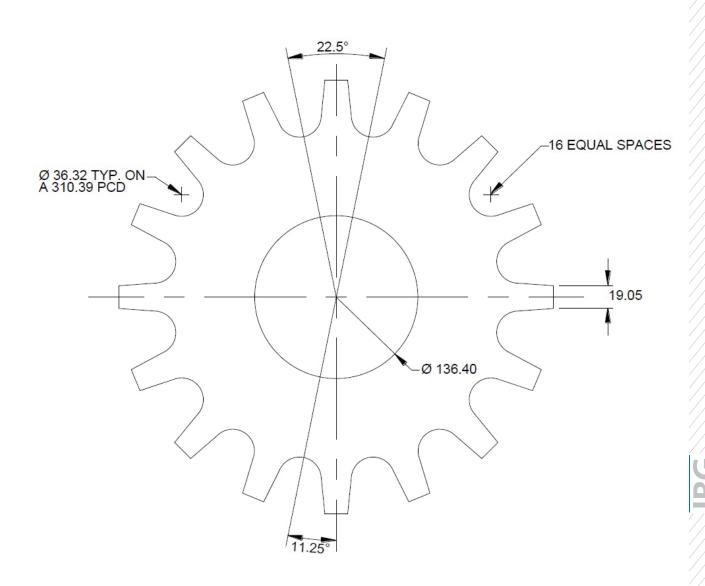


CREATION OF AN INDIVIDUAL CUTTING PROGRAM





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SECTION 1.

INSTALLING FASTCAM® SOFTWARE:

1. Insert CD.

2. Select "English". Preferred language can be changed later.

3. Select "Install FastCam".

4. Follow the wizard "Next".

5. Accept the "terms of the license agreement".

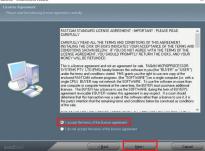






View Demo

Install FastCAM



6. Select the "START" field.

7. Select "Install" in the next window.

8. Installation completed "Finish".

 When the installation is complete, a new folder "FastCAM" will appear on the desktop.



10. Open folder. 10. Open folder. TestCAM → CAD / program creation Testing FastNEST → Nesting Edit NC code

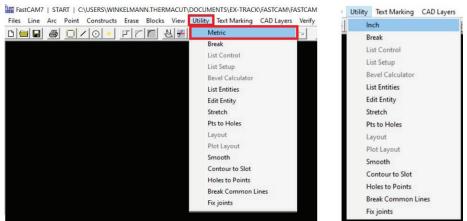
11. To open the software, the **Software protection USB-dongle** must be used. Then open the "FastCAM" software to change the national language.



12. Click on "Language" in the upper bar and select the preferred language.

es Line	Arc	Point	Constructs	Erase	Blocks	View	Utility	Text Marking	CAD Laye	rs Verify	Trim	Program Path	-Control pts	Bevel L	anguage
	-		10+	Fr	r.	₩/≁(X A		2 + -	n a	35	2 🗘	<u>ل</u>		Chinese
															Chinese-TW
															Czech
															Dutch
															 English
															French
															German
															Italian
															Japanese
															Korea
															Polish

13. If necessary click on "Utility" in the upper bar, and change the measurement unit of Metric to Inch.



14. The installation is complete, after selecting the preferred language and changing of the measurement unit. When using the software, the delivery included **Software protection USB-dongle** must always be used.

SECTION 2

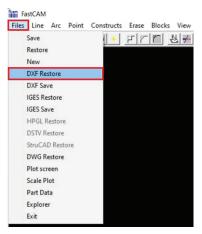
CREATING A SIMPLE CUTTING PROGRAM:

This quick guide is an example of how to create a cutting program easily and quickly. There could be also be other ways to create a cutting program.

1. Open the software "FastCAM" (only with Software protection USB-dongle) on a PC.



2. Restore DXF/DWG.



3. Adjust DXF Option.

DXF Options	×
File Selection	
DXF file units ⊂ Inch ™ Metric ⊂ User Defined Multiply incomin	g units X
	CAD Fix
Apply Z axis extrusion Check for orphans	Recover corrupt file
Enter	Cancel

- 1. Files
- 2. DXF or DWG Restore

- 1. File Selection Select "Single file"
- 2. DXF file unit Select "Metric"
- 3. Select the options
 - CAD Clean
 - CAD Fix
 - Check for orphans

(These three options check the DXF/DWG after small errors, such as lines that are too small.)

4. Confirm with "Enter"

IMPORTANT - Requirement regarding a DXF/DWG drawing:

- The drawing should be in scale 1:1.
- All contours must be closed.
- No orphans.
- No double lines.
- The smallest radius must not be smaller than the kerf setting for cutting.

- 4. Select DXF / DWG on the hard disk.
- 🖏 DXF file name

	17 - 17
Look in: 🖃 c: [System] 🔹 🖻	
C:\ Muster.dxf Users minkelmann.THERMACUT Documents minkelmann.THERMACUT FastCaM minkelmann.THERMACUT FastCam FastCam Muster Muster	
File name: Muster.dxf 08.10.2019 10:24:37	3.4 kb Text
Files of type: *.DXF	<u>S</u> elect Cancel

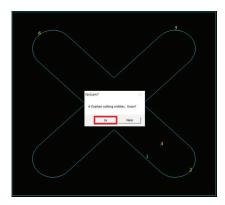
5. Import the DXF drawing and verify it by the previous "Option" selections.

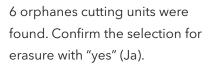


Confirm the preset value with "Enter".

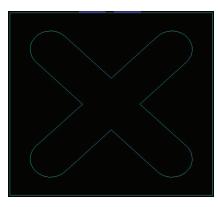
It ask for the maximum gap in the contour.

Everything smaller than 0,2mm is automatically deleted.





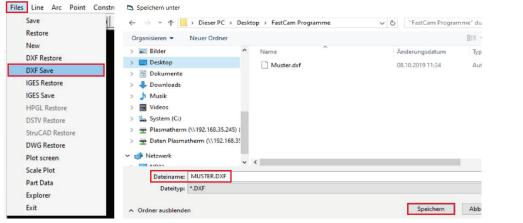
When checking the drawing, the FastCAM found 6 small points that would have caused problems when cutting later.



×

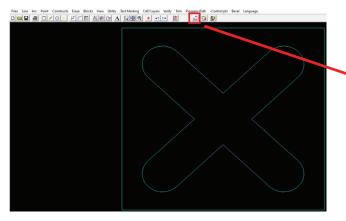
The cleaned drawing is shown.

6. If necessary, save the clean DXF/DWG drawing on the PC, as seen below.



- 1. Files
- 2. DXF Save
- 3. Select the directory on the PC and save (Speichern).

7. Creating cutting technology.



8. FastPATH settings.

ss E	ernal ntry	Internal Entry	Cut Sequence	Specials	Stitch / Kerf	Nest Options	Bevel	Router / Bridges
Selected	l proces	ises	Kerf	Side			Available p	processes
rking TTING			None Left	Both			DRILL	
ply proce	s whole	nest		elect proces de by clicki	sses in the	set order require em.	ed. Chang	e kerf and
Ext	ernal	Internal	Cut	Specials	Stitch /	Nest	Ac	Router / Bridges
Ext		Internal Entry	Cut Sequence	Specials	Kerf	Options Smart (Pat	Bevel	Router / Bridges
ss E	ernal		Sequence	Specials	Kerf	Options Smart (Pat	Bevel t.,) Jox Height Box Width	Router / Bridges
ss Ext E F ntry On/Off	ernal ntry Position	Entry Bottom left	Straight		Edge	Options Smart (Pat n/Off E Maximum cl Plate edge s Edge Start	Bevel	Router / Bridges
ss Ext E F ntry On/Off Corner (ernal ntry Position	Entry Bottom left	Sequence		Kerf Edge	Options Smart (Par n/Off E Maximum cl Plate edge s Edge Start ngle (plasma ment minin	Bevel t.) lox Height Box Width hain length t.art none Kerf at) C hization	Router / Bridges
F F Ntry On/Off Corner	ernal ntry Position	Entry Bottom left Type [L on L Type [S Let	t Straight 	•	Kerf	Options Smart (Pai n/Off E Maximum cl Plate edge s Edge Start ngle (plasma ment minim lumns only ws only	Bevel	Router / Bridges
ss Ext E F ntry On/Off Corner (Corner (Corner (Con/Off	ernal ntry Position	Entry Bottom left Type [L on L Type [S Le	t Straight Length 6. Angle 0 Length 0 Straight Itraight Length 5. Angle 0 Itraight 0	· ·	Kerf	Options Smart (Pari Maximum cl Plate edge s Edge Start ngle (plasma ment minin lumns only ws only s	Bevel t.) lox Height box Height box Height box Height hain length tart none tart none tart none tart none tart none tart none tart start type Kar at the start the star	Router / Bridges

Select the function "Set FastPATH" This function is used to define the lead-in and lead-out geometry.



Select tab "Process" defines the process.

- Selected processes box = Select "Cutting".
- Kerf box = Select "Left".
- Side box = Select "Both".

- Select tab "External Entry" defines the lead-in and leadout geometry for the outer contour.
- "Position" box defines select the starting point.
- "Entry" box defines the lead-in geometry.
- Type = Select the type of lead-in in Pull-Down menu (straight ahead, quarter circle or semicircle).
- Length = length of the lead-in geometry in mm or inch.
- Angle = 0° , 45° or 90° lead-in angle.
- Corner pierce = check box (If available the lead-in is placed at a corner).
- "Exit" box defines the lead-out geometry.
- Type = Select the type of lead-out (straight ahead, quarter circle or semicircle).
- Length = length of the lead-out geometry in mm or inch.
- Angle = 0° , 45° or 90° lead-out angle.

ocess	External Entry	Internal Entry	Cut Sequence	Specials	Stitch / Kerf	Nest Options	Bevel	Router / Bridges
	Position	Bottom		•	□ #	iternal sa	me as	
C Pie C Bre C Bre	ition erce in Corne eak eak longest eck entry lisions		Entry on/Off Extensio Exit on/Off	Radi An n Leng Ty Radi	pe Quarter 0 us 6. gle 0 th 0 pe Quarter 0 us 5.			
Cer	nter Pierc		☐ Extension		gle 0 gth 0 n	0		

Select tab "Internal Entry" defines the lead-in and leadout geometry for the inner contour.

- "Position" box defines select the starting point.
- **"Entry" box** defines the lead-in geometry. Select On or OFF then enter.
- Type = Select the type of lead-in (straight ahead, quarter circle or semicircle).
- Radius = Enter value.
- Angle = 0° , 45° or 90° lead-in angle.
- Length = length of the lead-in geometry in mm or inch.
- "Exit" box defines the lead-out geometry
- Type = Select the type of lead-out (straight ahead, quarter circle or semicircle).
- Length = length of the lead-out geometry in mm or inch.

- Angle = 0° , 45° or 90° lead-out angle.

Tipp's for the lead-in and lead-out geometry

Inner contours:

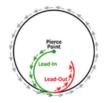
You should try to move to the contour with a radius (quarter circle / half circle). The radius should be adapted to the material thickness or hole diameter. The starting point of the lead-in should be at least so far away from the contour that the contour is not damaged when piercing.

The lead-in and lead-out geometry may be different for materials and material thicknesses.

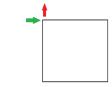
Outer contours:

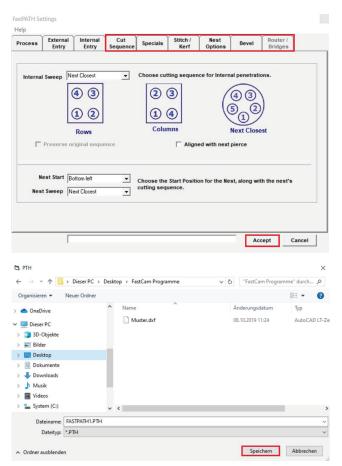
If there is a "sharp" corner (90 degrees) on the outer contour, this is the ideal starting point. The preferred lead-in geometry is then to move "straight ahead" on the contour. Otherwise, as with the inner contours, you should move gently with a radius to the contour.

Example hole:



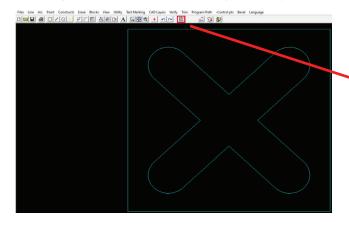
Example outer contour with a sharp edge:



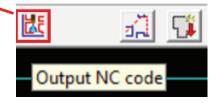


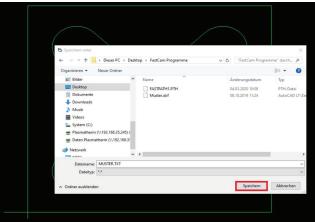
- In "Cut Sequence" you can change the cutting sequence.
- "Specials / Stitch, Kerf / Nest Options / Bevel" are for the time being not required for creating a cutting program.
- As soon as the settings are completed, close the field with "Accept".
- Then FastCAM wants to save the settings for lead-in and lead-out geometry.
- Select the required directory.
- It will be saved as FASTPATH1.PTH (The name can be changed. It is important that the file is saved as .PTH).
- Close the field with "Save" (Speichern).

9. Assign lead-in and lead-out geometry / create cutting program.



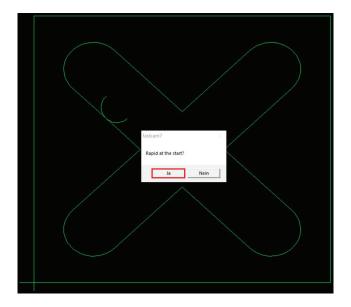
Select function "Output NC Code". With this function the setting of lead-in and lead-out geometry assigned.

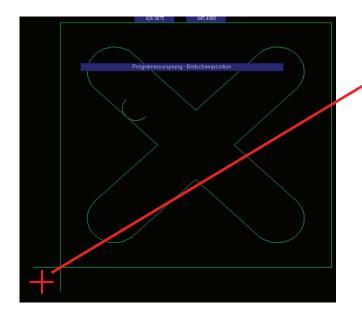


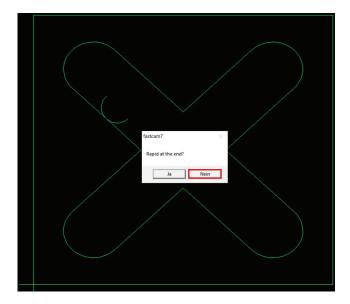


Then FastCAM wants to save the cutting program

- Select the required directory.
- It will be saved as Muster.TXT (The name can be changed. It is important that the file is saved as.TXT).
- Close the field with "Save" (Speichern).







FastCAM asks "Rapid at the start"? - Select these message with "yes" (Ja).

Yes (Ja) means:

It can be selected with the mouse by clicking in the field of the program starting point (see next page).

No (Nein) means:

The cutting program starts at the starting point of the outer contour. This can therefore be any position, depending on the starting point for the outer contour set before.

For pierce starting, when positioning the cutting torch, care should be taken to ensure that the lead-out is still in the material.

If the previous field was confirmed with "yes", you can now use the mouse to set the program starting point. For example, click with the left mouse button on the left below where the "red cross" is shown.

This method has the advantage that the later positioning of the cutting torch is simplified.

This means that when standing in front of the CNC control, the cutting torch can be positioned at the bottom left of the plate to be cut, without having to take care that the lead-out can still take place in the material.

After assigning the program start point, FastCAM asks "Rapid at the end?"

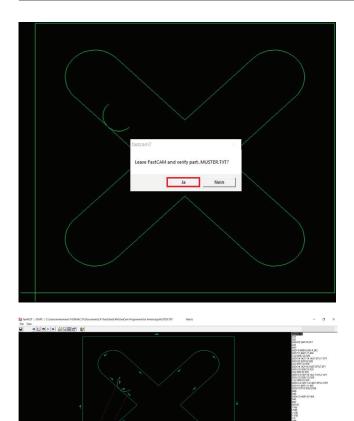
- Select this message with "no" (Nein).

No (Nein) means:

As soon as the last contour has been cut, the cutting torch stops at this contour.

Yes (Ja) means:

As soon as the last contour has been cut, the cutting torch moves back to the program starting point.



By pressing this field, the cutting program (NC code) can do a Dry-Run step by step with the cursor keys

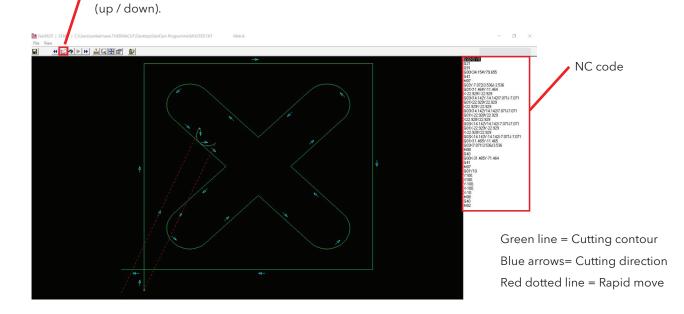
10. Check cutting program.

FastCAM ask "Leave FastCAM and verify part. Muster TXT?"

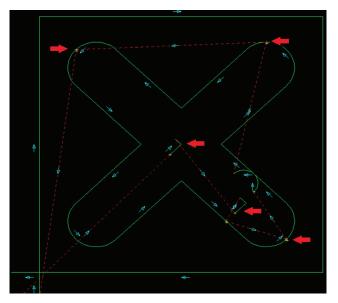
- Select this message with "yes" (Ja).

After it, the FastPLOT program opens automatically. Here the program can be checked whether

- the cutting sequence is ok
- the rapid moves are ok
- starting point is ok
- etc.

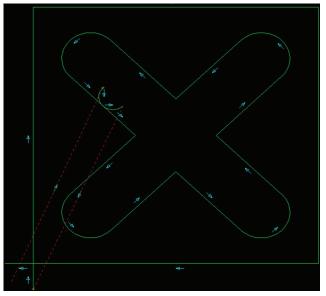


Example of a faulty DXF drawing.



Because the DXF drawing is faulty (e.g. by double lines or small points on a line), the FastCAM generates too many starting points, which can be easily recognized by too many rapid movements and repeated starts on a line (contour).

The red arrows show the wrong points and lines.



After cleaning the DXF drawing, FastCAM shows the correct cutting sequence.

It is clearly visible that there are less rapid movements and that each line (contour) is only cut once.

In the case of a line or contour, only a rapid movement should lead to the contour and away again at the end of the line (contour).

11. Cutting program.

The finished cutting program can now be saved from the PC to a USB flash drive and can be cut on the EX-TRACK.

The finished cutting programs are saved as .TXT.

USB Flash Drives or Memory Sticks MUST BE FORMATTED TO FAT (FAT16) or FAT32. Best to have only program files on dedicated USB flash drive, or CNC may lockup trying to read other formats. FAT32 will work for USB drives up to 32 GB in size. Files can be no larger than 4GB. If your USB drive is larger than 32 GB, it can be reset to 32.

SECTION 3.

NESTING:

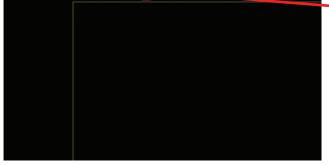
When nesting, different contours can be nested in a define plate size.

1. Open the software "FastNEST" (only with USB-dongle).

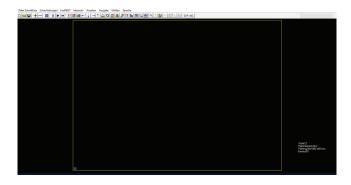


2. Define plate size.

Rie Cut List Nexts FastNST Interactive View Output Ublities Language



Plates List								×
# Plate name	Length	Width	Area m2	Parts Th	ickne			
						Length	1000.	mm
						Width	800.	mm
						Thickness	0	mm
Rectangle	C Remnant C	AM C	FastTRA	CK databa	se	Material		•
	Number of plate	s in FastTl	RACK			Grade		~
	List			~	Insert	Branch		•
+ -	- 1		Maxin	num Plates		i Search		Done
					1	000/01		



Select the function "change plate".



A new window opens where the plate size can be defined.

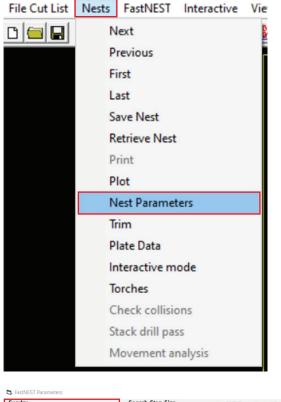
- Enter the length and width.
- Close the field with "Done".

Do not need set the thickness and material, because the EX-TRACK[®] has no automatic cutting database.

Important - Maximum plate size is 3050×1525 mm (10 x 5 ft.). This is the maximum working area of the EX-TRACK^{*} system.

The yellow frame shows the adjusted plate size.

3. Set nesting distance.



Sundry Search Step Size NC Output questions Part to Part 10 mm Angles in 90 C Ask all questions Part to plate 10 mm Angle Step Preselect answers Maximum plate num Search Step 10 Verify nest with FastPLOT Plate loading Pause at new plate □ Plot nest Disable internal nesting ✓ Do not rotate plates Resequence ✓ Length priority ✓ Move entries Do not jostle after each array NC collision check Use subroutines Part Loading Determine optimum nest angle Check NC output for collisi Calculate arrays Approach distance .6 mm Change corners Limit move when collisions C Round C Sharp Nest Type Corner distance 0 mm Standard Profile type None -C Common Cut Nest Exclude acute corners C Bridge Nest Enter Cancel

4. Set file type.

File Cut List Nets FastNEST Interactive View Output Ubilities Language

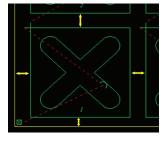
Select the "Nests" menu and then "Nest Parameters".

In this menu, the nesting distance of the plate edge to the cutting part as well as between the individual cutting parts can be adjusted.

The distances can be set in the "Sundry" section.

- Part to part = Nesting distance between the parts to be cut.
- Part to plate = Nesting distance between plate edge and the part to be cut.

The nesting distance depends on the parts to be cut and the material thickness and can be different..

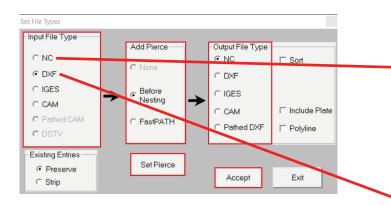


Select the function "DXF - NC".



FastPATH Settings

Help



Input File Type

First possibility = select "NC" and confirm "Accept" You can directly continue with point 5 "Add cutting parts". The requirement is that the individual cutting programs to be nested have already been created in advance (xxx.TXT).

Second possibility = By selecting the "DXF", then continue with the following steps.

Add Pierce - Select "Before Nesting". Output File Type - Select "NC".

Then click on "Set Pierce", to define the lead-in and lead-out geometry.

By selecting the field " Set Pierce" the field "FastPATH Settings" opens.

 Repeat the procedure description "creation of a simple cutting program" under position 8 "FastPATH Settings".

Then FastNEST wants to save the settings of the lead-in and lead-out geometry.

- Select the required directory.
- It will be saved as NEST.PTH.

(The name can be changed. It is important that the file is saved as .PTH)

- Close the field with "Save" (Speichern).

rocess	External Entry	Internal Entry	Cut Sequence	Specials	Stitch / Kerf	Nest Options	Beve	Route Bridg		
Sel	ected proce		Kerf	Side			Availabl	e processe		
				Jide	-		0000000280	processe		
MARKIN		_	None Left	Both			DRILL			
¢Α	rocesses	e nest				set order requir tem.	ed. Cha	nge kerf ar	nd	
								Accept	Cancel	
	↑	Dieser PC →	Desktop > Fr	astCam Progra	amme	~			Cancel	
• → •		Dieser PC > uer Ordner	Desktop > Fi	astCam Progra	amme	~				
> •	en 🔻 Ner		Desktop > Fi		amme	×	ල් "Fa		ramme" durch	
- → ✓ Drganisiere	en 🔻 Ner		^ Name		amme	v	ی "Fa: Änderut	tCam Progr	ramme" durch ≣≣ ▼ Typ	(
 Drganisiere Desl	en 🕶 Ner		↑ Name	ACKUP.CAM	amme	v	ල් "Fa	tCam Progr Igsdatum 20 10:55	ramme" durch	Date
Organisiere Desi	en ▼ Ner ktop umente vnloads		 Name BJ BJ 		^	v	ی "Fa: Änderur 04.03.20	tCam Progr gsdatum 20 10:55 20 10:55	ramme" durch IIII ▼ Typ CAM-E	Datei
- → ✓ Organisiere Desl Dok Dok Dok	en v New ktop umente vnloads sik		 Name BJ BJ FA 	ACKUP.CAM ACKUP.PTH	^	v	ی "Fa: Änderur 04.03.20 04.03.20	tCam Progr Igsdatum 20 10:55 20 10:55 20 10:08	ramme" durch IIII ▼ Typ CAM-E PTH-D	Datei atei atei
Drganisiere Doganisiere Dosk Dosk Dosk Dosk Dosk Dosk Dosk Dosk	en v New ktop umente vnloads sik		 Name BJ F4 M 	ACKUP.CAM ACKUP.PTH ASTPATH1.PTH	^	v	ق "Fa: Anderut 04.03.20 04.03.20 04.03.20	tCam Progr 1gsdatum 20 10:55 20 10:55 20 10:08 19 11:24	Tamme" durch	Date ate AD

Speichern Abbrechen

Daten Plasmatherm (\\192.168.3

Dateiname: NEST.PTH

Dateityp: *.PTH

V 🔿 Netzwerk

> 🛄 NB01

5. Add cutting parts.





Individual parts can be added and removed by pressing the " + " and " - " fields.

- Select " + ".

Select the required DXF file to be cut

- Press "Select" to confirm.

Either select the DXF files here, or if the cutting programs have been created in advance, select the cutting programs.

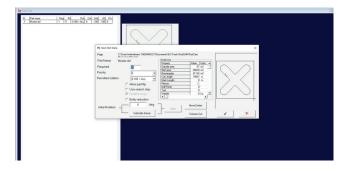
Depending on whether DXF or NC was selected in "Input - File type", the corresponding file type is displayed here.

A new window opens, where the amounts can be set..

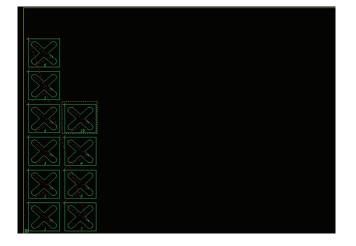
Enter the number of parts to nest in the "Required" field.

At "Initial Rotation", enter the rotation (if necessary). Then confirm.

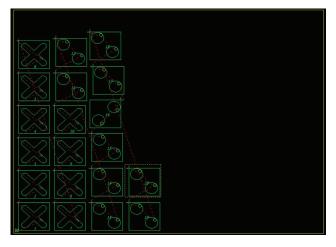
After confirming the parts are nested on the plate.



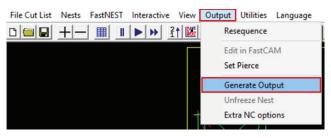
🖏 Nest Part Da	ita			×
Path	C:\Users\winkelmann.THERMACUTV Programme\Muster\	Documents\EX-Track\FastC	AM\FastCam	
Part Name	Muster.dxf	Analysis		
		Property	Value Units 🔺	
Required	10	Outside area	.01 m2	
		Nett area	.00638 m2	
Priority	5 -	Rectangular	.01124 m2	
Permitted rotat	tion	Cut Length	.78507 m	
Fernilleuroldi	tion 0,180 + ALL 💌	Mark Length	0 m	
	Allow part flip	Pierces	2.	
		Drill Points	0	
	Use search step	Text	0	
	🔽 Disable Array	Weight	0 kg 💌	
	Entity reduction		•	
Initial Rotation	n 0 deg	Apply	Move Entries	
	Indicate base		Common Cut	✓ ×

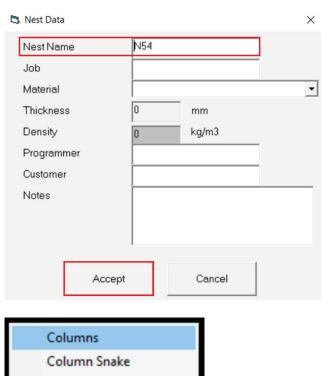


6. Add more parts.



7. Save nesting.





Rows

- Row Snake
- Next Closest

Minimum Rapid

Indicate Next

Starting at Position 4 "Set file type", further parts can be nested on the plate.

As an example, 10 more parts were added here.

Choose "Output" in the menu and click on "Generate Output".

A new window "Nest Data" appears.

- "Nest Name" enter the name.

- Accept.

In the next window define one of the possible nesting sequences.

Examples for nesting sequences:

<u>Columns</u>

Rows

6 7 8 9 10

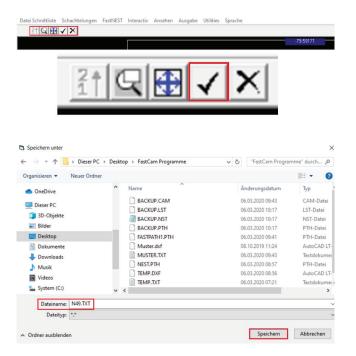
1 2 3 4 5

1 10 Row Snake

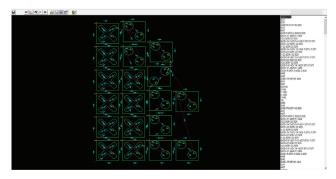
> 6 5

10	9	8	7
1	2	3	4

"Next Closest" = The closest part is cut next. "Minimum Rapid" = Try to keep the rapid movements from part to part as short as possible.



8. Check nesting.



9. Nesting program.

The finished cutting program can now be saved from the PC to a USB flash drive and can be cut on the EX-TRACK[®]. The nesting program is also saved as .TXT.

The menu changes. Confirm by clicking the

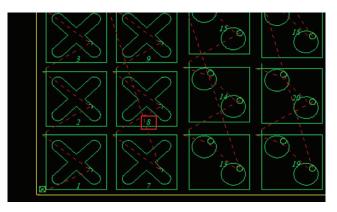


A new window appears where the nested program can now be saved.

After saving the nesting is automatically opened in FastPLOT.

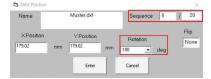
As descriped in point 10 "Check cutting program", the nesting can also be checked and dry-run.

Information about the Nesting



The numbers displayed in the parts indicate the sequence.

By double-clicking on a part, the sequence can also be changed. Red box below: Drag up to Sequence 8 / 2 the individual parts can also be rotated afterwards.



If you click on a part and keep the left mouse button pressed, the chosen part can be moved.

As you can see, the software also shows nesting errors as soon as parts placed on top of each other. This is shown with a red line.



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When a part is selected on the plate, it can be repositioned to the set nesting distances using these arrow keys.

If a nested part should be removed, select the required part and delete it with the " - " button.

NOTES:



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