

File Format Specification for DUBUS interface

Version J - 2025-03-05

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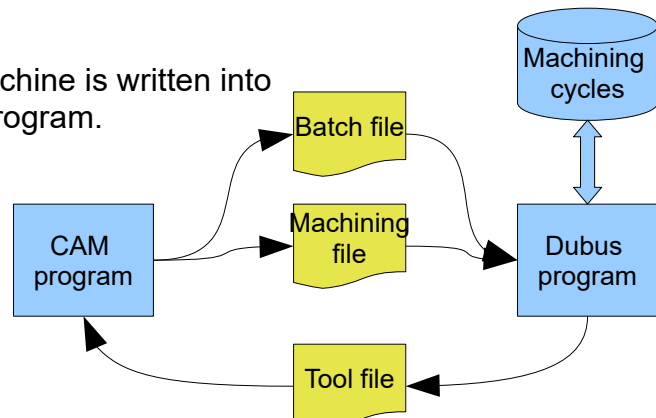
Changes in version F are highlighted in yellow
Changes in version G are highlighted in orange
Changes in version H are highlighted in green
Changes in version I are highlighted in pink
Changes in version I are highlighted in blue

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	<i>Reference</i>	Name of the cross-section of the bar.
Color	<i>Reference</i>	Name of the color of the bar.
Nominal_length	<i>Dimension</i>	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	<i>Text</i>	Special instruction for the machine operator, e.g. position of the bar in the magazine
Offcut_label	<i>Text</i>	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.

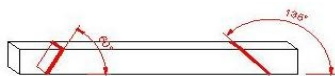
DP ; Length; Left_Cut ; Right_Cut ; Id ; Steel; Rack; Box

Length	<i>Dimension</i>	Length of the piece, measured along the reference line of the bar.
Left_Cut, Right_Cut	<i>Angles or symbol</i>	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	<i>Reference</i>	Unique id of the piece, used to find the piece if it has to be cut again.
Steel	<i>Reference</i>	Steel reinforcement name. This field stays empty if the piece is not reinforced.
Rack, Box	<i>Numbers</i>	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

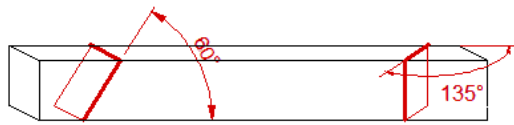
Cut angle for a one-blade saw



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	<i>Reference</i>	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 ...
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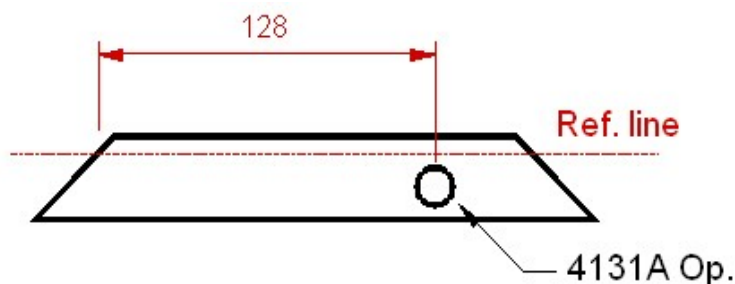
Note 1: It is important that the same machining operation always has the same name to limit the number of operations declared and allow the user to modify them on the machine

Note 2: symmetrical operations have different names (e.g. keyhole on a left or a right jamb).

Position_X	<i>Dimension</i>	Distance between the left end of the piece and the reference point of the operation, measured along the reference line of the bar
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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

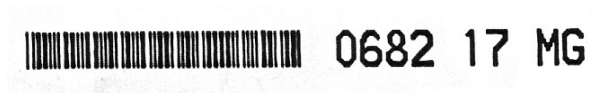
The ET record defines the label of the current piece. Only one label can be printed on each piece. The label layout depends on the printer.

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

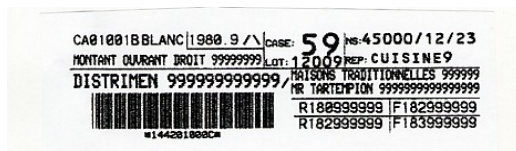
Logo	<i>Reference</i>	Name of the drawing to print. Usable only with Image or Windows driven printer. With Image printer, the logo is made of a sequence of graphical characters resident in the printer memory. With a Windows driven printer, the drawing is a monochrome bitmap, 200 x 200 dots.
Barcode	<i>Text</i>	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	<i>Text</i>	Data to print. Font, size and position of each field is adjustable by the user.

Examples of labels

- Image 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

<i>File</i>	<i>Comments</i>	
DB;MP408;BL;6000;Ouvrant Série Equinoxé	B	New bar
DP;2240;V;V;044CC68205MD;;	A	New piece
OP;4160A;934.2	R	Mach. Op.
ET;;;05;ROU0737145GA;MD/2240,0/044CC682/05/-;,,,,,;	E	Mach. Op.
DP;703.2;V;V;044CC68209TH;;	1	Mach. Op.
ET;;;09;-;TH/ 703,2/044CC682/09/-;,,,,,;	1	Label
DP;703.2;V;V;044CC68209TB;;	P	New piece
OP;4131A;128	I	Mach. Op.
OP;4131A;575.2	E	Mach. Op.
OP;4171B;609.7	C	Mach. Op.
OP;4171B;93.5	E	Mach. Op.
ET;;;09;ROU6007097GA;TB/ 703,2/044CC682/09/-;,,,,,;	2	Label
DP;703.2;V;V;044CC68210TH;;	P	New piece
ET;;;10;-;TH/ 703,2/044CC682/10/-;,,,,,;	3	
DP;664.2;V;V;044CC68204TH;;	P	New piece
ET;;;04;-;TH/ 664,2/044CC682/04/-;,,,,,;	4	
DP;664.2;V;V;044CC68204TB;;	P	New piece
OP;4131A;128	I	
OP;4131A;536.2	E	
OP;4171B;570.7	C	
OP;4171B;93.5	E	
ET;;;04;ROU6007097GA;TB/ 664,2/044CC682/04/-;,,,,,;	5	
DB;MP408;BL;6000;Ouvrant Série Equinoxé	B	New bar
DP;2260;V;V;044CC68211MG;;	A	
OP;4159A;1325.8	R	
ET;;;11;ROU0737145GA;MG/2260,0/044CC682/11/-;,,,,,;	2	

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

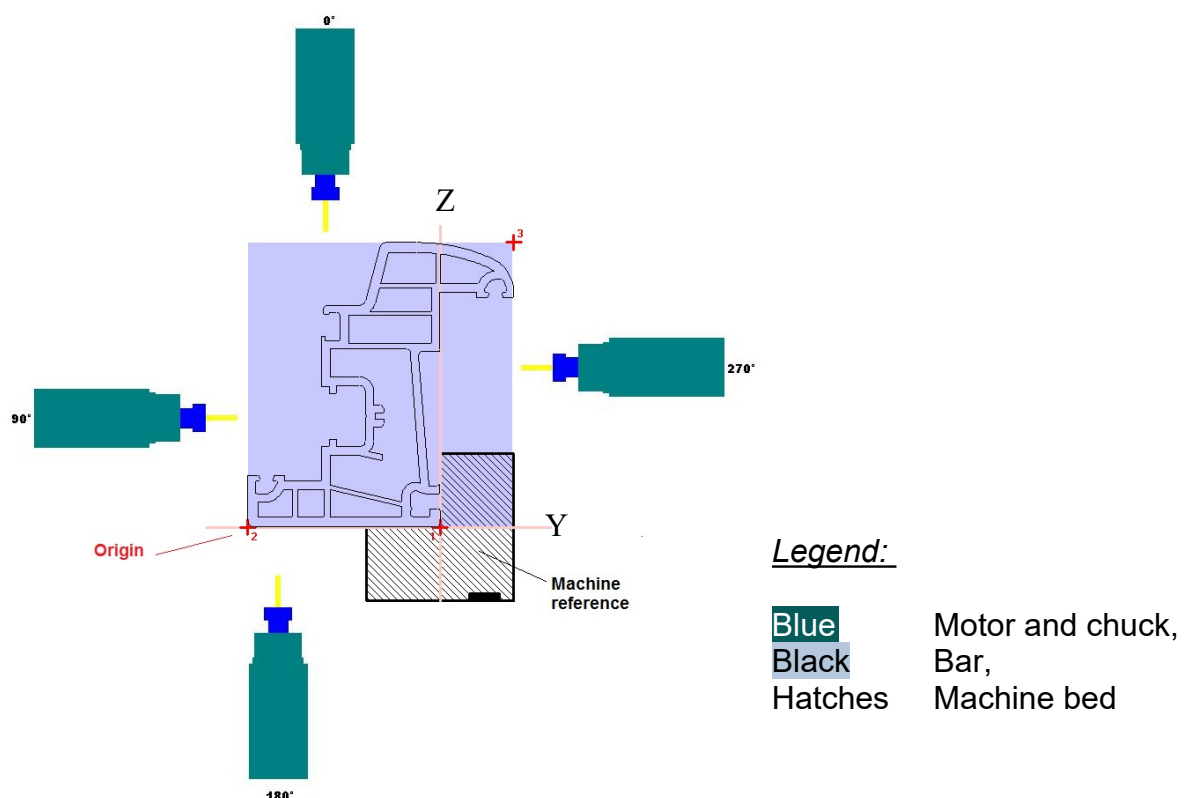
Operation	<i>Reference</i>	Name of the machining operation. See 2.3 It is important that the same machining operation always has the same name to limit the number of operations declared and allow the user to modify them on the machine
Section	<i>Reference</i>	Name of the cross-section of the bar. See 2.1
Sorting	<i>Number</i>	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	<i>Text</i>	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	<i>Reference</i>	CIRCLE, RECTANGLE, KEYHOLE, TAP or FREE_CONTOUR.
Origin	<i>Number</i>	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	<i>Dimension</i>	Position of the reference point of the operation from the reference point of the section (see diagram).
Pos_A	<i>Angle</i>	Angular position of the operation around X axis (see diagram).
Comment Name	<i>Text Text</i>	Basic operation name (optional)



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

Delta_Radius	<i>Number</i>	offset between each pass to avoid hitting with the shank of the tool
Cutting_Depth	<i>Number</i>	Maximum depth of cut. If $D_i - A_i > CD$, the post-processor will automatically create several passes

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

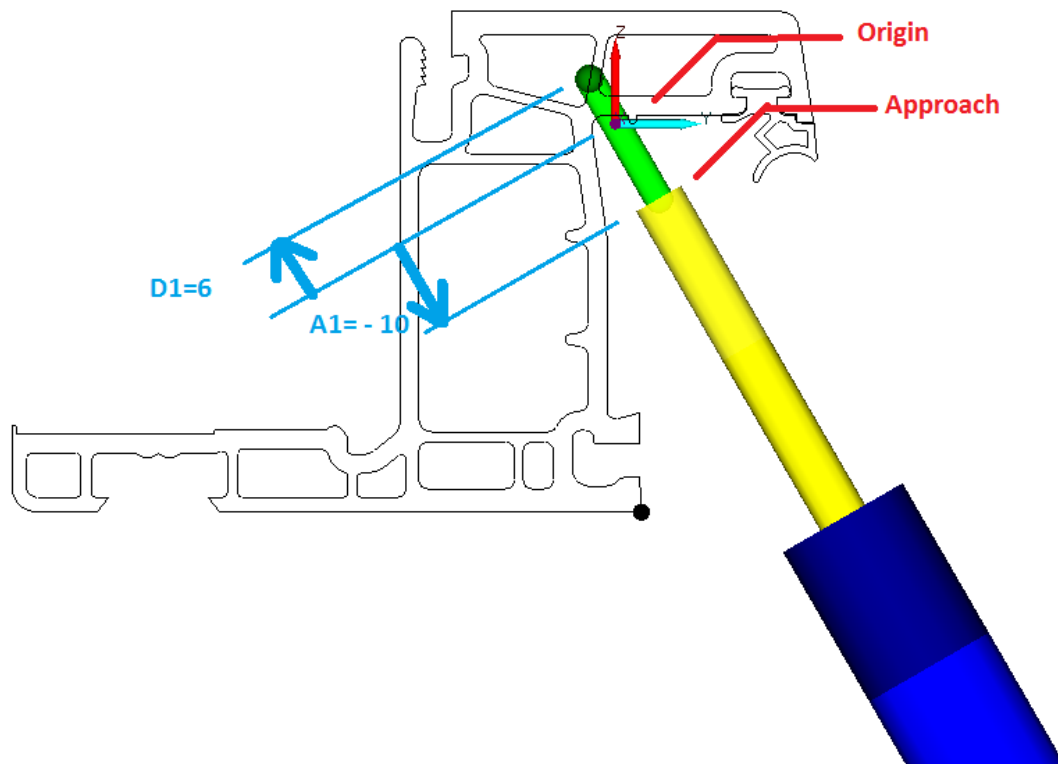


Illustration 1: Approach and depth - exemple 1

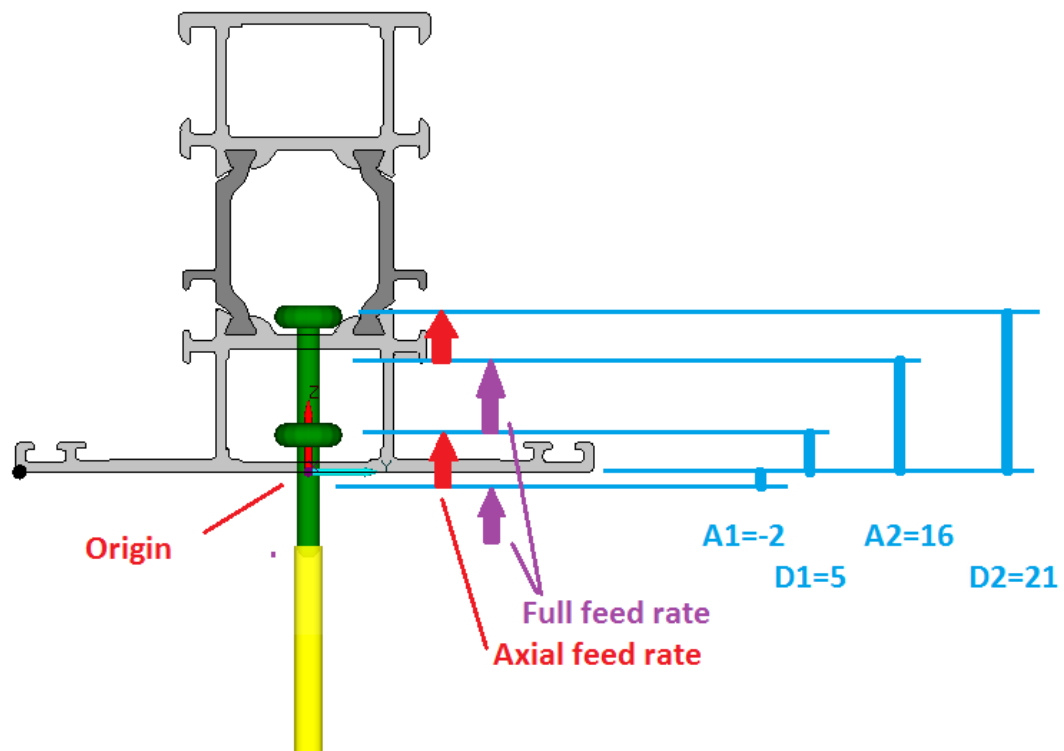


Illustration 2: Approach and depth - exemple 2

3.3.1 Circle

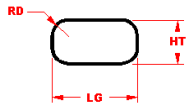


Necessary parameters : NT; D1

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

Set DM to zero to drill

3.3.2 Rectangle



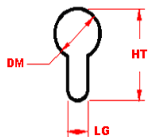
Necessary parameters: NT; LG; D1

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

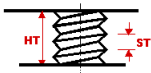
3.3.3 Keyhole



Necessary parameters: NT; DM; HT; LG; D1

Optional parameters : D2...D0; A1...A0; DI; RO; LS; AS; CD; DR

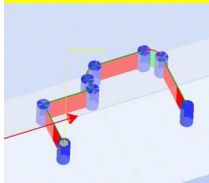
3.3.4 Tap



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,Z and R coordinates of next point. R 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.

Z coordonates could be given either by SP and NP or by D1...D0

Exemple

SP;0; 0; 0

NP;0; 20; 0; 0

NP;20; 20; 0; 0

NP;20; 25; 0; 0

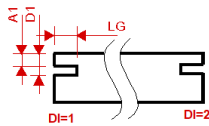
NP;25; 30; 0; 5

NP;45; 30; 0; 0

NP;50; 25; 0; 5

NP;50; 0; 0; 0

3.3.6 Noch

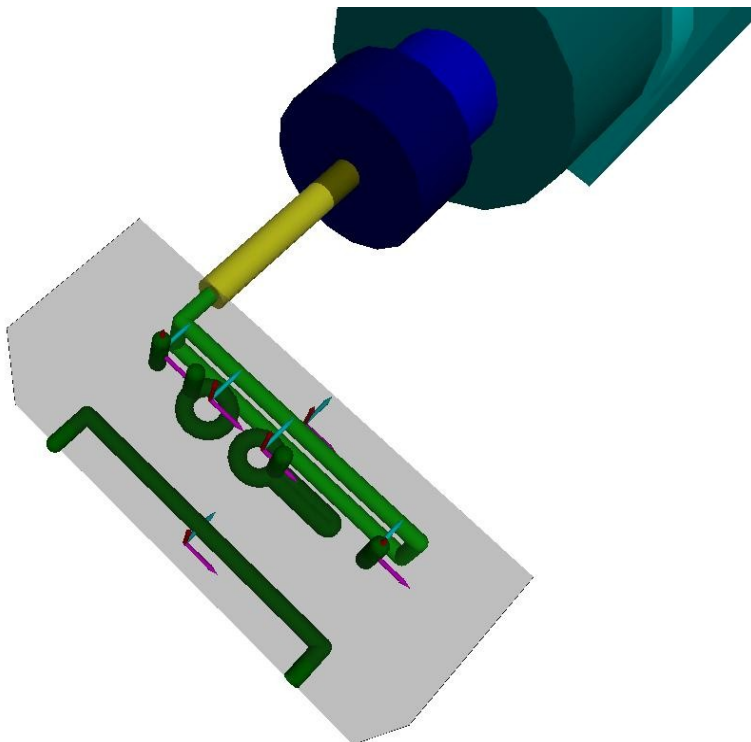


Necessary parameters: NT; DI; LG; D1

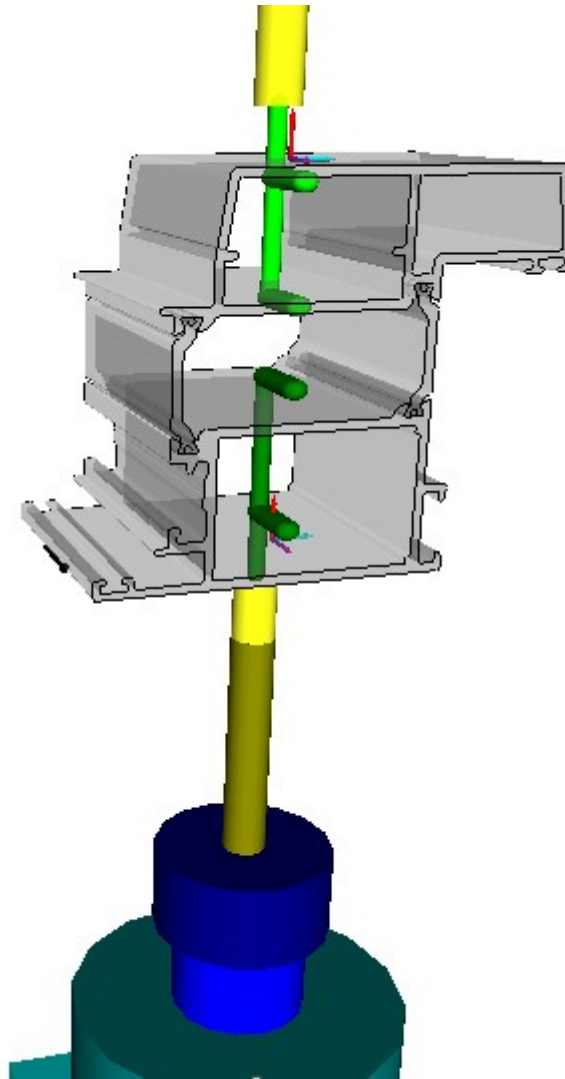
Optional parameters : A1; AS; LS

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;46.1
 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;46.1
 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.

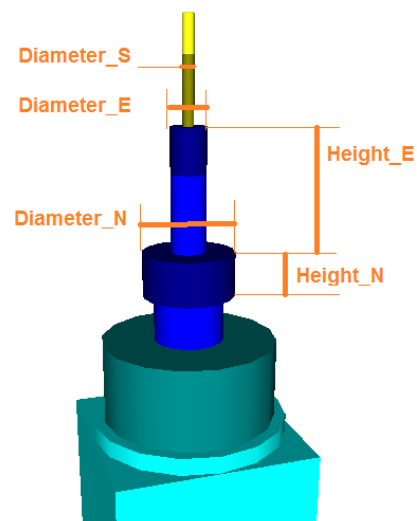
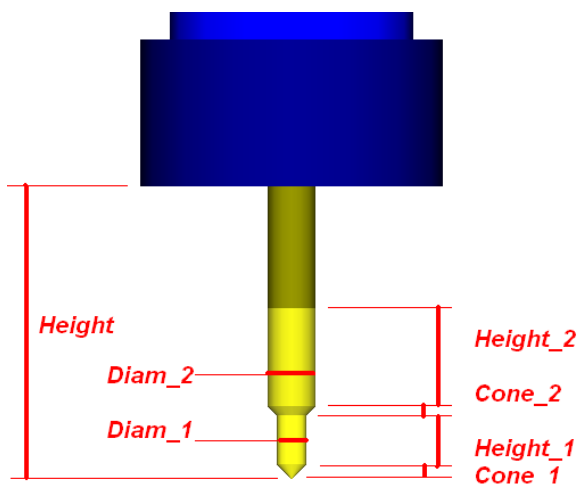
The first field of each record gives its category. The other fields give data according to their category.

Categories are:

- TOOL_SET: toolset number, from 1 to 4
- BAR_NAMES: bars machined with toolset

- 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	<i>Number</i>	Tool number	
Pos_A	<i>Angle</i>	Angular position of the operation around X axis (see diagram p10). When several inclinations are possible, we give here the different angles available separated by commas.	
Type	<i>Reference</i>	DRILL, MILL, DISC, TAP, or FLOWDRILL	
Height	<i>Dimension</i>	See diagram below	
Cone_1	<i>Dimension</i>	See diagram	
Diameter_1	<i>Dimension</i>	See diagram	Cut #1
Height_1	<i>Dimension</i>	See diagram	
Cone_2	<i>Dimension</i>	See diagram	
Diameter_2	<i>Dimension</i>	See diagram	Cut #2
Height_2	<i>Dimension</i>	See diagram	
Cone_S	<i>Dimension</i>	See diagram	Shank
Diameter_S	<i>Dimension</i>	See diagram	
Diameter_E	<i>Dimension</i>	See diagram	Extension
Height_E	<i>Dimension</i>	See diagram	
Diameter_N	<i>Dimension</i>	See diagram	Nut
Height_N	<i>Dimension</i>	See diagram	
Comment	<i>Text</i>	Tool description	



Exemple

```
TOOL_SET;1
BAR_NAMES;112710;112730;156890+284480;170680;312000;315770;315970;319980;322270;322410;322450;325390;325600
;325620;325650;331620;331810A;336240;339570;339600;340120;340300;341130E;341330;341330E;349750;349760;34996
0;349980;352620;354480;354500;355590;355630;355640;367360;373610;390260;390290;396330;396340;60X40
TOOL_DATA;1;180;END_MILL;51;0;25;5;0;0;0;0;10;0;0;42;20;Fraise Woodruff Ø25 Lt=85 Lu=5 Ls=51 (EP09357)
TOOL_DATA;2;180;END_MILL;50;2;3;12;0;3;12;3;6;0;0;42;20;Fraise Ø3/6 Lt=70 Lu=13 Ls=39 (EP54882)
TOOL_DATA;3;90;END_MILL;51;2;3;12;0;3;12;3;6;0;0;42;20;Fraise Ø3/6 Lt=70 Lu=13 Ls=40 (EP54882)
TOOL_DATA;4;90;END_MILL;51;0;5;35;0;0;0;0;5;0;0;42;20;Fraise Ø5 Lt=70 Lu=35 Ls=49 (EP43676)
TOOL_DATA;5;0;END_MILL;45;0;10;30;0;0;0;0;10;0;0;34;19;Fraise Ø10 Lt=75 Lu=30 Ls=45 (EC8946)
TOOL_DATA;6;0;END_MILL;16;0;3;8;0;0;0;0;3;12;84;42;20;Fraise Ø3 Lt=30 Lu=8 Ls=16 (EC4724)
TOOL_DATA;7;270;END_MILL;46;0;8;40;0;8;0;0;8;0;0;42;20;Fraise Ø8 Lt=80 Lu=40 Ls=46 (EP46113)
TOOL_DATA;8;270;END_MILL;41;0;10;30;0;0;0;0;10;0;0;42;20;Fraise Ø10 Lt=75 Lu=30 Ls=41 (EC8946)
TOOL_DATA;11;180;END_MILL;45;0;5;16;0;0;0;0;5;16;54.5;42;20;Fraise Ø5 Lt=60 Lu=18 Ls=45.5 (EC8938)
TOOL_DATA;12;180;END_MILL;56;0;8;40;0;0;0;0;8;0;0;42;20;Fraise Ø8 Lt=90 Lu=40 Ls=56 (EP52473)
TOOL_DATA;13;90;END_MILL;50;0;10;30;0;0;0;0;10;0;0;34;19;Fraise Ø10 Lt=123 Lu=63 Ls=89 (EC8166)
TOOL_DATA;14;90;END_MILL;26;0;5;16;0;0;0;0;5;0;0;34;19;Fraise ø5 Lt=60 Lu=16 Ls=26 (xxxxxxx)
TOOL_DATA;15;0;END_MILL;46;0;8;40;0;0;0;0;8;0;0;34;19;Fraise Ø8 Lt=80 Lu=40 Ls=46 (EC8945)
TOOL_DATA;16;0;END_MILL;45;0;5;16;0;0;0;0;5;12;44;34;19;Fraise Ø5 Lt=60 Lu=16 Ls=26 (EP45033)
TOOL_DATA;17;270;END_MILL;39;0;5;30;0;0;0;0;5;0;0;34;19;Fraise Ø5 Lt=70 Lu=30 Ls=39 (EC8939)
TOOL_DATA;18;270;END_MILL;51;2;3;12;0;3;12;3;6;0;0;34;19;Fraise Ø3/6 Lt=71 Lu=13 Ls=40 (EP54882)
TOOL_DATA;19;90;END_MILL;39;0;2.5;4;0;5;35;0;0;0;0;34;19;PALPEUR Y
TOOL_DATA;20;0;END_MILL;39;0;2.5;4;0;5;35;0;0;0;0;34;19;PALPEUR Z
TOOL_DATA;21;200;END_MILL;45;0;5;16;0;0;0;0;5;16;54.5;42;20;Fraise Ø5 Lt=60 Lu=18 Ls=45.5 (EC8938)
TOOL_DATA;23;98;END_MILL;50;0;10;30;0;0;0;0;10;0;0;34;19;Fraise Ø10 Lt=123 Lu=63 Ls=89 (EC8166)
TOOL_DATA;24;93;END_MILL;26;0;5;16;0;0;0;0;5;0;0;34;19;Fraise ø5 Lt=60 Lu=16 Ls=26 (xxxxxxx)
TOOL_DATA;26;340;END_MILL;45;0;5;16;0;0;0;0;5;12;44;34;19;Fraise Ø5 Lt=60 Lu=16 Ls=26 (EP45033)
TOOL_SET;2
BAR_NAMES
TOOL_SET;3
BAR_NAMES
TOOL_SET;4
BAR_NAMES
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