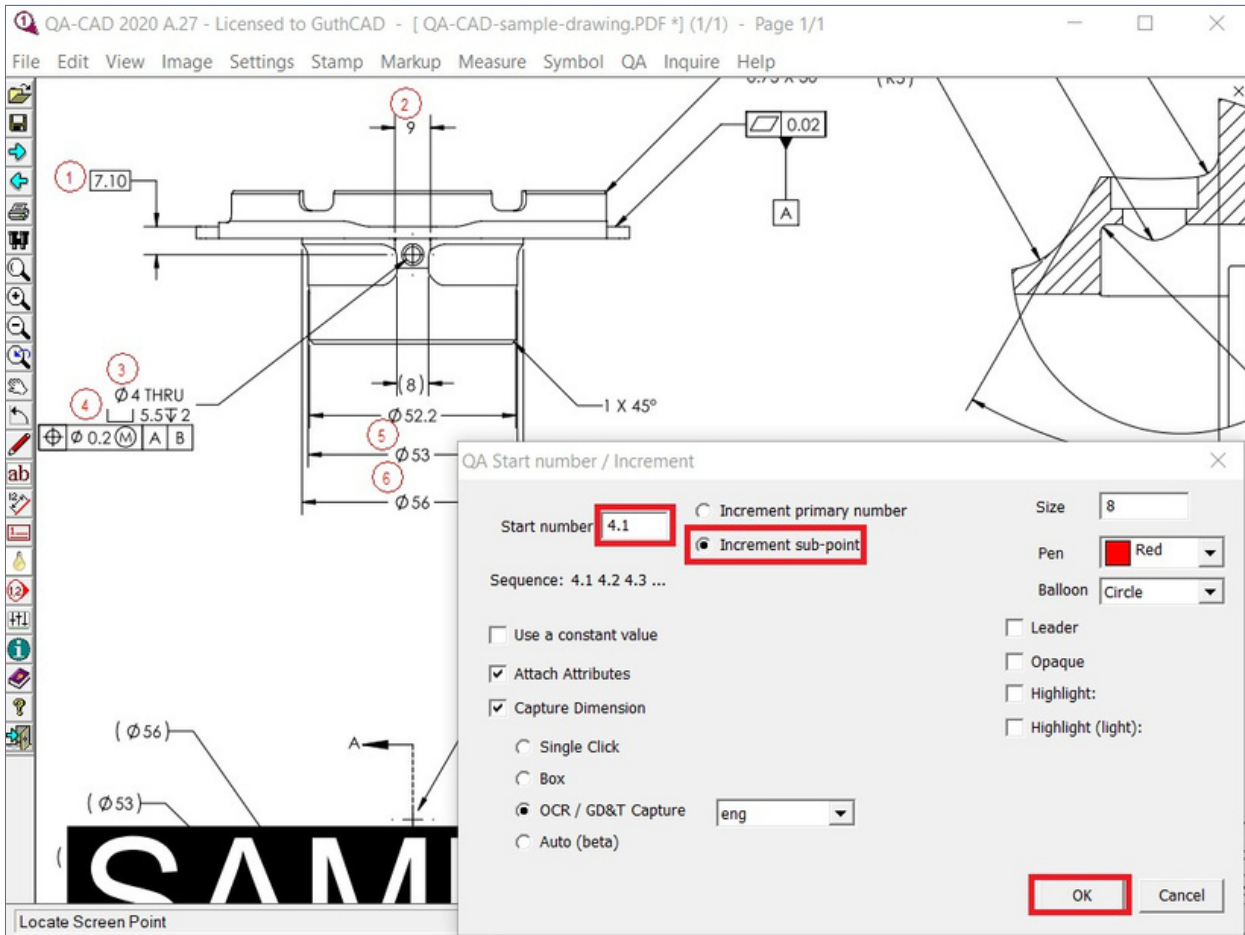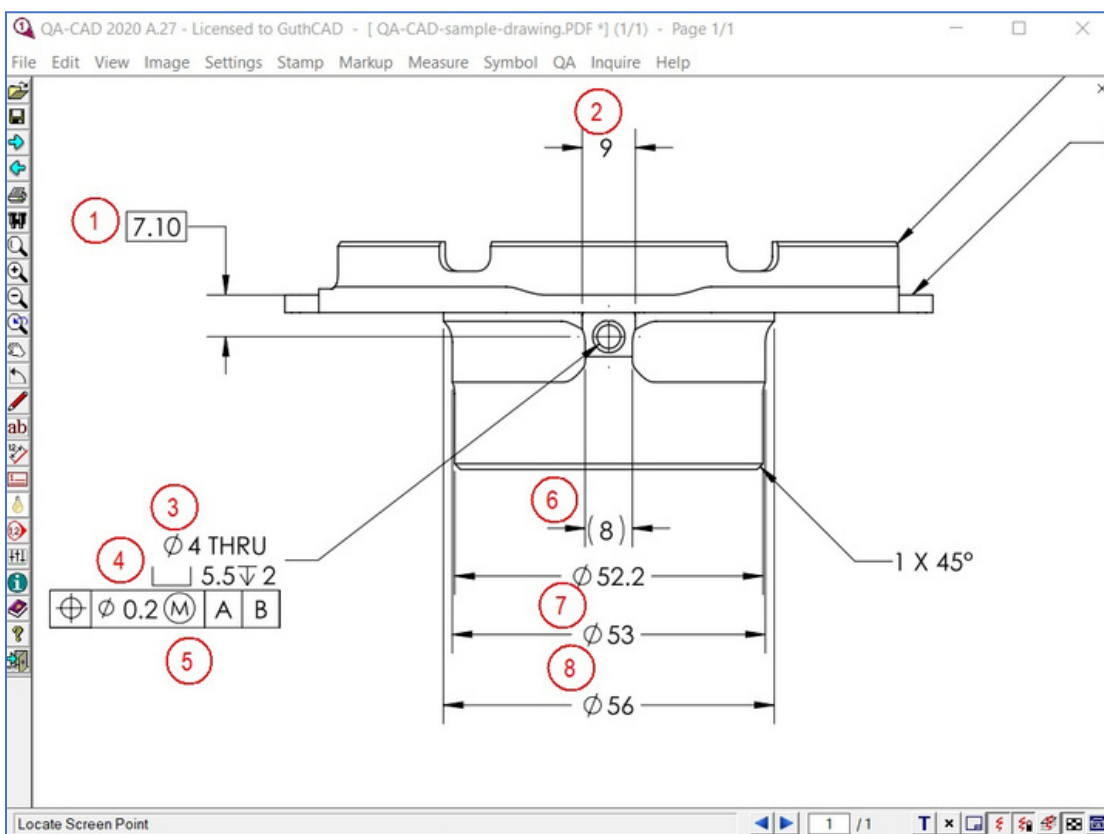

Draw new balloon(s) on the drawing (for example: 4.1 and 4.2 in the blue rectangles of the sample image).
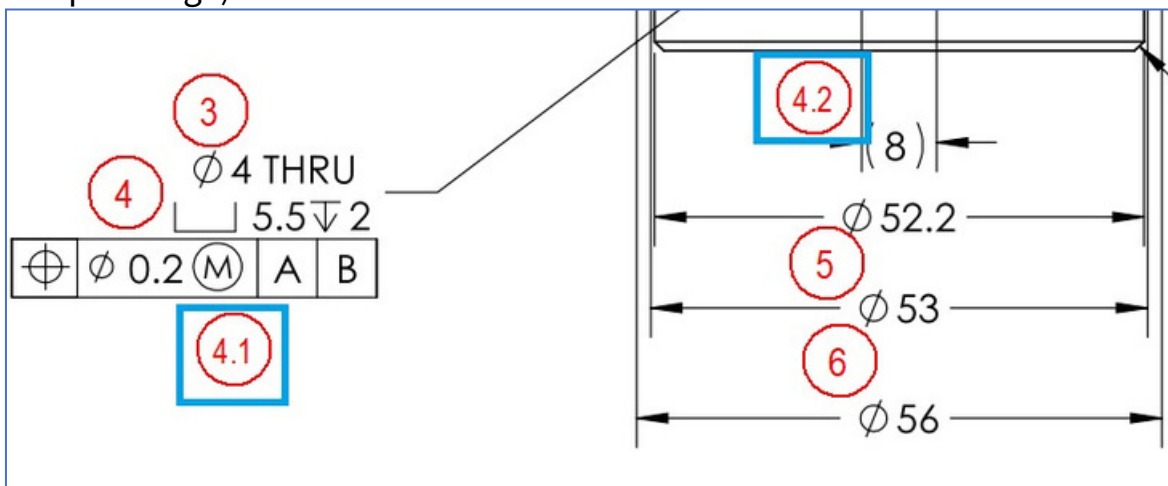
Select the renumber from the QA menu. Press the Apply button in the QA Renumber window (Please leave 1 as a Start number here).
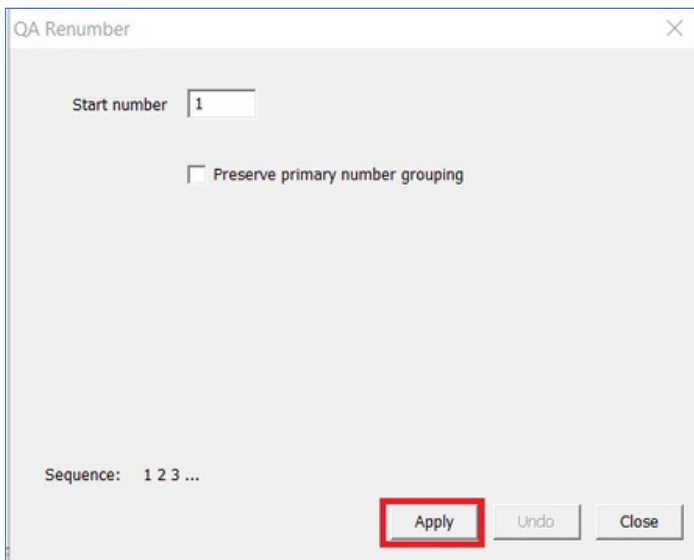

Then balloon # 4.1, 4.2, and the following balloon numbers are renumbered automatically. (1,2,3,4,4.1,4.2,5,6) --> (1,2,3,4,5,6,7,8)

How to output captured data to two different EXCEL forms (Split the EXCEL output)

QA-CAD can export captured data to two different EXCEL forms. Before you do ballooning, select the QA settings from the QA menu. Tick the Attributes Tab and click the Configure EXCEL template button. The Manage EXCEL templates Window opens. Tick 'Split data output'. Select a new Sheet and press the Configure Columns button. Once you finish configuring your second EXCEL output columns, press the Save button and the OK button.
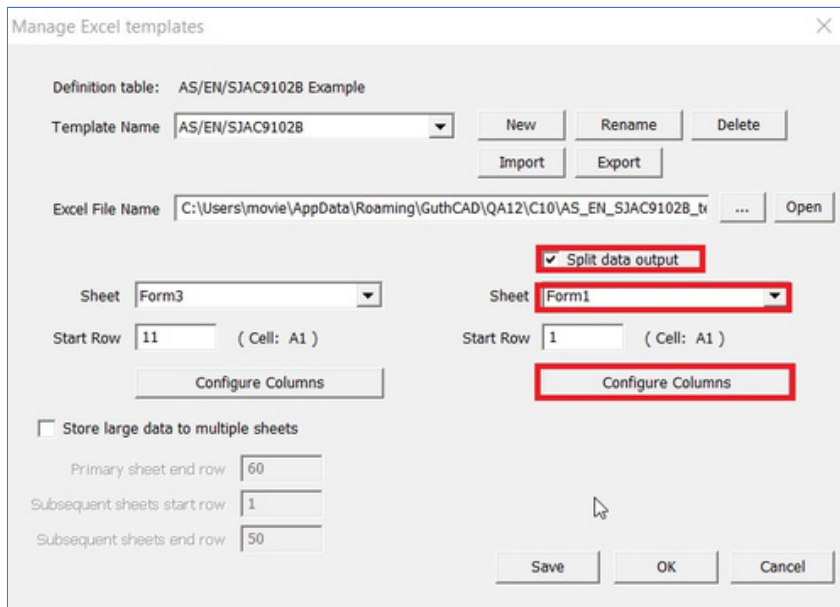
Once you complete ballooning, select the Export Attributes from the QA menu. Then the Export QA Attributes Type Window Opens. Tick 'Constrain output by balloon number range'. Then set up two different balloon number groups (In the below example image, the balloon number 1 to 10 are selected to export to an EXCEL Form3 and the balloon number 11 to 20 are selected to export to an EXCEL Form1). Press the OK button to export to EXCEL forms.

http://www.iqmsolutions.co.in/digiverse
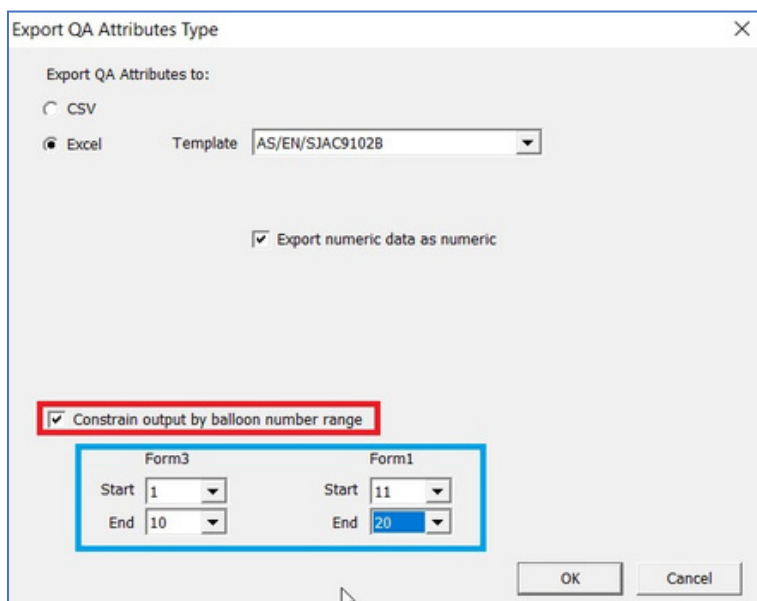
Mailing Address:

C-521, I-Thum Building, Plot No A-40,

Sector-62, Noida-201301, Uttar Pradesh,

INDIA

Telephone:

+91 9871860255

Email:

info@iqmsolutions.co.in