# CNCCutPipes

Overview

CNCCutPipes , it is an interface application between STL files and ESAB pipe cutting cnc file.

The main task is to read the STL files, process the solid object which describe a tube (pipe part), to extract all the 3D cutting paths and convert the 3D paths to ESAB cutting info. Because read STL file format it is a post processing link between 3D CAD application and cnc machine.

Also an important aspect , very easy to learn and to use .

Bellow a screen shot of application main form
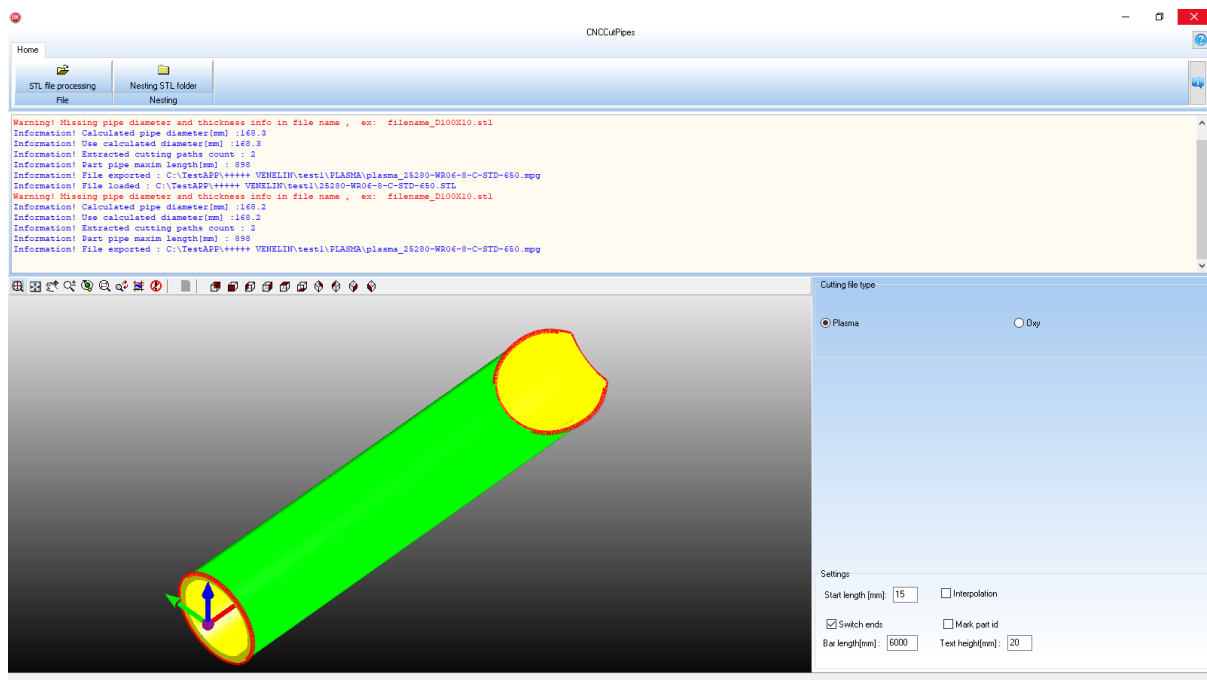
STL file

The STL file format it is a very popular file format used by 3D CAD modelling application like: AutoCAD, Solid Works, Pro Engineerin , Microstation, Catia, to export solid object.

 The STL file format can be in ASCI code or binary code, and the CNCCutPipes application can read both file format automatically
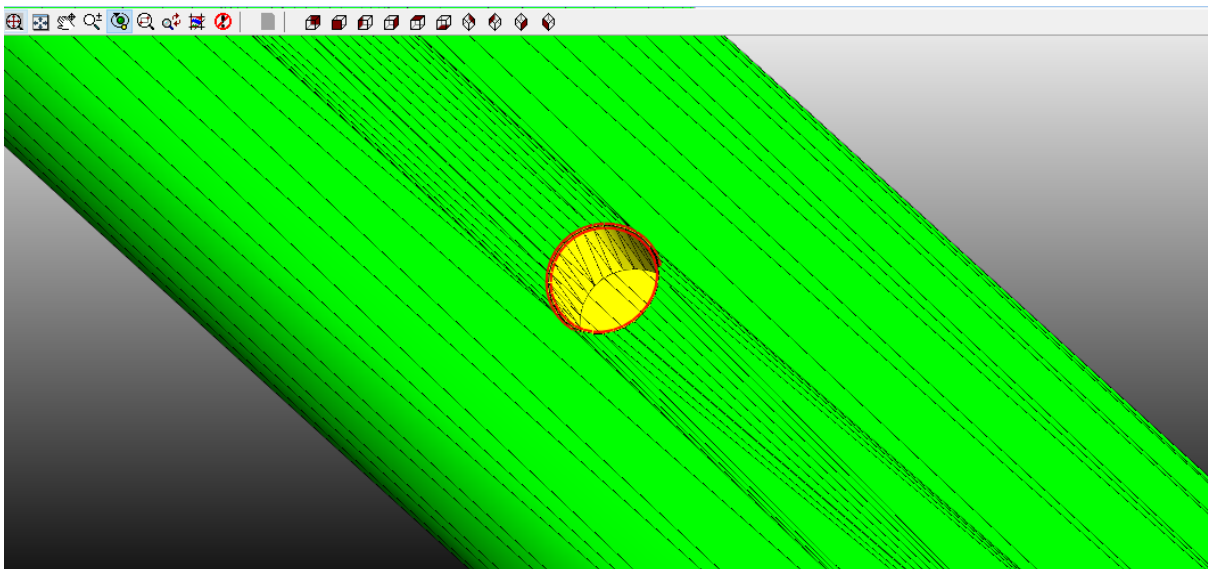
For each solid object a corresponding STL file is generated by CAD application.

The STL format store the solid tube definitions by a collection of triangle faces.

Bellow an example of pipe endcut
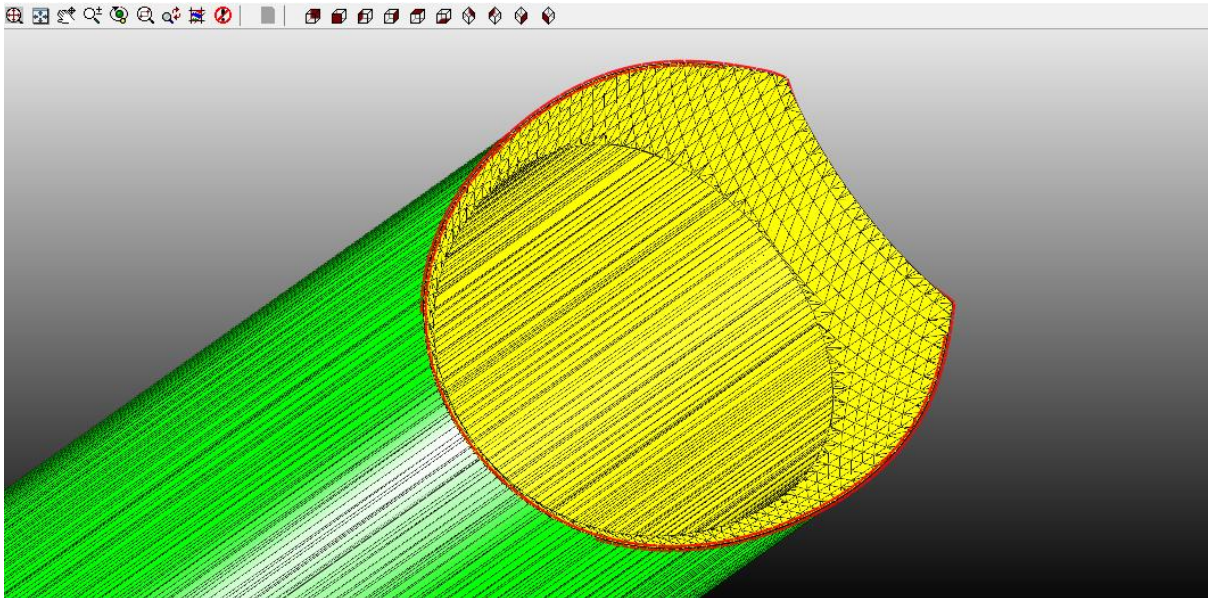
Bellow an example of hole in pipe

The good thing about STL file is: it is available in almost all 3D CAD application from the market.

STL file naming. The user can export the STL file whit next rule about naming :

Partname_DpipeouterdiameterXpipeThickness , the application can read and use this info.

Ex: PipePart1_D100X10 , outer diameter is 100mm and the thickness is 10mm.
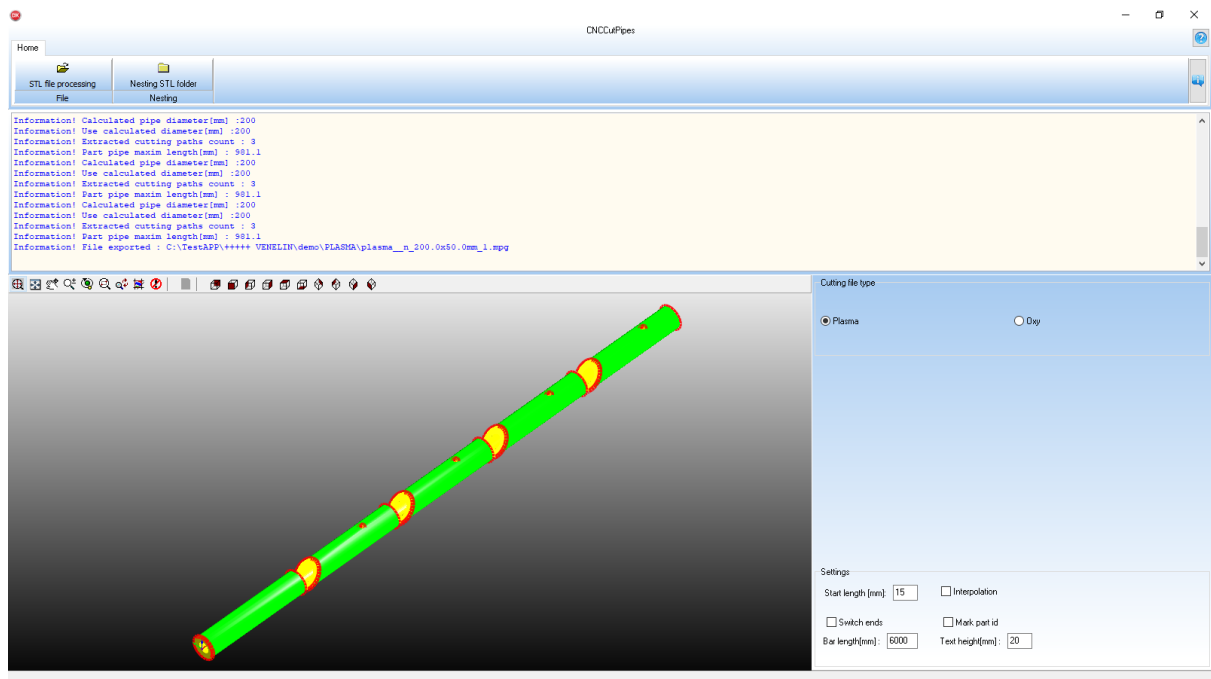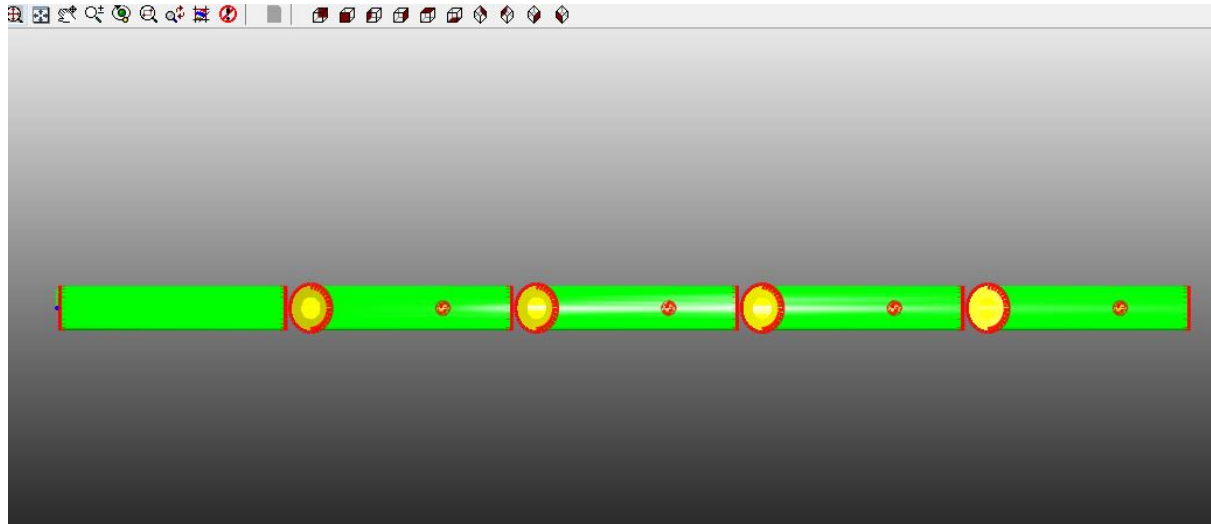
Triangle faces processing

The CNCCutPipes application, automatically identify the outer contour of pipe part (green faces) and extract and joint all the 3D paths from these faces (red polylines)

Bellow a complex pipe cutting processing example
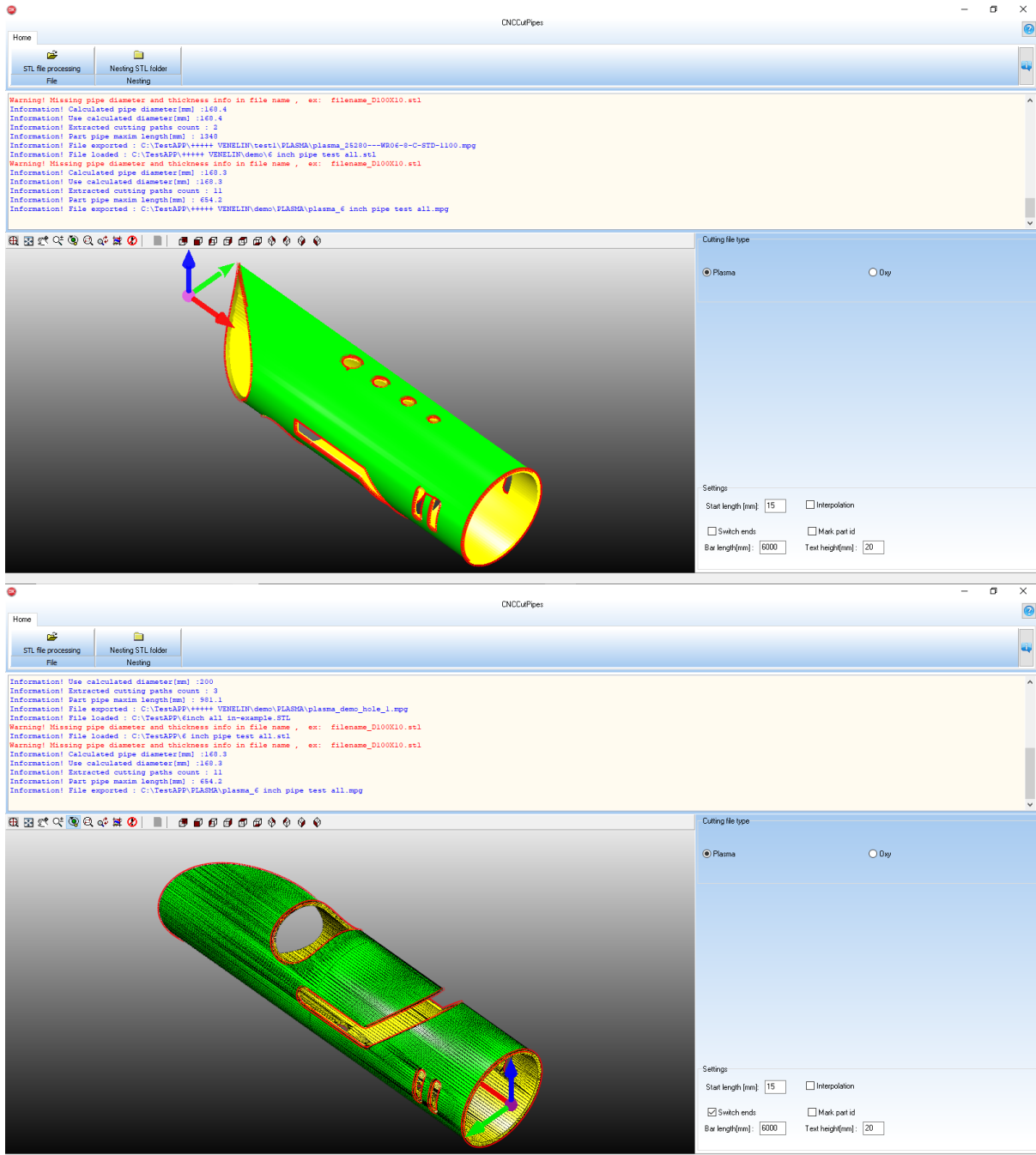
CNC file

The CNCCutPipes application can export nesting part cnc file or individual file for each part

Both files, nesting or individual, can be exported for plasma machine or oxy-gas machine.

Also an automatically part marking ID can be generated and can be included in cnc file.

Bellow an example of layout of file, ESAB style

```
Lister - [c:\TestAPP\PLASMA\plasma_6 inch pipe test all.mpg]
File  Edit  Options  Help
; [neuer code] Tube dimension- 168.3x    6.3 mm
N000010   G1000 D2
N000020 G199 D 168.300
N000030 M1063
N000040 G240 D 100
N000050 G198
N000060 G198
N000070 G198
N000080 G00 X 00005.000 B-00528.730 A 00000.000   C-00090.000
N000090 G41
N000100 M65
N000110 G01 X 00005.000 B-00528.730 A 00000.000   C-00090.000
N000120 G01 X 00020.000 B-00528.730 A 00000.000   C-00090.000
N000130 G01 X 00020.000 B-00527.517 A 00000.000   C-00090.000
N000140 G01 X 00020.000 B-00522.667 A 00000.000   C-00090.000
N000150 G01 X 00020.000 B-00517.816 A 00000.000   C-00090.000
N000160 G01 X 00020.000 B-00512.965 A 00000.000   C-00090.000
N000170 G01 X 00020.000 B-00508.114 A 00000.000   C-00090.000
N000180 G01 X 00020.000 B-00503.264 A 00000.000   C-00090.000
N000190 G01 X 00020.000 B-00498.413 A 00000.000   C-00090.000
N000200 G01 X 00020.000 B-00493.562 A 00000.000   C-00090.000
N000210 G01 X 00020.000 B-00488.711 A 00000.000   C-00090.000
N000220 G01 X 00020.000 B-00483.861 A 00000.000   C-00090.000
N000230 G01 X 00020.000 B-00479.010 A 00000.000   C-00090.000
N000240 G01 X 00020.000 B-00474.159 A 00000.000   C-00090.000
N000250 G01 X 00020.000 B-00469.308 A 00000.000   C-00090.000
N000260 G01 X 00020.000 B-00464.458 A 00000.000   C-00090.000
N000270 G01 X 00020.000 B-00459.607 A 00000.000   C-00090.000
```

Remarks: the actual software version, generate cnc code for non bevelling machine,

which usually cut thinner pipes, so no special welding preparation needed.

Few self explained settings to control the information

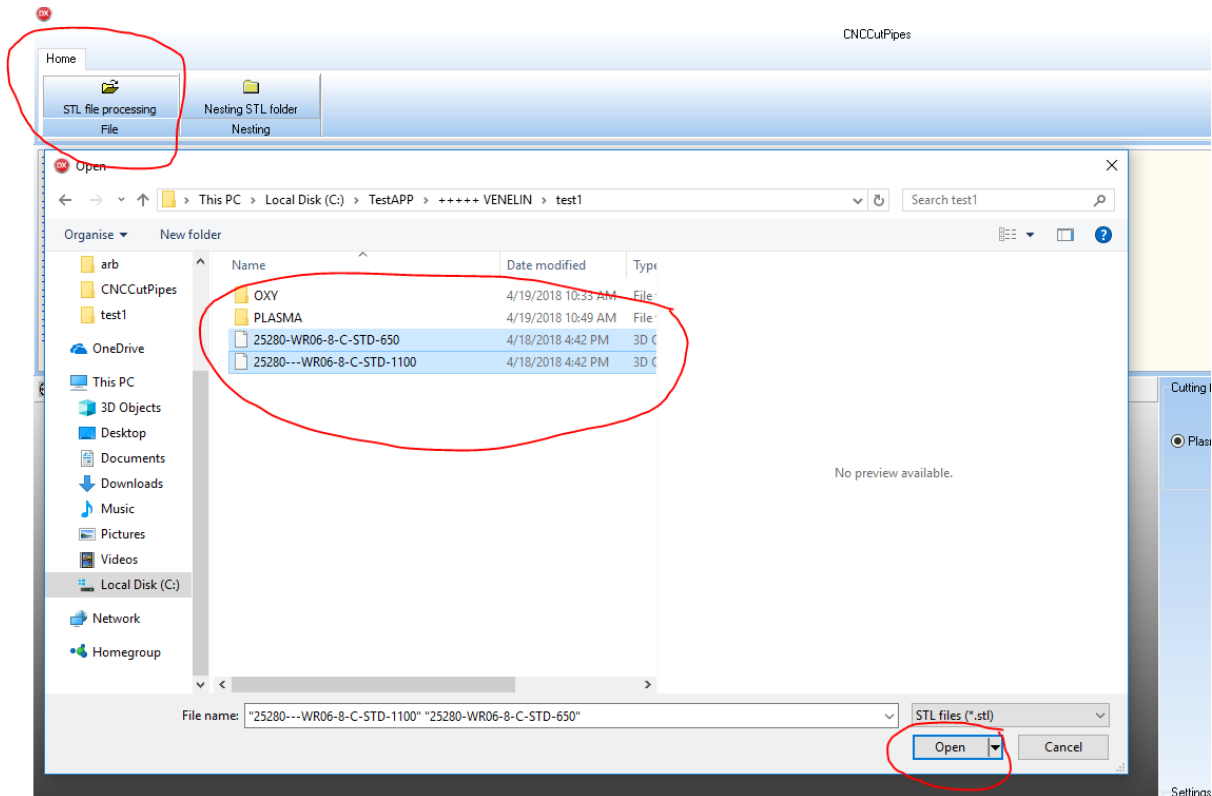Cutting file type

◉ Plasma   ○ Oxy

Settings

Start length [mm]: `15`   ☐ Interpolation

☐ Switch ends   ☐ Mark part id

Bar length[mm] : `6000`   Text height[mm] : `20`

User guide

a) **Working style by individual pipe part cnc file :**

Select STL files by pressing „STL file processing" button

The user can select multiple files and the application will process one by one and ofcourse will export coresponding cnc files.

Automatically for each cutting process type a subfolder will be created :

OXY for oxi-gas(store oxi gas mpg files) and

PLASMA (store plasma mpg files).

Remarks : all oxi-gas file name will start whit oxy_ prefix , and plasma file name whit plasma_ prefix , to be easy identify by machine operator.
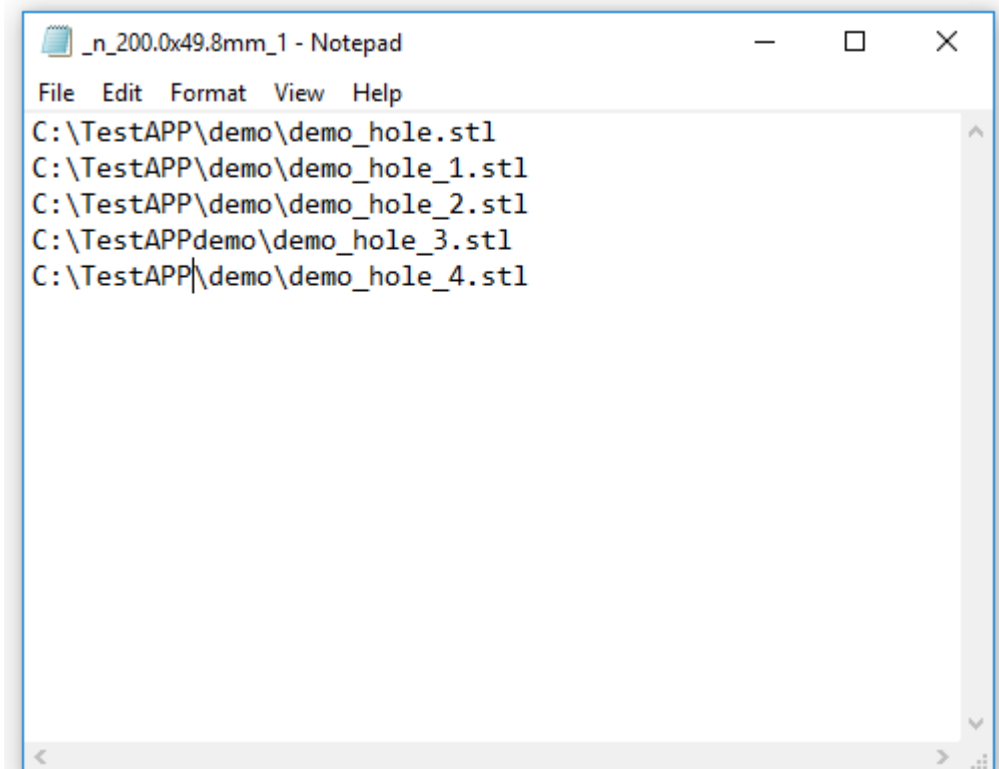
Durring processing in message window area the application will display the info about current actions.

b) **Working style by nesting of pipe parts**
   Select a STL folder by pressing „Nesting STL folder"
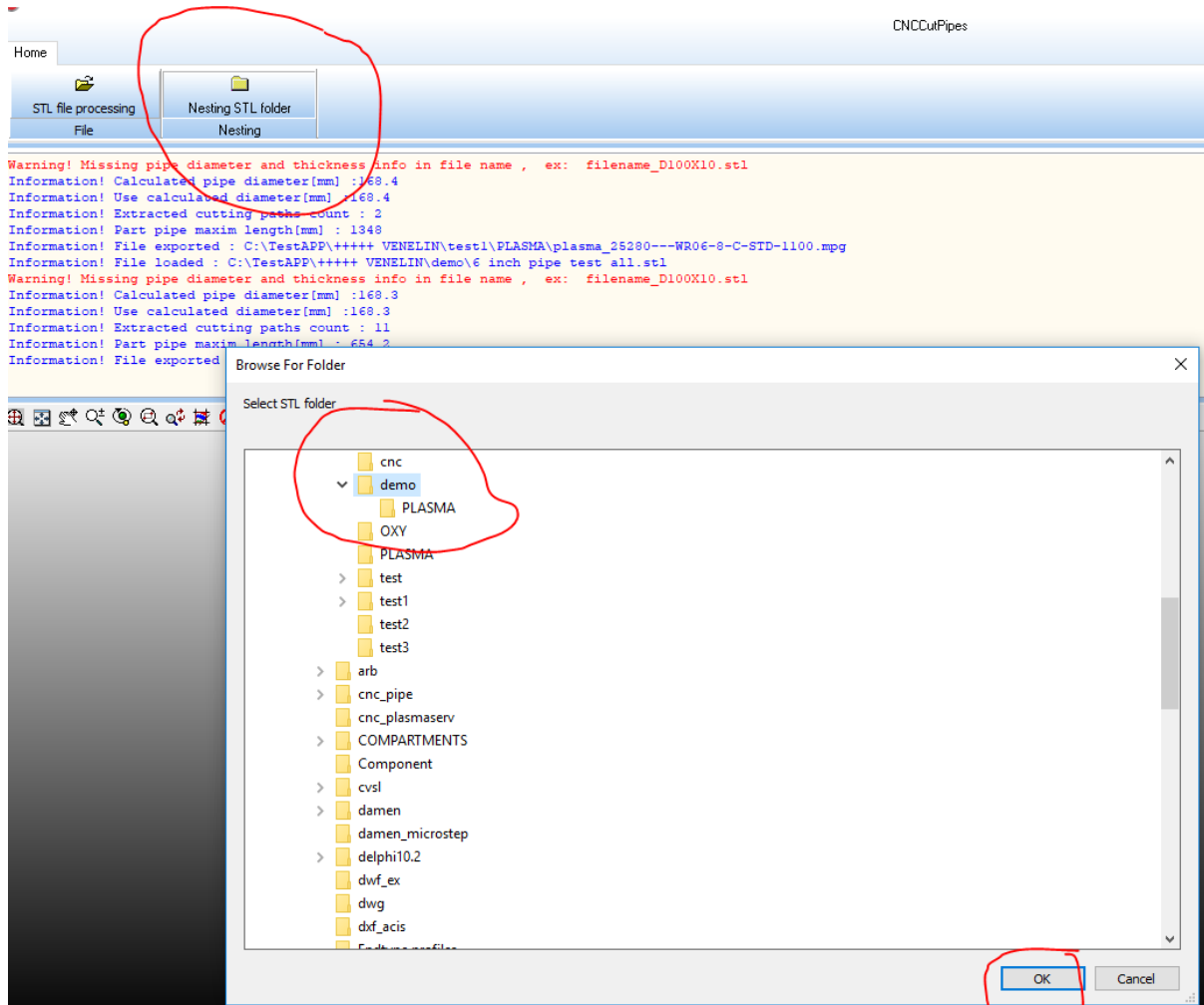
The application will read all the files , make nesting of parts on a raw bar , and for each nesting bar a cnc file will be created . Also a coresponding txt file will be create whit info about parts order in bar , to be used for part id after cutting , if the machine can't mark the part id.

Remarks: **All the pipe parts from processing folder must have the same properties like size and materials.**

That means the user can create for each pipe size and material a coresponding folder :

EX:

D100TH10 , all pipe parts whit outer diameter 100 and thickness 10 , an so on....