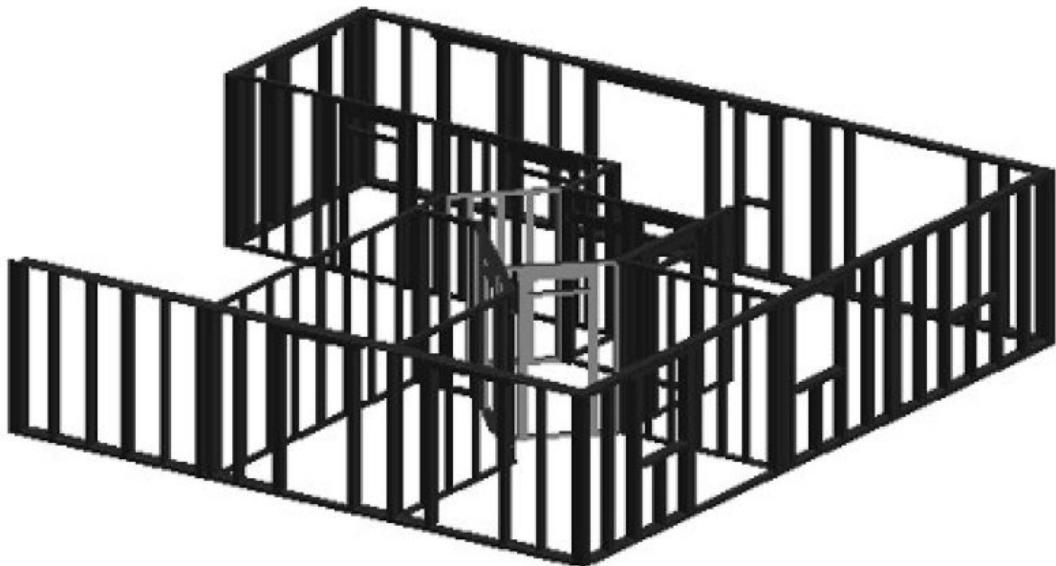




4.7.2

Interface description for prefabricated house elements



T:\8482\472053\X00001TD.jpg

**The party responsible for the development and maintenance of this interface is:**  
WEINMANN Holzbausystemtechnik GmbH, Forchenstr. 50, 72813 St. Johann, Germany

## Interface version 3.5

As at: 11/3/2020

The right to make changes is reserved.

**Contents:**

<b>1 General</b>	<b>4</b>
1.1 File structure .....	5
1.2 General syntax/value ranges.....	6
1.3 Coordinate systems .....	7
1.3.1 Element coordinate system.....	7
1.3.5 Plane coordinate system.....	9
1.3.6 Spatial processing coordinate system.....	10
1.4 Processing the file .....	11
<b>2 Change history</b>	<b>11</b>
2.1 Changes from interface version 1.x.....	11
2.2 Changes for interface version 2.x.....	11
2.3 Changes for interface version 3.x.....	12
2.3.1 Interface version 3.0 .....	12
2.3.2 Interface version 3.1 .....	12
2.3.3 Interface version 3.2 .....	12
2.3.4 Interface version 3.3 .....	13
2.3.5 Interface version 3.4 .....	14
2.3.6 Interface version 3.5 .....	14
<b>3 Syntax</b>	<b>15</b>
3.1 The file header.....	15
3.2 Components .....	17
3.2.1 Single components, single bars .....	17
3.2.2 Panels and shuttering .....	21
3.2.3 Unprocessed parts .....	23
3.2.4 Modules .....	23
3.3 Spatial processing plane .....	24
3.4 Operations .....	26
3.4.1 Component processing steps.....	26
3.4.2 Panel processing steps, shuttering processing.....	30
3.4.3 Units.....	32
3.4.4 External NC programs .....	32
3.4.5 Assignment of signs for trimming and drilling.....	32
3.5 Attributes, properties .....	33
3.6 Polygon paths .....	34
<b>4 Material index, installation position</b>	<b>36</b>
4.1 Installation position of UG, OG, LS, QS, EBT .....	36
4.2 Material indices for components.....	37
4.3 Material indices for panels and shuttering .....	37
<b>5 Control codes for processing steps</b>	<b>38</b>
5.1 Sawing and polygon trimming .....	38
5.1.1 Tool category .....	38
5.1.2 Undercut and overcut.....	39
5.1.3 Tool radius correction .....	40
5.1.4 Synchronous and reverse rotation .....	41
5.1.5 Examples .....	41
<u>Circular notch in a clockwise direction</u> .....	41
<u>Closed, rectangular notch</u> .....	41
<u>Notch with arc</u> .....	41
5.2 Pocket trimming .....	41
5.3 Highlight.....	42
5.4 Polygon bocked surfaces .....	42



4.7.2

<b>6</b>	<b>Angles and radii</b>	<b>43</b>
6.1	Rotation and tilt angle of spatial processing plane RBE2 .....	43
6.2	Rotation, tilt, and gradient angle of the saw cut SG .....	43
6.2.1	Saw cut without gradient angle .....	43
6.2.2	Saw cut with gradient angle .....	44
6.3	Tilt angle for polygon points PP, KB, and MP .....	45
6.4	Radius for polygon point MP .....	46
<b>7</b>	<b>Examples</b>	<b>47</b>
7.1	Example file header .....	47
7.2	Example: components .....	47
7.3	Example of panels .....	48
7.4	Example slats and contra slats .....	49
7.5	Polygon paths .....	50





4.7.2

## 1 General

This document describes the structure of an element of a prefabricated house.

With one exception, the document does not contain any specific definitions for specific machines.

WEINMANN recommends using the file extension "wup".





## 1.1 File structure

The file must be available in MS-DOS text format. Line break: CR/LF (# 0D0A).

Permissible codings are: ASCII and UTF-16 (BMP, LITTLE ENDIAN).

File header: VERSION, ANR, ELB, ELN, ZNR, REIHE, ELA, ELM, WNP, CAD, CADRELEASE	
	Optional: definition of unprocessed parts: RT
	(A) Definition of components of the frame work, introduced by the definition of a component: UG, OG, LS, QS, BT4, BT6, EBT, BTn
	Attributes of a component: PROPERTY
	Component processing steps: UNIT, SG, PSG, TA, KN, MPL, PAF, PZF, PSF, SZ Spatial processing plane RBE/RBE2, followed by component processing steps
	(B) Definition of component positions, introduced by the definition of layered components of the same type: PLI0...PLI10, PLA0...PLA10, SLI1...SLI10, SLA0...SLA10
	Layer processing steps: UNIT, PSG, PAF, PSF, NR, NBR, PSZ, PML, KN Spatial processing plane RBE/RBE2, followed by the corresponding processing steps
	(C) Definition of modules: MODUL, ENDMODUL
	Definition of the component positions (B) or components of the frame work (A)

Multiple specifications of definitions of the categories (A), (B), or (C) are possible.

The definition of a category is completed by the definition of a new category.



## 1.2 General syntax/value ranges

- Maximum line length: 250 characters.
- Spaces and tabs are permissible between keywords and/or parameters.
- Any line can be designed as a "comment" line. It begins with the keyword "TXT"
- Each definition of a header date, a component, a processing step, or a comment ends with the limiter ";". Characters behind this are comments.
- Parameter range for integers, unless specified otherwise:  
-32768 ... +32767
- Parameter range for floating point numbers, unless specified otherwise:  
+- 3.402 \* 10<sup>38</sup>.  
Max. three decimal points separated by a point, up to +/- 10000000 not specified exponentially. Floating point numbers are used for lines, radii, angles, and coordinates.
- Positions and dimensions are specified in mm
- Angles are specified in degrees.
- Within full version numbers, such as 3.0–3.9, the keywords remain constant.
- In this document, optional parameters are specified in square brackets (e.g. [z]). Standard settings are specified in curly brackets (e.g. {0})
- "\*" behind a parameter indicates any frequent reproducibility of the parameter.
- Explicitly named data types are listed in brackets preceded by a colon. Character string (:string), floating point number (:float), integer (:int), natural number (:uint).
- Format of individual data types:  
Character string: Unless specified otherwise, printable characters, with the exception of semicolon and comma, max. 70 characters.  
Floating point number: Maximum three decimal places separated by a point, support for exponential notation of values  
larger than +10000000 and smaller than -10000000.



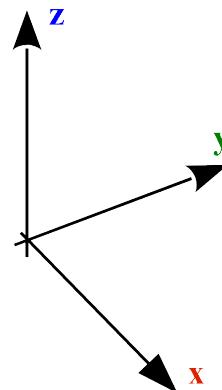
4.7.2

## 1.3 Coordinate systems

All coordinate systems are right-rotating coordinate systems.

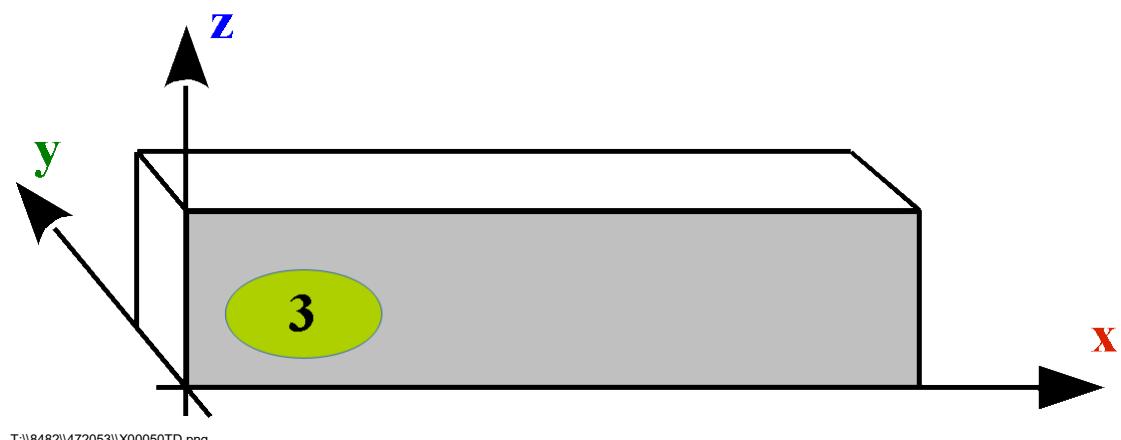
### 1.3.1 Element coordinate system

The measurement of components and layer processing steps is based on a right-rotating coordinate system.



### 1.3.2 Component coordinate system

The component processing steps SG, SZ, BOX, BOY, BOZ, FRY, FRZ, PFZ, PFY, and REFKER are based on the following coordinate system:

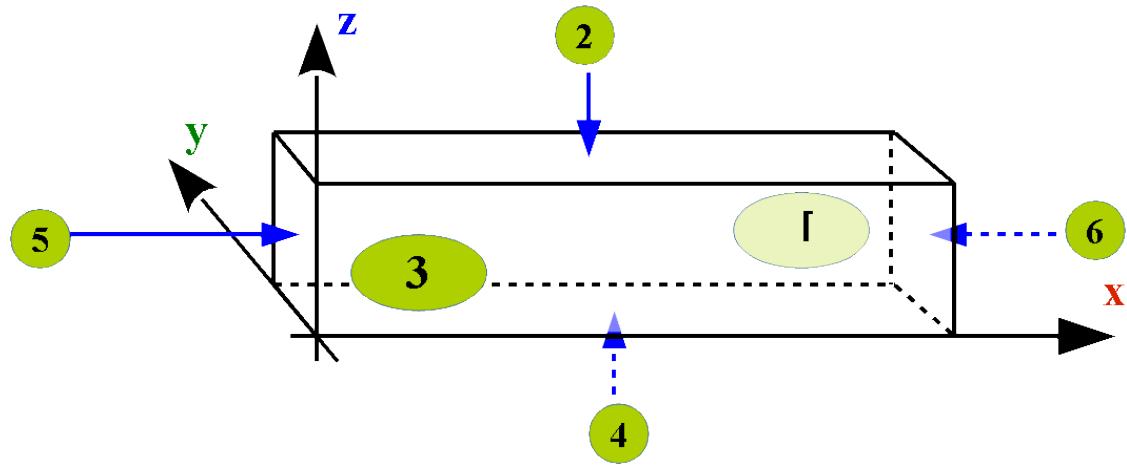




4.7.2

### 1.3.3 Reference planes

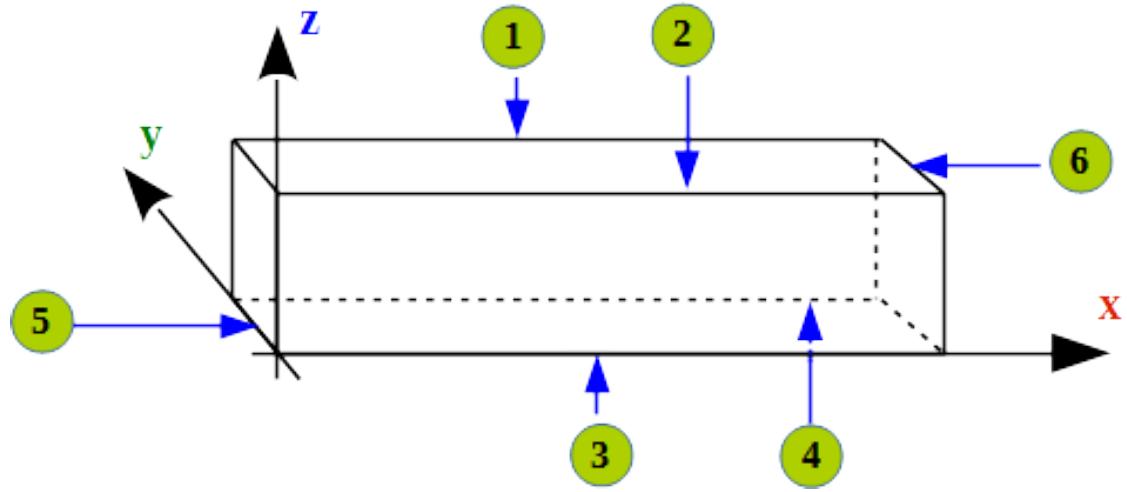
Definition of the reference planes of hexahedral components: UG, OG, LS, QS, RT



T:\|8482\|472053\|X00060TD.png

### 1.3.4 Reference edges

Definition of the reference edges of components: UG, OG, LS, QS, RT



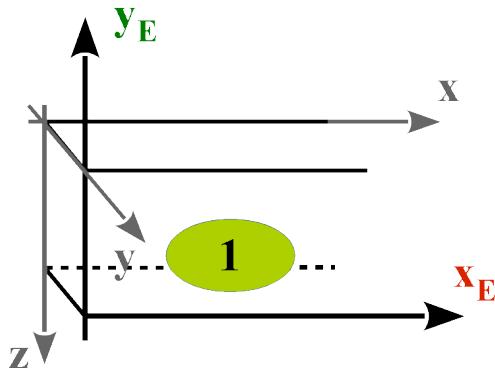
T:\|8482\|472053\|X00065TD.png



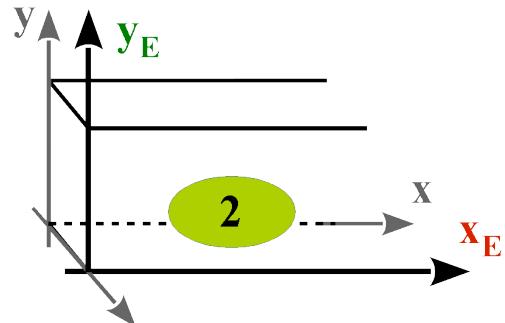
4.7.2

### 1.3.5 Plane coordinate system

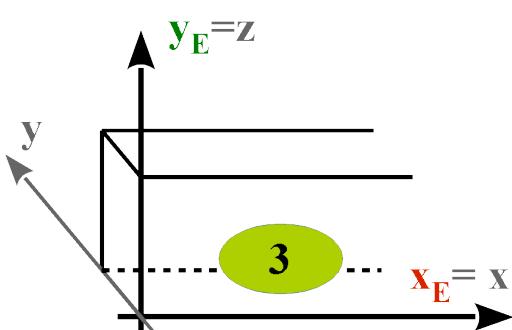
The component processing steps PSG, TA, KN, MPL, PAF, PZF, PSF as well as the spatial processing plane RBE2 are based on the following definitions of the plane and the following coordinate systems:



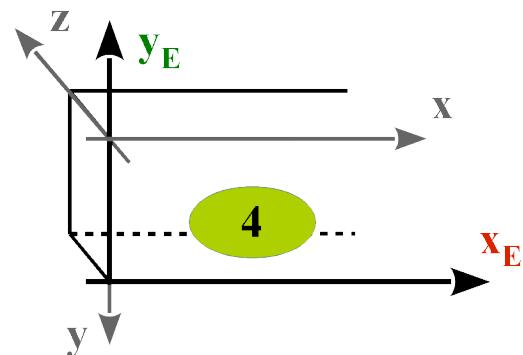
T:\|8482\|472053\|X00070TD.png



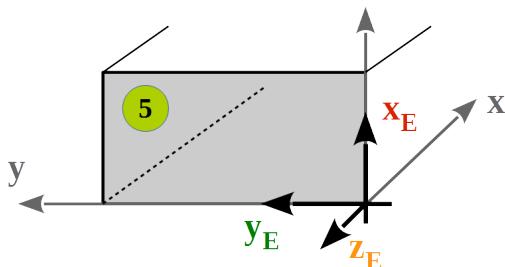
T:\|8482\|472053\|X00080TD.png



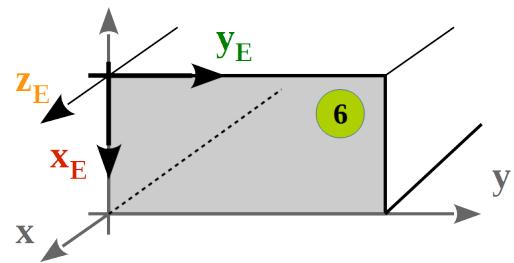
T:\|8482\|472053\|X00090TD.png



T:\|8482\|472053\|X00100TD.png



T:\|8482\|472053\|X00110TD.png



T:\|8482\|472053\|X00120TD.png

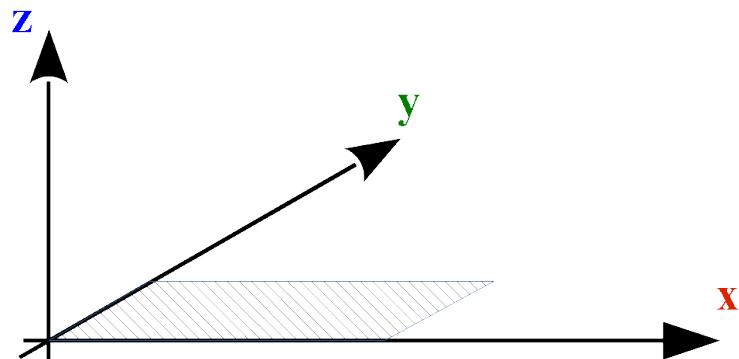


4.7.2

### 1.3.6 Spatial processing coordinate system

The definition of a spatial processing plane defines a new coordinate system. All processing steps applied to it must be defined with reference plane 2.

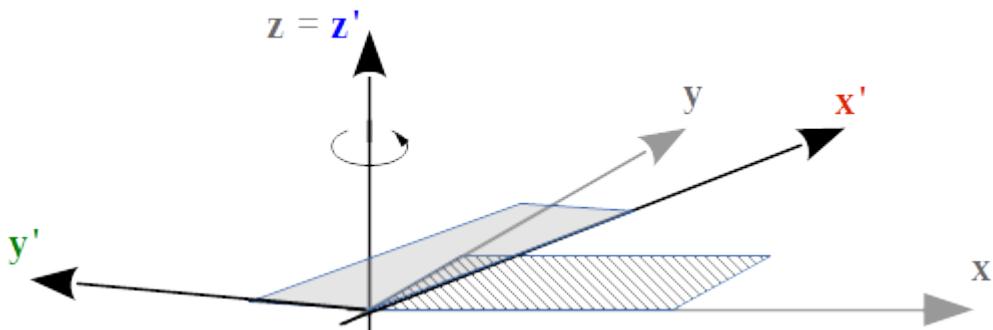
Original plane



T:\l8482\l472053\lX00130TD.png

Figure a

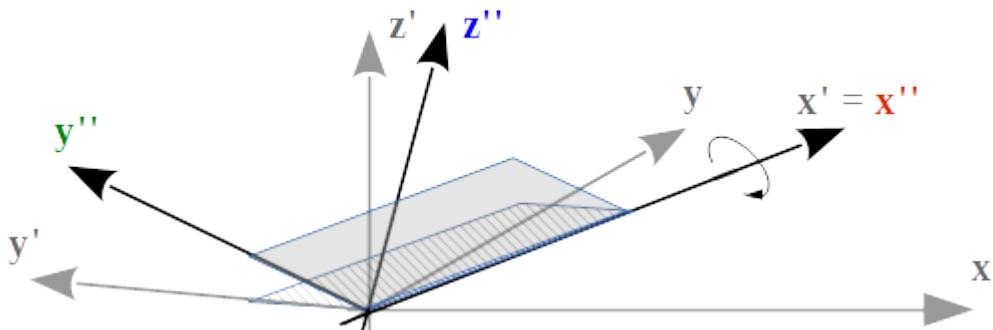
Transformation of the original plane via rotation around the Z axis



T:\l8482\l472053\lX00140TD.png

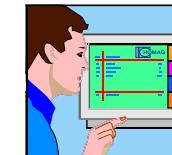
Figure

Transformation of the plane via tilting around the X' axis



T:\l8482\l472053\lX00150TD.png

Figure c



## 1.4 Processing the file

When processing a wup file, you must take into account that component and processing definitions can contain incomplete parameter sets.

A processing program of a wup file should check the minimum number of parameters and complete missing values by adding default values. The default values are always specified in the relevant definition by values that are placed in curly brackets.

New parameters added are always located at the end of the parameter set. They never replace preceding parameters. If parameters contradict other parameters, the parameters to the right have priority.

## 2 Change history

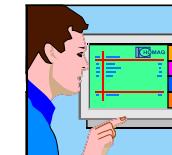
### 2.1 Changes from interface version 1.x

- Interface version number introduced. Keyword: VERSION
- BT4 and BT6 replace QSS
- Introduction of element-oriented (ABE) and component-oriented (ABB) sections.
- The keyword SG replaces SGO and SGU
- PLI1...PLI9 and PLA1...PLA9 replace SPI, SPA, and RPI
- Introduction of the blocked zone SZ for the bottom and top plates.
- Introduction of the marking line MPL
- Introduction of the assembly keywords MODUL and ENDMODUL
- Introduction of built-in parts EBT

### 2.2 Changes for interface version 2.x

- 2.1: Introduction of polygon trimming on components PFZ, PFY
- 2.2: Introduction of shuttering SLI, SLA
- 2.3: The changes for interface version 2.3 are not documented.





4.7.2

## 2.3 Changes for interface version 3.x

### 2.3.1 Interface version 3.0

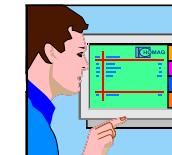
- Introduction of the series REIHE
- Keywords ABE/ABB, NBA, PNR are no longer required.
- Component processing steps are generally sized in the component coordinate system.
- Panel processing steps are generally sized in the element coordinate system.
- NBR is limited to use with wood components.
- Introduction of the standard notch in roof production: REFKER
- Additional parameters added for the material index and name for panels and components.
- Introduction of the polygon which describes the outline, after the panel definition.
- The combination PP, PP is no longer permitted for blocked areas.

### 2.3.2 Interface version 3.1

- Introduction of the NC program call-up for components.
- Addition of the keyword SG for components.
- Introduction of the protection zone in panel processing.
- Additional parameters for the depth and index for centers of circles MP
- Introduction of the marking line for panel processing.
- Introduction of the tilt angle for saw and trim lines in panel processing.
- Introduction of floating point numbers for angles and radii.

### 2.3.3 Interface version 3.2

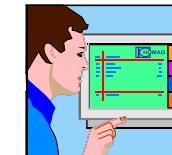
- Introduction of the arc.
- Introduction of the Z coordinates for polygon points.
- Addition of the keyword WNP (workpiece zero point) to the file header.
- Additional parameters for the keyword KN (beam processing): y, z, i
- The keyword KN also applies to layer processing.



4.7.2

#### 2.3.4 Interface version 3.3

- Introduction of the Z ordinate for: OG, UG, LS, QS, EBT, BT4, BT6, PLI, PLA, SLI, SLA, MODUL
- Component name is no longer optional for: OG, UG, LS, QS, EBT, BT4, BT6, PLI, PLA, SLI, SLA
- Introduction of the tilt angle  $\beta$  for SG
- Change for NC
- The keywords PAF, PSG are also valid for beam processing.
- Expansion of the polygon trimming line and the polygon saw cut around the reference plane for beam processing.
- Introduction of the PZF tenon joint for beam processing.
- Introduction of planes 5 and 6 for beam processing.
- Introduction of planes 7 and 8 for component BT6
- Introduction of the processing group. Keywords UNIT and ENDUNIT
- The keyword PLZ is no longer required.
- PFY and PFZ designated as obsolete. Replacement PAF with reference plane.
- Introduction of spatial processing plane RBE for beams.
- Special rule for depth = 0. Utilization of the entire layer thickness and/or component thickness.
- Layers 0 and 10 introduced: PLI0, PLA0, PLI10, PLA10, SLI10, SLA10
- The workpiece zero point WNP is limited to the value "links unten".



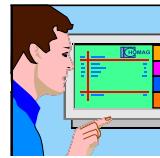
4.7.2

### 2.3.5 Interface version 3.4

- Supports Unicode format (UTF-16/BMP).
- Introduction of definitions in the file header: CAD, CADRELEASE
- Withdrawal of the WNP definition in the file header.
- Introduction of components RT, BTn
- Introduction of spatial processing plane RBE2, ENDRBE2
- Introduction of processing step TA
- Introduction of a definition for attributes of a component: PROPERTY
- The polygon blocked surface PSF can be used in the context of component processing steps.
- Additional parameters for the tool number for the processing steps PAF, ...  
Withdrawal of the keywords: BOX, BOY, BOZ, FRZ, FRY, PFY, PFZ, KER, REFKER and RBE. These definitions should no longer be used in future. There is an adequate replacement for each one.
- Withdrawal of Z alignment within the installation position. See: Installation position of UG, OG, LS, QS, EBT. This should no longer be used in future.
- KN as a panel processing step no longer has any specification of the reference plane.
- The trimming as part of the PAF processing step is controlled via parameters.
- Some parameters, optional until interface version 3.3, are now mandatory.
- The special rules for interface version 3.3 have been removed.
- Thousands position removed in the control code of marking lines.

### 2.3.6 Interface version 3.5

- Introduction of ENDRT, STAPEL
- Withdrawal of SLA



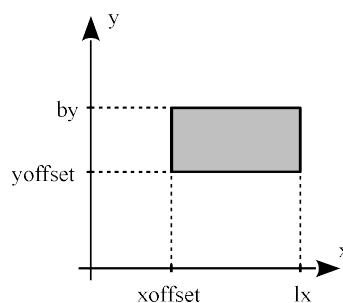
4.7.2

## 3 Syntax

### 3.1 The file header

Elements of the file header must be located at the beginning of each file. The keyword VERSION, with information about the interface version, must be in the first line of the file.

Command	Parameter	Optional	Description
VERSION	Version.issue		Version and issue Example: 3.5
ANR	nummer	X	Number of the order
ELB	name	X	Element name for unique identification of the wall type. Permitted characters: a-z, A-Z, 0-9 and _
ELN	name	X	Element name
ZNR	nummer	X	Drawing number
REIHE	nummer	X	Production sequence
STAPEL	nummer	X	Label of the loading unit
ELA	ansicht		Element view {INNEN} Value range: INNEN, AUSSEN, INTERIOR, EXTERIOR, INTERNAL, EXTERNAL
ELM	lx, by, hz [,n [,xoffset[,yoffset]]]		Element dimensions of a prefabricated house element. lx: Maximum value of the x ordinate (:float) by: Maximum value of the y ordinate (:float) hz: Maximum value of the z ordinate (:float) n: Quantity {1} (:unsigned int) xoffset: Offset dimension in x direction {0} (:float) yoffset: Offset dimension in y direction {0} (:float)



T:\l\8482\l472053\lX00030TD.png



Command	Parameter	Optional	Description
WNP	wert	X	Workpiece zero point Sole permissible value: LINKS UNTEN WNP should no longer be used.
CAD	wert	X	Specification of the CAD program (free text)
CADRELEASE	wert	X	Specification of the CAD version (free text)

If optional commands such as ZNR, ELB etc. are specified, they must be followed by a valid value or a non-blank character string.



4.7.2

## 3.2 Components

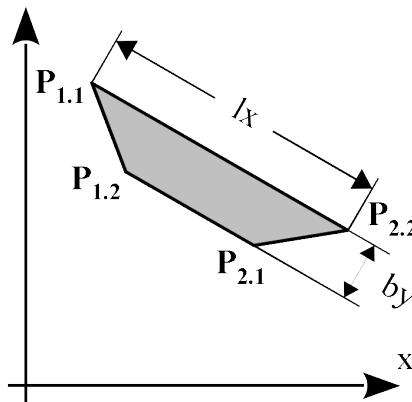
### 3.2.1 Single components, single bars

Command	Parameter	Description
OG	lx, by, hz, x, y, i, name, z	Top plate lx: Length by: Width hz: Height x, y: Position i: Material index and installation position name: Component designation (optional up to interface version 3.1) z: Position {0}
UG	lx, by, hz, x, y, i, name, z	Bottom plate: Parameters and syntax as OG
LS	lx, by, hz, x, y, i, name, z	Longitudinal stud: Parameters and syntax as OG
QS	ly, bx, hz, x, y, i, name, z	Beam ly: Length, along the Y axis bx: Width, along the X axis Remaining parameters and syntax as OG



4.7.2

Command	Parameter	Description
BT4	lx, by, hz, x11, y11, x12, y12, x21, y21, x22, y22, i, name, z	<p>Component with 4 corner points</p> <p>lx: Length by: Width hz: Height</p> <p>x11, y11: Coordinates, point 1.1 x12, y12: Coordinates, point 1.2 x21, y21: Coordinates, point 2.1 x22, y22: Coordinates, point 2.2</p> <p>i: Material index name: Component name z: Position {0}</p> <p>Points P1.1...P2.2 were called Plu, Pru, Pro and Plo in previous versions.</p> <p>The line P1.1-P2.2 and/or P1.2-P2.1 determines the timber grain direction and forms the basis of the length calculation.</p> <p>Both lines must be parallel.</p> <p>If points coincide, the remaining line is used as a reference.</p>



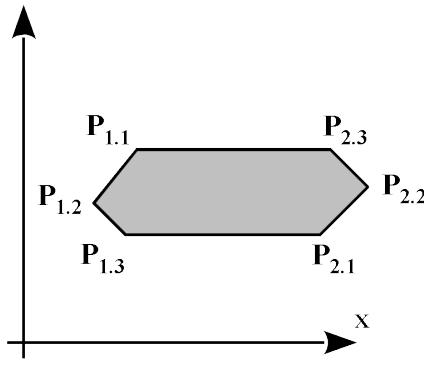
T:\8482\472053\X00010TD.png



4.7.2

#### Command Parameter

BT6      lx, by, hz, x11, y11,  
          x12, y12, x13, y13, x21, y21,  
          x22, y22, x23, y23, i, name, z



T:\8482\472053\X00020TD.png

#### Description

Component with 6 corner points

lx: Total length

by: Total width

hz: Total height

x11, y11: Coordinates, point 1.1

x12, y12: Coordinates, point 1.2

x13, y13: Coordinates, point 1.3

x21, y21: Coordinates, point 2.1

x22, y22: Coordinates, point 2.2

x23, y23: Coordinates, point 2.3

i: Material index

name: Component name

z: Position {0}

The length of the component is calculated from the maximum distance of P1.x to P2.x

Points P1.1...P2.3 were called Plu, Pmu, Pru, Pro, Pmo and Plo in previous versions.

The line P1.1-P2.3 and/or P1.3-P2.1 determines the timber grain direction and forms the basis of the length calculation. Both lines must be parallel. If points coincide, the remaining line is used as a reference.



Command	Parameter	Description
BTn	lx, by, hz, x, y, z, i, name	Component with N corner points, followed by polygon points of the types PP or KB lx: Total length by: Total width hz: Total height x, y, z: Position i: Material index name: Component name
EBT	lx, by, hz, x, y, i, name, z	Built-in part, e.g. iron girder, triangular studs, etc. lx: Length by: Width hz: Height x,y,z: Installation position i: Material index and installation position name: Item name z: Position {0}

For the components, LS, QS, OG, UG, BT4, and BT6 the parameter [z] was optional up to interface version 3.3.

All data types, with the exception of "name" and "i": floating point number

Data type of i: Natural number

Data type of name: Character string

All readable characters from the ASCII character set are allowed.

Exceptions: , < > : # \$ % = ; ! \ |



### 3.2.2 Panels and shuttering

The start of a panel definition or shuttering definition starts the definition of a component position. It ends with the start of a new panel or shuttering definition for a different position.

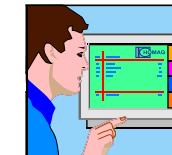
Command	Parameter	Description
PLI0	lx, by, hz, x, y, i, name [, z]	Inside panels, layer 0 – 10 lx: Length by: Width hz: Height x, y: Position i: Material index name: Name z: Position {value is calculated}
...		
PLI10		
PLA0	lx, by, hz, x, y, i, name [, z]	Outside panels, layer 0 – 10 lx: Length by: Width hz: Height x, y: Position i: Material index name: Name z: Position {value is calculated}
...		
PLA10		
SLI1	lx, by, hz, xlu, ylu,	Inside shuttering, layer 1 – 10 lx: Length by: Width hz: Height xlu, ylu: Bottom left coordinates
...	xmu, ymu, xru, yru, xro, yro,	xmu, ymu: Bottom center coordinates
SLI10	xmo, ymo, xlo, ylo, i, name [,z]	xru, yru: Bottom right coordinates xro, yro: Top right coordinates xmo, ymo: Top center coordinates xlo, ylo: Top left coordinates i: Material index name: Name z: Position {value is calculated}



**Note:** PLI0 is a panel within the beam layer.



**Note:** PLA0 is a panel within the beam layer.



Command	Parameter	Description
SLA1	lx, by, hz, xlu, ylu,	Outside shuttering 1 – 10
...	xmu, ymu, xru, yru, xro, yro,	lx: Length
SLA10	xmo, ymo, xlo, ylo, i, name [,z]	by: Width hz: Height xlu, ylu: Bottom left coordinates xmu, ymu: Bottom center coordinates xru, yru: Bottom right coordinates xro, yro: Top right coordinates xmo, ymo: Top center coordinates xlo, ylo: Top left coordinates i: Material index name: Name z: Position {value is calculated}

The parameter [z] was optional up to interface version 3.3.

All data types, with the exception of "name" and "i": floating point number

Data type of i: Natural number

Data type of name: Character string

All readable characters from the ASCII character set are allowed.

Exceptions: , < > : # \$ % = ; ! \ |

**Note:**

- Panels are generally defined precisely by the outlining polygon.
- If polygon points are specified for PLI and PLA, the definition of the polygon points takes precedence over the parameters "lx" and "by". In total, polygon points must define one plane. Optional, missing attributes of PLI or PLA can be specified in more detail using attributes of the polygon points. The polygon points must describe precisely one surface. The polygon path should be closed. It is not possible to define warped planes.
- If different height definitions are specified within a panel layer, the lowest height applies as the height for the entire panel layer. This means that at certain positions, the tool is lower than permissible and there is a risk of collision. Therefore, define the Z coordinates of all panels completely.
- Panels with a height of 1 mm and less are not taken into account during the offset calculation.



### 3.2.3 Unprocessed parts

Nesting can be defined using unprocessed parts.

An unprocessed part can contain one or more components of the types LS, QS, OG, UG, BTn.

The unprocessed part itself does not have any processing steps.

Command	Parameter	Description
RT	lx, by, hz, x, y, z, i, name	Unprocessed part, followed by component definitions lx: Total length (:float) by: Total width (:float) hz: Total height (:float) x, y, z: Position (:float) i: Material index (:ushort) name: Component name (:string) <i>All readable characters of the ASCII character set are allowed.</i> <i>Exceptions: , &lt; &gt; : # \$ % = ; ! \  </i>
ENDRT		End of the unprocessed part definition

### 3.2.4 Modules

Defines prefabricated components, and their processing steps, that are combined into an assembly.

Command	Parameter	Description
MODUL	lx, by, hz, x, y, name[,z]	Assembly, followed by components and their processing steps lx: Length (:float) by: Width (:float) hz: Height (:float) X, y: Position (:float) name: Name (:string) <i>All readable characters of the ASCII character set are allowed.</i> <i>Exceptions: , &lt; &gt; : # \$ % = ; ! \  </i>
ENDMODUL		z: Position {0} (:float) End of assembly definition

Components and processing steps within a module refer to an element coordinate system that starts in the origin of the module.



### 3.3 Spatial processing plane

The spatial processing plane defines a new coordinate system.

Command	Parameter	Description
RBE2	e, x, y, z, $\alpha$ , $\gamma$ , $\delta$	Spatial processing plane for beams e: reference plane. Value range: - Component processing: 1...6 - Panel processing: 2 x,y,z: Position $\alpha$ : Rotation angle to the X axis $\gamma$ : Tilt angle to the y' axis $\delta$ : Rotation angle to the x" axis
ENDRBE2		End of the spatial processing plane

Data types: floating point number. Exceptions "e": Natural numbers.

Processing steps that can be combined with RBE2 are: PAF, PZF, and TA

The processing steps within an RBE2 / ENDRBE2 bracket with the same nesting index refer to the coordinate system drawn out with RBE2

The spatial processing plane RBE2 can generally be nested. However, only one nesting level is possible at present.

For panel and layer processing steps, the specification ,e' is ignored and the position x, y, z is specified in the element coordinates system.

Rotations around alpha  $\alpha$ , gamma  $\gamma$  and delta  $\delta$  follow shifts in the X, Y and Z directions. The dependency of the angles is: delta is dependent on gamma, gamma is dependent on alpha.

Alpha describes a rotation around the Z axis, gamma a rotation around the X axis, and delta a rotation around the z" axis. In each case the rotation is in the mathematically positive direction, i.e. for a coordinate arrow directed towards itself, counter-clockwise.

The depth of eroding processing must be specified as a positive value. The processing operates counter to the z" axis of the new coordinate system drawn out. Specifications of the length refer to the x" axis, width specifications to the y" axis.



4.7.2

No longer supported form of the spatial processing plane

Command	Parameter	Description
RBE	x, y, z, $\alpha$ , $\gamma$ , e	<p>Spatial processing plane for beams</p> <p>x, y, z: Position</p> <p><math>\alpha</math>: Observe the rotation angle of the RBE reference plane</p> <p><math>\gamma</math>: Observe the tilt angle of the RBE reference plane</p> <p>e: reference plane. Value range: 1...4</p>

**Note:** This keyword has been withdrawn.



## 3.4 Operations

### 3.4.1 Component processing steps

Component processing steps can be applied to the components: UG, OG, LS, QS, BT4, BTn, RT

Command	Parameter	Description
SG	x, y, z, α, γ, h, e, i [, β [, s]]	<p>Sawing</p> <p>x, y, z: Position in the element coordinate system</p> <p>α: Rotation angle of the saw</p> <p>γ: Tilt angle of the saw</p> <p>h: Depth of the saw cut perpendicular to the reference plane in the position (x,y,z)</p> <p>e: Reference plane for angle (1–6)</p> <p>i: Control code 1=positive correction relative to the X axis 2=negative correction relative to the X axis 3=no correction <i>For reference plane 5 and 6, the correction is relative to the Y axis.</i></p> <p>β: tilt angle in the cutting surface {0}</p> <p>s: s = 1: Relative to the cutting surfaces s = 0: Relative to reference edges (standard      value)</p>
KN	x, e, txt [, y [, z [, i]] ]	<p><b>Note:</b> SG defines a half-plane along the sawing line. Define point-to-point saw cuts with PSG</p> <p>Identification</p> <p>x: Position</p> <p>e: Reference plane</p> <p>txt: Identification (40 character limit) <i>All readable characters from the ASCII character set are allowed.</i> <i>Exceptions:</i> , &lt; &gt; : # \$ % = ; ! \  </p> <p>y: Position {0}</p> <p>z: Position {0}</p> <p>i: Control code {0}</p>
MPL	xa, ya, xe, ye, i, e	<p>Marking line</p> <p>xa, ya: Start point</p> <p>xe, ye: End point</p> <p>i: Control code</p> <p>e: Reference plane</p>
PML	e	<p><b>Note:</b> PML will replace MPL in the medium term.</p> <p>Marking line, subsequent polygon points</p> <p>e: Reference plane</p>



Command	Parameter	Description
PAF	e [,i [,T ]]	<p>Start of countersinking, subsequent polygon points</p> <p>e: Reference plane</p> <p>i: Trimming according to the rules of the machine (0), No trimming (1), Trimming (2) {0}</p> <p>T: Tool number {0}</p> <p>Up to and including interface version 3.3, the machine's control system determined whether the material was trimmed depending on the contour surface. There was no trimming with complex contours. Complex contours are those with which the surface cannot be calculated directly.</p> <p>From interface version 3.4, the polygon trimming (PAF) control code controls whether trimming takes place.</p>
PSG	e [, T]	<p>Start of a sawing polygon, subsequent polygon points</p> <p>e: Reference plane</p> <p>T: Tool number {0}</p>
PZF	e	<p><b>Note:</b> PSG must not separate a component longitudinally.</p> <p>Only polygon points of the type "PP" permitted</p> <p>Start of a tenon joint, subsequent polygon points</p> <p>e: Reference plane</p>
SZ	x, l	<p>Blocked zone of plates.</p> <p>This zone describes the area between two elements that are attached to one another (e.g. in a "multiwall").</p> <p>No processing can take place in this area. In addition, any processing of an overhanging panel cannot infringe on this zone (e.g. a mounting).</p> <p>x: Position on the plate</p> <p>l: Length of the blocked zone</p>



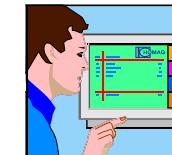
#### Notes:

The tool number T = 0 causes the machine to determine the tool.



Processing steps no longer supported

Command	Parameter	Description
KER	x, txt	Standard notch for roofing parts x: Position txt: Name 2 x SG replaces KER completely.
REFKER	x,txt	Standard notch for roofing parts x: Position txt: Designation
BOZ	x, y, d, t	Drilling in the Z direction x, y: Position d: Diameter t: Signed depth in the Z direction PAF / MP replaces BOZ
BOY	x, z, d, t	Drilling in the Y direction x, z: Position d: Diameter t: Signed depth in the Y direction PAF / MP replaces BOY
BOX	y, z, d, t	Drilling in the X direction y, z: Position d: Diameter t: Signed depth in the X direction PAF / MP replaces BOX
FRZ	x, xb, ty, tz	Trimming in the Z direction x: Position xb: Trimming width ty: Depth in the Y direction tz: Signed depth in the Z direction PAF / PP replaces FRZ
FRY	x, xb ,ty, tz	Trimming in the Y direction x: Position xb: Trimming width ty: Depth in the Y direction tz: Signed depth in the Z direction PAF / PP replaces FRY



Command	Parameter	Description
PFZ	tz	Trimming in the Z direction tz: Signed depth in the Z direction Subsequent trimming polygon PAF / PP replaces PFZ
PFY	ty	Trimming in the Y direction ty: Signed depth in the Y direction Subsequent trimming polygon PAF / PP replaces PFY

All data types, with the exception of "e", "i" and "txt": floating point number.

Data types of e and i: Natural number

Data type of txt: Character string

If a number value is specified as less than zero in the case of the signed depth for BO\_, FR\_ and PF\_, the depth takes effect in the opposite direction to the direction of the corresponding coordinate axis.



### 3.4.2 Panel processing steps, shuttering processing

Panel processing steps can be applied to the components: PLI, PLA, SLI, and SLA  
The execution of the panel processing steps takes place counter to the Z ordinate.

Command	Parameter	Description
PAF	[e [, i [, T ]]]	e: Reference plane { 2} i: Trimming according to the rules of the machine (0), No trimming (1), Trimming (2) {0} T: Tool number { 0}
		Up to and including interface version 3.3, the machine's control system determined whether the material was trimmed depending on the contour surface. There was no trimming with complex contours. Complex contours are those with which the surface cannot be calculated directly. From interface version 3.4, the polygon trimming (PAF) control code controls whether trimming takes place.
PSG	[e [, T ]]	Start of a sawing polygon, subsequent polygon points of the type "PP" e: Reference plane { 2} T: Tool number { 0}
NR	xa, ya, xe, ye, a, i	Nail line xa, ya: Position of the first nail point xe, ye: Position of the last nail point a: Nail distance i: Control code for the nailing/ Stapling device
NBR	x, y, i	The optional subsequent keyword NBR can specify a nail line in more detail. Nail pattern, relative x, y: Nail point-based relative coordinates i: Control code for the nailing/ Stapling device

NBR can only be used in conjunction with NR.



Command	Parameter	Description
PSF		Start of a blocked surface, subsequent polygon points. The polygon must be closed. There is no nailing or stapling within the defined range. → Only the combinations "PP-PP ..." or "MP" are permitted.
PSZ		The control code controls the scope of application. Start of a protected zone, subsequent polygon points. No processing takes place in this area. The machine does not cross the specified surface (e.g. flush boxes). The polygon must be closed. → Only the combinations "PP-PP ..." or "MP" are permitted.
PML		Marking line, subsequent polygon points
KN	x, txt, y, z, i	Identification x, y, z: Position txt: Identification (40 character limit) <i>All readable characters of the ASCII character set are allowed.</i> <i>Exceptions:</i> , < > : # \$ % = ; ! \   i: Control code {0}

### Processing steps no longer supported

Command	Parameter	Description
BOZ	x, y, d, t	Drilling in the Z direction x, y: Drill position d: Drill hole diameter t: Depth of bore hole
		All data types, with the exception of "e", "i" and "txt": floating point number
Data types of e and i:		Natural number
Data type of txt:		Character string



### Notes:

The tool number T = 0 causes the machine to determine the tool.



### 3.4.3 Units

Logical processing consisting of one or more individual processing steps.

Command	Parameter	Description
UNIT	name	Processing group, followed by individual processing steps. The order of the specified processing steps does not necessarily determine the processing sequence.
	name:	Designation. The '@' character is reserved for internal use.
ENDUNIT		End of the processing group

### 3.4.4 External NC programs

The use of external NC programs is possible with NC. NC is being withdrawn.

NC	prog-name [param]*	Call up NC program for special processes. The first parameter determines the program name. All other parameters go directly to the NC program. param: Parameter (:string)
----	--------------------	---

### 3.4.5 Assignment of signs for trimming and drilling

The depth for eroding processing is specified with positive numbers.

Exception: Withdrawn processing steps.

Processing is then counter to the Z axis of the respective plane coordinate system.



## 3.5 Attributes, properties

Attributes and properties of individual structural elements are indicated by the keyword PROPERTY. PROPERTY can be used several times. PROPERTY follows directly behind the structural element, which should be given a property.

Structural elements that can be provided with a PROPERTY: All components from 3.2.1 and 3.2.2 and all processing steps from 3.4.1 and 3.4.2.

Command	Parameter	Description
PROPERTY	n, w;  Data type of 'n': Data type of 'w':	Property of a structural element n: Name of the property w: Value Character string. Either numerical value or character string in double quotation marks (""). On a conceptual level, numerical values are not specified as a character string.

A wood processing machine can use PROPERTY to control and optimize processing sequences. Ask the machine manufacturer which type of machine processes which attributes. Improper utilization of reserved property names may lead to a machine malfunction.

Incomplete list of names of properties reserved by WEINMANN:

"Count", "ProducedCount", "SingleMemberNumber", "StackSize", "Group", "Package", "Storey", "StoreyType", "Designation", "Annotation", "AssemblyNumber", "OrderNumber", "Volume", "UserAttribute:Process", "UserAttribute:ELB"



## 3.6 Polygon paths

You can use polygon paths to specify some processing steps or components in more detail.  
Unless specified otherwise, the following combinations are permitted:

- PP, followed by at least one element PP or KB
- KB, with at least one preceding element PP or KB
- MP and/or TA as a single element

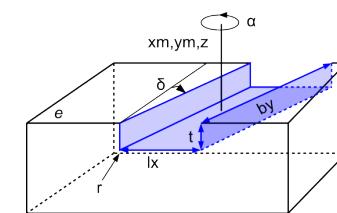
Command	Parameter	Description
PP	x, y, t, i, $\alpha$ , z	<p>Polygon point of a polygon path or the start point</p> <p>x, y: Position</p> <p>t: Depth counter to the Z axis of the reference plane at the point (x,y,z)</p> <p>i: Control code</p> <p><math>\alpha</math>: Tilt angle of the trimming or Sawing line</p> <p>z: Position {0}</p>
KB	x, y, r, typ, t, i, $\alpha$ , z	<p>Target point of the arc</p> <p>x, y: Position of the target point</p> <p>r: Radius</p> <p>typ: Type of the arc</p> <p>Acw: Clockwise arc (<math>\leq 180^\circ</math>)</p> <p>Acc: Counterclockwise arc (<math>\leq 180^\circ</math>)</p> <p>ACW: Clockwise arc (<math>&gt; 180^\circ</math>)</p> <p>ACC: Counterclockwise arc (<math>&gt; 180^\circ</math>)</p> <p>t: Depth counter to the Z axis of the reference plane at the point (x,y,z)</p> <p>i: Control code</p> <p><math>\alpha</math>: Tilt angle of the trimming line</p> <p>z: Position {0}</p>



**Note:** If PP is used in a panel outline or a blocked surface, the specification of x and y suffices.



Command	Parameter	Description
MP	xm, ym, r, t, i, zm	<p>Center point</p> <p>xm, ym: Position of the center point</p> <p>r: Radius <math>&gt;0</math> = clockwise circle <math>&lt;0</math> = counterclockwise circle</p> <p>t: Depth counter to the Z axis of the reference plane at the point (x,y,z)</p> <p>i: Control code</p> <p>zm: Position {0}</p>
TA	lx, by, xm, ym, z, t, r, $\alpha$ , $\delta$ , i	<p>Pocket. Defines internal trimming.</p> <p>lx, by: Edge lengths of the pocket</p> <p>xm, ym, z: Center point or pivot of the pocket</p> <p>t: Processing depth</p> <p>r: Corner radius {0}</p> <p><math>\alpha</math>: Rotation angle. Value range: <math>+- 360^\circ</math> {0}</p> <p><math>\delta</math>: Shear angle. Values: <math>-90^\circ &lt; \delta &lt; +90^\circ</math> {0}</p> <p>i: Control code</p>



T:\|8482\|472053\|X00230TD.png

All data types, with the exception of "typ" and "i": floating point number.

Data types of i: Natural number

Data type of typ: Character string



#### Notes:

- A polygon path does not have to be closed.
- Polygon points have been available since interface version 3.2. From interface version 3.4, the Z ordinates are no longer optional.
- Exception: PP in the context of a panel outline or of a blocked surface.
- For attributes of dual polygon points that cannot be interpolated, the attribute of the end point of a line or an arc applies.
- The elements PP, KB, MP can be used for processing PAF, PZF, and PSF. They can also be used for the components PLI-x, PLA-x, and BTn
- The element TA can only be used for PAF processing.
- PROPERTY must be inserted between the component/processing keyword and PP / KB / MP / TA



4.7.2

## 4 Material index, installation position

### 4.1 Installation position of UG, OG, LS, QS, EBT

The identification of the installation position via the material index is used in conjunction with automatic storage. It can be used to control the material flow through the machine.

The ones position in the material index defines the installation position.

- 0: Normal
- 1: Flat and flush to the external side
- 2: Flat and flush to the internal side
- 3: flat in the center of the wall

The definition of the Z position takes precedence over the installation position.  
The evaluation of the ones position is being withdrawn.

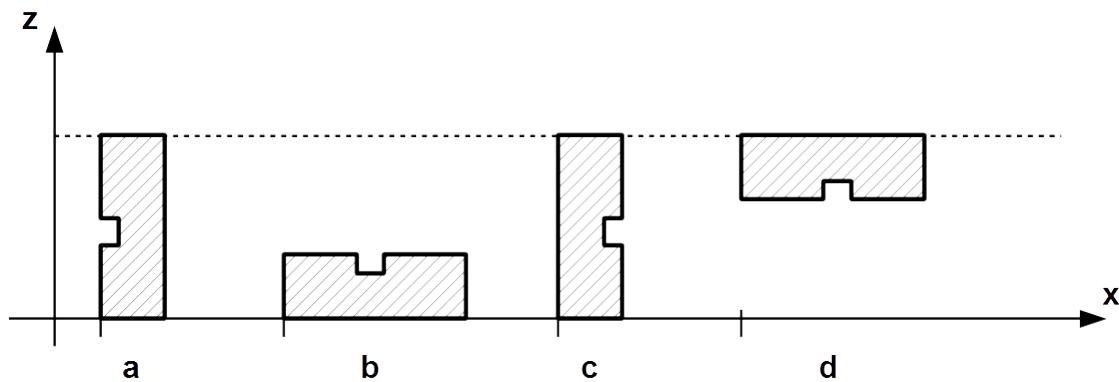
The tens position in the material index defines the rotation around the longitudinal axis of the component.

- 0: Not rotated
- 1: rotated by 90°
- 2: rotated by 180°
- 3: rotated by 270°

If the rotation and alignment are specified, the rotation takes effect before the alignment.

Different materials have different values in the hundreds position of the material index.

Example: Traverse studs, view INNEN



T:\!8482\!472053\X00160TD.png

Definition

i = 11

i = 20

i = 32





4.7.2

## 4.2 Material indices for components

Different materials have different values in the hundreds position of the material index.

The numerical values 0 ... 9900 can be used as required.

The numerical values from 10000 to 29900 and from 32700 are reserved for internal purposes.

## 4.3 Material indices for panels and shuttering

The material index identifies the type of panel.

Material	Index
Wood component	01-09
Fermacell	10-19
Soft fiber panel (Gutex, ...)	20-29
OSB	30-39
Chipboard	40-49
Plaster-base sheeting	50-59
Plaster	60-69
Gypsum plasterboard	70-79
Plastic panel	80-89
Plywood panel	90-99
Plaster	100-109
Shuttering	110-119
Three-layer panel	120-129
Glue	130-139
Insulating plate (Diffutherm)	140-149
Insulating plate (Heraklith)	150-159
Floorboards	160-169
Adhesive tape	170-179
Film/vapor block	180-189*
Plywood panel	190-199
Hardboard	200-209
Profiled panel <sup>1)</sup>	210-219
Porous concrete	220-229
Cavity insulation: cellulose	230-239
Cavity insulation: soft wood fiber	240-249
Cavity insulation: mineral wool	250-259

\*Components in this index range have no influence on the offset and length calculation. The same applies for panels and shuttering with a thickness of 1 mm or less.

<sup>1)</sup> For example, trapezoidal or sinusoidal sheets.



4.7.2

## 5 Control codes for processing steps

### 5.1 Sawing and polygon trimming

The following control codes are used to control the saw or trimming unit.

Control code	PAF meaning	PSG meaning
1	Cylindrical trimmer	Standard saw blade
2	Trimmer with chamfer	Fine-toothed saw blade
3	Trimmer for horizontal groove	Chainsaw
4	Vertical marking trimmer	
5...9	<i>Not used</i>	<i>Not used</i>
10	Overshoot trimming line	Overshoot cut
20	Undershoot trimming line	Undershoot cut
30...90	<i>locked</i>	
100	Tool radius correction "left" Workpiece is located to the right of the processing line	
200	Tool radius correction "right" Workpiece is located to the left of the processing line	
300	No tool radius offset	
400...900	<i>locked</i>	
1000	Synchronous rotation	<i>Not used</i>
2000...9000	<i>locked</i>	

**Note:**

The ones and thousands position of the control code cannot be interpolated. The reference point is therefore always the end point of a partial section of a polygon path.

**Example:**

Cylindrical trimmer (1) + overshotting (10) + tool radius correction to the right (200) + reverse rotation (0000) results in a control code of 211.

#### 5.1.1 Tool category

The ones position in the control code determines the tool category. See the table under 5.1.



4.7.2

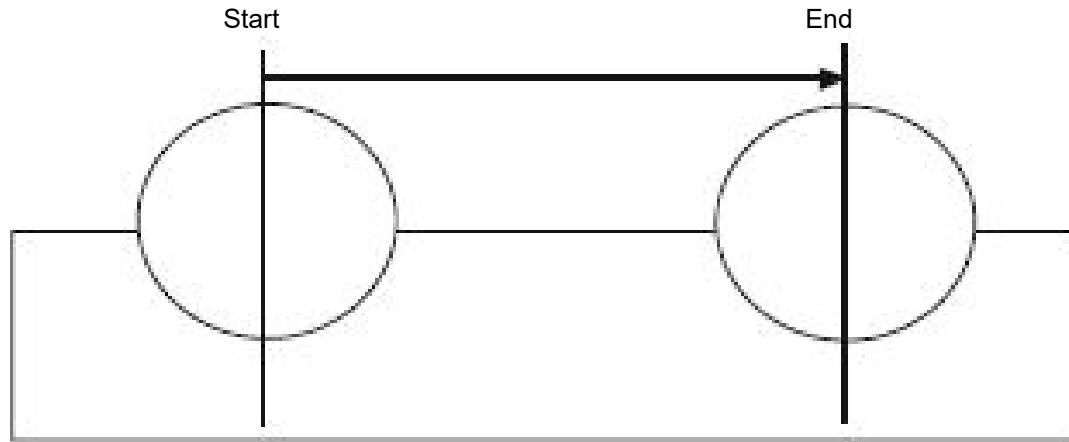
## 5.1.2 Undercut and overcut

The tens position in the control code determines the overcut and undercut.

---

Overcut: control code: xx1x

---

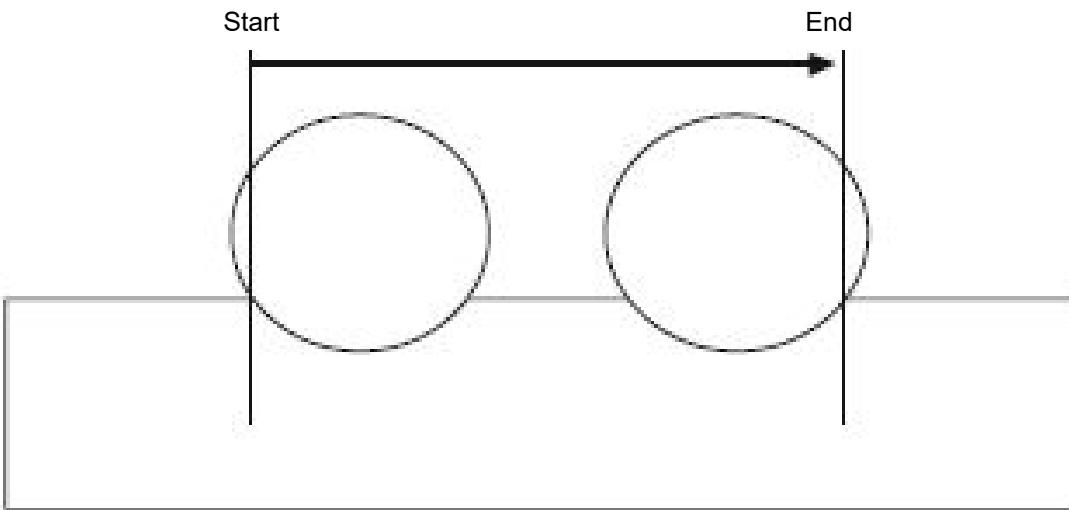


T:\|8482\|472053\|X00011TD.jpg

---

Undercut: control code: xx2x

---



T:\|8482\|472053\|X00012TD.jpg



### 5.1.3 Tool radius correction

The hundreds position in the control code determines the tool radius correction.

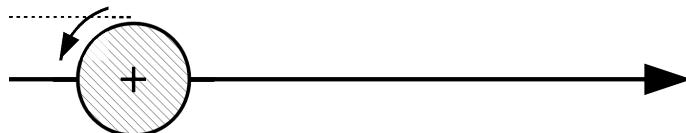
**Note:** The reference for the tool radius correction is the processing direction.

---

#### No tool radius correction (control code 300)

---

Processing direction



T:\|8482\|472053\|X00180TD.png

With control code 300, no differentiation between material waste and a required part is possible.

---

#### Tool radius correction in the processing direction to the left (control code 100)

---

Processing direction



T:\|8482\|472053\|X00170TD.png

The material waste is located on the side of the chipping processing unit.

---

#### Tool radius correction in the processing direction to the right (control code 200)

---

Processing direction



T:\|8482\|472053\|X00190TD.png

The material waste is located on the side of the chipping processing unit.



4.7.2

## 5.1.4 Synchronous and reverse rotation

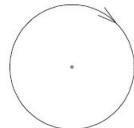
The thousands position of the control code specifies synchronous or reverse rotation for the processing steps. See the table under 5.1.

## 5.1.5 Examples

### Circular notch in a clockwise direction

PAF

MP 3382,40,34,18,211;



T:\l8482\l472053\lX00018TD.jpg

### Closed, rectangular notch

PAF

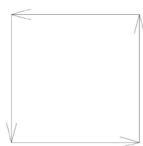
PP 65,2201,34,121,0;

PP 133,2201,34,121,0;

PP 133,2269,34,121,0;

PP 65,2269,34,121,0;

PP 65,2201,34,121,0;



T:\l8482\l472053\lX00019TD.jpg

### Notch with arc

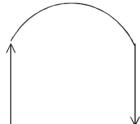
PAF

PP 2000,0,16,211,0;

PP 2000,1800,16,211,0;

KB 3000,1800,800,Acw,16,211,0;

PP 3000,0,16,211,0;



T:\l8482\l472053\lX00022TD.jpg

## 5.2 Pocket trimming

The trimming unit is activated via control codes.

Control code	Meaning
0	Overcut/undercut according to the machine rules
1	Overcut
2	Undercut

**Note:**

The specification for overcut or undercut refers to all four corners of a pocket.



## 5.3 Highlight

The activation of the marking unit for MPL and PML processing is via control codes.

Control code	Meaning
1	Inkjet printer
2	Ballpoint pen
3	Marking awl
10	Marking on the opposite plane
20	Marking on the definition plane/layer
100	Line color: black
200	Line color: blue
300	Line color: green

**Note:**

The control codes cannot be interpolated. They are therefore always based on the end point of a partial section of a polygon path.

**Example:**

Black line with ballpoint pen on panel: 122

## 5.4 Polygon bocked surfaces

The control code of a blocked surface qualifies the blocked surface for ...

Control code	Processing class
0	Fixtures
1	Glueing
2	Plastering



4.7.2

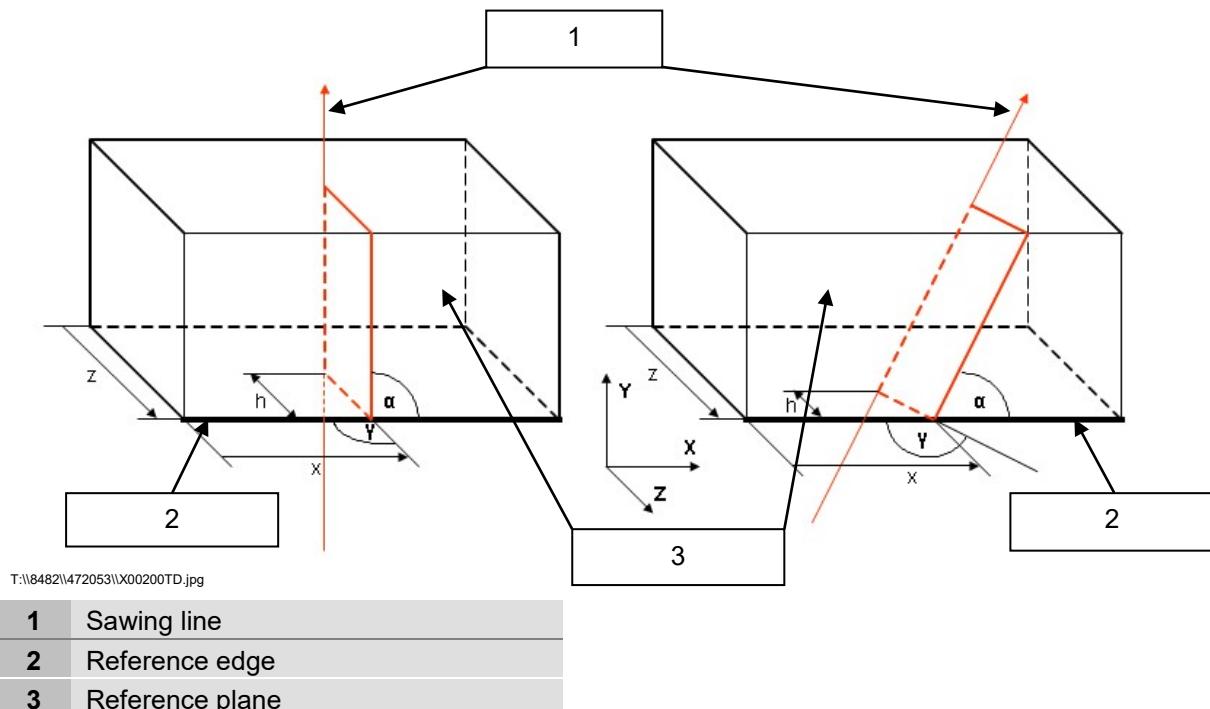
## 6 Angles and radii

### 6.1 Rotation and tilt angle of spatial processing plane RBE2

Starting from the image under 1.3.5, the transformation from Figure a.) to Figure b.) arises through the positive angle  $\alpha$ . The transformation from b.) to c.) arises through the positive angle  $\gamma$ . A positive angle  $\delta$  would rotate the plane from Figure c.) around the already transformed Z" axis again.

### 6.2 Rotation, tilt, and gradient angle of the saw cut SG

#### 6.2.1 Saw cut without gradient angle



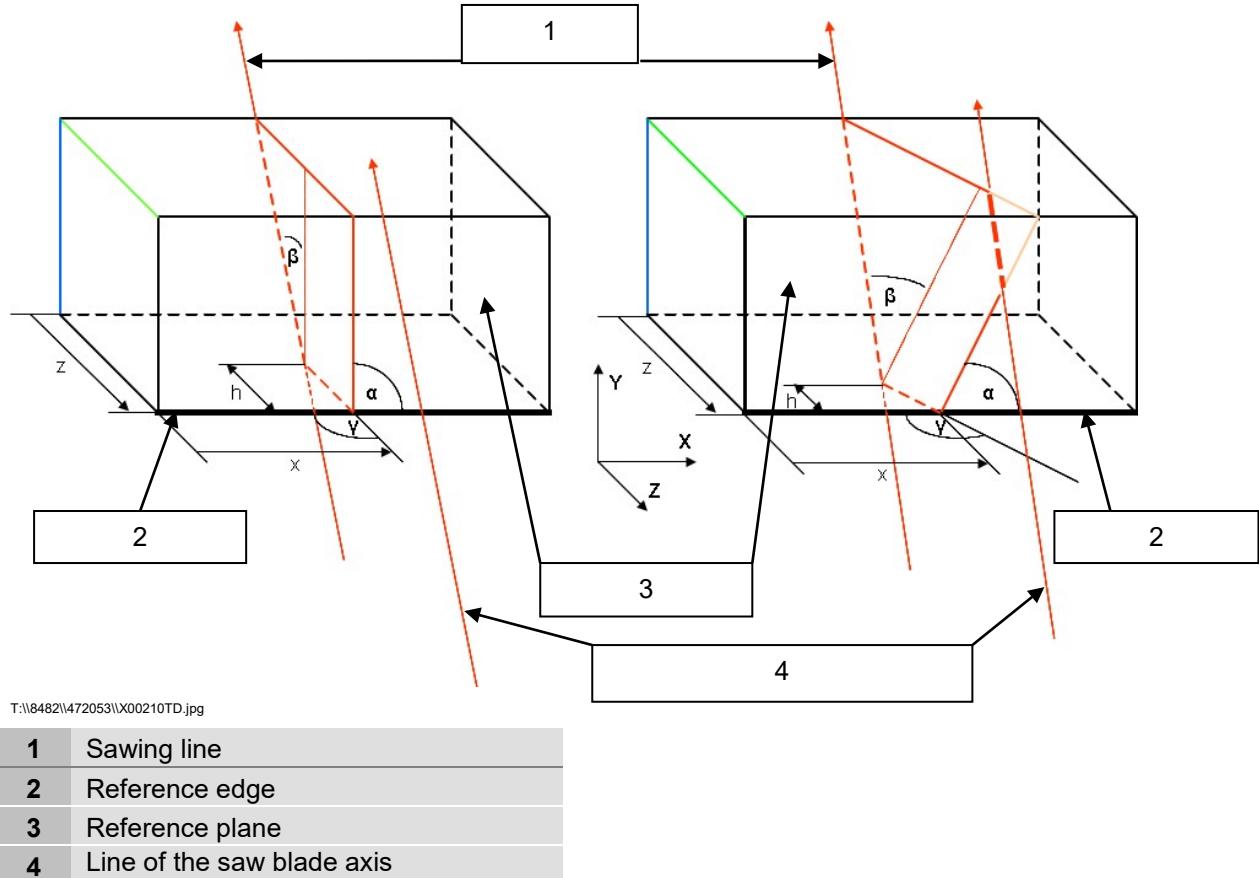
Please note:

The tilt angle  $\gamma$  relates to edges or surfaces depending on the value of the s bit.  
See definition of the saw cut.



4.7.2

## 6.2.2 Saw cut with gradient angle



Please note:

In the reference drawing, the gradient angle  $\beta$  has a positive numerical value.

LS 4519.4,100,200,0,0,10000,Kehlschifter links,0;  
SG 500,0,200,90.000,90.000,100,2,2,40.000,1;



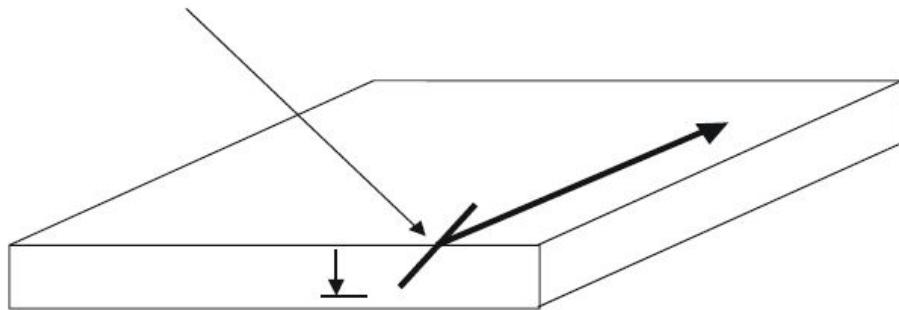
4.7.2

## 6.3 Tilt angle for polygon points PP, KB, and MP

The tilt angle of a polygon point always references to the tangent of the processing line in the processing direction at this point.

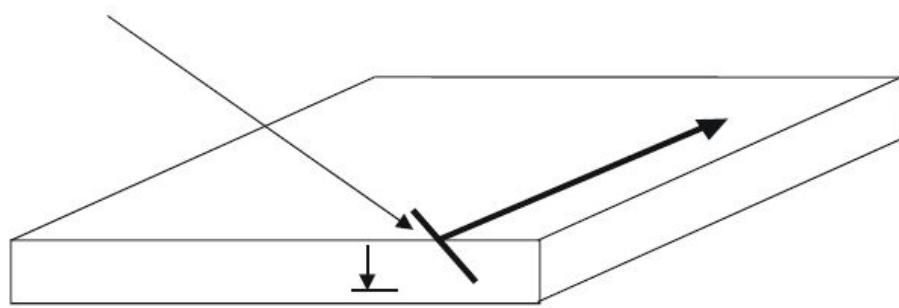
If two sequential polygon points have different tilt angles, the tilt angle between the two points is interpolated linearly.

Positive tilt angle: clockwise in the direction of the processing line



T:\|8482\|472053\|X00016TD.jpg

Negative tilt angle: counter-clockwise in the direction of the processing line



T:\|8482\|472053\|X00017TD.jpg

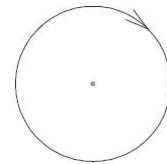


## 6.4 Radius for polygon point MP

If a positive radius is specified, an arc is processed in the clockwise direction.

If a negative radius is specified, an arc is processed in the counterclockwise direction.

The specifications refer to a consideration counter to the Z axis of the corresponding coordinate system.



T:\18482\472058\X00018TD.jpg



4.7.2

## 7 Examples

### 7.1 Example file header

```
TXT      Created by wupEditor;  
VERSION 3.5;  
ANR     1834;  
ELB     GABLE;  
ELN     gi003686;  
ZNR     4921;  
REIHE   1;  
ELA     INSIDE;  
ELM     8144, 2852, 192, 1;  
CAD     ;  
CADRELEASE ;
```

### 7.2 Example: components

Upper beam

```
OG      8932,80,80,0,2520,0,Obergurt,0;
```

Bottom plate (threshold)

```
UG      8932,80,80,0,0,0,Untergurt,0;
```

Transverse stud

```
Crosscut 2440,80,80,0,80,0,Stiel-W,0;
```

Horizontal beam

```
LS      890,60,80,4210,2100,0,Sturz,0;
```

Component with 4 corner points

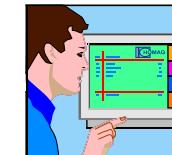
```
BT4     2440,165,80,2375,80,2540,80,2540,2339,2375,2520,0,Stiel-S,0;
```

Component with 6 corner points

```
BT6     2440,165,80,2375,80,2458,80,2540,80,2540,2339,2459,2520,2375,2520,0,Stiel-S,0;
```

Built-in part

```
EBT    890,60,80,4210,2100,1,Eisenträger,0;
```



## 7.3 Example of panels

### Panel, layer 1, inside

```
PLI1      643,2600,15,6251,0,40,Spanplatte,220;  
PP       6251,0,15,0,0.220;  
PP       6894,0,15,0,0.220;  
PP       6894,2600,15,0,0.220;  
PP       6251,2600,15,0,0.220;  
PP       6251,0,15,0,0.220;
```

### Panel, layer 2, inside

```
PLI2      643,2600,15,6251,0,40,Spanplatte,235;  
PP       6251,0,15,0,0.235;  
PP       6894,0,15,0,0.235;  
PP       6894,2600,15,0,0.235;  
PP       6251,2600,15,0,0.235;  
PP       6251,2600,15,0,0.235;
```

### Panel, layer 1, external side

```
PLA1      643,2600,15,6251,0,40,Spanplatte,-100;  
PP       6251,0,15,0,0,-100;  
PP       6894,0,15,0,0,-100;  
PP       6894,2600,15,0,0,-100;  
PP       6251,2600,15,0,0,-100;  
PP       6251,0,15,0,0,-100;
```

### Panel, layer 2, external side

```
PLA2      643,2600,15,6251,0,40,Spanplatte,-115;  
PP       6251,0,15,0,0,-115;  
PP       6894,0,15,0,0,-115;  
PP       6894,2600,15,0,0,-115;  
PP       6251,2600,15,0,0,-115;  
PP       6251,0,15,0,0,-115;
```



## 7.4 Example slats and contra slats

### Contra slats

```
PLA1    2579,70,24,58,0,3,PLA #1,200;
PP      58,0,24,0,0.200;
PP      2637,0,24,0,0.200;
PP      2637,70,24,0,0.200;
PP      58,70,24,0,0.200;
PP      58,0,24,0,0.200;
NR      78,48,2617,48,250,10;
PLA1    5625,70,24,58,867,3,PLA #2,200;
PP      58,867,24,0,0.200;
PP      5683,867,24,0,0.200;
PP      58,937,24,0,0.200;
PP      58,867,24,0,0.200;
NR      78,902,4983,902,250,10;
```

### Slat

```
PLA2    50,2744,38,319,0,PLA #1,224;
PP      319,0,38,0,0.224;
PP      369,0,38,0,0.224;
PP      369,2744,38,0,0.224;
PP      319,2744,38,0,0.224;
PP      319,0,38,0,0.224;
NR      344,48,344,48,1,10;
NBR    0,0,2;
NR      344,1828,344,1828,1,10;
NBR    10,-5,2;
NBR    -10,5,2;
NR      344,2729,344,2729,1,10;
NBR    10,10,2;
NBR    -10,-10,2;
```



4.7.2

## 7.5 Polygon paths

### Closed polygon path

```
PAF;  
PP      65,2201,34,121,0,0;  
PP      133,2201,34,121,0,0;  
PP      133,2269,34,121,0,0;  
PP      65,2269,34,121,0,0;  
PP      65,2201,34,121,0,0;
```

### Open polygon path

```
PAF;  
PP      100,0,20,111,0,0;  
PP      100,500,20,111,0,0;  
PP      200,700,20,111,0,0;  
PP      200,1000,20,111,0,0;  
PP      500,1000,20,111,0,0;  
PP      500,150,20,111,0,0;
```

### Polygon path with arc

```
PAF;  
PP      2000,0,16,211,0,0;  
PP      2000,1800,16,211,0,0;  
KB      3000,1800,800,Acw,16,211,0,0;  
PP      3000,0,16,211,0,0;
```



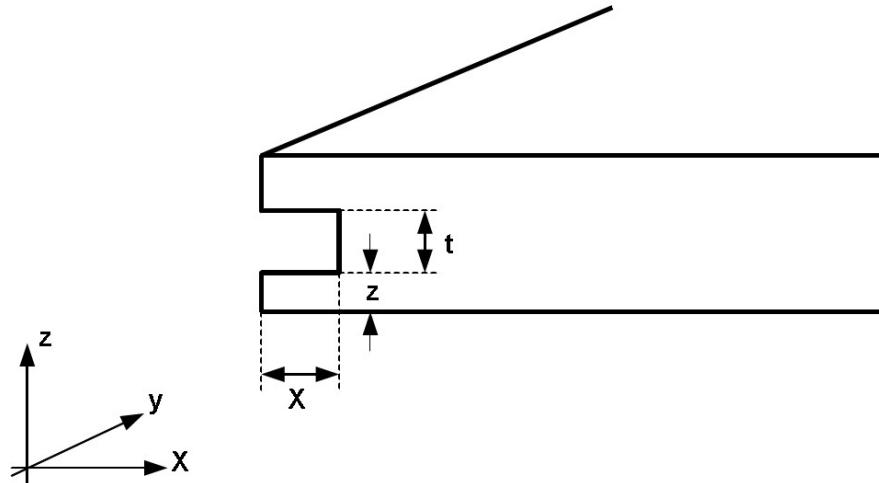
4.7.2

## Polygon path for lateral groove

PAF;

PP            40,0,35,113,0,30;

PP            40,1800,35,113,0,30;



T:\l8482\l472053\lX00220.jpg



4.7.2