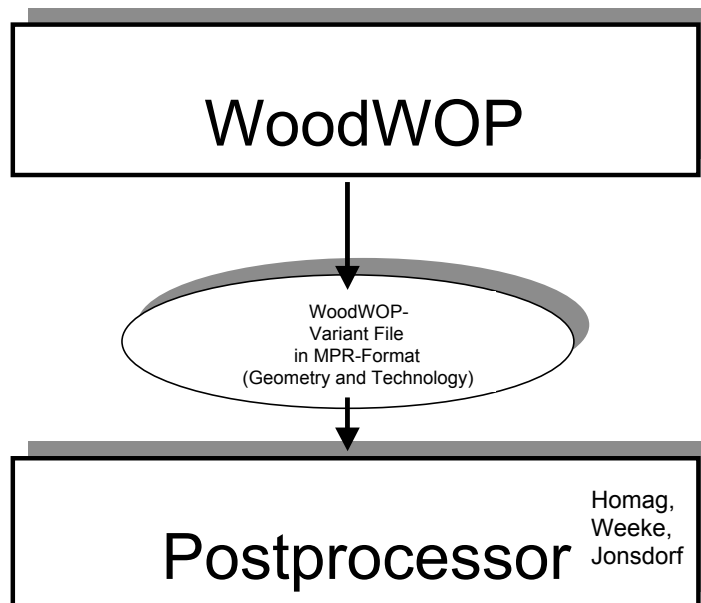


woodWOP- FILE-Description (MPR-Format)

Valid from woodWOP Version 5.0.750.1





PRODUCT INFORMATION

Description
woodWOP- file

Subject : 4.2.7

9-080-42-7190 -D00

Nov 22nd 2005

Table of Contents:

1 Introduction	4
3 Format of Parameter Rows.....	6
4 Parser.....	7
4 Parser.....	7
5 Data Head	8
5 Data Head	8
6 Variable table	10
7 Cartesian Coordinate System	11
8 Contour moves.....	13
8 Contour moves.....	13
8.1 Points.....	13
8.2 Lines	13
8.3 Circle arcs.....	14
8.4 Corner rounding.....	15
8.5 Chamfer edge.....	15
8.6 Split Element	16
9 Processes	17
9.1 Base macros.....	17
9.1.1 Werkstck : Workpiece explanation.....	17
9.1.2 Comment : Comment.....	18
9.2 Processings macros	19
9.2.1 BohrVert: Drillings vertical	19
9.2.2 BohrHoriz: Drilling horizontal	20
9.2.3 BohrUniv: Drilling universal (Space drilling)	21
9.2.4 UfluBohr: drilling from below	22
9.2.5 Grooving: Grooving and Sawing	22
9.2.6 groove_R: Angled Grooving	23
9.2.7 Polygonzug: Polygon milling.....	24
9.2.8 Graphic Comment.....	25
9.2.9 Pocket: Vertical pocket milling	26
9.2.10 HTasc: Horizontal Pocket Routing	27
9.2.11 FreiFormTasche (Free form pocket).....	27
9.2.12 VTasche: Vector Pocket Routing	29
9.2.13 UflurTasche: Pocketing from below	29
9.2.14 NC-Code: Free NC-Code	30
9.2.15 NC-Stop: NC-Stop-Makro	31
9.2.16 Universal Macro	31
9.2.17 Messen: Measure.....	32
9.2.18 Probing Actual Location of Workpiece	33
9.2.19 Block: Block macro.....	33
9.2.20 Komponente: Component Macro	34
9.3 Contour processing makros	36
9.3.1 Contourfraesen: Routing to a Contour elements.....	36
9.3.2 Contourverleimen: Edgebanding at Contour Element.....	37
9.3.3 Stegkante: T-molding	39
9.3.4 Buendigfraesen: Flush Trimming	40
9.3.5 Kappen: End Trimming	41
9.3.6 Klink: Corner notching.....	42
9.3.7 Schleifen: Contour Sanding.....	43
9.3.8 Drucken: Pressure Zone at a Contour	44
9.3.9 Ritzen: Processing of an Edge at Door Rabbit Processing r.....	44
9.3.10 Horizontales Fraesen: Contour Element.....	45
9.3.11 Vektor Fraesen: 5-Axis Routing	46



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

9.3.12	Unterflurfräsen : Routing from below	47
9.3.13	Vert Getastet-Fraesen: Vertical Touched Routing	48
9.3.14	Abblasen: Blow Cleaning of Contour.....	50
9.3.15	Laser-Anzeige: Showing Contour by Laser.....	50
9.3.16	NC-New: Discharge Macros.....	51
9.3.17	Ablauf: Run Macro (Sequence Macro).....	53
9.3.18	Contour routing with C-Axis.....	53
	Routing with a FK-Unit.....	54
	Routing with a CF-Unit.....	55
	Gluing with a CF-Unit.....	55
	Flush trimming with a CF-Unit	56
	Pressure with a CF-Unit.....	57
	Cutting with a CF-Unit.....	57
	Sanding with a CF-Unit.....	58
	Contur operation with a CF-Unit	58
	Operation without contour with a CF-Unit.....	59
9.4	Konsolen und Saugermacos: Vacuum Cup Macros	61
9.4.1	Single-Vacuum-Cup	61
9.4.2	SaugerK: Vaccum cups (parallel to Y-Axis)	61
8.4.3	SaugerL: Konsolensauger längs (parallel to X-Axis).....	62
9.4.4	Transport: Work piece Transport with Vacuum Carpet.....	63
9.4.5	Transport: Part handling with bridge	64
9.4.6	Gebietsmakro: Area Macro	65

1 Introduction

The programing system WoodWop generates for the saving of the given data and for introduction to the post processor a so called „Variant File“ in MPR-format. This File for CNC program generating contains the whole work piece description. Out of this variant file you can generate a CNC-program.

The individual sections in the variant file will be devided with a section header, that means, in each section is only one header. The variant file is in ASCII-code.

The variant file is arranged in several blocks:

- **Data head**
Determines the version
- **Variable table**
- **Definition and value assignment of parameters** (variables)
- **Cartesian coordinate systems**
Description of additional defined Cartesian coordinate systems.
- **Contour elements**
Description of single points or elements of the work piece.
- **Processing**
Description of the raw work piece and the single processing steps that have to be done at the work piece.

The sequence of the blocks is fixed and can't be changed. The variable table and the contour elements are optional and are applicable.



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

2 Descriptor Of Variant File

The variant file is section oriented . Each section begins with a descriptor which defines the sense of the following argument.

General:

\ = Comment descriptor. Characters between comment characters and row end will be ignored.
! = End of variant file

Data head:

[H = Start of data head

Variable table:

[0 = Start of variable table

Cartesian coordinate systems:

[K = Start of Cartesian coordinate systems

Contour elements:

All specifications in mm resp. degree

Jn = Start of contour element description of contour n

\$Em = Contour element description of contour m

KP = Descriptor of contour point

KL = Descriptor of contour line

KA = Descriptor of arc

KR = Descriptor of corner rounding

KF = Descriptor of champfer edging

KSL = Contour split element in one line

KSA = Contour split element in a circle

Processingen:

<n : Processing n

?? : Condition sign

KM : Comment

MX : Processing is dependant from previous measurement in X

MY : Processing is dependant from previous measurement in Y

MZ : Processing is dependant from previous measurement in Z

MXF : Measurement factor X (default=1)

MYF : Measurement factor Y (default=1)

MZF : Measurement factor Z (default=1)

EN : Enabled



PRODUCT INFORMATION

Description
woodWOP- file

Subject : 4.2.7

9-080-42-7190 -D00

Nov 22nd 2005

3 Format of Parameter Rows

Generally the format of the parameter rows is changing Starting from version 4.0. A Parameter row inside the blocks **data head**, **Variable table** and **processings** of MPR-file consists of a Descriptor, the equals sign and the input string. The input string is stated in double high commas.

E.g.:
XA="1000-32"
YA="B/2"
DU="5"

The Format of the Parameter rows within the Blocks **contour elements** do not change. The input string is not stated in double high commas.

E.g.:
X=0.0
Y=120.0
Z=D-2

4 Parser

Mathematic expressions will be calculated by a parser .

Following predefined marks will be recognized by the Parser :

Name/Descriptor	Meaning	Typ
_cc	counter clockwise, small arc	Constant (=0)
_cw	Clockwise, small arc	Constant (=1)
_CC	counter clockwise, big arc	Constant (=2)
_CW	Clockwise, big arc	Constant (=3)
_mirror	Mirror in X active=1, Mirror in X deactive=0	Variable
_nonmirror	Mirror in X active=0, Mirror in X deactive=1	Variable
_ymirror	Mirror in Y active=1, Mirror in Y deactive=0	Variable
_nonymirror	Mirror in Y active=0, Mirror in Y deactive=1	Variable
_BSX	Work piece lenght of processed part	Variable
_BSY	Work piece width of processed part	Variable
_BSZ	Work piece thickness	Variable
_ok	1	Constant
_no	0	Constant
_lf	Tool radius correction left	Constant (=1)
_ri	Tool radius correction right	Constant (=2)
@	Descriptor for relative measuring	Descriptor
SIN()	Sinus, Argument in degrees	Funktion
COS()	Cosinus, Argument in degrees	Funktion
TAN()	Tangens, Argument in degrees	Funktion
ARCSIN()	Arkussinus	Funktion
ARCCOS()	Arkuscosinus	Funktion
ARCTAN()	Arkustangens	Funktion
EXP()	Exponential function	Funktion
LN()	Natural Logarithmus	Funktion
SQRT()	Sqare root	Funktion
MOD()	Modulo function	Funktion
PREC()	Pre commas are not applicable	Funktion
AND	AND-links (only by conditions)	Operator
OR	OR-links (only by conditions)	Operator
NOT	NOT-links (only by conditions)	Operator
IF() THEN () ELSE()	If condition meets, i.e. the value in IF parenthesis is not equal 0, the parameter is equal the value in THEN parenthesis. Otherwise the value in ELSE parenthesis . Is the THEN and ELSE parenthesis not filled then 0	Funktion
STANDARD	Arranges the NC-generator to use the standard value for the corresponding parameter.	Keyword



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

5 Data Head

To establish the version of the MPR-file in a easy way a header is created.

The header Starts with descriptor [H and is located in the first section of the MPR-data.

[illegible]

Explanation:

VERSION: Version of MPR-file. (string parameter) Possible values:
4.0 : WoodWOP-Version 4.0

R00 - R27: Bitmap of programs. Generally, meaningfully only to use with WoodWop components. Here there can be inserted a bitmap 28 X 28. These bitmap will be showed instead of the workpiece bitmap or the component macro bitmap. The parameter R00 to R27 are optional

MAT : Machine type (HOMAG, CF-HOMAG, FK-HOMAG odře WEEKE)



PRODUCT INFORMATION

Subject : 4.2.7

Description woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

- OP : Optimating modus; The drill processes will be optimized to processing time.
It will be chedged if processes can be operated together.
And the sequence orof will be chedged:
= 0 => No Optimizing
= 1 => Optimizing drilling from below cociofing of the next processes.(Default).
= 2 => Best possible optimizing
- O2 : = 1 => Avoid cross drive hight by horizontal processing
O3 : = 1 => Avoid cross drive hight by processing from below
O4 : = 1 => Clockwise optimizing of vertical drillings
O5 : = 1 => Avoid cross drive hight by finish processing
- FM : Clearancemodus controls the direction of clearing the machine after processing
= 0 => No clearance
= 1 => Clear ance to rear right (default)
= 2 => Clear ance to rear left
= 3 => Clearance to front left
= 4 => Clear ance to front right
- CB : Edge grouping
ML : Max. edge lenghts which can be grouped
DN : Dynamic Mode relative (default 100)
NP : NC-program shall be generated as normal program (not mirrored)
GP : NC-program shall be generated as in X mirrored program
GY : NC-program shall be generated as in Y mirrored program
GXY : NC-program shall be generated as in X and Y mirrored program
UP : NC-program shall be generated as sub program
NE : Don't clear tool after end of program
A : Don't feed out tool after end of program (only by throughfeed table)
DW : Turn angle. NC-programme shall be turned. At present adcenterd angle : 0.90.-90
MI : Mirror. Doesn't matter if drawn mirrorwise or not. No influence of NC-generation. Determines only the direction of the object while loading to WoodWop.
= 0 drawn unmirrored
= 1 drawn mirrored
- INCH : = 0 Measures in mm
= 1 Measures in INCH
- VIEW : Representation in WoodWOP (NOMIRROR / XMIRROR / YMIRROR / XYMIRROR)
_BSX : Boardsize in X,. These _* - parameters contain the calculated values of the work piece description. These values are used from external evaluation programs, because an indipendent parsen is large-scale. These informations are irrelevant for the NC-generator.
- _BSY : Boardsize in Y,.
_BSZ : Boardsize in Z,.
_FNX : Offset of finished workpiece in X
_FNY : Offset of finished workpiece in Y
_RNX : Offset of raw work piece in X
_RNY : Offset of raw work piece in Y
_RNZ : Offset of raw work piece in Z
_RX : Size of raw work piece in X
_RY : Size of raw work piece Y
ANZ : Number of pieces to be produced
BES : time to apply parts to the machine (woodTime)
ENT : time to remove parts from the machine (woodTime)



PRODUCT INFORMATION

Description
woodWOP- file

Subject : 4.2.7

9-080-42-7190 -D00

Nov 22nd 2005

6 Variable table

A variable table will be initialized by the sign '[' in the first column of a section. After that an ID-number declaration will be showed in column 2. The ID-number has to be 0. The following rows will introduced as variables untill the cartesan coordinate system, contour elements and processing macros are declared. The name of the variable starts at column 1. Its name can not exceed eight characters. The first character can't be a number but a letter. The, to the variables assigned values, follow, divided with a equals sign , in the same row. Here are also formula expressions allowed. There can only be used prespecified variables in the formulas.

After each variable a comment can be specified in the following row which closely describes the variable. These will be introduced by the descriptor KM. KM is a stringparameter. The comment is maximally 80 characters long.

E.g.:

```
[000
L="950.0"
KM="Lenghts of work pieces in X"
B="600.0"
KM="Width of work pieces in Y"
Center="L/2"
KM="Mid axle"
Distance1="307.5"
KM="Distance between construction drills for hardware H3245"
```

7 Cartesian Coordinate System

The list of Cartesian coordinate systems will be produced by descriptor '[K]' in the first and second column of a row. After that the coordinate systems starts with descriptor <00.

E.g.:
[K
<00 \Coordinate system\
NR="05"
XP="1500"
XF="1"
YP="0"
YF="1"
ZP="0"
ZF="1"
D1="0"
KI="0"
D2="0"
MI="0"

Explanation:

NR : Number of Cartesian coordinate systems. 4 to 99 are the valid values at present. The coordinate systems 0 to 3 are fix and won't be saved in the MPR-file.

XP : X-Position refers to coordinate system 0.

XF : X-Faktor. Zoom-factor of X-axis.

YP : Y-Position refers coordinate system 0.

YF : Y-factor. Zoom-factor of Y-Axis.

ZP : Z-position refers coordinate system 0.

ZF : Z-factor. Zoom-factor of Z-Axis.

D1 : Turn angle 1 around Z-Axis of coordinate system 0.

KI : Tilt angle around X-Axis of new coordinate system (after turning around D1)

D2 : Turn angle 2 around Z-Axis of new coordinate system (after turning around D1 and tilting around KI)

MI : Mirror. Mirrored (right turned) coordinate system or wise versa.
= 0 unmirrored (left turned, resp. like in coordinate system 0)
= 1 mirrored (right turned, resp. like in coordinate system 1)

In WoodWOP are, without listed in the MPR-file, 20 Coordinate systems pre defined at the corner points of the finished work pieces:

00:	Coord. syst. XY-Level	X=0	Y=0	Z=0	Turnangle 0 X-Axis positiv
01:	Coord. syst. XY-Level	X=L	Y=0	Z=0	Turnangle 0 X-Axis negativ
02:	Coord. syst. XY-Level	X=L	Y=B	Z=0	Turnangle 180X-Axis positiv
03:	Coord. syst. XY-Level	X=0	Y=B	Z=0	Turnangle 180X-Axis negativ
A0:	Coord. syst. XZ-Level (Y+)	X=0	Y=0	Z=0	Turnangle 0 X-Axis positiv
A1:	Coord. syst. XZ-Level (Y+)	X=L	Y=0	Z=0	Turnangle 0 X-Axis negativ
A2:	Coord. syst. XZ-Level (Y+)	X=L	Y=0	Z=D	Turnangle 180X-Axis positiv
A3:	Coord. syst. XZ-Level (Y+)	X=0	Y=0	Z=D	Turnangle 180X-Axis negativ
B0:	Coord. syst. YZ-Level (X-)	X=L	Y=0	Z=0	Turnangle 0 X-Axis positiv
B1:	Coord. syst. YZ-Level (X-)	X=L	Y=B	Z=0	Turnangle 0 X-Axis negativ
B2:	Coord. syst. YZ-Level (X-)	X=L	Y=B	Z=D	Turnangle 180X-Axis positiv
B3:	Coord. syst. YZ-Level (X-)	X=L	Y=0	Z=D	Turnangle 180X-Axis negativ
C0:	Coord. syst. XZ-Level (Y-)		X=L	Y=B	Z=0 Turnangle 0 X-Axis positiv
C1:	Coord. syst. XZ-Level (Y-)		X=0	Y=B	Z=0 Turnangle 0 X-Axis negativ
C2:	Coord. syst. XZ-Level (Y-)		X=0	Y=B	Z=D Turnangle 180X-Axis positiv



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

C3:	Coord. syst. XZ-Level (Y-)	X=L	Y=B	Z=D	Turnangle 180X-Axis negativ
D0:	Coord. syst. YZ-Level (X+)	X=0	Y=B	Z=0	Turnangle 0 X-Axis positiv
D1:	Coord. syst. YZ-Level (X+)	X=0	Y=0	Z=0	Turnangle 0 X-Axis negativ
D2:	Coord. syst. YZ-Level (X+)	X=0	Y=0	Z=D	Turnangle 180X-Axis positiv
D3:	Coord. syst. YZ-Level (X+)	X=0	Y=B	Z=D	Turnangle 180X-Axis negativ

9-080-42-7190 -D00

Nov 22nd 2005

8 Contour moves

Contour moves consists of contour elements. By contour processing from these elements will be taken reference. The elements in the MPR-File will be numbered and identified by following key letters:

KP : Contour point
KL : Contour line
KA : Contour circle arc (arc)
KR : Contour rounding (edges rounding)
KF : Contour face
KSL : Contour split element on a line
KSA : Contour split element on a circle

The Art, in which the Element in WoodWOP-dialog are definiert (lines by end point or line by length and angle, etc.) comes of the following parameter rows. By definition of contour elements the coordinates of end points are always specified. The Start point of a contour elements is always the end point of the previous contour element. Because of this the first element of a contour move has to be always a start point. Each element can display optional to the feeding parameters the result parameters ("point value").

8.1 Points

Start point of a contour. Key letter is **KP**. Point values are the absolute coordinates of the point in relation to the respective coordinate system and the coordinate number itself.

E.g.:
\$E0
KP
X=10.0000
Y=10.0000
Z=0.0000
KO=00
.X=10.0000
.Y=10.0000
.Z=0.0000
.KO=00

Possible parameters:

X : X-coordinate
Y : Y-coordinate
Z : Z-coordinate
KO : Number of coordinate systems

8.2 Lines

Line, defined by line dialog. Key letter is **KL**. Point values are the absolute coordinates of end points refers to the respective coordinate systems, i.e. the coordinate system of start point. The angle of the line in the X/Y level is specified with **WI**. The angle of the line to X/Y-level is **WZ**.

Angles are given in arc length
(1.570796 = 90 degrees).

E.g.:
\$E1



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

```
KL
X=1340.0000
Y=10.0000
.X=1340.0000
.Y=10.0000
.Z=0.0000
.WI=1.570796
.WZ=0.0000
```

Possible parameter:

X : X-coordinate of end point
Y : Y-coordinate of end point
Z : Z-coordinate of end point
L : Length
WI : Angle in X/Y-level
WZ : Angle to X/Y-level

8.3 Circle arcs

Circle arc, defined by circle arc dialog. Key letter is **KA**. Point values are the absolute coordinates of end point refers to the respective coordinate system, i.e. the coordinate system of the start point. Further will be shorten the absolute coordinates of circle midpoint with **.I**, **J**, **K**, the increase of start and endpoint in the arc bow with **.A** and **.E**, the rotatory direction with **.DS**, the radius with **.R**, the angle of arc length in startpoint with X/Y level with **.WI**, the angle of arc length in X/Y level with **.WO** and the angle to X/Y level with **.WAZ**. **Angles are given in arc length.**

```
E.g.:
$E2
KA
X=1400
Y=0
DS=0
R=B/2
.X=1400.0000
.Y=0.0000
.Z=0.0000
.I=1400.0000
.J=400.0000
.DS=0
.R=400.00000
.WI=0.000000
.WO=3.141593
.WAZ=0.000000
```

Possible parameter:

X : X-coordinate of end points
Y : Y-coordinate of end points
Z : Z-coordinate of end points
I : Circle midpoint coordinate in X
J : Circle midpoint coordinate in Y
DS : Rotary direction
=0 Arc <= 180 degree clockwise
=1 Arc <= 180 degree counterclockwise
=2 Arc > 180 degree clockwise
=3 Arc > 180 degree counterclockwise



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

R : Radius
WI : Start angle in X/Y-level
WO : End angle in X/Y-level
WZ : Angle to X/Y-level of connecting line from start to end point.
WAZ : Angle to X/Y-level on the arc path.

8.4 Corner rounding

Circle arcs, defined by dialog for corner rounding Key letter is **KR**. Point values are the same like by circle arcs.

E.g.:
\$E6
KR
R=50
.X=50.0000
.Y=800.0000
.Z=0.0000
.I=50.0000
.J=750.0000
.DS=0
.R=50.000000
.WI=0.785398
.WO=0.000000
.WAZ=0.000000

Possible parameter:

R : Radius

8.5 Chamfer edge

Line defined by dialog for chamfer edge. Key letter is **KF**. Point values are the same than by lines.

E.g.:
\$E3
KF
L=30
.X=1365.0000
.Y=765.0000
.Z=0.0000
.WI=0.785398
.WZ=0.000000

Possible parameter:

L : Length of chamfer
FB : Chamfer width
WI : Start angle
WO : End angle
KX : Shrinking of predecessor element.
KY : Shrinking of successor element.



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

8.6 Split Element

Use split element across dialog for Element splitting. Key letter are **KSL** for splitted line and **KSA** for splitted circle. Point values are the same like by lines or arcs.

```
E.g.:  
$E2  
KSL  
X=400  
.X=500.000000  
.Y=300.000000  
.Z=0.000000  
.WI=0.463648  
.WZ=0.000000
```

Possible parameter:

X : Split point X-coordinate
Y : Split point Y-coordinate
Z : Split point Z-coordinate
AV : Distance between previous point. By negative value distance from sucession point
Relative value declaration relates to element length. E.g. AV=@0.5 means splitting in middle of element.
AK : Distance from konstruktion point. By negative value distance to sucession point.

9 Processes

Processes will be itemized in the variant file by process macros. The base macros of the workpiece creates the actual program head and is absolutely necessary. The rest processing macros are optional.

The declaration of a processing macro will be introduced by the character '<' in column 1 of a row. After that follows the ID-number and the name of the macro as comment between two '\'-Characters. The Parameter drilling from below have to follow in the next row in a specific order. All drilling from below will be drilling from below by addescriptor marks. The expression (feeding string) will be specified by double high commas. Condition parameters are only displayed when they are filled in WOODWOP.

If parameters with default are documented, they don't have to be necessary displayed in MPR-format.

9.1 Base macros

9.1.1 Werkstck : Workpiece explanation

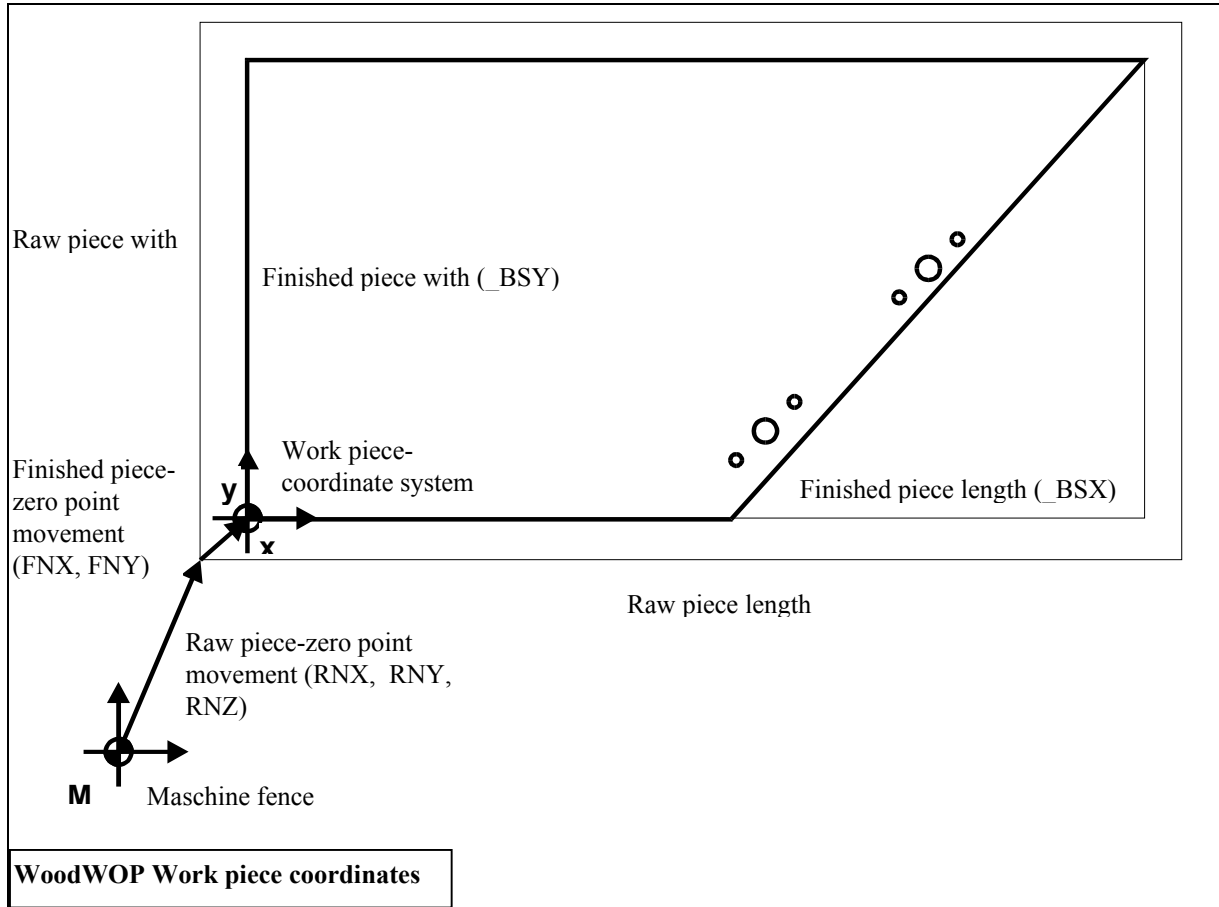
Describes the seizes of the workpiece as raw material and prefabricated part as well as the remove measure regarding to the machine fence.

ID-Number: 100

E.g.:
<100 \Werkstck\
LA="800"
BR="600"
DI="20"
AX="5"
AY="5"
RNX="100"
RNY="0"
RNZ="0"
FNX="2.5"
FNY="2.5"

Explanation:

LA : Length of finished part. (global variable _BSX)
BR : Width of finished part. (global variable _BSY)
DI : Thickness of work piece. (globale variable _BSZ)
AX : Offset in X = length of raw piece – length of finished part.
AY : Offset in Y = Width of raw piece – width of finished part.
RL : Länge of raw piece in X. Alternatively can be declared AX and AY or RL and RB.
RB : Width of raw piece in Y.
RNX : Raw piece –zero point removing regarding machine fence in X e.g. by template.
RNY : Raw piece –zero point removing regarding machine fence in Y e.g. by template
RNZ : Raw piece –zero point removing regarding machine fence in Z e.g. by higher vacuum cupss. All those processes will be moved in Z direction by this value.
FNX : Finished piece –zero point removing regarding machine fence in X e.g. by offset . All those prozesses will be moved about the value RNX+FNX in X-direction
FNY : Finished piece –zero point removing regarding machine fence in Y e.g. by offset . All those prozesses will be moved about the value RNX+FNX in Y-direction



9.1.2 Comment : Comment

Comment text, e.g. for explanation of Work piece.

ID-number: 101

E.g.:
 <101 \Comment\
 KM="Schranksseite Modell 17A9 "Erika"
 KM="Best.-Nr.: 739598"
 KM="Werkstoff: Buche hell"

Explanation:

KM : Comment row. By each CR in the comment text in WoodWOP will be inserted a new KM-insertion.

EN : Enable (default=1)

9-080-42-7190 -D00

Nov 22nd 2005

9.2 Processings macros

By processing macros there can be fundamental existing following parameters:

?? : Condition (default=1)
 EN : Enable (default=1)
 HP : Hood position (default=0)
 0 = Hood controlling automatically
 1 = Hood down position
 2 = Hood middle position (new: intermediate position 2)
 3 = Hood top position
 100= new: Hood intermediate position 1

 SP : Spindle controlling (default=0)
 0 = Spindle controlling automatically
 1 = Spindle left
 2 = Spindle right
 3 = Spindle using left and right
 YVE : Y-offset of second spindle, if processing has to be done with both spindles.
 (default=0)
 MX : Processing is depend from previous measures in X (default=0)
 MY : Processing is depend from previous measures in Y (default=0)
 MZ : Processing is depend from previous measures in Z (default=0)
 ASG : Exhauster
 0 = Off
 1 = On
 2 = Automatic
 RSEL : set of rules selected (1) / not selected (0) (Techauto)
 RWID: selected set of rules identifier (Techauto)
 KAT: processing category (woodTime)
 MNM: Macro name (localized, woodTime)

All others parameter will be explained in following.

9.2.1 BohrVert: Drillings vertical

ID-Number: 102

E.g.:
 <102 \BohrVert\
 XA="200"
 YA="300"
 BM="SS"
 TI="10"
 DU="5"
 \alternative zu DU: TNO="121\
 AN="10"
 MI="0"
 AB="32"
 XR="0"
 YR="1"
 S_ =2
 \Optional additiv: WI="90"
 F_="STANDARD"
 KO="2"



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

??= "_mirror"

Explanation:

XA : Drill coordinate in X
YA : Drill coordinate in Y
BM : Drill mode (stringparameter):
 LS =0: slow-fast to depth
 SS =1: fast - fast to depth
 LSL =2: slow - fast - slow compl. across
 SSS =3: fast - fast – fast comp. Across
 LSU =6: slow - fast from the bottom
 LSLU =8: slow - fast - slow from the bottom
 All further declarations relates to self defined drill cycles.
 e.g. 001 etc.-> calls NC-sub program TVBOHR40.001.

TI : Depth of drilling
DU : Diameter of drilling (*alternative DU or TNO*)
TNO : T-number (tool number) (*alternative TNO or DU*)
LA : Lengths of hole row (*alternative LA or AN*)
AN : Number of drillings (*alternative LA or AN*)
MI : Hole row type: 0:start point- 1:center point.
AB : Raster distance of drillings
WI : hole raster direction angle in X/Y-Level (optional additiv to WI or XR and YR). The angle will be declared in degrees (e.g. 90.0). If this parameter is specified, WOODWOP will recognize that the input is given across the angle. Accordingly the input mask will be configured.
The NC-generator ignores the Angle and uses only XR and YR.

XR : Hole row direction in X
YR : Hole row direction in Y
F_ : Feedrate: contains either the correct value in m/min or the key word STANDARD.
By STANDARD, the feedrate of the tool datas will be used (*default*).
S_ : r.p.m.
 0: Slow
 1: Normal
 2: Fast

KO : Coordinate system:
 0: Work piece coordinate system ("left below") (*default*)
 1: Work piece coordinate system ("right below")
 2: Work piece coordinate system ("right top")
 3: Work piece coordinate system ("left top")
 4-100: Work piece coordinate system user defined

?? : condition (*default=1*)
EN : Enable (*default=1*)

9.2.2 BohrHoriz: Drilling horizontal

ID-Number: 103

E.g.:
<103 \BohrHoriz\
XA="200"
YA="300"
ZA="D/2"
DU="8"
TI="35.0"
BM="XP"
AN="3"
AB="32"
F_="STANDARD"



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

ANA="15"
??= "_mirror"
EN="0"

Explanation:

XA : Drill coordinate in X
YA : Drill coordinate in Y
ZA : Drill coordinate in Z
BM : Drill mode(string parameter):
 XP =0: X-Plus, i.e. in positive X-direction
 XM =1: X-Minus, i.e. in negative X-direction
 YP =2: Y-Plus, i.e. in positive Y-direction
 YM =3: Y-Minus, i.e. in negative Y-direction
 C =4: with free C-angle
WI : Angle of drilling in X/Y-level. The angle will be declared in degrees (e.g. 45.0). These parameter ist only necessary by BM=C.
TI : Depth of drilling
DU : Diameter of drilling
AN : Number of drillings
LA : Lengths of hole row (*alternative LA or AN*)
MI : Hole row typ: 0:Start point- 1:Middle point
T_ : T-number (Tool number) (*alternative T or DU*)
AB : Raster distance of drillings
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
by STANDARD the Feedrate of the tool data will be used (*default*).
ANA : Additional start distance
MD : Mode. (Extension for self defined subroutine)
KO : Coordinate system
?? : Condition (*default=1*)
EN : Enable (*default=1*)

9.2.3 BohrUniv: Drilling universal (Space drilling)

ID-number: 104

E.g.:
<104 \BohrUniv\
XA="500"
YA="300"
ZA="17"
CA="45"
WI="9"
DU="8"
TI="20"
AN="3"
AB="32"
F_=STANDARD

Explanation:

XA : Drill coordinate in X (first Drilling) (*alternative XA or XM*)
YA : Drill coordinate in Y (first Drilling) (*alternative YA or YM*)
XM : Drill coordinate in X (center hole row) (*alternative XA or XM*)
YM : Drill coordinate in Y(center hole row) (*alternative YA or YM*)
ZA : Drill coordinate in Z
CA : Turn angle C-Axis in of X-Y-Level, declared in degrees.
WI : Swing angle of space drill unite, declared in degrees.
DU : Diameter of drilling
TI : Depth of drilling

9-080-42-7190 -D00

Nov 22nd 2005

AN : Number of drillings
 LA : Lengths of hole row (*alternative LA or AN*)
 F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
 by STANDARD the Feedrate of the tool data will be used (*default*).
 KO : Coordinate system
 ?? : Condition (*default=1*)
 EN : Enable (*default=1*)

9.2.4 UfluBohr: drilling from below

ID-number: 131

E.g.:
 <131 \UfluBohr\
 XA="0"
 YA="0"
 DU="8"
 WI="0"
 TI="0"
 AB="10"
 F_="STANDARD"
 EN="0"

Explanation:

XA : Coordinate in X
 YA : Coordinate in Y
 DU : Drilling diameter
 WI : C-angle
 TI : Drill depth
 AB : Distance of dive in / dive out of drilling holes in direction of C-angles
 F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
 By STANDARD the feedrate of tool data will be used (*default*).
 MD : Modus. (extension of self defined start makros)
 KO : Coordinate system
 ZA : Z-Reference value for the depth
 ?? : Condition (*default=1*)
 EN : Enable (*default=1*)

9.2.5 Grooving: Grooving and Sawing

ID-number: 109

E.g.:
 <109 \grooveen\
 XA="0"
 YA="200"
 XE="L"
 YE="400"
 NB="5"
 RK="WRKL"
 EM="MOD0"
 TV="5"
 MV="GL"
 TI="67"
 MN="GL"
 OP="1"
 T_="140"
 F_="STANDARD"



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

EN="0"

Explanation:

XA : Start coordinate in X
YA : Start coordinate in Y
XE : End coordinate in X
YE : End coordinate in Y
WI : Angle, declaration only necessary by AN = 1 or 2
AN : Selection of feeding in way. (default=0)
0 = X ENDE_Y ENDE
1 = X ENDE_ANGLE
2 = Y ENDE_ANGLE
NB : Groove width
RK : Radius correction:
NOWRK =0: Tool runs on programmed line
WRKL =1: Toolruns left of programmed line
WRKR =2: Tool runs right of programmed line
EM : Insert mode
MOD0 =0: Groove has at start- and end-coordinates full depth
MOD1 =1: Groove starts at start- and end-coordinates
MOD2 =2: Start and end-coordinates will be calculated with safety distance.
Suitable for grooving through entire work piece.
FM : Feed mode: self defined insertion-resp. start mode (Stringparameter). (alternative declare FM or EM)
TV : depth
MV : Mode scoring
GL =0: downcut scoring
GGL =1: conventional scoring
TI : Groove depth
MN : Mode grooving
GL =0: downcut grooving
GGL =1: conventional grooving
OP : Optimizing
0: optimizing off. Free movements by wide groove.
1: optimizing on. Return drive by processing by wide groove.
XY : Deliver factor
T_ : Tool number, unit
F_ : Feedrate: contains either the concrete value in m/min or the keyword STANDARD.
By STANDARD the feedrate will be taken from the tool datas (default).
KO : Coordinate system
?? : Condition (default=1)
EN : Enable (default=1)

9.2.6 groove_R: Angled Grooving

ID-number: 124

E.g.:
<124 \groove_R\
XA="0"
YA="0"
XE="0"
YE="0"
ZA="0"
RK="WRKL"
WI="45"
EM="MOD0"



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

TV="0"
MV="GL"
TI="0"
MN="GL"

Explanation:

XA : Start coordinate in X
YA : Start coordinate in Y
XE : End coordinate in X
YE : End coordinate in Y
ZA : Start coordinate in Z
RK : Radius correction:
 NOWRK =0: Tool runs on programmed line
 WRKL =1: Toolruns left of programmed line
 WRKR =2: Tool runs right of programmed line
EM : Insert mode
 MOD0 =0: Groove has at start- and end-coordinates full depth
 MOD1 =1: Groove starts at start- and end-coordinates
 MOD2 =2: Start and end-coordinates will be calculated with safety distance.
 Suitable for grooving through entire work piece.
FM : Feed mode: self defined insertion-resp. start mode (string parameter). (alternative declare FM or EM)
TV : Scoring depth (declaration alternative to scoring Z value)
VZ : Z-value for the scoring (declaration alternative to scoring depth)
MV : Mode scoring
 GL =0: downcut scoring
 GGL =1: conventional scoring
XY : Art of declaration of XY-coordinates
 0: XY-declaration to Z-start-level
 1: XY-declarations to Z-zero-level
TI : Groove depth (declaration alternative to Z-value)
Z_ : Z-value of groove (declarations alternative to depth)
MN : Modus grooving
 GL =0: downcut grooving
 GGL =1: conventional grooving
T_ : Toolnumber, unite
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD theFeedrate of the Tooldatas will be used (default).
XY : Height of XY-value
 0: XY-Value on Z-Level
 1: XY- Value on Z-0-Level
TI : Depth of the groove (Instead of Z-Value)
KO : Coordinate system
?? : condition (default=1)
EN : Enable (default=1)

9.2.7 Polygonzug: Polygon milling

ID-number: 119

E.g.:
<119 \Polygonzug\
NM="_gk.ply"
XA="0"
YA="0"
BR="46.6"
HE="100"



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

WI="0"
TI="3"
WZ="101"
RK="NOWRK"
F_="5"

Explanation:

NM : Name of Polygon. Reference to a polygon file *.ply.
XA : Center coordinate in X
YA : Center coordinate in Y
BR : Width (Dimension in X)
HE : Height (Dimension in Y)
WI : Turn angle
TI : Depth
WZ : Tool number
RK : Radius correction:

NOWRK =0: Tool runs on programmed line
WRKL =1: Toolruns left of programmed line
WRKR =2: Tool runs right of programmed line

8.2.8 G F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD theFeedrate of the Tooldatas will be used (default).

KO : Coordinate system
?? : condition (default=1)
EN : Enable (default=1)

LOCAL : Polygon Milling can be saved locally (default=0)
STARTLOCAL : start-flag for local Polygon Milling (if LOCAL=1)
ENDLOCAL : end-flag for local Polygon Milling

HU : Tracing stroke for unit with mechanical tracing
MT : mechanical tracing on(1) or off(0)
Note: if mechanical tracing is active, depth(TI) is disabled.
Tracing stroke is only enabled if mechanical tracing(HU) is active

9.2.8 Graphic Comment

ID-number: 152

E.g.:
<152 \Grafischer Comment\
NM="BOHRKOPF.PLY"
MD="1"
XA="0"
YA="0"
BR="36.0"
HE="38.9"
WI="45"
KO="01"
ROT="0"
GRUEN="0"
BLAU="255"
STYLE="0"

Explanation:

NM : Name of Polygon. Reference to a polygon file *.ply.
XA : Center coordinate in X
YA : Center coordinate in Y
BR : Width (Dimension in X)



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

HE : Heigth (Dimension in Y)
WI : Turn angle
ROT : Red-Part of the dysplay color
GRUEN: Green- Part of the dysplay color
BLAU : Blue- Part of the dysplay color
STYLE: Linestyle for display (0:SOLIDPEN, 1: DASH, 2: DOT, 3: DASHDOT, 4: DASHDOTDOT,5: NONE)
WIDTH: Line width in pixel (*default=1*)
KO : Coordinate system
?? : condition (*default=1*)
EN : Enable (*default=1*)
LOCAL : Graphic Comment can be saved locally (*default=0*)
STARTLOCAL : start-flag for local Graphic Comment (if LOCAL=1)
ENDLOCAL : end-flag for local Graphic Comment

9.2.9 Pocket: Vertical pocket milling

ID-number: 112

E.g.:
<112 \Tasche\
XA="0"
YA="0"
LA="120"
BR="20"
RD="5"
WI="0"
TI="2"
ZT="0"
XY="80"
DS="1"
T_="101"
F_="STANDARD"

Explanation:

XA : Center coordinate in X
YA : Center coordinate in Y
LA : Lenght (dimension in X)
BR : Width (dimension in Y)
RD : Edges radius
WI : Turn angle
TI : Depth
ZA : Z-Reference value for the depth
ZT : Deliver depth
XY : Delivering in XY-level
T_ : Tool number
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD theFeedrate of the Tooldatas will be used (*default*).
DS : Turning direction: 0 = clockwise, 1= counter clockwise
KO : Coordinate system
?? : Condition (*default=1*)
EN : Enable (*default=1*)

9.2.10 HTasc: Horizontal Pocket Routing

ID-number: 123



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

E.g.:
<123 \HTasc\
XA="0"
YA="120"
ZA="9"
LA="120"
BR="40"
RD="4"
WI="90"
TI="20"
ZT="0"
AB="10"
T_="101"
F_="STANDARD"
DS="1"

Explanation:

XA : Center coordinate in X
YA : Center coordinate in Y
ZA : Center coordinate in Z
LA : Length (dimension in XY- level vertical to Tool)
BR : Width (dimension in Z)
RD : Edge radius
WI : Turn angle (in XY-level)
TI : Depth
ZT : Deliver depth
MD : Mode. (extension of self defined start macros)
AB : Start distance
T_ : Tool number
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD the Feedrate of the Tooldata will be used (default).
DS : Turning direction: 0 = clockwise, 1= counter clockwise
KO : Coordinate system
?? : Condition (default=1)
EN : Enable (default=1)

9.2.11 FreiFormTasche (Free form pocket)

ID-number: 181

E.g.:
<181 \FreiFormTasche\
EA="1:0"
AD="0"
AZ="0"
ZU="0.5"
TI="0"
ZT="0"
XY="80"
T_="101"
F_="5"
DS="1"
HP="0"
SP="0"
YVE="0"



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

WW="1,3,401,403"
ASG="2"
MX="0"
MY="0"
MZ="0"
MXF="1"
MYF="1"
MZF="1"

Erklärung:

EA : Number of start elements
AD : Distance for last path to clear (normally the outermost contour)
AZ : Start distance in Z
ZU : Infeed speed for sensitive workpieces
TI : Depth
ZT : Step depth
XY : Infeed in XY
T_ : Tool number
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD the Feedrate of the Tooldata will be used (default).
DS : direction of rotation: 0 = clockwise, 1= counter clockwise
HP : Hood position (default=0)
0 = Hood controlling automatically
1 = Hood down position
2 = Hood middle position
3 = Hood top position
100= New: Hood inclined position 1
SP : Spindle controlling (default=0)
0 = Spindle controlling automatically
1 = Spindle left
2 = Spindle right
3 = Spindle using left and right
YVE : Y-offset of second spindle, if processing has to be done with both spindles.
(default=0)
WW : default tool numbers suitable for this macro
ASG : Exhauster
0 = Off
1 = On
2 = Automatic
MX : Processing is depend from previous measures in X (default=0)
MY : Processing is depend from previous measures in Y (default=0)
MZ : Processing is depend from previous measures in Z (default=0)
MXF : Measuring factor in X
MYF : Measuring factor in Y
MZF : Measuring factor in Z
HU : Tracing stroke for unit with mechanical tracing
MT : mechanical tracing on(1) or off(0)
*Note: if mechanical tracing is active, depth, step depth and feed adjustment are disabled.
Tracing stroke is only enabled if mechanical tracing is active*

9.2.12 VTasche: Vector Pocket Routing

ID-number: 141

E.g.:



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

<141 \VTasche\

XA="100"

YA="200"

LA="120"

BR="50"

RD="10"

WI="45"

TI="10"

ZT="10"

XY="80"

T_="225"

F_="5"

DS="1"

A_="0"

C_="90"

Explanation:

XA : Center coordinate in X

YA : Center coordinate in Y

LA : Length (dimension in XY- level vertical to Tool)

BR : Width

RD : Edge radius

WI : Turn angle (in XY-level)

TI : Depth

ZT : Deliver depth

MD : Modus. (extension of self defined start macros)

XY : Delivery

T_ : Tool number

F_ : Feederate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD the Feederate of the Tooldata will be used (default).

DS : Turning direction: 0 = clockwise, 1= counter clockwise

A_ : A-Angle

C_ : C-Angle

KO : Coordinate system

?? : Condition (default=1)

EN : Enable (default=1)

9.2.13 UflurTasche: Pocketing from below

ID-number: 151

E.g.:

<151 \ UflurTasche\

XA="0"

YA="0"

LA="120"

BR="20"

RD="5"

WI="0"

AB="30"

AWI="90"

TI="2"

ZT="0"

XY="80"



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

DS="1"
T_="125"
F_="STANDARD"

Explanation:

XA : Center coordinate in X
YA : Center coordinate in Y
LA : Length (dimension in XY- level vertical to Tool)
BR : Width
RD : Edge radius
WI : Turn angle (in XY-level)
AWI : Angle of unite
TI : Depth
ZA : Z-Reference value for the depth
ZT : Deliver depth
AB : Start distance
AM : Inserting mode
 0: vertical diving
 1: dive in the move
MD : Modus. (extension of self defined start macros)
XY : Delivery
T_ : Tool number
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
 By STANDARD theFeedrate of the Tooldatas will be used (default).
DS : Turning direction: 0 = clockwise, 1= counter clockwise
KO : Coordinate system
?? : Condition (default=1)
EN : Enable (default=1)

9.2.14 NC-Code: Free NC-Code

ID-Number: 116

E.g.:
<116 \NC-Code\
PA="(***** Freier NC-Code *****)"
UPG="1"
NM=""
TA="1"
PR="1"
XA="0.0"
YA="0.0"
ZA="0.0"

Explanation:

PA : NC-row (can occur more than once)
UPG : Inserting drilling from below yes/no 1/0
NM : Drilling from below file names
TA : Tool tcleaning yes/no 1/0
PR : parse NC-row values yes/no 1/0
XA : Insert coordinate in X
YA : Insert coordinate in Y
ZA : Insert coordinate in Z
KO : Coordinate system
?? : condition (default=1)



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

EN : Enable (*default=1*)

9.2.15 NC-Stop: NC-Stop-Makro

ID-Number: 117

E.g.:
<117 \NCStop\
VL="1"
XA="34"
YA="45"
_Y="1"
XV="0"
YV="0"

Explanation:

XA : X-position (drive away position)
YA : Y-position
XV : X-offset (after release vacuum land tighten again)
YV : Y-offset
VL : Release vacuum 1/0
KM : Comment
MD : Mode. (extension of self defined start macro)
_Y : Declare Y-coordinate 1/0
KO : Coordinate system
ZR : display message at realtime
WT : time to wait
?? : condition (*default=1*)
EN : Enable (*default=1*)

9.2.16 Universal Macro

ID-number: 153

E.g.:
<153 \Universal Makro\
NM=""
XA="100"
YA="20"
ZA="10"
WI="25"
WZ="77"
S_="STANDARD"
F_="STANDARD"
P1="0"
P2="0"
P3="0"
P4="0"

Explanation:

XA : Coordinate in X
YA : Coordinate in Y
ZA : Coordinate in Z
WI : Angle
WZ : Tool
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD theFeedrate of the Tooldatas will be used (*default*).

9-080-42-7190 -D00

Nov 22nd 2005

S_ : Revolution per minute: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD the revolution will be used (*default*).

P1 : Free parameter

P2 : Free parameter

P3 : Free parameter

P4 : Free parameter

KO : Coordinate system

?? : condition (*default=1*)

EN : Enable (*default=1*)

LOCAL : Subroutine can be saved locally (*default=0*)

STARTLOCAL : start-flag for local subroutine (if LOCAL=1)

ENDLOCAL : end-flag for local subroutine

SM : Revolution mode
0: revolutions in percent
1: in RPM

PA : NC-row (can occur more than once)

PR : parse NC-row values yes/no 1/0 (*default = 1*)

9.2.17 Messen: Measure

ID-number: 129

E.g.:
<129 \Messoriz\
XA="0"
YA="0"
ZA="0"
TI="20"
MD="X"
MP="0"

Explanation

XA : X-start position

YA : Y- start position

ZA : Z- start position

TI : depth

MD : Measure direktion "X","Y" or "Z"

MP : Measure point

PO : Position (0: at cross 1: at tappet)

T_ : Tool

AB : Distance of dive movement from start position (door rabbit measuring)

KO : Coordinate system

?? : condition (*default=1*)

EN : Enable (*default=1*)

9.2.18 Probing Actual Location of Workpiece

ID-number: 132

E.g.:
<132 \LageVermessen\
X1="0"
Y1="B/2"
Z1="10"



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

X2="100"
Y2="0"
Z2="10"
X3="L-100"
Z3="10"
MM="VR"
WI="90"
WZ="39"
VR="0"

Explanation:

X1 : Measure point 1 in X
Y1 : Measure point 1 in Y
Z1 : Measure point 1 in Z
X2 : Measure point 2 in X
Y2 : Measure point 2 in Y
Z2 : Measure point 2 in Z
X3 : Measure point 3 in X
Y3 : Measure point 3 in Y
Z3 : Measure point 3 in Z
MM : Measure mode (string parameter):
 0: HL (back left, triple measuring)
 1: HR (back right, triple measuring)
 2: VL (front left, triple measuring)
 3: VR (front right, triple measuring)
 4: H (from back single measuring)
 5: V (from front single measuring)
 6: L (from left single measuring)
 7: R (from right single measuring)
WI : Included Angle
WZ : Tool
VR : Measuring on raw piece edge
PO : Position (0: at cross 1: at tappet)
?? : condition (*default=1*)
EN : Enable (*default=1*)

9.2.19 Block: Block macro

Allows the combining of several processes to a block. All processes in a block

- Will be shifted by the offset in the block. (excluded contour processing. These relates to the non changed contour).
- Get the coordinate system of the block.
- Will be calculated with the conditions of the block. (AND-link).
- And will be switched with the block. (EN).

Blocks can be saved and loaded . Files with the saved blocks have the extension **.blk**.

ID-number: 121

E.g.:
<121 \Block\
XP="0.0"
YP="0.0"
ZP="0.0"
NM="topfband.blk"
DP="3"

Explanation:



PRODUCT INFORMATION

Subject : 4.2.7

Description woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

XP : Position (Offset) in X
YP : Position (Offset) in Y
ZP : Position (Offset) in Z
NM : Name of blocks (filename if block was loaded from a file)
DP : Dependent, i.e. Number of depended makros in a block
KO : Coordinate system
?? : condition (*default=1*)
EN : Enable (*default=1*)
CS : CNC-Loop (*default=0*)

9.2.20 Komponente: Component Macro

Refers to a separate WoodWOP-program (MPR-file) which will be included in the main document.

All processes and contourelements in the MPR-file

- Will be shifted by the offset in the block.
- Get the coordinate system of the block.
- Will be calculated with the conditions of the block. (AND-link).
- And will be switched with the block. (EN).

Components can include a refer to an extern MPR-file or to a embed MPR-file. If the MPR-file is embedded, follows after the finish characters of the main document („!“-Characters) the complete MPR-file of the components. The component file will practically be „appendet“ to a main program. MPR-files which are used in the component macros have the extension **.mpr**, but are located for usual in a seperat list (./ML4).

ID-number: 139

E.g.:
<139 \Komponente\
IN="topfband.mpr"
XA="0.0"
YA="0.0"
ZA="0.0"
EM="0"
VA="Turnwink 0"
VA="Durchm1 17"
VA="Drilling 1"
VA="Durchm2 12"
VA="depth 16"

Explanation:

IN : Name of Include-file
XA : Position (Offset) in X
YA : Position (Offset) in Y
ZA : Position (Offset) in Z
EM : Embed mode
0 = to Include-files will be referred externaly.
1 = Include-File is imbeded internaly.
PR : Privat, protected (optional) (*default=0*)
0 = variable values changeable; _BSX, _BSY, ..., and coordinate systems from the main document counts also in the macros of the include-file
1 = variable values are inserted as fix in the variable list of the include-file; _BSX, _BSY, ..., and coordinate systems from the main document counts not in the macros of the include-file
VA : Variable expressions of the components, as many as. As variables will be used the entrys from the variable table of the include-file. The variable value will be seperated by free characters from the variable name. "<variable name> <Space> <parameter entry>"
KO : Coordinate system
?? : Condition (*default=1*)
EN : Enable (*default=1*)



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

9.3 Contour processing makros

9.3.1 Contourfraesen: Routing to a Contour elements

ID-Number: 105

```
E.g.:
<105 \Contourfraesen\
EA="1:1"
MDA="TAN"
RK="WRKL"
EE="1:2"
MDE="TAN_AB"
EM="1"
RI="1"
TNO="101"
SM="0"
S_="100"
F_="20"
AB="0"
ZA="2"
```

Erklärung:

EA : Number of start elements
MDA : Start mode
 TAN =0: tangential
 SEI =1: from side
 SEN =2: vertical
 or self defined start mode
RK : Radius correction:
 NOWRK =0: Tool runs on programmed line
 WRKL =1: Tool runs left of programmed line
 WRKR =2: Tool runs right of programmed line
EE : Number of end element
MDE : Start mode
 TAN_AB =0: tangential
 SEI_AB =1: from side
 SEN_AB =2: vertical
 or self defined start mode
MD : Self defined mill mode
EM : Insert mode
 0: vertical dive
 1: inserting in the move
RI : Direction of processing
 1: forward, i.e. in drawing direction of contour element
 0: not forward, i.e. counter drawing direction of contour element
TNO : T-Number (toolnumber)
SM : Revolution mode
 0: revolutions in percent
 1: in RPM
S_ : Revolutions in percent
S_A : Revolutions in RPM
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
 By STANDARD the Feedrate of the Tooldata will be used (*default*).
AB : Distance from programmed contour. If distance is negative ist, material will be milled away.



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

AF : approach distance
ZA : Start coordinate in Z
?? : condition (default=1)
EN : Enable (default=1)
VLS : Extension at startpoint
VLE : Extension at endpoint
STUFEN : routing by steps (default = 0)
ZSTART : Z-Start routing by steps
ANZZST : stepcount for routing by steps

9.3.2 Contourverleimen: Edgebanding at Contour Element

ID-number: 106

E.g.:
<106 \Contourverleimen\
EA="1:0"
EE="1:1"
P59="1"
AB="0"
P60="0"
WS="3"
F_="5"
DZ="0"
S_="45"
S_="0"
TL="1"
M15="1"
NM="STANDARD"
KM="PVC-Kante 2mm"
KN="32"
KZ="20"
DK="0"
KA="110"
LA="0"
SV="0"
SE="0"
ABN="20"
RI="1"
ABV="30"
ABA="5"
VA="2"
ABT="60"
FK="2"
TB="30"
SK="2"
RSP="1"
AC="1"
SL="100"
SA="10"
CF="5"
??=" _nonmirror"

Explanation

EA : Number of start elements
EE : Number of end elements
P59 : Edge (choosing edge channel)



PRODUCT INFORMATION

Subject : 4.2.7

Description woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

AB	:	Distance from programmed contour. If distance is negative, more pressure will be given to work piece.
Z_	:	Z-value (optional) (<i>default=0</i>)
P60	:	C-angle
WS	:	Maintanance time
F_	:	Feedrate
DZ	:	define revolution speed relative (default: 0, must be defined prior to S_ and S_P)
S_	:	revolution speed (must be „0“ if DZ=1)
S_P	:	revolution speed (must be „0“ if DZ=0)
TL	:	Test run (without edge) 0: no test run 1: test run, e.g. without edge material and glue
M15	:	Test run (without M15 i.e. over work piece)
NM	:	Name of gluing parameter file
KM	:	Comment
VM	:	Gluing makro (Art of gluing unit) – up to WoodWOP-Build 556
KN	:	Art of gluing unit – WoodWOP-Build 556 or greater
MD	:	Self defined mode – WoodWOP-Build 556 or greater
TNO	:	T-Number (tool number)
HL	:	Heat power in %
HL2	:	Heat power 2 in %
KZ	:	Edge material adding
DK	:	Thickness of edge
LA	:	Slow pull out
SV	:	Bulb pre snip station
SE	:	Bulb gluing station
ABN	:	Distance post press roller on
RI	:	Direction of processing 1: forward, i.e. in drawing direction of contour element 0: conter forward i.e. against drawing direction of contour element
ABV	:	Distance edge transport
ABA	:	Distance post press roller off KA : Snipdistance from end only in conjunction with NC-Generator-Option „edge material grouping“)
VA	:	Waiting time post press roller
ABT	:	Distance , drive way-sensor
FK	:	Feedrate sensing
TB	:	Sensor area, slow way
SK	:	Joint correction
KS	:	Swing snipping saw
SVK	:	Pre snipping station with bulb
RV	:	Banding around, i.e. Joint at not cosed contour (optional) (<i>default=0</i>)
RSP	:	Turnung of gluing station to start point 1: clockwise 0: conter clockwise Ist parameter not declarated, the minimum turning of gluing station will be calculatedt.
AC	:	Automatic correction of the C-Offset (collision test) 1: ON 0: OFF
SL	:	Splitting length: Length for the splitting of the contour
SA	:	Safety distance for the collision test.
CF	:	C-Korrekturwinkel:
??	:	condition (<i>default=1</i>)
EN	:	Enable (<i>default=1</i>)
SCA	:	Specify Glueing section with swivel arm for portal machines



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

9.3.3 Stegkante: T-molding

ID-number: 136

E.g.:
<106 \Stegkante\
EA="1:0"
EE="1:1"
P59="1"
AB="0"
P60="0"
WS="3"
KA="0"
RK="WRKL"
F_="5"
S_="45"
TL="1"
M15="1"
NM="STANDARD"
KM="PVCKante 2mm"
VM="27"
LA="1"
KZ="20"
ABN="20"
RI="1"
ABV="30"
ABA="5"
VA="2"
ABT="60"
KSE="250"
KSF="3.5"
ARA="200"
ARE="60"
APR="300"
FK="2"
TB="30"
SK="2"
RSP="1"
AC="1"
SL="100"
SA="10"
CF="5"
??="_nonmirror"

Explanation:

EA : Number of start elements
EE : Number of end elements
P59 : Edge (choosing edge channel)
AB : Distance from programmed contour. If distance is negative, more pressure will be given to work piece.
Z_ : Z-value (optional) (default=0)
P60 : C-angle
WS : Maintenance time
F_ : Feedrate
S_ : Revolutions
TL : Test run (without edge)
0: no test run
1: test run, e.g. without edge material and glue



PRODUCT INFORMATION

Subject : 4.2.7

Description woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

M15 : Test run (without M15 i.e. over work piece)
NM : Name of gluing parameter file
KA : With glue apply
LA : Slow pull out
RK : Processing side (WRKL = Left, WRKR = Right)
KM : Comment
VM : Makro (art of units)
TNO : T-Number (tool number)
KZ : Edge material addition
ABN : Distance pre pressure roll on
RI : Direction of processing
1: forward, i.e. in drawing direction of contour element
0: counter forward i.e. against drawing direction of contour element
ABV : Distance edge transport
ABA : Distance post press roller off
KA : Snipdistance from end only in conjunction with NC-Generator-Option „edge material grouping“)
VA : Waiting time post press roller
ABT : Distance , drive way-sensor
FK : Feedrate sensing
TB : Sensor area, slow way
SK : Joint correction
KS : Swing snipping saw
KA : With/without glue application
KSE : Distance glue on
KSF : Feedrate while glue application
ARA : Distance pressure roll off
ARE : Distance pressure roll on
APR : Distance post pressing
RV : Banding around, i.e. Joint at not closed contour (optional) (*default=0*)
RSP : Turning of gluing station to start point
1: clockwise
0: counter clockwise
1st parameter not declared, the minimum turning of gluing station will be calculated.
AC : Automatic correction of the C-Offset (collision test)
1: ON
0: OFF
SL : Splitting length: Length for the splitting of the contour
SA : Safety distance for the collision test.
CF : C-Korrekturwinkel:
?? : condition (*default=1*)
EN : Enable (*default=1*)
AI : Unit with Interface (*default=1*)
BP : approach feed position (*default=0*)

9.3.4 Buendigfraesen: Flush Trimming

ID-number: 107

E.g.:
<107 \Buendigfraesen\
EA="1:1"
EE="1:5"
AG="110"
RI="1"
AB="2"
P60="12"



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

F_="STANDARD"
MD="LI"
AC="1"
KU="0"
SL="100"
SA="10"
CF="5"
??=" _nonmirror"

Explanation:

EA : Number of start elements
EE : Number of end elements
AG : Unit
RI : Direction of processing
1: forward i.e. in drawing direction of contour element
0: counter forward, i.e. against drawing direction of contour element
AB : Distance from programmed contour. If distance is negative, more pressure will be given to work piece.
P60 : Offset C-axis
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD the Feedrate of the Tooldata will be used (default).
MD : Mode
LI =0: Tool runs left
RE =1: Tool runs right
MOD : Modus (selfdefined start sub program)
Z_ : Z-coordinate
AC : Automatic correction of the C-Offset (collision test)
1: ON
0: OFF
KU : finish by grinding yes(1) / no(0) (default=0)
SL : Splitting length: Length for the splitting of the contour
SA : Safety distance for the collision test.
S_ : Revolutions
?? : condition (default=1)
EN : Enable (default=1)

9.3.5 Kappen: End Trimming

ID-number: 108

E.g.:
<108 \Kappen\
EA="1:1"
EE="1:1"
P60="0"
P61="0"
P62="1"
RI="1"
ABV="0"
ABH="0"
VH="1"
VK="1"
HK="1"
RK="1"

Explanation

EA : Number of start element (front edge)



PRODUCT INFORMATION

Subject : 4.2.7

Description woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

EE : Number of end element (back edge)
P60 : Offset C-Axis front edge
(positiv=away from work piece, negativ=to work piece)
F_ : Feedrate
S_ : Revolutions
P61 : Offset C-Axis back edge
(positiv=away from work piece, negativ=to work piece)
P62 : Offset C-Axis (free cut angle e.g. 1)
RI : Direction of processing
1: forward, i.e. in drawing direction of contour element
0: conter forward i.e. against drawing direction of contour element
ABV : Distance edge transport
(positiv=away from work piece, negativ=to work piece)
ABH : Distance from programmed contour point back edge
(positiv=away from work piece, negativ=to work piece)
VH : =1 -> front edge before back edge
=0 -> back edge before front edge
VK : snipping front edge yes/no (1/0)
HK : snipping back edge yes/no (1/0)
MD : Mode
T_ : Tool (optional)
RK : Edge side (optional)
1=Left
2=Right
?? : condition (default=1)
EN : Enable (default=1)

9.3.6 Klink: Corner notching

ID-number: 127

E.g.:
<127 \Klink\
EA="1:1"
P60="0"
ABV="0"
AEV="0"
MD="MOD0"

Explanation:

EA : Number of start elements
P60 : Offset C-Axis VK
P61 : Offset C-Axis HK
ABV : Distance element VK
AEV : Distance edge VK
ABH : Distance element HK
AEH : Distance edge HK
MD : nodging mode
MOD0: double side nodging VK and HK
MOD1: nodging only VK
MOD2: nodging only HK
MOD : Self defined mode (optional)
RK : Tool radius correction LI=left RE=right
TNO : Unit (optional)
?? : condition (default=1)
EN : Enable (default=1)



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

9.3.7 Schleifen: Contour Sanding

ID-number: 125

E.g.:
<125 \Schleifen\
EA="1:1"
MDA="TAN"
RK="WRKL"
EE="1:5"
MDE="TAN_AB"
RI="1"
TNO="101"
SM="0"
S_="STANDARD"
F_="STANDARD"
AB="0"
P60="0"
ZA="0"

Explanation:

EA : Number of start elements
MD : Mode
MDA : Start mode
TAN =0: tangential
SEI =1: from side
SEN =2: vertical
or self defined start mode
RK : radius correction:
NOWRK =0: Tool runs on programmed line
WRKL =1: Tool runs left of programmed line
WRKR =2: Tool runs left of programmed line
EE : Number of end element
MDE : Start mode
TAN_AB =0: tangential
SEI_AB =1: from side
SEN_AB =2: horizontal
or self defined start mode
RI : Direction of processing
1: forward, i.e. in drawing direction of contour element
0: counter forward i.e. against drawing direction of contour element
TNO : T-Number (Toolnumber)
EM : Insert mode
SM : Revolution mode
0: revolutions in Prozent
1: R.P.M.
S_ : Revolutions
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD the Feedrate of the Tooldata will be used (default).
AB : Distance to programmed contour. If distance is negative material will be sanded away.
P60 : C-Angle
ZA : Start coordinate in Z
?? : condition (default=1)
EN : Enable (default=1)

9.3.8 Drucken: Pressure Zone at a Contour

ID-number: 134

9-080-42-7190 -D00

Nov 22nd 2005

E.g.:
<134 \Drucken\
EA="1:0"
RK="WRKL"
EE="1:1"
RI="1"
F_="5"
AB="30"
AS="0"
AN="30"
TI="10"
HL="10"
HO="0"

Explanation:

EA : Number of start elements
EE : Number of end elements
RK : radius correction:
 NOWRK =0: Tool runs on programmed line
 WRKL =1: Tool runs left of programmed line
 WRKR =2: Tool runs right of programmed line
TNO : T-Number (tool number)
MOD : Self defined mode
RI : Direction of processing
 1: forward, i.e. in drawing direction of contour element
 0: conter forward, i.e. against drawing direction of contour element
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD theFeedrate of the Tooldatas will be used (default).
AS : Distance from programmed contour.
AN : Start distance
AB : Stop distance
TI : Pre heat time (in seconds)
HO : Hights (Z-coordinate, measured from Z=0)
HL : Heating power
?? : condition (default=1)
EN : Enable (default=1)

9.3.9 Ritzen: Processing of an Edge at Door Rabbit Prozzessing r

ID-number: 138

E.g.:
<138 \Ritzen\
EA="1:0"
RK="WRKL"
EE="1:1"
RI="1"
F_="5"
FB="30"
SB="10"
TV="0"
MD="VKANDHKSLOTTING"
MX="0"
MY="0"
MZ="0"



PRODUCT INFORMATION

Subject : 4.2.7

Description woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

Explanation:

EA : Number of start element
EE : Number of end element
RK : radius correction:
 NOWRK =0: Tool runs on programmed line
 WRKL =1: Tool runs left of programmed line
 WRKR =2: Tool runs right of programmed line
TNO : T-Number (tool number)
MOD : Self defined mode
RI : Direction of processing
 1: forward, i.e. in drawing direction of contour element
 0: conter forward, i.e. against drawing direction of contour element
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD theFeedrate of the Tooldatas will be used (default).
FB : Distance von of programmierten Contour.
SB : Area
TV : Groove hight
?? : condition (default=1)
EN : Enable (default=1)

9.3.10 Horizontales Fraesen: Contour Element

ID-number: 133

E.g.:

```
<133 \Contourfraesen\  
EA="1:0"  
MDA="TAN"  
RK="WRKL"  
EE="1:1"  
MDE="TAN_AB"  
EM="0"  
RI="1"  
TNO="156"  
SM="0"  
S_="STANDARD"  
F_="5"3  
AB="0"  
ZM="0"
```

Explanation:

EA : Number of start element
MDA : Start mode
 TAN =0: tangential
 SEI =1: from side
 SEN =2: vertical
 or self defined start mode
RK : radius correction:
 NOWRK =0: Tool runs on programmed line
 WRKL =1: Tool runs left of programmed line
 WRKR =2: Tool runs right of programmed line
EE : Number of end element
MD : Self defined mill mode



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

MDE : Start mode
TAN_AB =0: tangential
SEI_AB =1: from side
SEN_AB =2: horizontal
or self defined start mode

EM : Inserting mode
0: vertival diving
1: dive in the move

RI : Direction of processing
1: forward, i.e. in drawing direction of contour element
0: conter forward, i.e. against drawing direction of contour element

TNO : T-Number (tool number)

SM : Revolution mode
0: revolutions in Prozent
1: R.P.M.

S_ : Revolutions

F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD theFeedrate of the Tooldatas will be used (*default*).

AB : Distance to programmed contour. If distance is negative material will be sanded away.

ZM : Z-Mass

XY : Side X/Y. If Horizontal milling will be used to a contour element in of XY-Level

C_ : C-value (If Tool not vertical to XY-level of macro coordinate system)

A_ : A-value (If Tool not vertical to XY-level of macro coordinate system)

KO : Coordinate system (normally horizontal coordinate system A0,A1,...D3, see
default coordinate system)

AN : Start distance (optional)

ABT : Stop distance (optional)

?? : condition (*default=1*)

EN : Enable (*default=1*)

9.3.11 Vektor Fraesen: 5-Axis Routing

ID-number: 140

E.g.:
<140 \Vektorfraesen\
EA="1:0"
MDA="TAN"
RK="WRKL"
EE="1:1"
MDE="TAN_AB"
EM="0"
RI="1"
TNO="156"
SM="0"
S_="STANDARD"
F_="5"
AB="0"
ZM="0"

Explanation:

EA : Number of start element

MDA : Start mode
TAN =0: tangential
SEI =1: from side
SEN =2: vertical
or self defined start mode



PRODUCT INFORMATION

Subject : 4.2.7

Description woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

RK : radius correction:
NOWRK =0: Tool runs on programmed line
WRKL =1: Tool runs left of programmed line
WRKR =2: Tool runs right of programmed line

EE : Number of end element
MD : Self defined mill mode
MDE : Start mode
TAN_AB =0: tangential
SEI_AB =1: from side
SEN_AB =2: horizontal
or self defined start mode

EM : Inserting mode
0: vertival diving
1: dive in the move

RI : Direction of processing
1: forward, i.e. in drawing direction of contour element
0: conter forward, i.e. against drawing direction of contour element

TNO : T-Number (tool number)

SM : Revolution mode
0: revolutions in Prozent
1: R.P.M.

S_ : Revolutions
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD theFeedrate of the Tooldatas will be used (*default*).

AB : Distance to programmed contour. If distance is negative material will be sanded away.

ZM : Z-Mass

XY : Side X/Y. If Horizontal milling will be used to a contour element in of XY-Level

C_ : C-value (If Tool not vertical to XY-level of macro coordinate system)

A_ : A-value (If Tool not vertical to XY-level of macro coordinate system)

KO : Coordinate system (normally horizontal coordinate system A0,A1,...D3, see
default coordinate system)

?? : condition (*default=1*)

EN : Enable (*default=1*)

CR : C-value relative to contour (*default=0*)

KG : smooth contour

MB : maximum track deviation (or maximum track error)

AS : skip record length smaller than [value]

MW : maximum angular deviation

AW : skip angular movements smaller than [value]

9.3.12 Unterflurfräsen : Routing from below

ID-number: 113

E.g.:
<113 \Unterflur-Fraesen\
EA="1:1"
RK="WRKL"
EE="1:5"
MDE="TAN_AB"
RI="1"
TNO="101"
SM="0"
S_="STANDARD"
F_="STANDARD"
WI="0"



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

AN="30"
AB="30"
ZA="3"

Explanation:

EA : Number of start element
MDA : Start mode
 TAN =0: tangential
 SEI =1: from side
 SEN =2: vertical
 or self defined start mode
RK : radius correction:
 NOWRK =0: Tool runs on programmed line
 WRKL =1: Tool runs left of programmed line
 WRKR =2: Tool runs right of programmed line
EE : Number of end element
MD : Self defined mill mode
MDE : Start mode
 TAN_AB =0: tangential
 SEI_AB =1: from side
 SEN_AB =2: horizontal
 or self defined start mode
EM : Inserting mode
 0: vertical diving
 1: dive in the move
RI : Direction of processing
 1: forward, i.e. in drawing direction of contour element
 0: counter forward, i.e. against drawing direction of contour element
TNO : T-Number (tool number)
SM : Revolution mode
 0: revolutions in Prozent
 1: R.P.M.
S_ : Revolutions
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD the Feedrate of the Tooldata will be used (*default*).
AB : Distance to programmed contour. If distance is negative material will be sanded away.
ZM : Z-Mass
XY : Side X/Y. If Horizontal milling will be used to a contour element in of XY-Level
C_ : C-value (If Tool not vertical to XY-level of macro coordinate system)
A_ : A-value (If Tool not vertical to XY-level of macro coordinate system)
ABS : Distance from the contour
KO : Coordinate system (normally horizontal coordinate system A0,A1,...D3, see
default coordinate system)
?? : condition (*default=1*)
EN : Enable (*default=1*)

9.3.13 Vert Getastet-Fraesen: Vertical Touched Routing

ID-number: 128

E.g.:
<128 \Vert Getastet-Fraesen\
EA="1:0"
MDA="TAN"
RK="WRKL"
EE="1:1"



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

```
MDE="TAN_AB"  
RI="1"  
TNO="230"  
EM="MOD0"  
S_="100"  
F_="5"  
WI="90"  
AB="0"  
ZA="19"  
TH="2"  
TM="0"  
_CM="1"  
CM="1"  
HP="1"  
SP="3"  
YVE="1000"  
MX="1"  
MY="0"  
MZ="0"
```

Explanation:

EA : Number of start element
MDA : Start mode
 TAN =0: tangential
 SEI =1: from side
 SEN =2: vertical
 or self defined start mode
RK : radius correction:
 NOWRK =0: Tool runs on programmed line
 WRKL =1: Tool runs left of programmed line
 WRKR =2: Tool runs right of programmed line
EE : Number of end element
MDE : Start mode
 TAN_AB =0: tangential
 SEI_AB =1: from side
 SEN_AB =2: horizontal
 or self defined start mode
RI : Direction of processing
 1: forward, i.e. in drawing direction of contour element
 0: conter forward, i.e. against drawing direction of contour element
TNO : T-Number (tool number)
EM : Insert mode
 MOD0 =0: groove has at start and end-coordinates full depth
 MOD1 =1: groove starts at start and end coordinates
S_ : Revolutions
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD theFeedrate of the Tooldatas will be used (default).
WI : C-angle
AB : Distance from programmed contour.
ZA : Z-value touching
ZWZ : Z-value routing or
TH : touch lift
CM : C-value mode
 0: as offset
 1: absolut



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

FL : dive in mode
AB : approach distance
_CM : CNew mode
TM : Test Mode, i.e. span touching
MD : Mode
?? : condition (*default=1*)
EN : Enable (*default=1*)

9.3.14 Abblasen: Blow Cleaning of Contour

ID-number: 126

E.g.:
<126 \Abblasen\
EA="1:1"
RK="WRKL"
EE="1:5"
RI="1"
F_="STANDARD"
AB="0"
P60="0"
ZA="0"

Explanation:

EA : Number of start element
RK : radius correction:
 NOWRK =0: Tool runs on programmed line
 WRKL =1: Tool runs left of programmed line
 WRKR =2: Tool runs right of programmed line
EE : Number of end element
RI : Direction of processing
 1: forward, i.e. in drawing direction of contour element
 0: conter forward, i.e. against drawing direction of contour element
TNO : T-Number (tool number)
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD theFeedrate of the Tooldatas will be used (*default*).
AB : Distance from programmed contour.
P60 : C-Angle
ZA : Start coordinate in Z
?? : condition (*default=1*)
EN : Enable (*default=1*)

9.3.15 Laser-Anzeige: Showing Contour by Laser

ID-number: 154

E.g.:
<154 \Laser-Anzeige\
EA="1:1"
RK="WRKL"
EE="1:5"
RI="1"
F_="STANDARD"
ZY="1"
NR="1"



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

Explanation:

EA : Number of start element
EE : Number of end elements
RI : Direction of processing
 1: forward, i.e. in drawing direction of contour element
 0: counter forward, i.e. against drawing direction of contour element
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
 By STANDARD the Feedrate of the Tooldata will be used (default).
ZY : Number of Cycles (only reticule laser)
NR : Laser Number
?? : condition (default=1)
EN : Enable (default=1)

9.3.16 NC-New: Discharge Macros (outdated)

For changing of technology values. With a NC-New-Makro there can also be changed several technology values together like feedrate and revolution.

ID-number: 118

E.g.:

<118 \NCNew\

FF=32

EA="1:1"

F_="10"

S_="80"

Explanation:

FF : Funktion sflag (always 32)
EA : Number of refer element
Z_ : New value for Z-axis
F_ : New value for feedrate
M_ : New M-funktion
S_ : New value for evolution
C_ : New value for C-axis
A_ : New value for A-axis
G_ : New G-funktion
NC_ : New NC-sentence
HL : New heat power
HL2 : New heat power 2
?? : condition (default=1)
EN : Enable (default=1)

DS_TYPn (n =1..10): Type of Discharge, see below for details

DS_WERn (n =1..10): Value of Discharge Type (1 to 10)

DS_STRn (n =1..10): distance of Discharge Type (1 to 10)

Discharge Type:: Variables DS_TYP1 to DS_TYP10 can be assigned one of eleven possible values, their meanings are::

1: New value for feedrate
2: New value for C-axis
3: New value for evolution
4: New value for Z-axis
5: New M-funktion
6: New G-funktion
7: New NC-sentence
8: New value for A-axis
9: New heat power
10: New heat power 2
11: Edge Sanding Length (%)

9.3.16 Technology Macro: Discharge Macros

Modify Technology Paramters. Several (up to 16) parameters like feed or c-axis can be changed at a time.
ID-Number: 180

```
Example.:  
<180 \Neustr\  
FF=32  
EA="1:2"  
EE="1:3"  
DS_TYP1="1"  
DS_WER1="12"  
DS_ORT1="3"  
DS_STR1="0"  
DS_TYP2="2"  
DS_WER2="-45"  
DS_ORT2="2"  
DS_STR2="0"  
KM="This is a Comment"  
AU="0"  
FN=""
```

Explanation:

FF : Function-flag (always 32)
EA : Number of reference element (start element)
EE : Number of reference element (end element)
KM : comment (string)
AU : macro was generated automatically (value=1) or entered manually (value=0)
FN : filename (only set if macro was loaded from or saved to a file)
DS_TYPn: (n =1..16) Type of Discharge, see below for details
DS_WERn: (n =1..16) Value of Discharge Type
DS_ORTn: (n =1..16) Discharge type vaild at start (value=2)- or end (value=3)- point
DS_STRn: (n =1..16) distance of Discharge Type

Discharge Type: Variables DS_TYP1 to DS_TYP10 can be assigned one of eleven possible values:

- 1: New value for feedrate
- 2: New value for C-axis
- 3: New value for evolution
- 4: New value for Z-axis
- 5: New M-function
- 6: New G-function
- 7: New NC-Set
- 8: New value for A-axis
- 9: New heat power
- 10: New heat power 2
- 11: Edge Sanding Length (relative)

9.3.17 Ablauf: Run Macro (Sequence Macro)

Allows the grouping of several contour processes to one run. Application: Rabbet with several tools, complets edge processing . All processes in the run macro

- Relates to start and end point of run macro
- Will be calculated with the condition of the run macro (AND-link)
- And will be switched off with the run macro (Reminder: Space button puts processing to comment)

Run macros can be saved and loaded. Files withnsaved run macros have the extension **.abl**.



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

ID-number: 122

E.g.:
<122 \Ablto\
EA="1:1"
EE="1:5"
RI="1"
NM="profil1.abl"
DP="2"

Explanation

EA : Number of Startelements (Vorofkante)
EE : Number of Endelements (Hinterkante)
RI : Direction of Processing
1: vorwärts, i.e. in Zeichnungsdirection of Contour elementses
0: nicht vorwärts, i.e. gegen Zeichnungsdirection of Contour elementses
NM : Name of Abltomakros (Filename falls Ablto of a File geladen wurde)
DP : Dependent, i.e. Number abhängiger Makros im Ablto
?? : condition (default=1)
EN : Enable (default=1)

9.3.18 Contour routing with C-Axis

ID-number: 149

E.g.:
<149 \Contourfraesen mit C-Achse\
EA="1:0"
MDA="TAN"
RK="WRKL"
EE="1:1"
MDE="TAN_AB"
EM="0"
RI="1"
TNO="101"
C_="0"
SM="0"
S_="STANDARD"
F_="5"
AB="0"
ZA="-3"
HP="0"
SP="0"
YVE="0"
MX="0"
MY="0"
MZ="0"

Explanation:

EA : Number of Startelements (Vorofkante)
MDA : Start mode
TAN =0: tangential
SEI =1: from side
SEN =2: vertical
or self defined start mode
RK : radius correction:



PRODUCT INFORMATION

Subject : 4.2.7

Description woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

NOWRK =0: Tool runs on programmed line
WRKL =1: Tool runs left of programmed line
WRKR =2: Tool runs right of programmed line

EE : Number of end element
MD : Self defined router mode
MDE : Start mode
TAN_AB =0: tangential
SEI_AB =1: from side
SEN_AB =2: horizontal
or self defined start mode

SM : Revolution mode
0: revolutions in Prozent
1: R.P.M.

EM : Insert mode
0: horizontal dive
1: dive in move

RI : Direction of processing
1: forward, i.e. in drawing direction of contour element
0: conter forward, i.e. against drawing direction of contour element

TNO : T-Number (toolnumber)
C_ : C-value
S_ : Evolutions
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD theFeedrate of the Tooldatas will be used (default).

AB : Distance from programmed contour.
VLS : Extension at startpoint
VLE : Extension at endpoint
ZA : Start coordinate in Z
?? : condition (default=1)
EN : Enable (default=1)

Routing with a FK-Unit

ID-Number: 161

Bsp.:
<161 \ FK-Fraesen\
EA=""
RK="WRKL"
VK="0"
HK="1"
EE=""
RI="1"
TNO="1"
F_="10"
EL="-20"

EA : Number of Startelements (Vorofkante)
EE : Number of end element
RI : Direction of processing
1: forward, i.e. in drawing direction of contour element
0: conter forward, i.e. against drawing direction of contour element

RK : radius correction:
NOWRK =0: Tool runs on programmed line
WRKL =1: Tool runs left of programmed line
WRKR =2: Tool runs right of programmed line



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

AB : Distance from programmed contour.
TNO : T-Number (toolnumber)
F_ : Feedrate: contains either the concrete value in m/min or the key word STANDARD.
By STANDARD theFeedrate of the Tooldatas will be used (default).
EL : Distance
?? : condition (default=1)
EN : Enable (default=1)

Routing with a CF-Unit

ID-Number: 158

Bsp.:
<158 \CF-Fraesen\
EA="1:0"
EE="1:9"
BK="0"
RI="1"
TNO="101"
AB="0"
FS="10"

EA : Number of Startelements (Vorofkante)
EE : Number of end element
RI : Direction of processing
1: forward, i.e. in drawing direction of contour element
0: conter forward, i.e. against drawing direction of contour element
AB : Distance from programmed contour.
TNO : T-Number (toolnumber)
?? : condition (default=1)
EN : Enable (default=1)
FS : Cuting feed

Gluing with a CF-Unit

ID-Number: 159

Bsp.:
<159 \CF-Leimen\
NM="STANDARD"
KM="PVC-Kante 2mm REHAU"
EA="1:0"
EE="1:9"
BK="0"
DK="0"
RI="1"
TNO="101"
AB="0"
C_="10"
KZ="10"
KUH="0"
KUV="0"
KTA="10"
STR="10"
AC="0"
WA="0"



PRODUCT INFORMATION

Subject : 4.2.7

Description woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

EA : Number of Startelements (Vorofkante)
EE : Number of end element
RI : Direction of processing
1: forward, i.e. in drawing direction of contour element
0: conter forward, i.e. against drawing direction of contour element
AB : Distance from programmed contour.
TNO : T-Number (toolnumber)
?? : condition (default=1)
EN : Enable (default=1)
BK : Definition edge (0: begin of edge , 1: end of edge)
DK : Thick edge (0: no, 1: Yes)
C_ : C-angle
KZ : Kantenlängezugabe
KUH : Kantenueberstand vorne
KUB : Kantenueberstand hinten
KTA : Kantentransport aus
STR : Strahler
AC : Automatic correction of the C-Offset (collision test)
1: ON
0: OFF
SL : Splitting length: Length for the splitting of the contour
SA : Safety distance for the collision test.

Flush trimming with a CF-Unit

ID-Nummer: 157

Bsp.:
<157 \CF-Buendigfraesen\
EA=""
EE=""
BK="0"
RI="1"
TNO="101"
AB="0"
C_="10"
TT="10"
SLQ="10"
AC="0"
TS="0"

EA : Number of Startelements (Vorofkante)
EE : Number of end element
RI : Direction of processing
1: forward, i.e. in drawing direction of contour element
0: conter forward, i.e. against drawing direction of contour element
AB : Distance from programmed contour.
TNO : T-Number (toolnumber)
BK : Definition edge (0: begin, 1: end)
C_ : C-angle
CF : C- correction angle
TT : touch depth
SLQ : Splitting length for quality
TS : With touch(1: Yes, 0: No)
?? : condition (default=1)
EN : Enable (default=1)



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

Pressure with a CF-Unit

ID-Nummer: 165

Bsp.:
<165 \CF-Druck\
EA=""
EE=""
RI="1"
TNO="101"
AB="0"
HO="10"

EA : Number of Startelements (Vorofkante)
EE : Number of end element
RI : Direction of processing
1: forward, i.e. in drawing direction of contour element
0: conter forward, i.e. against drawing direction of contour element
AB : Distance from programmed contour.
TNO : T-Number (toolnumber)
?? : condition (default=1)
EN : Enable (default=1)
HO : Height

Cutting with a CF-Unit

ID-Nummer: 166

Bsp.:
<166 \CF-Kappen\
EA="1:0"
EE="1:9"
RI="1"
TNO="101"
AB="0"
C_="0"
HF="1"
VF="1"
HK="1"
VK="1"

EA : Number of Startelements (Vorofkante)
EE : Number of end element
RI : Direction of processing
1: forward, i.e. in drawing direction of contour element
0: conter forward, i.e. against drawing direction of contour element
AB : Distance from programmed contour. (Begin)
C_ : Distance from programmed contour. (end)
TNO : T-Number (toolnumber)
HK : end
VK : begin
HF : Hinterkante kappen mit Faseanschlag
VF : Vordererkante kappen mit Faseanschlag
?? : condition (default=1)
EN : Enable (default=1)



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

Sanding with a CF-Unit

ID-Nummer: 167

Bsp.:
<167 \CF-Schleifen\
EA="1:0"
EE="1:9"
RI="1"
TNO="101"
AB="0"
S_="10"

Erklärung:

EA : Number of Startelements (Vorofkante)
EE : Number of end element
RI : Direction of processing
1: forward, i.e. in drawing direction of contour element
0: conter forward, i.e. against drawing direction of contour element
AB : Distance from programmed contour.
TNO : T-Number (toolnumber)
S_ : Rotation
?? : condition (default=1)
EN : Enable (default=1)

Contur operation with a CF-Unit

ID-Nummer: 170

Bsp.:
<170 \CF-KTRStation\
EA="1:0"
EE="1:9"
RI="1"
TNO="101"
AB="0"

EA : Number of Startelements (Vorofkante)
EE : Number of end element
RI : Direction of processing
1: forward, i.e. in drawing direction of contour element
0: conter forward, i.e. against drawing direction of contour element
AB : Distance from programmed contour.
TNO : T-Number (toolnumber)
?? : condition (default=1)
EN : Enable (default=1)

Operation without contour with a CF-Unit

ID-Nummer: 169

Bsp.:
<169 \CF-Station\
SNO="101"

EA : Number of Startelements (Vorofkante)
SNO : Station-Number (toolnumber)
?? : condition (default=1)



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

EN : Enable (default=1)

Foiling (Heissprägen)

ID-Number: 135

E.g.:
<135 \Heisspraegen \
EA="1:0"
EE="1:1"
AB="-0.5"
Z_="1"
P60="0"
SLS="1001"
WSA="1754"
ZPE="0.3"
F_="5"
S_="50"
M15="1"
NM="STANDARD"
KM="Kante"
VM="180"
KN="180"
TNO="STANDARD"
ABN="90"
RI="1"
ABA="90"
ST="1"
AC="0"
SL="50"
SA="2"
CF="5"
??="_nonmirror AND _nonymirror "
MX="0"
MY="0"
MZ="0"
MXF="1"
MYF="1"
MZF="1"
HP="0"
SP="0"
YVE="0"
WW=""
ASG="2"
RSEL="0"
RWID="0"

Explanation:

EA : Number of start elements
EE : Number of end element
AB : Distance
Z_ : Z-value (optional) (default=0)
P60 : OffsetC
SLS : Heating
WSA : Backw. Dist. Heat lamp off

advice: parameter WSA and ZPE are permuted, this behaviour was never changed due to compatibility reasons



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

ZPE : Delay Embossing Roll On
F_ : Feed
S_ : Speed
M15 : Test run (without M15 i.e. over work piece)
NM : parameter-file name
KM : comment for parameter-file
VM : macro name
KN : ID
TNO : Tool
ABN : Dist. Swinging bolt on
ABA : Withdrawal Clearing
?? : condition (default=1)
EN : Enable (default : 1)
RI : Direction (1=In, 2= Out)
ST : Heating Lamp On
AC : AutoCorrect
SL : Splitting length: Length for the splitting of the contour
CF : CFactor
SA : Safety distance
HL : heating power



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

9.4 Konsolen und Saugermacros: Vacuum Cup Macros

9.4.1 Single-Vacuum-Cup

ID-number: 114

E.g.:
<114 \Sauger\
XA="300"
YA="B-70"
WI="45"
TY="0"

Explanation

XA : X-position of cup center
YA : Y-position of cup center
WI : Turn angle of cups
TY : Typ of cups (0 bis 19)
KO : Coordinate system
?? : condition (default=1)
EN : Enable (default=1)

9.4.2 SaugerK: Vaccum cups (parallel to Y-Axis)

ID-number: 115

E.g.:
<115 \SaugerK\
XA="0"
AN="1"
YA1="0"
YA2="0"
YA3="0"
YA4="0"
YA5="0"
YA6="0"
YA7="0"
YA8="0"
WI1="0"
WI2="0"
WI3="0"
WI4="0"
WI5="0"
WI6="0"
WI7="0"
WI8="0"
TY1="0"
TY2="0"
TY3="0"
TY4="0"
TY5="0"
TY6="0"
TY7="0"
TY8="0"



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

Explanation:

XA : X coordinate of console
AN : Number of cups
YA1 : Y coordinate of 1 cup
YA2 : Y coordinate of 2 cup
YA3 : Y coordinate of 3 cup
YA4 : Y coordinate of 4 cup
YA5 : Y coordinate of 5 cup
YA6 : Y coordinate of 6 cup
YA7 : Y coordinate of 7 cup
YA8 : Y coordinate of 8 cup
Wlx : Angle of cup x
TY1 : Typ of 1 cup
TY2 : Typ of 2 cup
TY3 : Typ of 3 cup
TY4 : Typ of 4 cup
TY5 : Typ of 5 cup
TY6 : Typ of 6 cup
TY7 : Typ of 7 cup
TY8 : Typ of 8 cup
VA1 : Vakuum cup 1: 1=on 0=of
VA2 : Vakuum cup 2: 1=on 0=of
VA3 : Vakuum cup 3: 1=on 0=of
VA4 : Vakuum cup 4: 1=on 0=of
VA5 : Vakuum cup 5: 1=on 0=of
VA6 : Vakuum cup 6: 1=on 0=of
VA7 : Vakuum cup 7: 1=on 0=of
VA8 : Vakuum cup 8: 1=on 0=of
KO : Coordinate system
?? : condition (default=1)
EN : Enable (default=1)

8.4.3 SaugerL: Konsolensauger längs (parallel to X-Axis)

ID-Number: 130

E.g.:

<130 \SaugerL\

YA="0"

AN="1"

XA1="0"

XA2="0"

XA3="0"

XA4="0"

TX1="0"

TX2="0"

TX3="0"

TX4="0"

WI1="0"

WI2="0"

WI3="0"

WI4="0"

WI5="0"

WI6="0"

WI7="0"

WI8="0"

VA1="1"

VA2="1"



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

VA3="1"
VA4="1"

Erklärung:

YA : Y Coordinate of Konsole
AN : Number of Sauger
XA1 : X Coordinate of 1 cups
XA2 : X Coordinate of 2 cups
XA3 : X Coordinate of 3 cups
XA4 : X Coordinate of 4 cups
XA5 : X Coordinate of 5 cups
XA6 : X Coordinate of 6 cups
XA7 : X Coordinate of 7 cups
XA8 : X Coordinate of 8 cups
Wlx : Angle of cup x
TX1 : Typ of 1 cups
TX2 : Typ of 2 cups
TX3 : Typ of 3 cups
TX4 : Typ of 4 cups
TX5 : Typ of 5 cups
TX6 : Typ of 6 cups
TX7 : Typ of 7 cups
TX8 : Typ of 8 cups
VA1 : Vakuum Sauger 1: 1=on 0=off
VA2 : Vakuum Sauger 2: 1=on 0=off
VA3 : Vakuum Sauger 3: 1=on 0=off
VA4 : Vakuum Sauger 4: 1=on 0=off
VA5 : Vakuum Sauger 5: 1=on 0=off
VA6 : Vakuum Sauger 6: 1=on 0=off
VA7 : Vakuum Sauger 7: 1=on 0=off
VA8 : Vakuum Sauger 8: 1=on 0=off
KO : Coordinate system
?? : condition (default=1)
EN : Enable (default=1)

Note: you can save up to 20 parallel-to-x-axis suction cups although for clarity reasons only 8 ones are used in the example above

9.4.4 Transport: Work piece Transport with Vacuum Carpet

ID-number: 148

E.g.:
<148 \OfTransport\
XA="100"
YA1="200"
YA2="200"
T_="16"
KL="241"
KR="241"
XV="1000"
KI="1"
LI="1"
RE="1"

Explanation:



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

XA : Start coordinate in X
YA1 : Start coordinate in Y left vacuum carpet
YA2 : Start coordinate in Y right vacuum carpet
F_ : Feedrate
T_ : Tool
KL : WZ-Descriptor left
KR : WZ-Descriptor right
XV : X-offset
KI : Critical, i.e. not to lift workpiece but sliding/pull out
LI : Left
RE : Right
KO : Coordinate system
?? : condition (*default=1*)
EN : Enable (*default=1*)

9.4.5 Transport: Part handling with bridge

ID-Nummer: 184

Bsp.:
<184 \Transport\
XA1="2"
YA1="3"
ZA1="4"
T_="92"
XA2="7"
YA2="8"
ZA2="9"
ST="1"
F_="5"
AM="6"
RE="1"
RI="2"
KO="00"
??="999"

Erklärung:

XA1 : X-Offset table
YA1 : Y- Offset table
ZA1 : Z- Offset table
XA2 : X- Offset table
YA2 : Y-Versatz Stapel
ZA3 : Z-Versatz Stapel
ST : Stapelnummer
F_ : Feed
RE : Cleaning
RI : Direction (1=In, 2= Out)
AM : Mode
KO : Coordinate system
?? : condition (*default=1*)
EN : Enable (*default=1*)
MD : userdefined transport mode.
T_ : Tool

9.4.6 Gebietsmakro: Area Macro

ID-number: 182



PRODUCT INFORMATION

Subject : 4.2.7

Description
woodWOP- file

9-080-42-7190 -D00

Nov 22nd 2005

E.g.:
<182 \Gebiet\
EA="1:0"
WE="1"
SF="0"
RT="0"
RW="1"
PT="1"
HS="1"
VS="1"
XP="0"
XM="0"
YP="0"
YM="0"
ZH="1"
ZV="1"
SX="0"
SY="1"
HV="1"
T_="102"
AS="0"
RX="50"
RY="50"
MB="10"
AZ="20"
ZU="0.5"
ZA="-3"
F_="STANDARD"
SW="300"

Explanation:

EA : Number of start elements
WE : the area macro defines the outer contour of a workpiece if WE equals 1
SF : the area macro defines the outer contour of a blocked area if SE equals 1
RT : Remainder contour when RT=1
RW : Partcontour with cutting remainder when RW=1
PT : Generae automatic parameters when PT=1
HS : Process horizontal cuttings when HS=1 (man. Parameter)
VS : Process vertical cuttings when VS=1 (man. Parameter)
XP : Vertical cuttings in X+ sequence
XM : Vertical cuttings in X- sequence
YP : Horizontal cuttings in Y+ sequence
YM : Horizontal cuttings in Y- sequence
ZH : Zigzag sequence horizontal
ZV : Zigzag sequence vertical
SX : Cutting sequence X+ for vertical cuttings
SY : Cutting sequence Y+ for horizontal cuttings
HV : Horizontal cuttings before vertical cuttings
T_ : Tool number
AS : Additional distance for cutting
RX : Grid size X
RY : Grid size Y
MB : Minimal cutting path length
AZ : Start distance in Z-Axis
ZU : Infeed speed for Z-Axis when doing remainder cutting
ZA : Z-Reference value for the depth
F_ : Feed



PRODUCT INFORMATION

Description
woodWOP- file

Subject : 4.2.7

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?? : Condition (*default=1*)
EN : Enable (*default=1*)
SW : Threshold for cross cutting
MD : selfdefined mode
TR : separate cuttings (1=on, 0=off)
NS : NCStop (1=on, 0=off)