File Format Specification for DUBUS interface
Version K - 2025-07-09

Contends

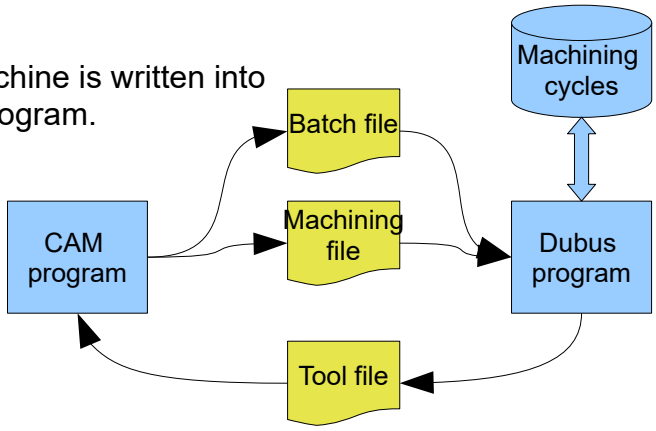
Changes in version G are highlighted in orange
Changes in version H are highlighted in green
Changes in version I are highlignted in pink
Changes in version J are highlignted in blue
Changes in version F are highlighted in yellow

1 Definitions

The CAM program describes finished parts (pieces) to be produced in a file called a batch file. This file specifies section, color, and length of the raw material (bars), lengths, cuts and labels of pieces, names and positions of machining operations.

The Dubus program associates the name of operation with a machining cycle. This machining cycle can either be entered by the user, or read in an additional file called a machining file.

The list of tools available on the machine is written into a file called tool file by the Dubus program.



2 Batch File Format

Text file
File name : 20 characters maximum
File extension : .LOT

The data for each record entry is written on one line, comprised of specific fields separated by a semicolon.

The first field of each record gives its category. The other fields give data according to their category.

Categories are:
- DB for Bar data. See 2.1
- DP for Piece data. See 2.2
- OP for machining Operation data. See 2.3
- ET for Label data. See 2.4

Types of data are:
- *Reference* 20 characters maximum, uppercase letters, figures or underscore only.
- *Dimension* Numerical value, in millimeters. Decimals are taken into account.
- *Angle* Numerical value, in degrees. Decimals are taken into account.
- *Number* Whole number (no decimals)
- *Text* Free text, 80 characters maximum, without semicolon or return.
- *Symbol* Either a letter or a letter plus a 3 digits figure (see figure 2.2)

2.1 DB - Bar records

Each DB record defines a new bar.

DB ; Section ; Color ; Nominal_length ; User_instructions ; Offcut_label

Section	*Reference*	Name of the cross-section of the bar.
Color	*Reference*	Name of the color of the bar.
Nominal_length	*Dimension*	Length of the bar to be loaded in the machine. Both nominal length given by batch file and minimum length calculated by the machine are shown on the screen.
User_instructions	*Text*	Special instruction for the machine operator, e.g. position of the bar in the magazine
Offcut_label	*Text*	Text to be printed on the offcut label, with offcut length, section and color.

Example ‘`DB;101428;WHITE;6500;Rack #18;Reserved for batch 678`’ means a 6.5m long bar of white 101428 section to be found in rack 18. The offcut is reserve for batch 678.

2.2 DP - Piece records

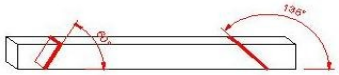
Each DP record defines a new piece. The piece is cut in the current bar.

DP ; Length; Left_Cut ; Right_Cut ; Id ; Steel; Rack; Box

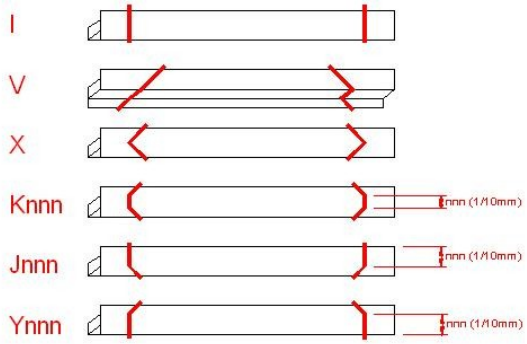
Length	*Dimension*	Length of the piece, measured along the reference line of the bar.
Left_Cut, Right_Cut	*Angles or symbol*	Cut angle in degrees, from 30° to 150°, for a one-blade saw Or Symbol for a three-blades saw Or Symbol for a machine equipped with 2 pivoting saws (see diagrams).
Id	*Reference*	Unique id of the piece, used to find the piece if it has to be cut again.
Steel	*Reference*	Steel reinforcement name. This field stays empty if the piece is not reinforced.
Rack, Box	*Numbers*	Storage position of the finished piece.

Id, Steel, Rack and Box fields are optional
For compatibility with older version of batch-file, Left_Cut and Right_Cut could be changed in First_Cut and Last_Cut

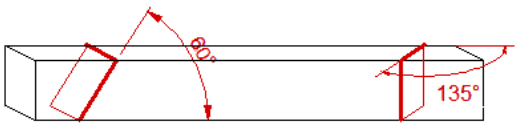
Cut angle for a one-blade saw



Cut symbols for a 3 blades saw



Cut symbols for a machine equipped with 2 pivoting saws



Haaa for a cut around a horizontal pivot
Vaaa for a cut around a vertical pivot

Example '`DP;703.2;V;V;044CC68TH`' means a 703.2mm long piece, with mitered cuts, whose ID is 044CC68TH .

2.3 OP - Machining operation records

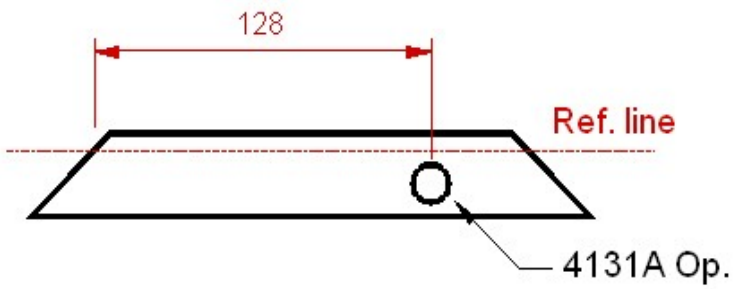
Each OP record defines a machining operation for the current piece.

OP ; Operation ; Position_X

Operation	*Reference*	Name of the machining operation. A set of parameters describes each operation on each cross-section. The set comprises: the tool number, the approach position, the tool-path ... Note 1: It is important that the same machining operation always has the same name to limit the number of operations declared and allow the user to modify them on the machine Note 2: symmetrical operations have different names (e.g. keyhole on a left or a right jamb).
Position_X	*Dimension*	Distance between the left end of the piece and the reference point of the operation, measured along the reference line of the bar

For compatibility with older version of batch file, Position_X could be the distance between the first end of the piece and the reference point of operation

Example '`OP;4113A;128`' means an operation 4113A positioned at 128mm from the left end of the piece (see diagram). The reference line is adjustable by the user on each section.



2.4 ET - Label records

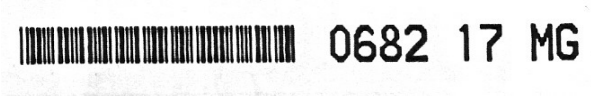
The ET record defines the label of the current piece. Only one label can be printed on each piece. The label layout depends on the printer.

ET ; Logo ; Barcode ; Text_1 ; Text_2 ; Text_3 ; Text_4 ; … ;Text_20

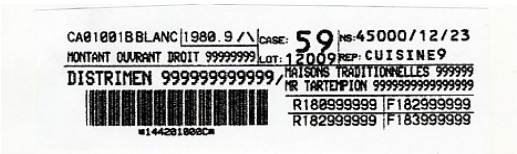
Logo	*Reference*	Name of the drawing to print. Usable only with Imaje or Windows driven printer. With Imaje printer, the logo is made of a sequence of graphical characters resident in the printer memory. With a Windows driven printer, the drawing is a monochrome bitmap, 200 x 200 dots.
Barcode	*Text*	Data to print in barcodes. Usable characters and maximum size of barcode field depends on the choice of the printer, the label size and the kind of bar codes (e.g. Code39, Code128, EAN13…)
Text_XX	*Text*	Data to print. Font, size and position of each field is adjustable by the user.

Examples of labels

- Imaje printer '`ET;;068217MG;0682 17 MG`'



- Zebra printer '`ET;;144201000C;59;12009;CUISINE9;45000/12/23;CA01001BBLANC`…



- Windows driven printer '`ET; F52730;F52730004;405;1;12063_001_Frame_(Left_jamb)`…

2.5 Example of batch file

File	Comments
DB;MP408;BL;6000;Ouvrant Série Equinoxe	New bar
DP;2240;V;V;044CC68205MD;;	New piece
OP;4160A;934.2	Mach. Op.
ET;;;05;ROU0737145GA;MD/2240,0/044CC682/05/-;;;;;;;;	Mach. Op.
DP;703.2;V;V;044CC68209TH;;	Mach. Op.
ET;;;09;-;TH/ 703,2/044CC682/09/-;;;;;;;;	Label
DP;703.2;V;V;044CC68209TB;;	New piece
OP;4131A;128	Mach. Op.
OP;4131A;575.2	Mach. Op.
OP;4171B;609.7	Mach. Op.
OP;4171B;93.5	Mach. Op.
ET;;;09;ROU6007097GA;TB/ 703,2/044CC682/09/-;;;;;;;;	Label
DP;703.2;V;V;044CC68210TH;;	New piece
ET;;;10;-;TH/ 703,2/044CC682/10/-;;;;;;;;	
DP;664.2;V;V;044CC68204TH;;	New piece
ET;;;04;-;TH/ 664,2/044CC682/04/-;;;;;;;;	
DP;664.2;V;V;044CC68204TB;;	New piece
OP;4131A;128	
OP;4131A;536.2	
OP;4171B;570.7	
OP;4171B;93.5	
ET;;;04;ROU6007097GA;TB/ 664,2/044CC682/04/-;;;;;;;;	
DB;MP408;BL;6000;Ouvrant Série Equinoxe	New bar
DP;2260;V;V;044CC68211MG;;	
OP;4159A;1325.8	
ET;;;11;ROU0737145GA;MG/2260,0/044CC682/11/-;;;;;;;;	

BAR 1 — PIECE 1 … PIECE 5

BAR 2 — P 6

3 Machining file format

Text file
File name : 20 characters maximum
File extension : .USI

The data for each record entry is written on one line, comprised of specific fields separated by a semicolon.

The first field of each record gives its category. The other fields give data.

Categories are:
- OC for complete operation data
- OB for basic operation data
- D1…D0, A1...A0, EY, DM, LG, RD, HT, ST, NT, DI, RO, LS, AS, QL for dimensional parameters

Types of data are:
- *Reference* 20 characters maximum, uppercase letters, figures or underscore only.
- *Dimension* numerical value, in millimeters. Decimals are taken into account.
- *Angle* numerical value, in degrees. Decimals are taken into account.
- *Number* whole number (no decimals)
- *Text* free text, 80 characters maximum, without semicolon or return.

3.1 OC - Complete operation

A complete operation gives details about machining operation used by the batch file.
A complete operation is made of one or more basic operations.

OC ; Operation ; Section; Sorting ; Comment

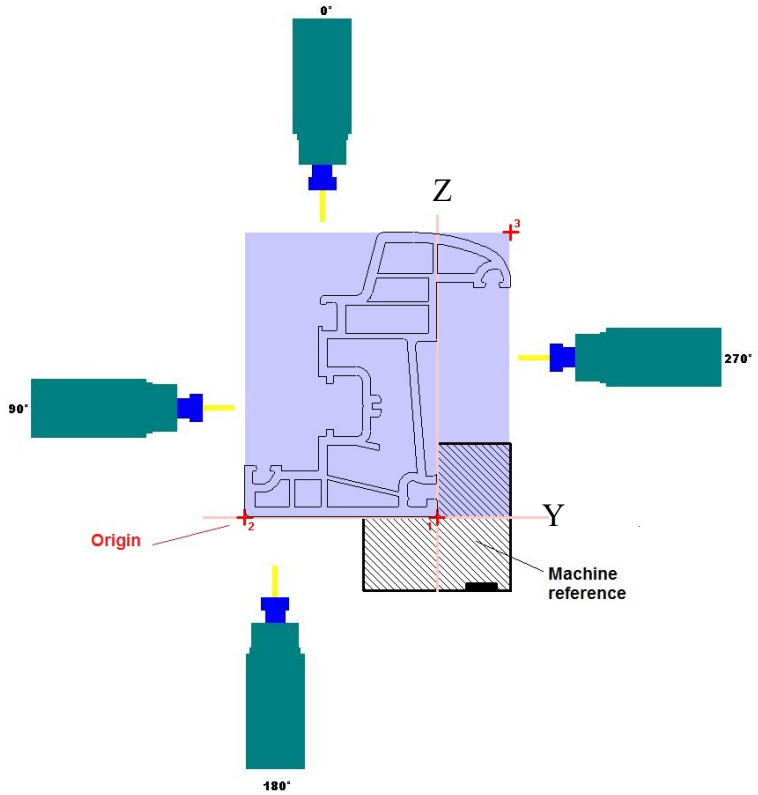
Operation	*Reference*	Name of the machining operation. See 2.3 It is important that the same machining operation always has the same name to limit the number of operations declared and allow the user to modify them on the machine
Section	*Reference*	Name of the cross-section of the bar. See 2.1
Sorting	*Number*	0: machine will automatically choose the shortest order for completing basic operations 1: machine will follow the order of the file for completing basic operations
Comment	*Text*	Additional user information

3.2 OB - Basic Operation

Each OB record defines a new basic operation. This basic operation is part of the current Complete Operation.

OB ; Shape ; Origin; Pos_X ; Pos_Y ; Pos_Z ; Pos_A ; Comment; Name

Shape	*Reference*	CIRCLE, RECTANGLE, KEYHOLE, TAP or FREE_CONTOUR.
Origin	*Number*	1 = machine reference (see diagram) 2 = lower left corner of the section (Y min, Zmin) 3 = top right corner of the section (Y max, Z max)
Pos_X, Pos_Y, Pos_Z	*Dimension*	Position of the reference point of the operation from the reference point of the section (see diagram).
Pos_A	*Angle*	Angular position of the operation around X axis (see diagram).
Comment	*Text*	
Name	*Text*	Basic operation name (optional)



Legend:

Blue	Motor and chuck,
Black	Bar,
Hatches	Machine bed

3.3 Dimensional parameters

Parameters for the current basic operation.

D1 ; Depth_1
…
D9 ; Depth_9
D0 ; Depth_10
A1 ; Approach_1
…
A9 ; Approach_9
A0 ; Approach_10
EY ; Empty
DM ; Diameter
LG ; Length
RD ; Radius
HT ; Height
~~ST ; Thread~~
NT; Tool_number;
DI; Work_direction
RO; Rotation
AS: Axial_Speed
LS; Lateral_Speed
SP; Start_point
NP; Next_point
QL; Quality
DR; Delta Radius
CD; Cutting depth

Depth	*Dimension*	Tool go to Approach position at full speed then to
Approach	*Dimension*	Depth position using axial feed rate (see diagram below)
Empty	*Number*	0=>cut around 1=>empty the pocket
Diameter	*Dimension*	
Length	*Dimension*	
Radius	*Dimension*	
Height	*Dimension*	
~~Thread~~	*~~Dimension~~*	~~Screw pitch (deprecated)~~
Tool_Number	*Number*	
Work_Direction	*Number*	1=>Work against feed 2=>Work in feed direction
Rotation	*Angle*	Angle of rotation of the shape
Axial_speed	*Number*	Axial feed rate (mm/min)
Lateral_Speed	*Number*	Lateral feed rate (mm/min)
Start_point	*Dimensions*	X,Y and Z coordinates
Next_point	*Dimensions*	X,Y,Z coordinates; radius; feed rate
Quality	*Number*	0 => priority is given to the speed of execution 1 => priority is given to the quality of machining

Delta_Radius	*Number*	offset between each pass to avoid hitting with the shank of the tool
Cutting_Depth	*Number*	Maximum depth of cut. If Di-Ai>CD, the post-processor will automatically create several passes

Usable parameters depends on shape and machine
Unspecified parameters are set to zero

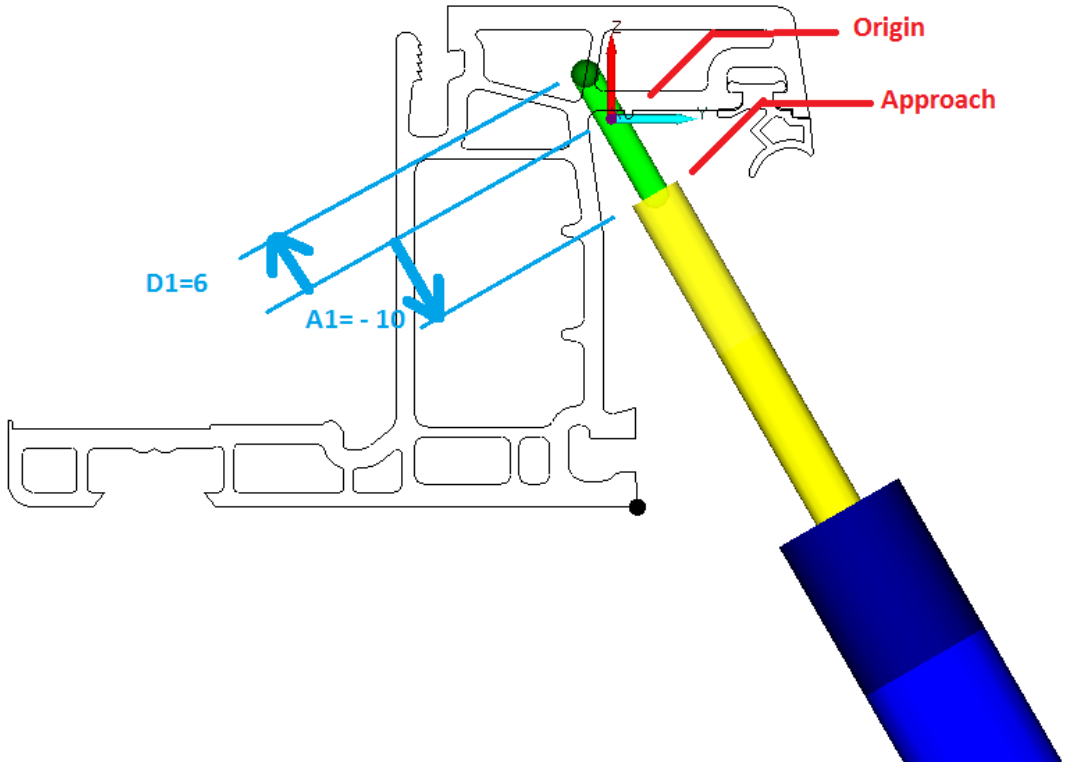


Illustration 1: Approach and depth - exemple 1

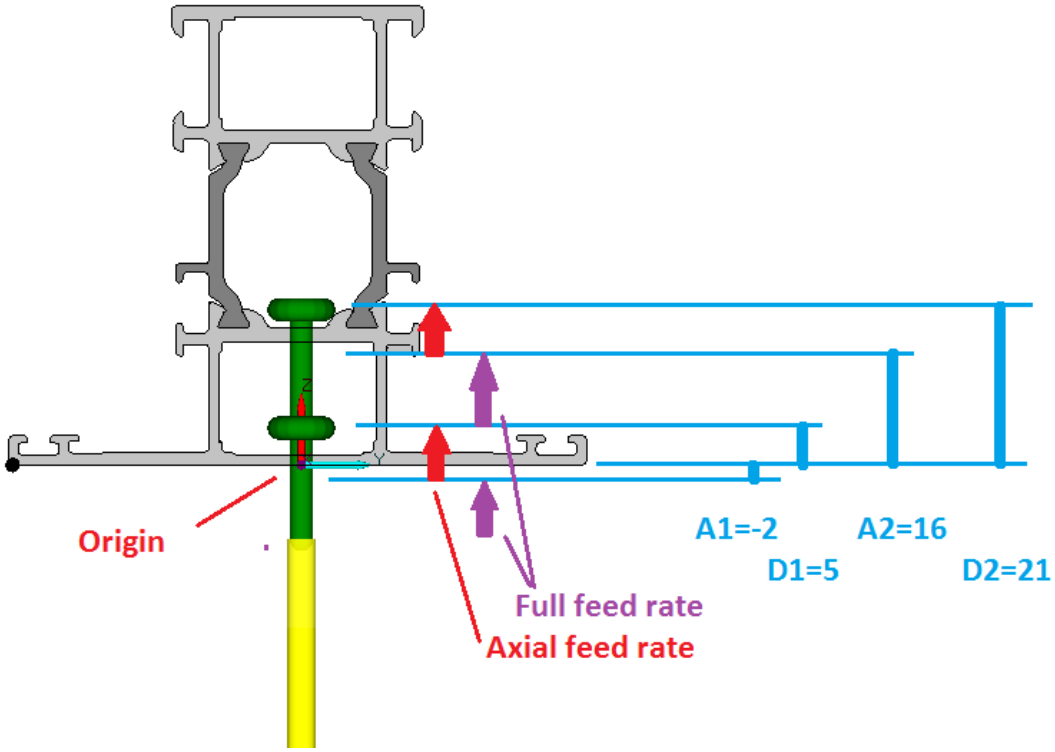


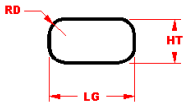
Illustration 2: Approach and depth - exemple 2

3.3.1 Circle

Necessary parameters : NT; D1
Optional parameters : D2...D0; A1...A0; DM; DI; LS; AS; EY; CD; DR

Set DM to zero to drill

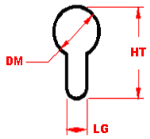
3.3.2 Rectangle



Necessary parameters: NT; LG; D1
Optional parameters : D2...D0; A1...A0; HT; RD; EY; DI; RO; LS; AS; CD; DR

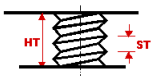
Set HT to zero to mill a slot
Set RD to zero to use tool radius

3.3.3 Keyhole



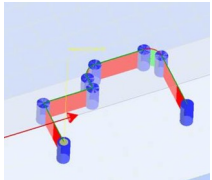
Necessary parameters: NT; DM; HT; LG; D1
Optional parameters : D2...D0; A1...A0; DI; RO; LS; AS; CD; DR

3.3.4 Tap



Necessary parameters: NT; HT
Optional parameters : A1

3.3.5 Free contour



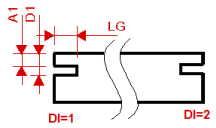
Necessary parameters: NT;SP;NP
Optional parameters: D1,...,D0,A1,...A0,AS, LS

SP parameter contains X,Y and Z coordinates of first point
NP parameter contains X,Y and Z coordinates of next point, radius, feed rate. Radius equals zero for a line, or radius for an arc. Radius is positive for a clockwise arc, and negative for an counterclockwise arc. Each arc is 180° at most. For a complete circle, ask for 2 semicircles. Feed rate is optional. Tool feed rates, AS and LS are used by default.
Z coordinates could be given either by SP and NP or by D1...D0.
The coordinates can be given by formulas using the tool radius (variable R).

Exemple 1
SP;0; 0; 0
NP;0; 20; 0; 0
NP;20; 20; 0; 0
NP;20; 25; 0; 0
NP;25; 30; 0; 5
NP;45; 30; 0; 0
NP;50; 25; 0; 5
NP;50; 0; 0; 0

Exemple 2
SP;R; 0; 0
NP;R; 20-R; 0; 0; 500
NP;20+R; 20-R; 0; 0
NP;20+R; 25; 0; 0
NP;25; 30-R; 0; 5-R
NP;45; 30-R; 0; 0
NP;50-R; 25; 0; 5-R
NP;50-R; 0; 0; 0

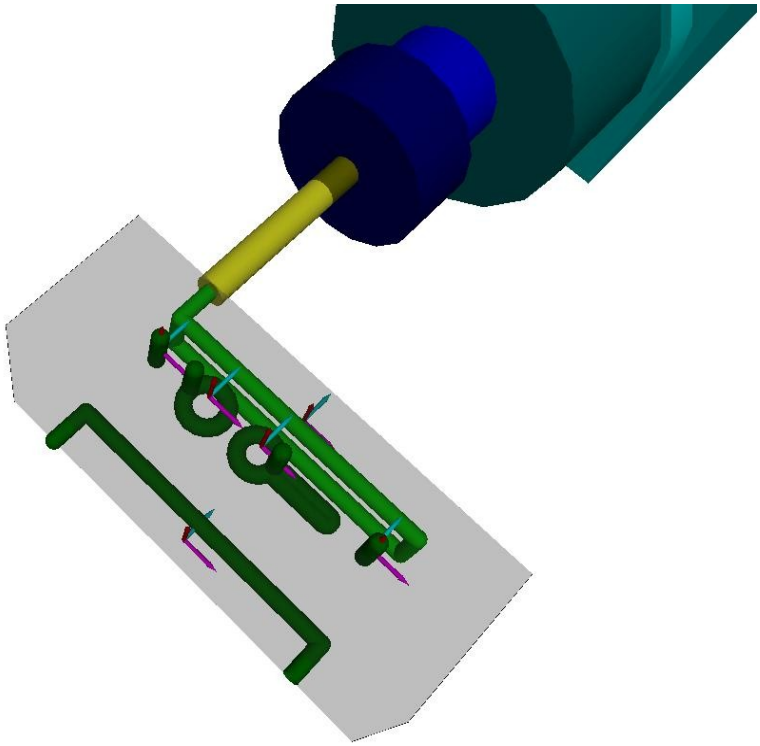
3.3.6 Noch



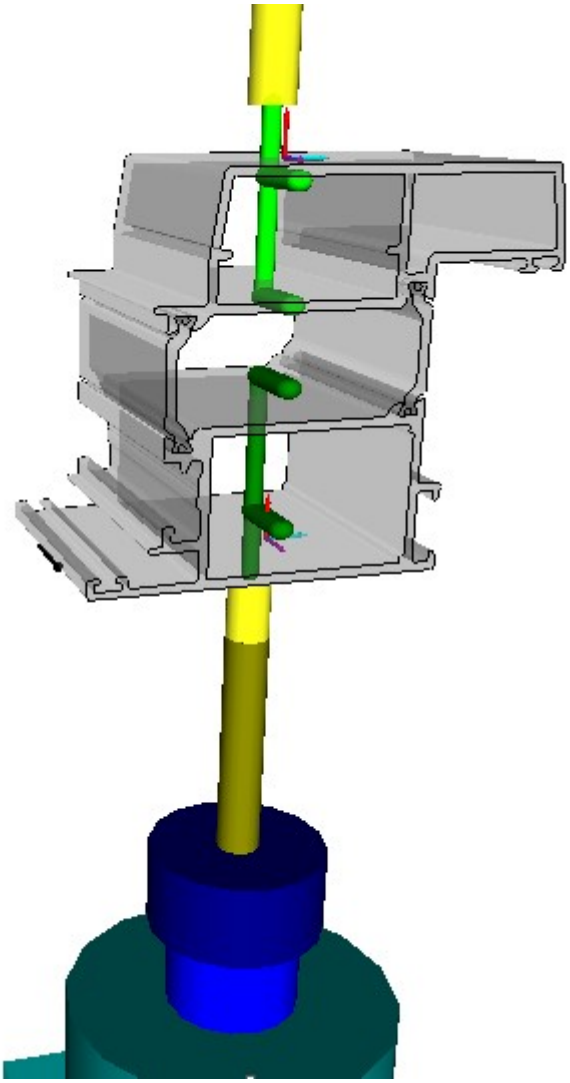
Necessary parameters: NT; DI; LG; D1
Optional parameters : A1; AS; LS

3.4 Examples

```
OC ;LOCK_LEFT ;ALU40X40 ;0 ;Lock on left jamb
OB ;CIRCLE ;0 ;20 ;40 ;0 ;Handle
NT ;5
DM ;20
D1 ;5
OB ;KEYHOLE ;15 ;20 ;40 ;0 ;Keyhole
NT ;5
DM ;19
HT ;35
LG ;12
D1 ;5
OB ;CIRCLE ;-15 ;20 ;40 ;0 ;Fixation (drill)
NT ;5
D1 ;5
OB ;CIRCLE ;45 ;20 ;40 ;0 ;Fixation (drill)
NT ;5
D1 ;5
OB;RECTANGLE;15;0;20;90;Slot 80
NT;3
LG;80
D1;5
OB;RECTANGLE;15;40;20;270;Rectangle 80X20
NT;7
LG;80
HT;20
D1;5
```



OC;13999700217_22;0770839;1;
OB;RECTANGLE;2;0;46.
NT;6
DI;1
LS;1000
AS;1500
QL;1
A1;-2
D1;3.9
A2;23
D2;27.8
LG;25.6
HT;11.1
RD;5.55
EY;0
RO;0
OB;RECTANGLE;2;0;46.
NT;1
DI;1
LS;1000
AS;1500
QL;1
A1;-2
D1;4.1
A2;28.8
D2;33.6
LG;25.6
HT;11.1
RD;5.55
EY;0
RO;0



4 Tool-list file format

Text file
File name : DUBUS_TOOL_LIST
File extension : .TXT

The data for each record entry is written on one line, comprised of specific fields separated by a semicolon.

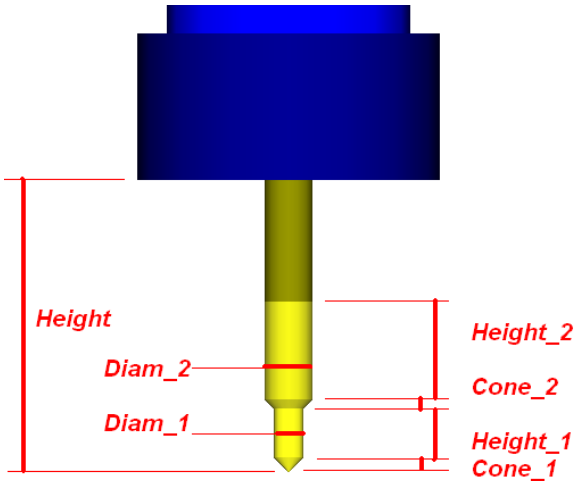
The first field of each record gives its category. The other fields give data according to their category.

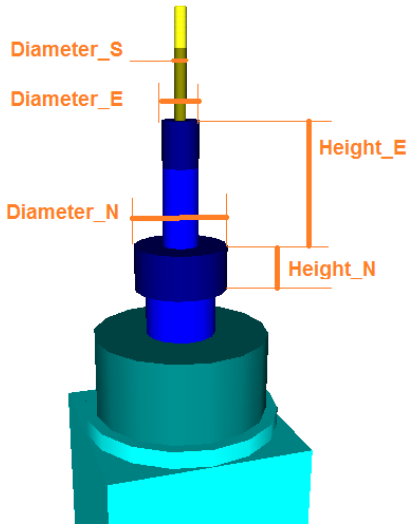
Categories are:
- TOOL_SET: toolset number, from 1 to 4
- BAR_NAMES: bars machined with tooolset
- TOOL_DATA: tool number and geometry

TOOL_DATA; Tool_number; Pos_A; Type; Height, Cone_1, Diameter_1, Height_1, Cone_2, Diameter_2, Height_2, Comment

Tool_Number	*Number*	Tool number	
Pos_A	*Angle*	Angular position of the tool around X axis (see diagram p10). When several inclinations are possible, we give here the different angles available separated by commas. When the tool inclination is numeric, we give the extreme values of the range separated by a dash.	
Type	*Reference*	DRILL, MILL, DISC, TAP, or FLOWDRILL	
Height	*Dimension*	See diagram below	Tool output length, from nut or extension
Cone_1	*Dimension*	See diagram	Cut #1
Diameter_1	*Dimension*	See diagram	
Height_1	*Dimension*	See diagram	
Cone_2	*Dimension*	See diagram	Cut #2
Diameter_2	*Dimension*	See diagram	

Height_2	*Dimension*	See diagram	
Cone_S	*Dimension*	See diagram	Shank
Diameter_S	*Dimension*	See diagram	
Diameter_E	*Dimension*	See diagram	Extension
Height_E	*Dimension*	See diagram	
Diameter_N	*Dimension*	See diagram	Nut
Height_N	*Dimension*	See diagram	
Comment	*Text*	Tool description	





Exemple

```
TOOL_SET;1
BAR_NAMES;109013621;115007575;115013399;115013405;115015020A;208024826;208027979;208027980;209025581;209025583;209025584;2090
25586;215028032;217029925;253032990;253032992;253033055;253033060;COM_PAV_026;FCC_AUV_802;FCC_AUV_803;FCC_AUV_804;FCC_SOU_701
;T40X60;T60X40
TOOL_DATA;1;180;END_MILL;70;0;6.8;10;2.6;12;22.4;0;12;0;0;42;20;20000;1000;1000;1000;Fraise Ø6.8-12 - Lu=10-25 - Ls=70mm
TOOL_DATA;2;180;END_MILL;29.6;0;15;10;0;5;10;0;5;16;44;42;20;20000;1000;1000;1000;Fraise Ø5 - Lu=10 - Ls=30mm
TOOL_DATA;3;90;END_MILL;55.4;0;10;20;0;9.5;35;0;10;0;0;50;22;20000;1000;1000;1000;Fraise Ø10 - Lu=20 - Ls=56mm
TOOL_DATA;4;90;END_MILL;70.5;0;6.8;10;2.6;12;22.4;0;12;0;0;42;20;20000;1000;1000;1000;Fraise Ø6.8-12 - Lu=10-25 - Ls=71mm
TOOL_DATA;5;0-20;END_MILL;71.8;0;14;45;0;0;0;0;14;0;0;42;20;20000;1000;1000;1000;Fraise Ø14 - Lu=45 - Ls=70mm
TOOL_DATA;6;0;END_MILL;64.7;0;6.8;10;2.6;12;22.4;0;12;0;0;50;22;20000;1000;1000;1000;Fraise Ø6.8-12 - Lu=10-25 - Ls=65mm
TOOL_DATA;7;270-290;DRILL;21;1;2.8;15;0;0;0;0;2.8;16;35;42;20;6000;1000;1000;1000;Foret Ø2.8 - Lu=16 - Ls=21mm
TOOL_DATA;8;270;END_MILL;64.9;0;6.8;10;2.6;12;22.4;0;12;0;0;50;22;20000;1000;1000;1000;Fraise Ø6.8-12 - Lu=10-25 - Ls=65mm
TOOL_DATA;11;180;END_MILL;59.3;0;10;20;0;9.5;35;0;10;0;0;50;22;20000;1000;1000;1000;Fraise Ø10 - Lu=20 - Ls=60mm
TOOL_DATA;13;90;END_MILL;39.2;0;5;25;0;0;0;0;5;16;65.2;42;20;20000;1000;1000;1000;Fraise Ø5 - Lu=25 - Ls=40mm
TOOL_DATA;16;0;END_MILL;29.5;0;5;10;0;0;0;0;5;16;44;42;20;20000;1000;1000;1000;Fraise Ø5 - Lu=10 - Ls=30mm
TOOL_DATA;18;270;END_MILL;29.3;0;5;10;0;0;0;0;5;16;44;42;20;20000;1000;1000;1000;Fraise Ø5 - Lu=10 - Ls=30mm
TOOL_SET;2
BAR_NAMES
TOOL_SET;3
BAR_NAMES
TOOL_SET;4
BAR_NAMES
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