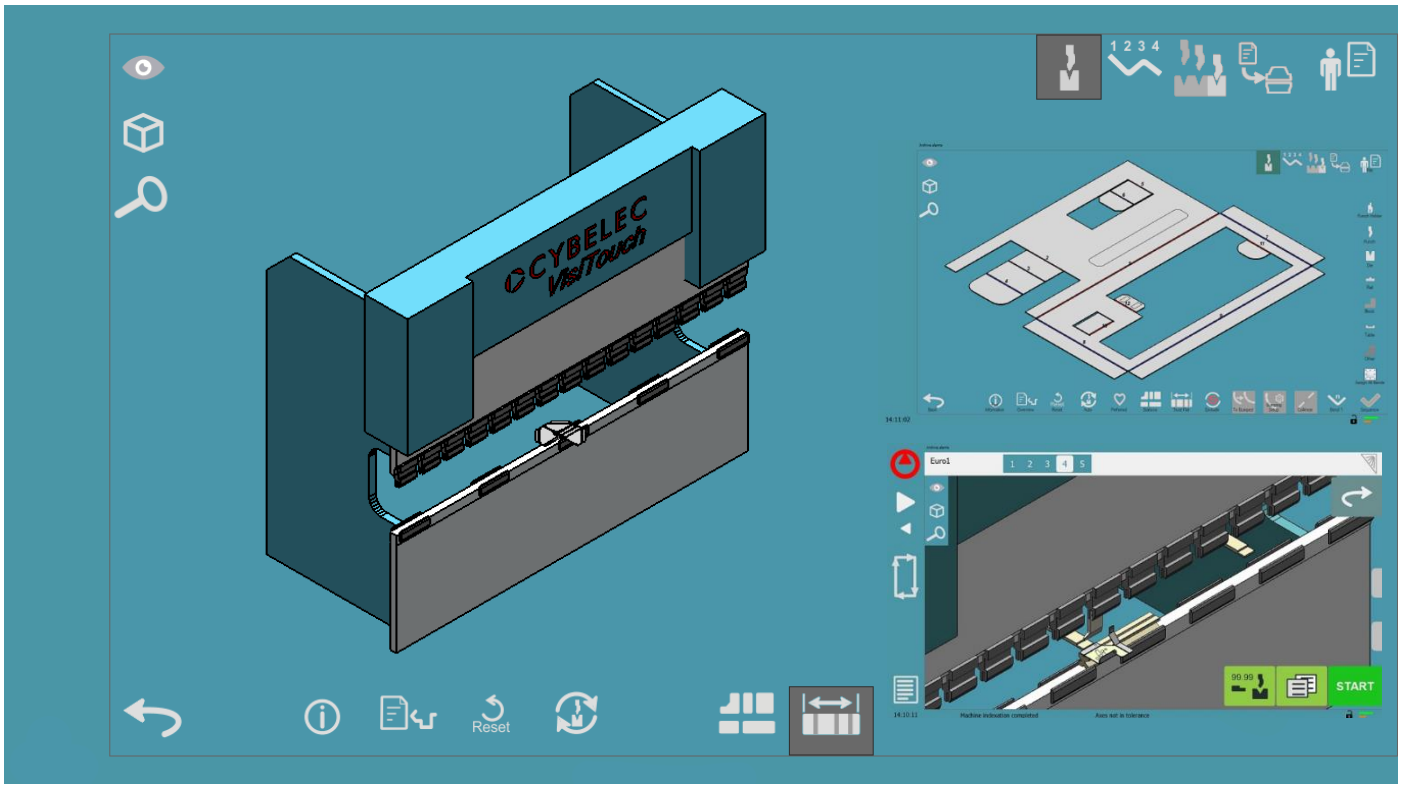
CYBELEC
INFRANOR GROUP COMPANY

VisiTouch MX



User Manual

For VisiTouch 19 MX & Offline PC

MAY
2020
V1.2

Table of Contents

SAFETY

GENERAL SAFETY

The users must have **Read** and **Understood**, but most of all must Respect the directives described in this manual.

All people coming into contact with the machine on which the numerical control is installed, whatever their function or whatever state the machine is in (assembly, disassembly, start-up, production, maintenance, repairs) must have read and understood the requirements concerning the security and the entirety of the directives of operation described in the manuals delivered with the machine.

The operator must be properly trained to work with the machine on which the numerical control is installed. Improper use of the numerical control can cause heavy damage on equipment and/or injuries to people.

Modification of machine parameters can cause important material damage or lead to irregular product quality.

Do not expose the numerical control to excessive humidity to avoid any risk of electrocution and any deterioration of the equipment.

Make sure the numerical control is disconnected from the mains power before carrying out any cleaning. Do not use liquids based on alcohol or ammoniac.

In case of malfunction of the numerical control, call a technician.

Do not expose the numerical control to direct sun rays or any other heat source.

Do not place the numerical control in the neighbourhood of magnetic equipment such as transformers, motors or devices which generate interference (welding machines, etc.)

SIGNS AND ICONS APPEARING IN THIS MANUAL

While using this manual, you will come across the signs and icons represented here below: they are directly related to the safety and security of persons. Carefully follow this advice and inform others about it.

General warning

This warning sign appears in the manual whenever it is necessary to pay attention to rules, instructions or advice. The correct sequence of operations is to be followed in order to avoid damage to the machine. **Symbolizes a serious personnel danger.**

Information

This warning sign appears in this manual whenever an important information needs to be taken into consideration. Pay attention to this sign and follow the instructions given.

Settings

This sign appears in this manual whenever setting instructions are given. Pay attention to this sign and follow the sequence of instructions given.

Navigation

This icon appears in this manual to give navigation information, to give the path to the subject treated in the chapter.

GETTING STARTED WITH VISITOUCH 19 MX

Depending on software evolutions and the press brake controlled by the VisiTouch (configuration/capabilities), the present manual may not fully correspond to the VisiTouch that you currently have. However, differences are only minor.

This manual describes all features of

- VisiTouch 19 software version VisiTouch19_Press_PS_PC_V1.13.x and above.
- MX software version 10.8.x and above.

Intuitive Simulation

The offline software VisiTouch MX enables in a quick, easy and efficient way, importing and unfolding 3D files, automatically finding solutions for tooling and bend sequences and simulating dynamically in 3D for checking collisions.

PC offline software for all Cybelec controls

Allows transferring tools and programs to CybTouch 8PS, 12PS, 15PS controls, VisiTouch 19 and 19 MX controls and ModEva.

INITIAL SCREEN

CREATING A NEW 3D PART - WORKFLOW

There are four ways to create a program part: with the Numerical Mode, with the Touch Profile Mode (Graphical 2D) and with the Graphical 3D Mode (by importing or creating a part). This manual refers to this last one.

To help you get started, here are the basic actions you are likely to do. (Follow the links to go directly to the tutorial video)

New 3D Part

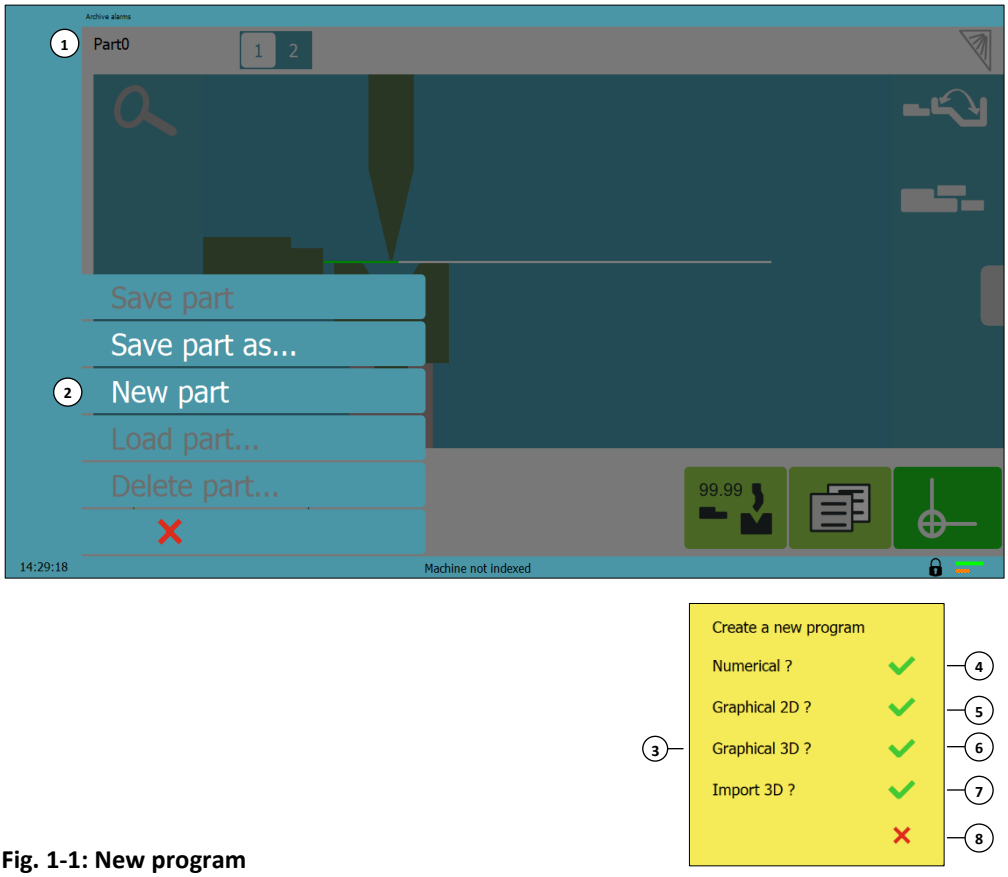


Fig. 1-1: New program

1. Program name
2. Menu
3. Type of program
4. New numerical part
5. New graphical 2D part
6. New graphical 3D part *(MX)*
7. Import 3D part *(MX)*
8. Back

Import 3D

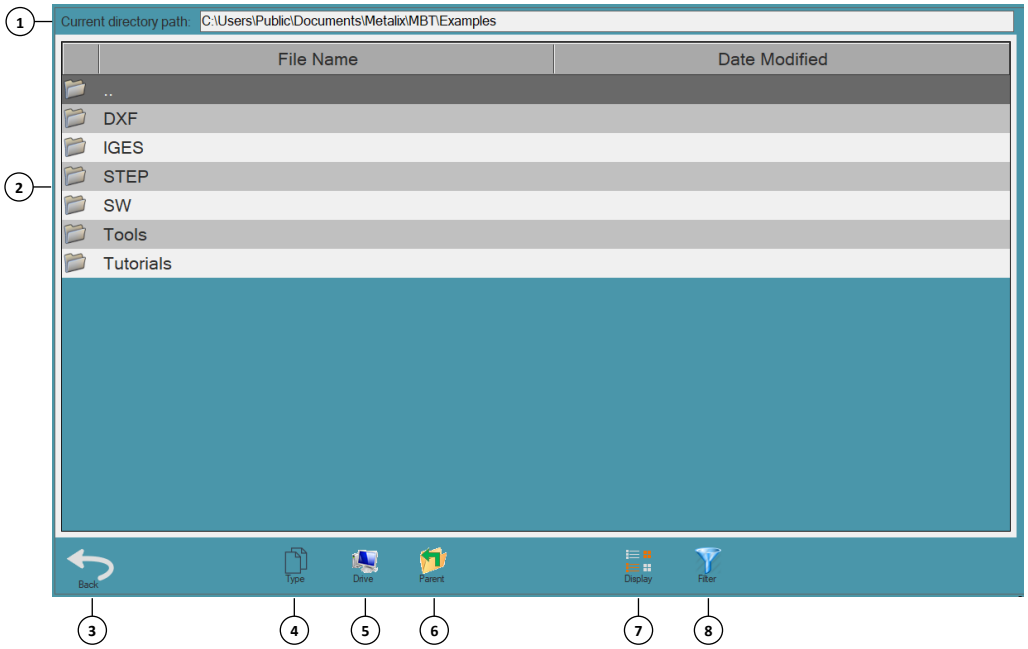
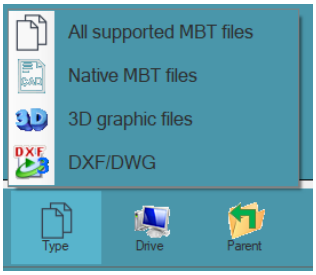


Fig. 1-2: Import 3D part screen

1. Current directory path
2. Folders
3. Back
4. Type
5. Drive location
6. Parent folder
7. Display (list or large icons)
8. Word filter

④ **Type**

- **All supported MBT files** – Only shows MBT files
- **Native MBT files** – Only shows MBT files
- **3D graphic files** – Only shows MBT files
- **DXF / DWG** – Only shows MBT files



Following the import of your file, you will have to choose the material.
After this step, you can go to the chapter Tooling Stage

DRAWING STAGE

In this chapter the machine is considered operational. The window below will appear after choosing a new Graphical 3D part on the main menu.

DRAWING A PROFILE

In this mode, the operator can very intuitively draw a profile directly on the screen by touching it (please refer to the manual instruction of the *VisiTouch 19* for further information)

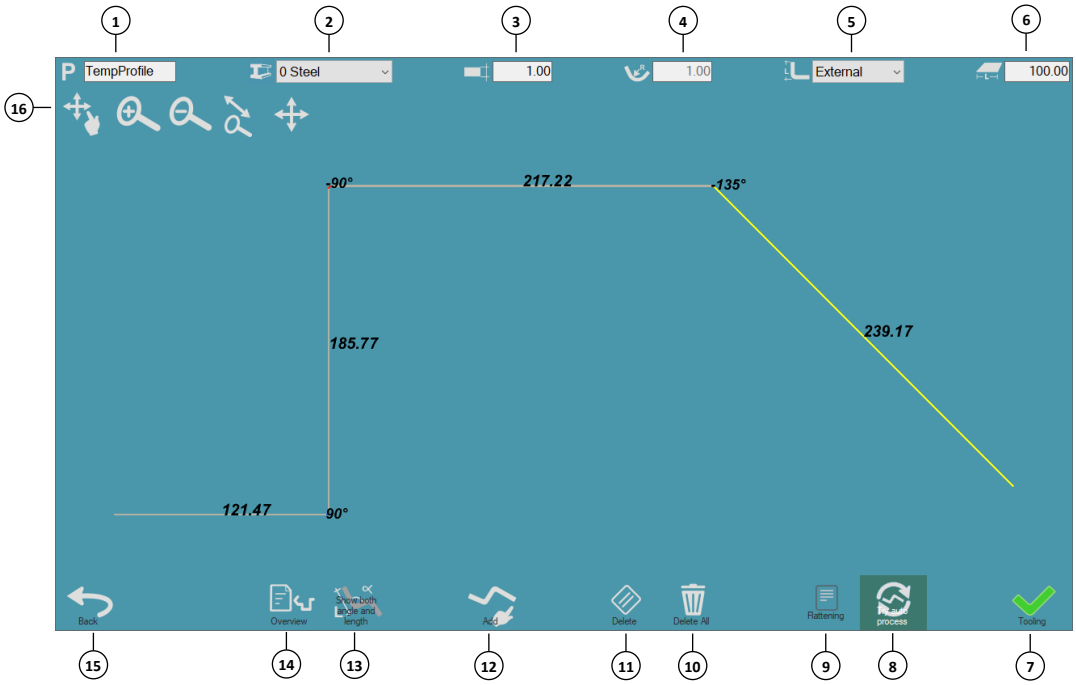


Fig. 2-1: Touch profile

1. Profile name
2. Material
3. Thickness
4. Radius
5. Internal/external measurement
6. Part length
7. Tooling / OK
8. Try auto process
9. Flattening
10. Delete all
11. Delete
12. Add / Modify segment/angle
13. Show measures/angles
14. Overview
15. Back
16. Zoom options

TOOLING STAGE

This is the first stage of the workflow.
In this stage you set the tooling for the part, define how to handle collinear bends, and exclude bends from the sequence.

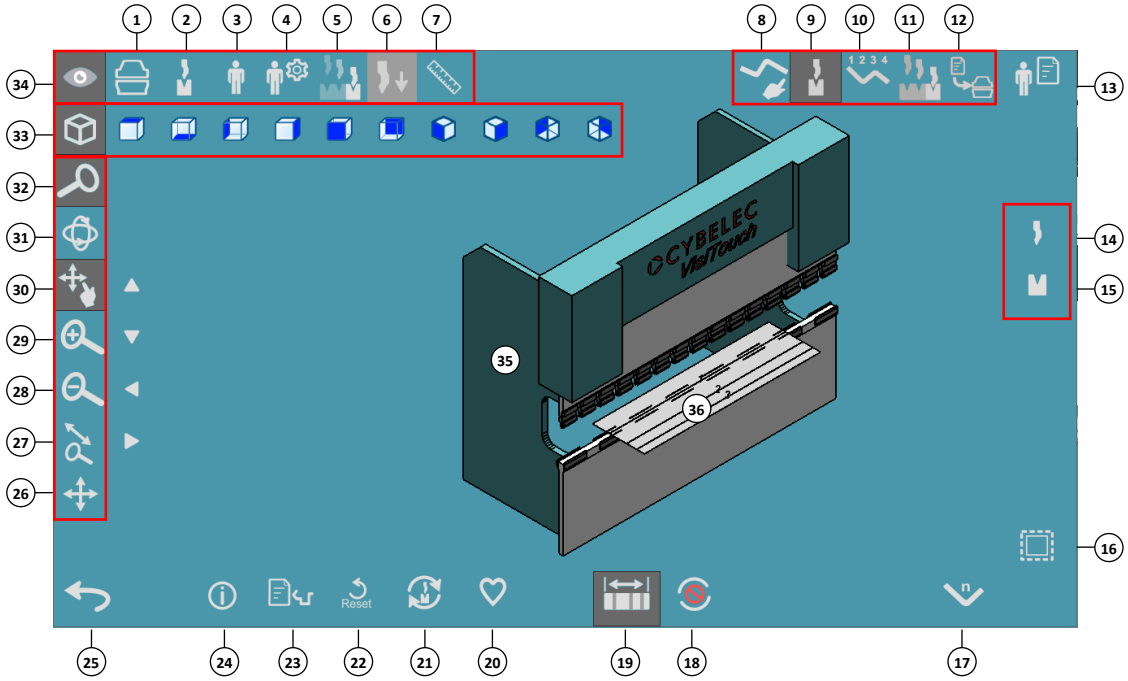


Fig. 3-1: Tooling

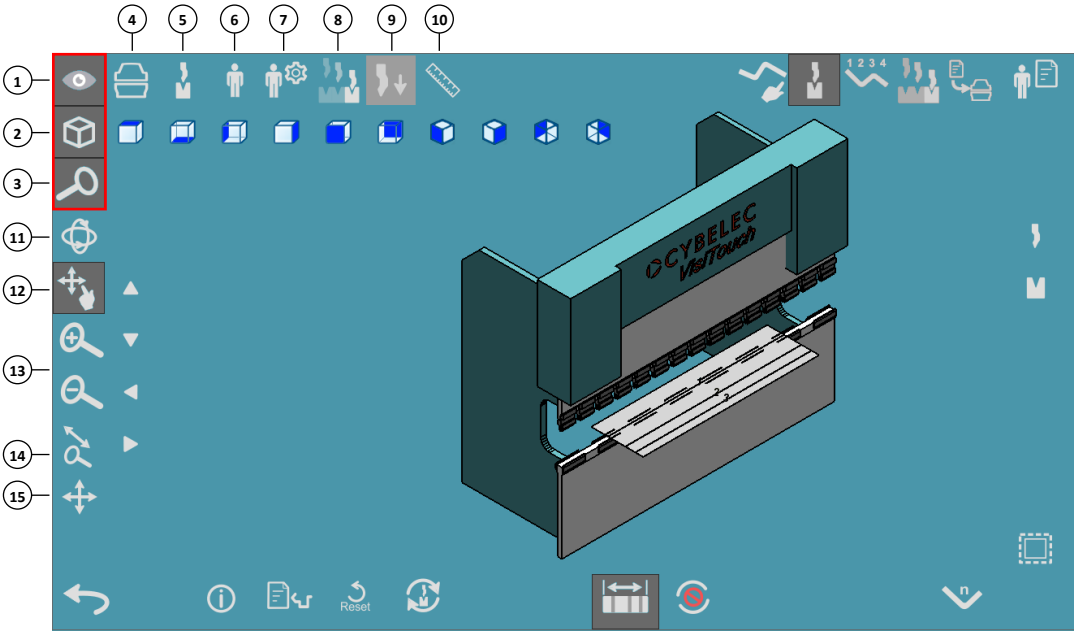
1. Full machine view
2. Tooling view
3. User view
4. User view setup: Temporary view
5. Animation speed
6. Beam up/down
7. Measure tool
8. 2D Part creation
9. Tooling Stage
10. Sequencing Stage
11. Simulation Stage
12. Output Stage
13. File action
14. Punch
15. Die
16. Assign all bends
17. Bend number
18. Exclude
19. Trust flat
20. Preferred
21. Auto tooling
22. Reset
23. Overview screen
24. Part information
25. Back
26. Move
27. Zoom forward/backward
28. Zoom -
29. Zoom +
30. Touch move
31. Rotate view
32. Zoom menu
33. Orientation menu
34. Equipment view menu
35. Press brake
36. Part

Tooling is the first stage in the process (followed by the Sequencing, Simulation, and Output stages). The current stage is visible in the top right corner (shown in red, above).

Each section of the tooling screen is explained separately, according to the red outlines.

DISPLAY

The display window is visible in all stages (Tooling, Sequencing, Simulation and Output).



Tapping each of the three buttons on the top right opens more options:

1. **Component Visualization**
2. **Orientation**
3. **Image View**

Component Visualization

These are the options available in the **Component Visualization** toolbar:

4. **Full Machine View**
5. **Tooling View**
6. **User View**
7. **User View Setup: Temporary View**
8. **Animation**
   Disable / enable animation for finger, bend movement, and placement.
   Show / hide machine outline, holes, and bend names in the simulation.
9. **Beam Up / Down**
10. **Measure**

Orientation

The items in the **Orientation** toolbar move the display so you can see the part from the angle you choose. Options:

- Left / Right / Front / Back / Top
- Bottom / Isometric Front-Left / Isometric Front-Right / Isometric Back-Left / Isometric Back-Right

Image View

These are the items in the **Image View** toolbar:

(11) **Rotate the Image**
(12) **Pan the Image**
(13) **Zoom In and Out**
(14) **Make the Image the Size of the Window you Draw**
(15) **Fit the Image to the Size of the Display Window**

File Action

File action:

- **Save** – Save the current file.
- **Save As** – Save the current file in a different format or location.
- **Problem Report** – Report a problem with the bending application.
- **Close Part** – Close the file without saving.
- **Close Application** – Terminate the bending application.

OVERVIEW SCREEN

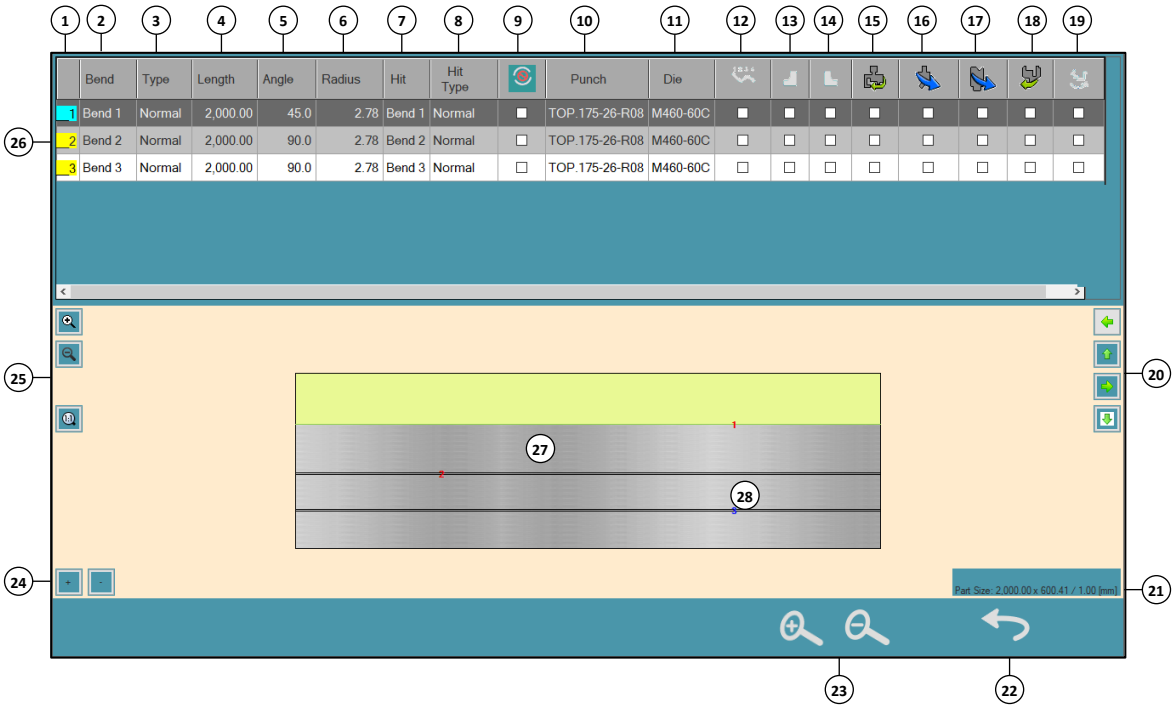


Fig. 3-2: Bend data

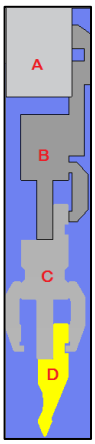
1. Bend number
2. Bend name
3. Type of bend
4. Bend length
17. Turned die
18. Turned die holders
19. 180° rotation
20. Part movement

5. Bend angle
6. Radius
7. Hit
8. Hit Type
9. Indicates excluded bends
10. Assigned punch tool
11. Assigned die tool
12. Whether sequenced
13. Whether the hit has a left heel
14. Whether the hit has a right heel
15. Turned punch holders
16. Turned punch
21. Part dimension
22. Return button
23. Display zoom
24. Text zoom
25. Zoom in/out
26. Hit row
27. Part
28. Bend number

① **Bend Number**
② **Bend Name**
③ **Type of Bend**
- **Normal** – A standard bend.
- **Hemming** – A hemming bend, which translates into two distinct hits – prebend and flattening.
- **Bumping** – A bumping radius bend, made by a series of shallow-angled hits designed to create a smooth result.
- **Excluded** – This bend is not performed on the press brake and is excluded from the hit sequence. Typically, these are performed beforehand in a turret press or performed in a different machine setup, either before or after the current one.

④ **Bend Length**
⑤ **Bend Angle**
⑥ **Radius**
⑦ **Hit**
⑧ **Hit type**
- **Prebend** – The hit is part of several hits that are needed to perform a bend, for example the prebend of a hemming action or a split bend.
- **Normal** – The hit is unchanged from its design, matching its bend.
- **Flattening** – The hit is the flattening action of the bend.
- **Finish** – The hit is the final action that closes a bend to its design angle.

⑨ **Indicates Excluded Bends**
⑩ **Assigned Punch Tool**
⑪ **Assigned Die Tool**
⑫ **Whether Sequenced**
⑬ **Whether the Hit has a Left Heel**
⑭ **Whether the Hit has a Right Heel**
⑮ **Turned punch holders**
Turns the punch holder and the punch connected to it 180° on the horizontal plane. Only active if the holder's topmost joint is rotatable or if the clamp's joint allows this.
⑯ **Turned punch**
Turns the punch tool 180° on the horizontal plane. Only active if the punch joint is rotatable or if the clamp's joint allows this (or the holder's if there is one).
⑰ **Turned die**
Turns the die tool 180° on the horizontal plane. Only active if the die joint is rotatable.
⑱ **Turned die holders**
Turns the die and die holder tool 180° on the horizontal plane. Only active if holder's lowest joint is rotatable.
⑲ Whether the part is rotated by 180° on the horizontal plane before executing the Hit



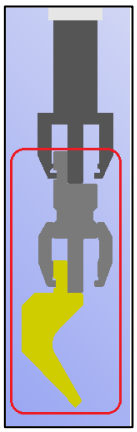
The following example demonstrates the behaviour of tool rotation:

Legend:

A – The upper beam.
B – The upper clamp. The down joint type is Euro and the clamp is non- symmetric.
C – A punch holder. The upper joint type is Euro and is not rotatable. The clamp is symmetric.
D – The punch. The joint type is Euro and it is not rotatable.

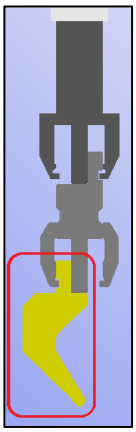
Combinations of the turned icons yield different results. The rotated objects are highlighted:

Turn Punch Holder



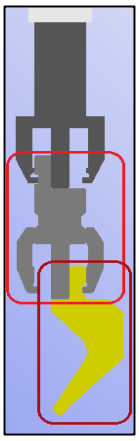
Holder and punch rotated together

Turn Punch



Punch alone rotated

Both



Holder rotated and punch rotated back

MANUAL TOOL SELECTION

On the right (below the File button) is where you manually select the tools.

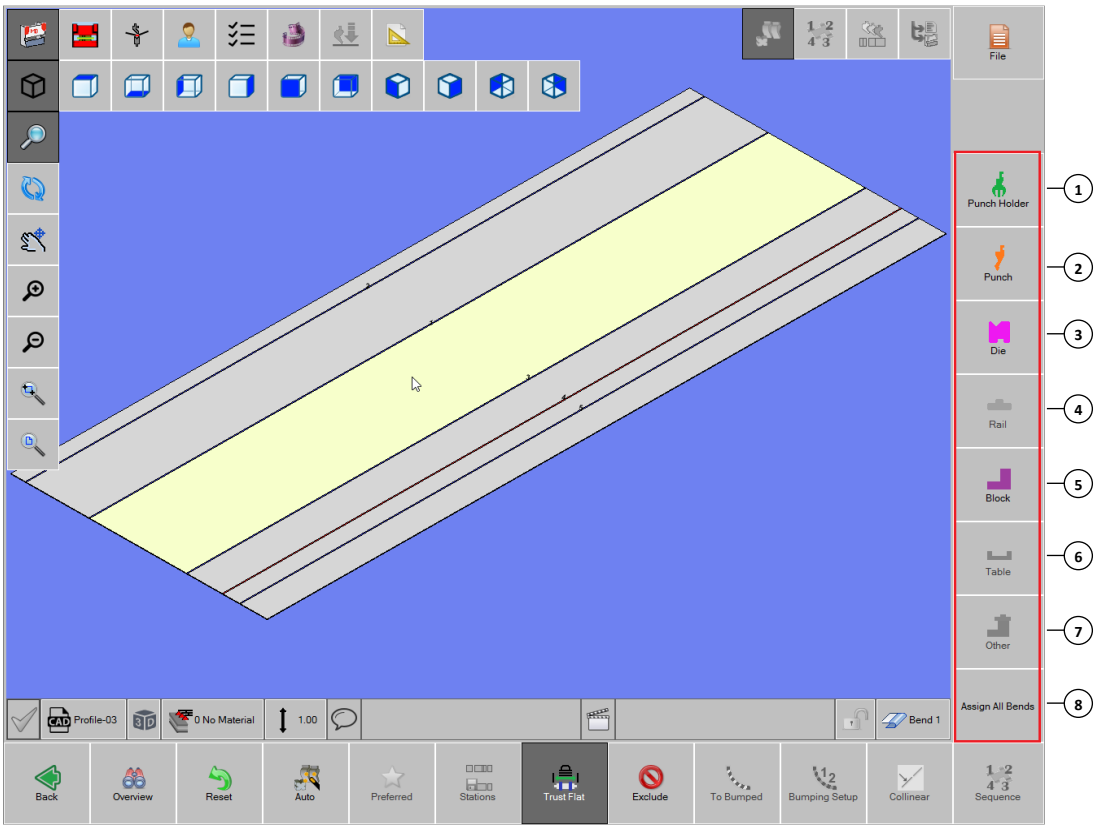


Fig. 3-3: Bend data

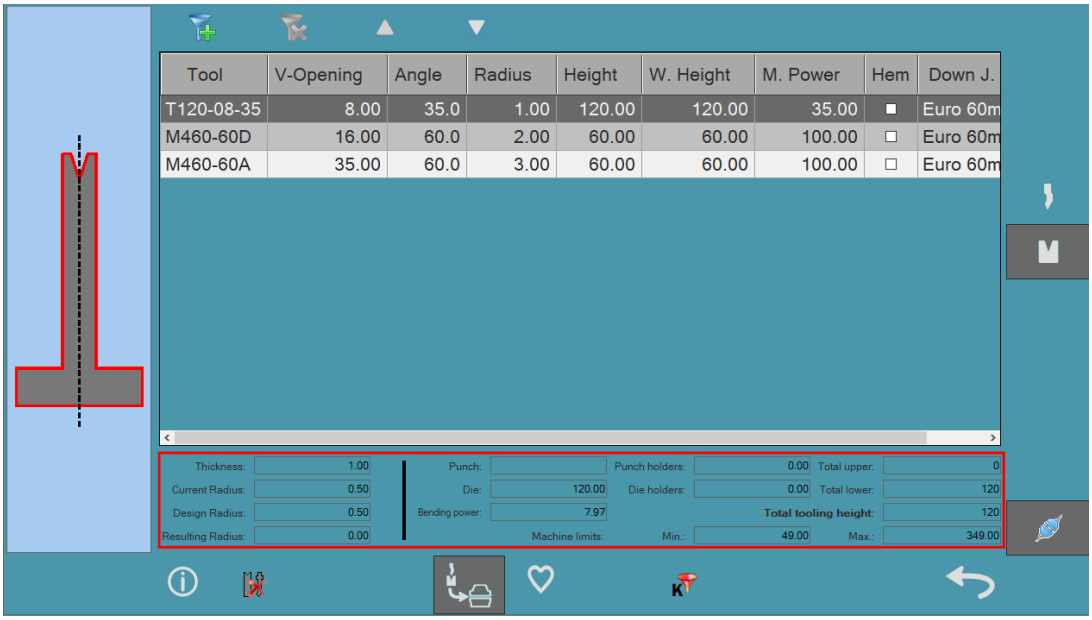
1. Punch holder
2. Punch
3. Die
4. Rail
5. Block
6. Table
7. Other
8. Assign All Bends

Some of these items may not be visible, depending on the components configured for your machine.

Change the display:

- See how the tool looks (as shown above on the left of the screen in the green box) by tapping one of the tools.
- Reduce the number of tools displayed by tapping **Filter**, and then to see the complete list again, Touch **Clear Filter**.
- Sort the tools by tapping **By Up Joint** and **By Down Joint**.
- Some of the columns may not be visible because they are hidden on the right. To make them visible, Touch the **Right Arrow**.

You cannot change the information displayed below the list of tools (displayed in the red box):



When you have tapped a tool, you can touch any of the other tool types on the right (such as **Punch**). The software remembers the tool you selected.

Punch Holder

The top centre of the screen shows a list of punch holder tools available on your machine.
The punch holder display looks something like this:

① Tool	② Height	③ M. Power	④ Up J.	⑤ Down J.	⑥ ID
Euro.to.Wila	67.00	100.00	Euro	Wila NSII	1

These are the columns:

① **Tool** - Punch holder name.
② **Height** - The height of the imported geometry.
③ **M. Power** - The maximum tonnage allowed for this tool.
④ **Up J.** - The joint type for connecting to an upper clamp or to another punch holder above.
⑤ **Down J.** - The joint type for connecting to a punch or to another punch holder below.
⑥ **ID** - Each tool has an identification (ID) number.

Punch

The top centre of the screen shows a list of punch tools available on your machine.
The punch display looks something like this:

① Tool	② Angle	③ Radius	④ Height	⑤ W. Height	⑥ M. Power	⑦ Hem	⑧ Up J.	⑨ ID
TOP.SP-134-24-10y	24.0	0.60	128.00	128.00	80.00	☑	Euro	16

These are the columns:

1. **Tool** - Punch name.
2. **Angle** - The angle of the punch's tip.
3. **Radius** - The radius of the punch's tip.
4. **Height** - The height of the imported geometry.
5. **W. Height** - The height for processing and calculations. (More details in Die.)
6. **M. Power** - The maximum tonnage allowed for this tool.
7. **Hem** - Specifies whether this tool can be used for hemming.
8. **Up J.** - The joint type for connecting to an upper clamp or to another punch holder above.
9. **ID** - Each tool has an identification (ID) number.

Die

The top centre of the screen shows a list of die tools available on your machine.
The die display looks something like this:

1 Tool	2 V-Opening	3 Angle	4 Radius	5 Height	6 W. Height	7 M. Power	8 Hem	9 Down J.
T120-08-35	8.00	35.0	1.00	120.00	120.00	35.00	☐	Euro 60m
M460-60D	16.00	60.0	2.00	60.00	60.00	100.00	☐	Euro 60m
M460-60A	35.00	60.0	3.00	60.00	60.00	100.00	☐	Euro 60m

These are the columns:

1. **Tool** - Die name.
2. **V-Width** - The width of the die's V.
3. **Angle** - The angle of the die's V.
4. **Radius** - The radii of the die's shoulders.
5. **Height** - The height of the imported geometry.
6. **W. Height** - The working height used for processing and calculations.
   For example, DXF geometry has a height of 96.34. The tool has a 30mm tang, so the actual working height is 66.34. The working height for each tool type measures a different attribute of the geometry. In general, the working height is the distance between the surfaces that transfer the force of the machine, so if a tool has a tang, its height is not included:

7. **M. Power** - The maximum tonnage allowed for this tool.
8. **Hem** - Specifies whether this tool can be used for a hemming bend.
9. **Down J.** - The joint type for connecting to a lower clamp or to a holder below.
   ID - Each tool has an identification (ID) number.

Rail

The top centre of the screen shows a list of rail tools available on your machine.
The rail display looks something like this:

1 Tool	2 Height	3 M. Power	4 Up J.	5 Down J.	6 Manufactu
300	10.00	100.00	Euro 2V Sym	Euro Bolt Down	Amada
30009	14.99	89.29	Amada 1V Sash	Euro Bolt Down	Amada
Rail_300	10.00	100.00	Euro 2V Sym	Euro Bolt Down	Amada

These are the columns:

1. **Tool** - Rail name.
2. **Height** - The height of the imported geometry.
3. **M. Power** - The maximum tonnage allowed for this tool.
4. **Up J.** - The joint type for connecting to a lower clamp.
5. **Down J.** - The joint type for connecting to a lower beam, block, or table.
6. **Manufacturer** - The name of the manufacturer who builds this tool.

Block

The top centre of the screen shows a list of block tools available on your machine.

Table

The top centre of the screen shows a list of table tools available on your machine.
The table display looks something like this:

1 Tool	2 Height	3 M. Power	4 Up J.	5 Down J.	6 ID
4016	20.00	100.00	Euro 60mm	Euram 80mm	28

These are the columns:

1. **Tool** - Table name.
2. **Height** - The height of the imported geometry.
3. **M. Power** - The maximum tonnage allowed for this tool.
4. **Up J.** - The joint type for connecting to a lower clamp or to another die holders.
5. **Down J.** - The joint type for connecting to a lower beam, block, or table.
6. **ID** - Each tool has an identification (ID) number.

Other

The top centre of the screen shows a list of table tools available on your machine.
The table display looks something like this:

1 Tool	2 Height	3 M. Power	4 Up J.	5 Down J.	6 Manufacturer	7 ID
Holder_53400	90.00	100.00	Euro 1V	Euro Bolt Down	Amada	3
Holder_05500	55.00	89.29	Euro 60mm	Euro 60mm	Amada	7
Holder_50008	50.00	100.00	Euro 60mm	Euro 60mm	Amada	16
Holder_53300_60mm	60.00	100.00	Euro 60mm	Euro 60mm	Amada	17
4018	50.00	100.00	Euro 60mm	Euro 60mm	Euram	31

These are the columns:

1. **Tool** - Tool name.
2. **Height** - The height of the imported geometry.
3. **M. Power** - The maximum tonnage allowed for this tool.
4. **Up J.** - The joint type for connecting to a lower clamp or to another die holders.
5. **Down J.** - The joint type for connecting to a lower beam, block, or table.
6. **Manufacturer** - The name of the manufacturer who builds this tool.
7. **ID** - Each tool has an identification (ID) number.

Assign All Bends

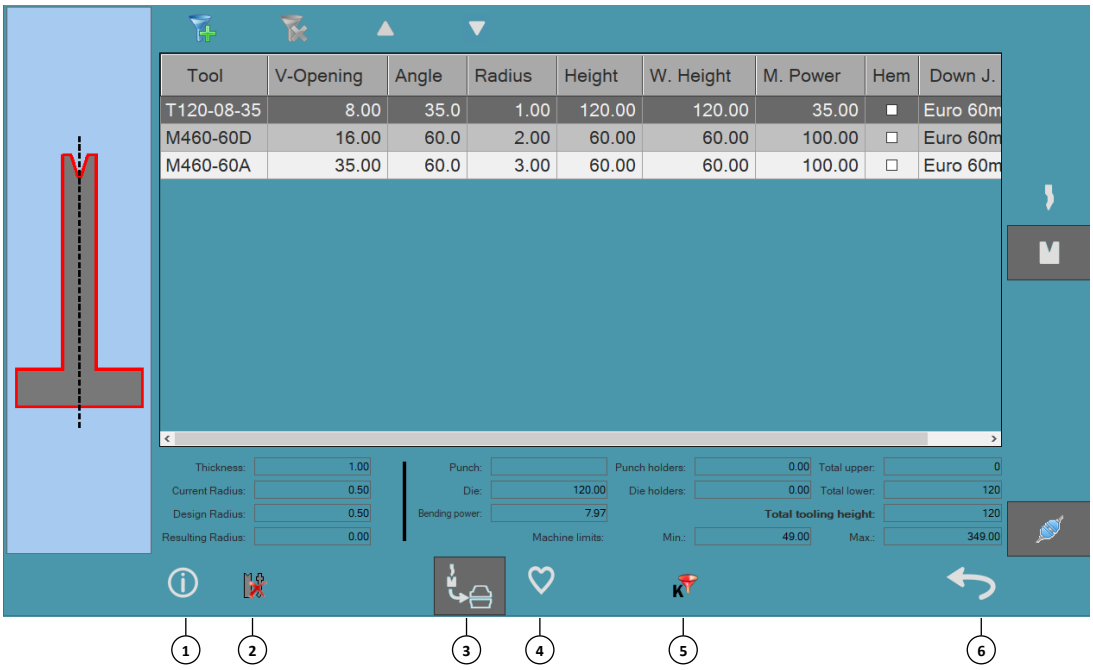
To assign the selected tooling (for the current bend) to all the bends of the part, Touch **Assign All Bends** (on the bottom right of the screen).
This icon is only active when you have assigned tools to at least one bend.
When you have assigned tools to all bends, you can continue to the Sequencing Stage by tapping **Sequence**.

TOOL FILTER AND SORT

You can filter the list of tools, so you see only those that answer specific criteria.

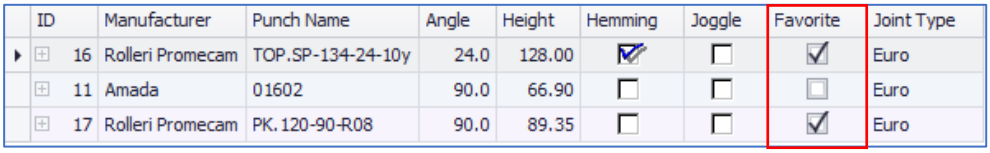
1. Touch **Filter** and set the parameters.
2. To cancel the filter, Touch **Clear Filter**.
3. When connecting tools such as a die and a die holder, you need to know which joint type matches your machine's clamping. To help you, sort by joint type (by tapping By **Up Joint** or By **Down Joint**).

MANUAL TOOL ACTIONS



At the bottom of the manual tool selection screen are the actions you can take:

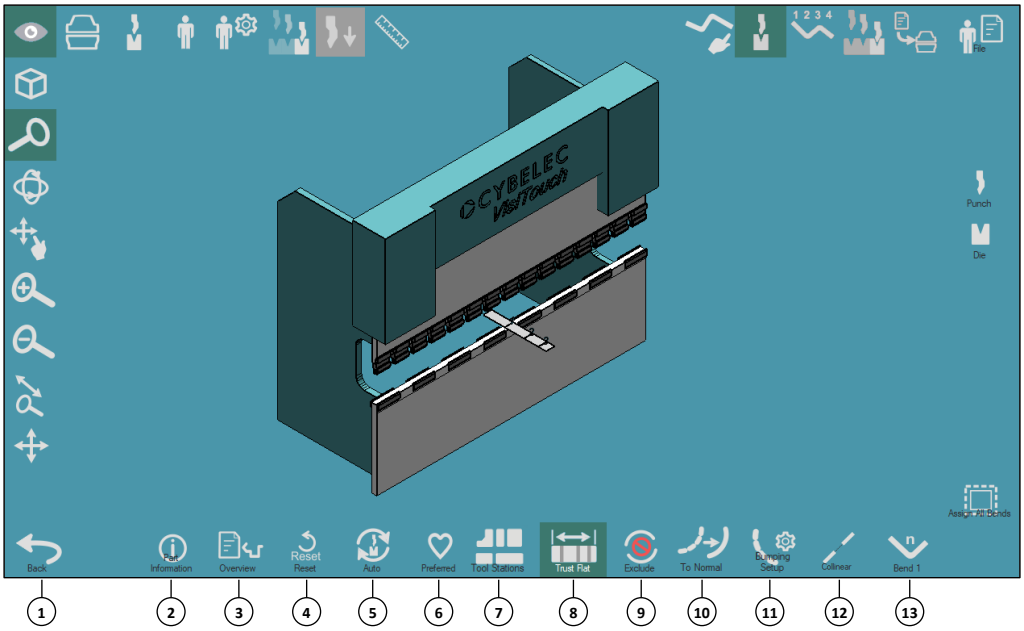
1. **Information**
2. **Remove Tools** – Remove tools from the selection showing in the middle of the screen
3. **Assigned** – You can define the assigned tools in **Settings** => **Machine** => **Punches / Dies / Holders**.
4. **Favourite** – You can define favourite tools in **Menu** => **…** => **Service** => **Parameters** => **Machine Dimensions** => **Edit 3D machine definition** => **Punches / Dies / holders** and check the checkboxes in the Favourite column.



5. **By Bend Table** – Show the tools that are compatible with the material, thickness, bend radius, and angle.
6. To use the selected tool for all bends, make sure **Assign all** is highlighted (with a dark background).

When you have selected acceptable tools (e.g., with correct stacking) to continue to the next stage, the **OK** button turns green.

AUTOMATIC TOOLING SELECTION



At the bottom of the tooling screen are the options for automatic tool selection:

1. To cancel the tool selection, Touch **Back**. You will be prompted to save or discard your tool selections.
2. **Part Information**
3. To see all the data regarding the bends, Touch Overview.
4. To reset the tool selections and continue working in this screen, Touch **Reset**.
5. To instruct the bending software to automatically select tools for the part, Touch **Auto**.
6. **Preferred**
   Set tools as the default for a specific combination of machine + materials + thickness

Material	Thickness	Punch	Die	Punch Holders	Die Holders
0 No Material	1.00	EsaDemo 135.85.R08 [1]	EsaDemo Hem. 2stage.V10 [1]		
0 No Material	1.20	EsaDemo 175.26.R08 [3]	EsaDemo T120-12-88 [8]		
0 No Material	2.00	EsaDemo 135.85.R08 [1]	EsaDemo T120-16-88 [9]		

   Add preferred tools in **Settings** => **Machines** => **Preferred**.

7. **Stations**
   Allows you to apply a previously saved tool setup.
8. **Trust Flat**
   Select this option when you do not want the size of the flat to change as a result of the selected tools.
9. **Exclude**
   Allows you to exclude desired hits. Any bend you touch is bent, its tooling is discarded, and it is added to the excluded list.
10. **To Bumped**
    Allows you to bump hits that almost always have a large radius. The bumping is a series of shallow-angled hits designed to create a smooth result.
11. **Bumping Setup**
    A window opens where you define the bumping steps, pitch, and method for the bend.
12. **Collinear**
    A group of two or more bends that can be created with a single hit.
13. **Bend Number**

When you have the desired tools, go to the Sequencing Stage by tapping Sequence.

Exclude

Exclude

This option allows defining hits as excluded. Any bend on which you touch, its tooling is discarded, and it is added to the excluded list.

Excluded bends are not intended to be in the bend sequence.

These bends are always placed at the beginning of the sequence and are not available in the Hit Sequencing panel.

They are usually

- For bends that are done before the sequence.
- A different sequence of hits that are done in a separate setup or on a different machine.

An example of an excluded bend is hemming bends, which are sometimes done separately from the rest of the bends in the part due to tooling or machine considerations.

To exclude bends, Touch **Exclude Bends**; you are now in the Exclusion Mode. Any bend you Touch is bent, its tooling is discarded, and it is added to the excluded list.

VisiTouch 19 MX assumes that excluded bends are bent prior to the VisiTouch 19 MX simulation. Note that excluded bends are different from untooled hits, which can be placed before or after the other bends.

To exit this mode, Touch the **Exclude Bends** button again.

To reverse the exclusion, re-enter the Exclusion Mode and Touch the bend again.

- For example, in the following part, bend 1 is done on a different machine; therefore, it is excluded:

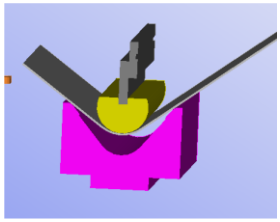
#	Radius
~~1~~	~~2.00~~
2	2.00
3	2.00
4	2.00

To Bumped

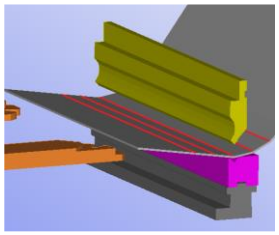
⑩ **To Bumped**

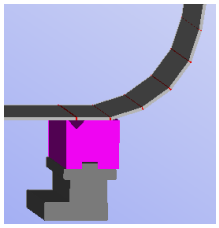
Allows users to bump desired hits, almost exclusively with a large radius, which is made by a series of shallow-angled hits designed to create a smooth result.

Instead of one hit with a very large V die:



Several hits with a smaller V achieve the smooth bend:



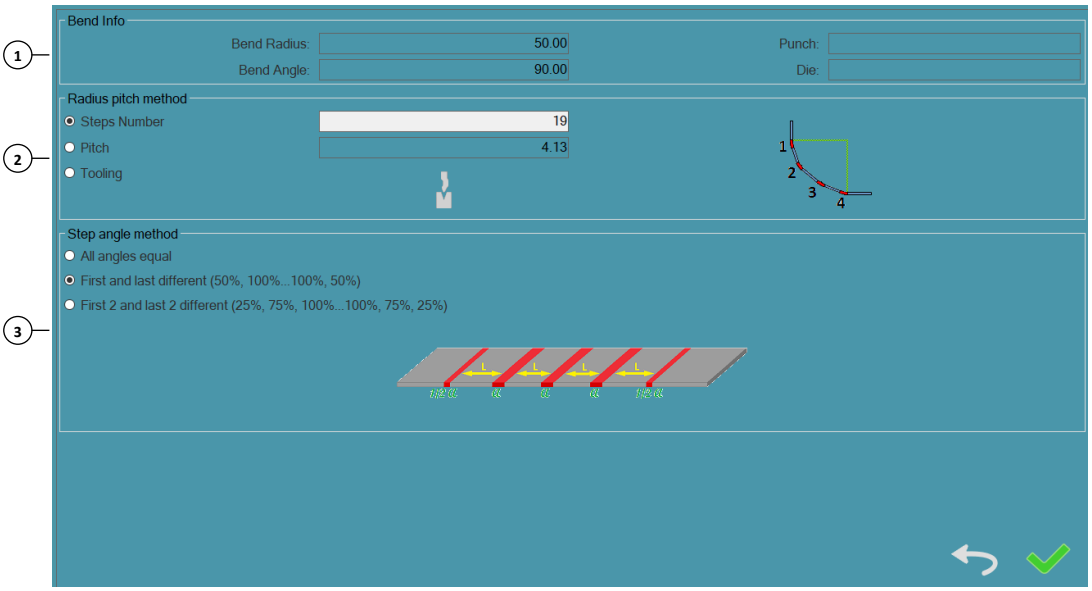


Convert Bumped to Normal:
Converting a bumped bend to a normal bend is useful for cases where a large V die, and large radius punch are available to perform the bend.
This option is only active when you highlight a bumped bend.

Convert to Bumped:
Converting a normal bend to a bumped bend is useful for cases where a bend is not automatically set as bumped.
When you Touch this icon, the Bumping Radius Setup dialog box opens, and you can define the bumping steps, pitch, and method for the bend.

Bumping Setup

A window opens and you can define the bumping steps, pitch, and method for the bend:



① **Bend Info**
This area displays information about the bend: the radius, angle, and tools (if any)

Radius Pitch Method Section
Here you can determine the method used to create the bumping:

The Steps Number and the Pitch are two parts of the same bumping calculation; when there are more steps (hits), the pitch is smaller. Conversely, when the pitch is bigger, the bend requires fewer steps.

Steps Number
Specify the number of steps (hits) to use in the bumping
When there are more steps, the pitch is smaller, and the result is smoother.

Pitch
Specify the distance between the hits in the bumping
When the hits are closer, the result is smoother, but more hits are required to achieve the bend.

Tooling
Specify which tools to use in the bumping

Use the Select Tools button to open the dialog box for tool selection.
The V width of the die is used to calculate the smallest possible pitch.
After the tool selection, you can always edit the number of steps if this calculation gives too many. This does not remove the tooling definition.

③ **Step Angle Method Section**

Here you can set how the defined pitch and the bend angle are distributed along the bend's arc.

All Angles Equal

All angles and pitches are equal

First and last different

All pitches are equal, but the first and last angles are half of the central ones:
This gives a smoother start and end for the resulting bend.

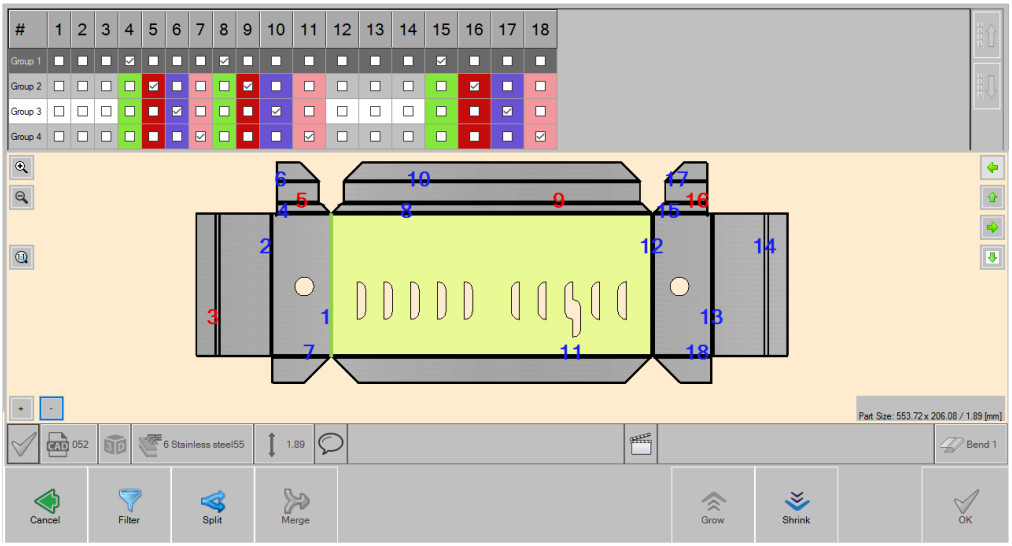
First two and last two different

Start and end angles and pitches are different from the central ones:

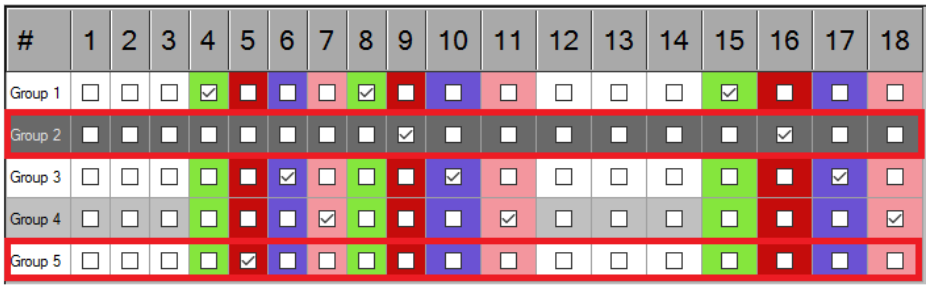
- The first and last angles are a quarter of the central angles. Their pitches are half of the central angles.
- The second and second-from-last angles have the same pitch. Their angles are three-quarters of the central angles.

Collinear

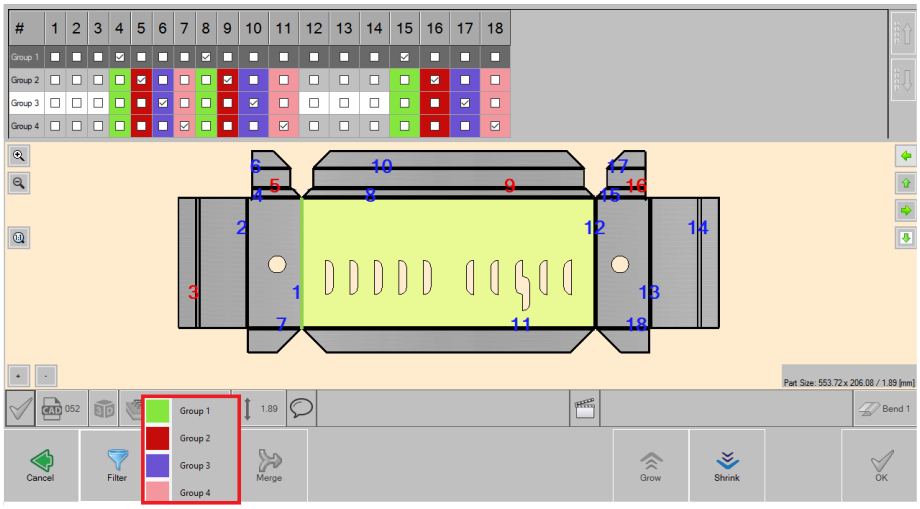
A group of two or more bends that can be created with a single hit. Touch **Collinear** to manage collinear bends:



- Each group of collinear bends is color-coded to make split groups easy to recognize.
- You may want to perform the collinear bends in two hits: one for Bends 5, 9, and 16.
- To do this, uncheck Bend 5 from the group, thereby causing a new line to be opened for it (since it is a new group):



- When your part has several groups, you may want to view only one of them. To select one group, Touch the **Filter** button:



- When you have the desired tools, go to the Sequencing Stage by tapping Sequence.

Auto-Screen

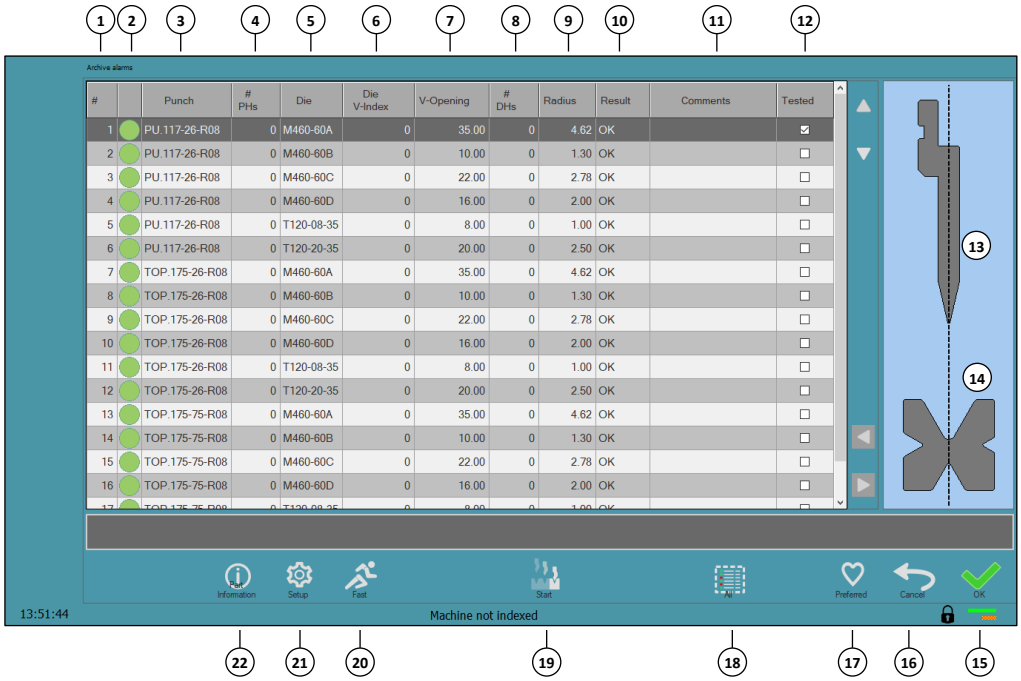


Fig. 3-4: Auto tooling selection screen

1. Row number
2. Result
3. Punch name
4. PHs number
5. Die name
6. Die V-Index
7. V-Opening
8. DHs number
9. Radius
10. Result
11. Comments

1. Tested
2. Punch visualization
3. Die visualization
4. Ok
5. Cancel
6. Preferred
7. Combination result visualization
8. Simulation start
9. Simulation type
10. Setup
11. Part information

The options in this screen:

(21) **Setup**
Opens the Auto Tooling Setup screen.

(20) **Fast**
Automatically chooses tooling for the bends in the part based on the following tests:

- Tool tonnage
- The radius that results from the tools, within the Bend Radius Testing Tolerance
- Tooling height
- The need for holders to connect the tools to the clamps.

Full
Performs the same checks as the Fast option, but in addition it tries to find a viable bend sequence, based on the Collision Settings.

(19) **Start**
Begins the search for compatible tools. Searches only the selected joint types.

(18) **All**
Selects all joint types so that when you Touch **Start**, the search runs on all the joint types (not just the selected joint types).

Usable / Succeeded / Suitable
Filters the visible results:

- Usable combines both succeeded and suitable results.
- Succeeded are all possible results, with all available segments.
- Suitable are all possible results, without enough segments.

(17) **Preferred**
The default tools for a specific combination of machine + materials + thickness.

Auto Tooling Setup Screen

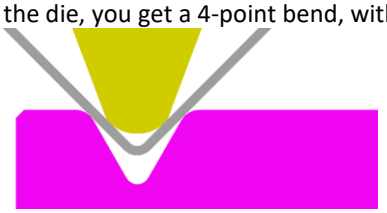
When the bending program selects the tools automatically, it uses these defined limitations.

1. **Tool Selection Mode**
   Fast / Full Mode
2. **Auto Tooling Parameters**
   - **Bend Radius Testing Tolerance**
     The bending application uses this tolerance to test the resulting radius of a given set of tools. This testing parallels the testing for the manual tool selection's Resulting Radius.

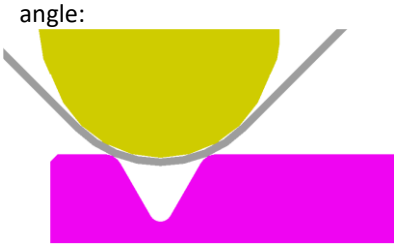
   - **Allow Punch Tip to Determine Bend Radius**
     The die usually determines the bend radius. When you select this option, the punch tip plays a part. There may be implications to allowing the punch tip.
     As long as the punch's radius is smaller than the resulting radius then you get a good bend:

However, when the radius of the punch is larger than the one you would expect to get from the die's width, problems ensue:

- If the punch radius is larger than the expected resulting radius, but smaller than the die, you get a 4-point bend, with the resulting material deformation:



- If the punch radius is larger than the die's width, you do not even get the correct angle:



The punch cannot penetrate low enough into the die, and instead of the desired 90° angle, you get an incomplete bend.

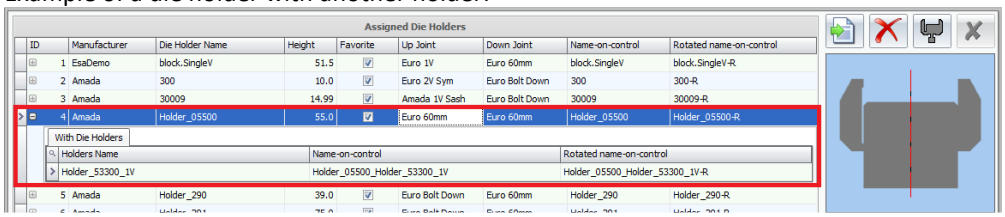
Use Preferred Holders Only

This option is available only if there are preferred tools for this material. When this option is selected, the automatic tool selection process only uses the holders from the Preferred set when testing tools.

Maximum Punch and Die Holders

This option is not available when you select the Use Preferred Holders Only option. These settings determine how many holders to use when testing how possible tooling combinations fit on the clamps.

Example of a die holder with another holder:



③ **Punches / Dies Tabs**

You can change the display and select tools:

- Filter the list of tools shown in these tabs by tapping the Filter button and defining conditions. Additional options:
  - Define more than one filter.
  - Use the tools resulting from the filter by tapping Shown tools.
  - Remove the filter(s) by tapping Clear Filter.

- Sort the list of tools using the By Up/Down Joint buttons.
- Select All / None tools from the list.
- By Bend Table – When selected, shows only the tools that are compatible with the material, thickness, bend radius, and angle.

SEQUENCING STAGE

In this stage you determine the order of the hits that create the bends and adjust the positions of the finger stops. You can only progress to the Sequencing Stage once you have determined the tools for each bend in the Tooling Stage.

Each bend consists of one or more hits. For example, a hemming bend may require a pre-bend hit and then a flattening hit. And a bumping bend consists of at least two hits.

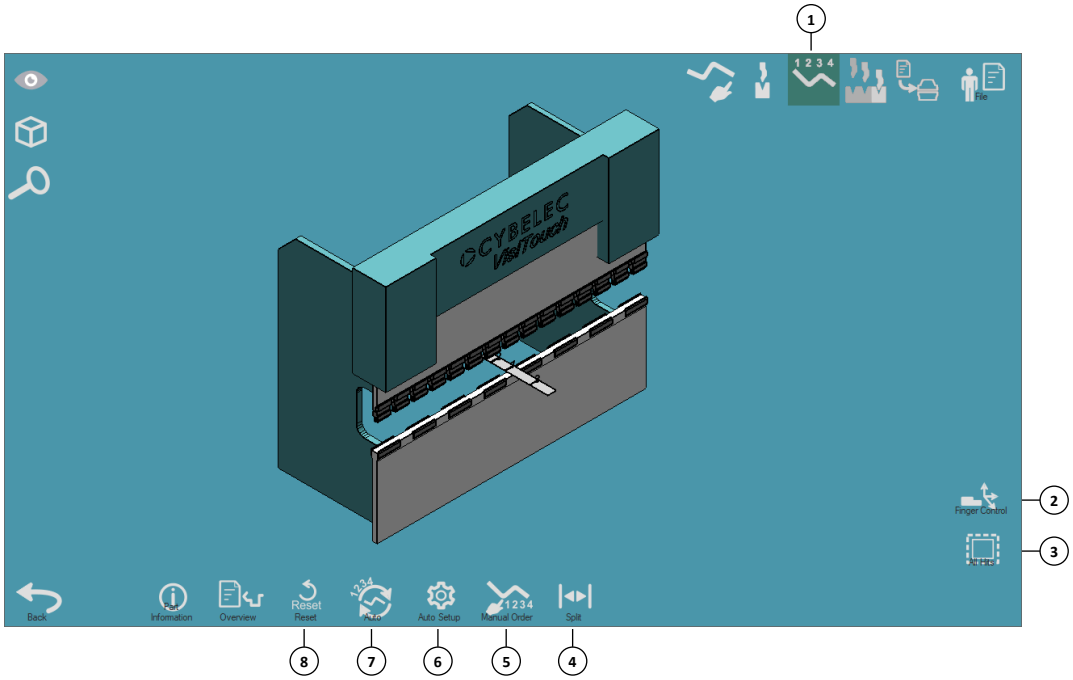


Fig. 4-1: Auto hit sequencing screen

1. Hit menu
2. Finger control
3. All hits
4. Split
5. Manual order
6. Auto setup
7. Auto
8. Reset

Auto-Mode

Touch **Auto** so the software can calculate the most efficient order

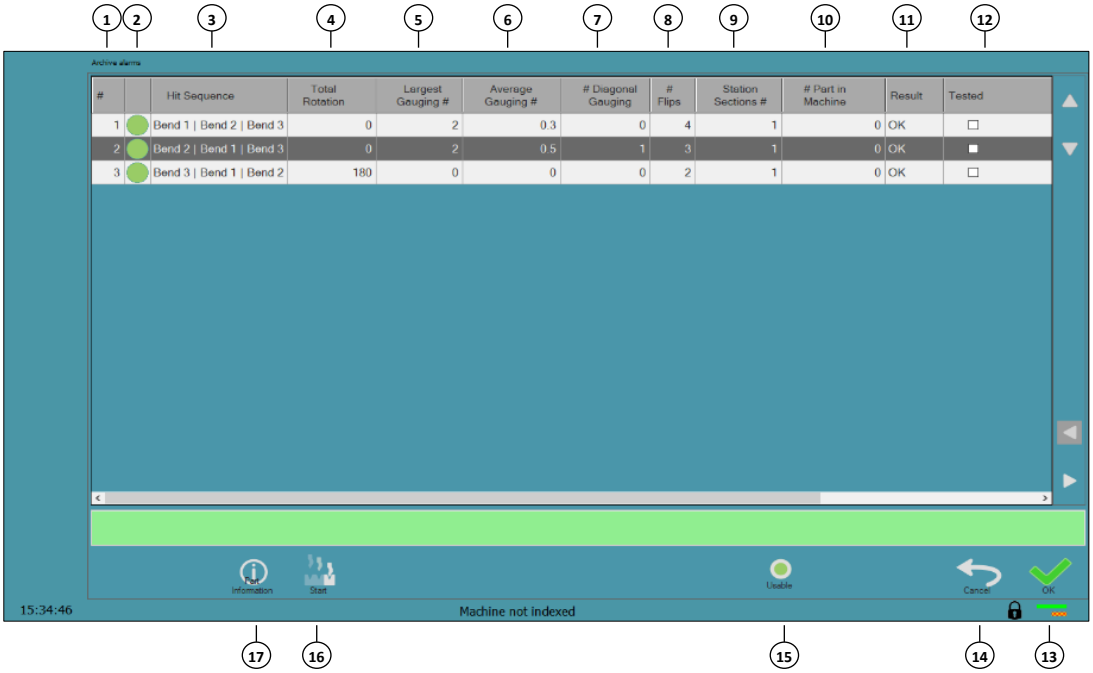


Fig. 4-2: Auto hit sequencing selection screen

1. Row number
2. Result
3. Order of the hits
4. Sum of total rotation
5. Largest gauging
6. Average gauging
7. Diagonal gauging
8. Sum of total flips
9. Number of stations required
10. Number of parts in machine
11. Result
12. Tested
13. Validation
14. Cancel
15. Filter
16. Start
17. Part information

The table shows these columns:

① **#**
The Row number

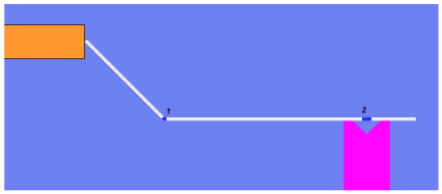
③ **Sequence**
The order of the hits.

④ **Total Rotation**
The sum of all part rotations, in degrees.

⑤ **Largest Gauging #**
Gauge # is the number of bent bends between the current hit and the furthermost point on the X axis, so this column shows the largest gauge number.

⑥ **Average Gauging #**
The average of the gauge numbers of the hits in this alternative.

⑫ **# Diagonal Gauging**
The number of hits that have a diagonal flange adjacent to the finger, as in the following example:



7 **# Flips**
Indicates how many times the user must flip the part.

8 **Tool Stations #**
The number of stations required.

9 **Result**
Indicates if this alternative is OK or only partially suitable (i.e., contains segment errors).

Back – closes auto sequencing screen without selecting a sequence.
Start – start auto sequencing (search starts automatically when no prior results exist).
Usable – show both suitable and succeeded results.
Succeeded – filter the results list to show only succeeded results.
Suitable - filter the results list to show only suitable results.
Stop – stop auto sequencing.
OK – accept selected sequence and go back to simulation screen.

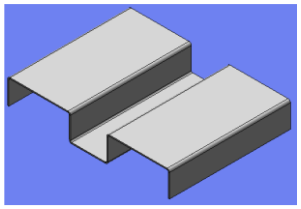
Auto-Setup

Here we can configure different settings controlling the auto sequencing process:

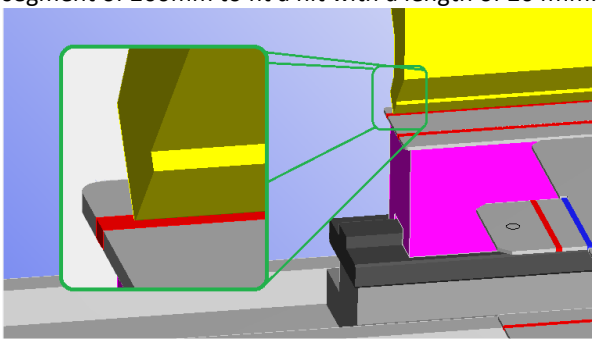
1 **Automatic Sequencing Parameters**

- Build Tool Stations
  When this option is enabled, VisiTouch 19 MX checks if the tested tooling set has the segmentation needed to create the tool stations for bending the part.

- Split Hits before Sequencing
  When this option is checked, VisiTouch 19 MX splits hits prior to the auto-sequencing process. This option is particularly applicable when your part is obviously requires splits, which may cause the auto-sequencing to time out (according to the Limit auto sequence execution time option).
  Example of a typical part requiring splits:



- Use Negative Tolerance
  When selecting tool segments to fit the length of a hit, the bending application may not find the exact match. The Negative Tolerance allows the bending application to select segments that cover less than the hit length, within this tolerance.
  For example, a Negative Tolerance of 5mm allows the bending application to select a segment of 200mm to fit a hit with a length of 204mm:



The default value is set in the Tools Configuration => General tab, in Negative tolerance in tool stations.

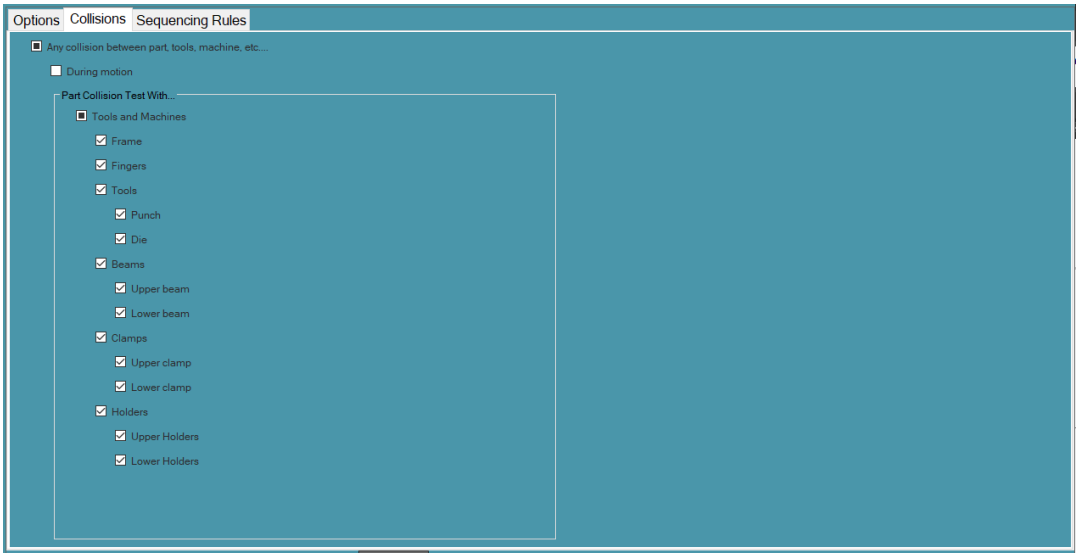
② **Untooled Hits Mode**

Choose where to sequence untooled hits:

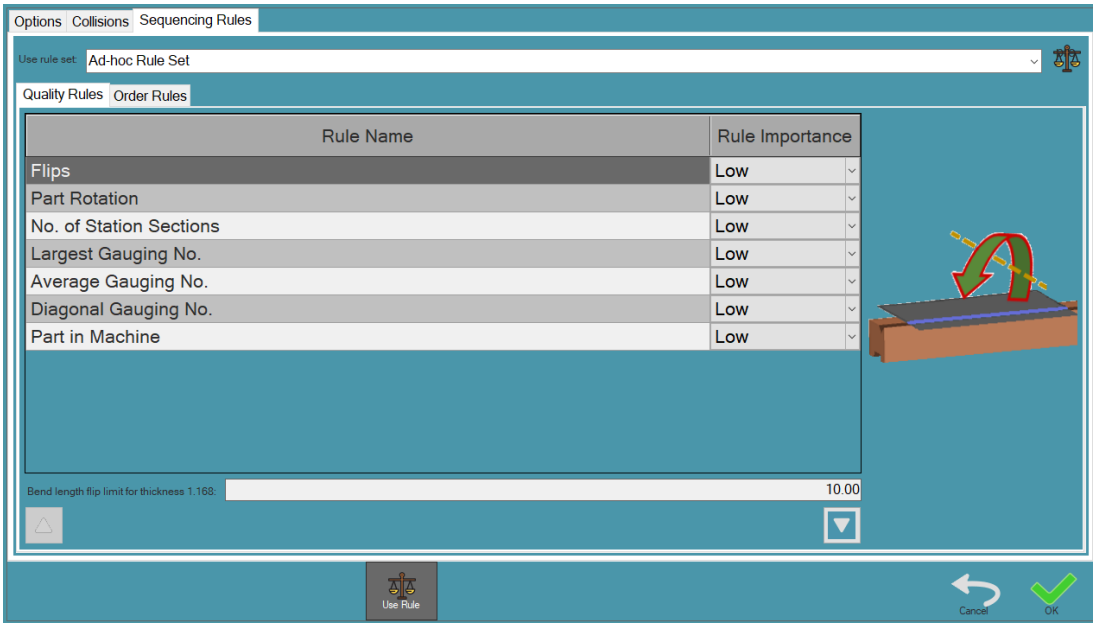
- **First** – Sequence the untooled hits before the tooled hits, as if they are to be bent on a previous operation
- **Regular** – Sequence the untooled hits as needed to avoid collisions.
- **Last** – Sequence the untooled hits after the tooled hits, as if they will be bent on a next operation.

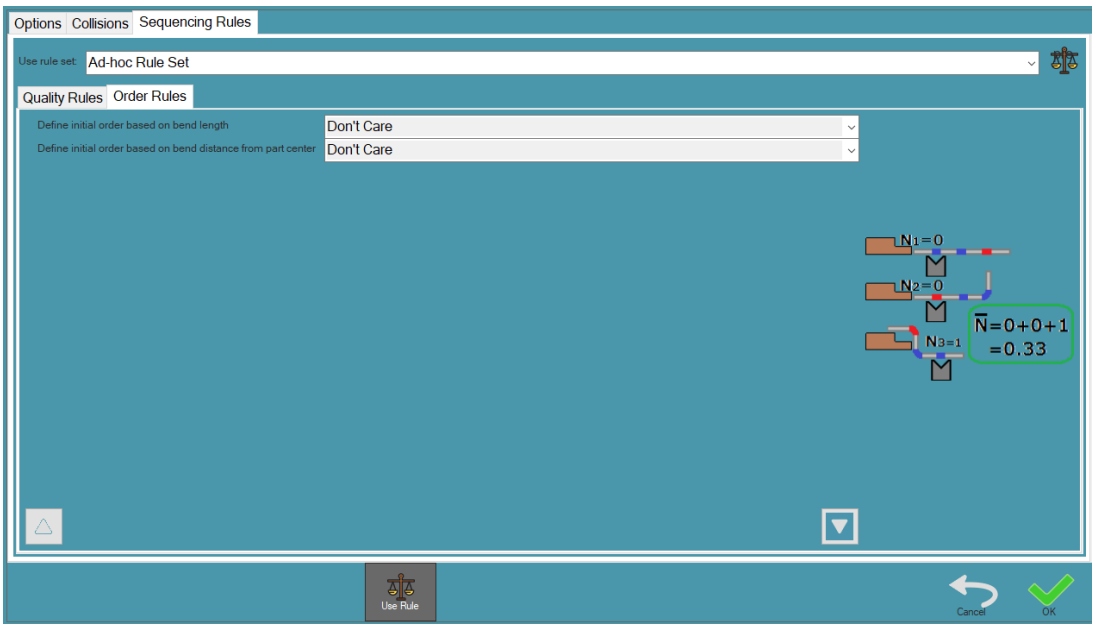
Collisions

These options enable and disable the various collision testing options that will be used during the automatic sequencing feature.



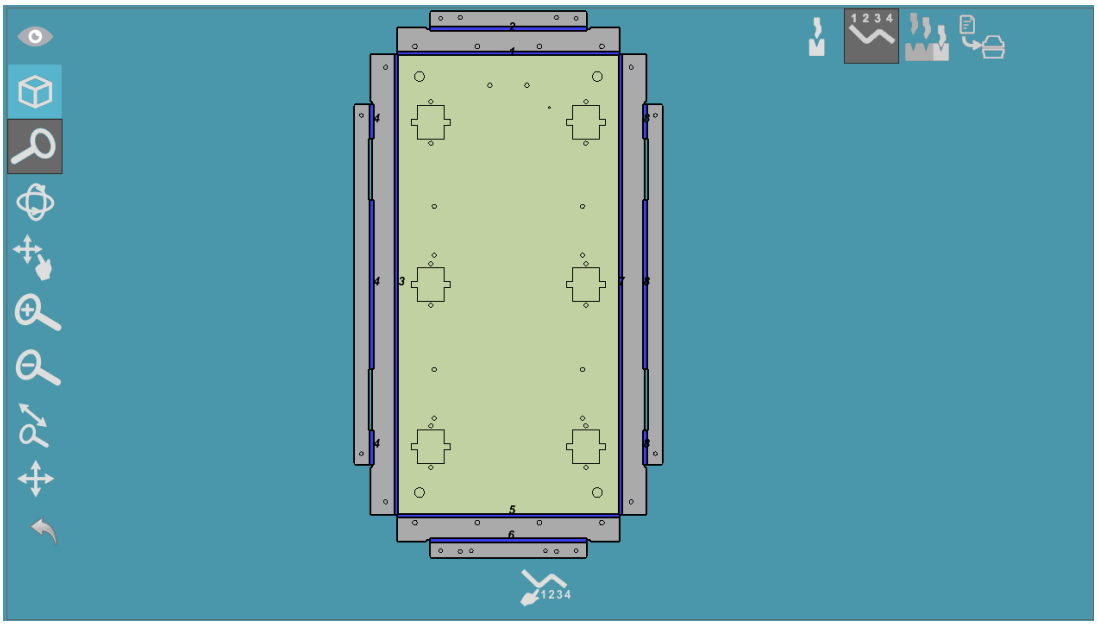
Sequencing Rules





MANUAL MODE

2D Sequencing



Allows you to Touch the bends in the 3D graphical representation of the part, thereby adding them to the hit sequence. If you have already defined a hit sequence, you must first approve its deletion. When you enter this mode, **Undo** becomes visible. (After you Touch one or more bends to add them to the sequence, this option allows you to undo the last hit.)

Tapping the bend name button in the lower right corner shows the hits sequenced so far.

To accept the sequence, Touch **Finish**.

3D Forward Sequencing

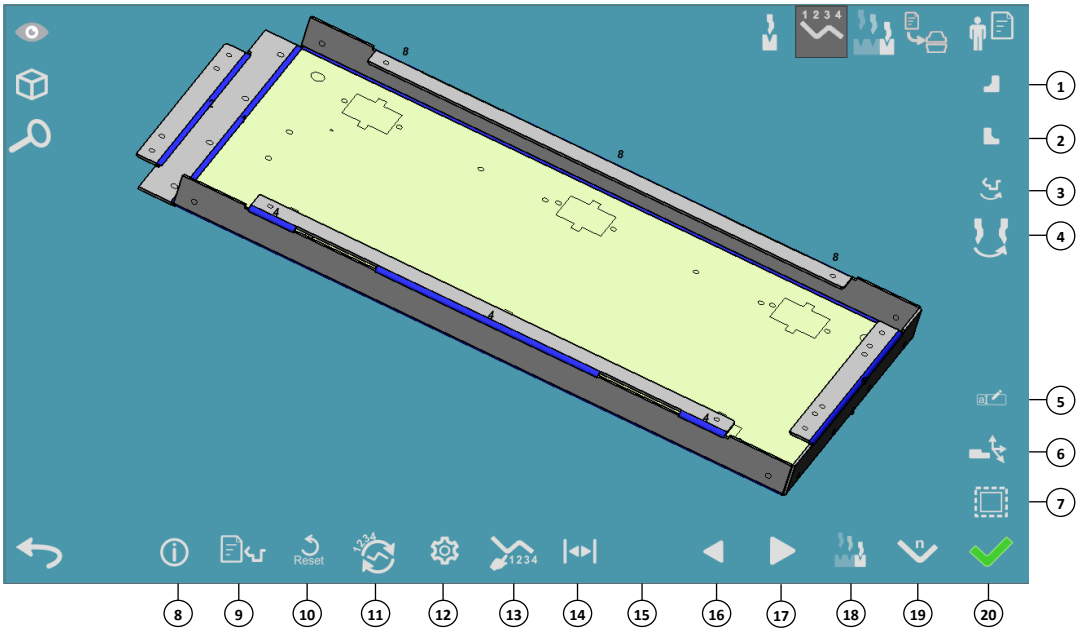


Fig. 4-3: Auto hit sequencing selection screen

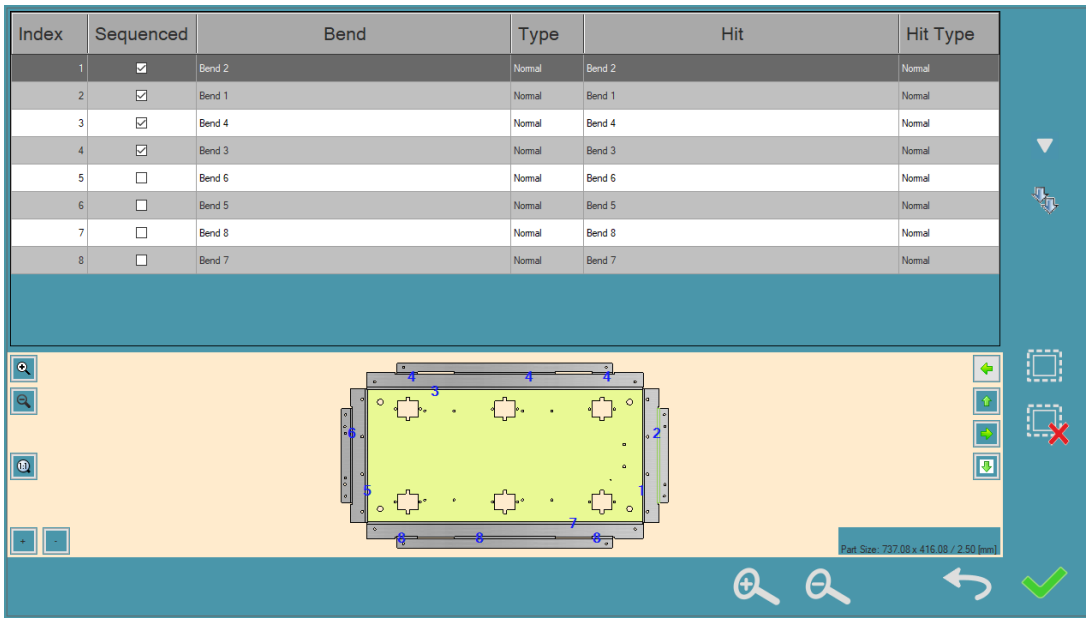
1. Left Heel
2. Right Heel
3. Rotate Part
4. Rotate Tools
5. Rename
6. Gauges Movement
7. Assign All
8. Information
9. Description Part
10. Reset
11. Automatic Bend Order
12. Options
13. Manually Bend Order
14. Split
15. Merge
16. Reverse
17. Play
18. Simulation
19. Play
20. Simulation

Allows you to Touch bends in the 3D graphical representation of the part, thereby adding them to the hit sequence. If you have already defined a hit sequence, you must first approve its deletion. When you enter this mode, two additional icons become visible:

- **Undo** - After you Touch one or more bends to add them to the sequence, allows you to delete the last hit.
- Tapping the bend name button in the lower right corner shows the hits sequenced so far.
- To accept the sequence, Touch **Finish**.

Order Hits Manually

Opens a screen where you can perform all the rotate and move manipulations described in Hit Sequencing. This is a quick manual method, where VisiTouch 19 MX does not recalculate and update the graphic display after each change:



FINGER MANAGEMENT

In the Sequencing Stage, the finger is in an absolute position on the machine.

Finger management is also possible in the Simulation Stage.

To make changes to the finger definitions:

- Drag the fingers in the graphic display. You can only drag the fingers in the Z axis.
- Touch the Sequence / Simulation tab and Touch **Finger Control**. In the dialog box that opens, you control the exact placement of the fingers. VisiTouch 19 MX performs calculations for you, and you can make changes.

To close the control button, Touch **Finger Control** again

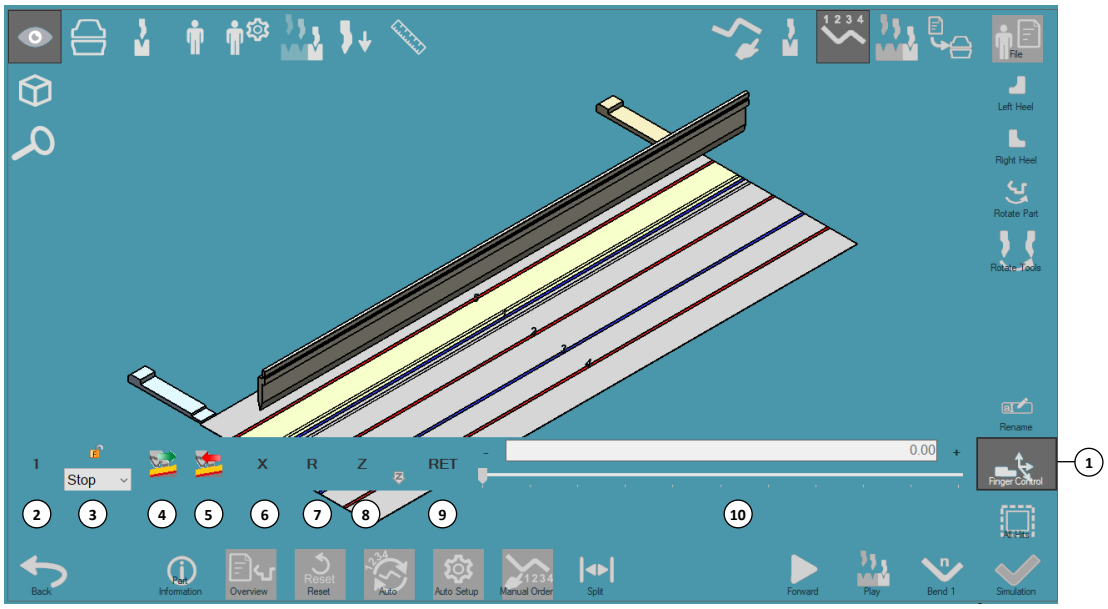


Fig. 4-4: Auto hit sequencing selection screen

1. Finger Control
2. Finger
3. Stop
4. Get Next Finger Position
5. Get Previous Finger Position
6. X Finger Movement
7. R Finger Movement
8. Z Finger Movement
9. Retract
10. Position

Positioning Finger

(2) **Finger**
Select 1 or 2, indicating the first and second fingers.

(3) **Stop**
The place on the finger that stabilizes the part. Select a finger stop position from among the possible options. The graphic display changes accordingly.

(5) **Get previous finger position**
Moves the selected finger to the previously available position (for any stop). If you are at the first position, VisiTouch 19 MX moves to the last available position. If moving the selected finger affects the other finger, it moves too (unless it is locked).

(4) **Get next finger position**
Moves the selected finger to the next available position (for any stop). If you are at the last position, VisiTouch 19 MX shows you the first available position. If moving the selected finger affects the other finger, it moves too (unless it is locked).

6 When you Touch one of the axis positions, the name of the active field changes to red, e.g., R.

7
8
9
10 You can change the values in this section in several ways:

- Touch one of the values and drag the slider to the right and the left:
- Type a value in the field.
- Use the plus and minus signs to manoeuvre the finger.

VisiTouch 19 MX allows you to change the finger positions along the X, R, and Z axes.

All machines have Z1 and Z2 axes, with at least one R and one X axes. The number of axes and their limitations depend on the machine's configuration.

X axis:

- **Retract** – VisiTouch 19 MX moves the fingers backwards before the hit, according to this value. Modes for the selected bend:
  - **Unselected** – Manual Retract Mode, i.e., you are manually changing the retraction value.
  - **Selected** – Auto Retract Mode, i.e., the retraction value is automatically set.

R axis:

- **R1** – Moves the finger up and down (or if the machine supports it, moves only the left finger).
- **R2** – (For machines that support this.) Moves the right finger up and down.

Z axis:

- **Z1** – Moves the left finger sideways, relative to the zero position.
- **Set current Z position for all next hits** – VisiTouch 19 MX copies the Z position you define here as the finger position for all the subsequent hits.
- **Z2** – (For machines that support this.) Moves the right finger sideways, relative to the zero position.

SIMULATION STAGE

This section explains the options available when in the Simulation Stage, the areas of the screen, and the changing views.

SIMULATION

In this stage, the bending application assigns tools with specific lengths, called segments, according to your inventory. The bending application sets up the smallest number of stations possible, depending on the shape of the part, your inventory, and the order of the hits.

If the sequence for the part was found using Auto Sequence, then the tool stations and segmentation are already calculated.

You can run through all the hits, checking for potential conflicts. When you are satisfied, you can create screenshots to insert into your report.

You can only progress to the Output Stage once you have played the simulation through to the end in this stage.

If you do not want to simulate a specific hit (for example if you have already done so previously) you can skip it by tapping the icon.

The Overview and Reset buttons are explained elsewhere.

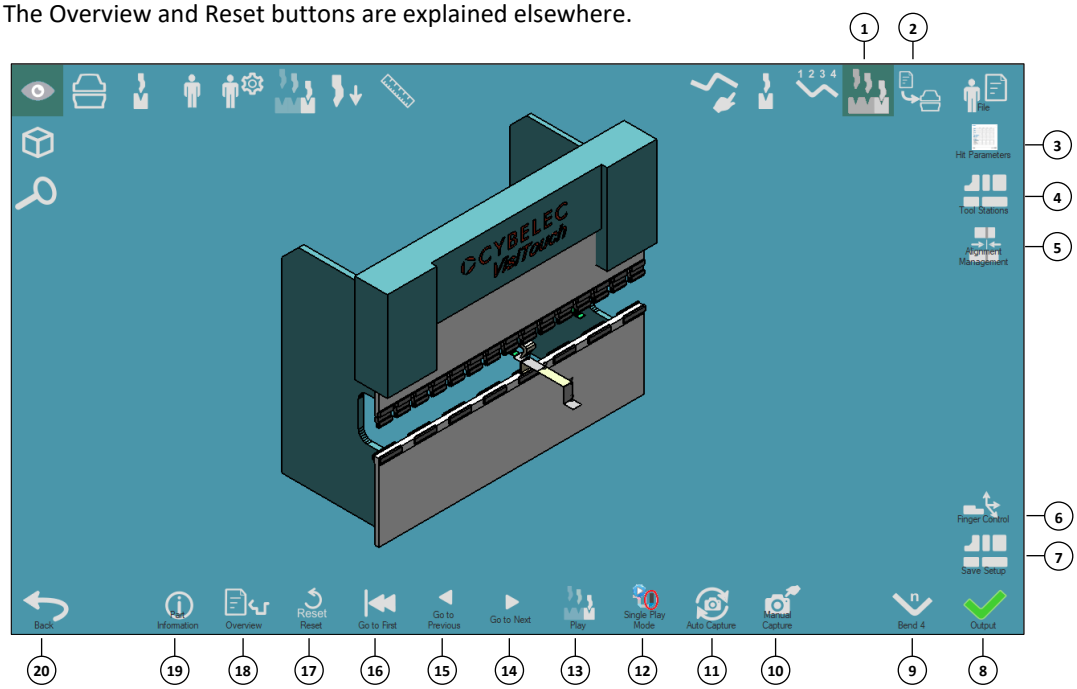


Fig. 5-1: Simulation stage screen

1. Simulation Stage
2. Output Stage
3. Hit parameters
4. Tool stations
5. Alignment management
6. Finger control
7. Save setup
8. Output
9. Bend number
10. Manual capture
11. Auto capture
12. Single play mode
13. Play
14. Go to next
15. Go to previous
16. Go to first
17. Reset
18. Overview
19. Part information
20. Back

Play Bends Simulation Section

In this section you can play and replay the hits in the simulated design using the arrow keys:

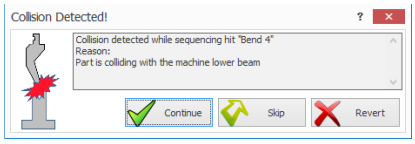
⑯ **Go to First**
Goes to the start of the simulation.

⑮ **Go to Previous**
Goes to the previous hit.

⑭ **Go to Next**
Goes to the next hit.

⑬ **Play**
Simulates bending the hits, continuously or one by one, depending if Single Play Mode is active.

⑫ **Single Play Mode**
If active, Play simulates the hits one by one.
If the bending application detects a collision, you will see this warning:



- **Continue** – Continue the simulation, ignoring this collision.
- **Skip** – Continue the simulation, ignoring all collisions in this hit.
- **Revert** – Stop the simulation, staying in the current hit.

Image Capture Options

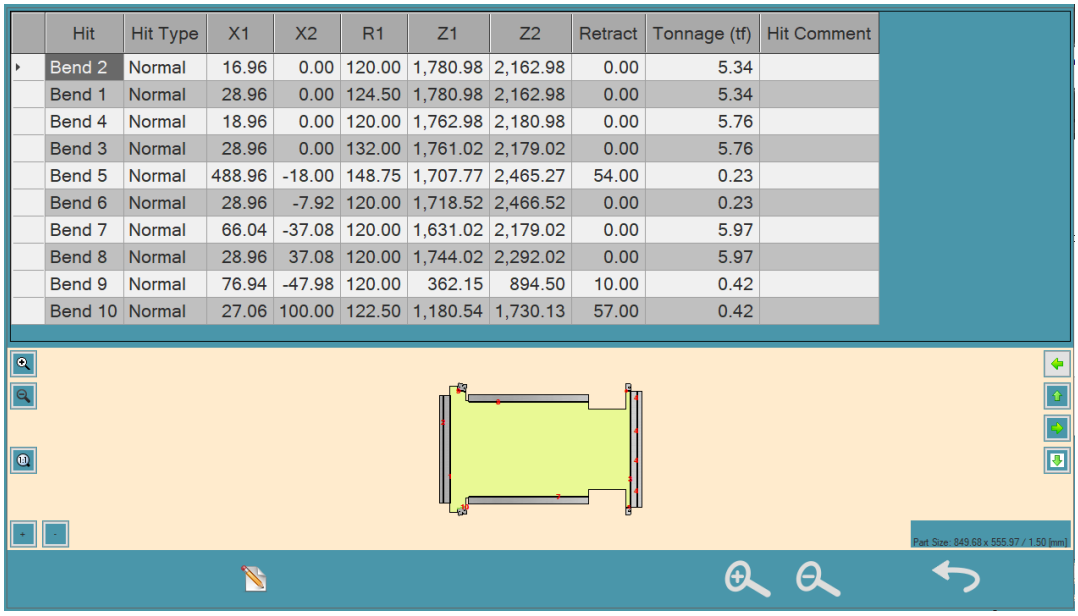
To manually select the images for showing the individual hits in the Setup Report, Touch these buttons.

⑪ **Auto Capture**
The bending application takes a screen shot of every hit as it is played (or skipped), using the current zoom and angle.

⑩ **Manual Capture**
Takes a screen shot for the current hit only.

Hit Parameters

To see the details of all the hits, Touch the **Hit Parameters** button. A dialog box opens. You can add descriptive information in the Hit Comments column.



	Hit	Hit Type	X1	X2	R1	Z1	Z2	Retract	Tonnage (tf)	Hit Comment
▸	Bend 2	Normal	16.96	0.00	120.00	1,780.98	2,162.98	0.00	5.34	
	Bend 1	Normal	28.96	0.00	124.50	1,780.98	2,162.98	0.00	5.34	
	Bend 4	Normal	18.96	0.00	120.00	1,762.98	2,180.98	0.00	5.76	
	Bend 3	Normal	28.96	0.00	132.00	1,761.02	2,179.02	0.00	5.76	
	Bend 5	Normal	488.96	-18.00	148.75	1,707.77	2,465.27	54.00	0.23	
	Bend 6	Normal	28.96	-7.92	120.00	1,718.52	2,466.52	0.00	0.23	
	Bend 7	Normal	66.04	-37.08	120.00	1,631.02	2,179.02	0.00	5.97	
	Bend 8	Normal	28.96	37.08	120.00	1,744.02	2,292.02	0.00	5.97	
	Bend 9	Normal	76.94	-47.98	120.00	362.15	894.50	10.00	0.42	
	Bend 10	Normal	27.06	100.00	122.50	1,180.54	1,730.13	57.00	0.42	

Allow Edit Button

To edit existing axis and other hit values, Touch the **Allow Edit** button and Touch one of the values. Touch a new value.
To set the current values for all subsequent hits:

1. Touch the Allow Edit button.
2. Set a new value. The **Propagate** button becomes active.
3. To set the subsequent values to match the current one, Touch the button.

For example, starting from these values:

	Hit	Hit Type	X1	X2	R1	Z1	Z2	Retract	Tonnage (tf)	Hit Comment
▸	Bend 2	Normal	16.96	0.00	120.00	1,800.00	2,162.98	0.00	5.34	
	Bend 1	Normal	28.96	0.00	124.50	1,780.98	2,162.98	0.00	5.34	
	Bend 4	Normal	18.96	0.00	120.00	1,762.98	2,180.98	0.00	5.76	
	Bend 3	Normal	28.96	0.00	132.00	1,761.02	2,179.02	0.00	5.76	
	Bend 5	Normal	488.96	-18.00	148.75	1,707.77	2,465.27	54.00	0.23	

Using Propagate for the Z1 value of Hit 1 (1,800.00) results in these values:

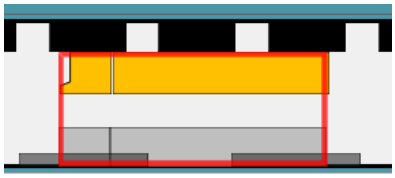
	Hit	Hit Type	X1	X2	R1	Z1	Z2	Retract	Tonnage (tf)	Hit Comment
▸	Bend 2	Normal	16.96	0.00	120.00	1,800.00	2,162.98	0.00	5.34	
	Bend 1	Normal	28.96	0.00	124.50	1,800.00	2,162.98	0.00	5.34	
	Bend 4	Normal	18.96	0.00	120.00	1,800.00	2,180.98	0.00	5.76	
	Bend 3	Normal	28.96	0.00	132.00	1,800.00	2,179.02	0.00	5.76	
	Bend 5	Normal	488.96	-18.00	148.75	1,800.00	2,465.27	54.00	0.23	

Tool Stations

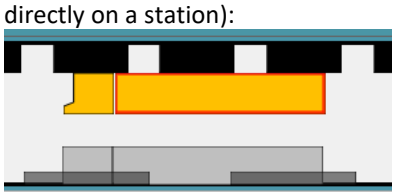
This window lists all the stations in your simulation, allowing you to review and change station positions, segment positions and part positions on the stations:

There are two forms of selection in the Tool Stations:

- **Station selection (default)** – Tapping any part of the station selects it all (highlighted by a red outline):

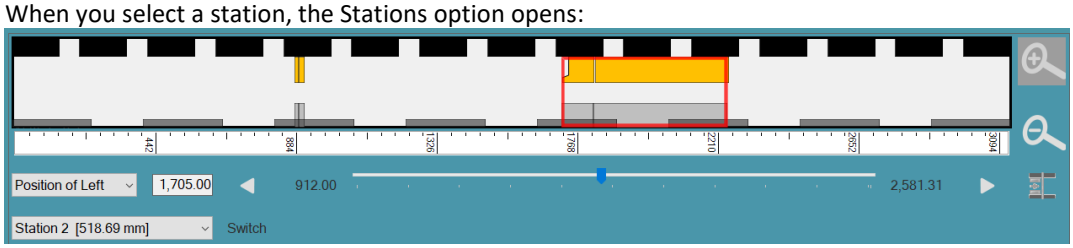


- **Segment selection** – To select individual segments in a station, Touch twice quickly (not directly on a station):

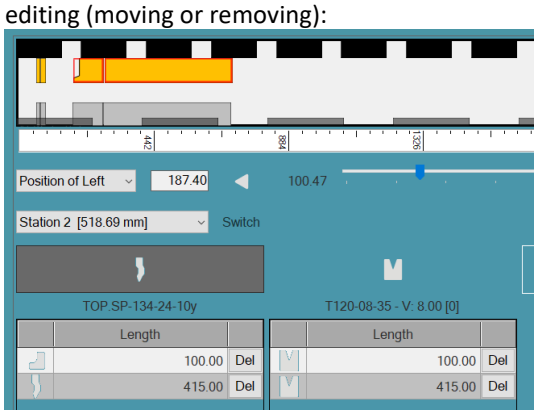


The Tool Stations window allows different actions, depending on your selection.

When you select a station, the Stations option opens:

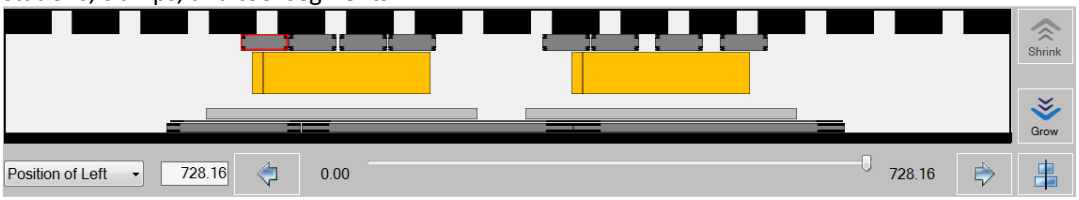


If you select a specific punch segment, the Tools option opens with the segment selected for editing (moving or removing):



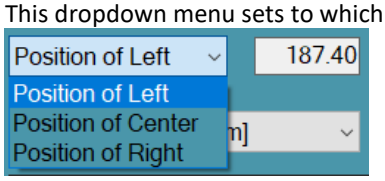
Positioning in Tool Stations

This area of the window enables you to set the position of items in the Tools Stations window, e.g., stations, clamps, and tool segments:



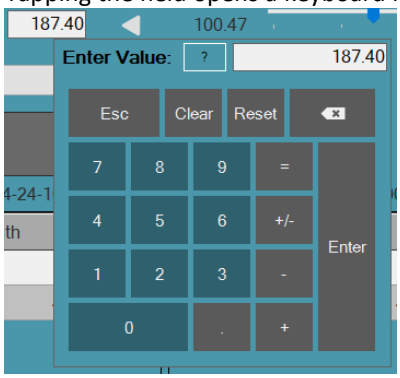
Positioning Reference

This dropdown menu sets to which part of the item the numerical positioning value refers:



Numerical Position

This field sets the position of the selected item (station, tool segment, hit).
When you move the item (using the slider, the position arrows, or by dragging), it is reflected in this field.
Tapping the field opens a keyboard for entering a new value:

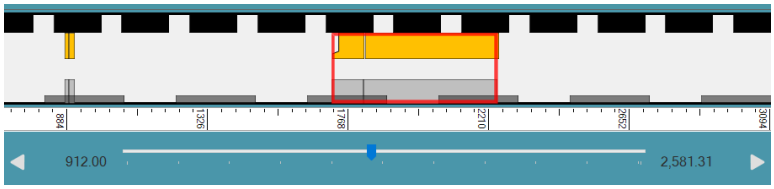


Left and Right Movement Arrow

To move the selected item to the left/Right, Touch the **Left** / **Right** Movement button
A single Touch moves it 5 mm. Continuous tapping results in continuous movement.

Movement Slider

This slider controls the position of the selected item.
The numbers at either side show the limit of the movement:



In the picture above the die segment is at the leftmost limit of its movement, as it is bound by the segment on its left, so the slider cannot be moved leftwards.
The movement rightwards, in contrast, is free, to the limit of the machine's length.

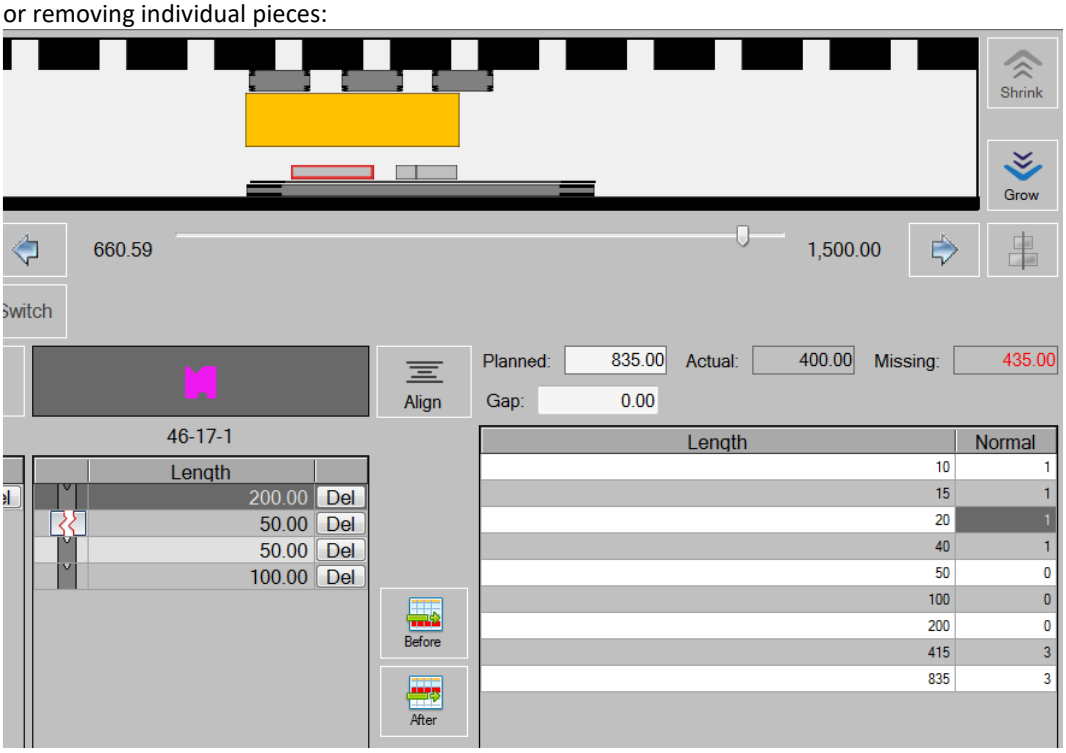
Align to Machine Centre Button

To move the selected item to the centre of the machine, Touch the **Align** to Machine Centre button.

This button is enabled only when the selected item is the only one of its kind in the setup, e.g., a station when it is the only one.

Segment Addition and Removal

After selecting a station and tooling (punch, die, holder) you can change the segmentation, adding or removing individual pieces:



Removing a Segment

To remove a segment, touch it and Touch the **Del** button next to it.

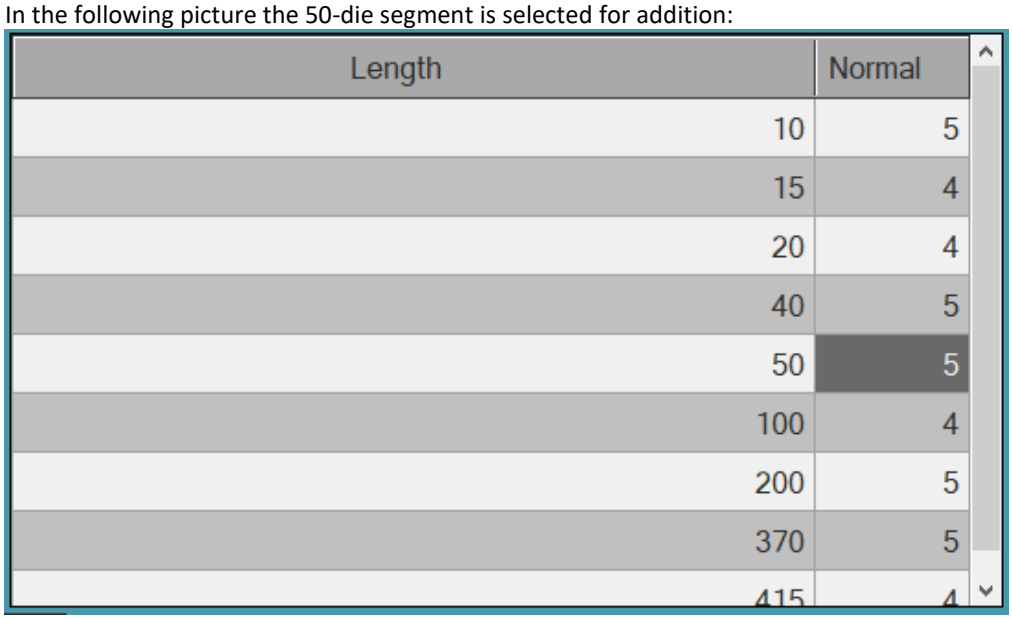
Adding a Segment

To add a segment:

Touch an existing segment.

Touch the quantity (not its length) of the segment to add.

In the following picture the 50-die segment is selected for addition:

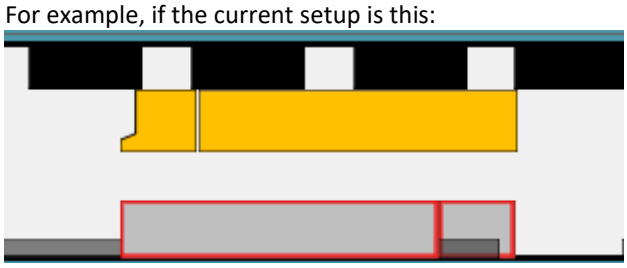


Length	Normal
10	5
15	4
20	4
40	5
50	5
100	4
200	5
370	5
415	4

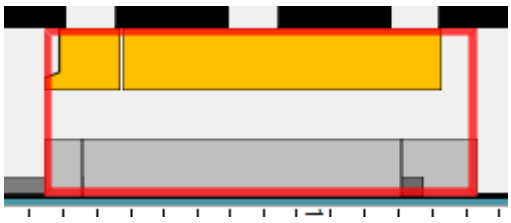
You can only add a segment if the quantity is greater than 0.

Touch the Before  or After  buttons to position the segment in relation to the existing one.

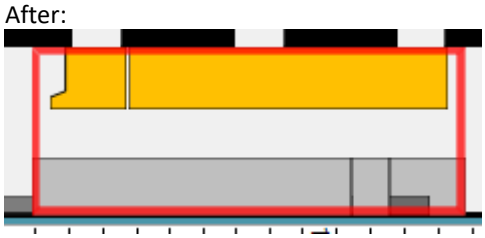
For example, if the current setup is this:



Before:



After:



Gap Addition and Removal

You can add or remove a gap between segments in two ways:

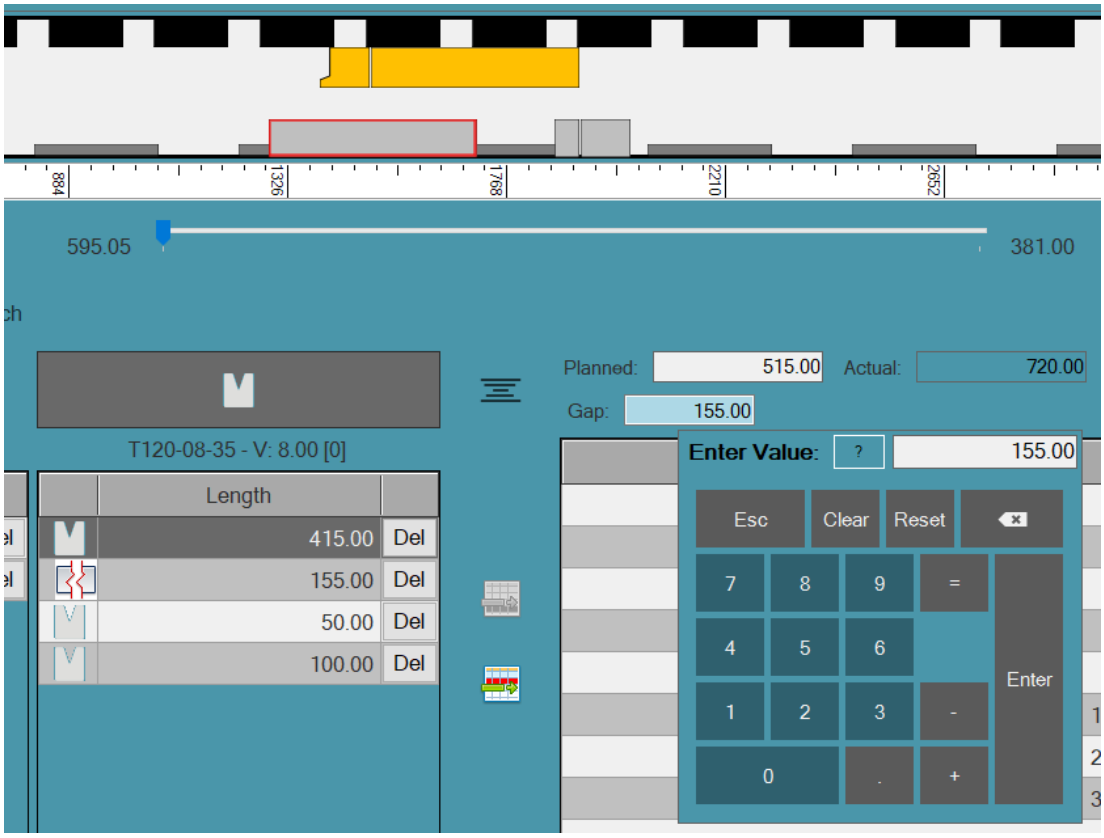
- **Dragging** – Drag a segment away from another. A gap is added automatically between them. Drag a segment to touch another and the gap is removed.
- Using the Before and After buttons.

Removing a Gap: To remove a gap, Touch the one you want and Touch the **Del** button next to it.

Adding a Gap: To add a segment:

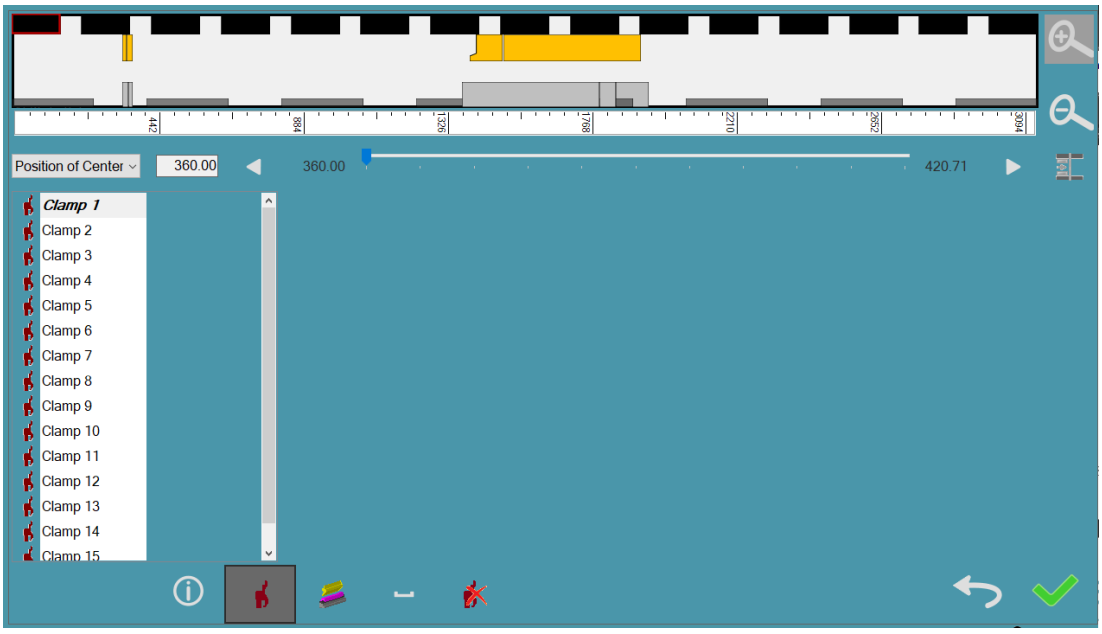
Touch the segment next to which you want to add the gap.

Touch inside the Gap field and the keyboard will open. enter the length of the gap you wish to add:



U Clamps

To set the positions of upper clamp or remove them from the current setup, Touch the **U Clamps** button:

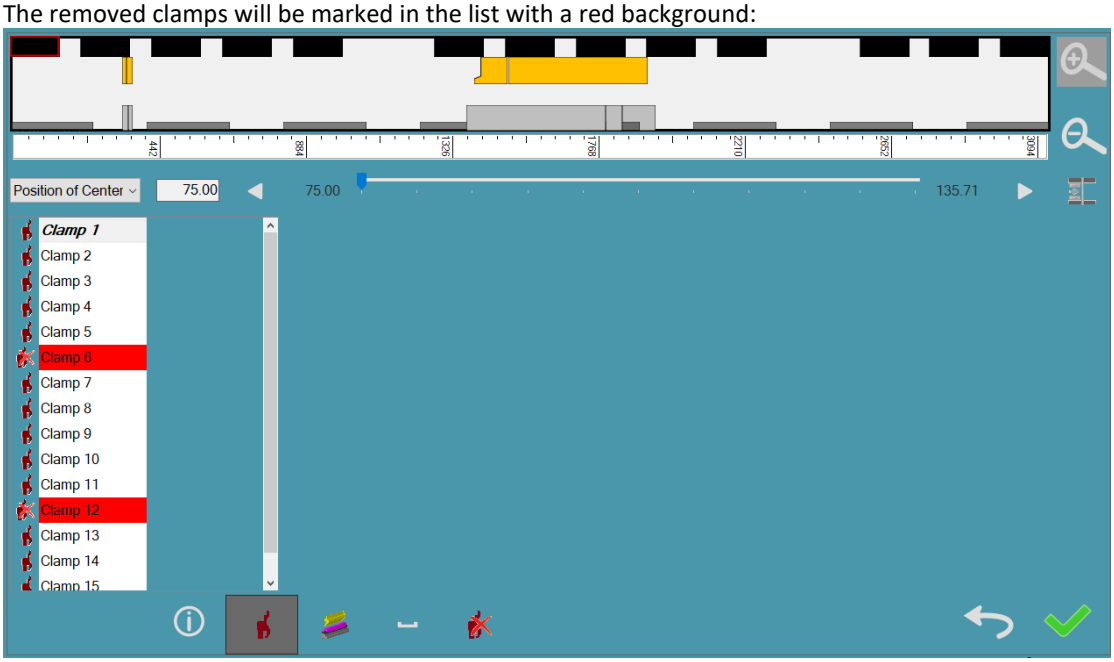


This button is active only if the upper clamping is separated into individual clamps – if there is only a continuous clamp, e.g., Wila clamping, then it will be disabled.

Remove Button

To remove the clamp from the setup, e.g., to avoid a collision with the part, Touch the **Remove** button.

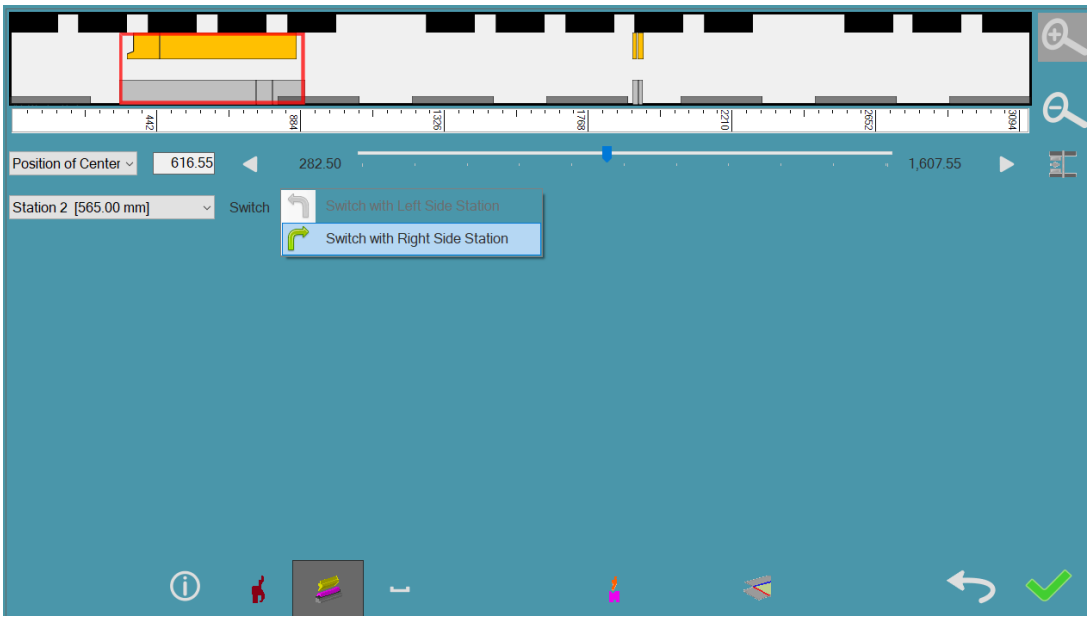
The removed clamps will be marked in the list with a red background:



Stations

To see and edit details of the hits and stations, Touch the **Stations** button. The Stations Setup dialog box opens.

You can also Touch the station itself to get to this window.



Examples of modifications you can make:

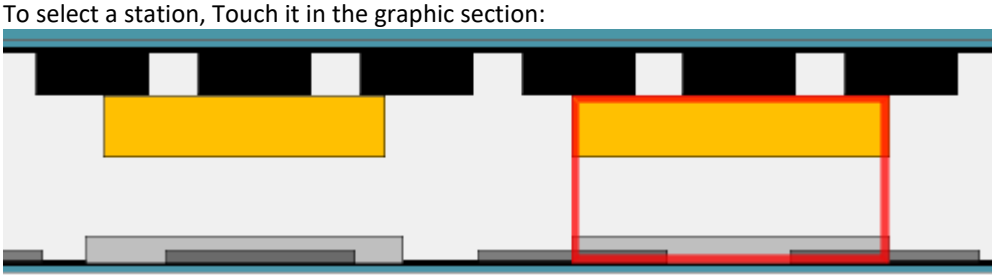
- Slide the stations to the right and the left in the graphic at the top.
- Change the position of the selected station by typing a new value on the right.

- Switch the length or position of a particular station with the station on the right/left side.
- Change the gap.
- Align parts with punch or die tools.
- Transfer hits from one station to another.
- Exclude a clamp from the upper or lower beam.
- Change the clamp's current position.

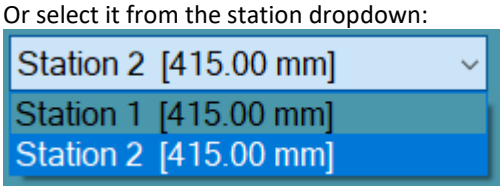
The following sections discuss the buttons outlined in green, above.

Station Selection

To select a station, Touch it in the graphic section:

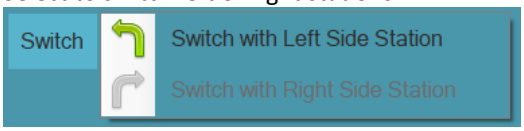


Or select it from the station dropdown:



Switch Button

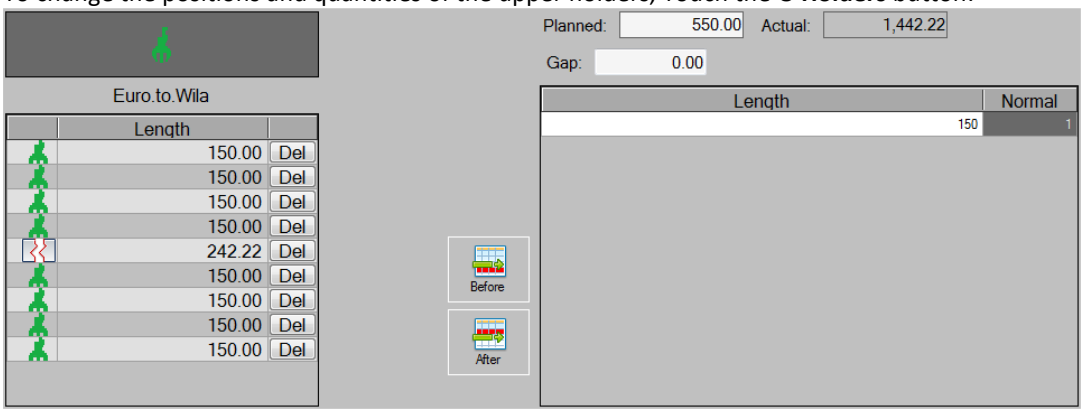
To switch the positions between two stations, Touch the **Switch** button.
Select to switch left or right stations:

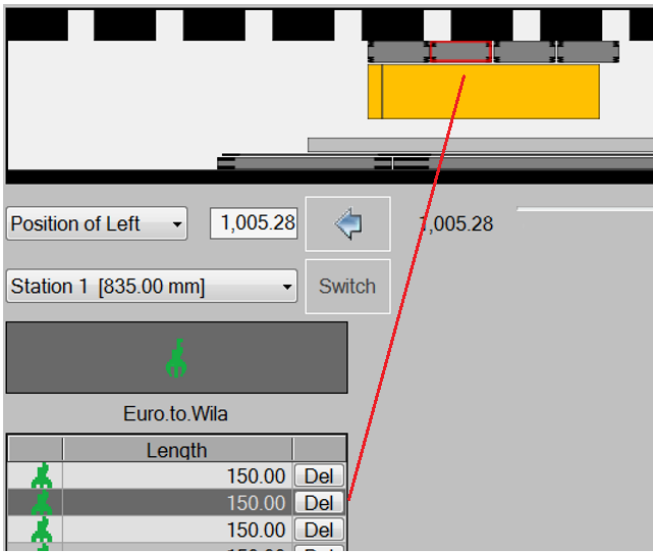


If the selected station is the rightmost, then the **Switch with Right Side Station** option is disabled, same for **Switch with Left**.

U Holders

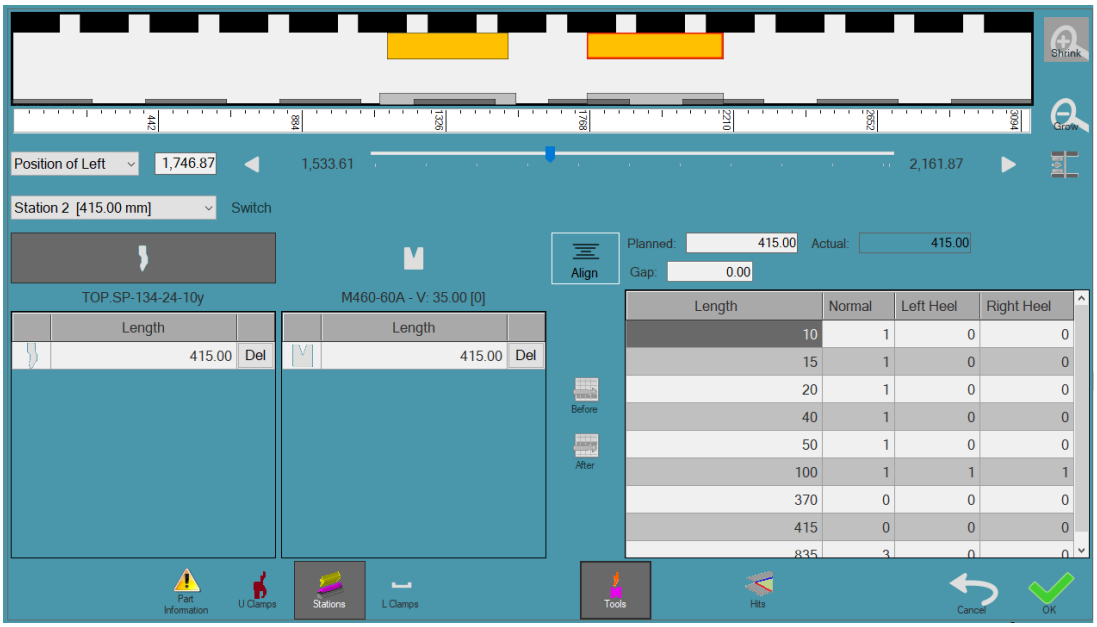
To change the positions and quantities of the upper holders, Touch the **U Holders** button:





Tools

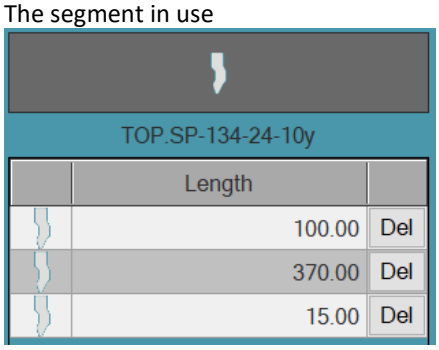
To change the positions and segmentation of the punches and dies, Touch the **Tools** button:



Punches

To change the positions and segmentation of the punches, Touch the **Punches** button.
The window that opens shows these things:

- The segment in use



- Overall segment availability: if “0” is showing then you cannot add this segment to the setup:

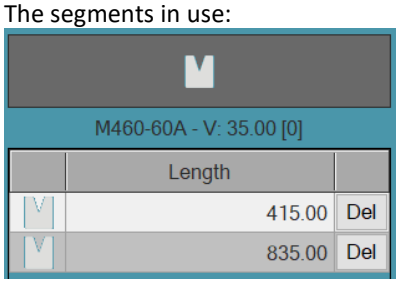
Length	Normal	Left Heel	Right Heel
10	1	0	0
15	0	0	0
20	1	0	0
40	1	0	0
50	1	0	0
100	0	1	1
370	0	0	0
415	0	0	0

  - **Normal** – The number of available regular (straight sides) segments.
  - **Left Heel** – The number of available left heel segments.
  - **Right Heel** – The number of available right heel segments.

Dies

To change the positions and segmentation of the dies, Touch the **Dies** button.
A window opens, showing these things:

- The segments in use:

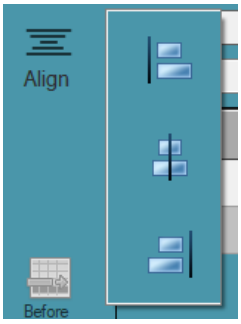


- Overall segment availability: if "0" is showing then you cannot add this segment to the setup:

Length	Normal
415	0
835	3

Align Tool Options

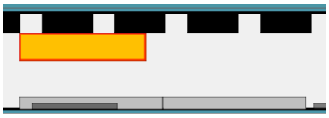
To align the punch segments to the die segments (and vice versa), Touch the **Align** button. A dropdown menu opens:



Tapping the Punches button causes them to move so they are aligned with the dies.
Tapping the Dies button causes them to be aligned with the punches.
The alignment functionality on the punches has the following results:

Align Centre

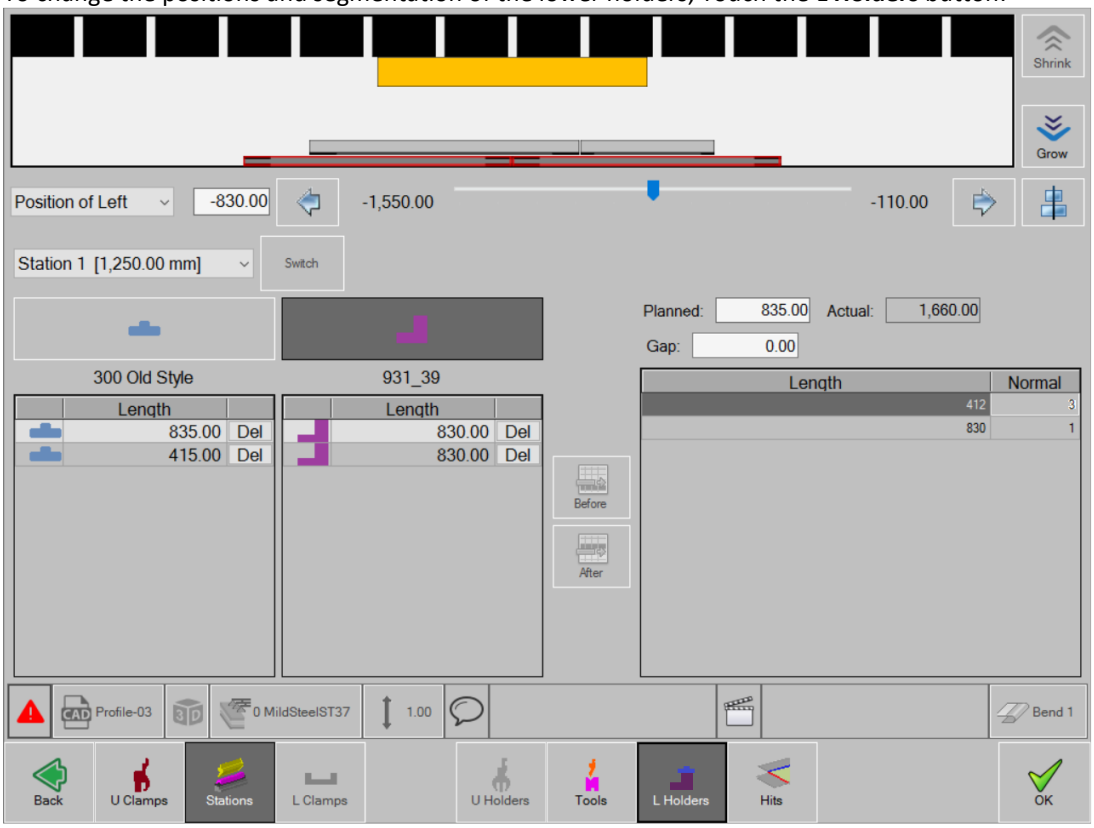
Align Left



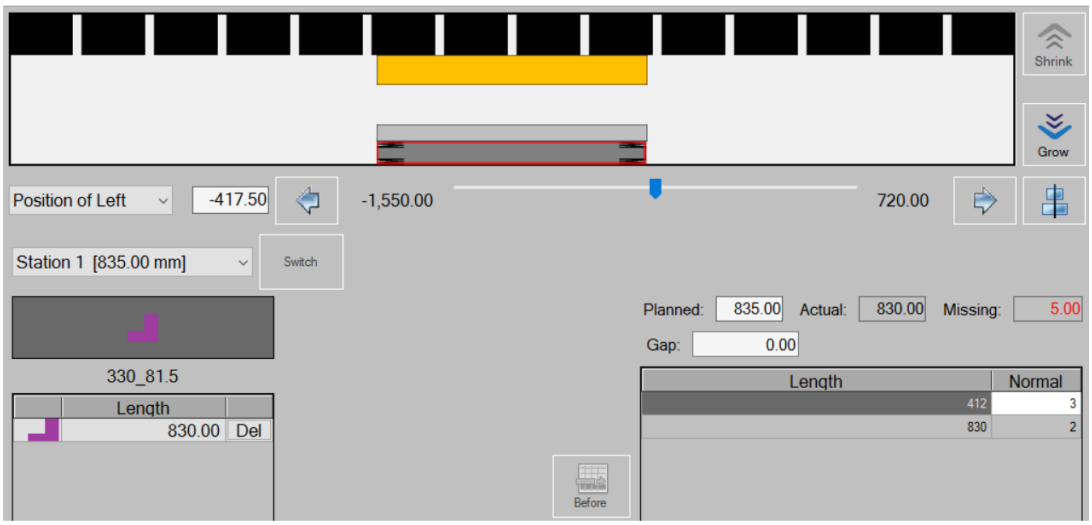
Align Right

L Holders

To change the positions and segmentation of the lower holders, Touch the **L Holders** button:



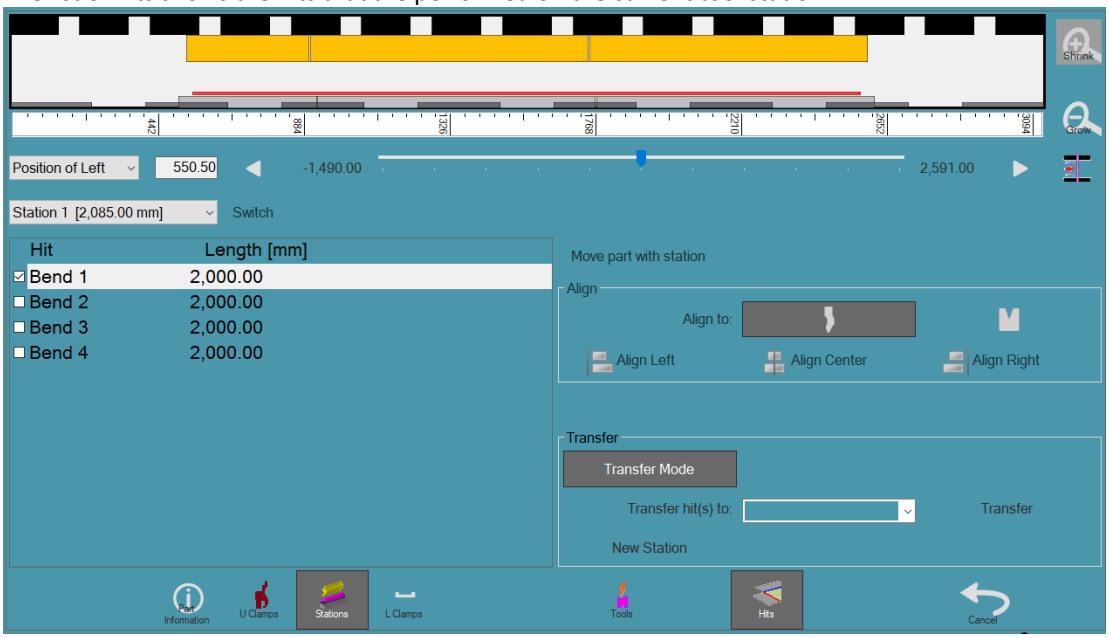
When there is only one type of holder, e.g., for a single V die, then there is only one column of holders:



The segmentation handling is the same as for the Punches and the Dies.

Hits

To change the position of the part for individual hits, Touch the **Hits** button.
The list of hits shows the hits that are performed on the current tool station:

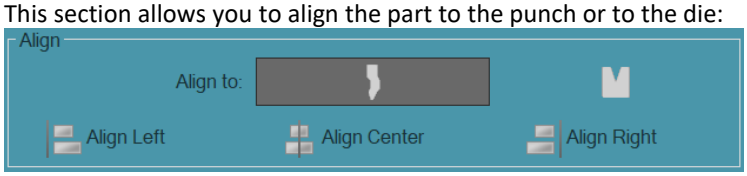


Move Part with Station

- When Move Part with Station is enabled, the part moves together with the station when the station moves.
- When this option is disabled, the part remains in place.

Align Hits Options

- This section allows you to align the part to the punch or to the die:



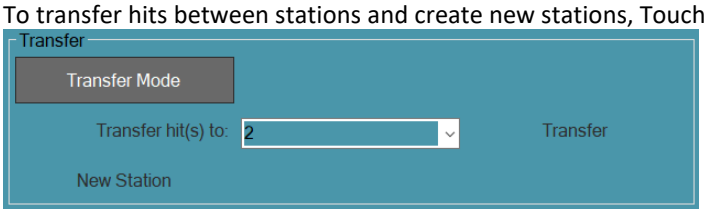
Align Left to the Punch results in this:

Align Right to the Punch results in this:

Align Right to the Die results in this:

Transfer Mode

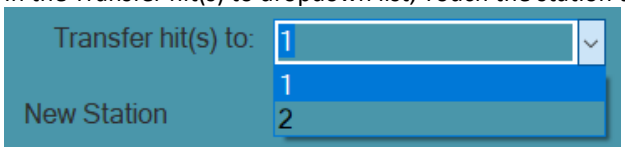
To transfer hits between stations and create new stations, Touch the **Transfer Mode** button:



To **Transfer** one or more hits:

Select a single hit or several from the hits list.

In the Transfer hit(s) to dropdown list, Touch the station to transfer to:



Touch the **Transfer** button.

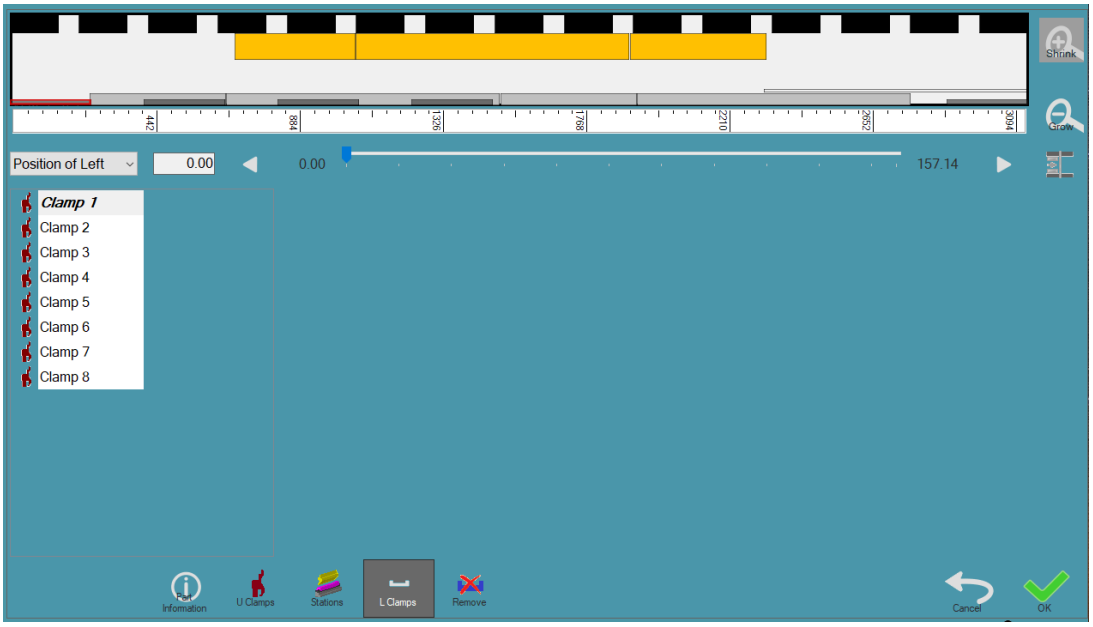
To create a **New Station**:

Touch the hit for which to create the station.

Touch the **New Station** button.

L Clamps

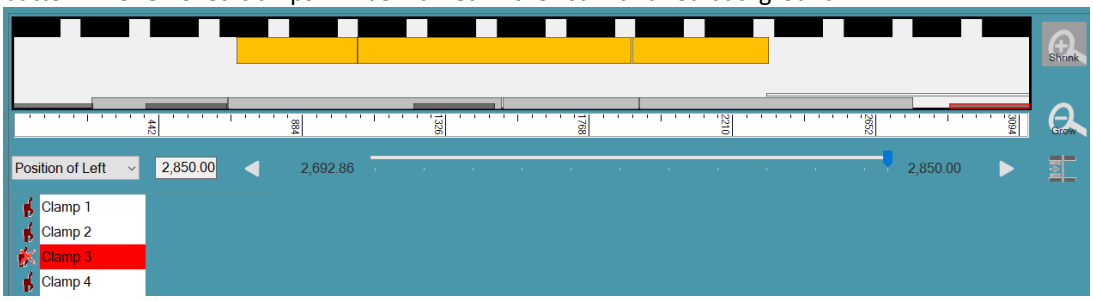
To set the positions of upper/lower clamps or remove them from the current setup, Touch the **L Clamps** button:



This button is active only if the upper clamping is sectioned into individual clamps. If there is only a continuous clamp, e.g., Wila clamping, then the button is disabled.

Remove Lower Clamp

To remove the clamp from the setup, e.g., to avoid a collision with the part, Touch the **Remove** button. The removed clamps will be marked in the list with a red background:



Finger Control

In the Simulation Stage, the bending application positions the finger relative to the part.
For more information, see Finger Management in the Sequencing Stage.

Save

The Save button saves the current setup of use in future parts.
This button becomes active only after you have run the simulation through to the end. This ensures that you have seen the simulation and are aware of what will happen, before you save the tooling setup you have defined.
You must give your setup a name. You can then use this tooling setup for another part.

Lock Tool Stations

The Lock Tool Stations button allows you to lock the current tooling setup.
This is used to prevent the bending application from recalculating the setup after changes in the Sequencing Stage.
This is useful when you have made manual changes to the setup that was calculated automatically, and you wish to keep these changes from being erased.

OUTPUT STAGE

This is the last stage of the process. In this stage, VisiTouch 19 MX generates the NC code.

OUTPUT SCREEN

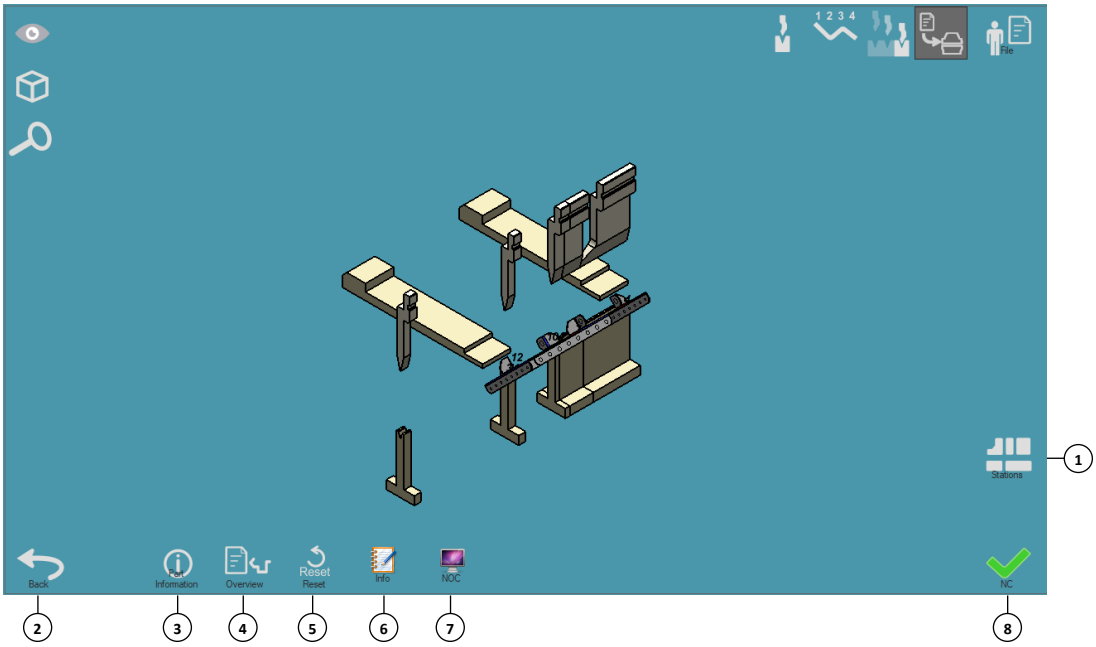


Fig. 6-1: Output stage screen

1. Stations
2. Back
3. Part Information
4. Overview
5. Reset
6. Information
7. Name-On-Control
8. Validation

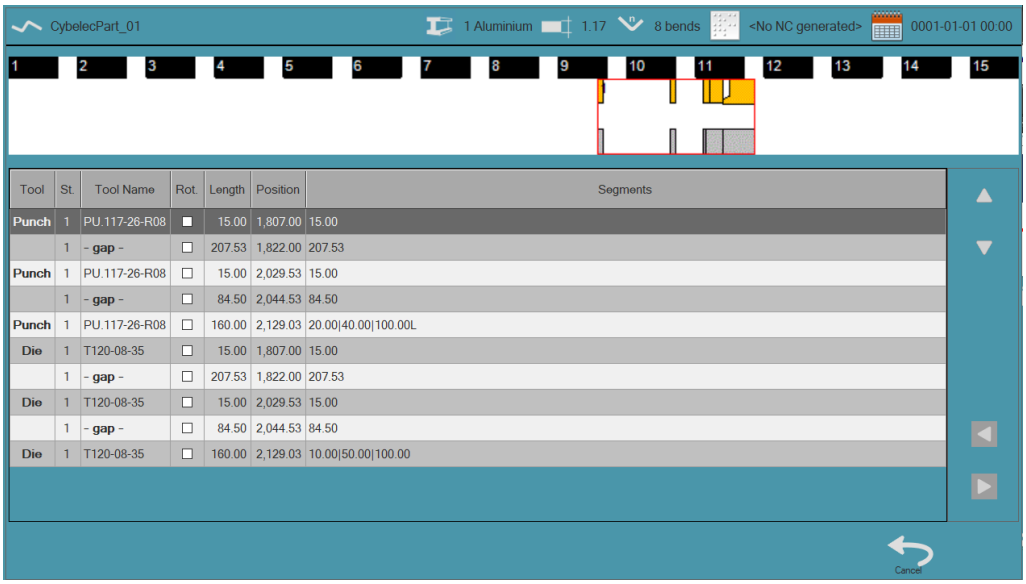


Fig. 6-2: Info screen

EDIT 3D MACHINE DEFINITION

MAIN SCREEN

Here you will find the main screen of the machine configuration.

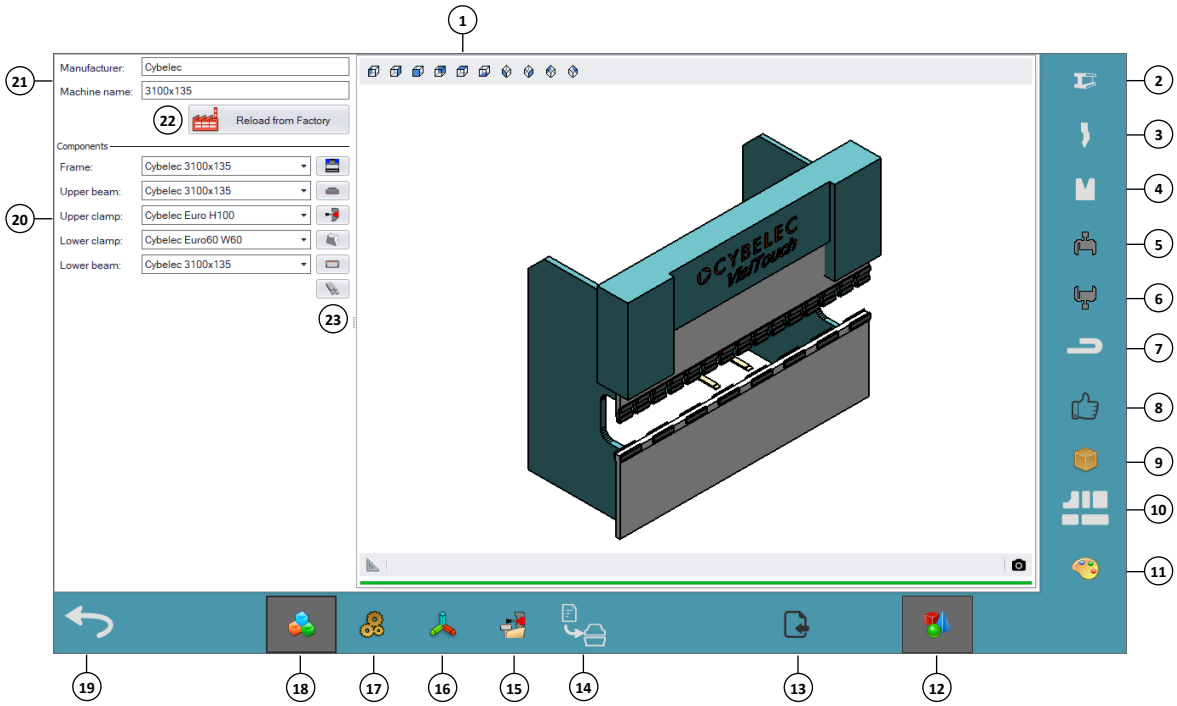


Fig. 6-1: Main menu

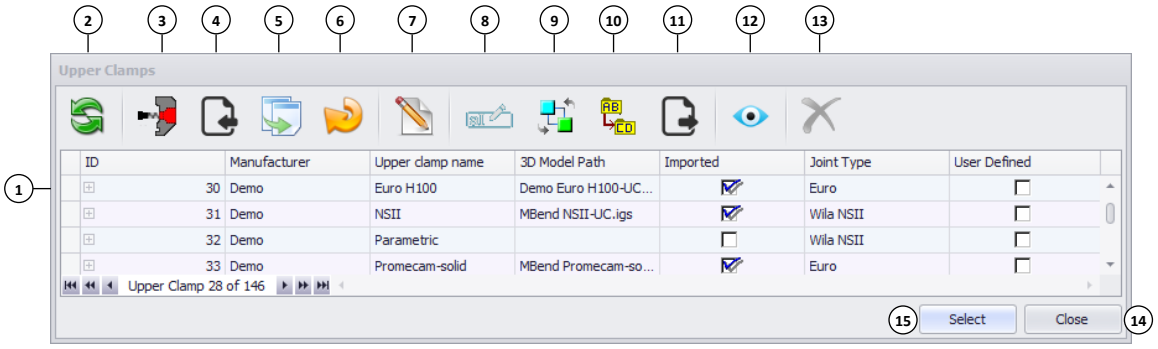
1. Orientation view
2. Material management
3. Punch management
4. Die management
5. Upper clamp management
6. Lower clamp management
7. Hemming management
8. Preferred tools menu
9. Fingers management
10. Tool station setup
11. Colours management
12. 3D / Static view
13. Import machine menu
14. NC Output management
15. Lower / Upper clamp configuration
16. R axis configuration
17. General machine parameters
18. Main menu
19. Back button
20. Machine components menu
21. Equipment's name
22. Load machine from library
23. Edit machine component
24. Select machine component

Components

Here you can select other components from dropdown lists, and open all the possible options for the components in a separate window.

For example, to make changes to the upper clamps' definitions or add new ones, Touch the **New Clamps** icon:

The icons in these dialog boxes allow you to refresh the list of displayed components, add a new one, and more: copy or edit an existing one, and see a graphical preview in a separate window:

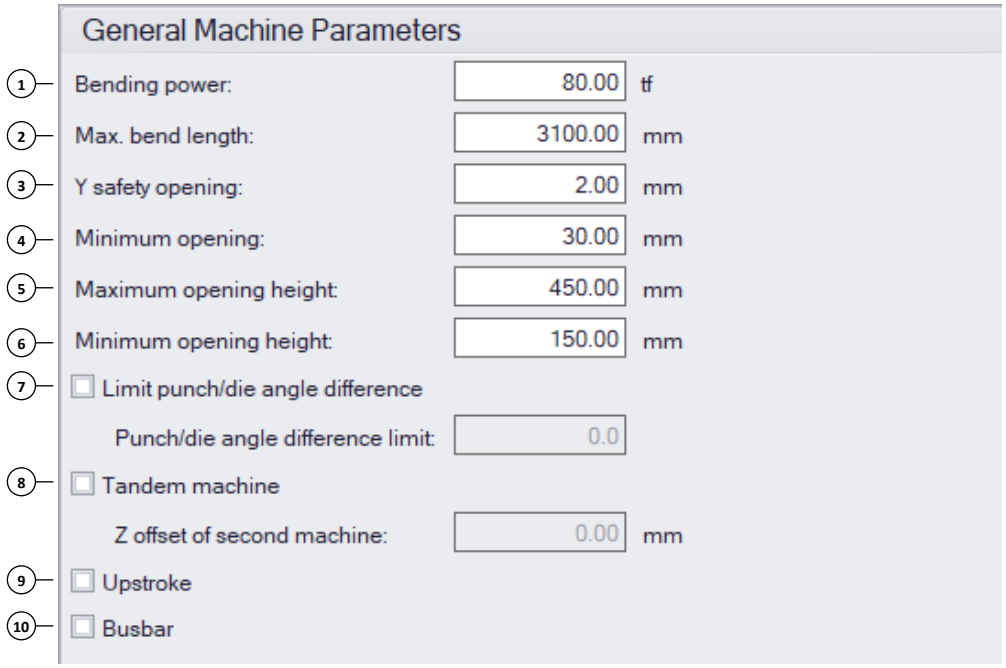


1. List of Upper Clamps
2. Refresh
3. Define New Upper Clamp
4. Import Upper Clamp (*.mbmUC)
5. Copy
6. Reload
7. Edit
8. Rename
9. Change Manufacturer
10. Rename Manufacturer
11. Export
12. Preview
13. Delete the component
14. Close the window
15. Select the Upper Clamp

Model

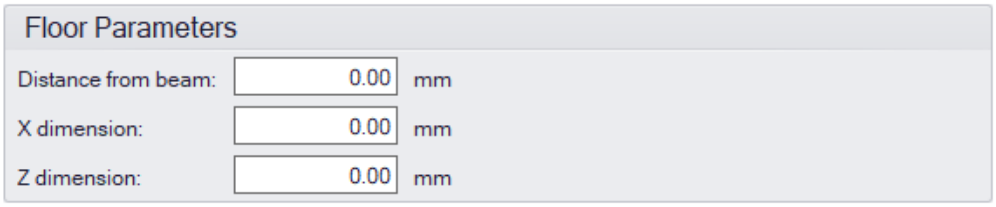
Here you configure general machine settings.

General Machine Parameters Section



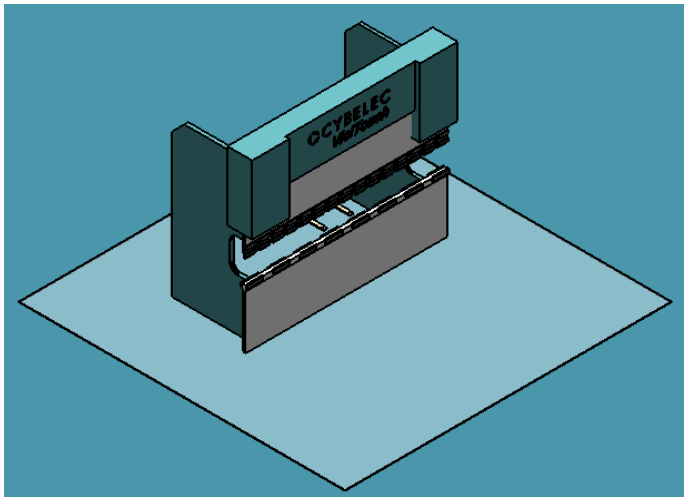
1. **Bending power**
   The maximum load or pressure.
2. **Max. bend length**
   The maximum length of the bend.
3. **Y safety opening**
   The mute position (also called the speed change position) of the die. If not defined for a particular die, this is the default.
4. **Minimum opening**
   The minimum top dead center (TDC) between bends. When added to the Y safety opening, indicates the actual opening.
5. **Maximum opening height**
   Between the upper and lower beams.
6. **Minimum opening height**
   Between the upper and lower beams.
7. **Limit punch / die angle difference**
   Select this option if your machine restricts the difference in punch/die angles.
8. **Punch / die angle difference limit**
   The allowed tolerance angle between punch and die. Only available when Limit punch/die angle difference is selected.
9. **Tandem machine**
10. **Z offset of second machine**

Floor Parameters Section

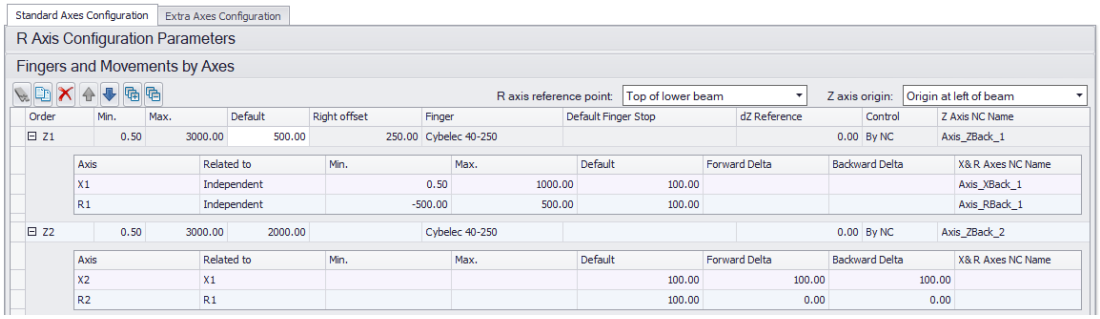


You can take the floor into account for collisions by changing the floor measurements for **Distance from beam**, **X dimension**, and **Z dimension.**

You can then see a visual representation of the floor relative to the machine when you load the program:



Axes Configuration



In this section you define dependencies between axes.
Add Finger opens an additional finger (with Z, X and R axes).

You also have these options:

- **Copy Finger**
- **Delete Finger**
- **Move Up/Down** – Changes the order of the fingers.
- **Expand/Collapse All** – Changes the amount of detail displayed

R axis reference point – Controls the up and down movement. This option defines the origin for the

R axis as defined on the machine. Select one:

- Top of lower beam
- Top of lower clamp system
- Top of die

Z axis origin – Options: Origin at left of beam, or Origin at centre of beam.

X axis controls the front and back movement.

R axis controls the up and down movement.

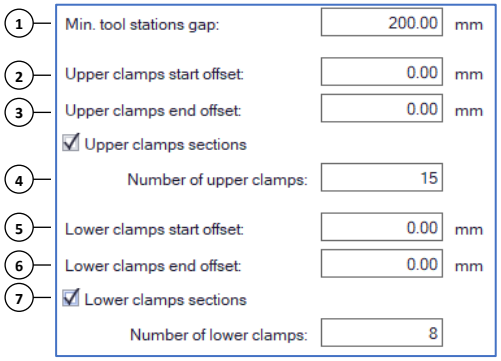
Parameters for each Z axis:

- **Order** – The name of the finger.
- **Min and Max** – The limitations of the finger positions on the Z axis, relative to the Z axis origin.
- **Default** – The default position.
- **Right offset** – The minimum distance between this finger and the finger to the right.
- **Finger** – Select one from the dropdown list.
- **dZ Reference** – Moves the finger reference point by this value on the Z axis.
- **Control** – Controlled by NC or manually.

Extra Axes Configuration

- **I Axis Supported** – For machines that can move the lower beam back and forth.
- **Pneumatic hemming die supported** – Allows pneumatic hemming die support.

Clamps



1. **Min. tool stations gap**
   The minimum gap between tool stations during the Simulation Stage.
2. **Upper clamps start/end offset.**
3. **Upper clamps sections**
   Allows defining the number of upper clamps.
4. **Number of upper clamps**
   Only available when Upper clamps sections is checked.
5. **Lower clamps start/end offset**.
6. **Lower clamps sections**
   Allows defining the number of lower clamps.
7. **Number of lower clamps**
   Only available when Lower clamps sections is checked.

Automatic name-on-control options:

- **Tools name-on-control** – Sets the names of assigned tools or materials to name-on-control names.
- **Materials name-on-control** – Sets the names of materials to name-on-control names.

Load

Loads a new machine configuration:

- Navigate to the location of the MBMD file to load using the Drive, Parent, and Step Into buttons.
- Change the way the files are displayed using the Display and Filter buttons. Reset the filter by tapping Clear Filter.
- When the number of files exceeds the space available on the screen, scroll up and down within the current folder by tapping the Up and Down buttons.
- Touch one of the machine configurations from those that are available, and Touch Select.

Materials

BT Material Name	Name on Machine	ID in NC
BT_Aluminium	BT_Aluminium	2
BT_Stainless	BT_Stainless	1
BT_Steel	BT_Steel	0

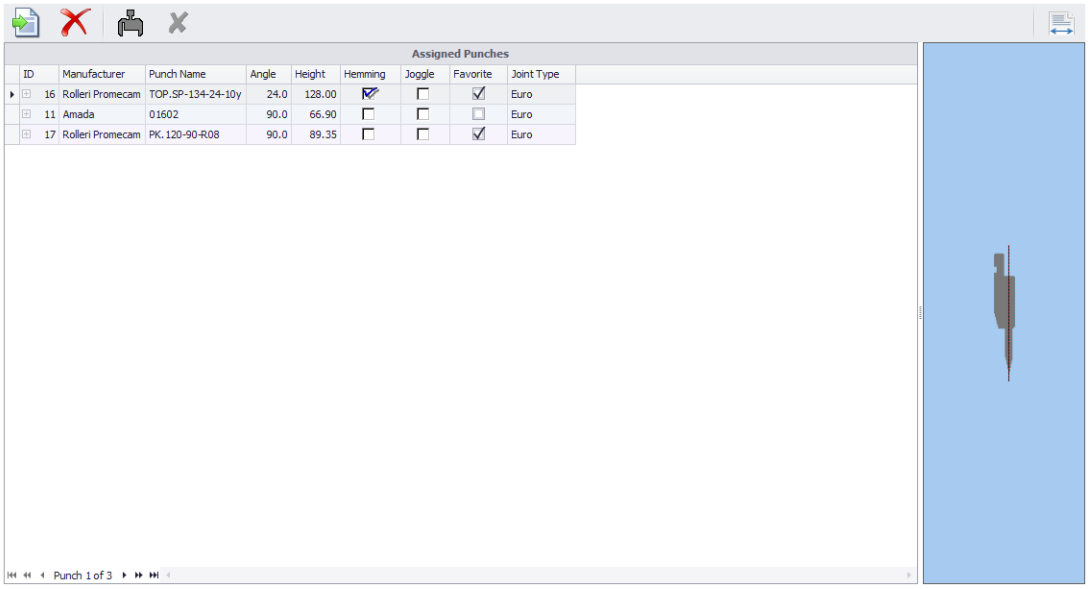
Here is the list of bend technology materials and their corresponding names on the machine are defined. The list comes from the BT Materials library (in the Materials dialog box).

- **Name on Machine** – The name on the control.
- **ID in NC** – The identifier on the control.

Punches / Dies / Holders

These dialog boxes list the punch and die tools and holders that are currently used on the machine.

For example:



Only these columns require further explanation:

- **Favourite** – Selected tools are the only ones visible when you Touch **Favourites** while selecting tools.
- **Name-on-control (NOC)** – The name of the tool on the controller. Cybelec controls only support a single punch/die holder, so a NOC is required for the tool and a separate NOC is required for the holder(s) combination.
- **Rotated name-on-control** – Only visible if the post-processor does not provide native support for rotating tools (e.g., the Cybelec post-processor). In this case, a separate rotated tool is required on the controller and you should define an appropriate NOC.

Use these icons to add/remove tools/holders:

- **Assign tools / holders** – Select from the list.
- **Remove assigned tools / holders**.
- **Select punch / die holders** – Only relevant for Punch holders and Die holders dialog boxes. If you see an error message saying that no holder can be assigned because no holder is configured in the database, go to the Punch holders and Die holders dialog boxes and assign a holder.
- **Remove punch / die holders** – Only relevant in Punch holders and Die holders dialog boxes. Becomes active when you add a punch/die holder and then select it.

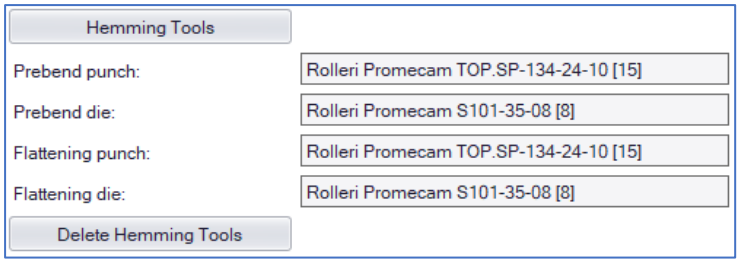
If your machine controller does not support tool holders, you can draw your tool with the holder on the controller. In the bending application, you give the corresponding tool + holder combination a name that matches the name on the machine.
For example:

- In the Die holders dialog box, add a die holder by tapping Assign and selecting a holder.
- In the Dies dialog box, Touch **Add Die Holders** and select the holder.

In Punch holders and Die holders you can stack holders on top of one another by selecting more than one holder. Give the combination of holders a name to match the one on the controller.

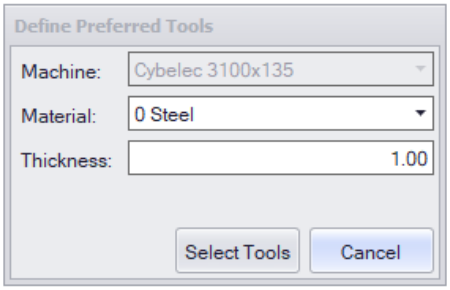
Hemming

Here you select the tools for prebend and flattening operations. These tools are automatically selected when loading a part.
You can use the same tools for both operations by tapping Use Flattening Tools for Prebend in the manual tool selection dialog box.
Tapping the Hemming Tools button opens the Hemming Tools Selection dialog box. You can read a full explanation in the Simulation section.
Add and remove prebend and flattening tools/holders by tapping the and buttons on the top right of the dialog.
Select the tools you want for hemming and Touch **OK**. The bending application fills in the Prebend punch, Prebend die, flattening punch, and Flattening die fields.



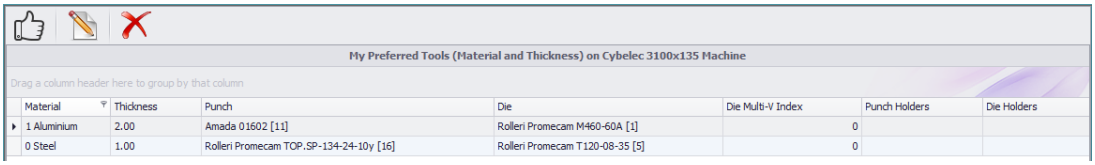
Preferred

Here you define which tools you prefer for each material and thickness on the machine. Use the icons:
New Preferred Tools – Opens a dialog box where you can select the material from a dropdown list, type a thickness, and Touch the relevant tools for the current machine:



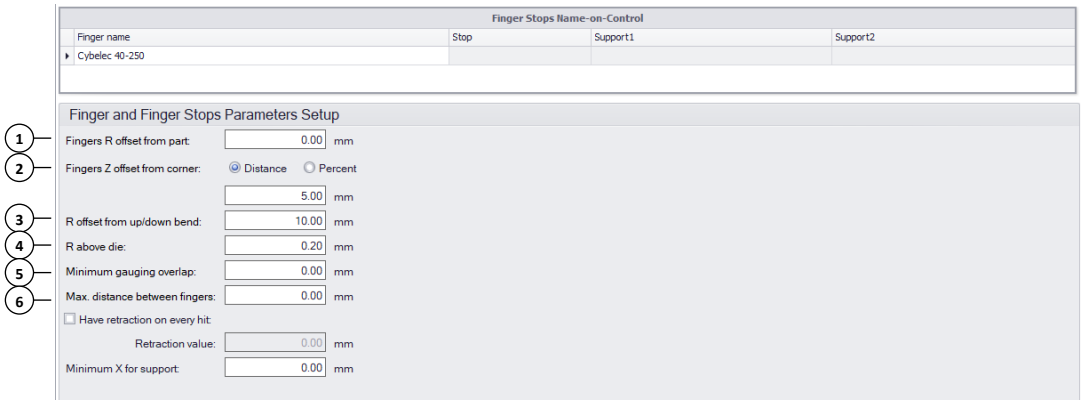
- **Edit Preferred Tools** – Modify the preferred tools for this material + thickness.
- **Delete Preferred Tools** – Delete a material + thickness combination.

You can also define a tool as preferred while selecting tools. During manual tool selection, Touch the Remember as preferred tools checkbox
All tools you have defined as preferred then appear in the Preferred Tools tab:



Finger Stops

Here you configure the finger stops:



1. **Default finger stop**
   Select a stop from the dropdown list. The bending application uses this stop as the default when trying to gauge the part.
2. **Fingers Z offset from part**
   Sets a constant value to the Z offset.
3. **Fingers R offset from corner**
   Sets a constant value to the R offset from the corner.
4. **R above die**
   When the finger is above the die, use this offset for R.
5. **Minimum gauging overlap**
   The minimum acceptable overlap between the finger and the part.
6. **Max distance between fingers**

Setup

If you have saved tool station setups, you can view them here.
To change between a table view and a card view, Touch the magnifying glass.
To change which details are displayed, Touch **Customize** and de/select fields.
You can define these setups in the Simulation Stage.
To use a saved setup, assign it in the Tooling Stage.

Colours

You can define customized colours for the different parts of the display:
Touch **Use Customized Colours**.
Touch each part in turn and select the colour you want.
To return to the default settings, Touch the **Copy Defaults** button.

TOOL CONFIGURATION

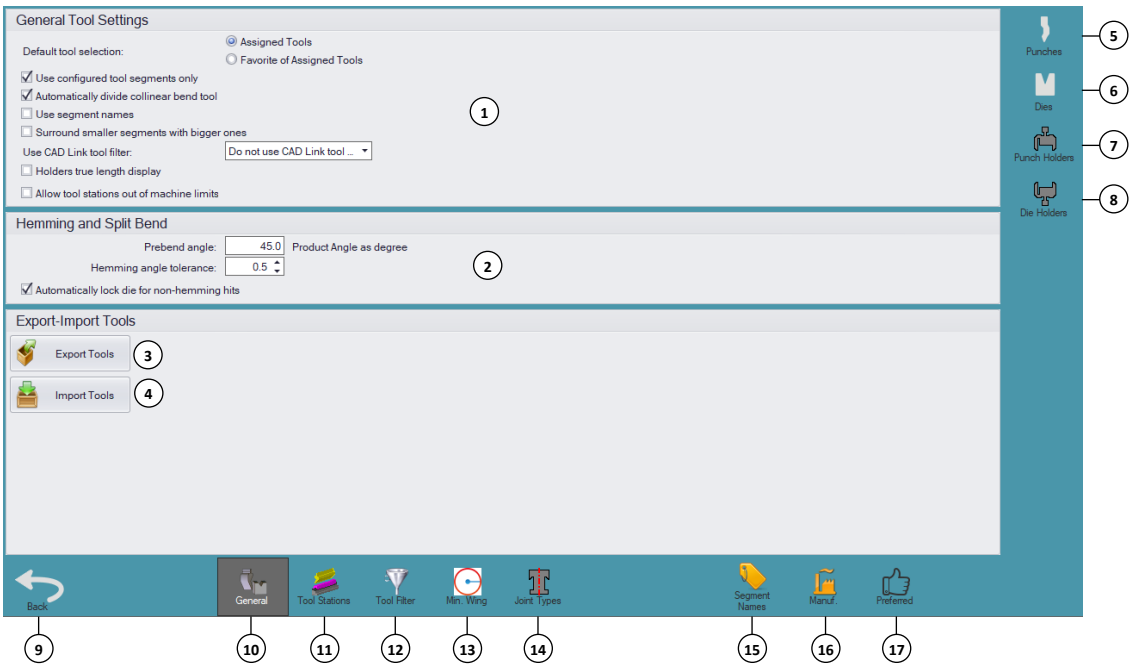


Fig. 7-1: Configuration menu

1. General Tool Settings
2. Hemming and Split Bend
3. Export Tools
4. Import Tools
5. Punches
6. Dies
7. Punch Holders
8. Die Holders
9. Back
10. General
11. Tool Stations
12. Tool Filter
13. Min. Wing
14. Joint Types
15. Segment Names
16. Manufacturer
17. Preferred

Default Tool Selection

The bending application offers three groups of tools:

- Entire tool library is the library of all available tools.
- Assigned Tools is a list of tools that can work with a particular machine (a subset of the tool library). You can select them in the Machines dialog box in the four tool tabs (Punches, Dies, Punch Holders, and Die Holders).
- Favourite of Assigned Tools are defined per machine and are a subset of the assigned tools. You can define tools as favourites in the Machines dialog box in the four tool tabs (Punches, Dies, Punch Holders, and Die Holders).

When selecting tools for specific bends, you can set the default as one of the above options. This is the group you see, for example, whenever you open the Tool Selection dialog box (via Auto Tools Selection or manual tool selection).

Use Configured Tool Segments Only
When selected, this option is relevant during the Simulation Stage. It tells the bending application to use only tools that are in the inventory. When segments are missing, the bending application shows a warning and asks whether to continue.

Automatically Divide Collinear Bend Tool
When selected, different tools are used for collinear bends.

Use Segment Names
Not currently in use.

Surround Smaller Segments with Bigger Ones
When the bending application creates tool stations, it places the smaller tools segments in the middle.

Holders True Length Display
When selected, prior to simulation, the bending application takes the true length of the part and uses it to calculate collisions. When not selected, the length is always the same size of the bend. Therefore, the bending application uses the true length data already in the Sequencing Stage to check for collisions.

Allow Tool Stations out of Machine Limits
When selected, the tool stations can extend beyond the boundaries of the machine.

Hemming and Split Bend Section
In this section you define defaults for hemming and split bends.

Prebend Angle
This is the default for prebending a split bend. It is the angle of the product after the first bend. You can split prebends into two.

Hemming Angle Tolerance
This is the maximum permitted deviation angle for a hemming bend.

Automatically Lock Die for Non-Hemming Hits
Locks spring hemming dies when a part has both normal, prebend, and flattening hits. Default is checked.

Punches
This button is located on the right of the tool settings screen.

Punches Table

This table shows the basic data for all the punch tools. The table includes these columns:

- If any of the data has changed in a particular row, the Edited column is checked.
- You can see the Punch ID, Manufacturer, Punch Name, and Up Joint.
- Height includes the tang. If the values for Height and Working Height are identical, Height may be displaying the working height by mistake. This may be an indication that the tables are not up to date.
- Radius is the radius of the punch tool tip.
- Angle is the angle of the punch tool tip.
- Max. Power is the force that each can be applied for each length. (The length unit is defined in the Options => Units tab.)
- Hemming – when selected, this tool can be used for hemming operations.

You can only change the parameters if they are user defined. The one exception is the Height. You can change the height of any tool because the tip of the tool may have worn down and then been filed down further by the customer and so the height changes.
You can copy (duplicate) a row to a new row. Now it is user defined (there is a check in the User defined column) so you can change (edit) the details in this row.

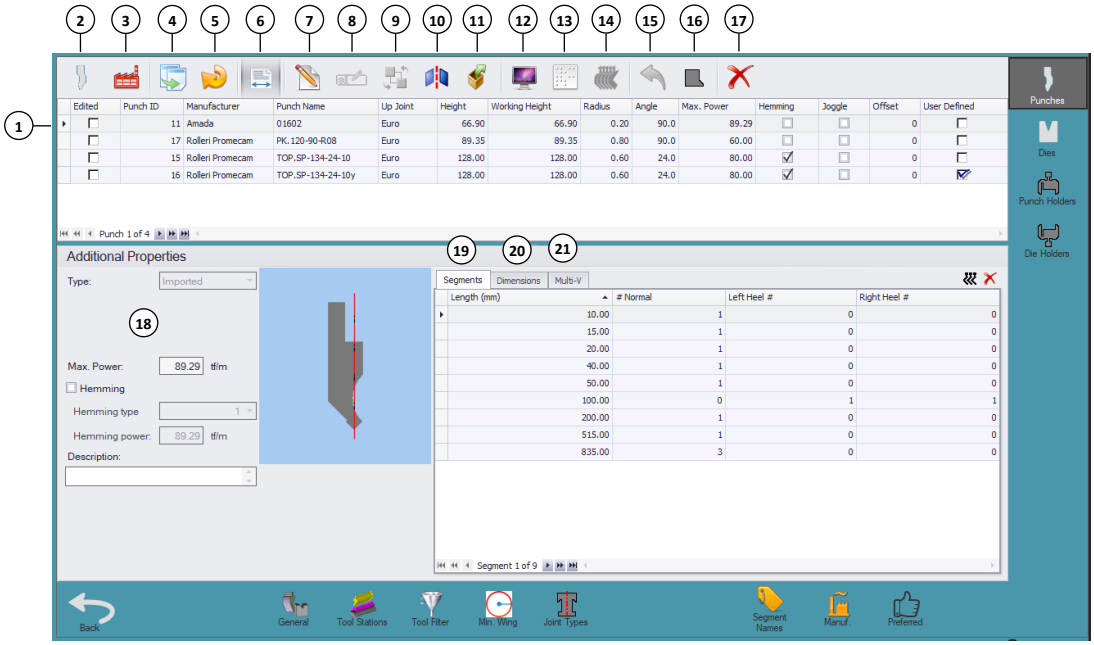
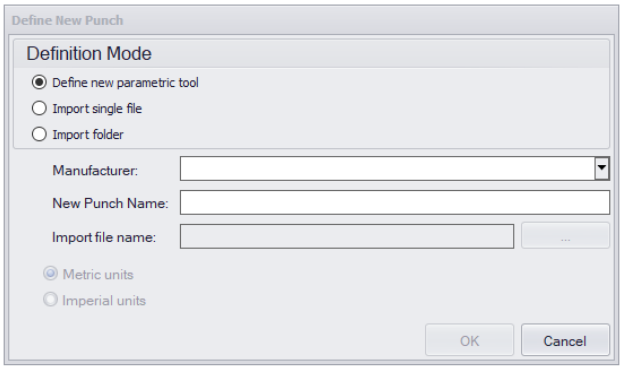


Fig. 7-2: Punch menu

1. List of Punches
2. New Punch
3. Import from factory database
4. Duplicate
5. Reload Tools
6. Auto columns width
7. Edit
8. Rename
9. Change Manufacturer
10. Mirror Tool around Power line
11. Export Tools
12. Name-on-control
13. Punch NC Properties Setup
14. Assign default segments
15. Undo change
16. Joint Types
17. Segment Names
18. Manufacturer
19. Preferred

The toolbar allows you to perform several operations:

- Create a punch tool parametrically or import one from a DXF file (New Punch). When you Touch the **New Punch** icon, the following dialog box opens:



You can select a manufacturer and type the name of the new punch tool. When importing a DXF file, make sure to select the correct unit (metric or imperial).
When defining the tool parametrically, type the values into the Tools Configuration table. In the Dimensions tab, type values for W1, W2, R, A, and H, and Touch **Apply**.

Additional Properties Section

The options in this section are only active when you create a tool.
Type – Displays the tool template used as the base for the created parametric tool. If the tool is imported, displays Imported.
Max. Power – The maximum power for this tool.
Hemming – If this tool can be used for hemming, check this option, then define the type and power.

- **Hemming Type** – Select from the dropdown list:
  1 – For two-stage hemming.
  2 – Relevant only for die tools. Indicates a spring die.
- **Hemming Power** – The maximum power for this hemming tool.

Description – Optional description of the new/imported tool.

Segment Tab

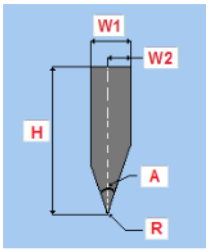
The table in this tab lets you edit the quantity of actual segments, with no heels, or with left or right heels, for different size segments.
If you created the tool, you need to define the measurements and quantities in this tab.

Dimension Tab

This tab displays the settings for the tool measurements.

Tool Dimensions Section

If the selected punch tool is defined parametrically, you can edit the dimensions, as explained in the graphics.
If the selected punch tool is imported, the bending application infers the dimensions from the DXF file and displays them. You cannot edit them.
For example:



Additional Properties, Use Customized Tang

If you want to use a tang measurement that differs from the default, check Use customized tang and type the height into Tang height.

Legend Tab

This tab is only visible when the tool is defined as a hemming tool. Here you can see a graphic representation of the measurements for width flattening (WF), width punch (WP), and height flattening (HF).

Dies

The explanations for this screen are very similar to the explanations for the Punches. These are the exceptions.

Dies Table

There is no Heel icon.
The Up Joint column is replaced by the Down Joint column.
There is a V-Width column.
The Radius refers to the measurement at the shoulder of the die.
For more explanations, see the Punches.

Additional Properties Section

This section contains these options:

- **Holder height** – Legacy option; not in use.
- **Dead zone** – Legacy option; not in use.
- **Mute position** – The height at which the beam slows its downward movement and increases its upward movement.
- **Max. Power** – The maximum power for this tool.
- **Hemming Types** (for die tools only):
  1 – Two-stage hemming
  2 – Indicates a spring die

Both options allow you to define additional parameters in the Dimensions.

- **Hemming Power** – The maximum power for this hemming tool.
- **Description** – Optional description of the new/imported tool.

For more explanations, see the Punches.

Tabs Section

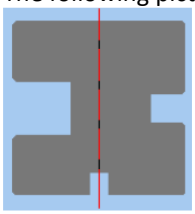
This section includes the segments and dimensions tabs.
There is no Legend tab.
For more explanations, see the Punches.

Segments Tab

In this table you can edit the quantity of actual segments, with no heels, or with left or right heels, for different size segments.
If you created the tool, you need to define the measurements and quantities in this tab.
For more explanations, see the Punches.

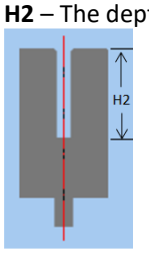
Dimensions Tab

This tab displays the settings for the die tool measurements.
The following picture shows an example of the power vector for a die tool:



When the Hemming Type is 1, you can define these parameters:

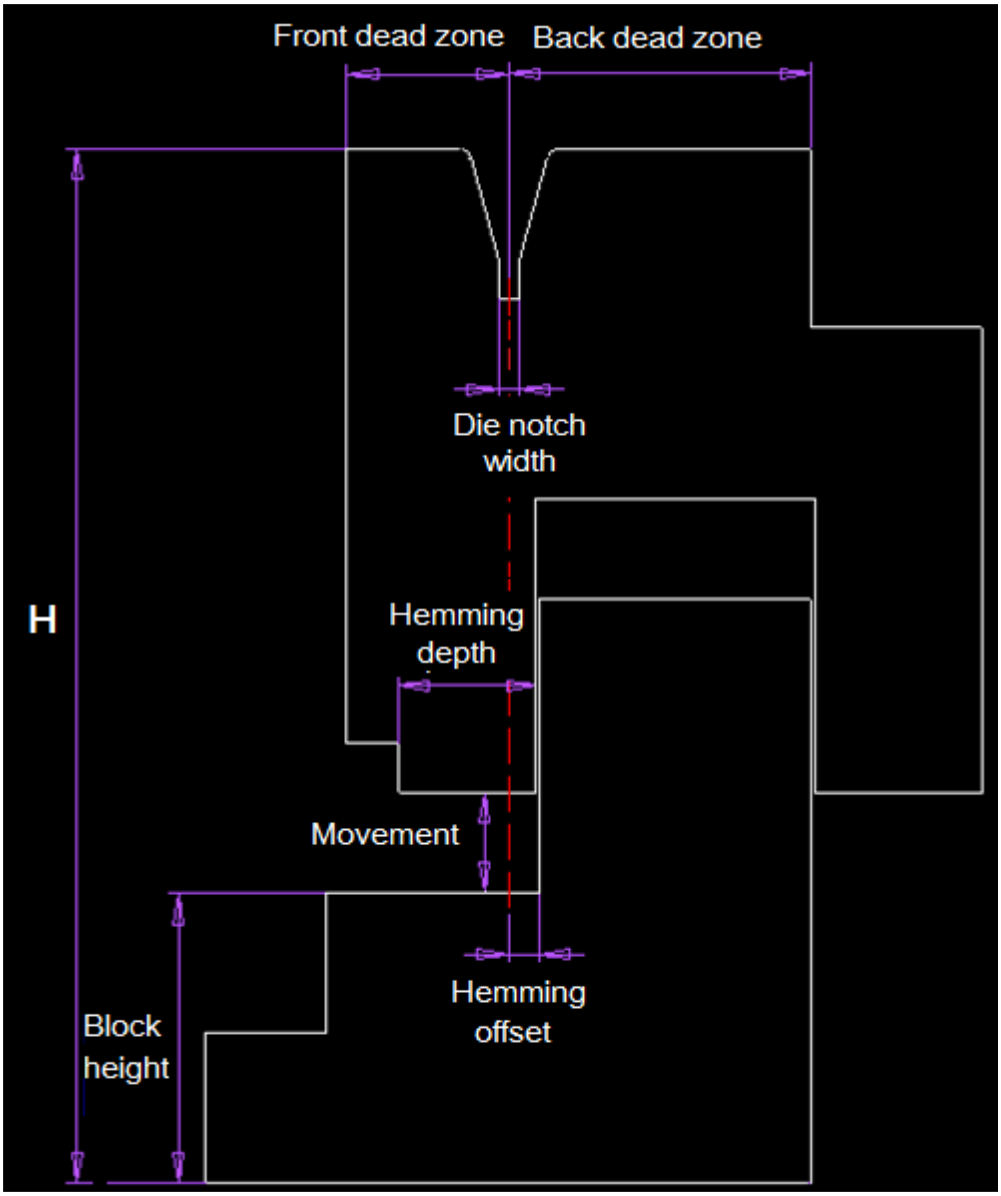
- **H2** – The depth of the die as shown:



- **XOffset** – The power offset from the centre for the hemming bend.

When the Hemming Type is 2, you can define these moving hemming die parameters, as shown in the picture below:

- Back Dead Zone
- Front Dead Zone
- Block Height
- Movement
- Hemming Offset
- Die Notch Width
- Hemming Depth



Punch Holders

The explanations for this screen are very similar to the explanations for the Punches. These are the exceptions.

Punch Holders Table

When creating a punch holder tool, there is no option for defining a tool parametrically. You can only import tool definitions from DXF files.
The DXF file indicates the origin for the power vector. The bending application shows the power vector based on the origin.
There are columns for both Up Joint and Down Joint.
There are no Radius, Angle, or Hemming columns.
For more explanations, see the Punches.

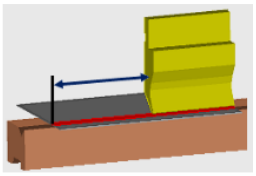
Die Holders

The explanations for this screen are very similar to the explanations for the Punches.
When creating a die holder tool, there is no option for defining a tool parametrically. You can only import tool definitions from DXF files.

Tool Stations

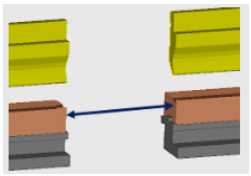
This button opens a window where you define default configuration for tool stations.

Negative Tolerance in Tool Stations



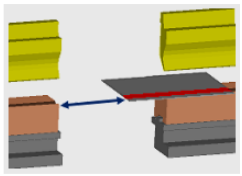
When selecting tool segments to fit the length of a hit, the bending application may not find the exact match. The Negative Tolerance allows the bending application to select segments that cover less than the hit length, within this tolerance

Minimum Distance between Tool Stations



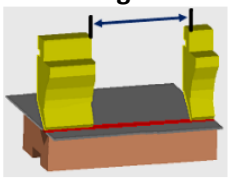
This distance helps avoid collisions between tool stations

Tool Station Offset



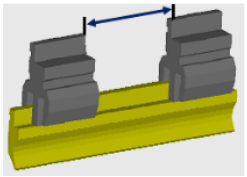
This distance is measured from the tool station to the part

Allowable Gap between Segments to Achieve Hit Length



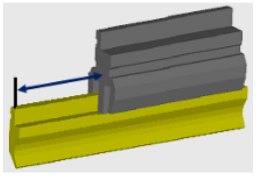
This is the maximum distance permitted between segments

Max. Distance between Holder Segments



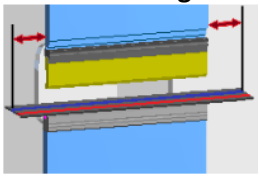
This is the maximum distance permitted between holder segments

Max. Holder Segments Start/End Offset



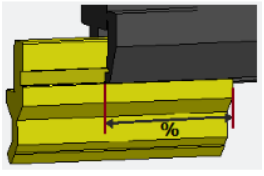
This distance is the offset from the start (or end) to the closest holder segment

Max. Allowed Part Overhang



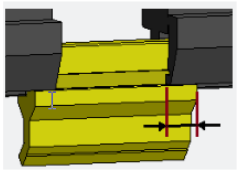
This is how much the part overhangs the machine on each side

Min. Segment Percent Held by Clamp



Relevant when there is a single clamp holding the punch

Min. Segment Length Held by Clamp



Relevant when there are two clamps holding the punch

Automatically Centre Single Station

When there is a single station, automatically centre it on the machine.

Radii

This section displays values from the bend technology table, allowing you to change the settings for the radii chart.

Export/Import Radii

You can import and export radii values from the bend technology table as TXT files. Perform these operations using the **Import** and **Export** buttons at the of the screen.

The data in the table might resemble this example:

```
[V]
4=0.5=3
5=0.7=3.5
6=0.8=4
8=1=5.5
10=1.3=6.5
12=1.5=8
16=2=10.5
```

Ignore Safe Flange Length Calculation

When selected, the bending application does not consider the minimum flange length required for secure bending (the calculation based upon V/2 + radius allowance + thickness). Instead, the bending application uses the B Relative values. (See the pictures in the dialog box.)

Radii Values Table

The table shows the calculations from the bend technology table, multiplied by the correction factor for each material as defined in the Bend Technology Table.
B Relative is the same as the Flange length security calculation, as shown in the figure on the right of the screen.
The values in this table are based on material of type 1 (steel).

Joint Types

This button opens a window where you can view and edit joint types.

Joint Types Section

You can customize the joint types:

- To add the name of a new joint type, Touch **New Joint Type** icon.
- To change the name of any joint type in the table, Touch the **Rename Joint Type** icon.
- To delete a joint type that you created, Touch the **Delete** icon. This option is only active when you have defined at least one joint type.

Configured Joint Types Table

The table shows you all the joints types, including ones you have defined.
You can see the name of each joint type, whether it is suitable for upper or lower beams, if it is rotatable, and (optionally) a description.
When you create a new joint type and Touch **OK**, the bending application assigns the joint type a numeric ID.

Segment Names

The Defined Segment Names table contains columns for Segment Length, Metric Name, and Imperial Name, to make it easy to refer to a particular length. For example, segment length is called ½" in Imperial measurements.
To define a new segment name, Touch it.

Makers

The table at the top of the screen shows default segments per punch manufacturer.
The table at the bottom of the screen shows default segments per die manufacturer.

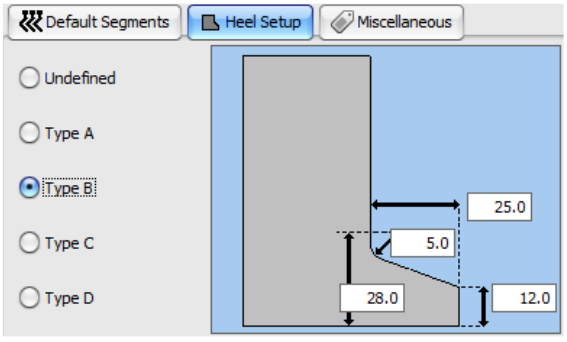
Default Segments Tab

This button opens a window to show the number of default segments for each measurement.
For punch tool manufacturers, the table also shows the number of default left and right heels.
Add a new segment by tapping the empty line at the bottom of the table.

Heel Setup Tab

Relevant for punch only.
Heels are defined differently for each tool manufacturer.
You have these options:

- Assign a heel manufacturer to selected tools.
- Change a default length or normal/left heel/right/heel position by tapping the field and typing the new value.
- For a punch tool, define which type of heel setup to use by tapping the Heel Setup tab and selecting one of the options:



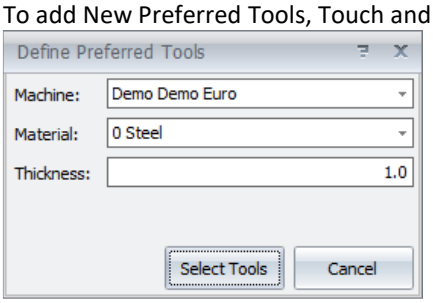
The graphic on the left shows you the measurements based on the heel type. Edit the displayed values.

Miscellaneous Tab

To change the name of the punch/die manufacturer, type the name into Manufacturer name.
To set the tang height, type the value in Tang height.

Preferred

To add New Preferred Tools, Touch and select a machine/material/thickness combination:

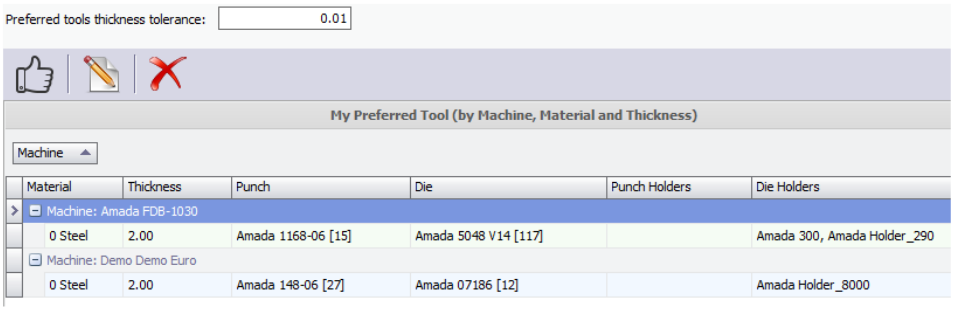


Later you can change the combination or delete it.
When you are in Simulation Stage, to indicate a preference for specific tools, Touch the **Remember** as preferred tools button:

- In the manual tool selection
- In the auto tool selection

My Preferred Tool Table

The table shows the preferred tools you selected in the manual tool selection for a particular material/thickness combination, sorted by machine. For example:



To change the order of the machines displayed in the table, Touch the **Machine** button.

Materials

When you Touch **Materials**, you are prompted to Touch a **password** and Touch **Enter**. You can get this password from your system administrator.

The Materials dialog box contains the data for each material, including tensile strength and density:

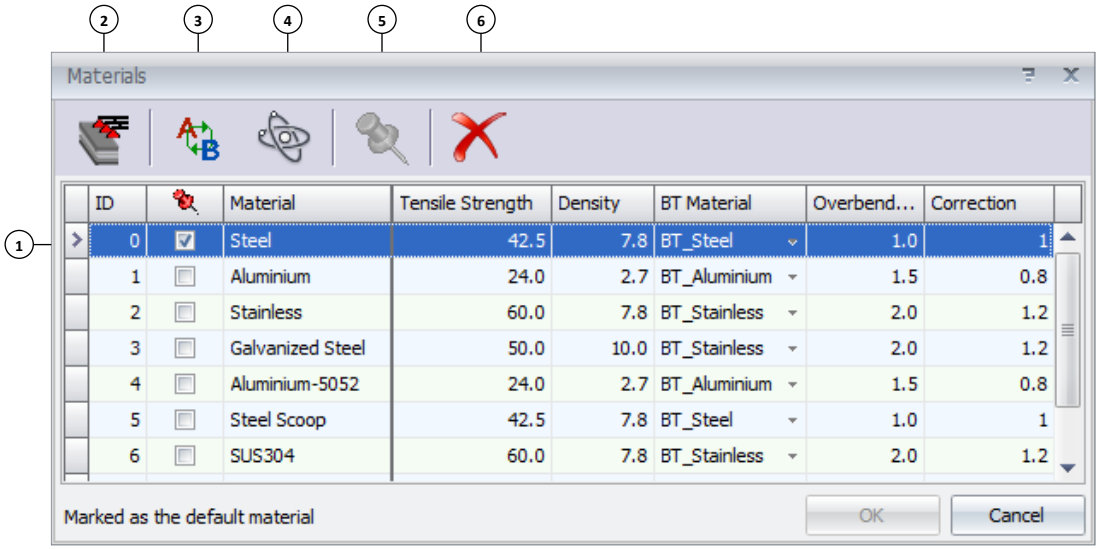


Fig. 7-3: Material menu

1. List of materials
2. New
3. Rename
4. View/Edit BT Materials
5. Set as Default
6. Delete

Bend Technology Materials

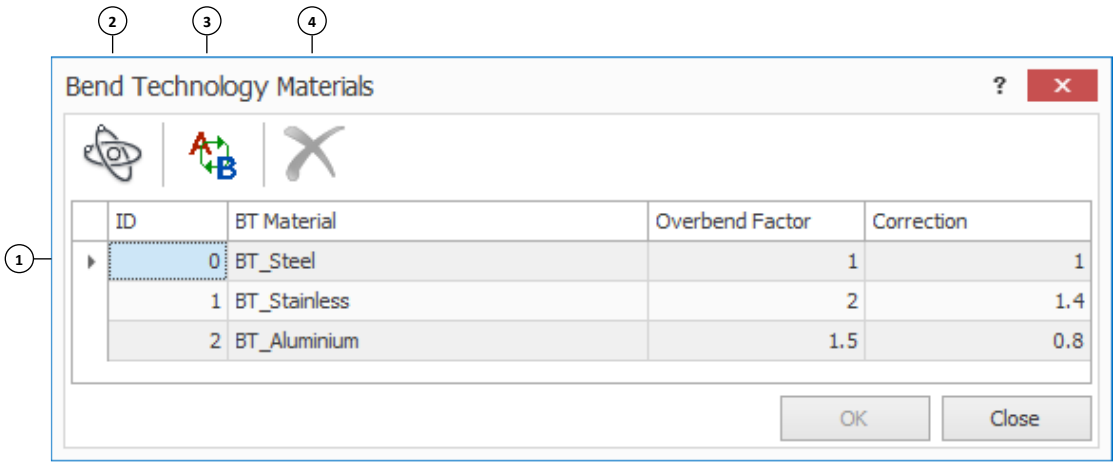


Fig. 7-4: Bend technology materials menu

1. List of materials
2. New
3. Rename
4. Delete

You can delete a technology material only if it is not being used by one of the materials in its BT Materials setting. So, before you can delete a technology table change that material's setting or delete it altogether.

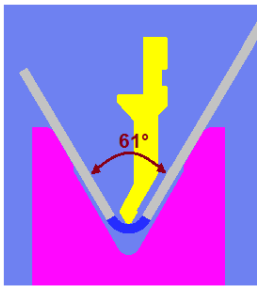
You can also edit the properties' technology materials by typing new values in the appropriate field:

- **Overbend Factor** – The overbend for this technology material. This will be the value for all materials that use this technology table.
- **Correction Factor** – The correction for this technology material. This will be the value for all materials that use this technology table.

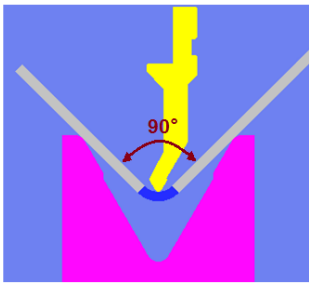
Overbend Factor

The bending application uses the overbend factor to calculate the overbend angle.
After the machine presses the material, the bend opens to some extent due to the material's flexibility (the spring back). The overbend angle is the difference between the angle to which the part must be pressed and the desired final angle.

Below is an example of bending 5 mm (0.2") armour plating, which has a very high overbend factor.



To achieve a bend with an angle of 90° it is necessary to press the material to a product angle of about 61



When the beam moves up, the material relaxes, springing back to the desired angle.

Delta = Punch Radius / (Thickness * 2.1);

- Formula from "Press Brake Technology - Steve D. Benson" pages 96-100.
  Spring Back = Delta * Over bend Factor
  Spring Back = (overbend Factor ∗ Punch Radius) / (Thickness ∗ 2.1)

Correction Factor

To select the correct die width for a specific bend, the bending application relies on the Radii Values table in the Tools dialog box.

When creating the flat of a part, the bending application examines each bend and selects the correct die width. The bending application uses this die width to select the correct value from the Compensation Table.

Because there is only one Radii Values table, the bending application must make allowances for the properties of different materials. To achieve a bend radius of 2 mm (approx. 0.08") for mild steel requires a V16 die (0.623"), while for aluminium it might require a V12 (0.472") die.

The Correction Factor determines how to select the correct die width, adjusted to the specific material of the part. The bending application takes a given radius (**r**), multiplies it by this factor, and arrives at the radius for this material (**rM**):

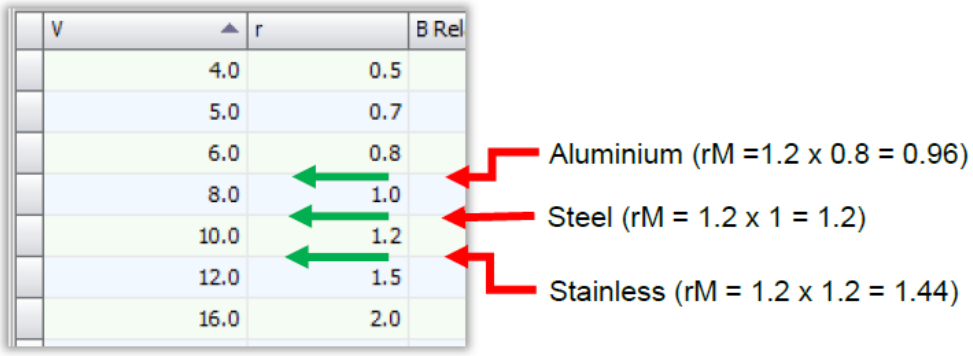
rM = **r** * Correction Factor

The bending application then finds the correct die width for this adjusted radius in the Radii Values table.

For example, this is the default Bend Technology table:

ID	BT Material	Overbend Factor	Correction
0	BT_Steel	1	1
1	BT_Stainless	2	1.2
2	BT_Aluminium	1.5	0.8

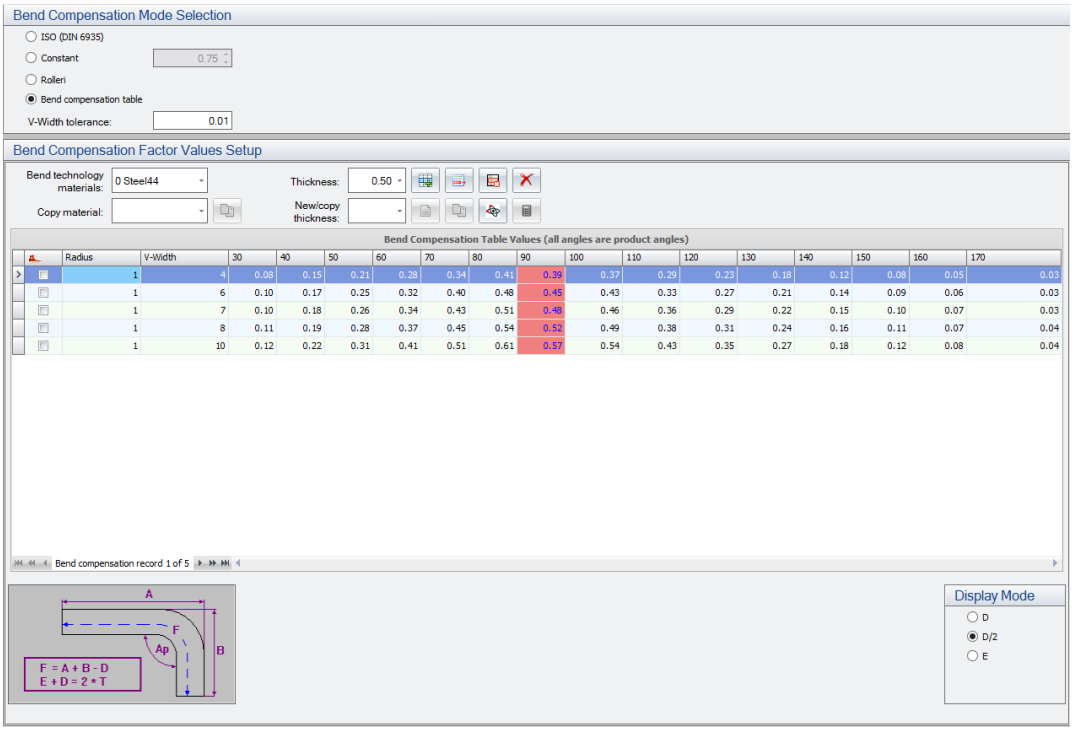
For a bend with a radius of 1.2 mm, the bending application makes the following selections:



So, for aluminium you get V8, for steel V10, and for stainless V12 (if there is no exact match then the bending application takes the next largest).

Bend Comp

This button opens the Bend Compensation Factor Setup dialog box:



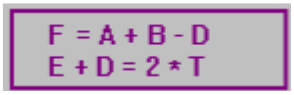
Towards the top of the dialog box you can choose the mode for calculating the bend compensation. Options:

- ISO (DIN 6935):
  Ri/e <= 0.5 0.8 1.2 2 3 >= 5
  K 0.5 0.6 0.7 0.8 0.9 1
  Where Ri is internal radius, e is thickness and K is the compensation factor.

- Constant: **K***e/2, where K is the compensation factor and **e** is the thickness.
- Rolleri: Special constant
- Bend compensation table: Use values from bend compensation table related to material, thickness, punch radius, and V width.

This dialog box contains bend factors tables, based on the material and thickness combination. If you change either of them, the data in the table changes accordingly.
There are also three compensation display modes: D, D/2, and E; where D stands for Bend

Deduction and E is the calculation visible at the bottom of the screen:



You can create a new entry in the table based upon an existing entry.

Stations

In this screen you can view saved station setups that you saved in the Simulation Stage.

IMPORTING MACHINE GEOMETRY

MAIN SCREEN

Here you will find the main screen of the machine configuration.

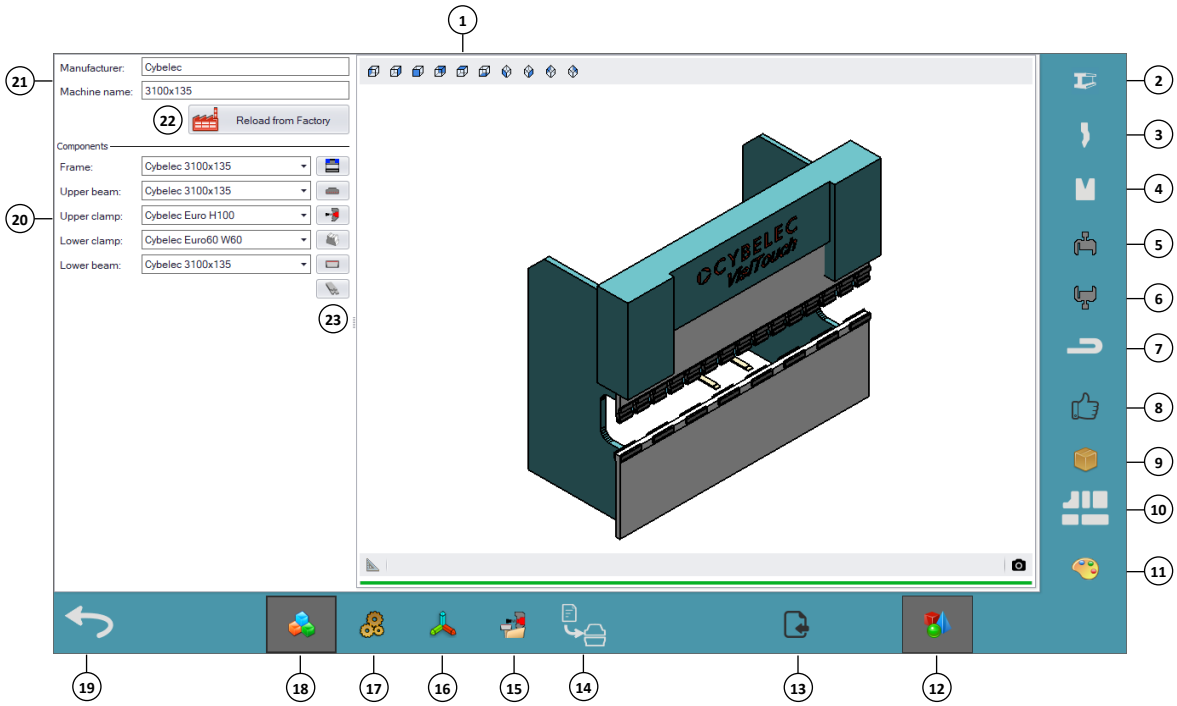


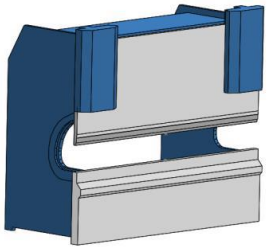
Fig. 8-1: Main menu

3. Orientation view
4. Material management
5. Punch management
6. Die management
7. Upper clamp management
8. Lower clamp management
9. Hemming management
10. Preferred tools menu
11. Fingers management
12. Tool station setup
13. Colours management
14. 3D / Static view
5. Import machine menu
6. NC Output management
7. Lower / Upper clamp configuration
8. R axis configuration
9. General machine parameters
10. Main menu
11. Back button
12. Machine components menu
13. Equipment's name
14. Load machine from library
15. Edit machine component
16. Select machine component

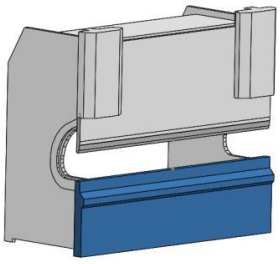
Basic Machine Components

Every machine in VisiTouch 19 MX has six basic components:

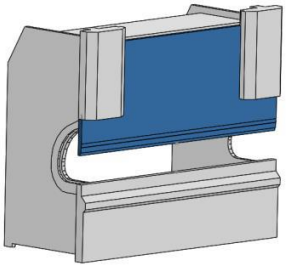
Frame



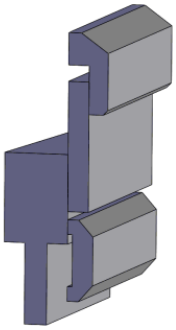
Lower Beam



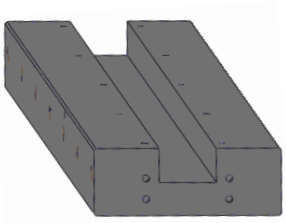
Upper Beam



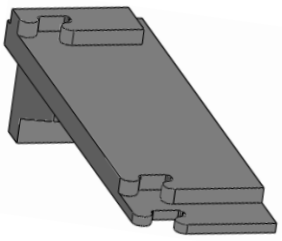
Upper Clamp



Lower Clamp



Fingers

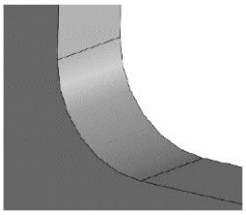


Preparing Components for Import

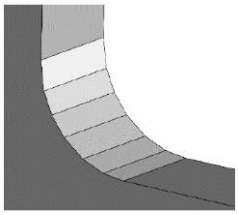
Before importing, the geometries should be prepared in several ways:

1. **Simplified** – only the bare minimum should be left, leaving out anything which has no bearing on collision detection, specifically:
   a. Holes, in frame or beams or as shown in the Lower Clamp above.
   b. Elements at the back of the frame, e.g. supports or cabinets.
2. **No arcs** – all arcs should be re-drawn as segmented planes (to make 3D analysis simpler):

A frame's throat with arcs



and after segmenting to planes:



3. **Coordinate system** – all components should use the same coordinate system, the origin position depending on their type, with axis directions being:
   a. X – positive pointing from machine **to the operator**.
   b. Y – positive **pointing up**.
   c. Z – positive pointing from centre **toward the left** of the machine.

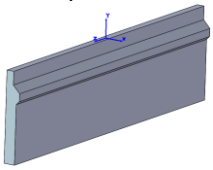
Once all components are defined in this way, they must be exported to IGS format.

DEFINING AND IMPORTING A LOWER BEAM

The origin of the Lower Beam should be defined as follows:

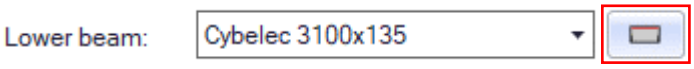
1. Y = 0 is where the clamping system connects.
2. X = 0 is where the force vector presses.
3. Z = 0 is in the middle of the beam.

Usually it will thus:

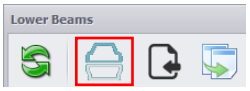


Once the IGS file is ready, do:

1. In the **Home** tab, select the **Lower Beams** button:



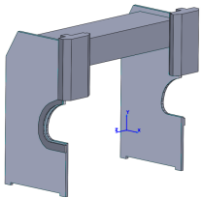
2. Click on **New**:



3. Input a **Manufacturer** name, select **Defined by IGS** and use the **Import IGS** button to select the beam's IGS file.
4. After selecting the file, the **Define New Lower Beam** dialog will open.
5. Enter a value for **Z** – the working length of the beam.

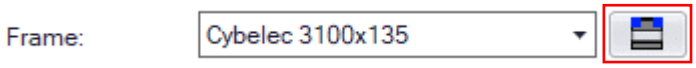
DEFINING AND IMPORTING A FRAME

The origin of the frame should be in the position where the Lower Beam's origin would be in the assembled machine:

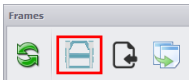


Once the IGS file is ready, do:

1. In the **Home** tab, select the **Frames** button:



2. Click on **New**:



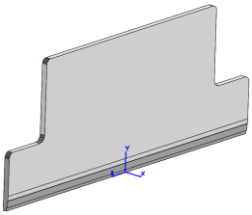
3. Input a **Manufacturer** name, select **Defined by IGS** and use the **Import IGS** button to select the frame's IGS file

DEFINING AND IMPORTING AN UPPER BEAM

The origin of the Upper Beam should be defined as follows:

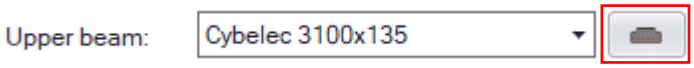
1. Y = 0 is where the clamping system connects.
2. X = 0 is where the force vector presses.
3. Z = 0 is in the middle of the beam.

Usually it will thus:

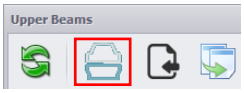


Once the IGS file is ready, do:

1. In the **Home** tab, select the **Upper Beams** button:



2. Click on **New**:



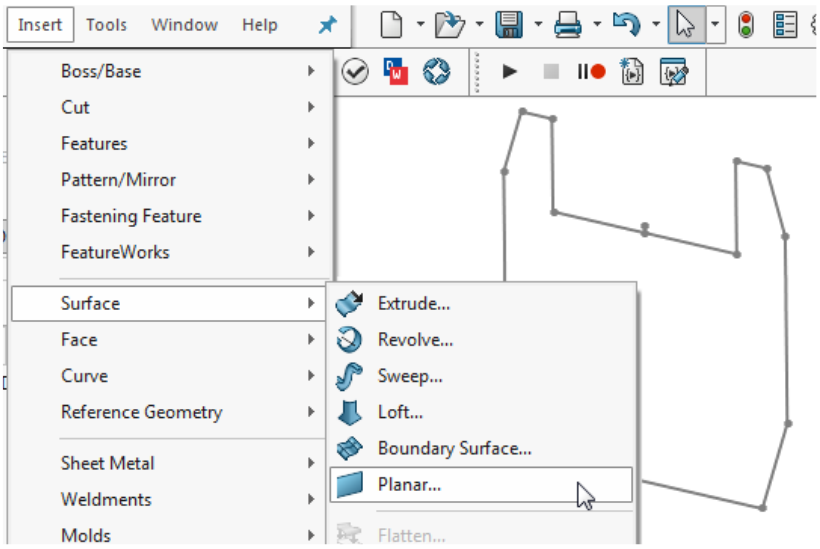
3. Input a **Manufacturer** name, select **Defined by IGS** and use the **Import IGS** button to select the beam's IGS file.
4. After selecting the file, the **Define New Upper Beam** dialog will open.
5. Enter a value for **Z** – the working length of the beam.

DEFINING AND IMPORTING A LOWER CLAMP

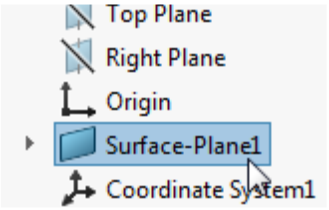
Whereas frames and beams are regular IGS solids, a Lower Clamp file must be a **Planar Surface**.

To create a planar surface part in SolidWorks, do:

1. Make a Sketch with the clamp's profile.
2. Select the Sketch element then select Insert => Surface => Planar



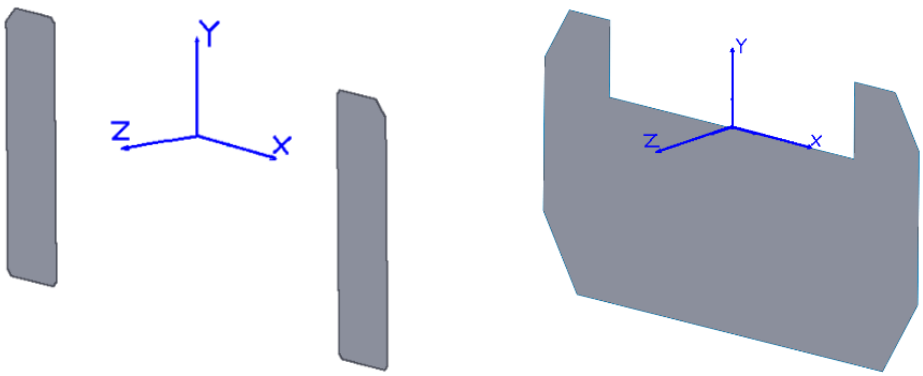
3. Once this is done you will see an element like this:



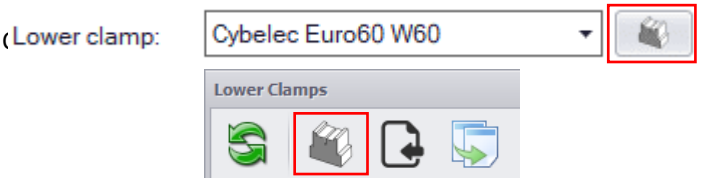
The origin of the Lower Clamp should be defined as follows:

1. Y = 0 is where the die connects.
2. X = 0 is where the force vector presses.
3. Z = 0 is toward the left, as the clamp sits on the lower beam.

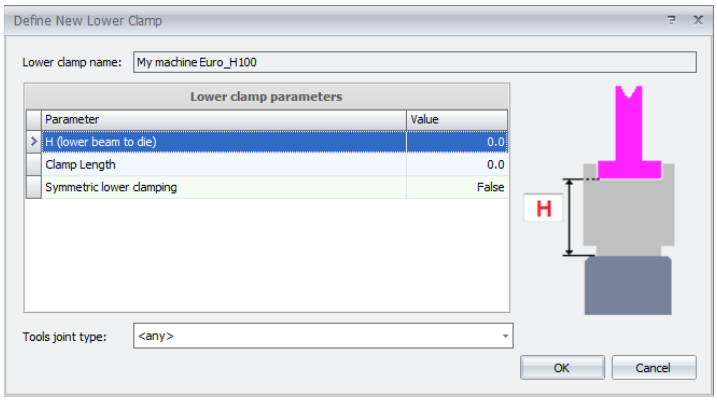
Usually it will thus:



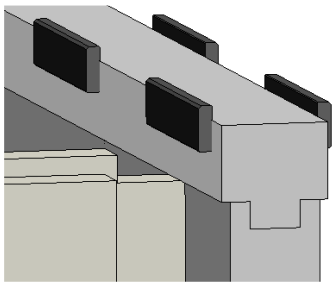
Once the IGS file is ready, do:

1. In the **Home** tab, select the **Lower Clamps** button:
2. 

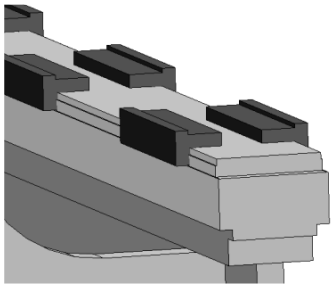
3. Input a **Manufacturer** name, select **Defined by IGS** and use the **Import IGS**
4. button to select the clamp's IGS file.
5. After selecting the file, the **Define New Lower Clamp** dialog will open:



6. Enter a value for:
   a. **H** – the height between the lower beam and the die.
   If these are clamping plates, then set this to 0.01 – a nominal 0.
   Then the clamp will be positioned like this:

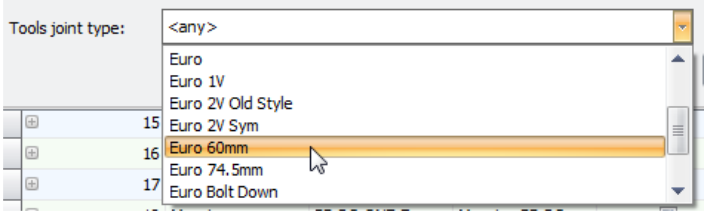


OR



   b. **Clamp Length** – the length of each clamping piece.
      i. **Clamping plate** – enter the length of the plate.
      ii. **Full length clamp** (e.g., Wila) – does not matter, can remain as "0".

   c. **Symmetric** – can the die be rotated in place on this clamp.
   d. **Joint Type** – which connector the clamp uses for holding tools:

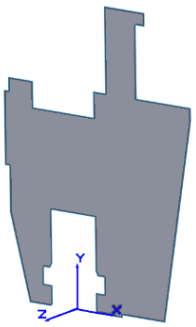


DEFINING AND IMPORTING AN UPPER CLAMP

Whereas frames and beams are regular IGS solids, an Upper Clamp file must be a **Planar Surface** (see above how to define such a part).
The origin of the Upper Clamp should be defined as follows:

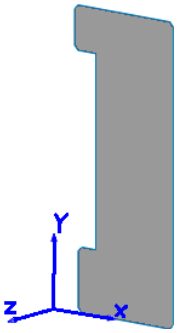
1. Y = 0 is the point from where the **Working Height** of punch is calculated (so for Wila\Trumpf clamps this may be inside the clamp or at its bottom).
2. X = 0 is where the force vector presses.
3. Z = 0 is toward the left, as the clamp sits on the upper beam.

Usually it will thus:



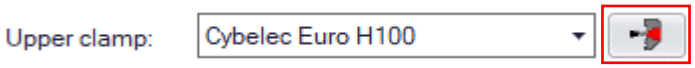
OR

OR a clamping plate

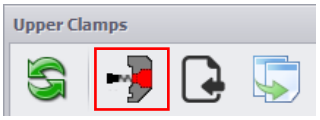


Once the IGS file is ready, do:

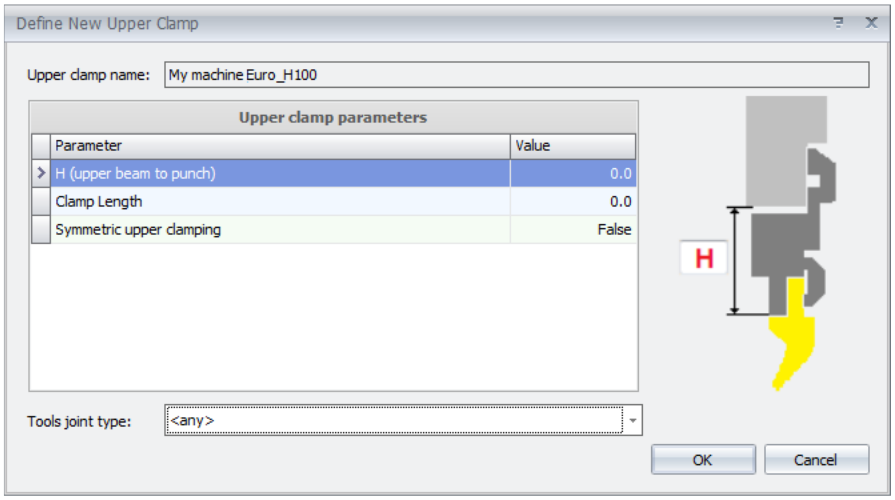
1. In the **Home** tab, select the **Upper Clamps** button:



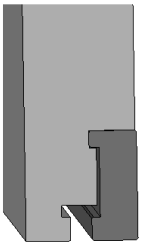
2. Click on **New**:



3. Input a **Manufacturer** name, select **Defined by IGS** and use the **Import IGS** button to select the clamp's IGS file.
4. After selecting the file, the **Define New Upper Clamp** dialog will open:



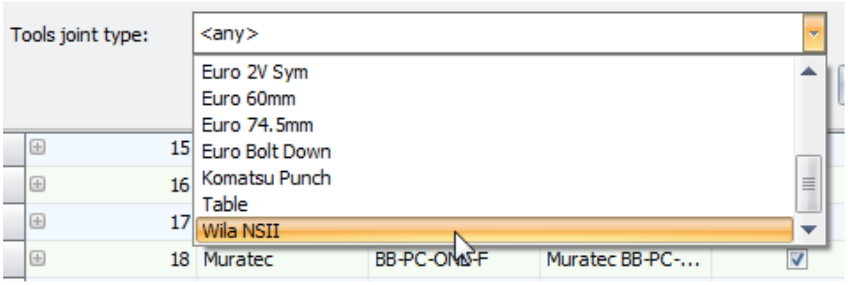
5. Enter a value for:
    a. **H** – the height between the upper beam and the punch.
    If these are clamping plates, then set this to 0.01 – a nominal 0.
    Then the clamp will be positioned like this:



    b. **Clamp Length** – the length of each clamping piece.
        i. Clamping plate – enter the length of the plate.
        ii. Full length clamp (e.g., Wila) – does not matter, can remain as "0".

    c. **Symmetric** – can the punch be rotated in place on this clamp (so for Wila this will be "True", for Euro one sided "False").

    d. **Joint Type** – which connector the clamp uses for holding tools:



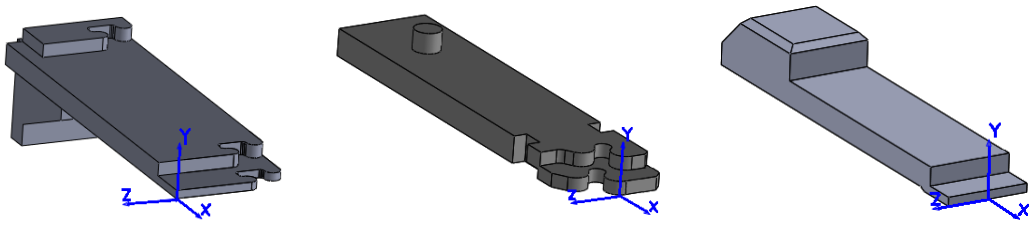
DEFINING AND IMPORTING FINGERS

The origin of the finger should be in the position where the machine control "thinks" it is, so when the control moves the finger to (X = 100, R = 100, Z = 1000) the origin of the geometry should be the point that is brought to that position.

Usually, the origin of the finger will be defined as follows:

1. Y = 0 is at the bottom of the first stop.
2. X = 0 is at the front of the first stop.
3. Z = 0 is determined according to the (actual, physical) machine configuration.

Possible origins are:



To define a finger requires defining the individual stops and the relationship between them.

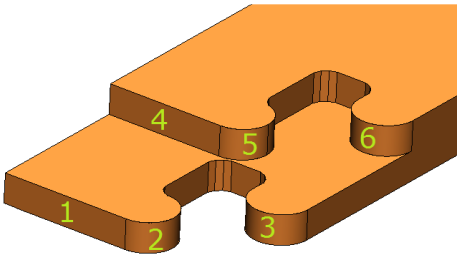
There are two types of stops:

1. **Flat** stop:

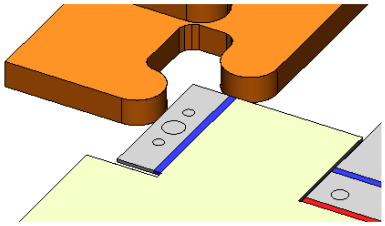
2. **Cylindrical** stop:

Fingers are the only geometry when it is permitted to have arcs.

For example, in the following (partial view of this) finger there are 6 stops:



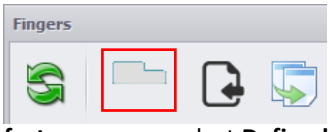
1 and **4** are flat stops, while **2**, **3**, **5** and **6** are cylindrical.
In addition, the pairs **2-3**, **5-6**, have a relationship – they are used for clamping ("crab claw" gauging) and have to be defined as such.
Defining **2 and 3** with a Crab Claw connection allows them to clamp a part thus:



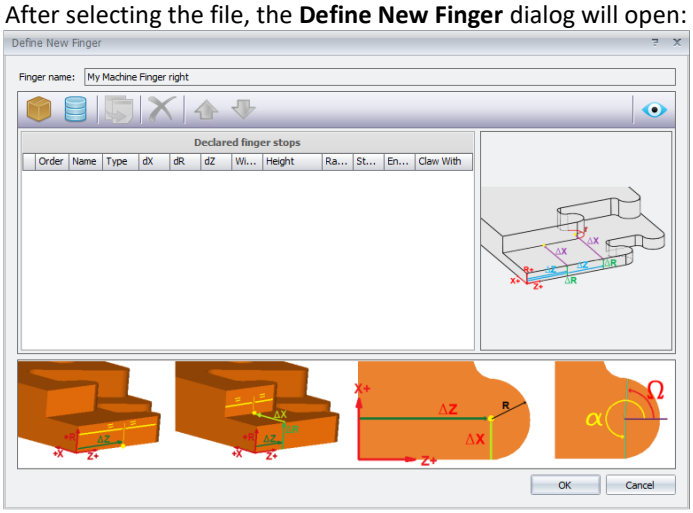
Once the IGS file is ready, do:

3. In the **Home** tab, select the **Fingers** button:

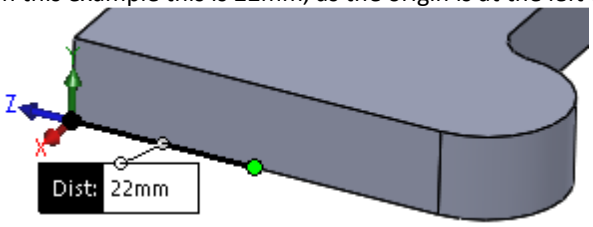
4. Click on **New**:



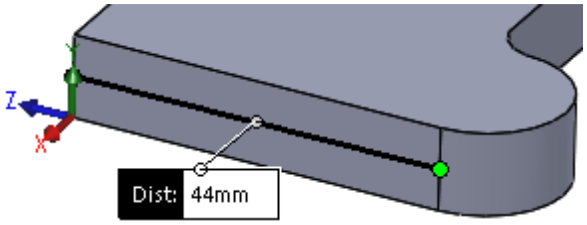
5. Input a **Manufacturer** name, select **Defined by IGS** and use the **Import IGS** button to select the clamp's IGS file.
6. After selecting the file, the **Define New Finger** dialog will open:



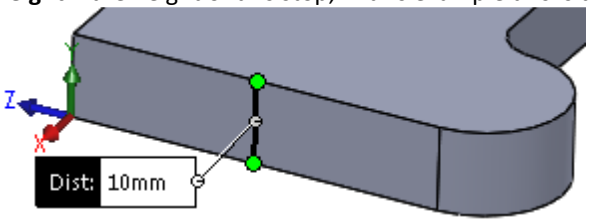
7. Now you must define each stop on the finger.
8. Defining a **Flat** stop:
    a. **Name** – the first stop is usually called "Stop".
    b. **dX** – distance from the front of the face to the origin along the machine X axis (so positive is front-to-back). If this is the first stop then this will be 0.
    c. **dR** – distance from the bottom of the face to the origin along the **R** (i.e. Y) axis. If this is the first stop then this will be 0.
    d. **dZ** - distance from the centre of the face to the origin along the **machine Z** axis (so positive is left-to-right). This value depends on the position of the origin.
    In this example this is 22mm, as the origin is at the left of the stop:



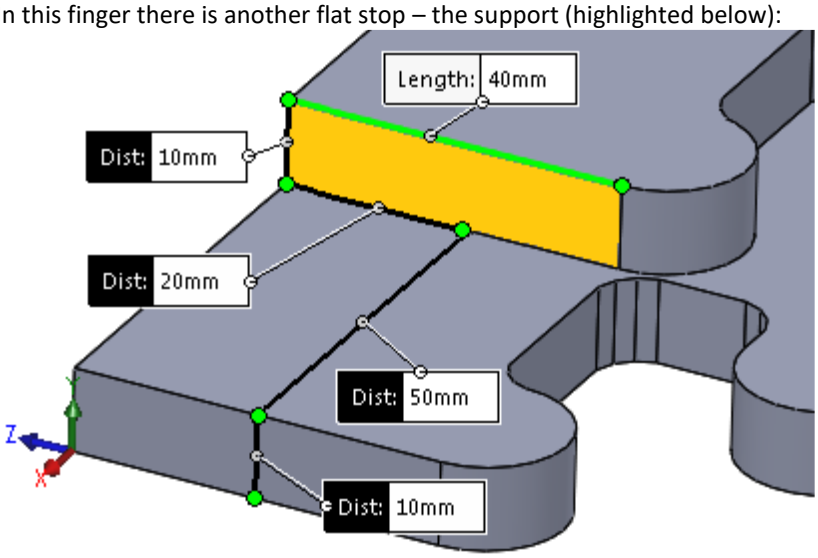
    e. **Width** – the width of the face; in this example this is 44mm:



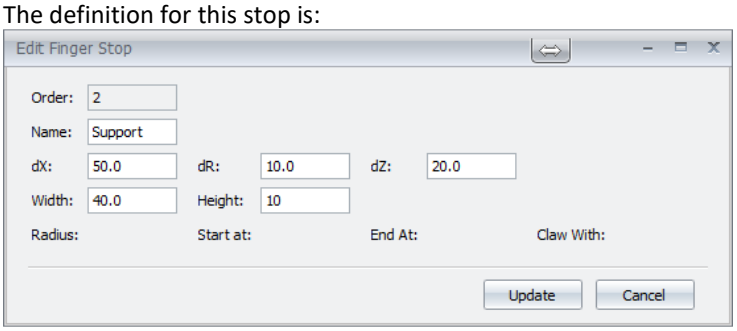
f. **Height** – the height of this stop; in this example this is this 10mm:



g. In this finger there is another flat stop – the support (highlighted below):

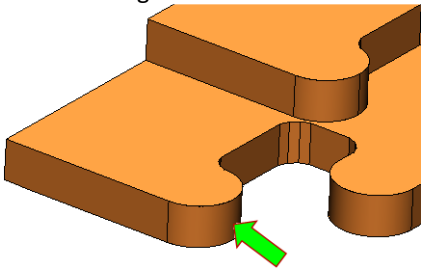


The definition for this stop is:

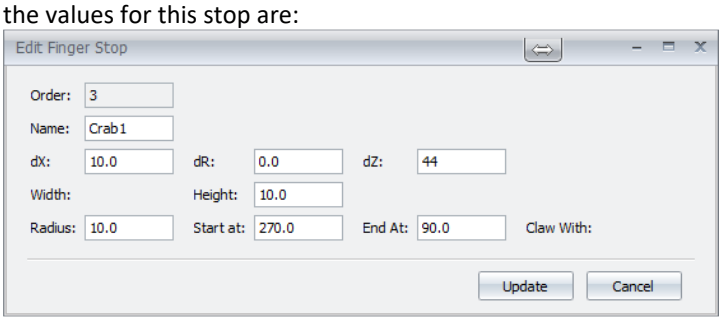


9. Defining a Cylindrical stop:

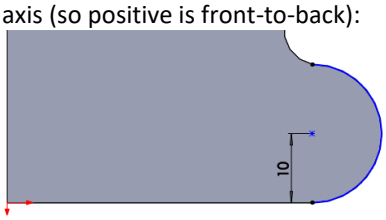
The following show the definition of this stop:



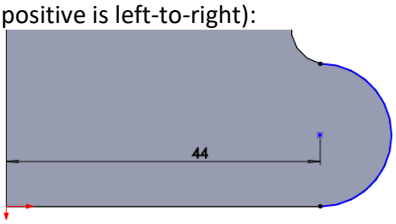
the values for this stop are:



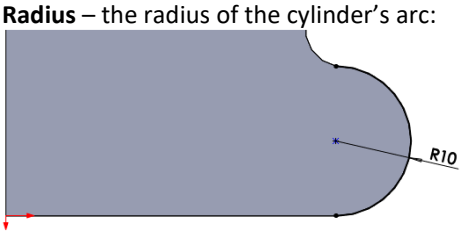
a. **Name** – designation for this stop.
b. **dX** – distance from the centre of the cylinder to the origin along the **machine X** axis (so positive is front-to-back):



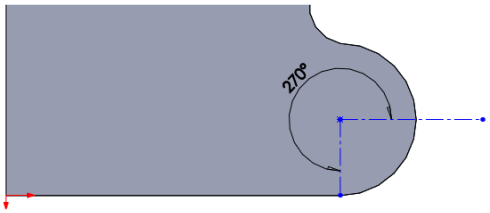
c. **dR** – distance of bottom of face to origin along the **R** (i.e. Y) axis. If this is the first stop then this will be 0.
d. **dZ** - distance of centre of cylinder's arc to origin along the machine Z axis (so positive is left-to-right):



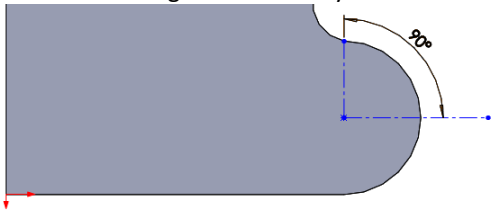
e. **Height** – the stop's height.
f. **Radius** – the radius of the cylinder's arc:



g. **Start at** – the angle where the cylinder's arc begins, with the arc going counter-clockwise:



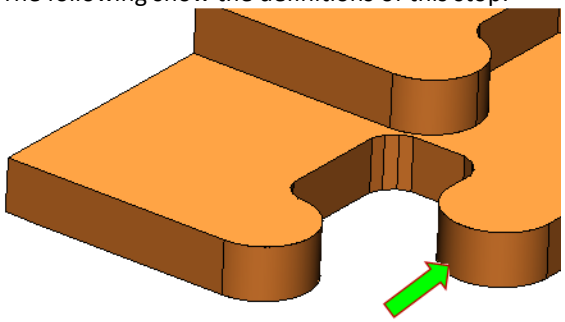
h. **End at** – the angle where the cylinder's arc terminates:



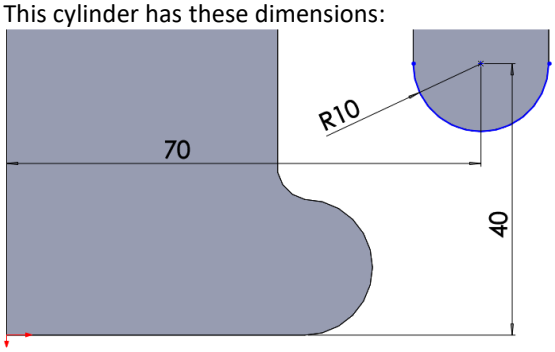
i. **Claw with** – if this stop is used to clamp with another stop. If this is the first Cylindrical stop then this option will be disabled.

j.

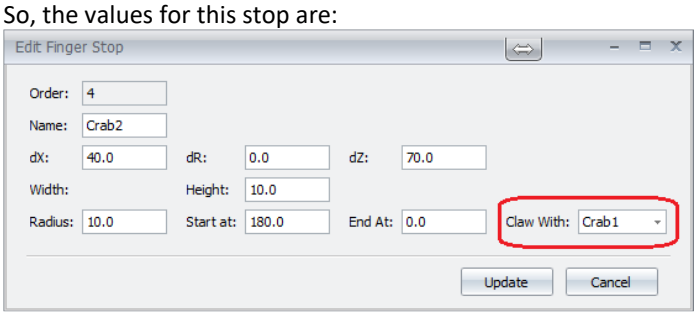
10. In this finger there are another four cylindrical stops.
The following show the definitions of this stop:



This cylinder has these dimensions:

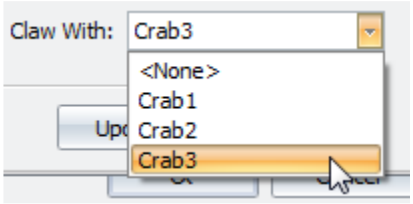


So, the values for this stop are:



Note that the **Claw with** setting now has a value – "Crab1". If you now return to the definition for Crab1 you will see that it now has a complimentary **Claw with** setting – with Crab2.

When you define the fourth cylinder, you will also have to define the **Claw With** value, but this time it will be set to "Crab3":



After defining all the stops for this finger, the result will be:

Define New Finger

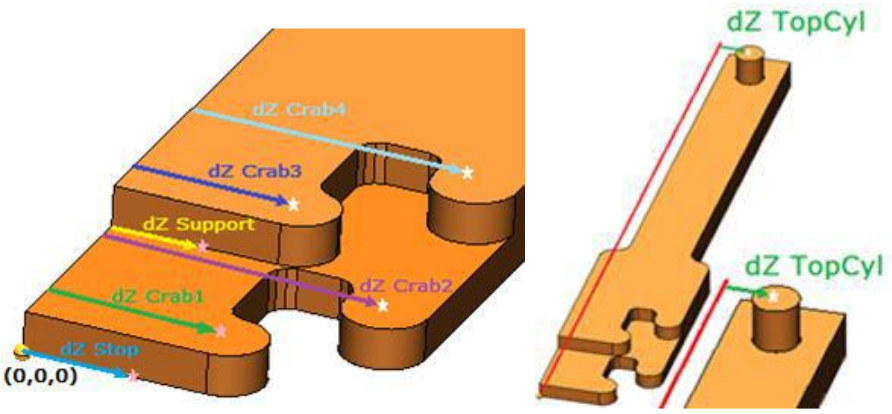
Finger name: My Machine Finger Left

Declared finger stops

Order	Name	Type	dX	dR	dZ	Width	Height	Ra...	Star...	En...	Claw With
1	Stop		0.0	0.0	22.0	44.0	10.0				
2	Support 1		50.0	10.0	20.0	40.0	10.0				
3	Crab 1		10.0	0.0	44.0		10.0	10.0	270.0	215.0	Crab 2
4	Crab 2		40.0	0.0	70.0		10.0	10.0	180.0	0.0	Crab 1
5	Crab 3		60.0	10.0	40.0		10.0	10.0	270.0	66.0	Crab 4
6	Crab 4		90.0	10.0	70.0		10.0	10.0	180.0	0.0	Crab 3
7	Top Cyl		414.0	20.0	40.0		20.0	10.0	180.0	0.0	

As mentioned above, the **dZ** value is measured along the machine's Z axis, with positive being left-to-right, from origin to centre of the face or cylinder.

So, the **dZ** values for stops in the finger are thus:

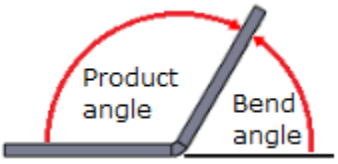


PREPARING A DXF \ DWG FILE FOR IMPORTING INTO VISITOUCH 19

DEFINING AND IMPORTING FINGERS

In order to import a DXF or DWG into VisiTouch 19 MX it must comply with several rules:

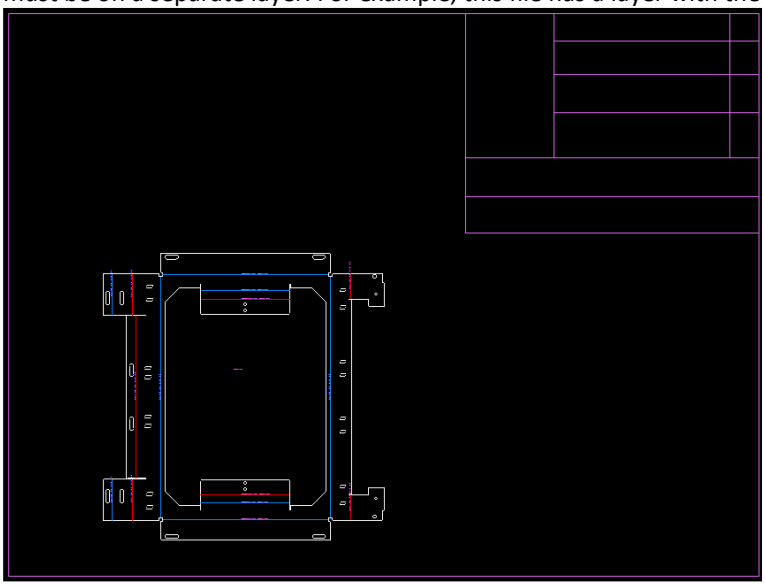
1. Must be a representation of the **flattened** part, not a profile or folded.
2. Must be divided into **layers**, where each layer contains an only one type of objects; the objects are:
    a. Part contour – outer contour, inner holes.
    b. Bend lines – can be bends with different angles on the same layer
3. Contour lines must be closed – no open geometries.
4. Each bend line must have a Text object positioned next to it, specifying its parameters.
5. The Text object must be very small and as close as possible to the centre of the bend line.
6. The bend parameters' format must be:
    a. **Bend angle** – can be in one of two formats, in CAPS or not:



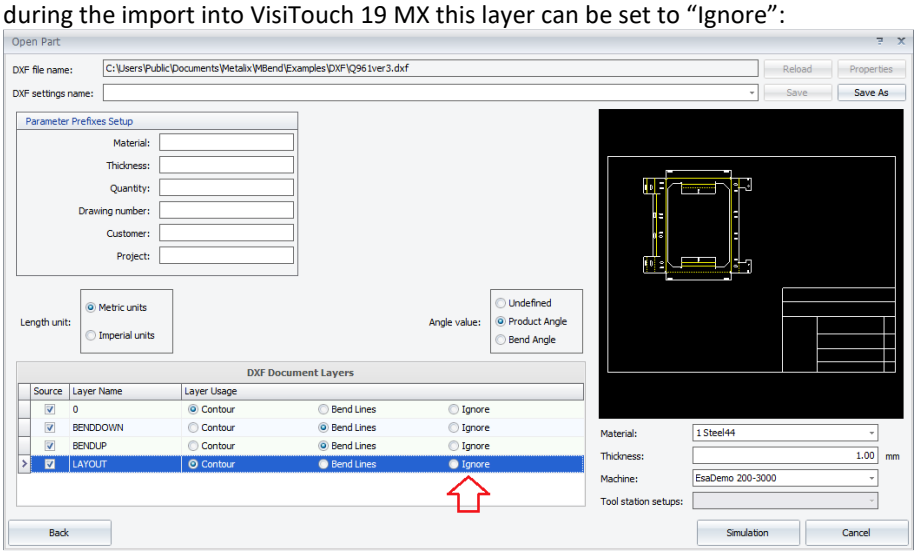
i. Product angle:
    1. Text format: **ap = <nn>**
    2. Example: **ap = 135**
ii. Bending angle:
    1. Text format: **ab = <nn>**
    2. Example: **ab = 45**

    b. **Bend radius**
    i. Text format: **R = <nn>**
    ii. Example: **R = 0.8**

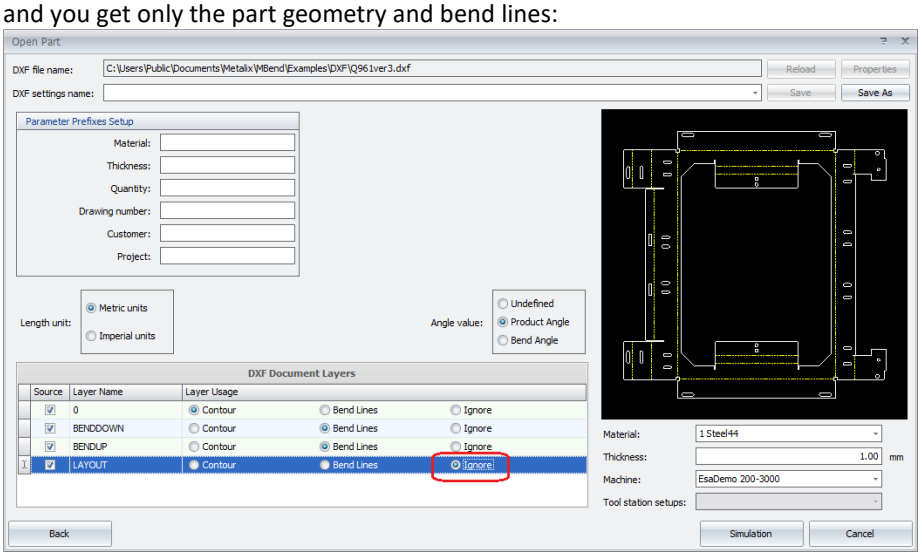
7. The file may include geometries that can be ignored during the import, but these must be on a separate layer. For example, this file has a layer with the sheet layout:



during the import into VisiTouch 19 MX this layer can be set to “Ignore”:

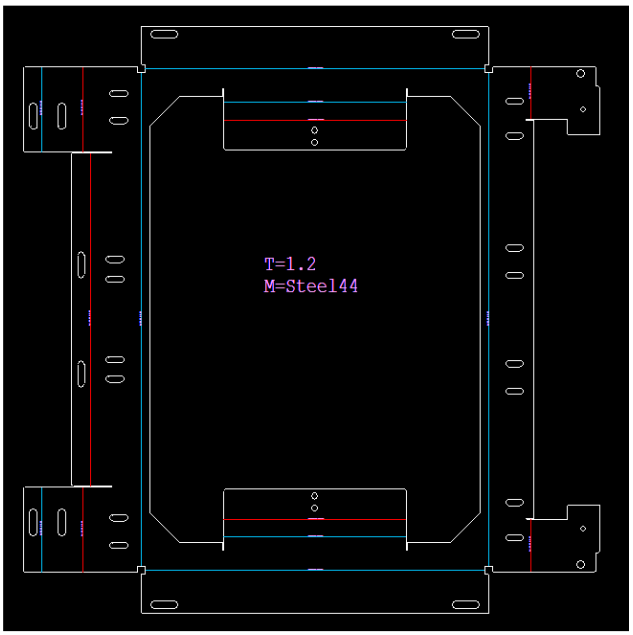


and you get only the part geometry and bend lines:

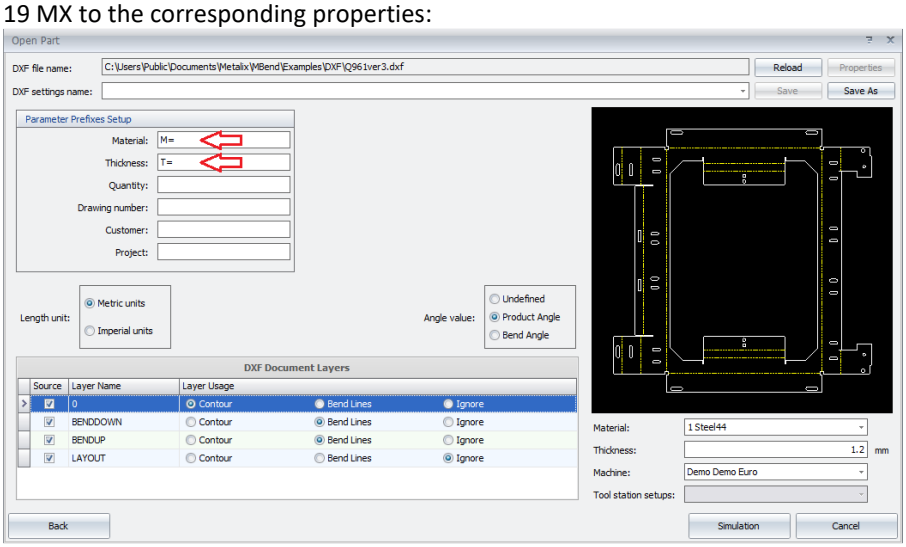


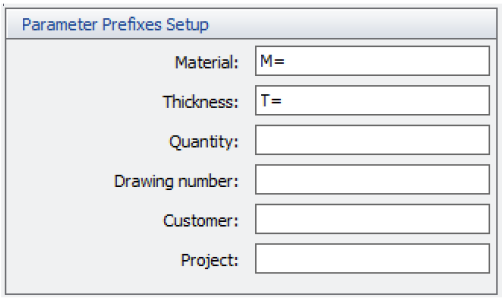
8. The file may include text objects that denote Thickness or Material, and these can then be read by VisiTouch 19 MX during the import. For example, the DXF may include **T = <thickness>** and **M = <Material>**:

9.



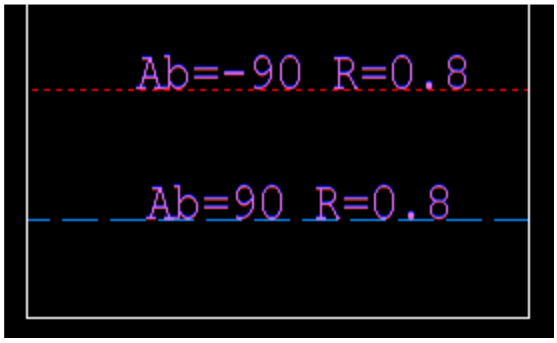
During the import these (and additional) designations can be mapped in VisiTouch 19 MX to the corresponding properties:





Examples of DXFs:

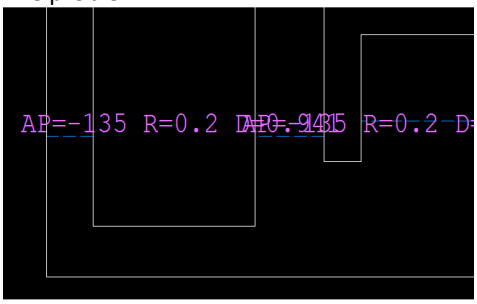
Good formatting:



Each bend line has a text object that clearly belongs to it.

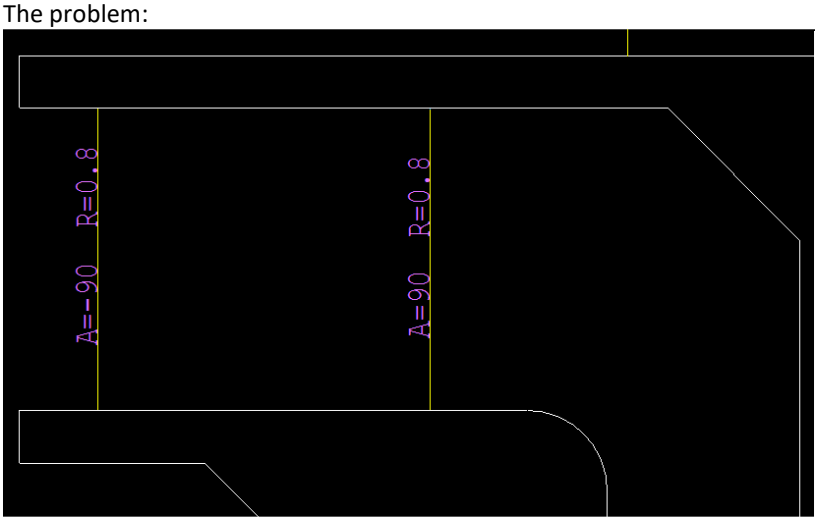
Bad formatting:

1. The problem:



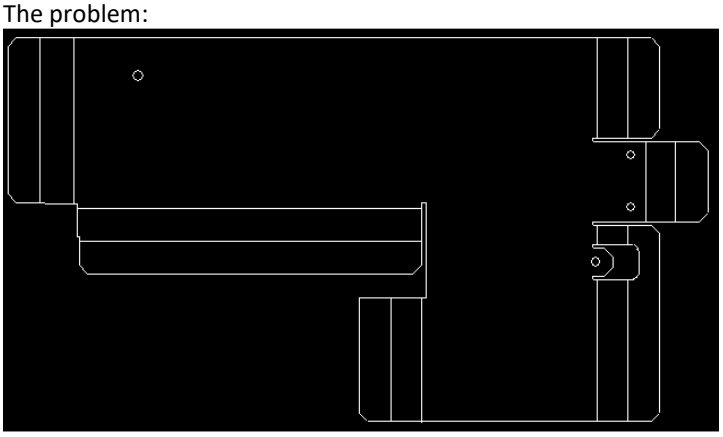
Texts from different bend lines overlap, making it unclear where they belong.

2. The problem:



The angles are given by "A=" instead of Ap= or Ab= (or AP, Ap, ap, etc.)

3. The problem:



No bend information, all lines are on the same layer.

RESOURCES

TUTORIALS - VIDEOS

Please subscribe to our YouTube channel to have our latest videos and tutorials.

https://www.youtube.com/channel/UCLBu-RxCGGf_epuHtMwoAcQ

Don’t forget to click on the ring bell button to stay in touch!

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Your feedback is very important for us in order to improve our equipment.

Please, let us know if you have any suggestion

Mail us to our support: support@cybelec.ch