

# Test drive nanoCAD

## Raster editing



# Formatting a raster image

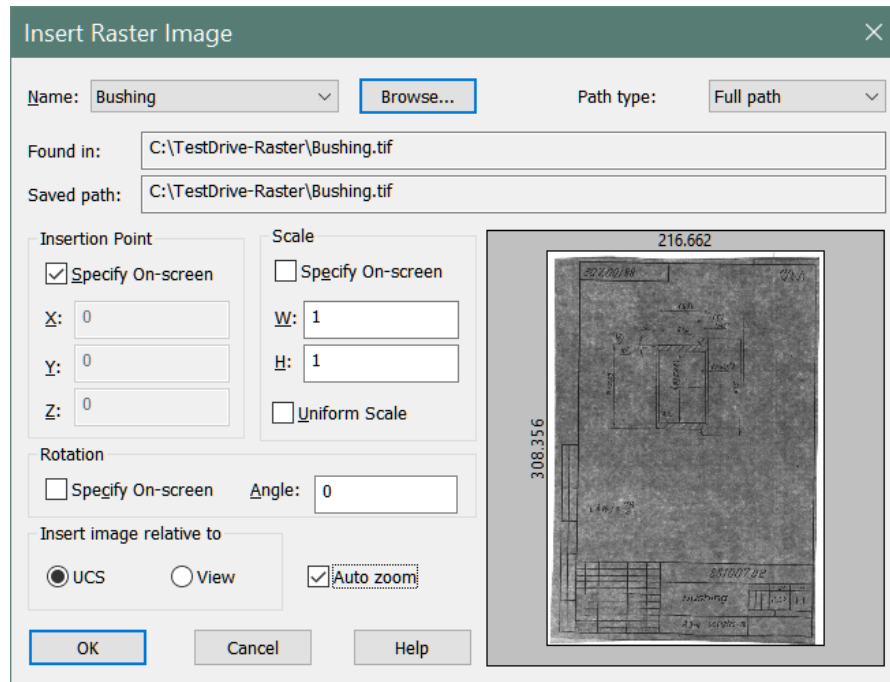
## 1. Inserting a raster image

1.1. Create a new document

1.2. Insert a raster image with the **Insert Image** command:



Ribbon: Raster>**Image from File** or Menu Raster>**Image from File**




1.3. In the window that opens, click the Browse button, and find the **Bushing.tif** file.

1.4. Specify the insertion point on the screen and click OK. A raster frame (border) will appear in the model space, left click anywhere in the model space.

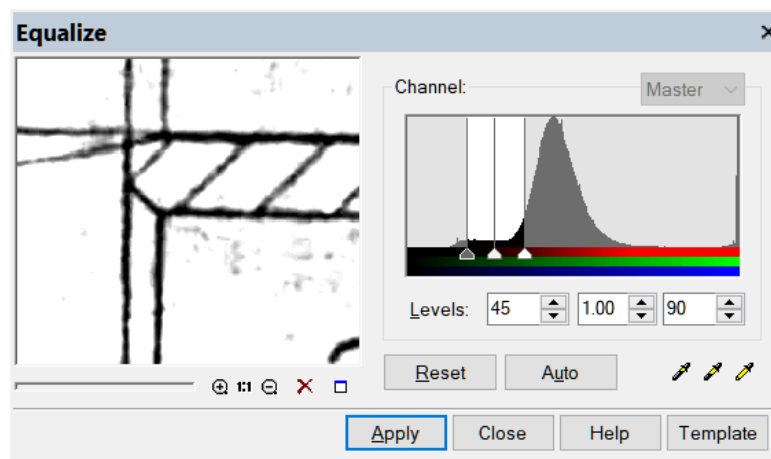
## 2. Correcting color image by histogram



2.1. Choose the Equalize  command (Ribbon: Raster>Equalize or Menu>Raster>Processing the raster>Equalize).

2.2. Set the threshold for dark tones. Using a dark eyedropper (take a sample for the lowest mark), specify on the screen the color that should turn black (select one of the lighter pixels on the black part of the image).

Then set the threshold value for light tones. Using a light eyedropper (take a sample for the highest mark), indicate on the screen the color you want to convert to white (select one of the dark pixels in the background).



2.3. Click Apply.

All pixels with a brightness value below the dark threshold will receive a brightness value of zero, and pixels with a brightness value higher than the brightest will receive the maximum brightness value

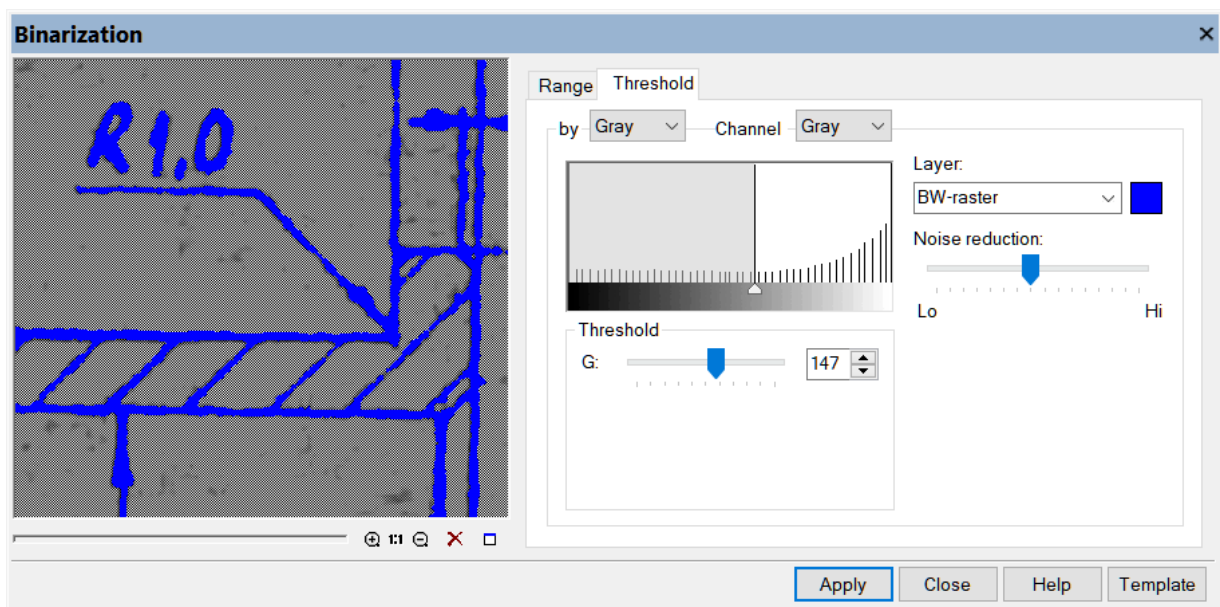
### 3. Converting a color image to monochrome



3.1. Select the Binarization command (Ribbon: **Raster>Processing>Binarization** or **Toolbar Modify Raster>Binarization**)

3.2. In the Binarization dialog box, select the Threshold tab.

3.3. On the loaded raster, select the part of the raster that interests us most by clicking on the raster with the cursor (you can see a red frame on the screen showing the boundaries of the viewport)



3.4. On the Threshold tab, select the **Range** tab by **Gray** and channel tab **Gray**.

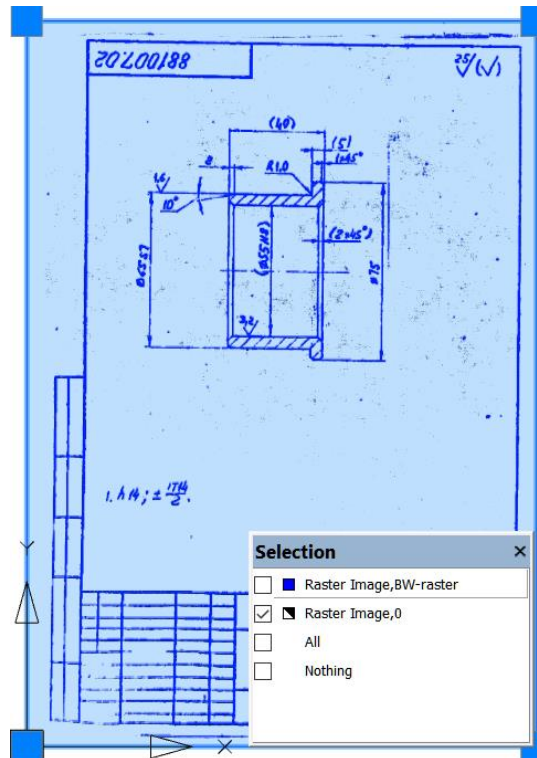
3.5. Select the threshold values **Threshold** value using the **G** slider.

3.6. Click **Apply**.

3.7. A new monochrome raster will be created on top of the original gray color raster.

3.8. The original raster can be deleted.

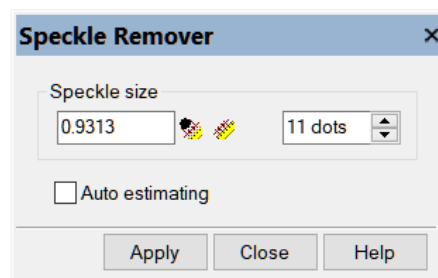
3.9. Click the LMB (left mouse button) on the border of the raster, in the dialog box that appears, select the source raster and press the Delete button on the keyboard.



## 4. Speckle Remover

4.1. Start the command from the Ribbon: **Raster>Filters>**  **Speckle Remover** or **Toolbar Raster>Filters>Speckle Remover**.

#### 4.2. Set the size of the raster speckle using the Measure maximum size button



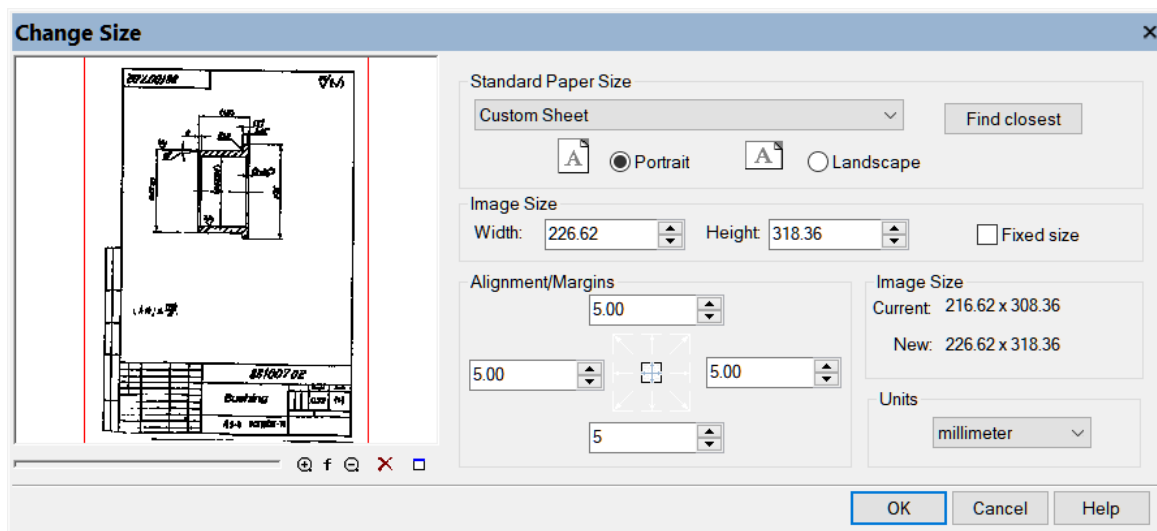
4.3. To measure the size of a raster object on the screen, click the button and specify a point inside the object

4.4. Click Apply.




## 5. Eliminating image distortion

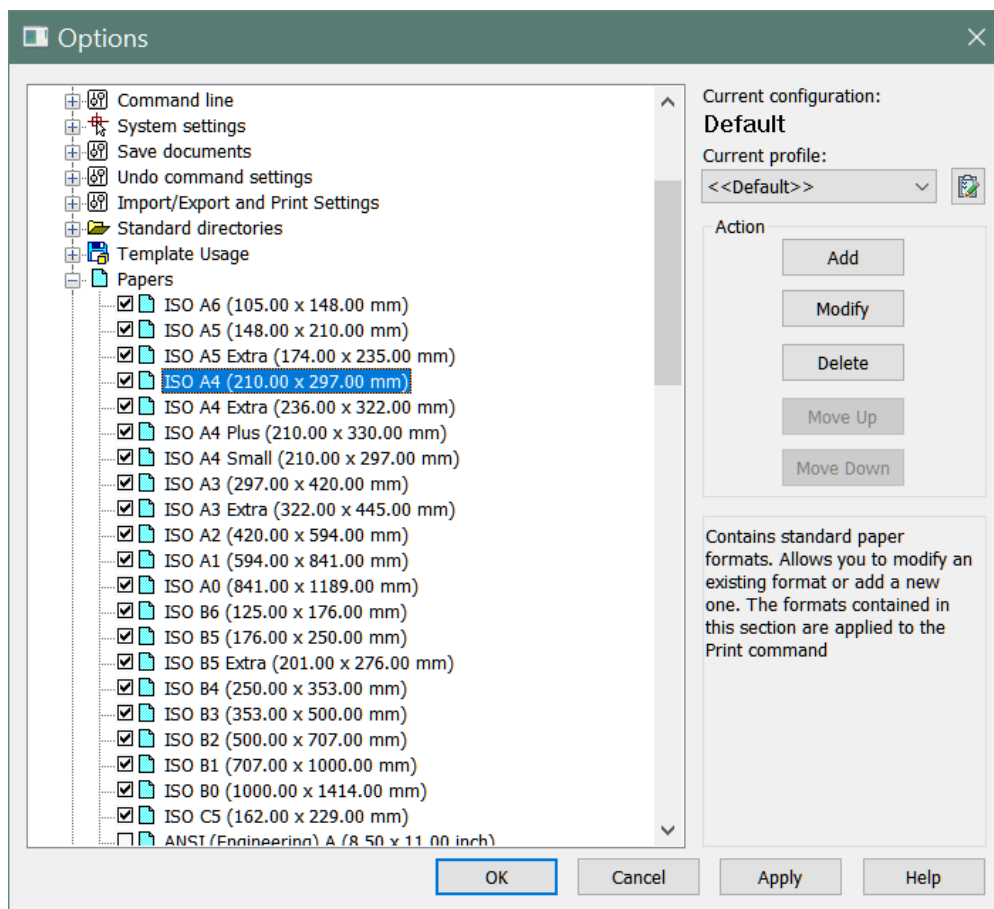




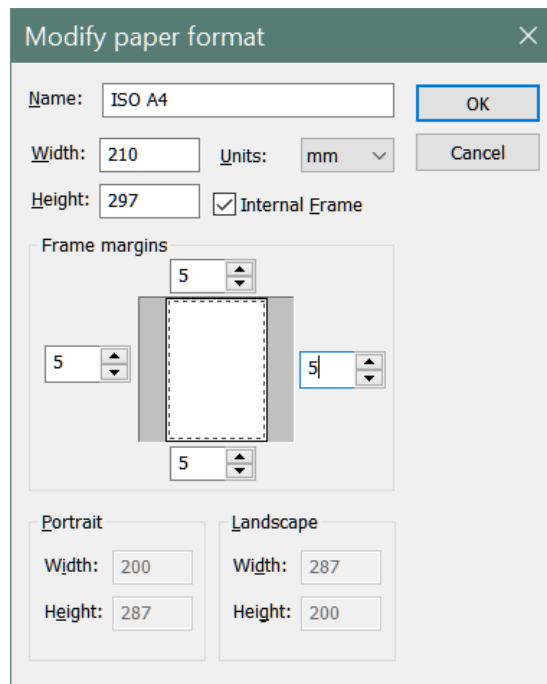
5.2. Click OK.

5.3. Since the outer frame of the stamp is partially lost in the drawing, carry out the 4-point correction using the inner frame of the drawing. To do this, you need to adjust its dimensions.


5.4. Open the Settings dialog box  (Ribbon: **Manage>Options** or Toolbar **Tools>Options**). Open the Paper Formats section, highlight the ISO A4 format (210.00 x 297.00 mm) and click Modify.



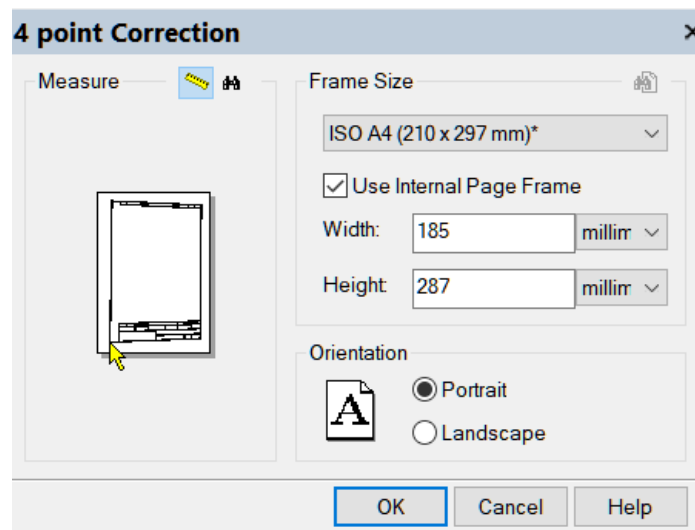
5.5. In the dialog box that opens, enable the Internal Frame checkbox and set the dimensions for the internal frame of the A4 stamp (portrait orientation).




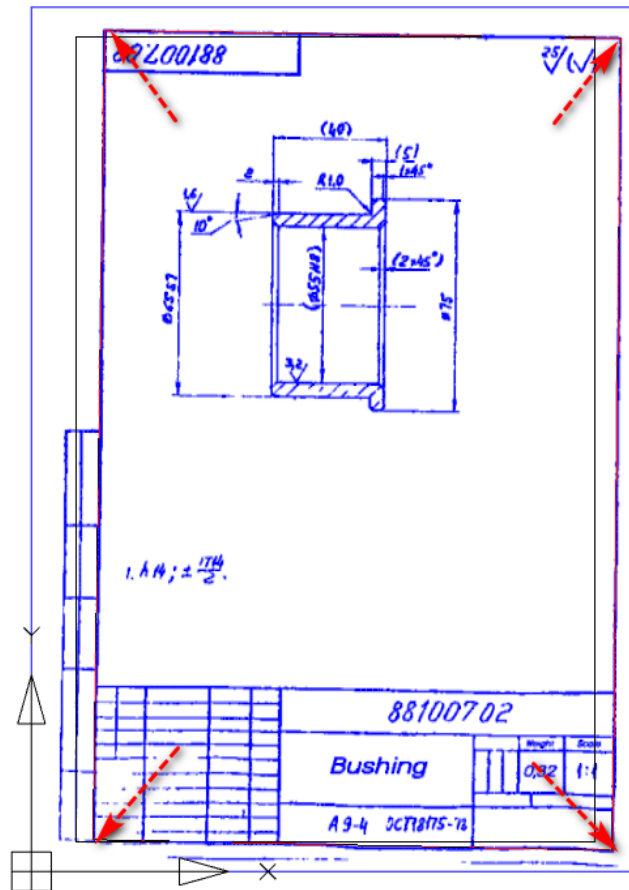
5.6. Click OK in Modify paper format and click OK in the Options dialog.

5.7. Run the 4-point Correction  (Ribbon: **Raster>Modification>4 Point Correction** or Toolbar **Raster Modify>4 point Correction**).

5.8. In the dialog box, select **ISO A4** format, enable **Use Internal Page Frame** and set portrait orientation.



5.9. Click **Measure Frame**  and consistently indicate the four corners of the internal frame.



5.10. Click **OK**.

## 6. Replacing the raster stamp of a drawing with a vector drawing

6.1. We will use a ready-made A4 format.

Open Ribbon: **Insert>Reference>DWG Reference**

6.2. In the window that opens, select the Forum\_F4.dwg file and click OK.



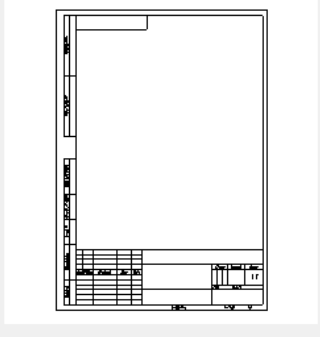
External reference

Name: Form\_A4 Browse...

Found in: C:\TestDrive-Raster\Form\_A4.dwg

Saved path: C:\TestDrive-Raster\Form\_A4.dwg

Preview



Scale

☐ Specify On-screen

X: 1

Y: 1

Z: 1

☐ Uniform Scale

Path Type

Full path

Rotation

☐ Specify On-screen

Angle: 0

Insertion Point

☒ Specify On-screen

X: 0

Y: 0

Z: 0

Block Unit

Unit: Millimeters

Factor: 1.000000

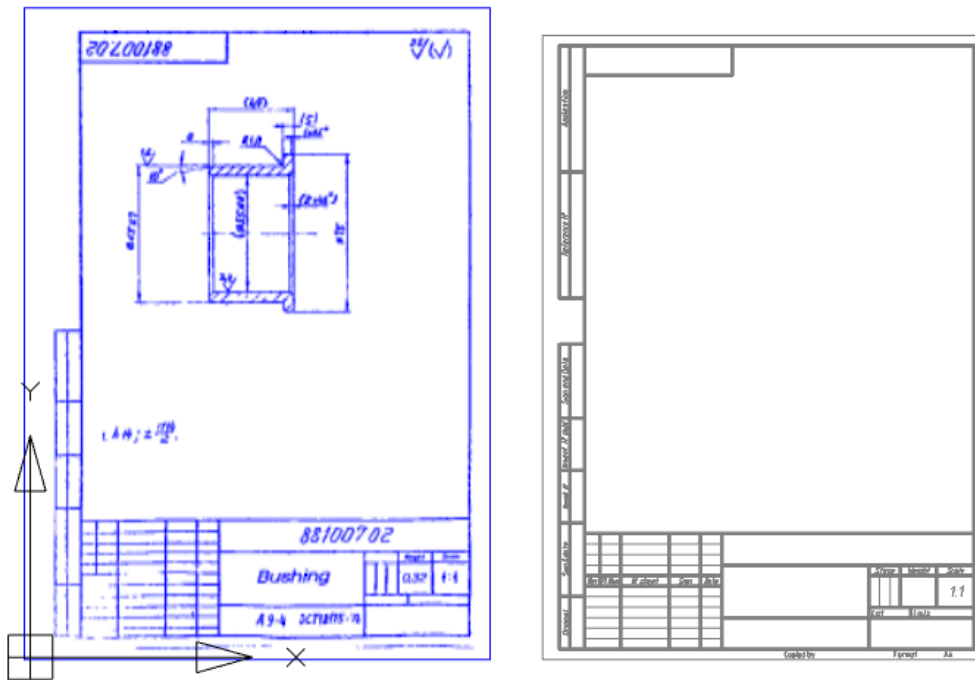
☐ Auto zoom

Reference Type

☒ Attachment ☐ Overlay

OK Cancel Help

6.3. Set the vector frame next to the raster.



Then move (Ribbon: Home>Modify>Move or Toolbar Modify>Move) and put a vector frame on a raster frame (as a base point, select the lower-left corner of the inner frame of the drawing).





Edit the drawing number and product name. Run the Editing Raster Text

command **T** (Ribbon: **Rasterize> Editing Raster Text**). Draw a rectangular border around the text you want to change, starting from the horizontal baseline.

		88100702		Specify text frame 12.8344 < 53 °	
Sign	Data	Bushina		Stage	Weight
					Scale
					1:1 1
				List	Lists
		A 9-4 OCT18175-18			
		Copied by		Format A4	

7.1. Enter a new text and press Enter. A new vector text appears on top of the original

88100702		Rasterize text <Yes>? <input checked="" type="button" value="Yes"/>	
		Yes	
		<input checked="" type="button" value="No"/>	
Bushina		Stage	Weight
			Scale
			1:1 1

bitmap text.

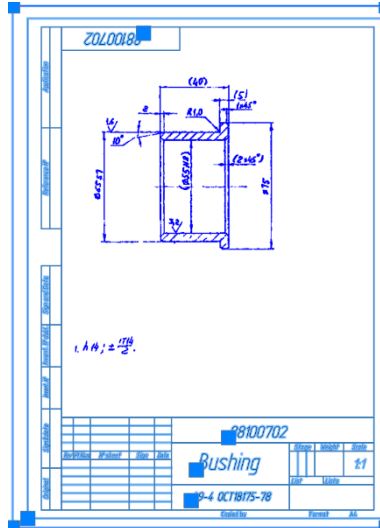
7.2. Select No to rasterize the text.


7.3. Select the received vector text and set the necessary parameters in the Properties bar, for example, style - Standard, Height - 7, Obliquing - 15

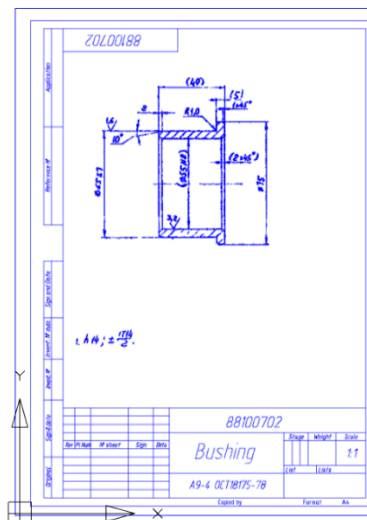
Text		-
Contents	88100702	
Style	Standard	
Annotative	No	
Justify	Left	
Height	7.0000	
Rotation	0	
Width Factor	1.0000	
Obliquing	15	
Text alignment X	0.0000	
Text alignment Y	0.0000	
Text alignment Z	0.0000	

7.5. Edit the text in other fields in the same way. For the turned text, you need to set the rotation angle in the properties – 180.


### 8.1. Select all vector data

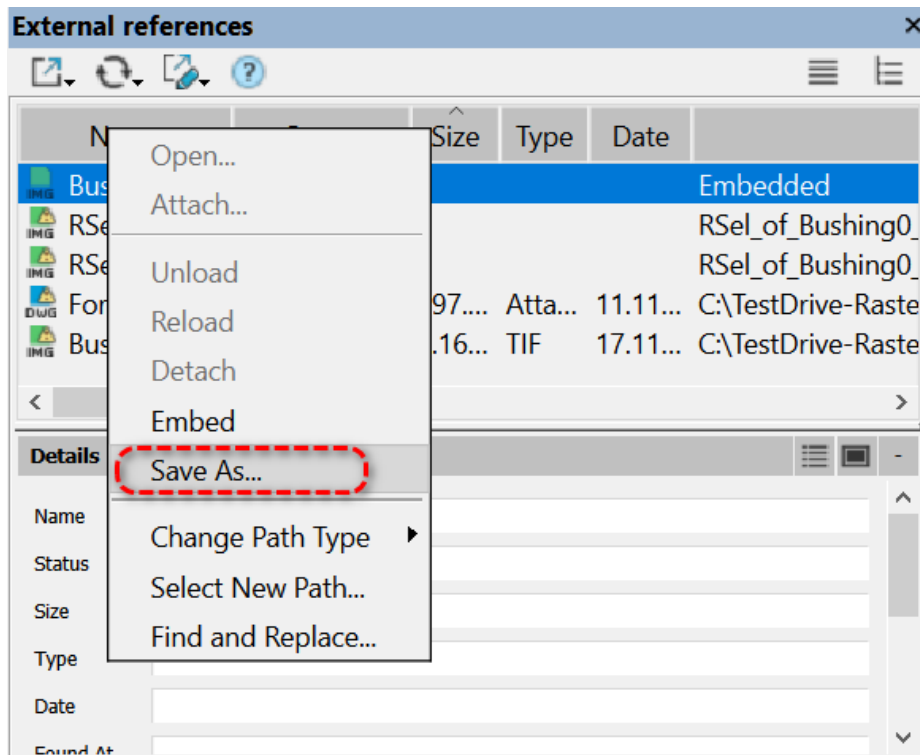


8.2. Run the Rasterization command with the deletion of the selection  (Ribbon: **Raster>Rasterize>Merge** or Toolbar>**Raster Modify>Merge**).



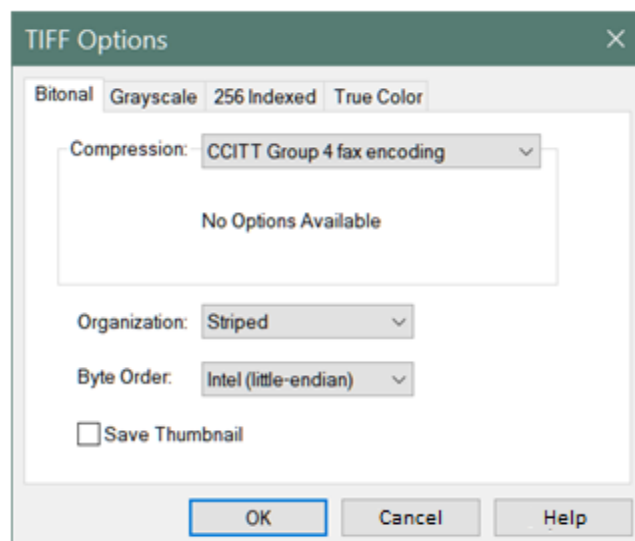
 (Ribbon: **Raster>Modification>CropAuto** or Toolbar>**Raster Modify>CropAuto**).

8.4. To save the result, open the External references dialog box  (Ribbon: Insert>External References). Highlight the link to **Bushing0**, which has the Embedded status and click Save As....



8.5. In the dialog that opens, specify the file name, file type (TIFF) and click Options.

8.6. On the Monochrome tab, configure the settings for saving the TIFF format.



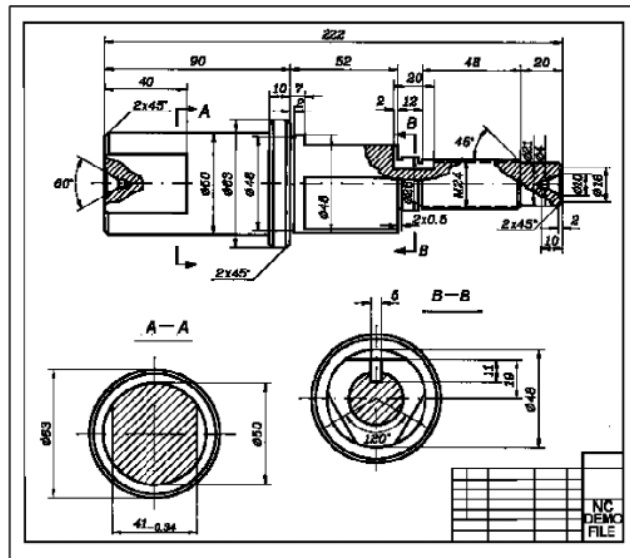
Click OK

Click Save.


Close the External References dialog.

# Converting raster graphics to vector format

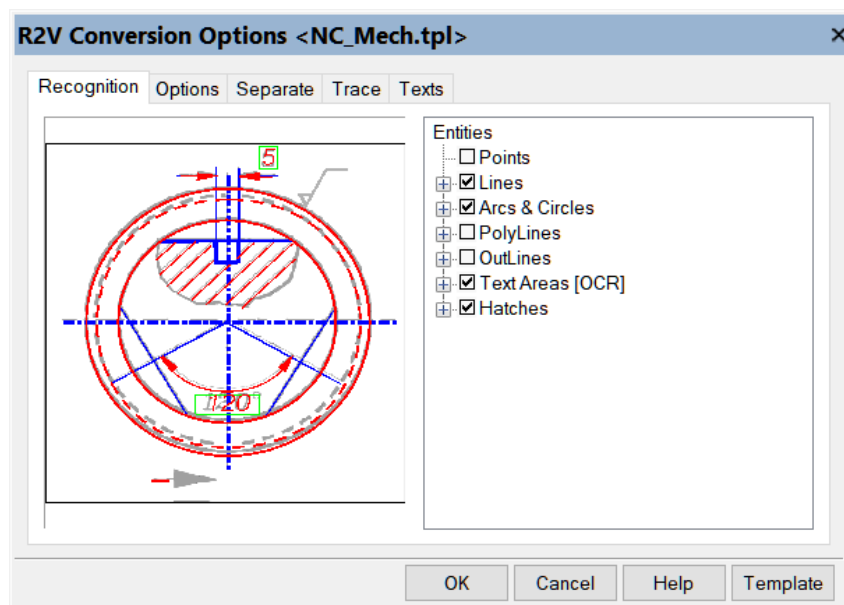
Open file **NC\_Mech.dwg**. (...\\TestDrive-Raster\\)



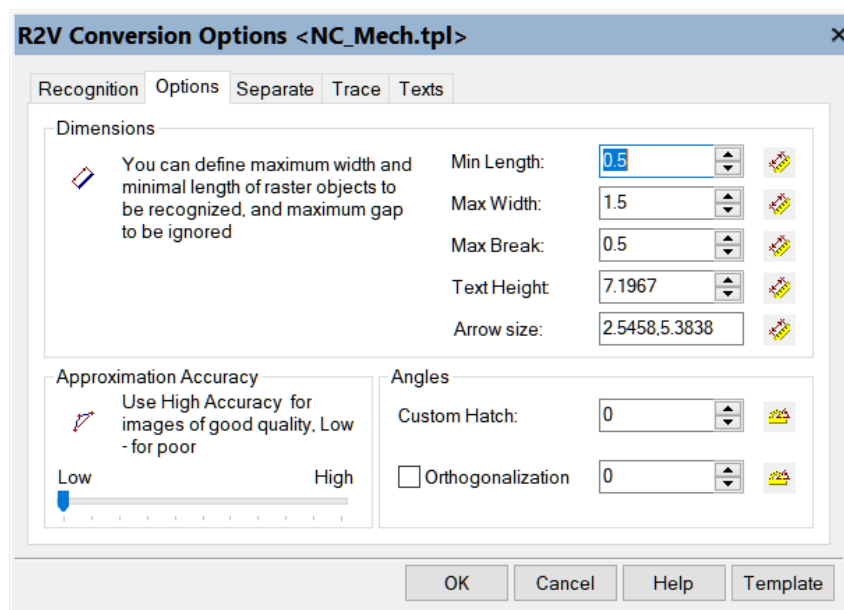
## 1. Setting conversion parameters

1.1. Run the R2V Conversion Options command  (Ribbon: **Raster>Conversion>R2V Conversion Options** or **Toolbar Raster to Vector>R2V Conversion Options**).


1.2. On the Recognition tab, mark Lines (line types and arrows), Arcs and Circles (line types and arrows), Text Area (OCR), Hatches ( $\pm 45^\circ$ ).

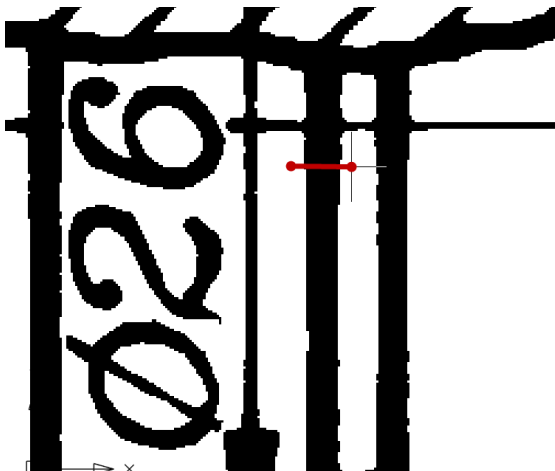


1.3. On the Options tab, set the maximum width, maximum break, text height, arrow




size, set the accuracy and adjust the orthogonalization.

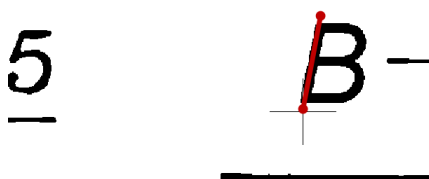
1.4. To set the maximum width, press  Measure the value opposite to the Maximum thickness field and cross the widest line of the drawing. The resulting value makes sense to increase slightly.



In this example, set the maximum thickness 1.5 mm.

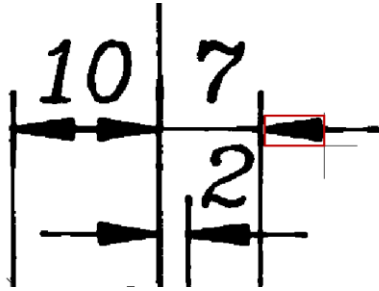
1.5. Set the maximum ignored break in raster lines. Set the break to 0.5 mm.

1.6. To set the height of the text, click  Measure the value opposite to the Text Height field and measure the maximum height of the text.

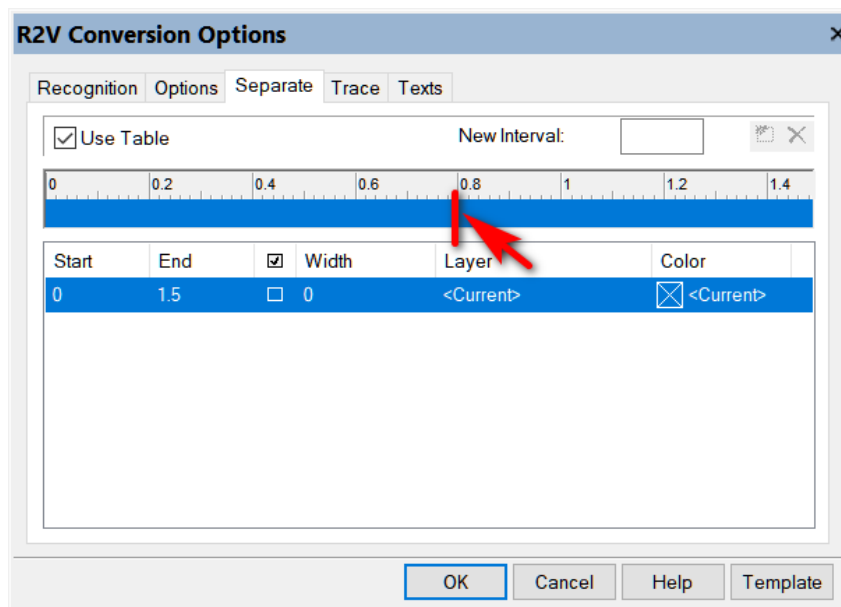




- 1.7. To set the size of the arrow, click  Measure the value opposite to the Arrow Size field and circle the arrow with a rectangular frame.

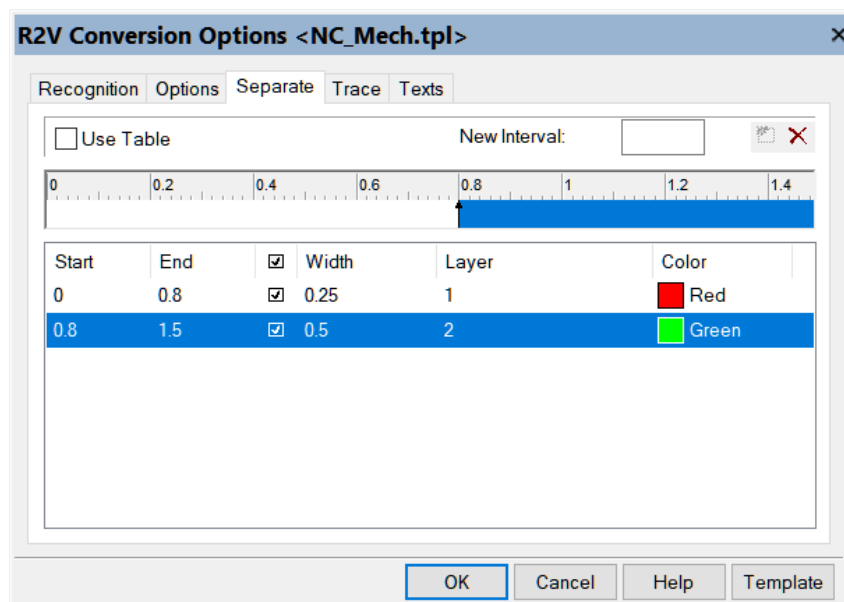


- 1.8. Set the accuracy to low values and enable orthogonalization.
- 1.9. On the Separate tab, configure the properties of the vector objects to be created (width, layer, color).
- 1.10. To divide the interval (from 0 to 1.5 mm) into several ranges (from 0 to 0.8 mm and from 0.8 mm to 1.5 mm), left-click in the appropriate place in the ruler of



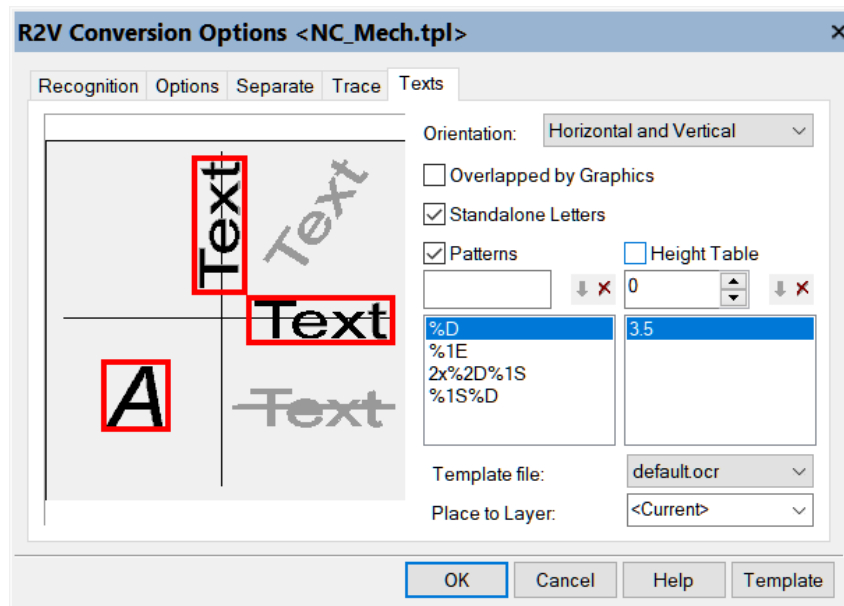
the thickness table.

- 1.11. Enable the Use Table checkbox.
- 1.12. For the first range, set the width - 0.25 mm, layer - 1, color - red. For the



second one, set the width - 0.5 mm, layer - 2, color - green.

- 1.13. On the Texts tab, set the horizontal and vertical orientation of the text,



include Free-standing letters, set the file with OCR characters default.ocr.

To configure OCR, you need to specify a set of word templates. A word pattern is a rule that specifies the allowed sequence of characters within a single recognized word. The OCR module will recognize only those words that match one of the specified patterns.

Buttons  Add template and  Delete Template control the composition of the list of word templates.

The following is a formal description of the definition of the word template:

[% [length] character type] || [letter] ...

Parameters for defining a word template

Parameter	Value
[%]	Beginning of character sequence definition
[length]	Any decimal number; missing with variable length
[type]	Character Type (D, E, e, N, n, S)
[letter]	Single letter

Encoding symbol types

Character encoding	Decryption
D	Digits
E	Upper case letters of the English alphabet (first alphabet)

Character encoding	Decryption
e	Lowercase letters of the English alphabet (first alphabet)
N	Uppercase letters of the national alphabet.
n	Lowercase letters of the national alphabet.
S	Special characters (plus and minus signs, equal sign, etc.)
%%	Single character "%"
[letter]	Single character

For example:

The Rz%D pattern corresponds to words that start with "Rz", followed by any sequence of digits, for example, "Rz40", "Rz2.5", "Rz5000".

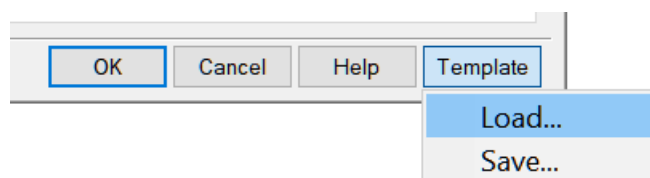
The template %1N%n corresponds to the words of the national alphabet with the uppercase first letter, for example "Hanover", "Oslo".

The template %D%% corresponds to the words of the following type: "20%", "1100%", "12.50%".

The %DV template corresponds to the words of the following type: "5V", "220V", "13.8V".

In the Height Table field, specify the possible heights of the texts. If you check the box, when generating recognized texts, the OCR module will create text objects with heights from this list, rounding the recognized height to the nearest one specified in the list.

The configured conversion parameters can be saved in the parameter set file (\*.tpl) by clicking the Template button.

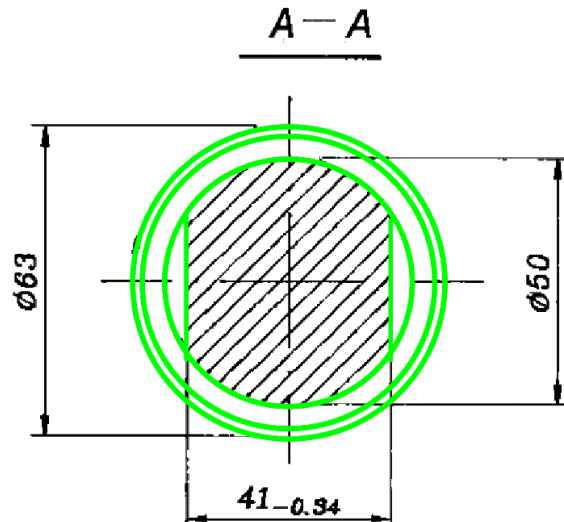


The saved parameter set file can be used to process rasters of similar quality.


1.14. To accept the conversion parameters, click OK.

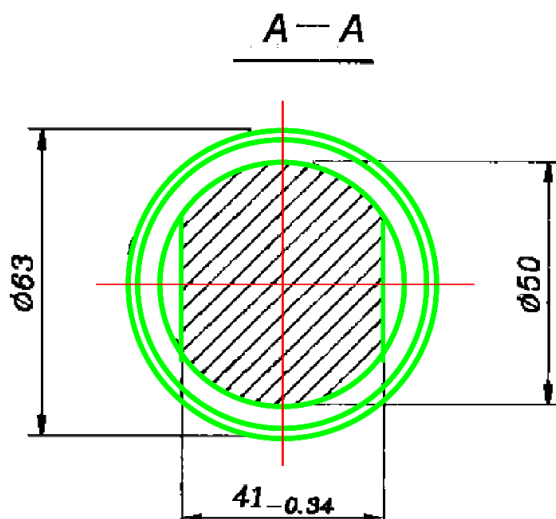
## 2. Vectorizing in trace mode


- 2.1. Trace the section A-A. Make Vector and Erase Raster mode  (Ribbon: **Raster>Trace >Make Vector and Erase Raster** or Toolbar **Raster to vector>R2V Convector**) and Trace Auto  command (Ribbon: **Raster>Trace> Trace**



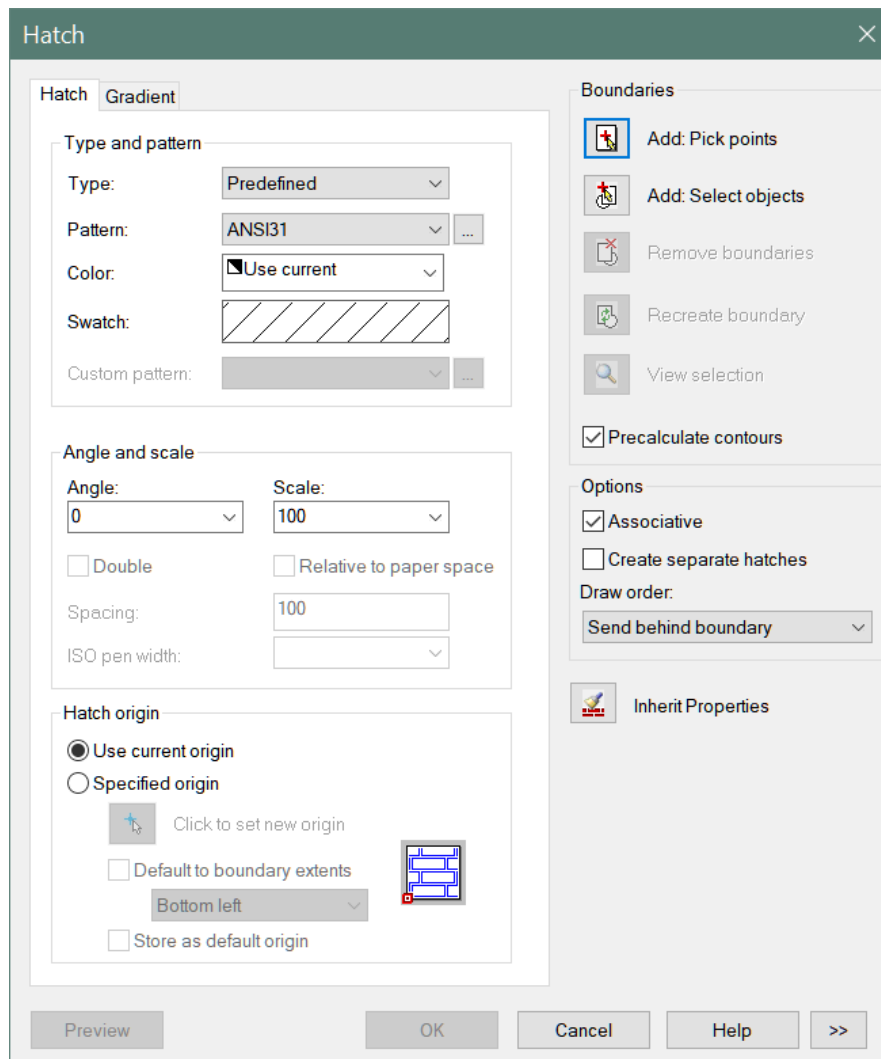
**Auto** or Toolbar **Raster to Vector>Trace Auto**).

- 2.2. To trace the axial and extension lines, enable the Line command  (Ribbon: **Raster>Trace>Line** or Toolbar **Raster to Vector>Line**). Specify the start and end points of these lines.




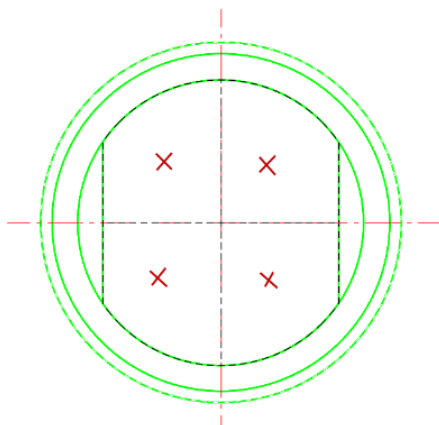
- 2.3. If necessary, use nanoCAD to adjust the received vectors (extend to the border, cut along the border) and change the type of lines.
- 2.4. Hatching in a closed contour is performed by means of nanoCAD.
- 2.5. Hide the raster display  (Ribbon: **Raster>Visualization>Hide Raster**).

2.6. Create a hatching  (Ribbon: **Draw>Add Hatch** or Toolbar **Draw> Add Hatch**).



2.7. Set the type - Standard, sample - ANSI31, scale -1.

2.8. Click the button  *Add: Select points and specify the points inside the hatching contours.*



2.9. Press Enter and in the Hatch window press *Ok*.

