3DXpert Guide

3DXpert for EOS

Tutorial_V1 - Updated: 13,0403,1487,1428(SP4P3)

3D SYSTEMS

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Introduction

This document explains the advantages of 3DXpert when working with EOS printers. This is also a technical guide explaining how to prepare (or setup) 3DXpert for use with EOS.

EOS is a leading vendor of metal printers, selling a large number of printers annually. The EOS software for 3D Printing is called EOSPRINT, and it is the only method to hatch part data and apply the relevant laser parameters on EOS printers.

In 2018, EOSPRINT is expected to run in the background (SDK) of the calling software such as Catia, NX or 3DXpert. You must still have a license for EOSPRINT in order to print on an EOS printer.

3DXpert does not yet have a direct interface to the EOSPRINT's SDK, but it can write data to the SLI format, which is the format used for both SLS and DMP machines.

Since EOS' SLS printers also use EOSPRINT in the same manner, 3DXpert can support those printers as well.

The 3DXpert Offering for EOS

1. 3DXpert is the most advanced and complete software solution for Additive Manufacturing and supports the following:
    a. Part preparation: positioning, supports, analysis, printability checks, tray management, etc.
    b. Printable lightweight and surface texture lattice structures.
    c. Integrated Build Simulation.
    d. Slicer for EOS.
2. 3DXpert optionally provides a solution and automation for the post processing workflow.
3. Unique offering:
    a. 3DXpert's advanced scan path strategies and multi-strategy approach as part of our 3D Zoning, are directly relevant for supports, and indirectly for the Part (described in detail below).
    b. Better use of wall supports with thickness for EOS.
    c. Optional hatching strategies for all support types.

3DXpert and 3D Printing Formats

3DXpert can work with all types of 3D direct metal (DMLS) printers.

It can output both **direct** and **indirect** interfaces to the different printers on the market.

The **indirect** format allows the user to export mesh data (STL type formats) or slicing data (CLI contour data) of the prepared geometry, while the **direct** format includes also the specific strategy with all hatching and laser parameter data in the machine specific format.

The **indirect** format contains the geometrical boundaries or alternatively, the slicing information for the geometry that it represents. It can also describe if the slicing motions belong to the up, down or middle facing areas of the model. This information can be used later on to define the required hatching and laser parameter values. Each printer vendor usually provides software that can load this data and then apply the hatching and laser parameters to this input.

The **direct** format includes all the relevant scan path information, including the laser parameters, which are attached to the specific scanning motions. This output can either be an external binary file or an ASCII (text format) file that the printer or the vendor software can directly read.

The output to EOS is a combination of the direct and indirect solutions. 3DXpert calculates the slicing information for the part and EOSPRINT will 'do' the hatching.

However, 3DXpert is fully capable of outputting the scan path for the supports' geometry, including hatching to an EOS direct format – an SLI file (SLI stands for Slice Layer Interface).

EOSPRINT can read the SLI file that 3DXpert writes. The laser parameters are then attached to the scan path within EOSPRINT.

EOS and 3D Zoning

3DXpert introduces a unique '**3D Zoning**' capability. This capability allows the user to set different scanning strategies for different volumes of the part.

This enables the use of different strategies for different geometries of the part. For example, thin walls require a different strategy than a full core solid, etc…Strategies may include different laser parameters, or different hatch strategies, or even different layer thickness values (to save on machining time).

This unique feature makes 3DXpert a powerful addition to EOS, as 3DXpert creates a dedicated SLI file (starting with 3DXpert 13.0 SP4) for each of the technologies and objects defined for the part.

Users should then be able to map these SLI files using the EOS software (EOSPRINT) and assign each printing technology (such as thin walls vs. thick solid) to the equivalent technology defined within the EOS software.

The described process is fully automatic starting from 3DXpert 13.0 SP5, including the calculation of the required overlaps and bricking in each layer and between the layers as required from the user control.
(With prior versions, the user is required to define the overlap and bricking between the volumes manually, before the slicing.)

The following sections of this document describe how to best configure 3DXpert for EOS and export the data and output to the SLI format.

Notes on 3DXpert Licensing

It is recommended that you get a dedicated 3DXpert license for EOS Printers.

If you do not have this 3DXpert license for EOS, you can still create your own, 'private' printer (and/or material) and export the slicing data as a CLI format (standard text format). This includes only the slicing (outer contours) data.

However, the license for EOS printers enables you to export the data directly in the EOS SLI format, thus gaining the additional advantages, which are described in this document.

Also, note that if you purchased the dedicated 3DXpert developer module for '3DX Slicer Parameter Write', you can edit and save build styles directly. In other words, you can directly open the EOS build style, edit its parameters and save it again with your own settings.

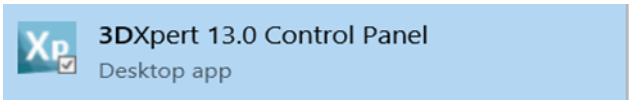
If you do not have this specific module in your license for 3DXpert, then work according to the method described in this document.

Installing the Materials Database for EOS

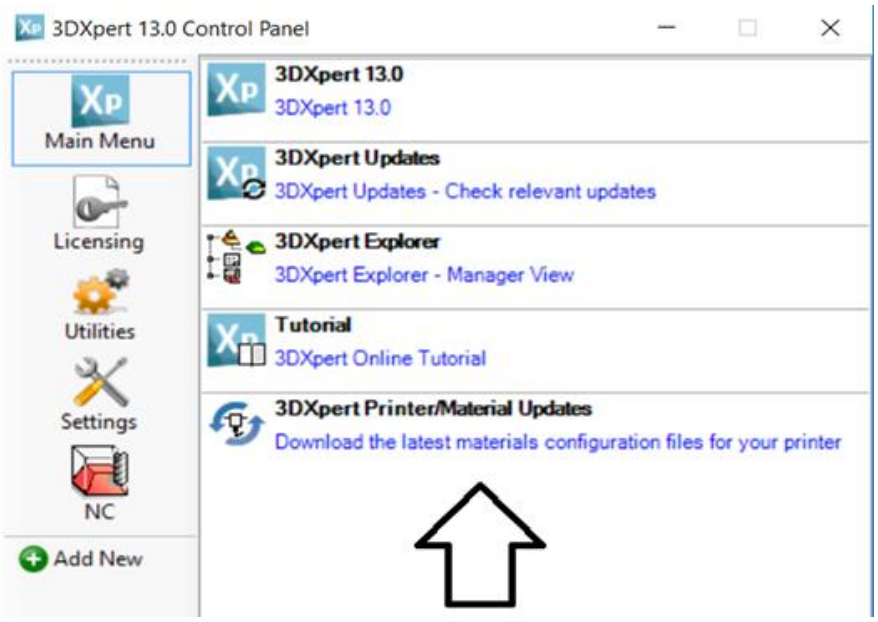
Creating a 3D Printing project in 3DXpert requires the definition of the printer and the specific material (metal powder) as mandatory first steps of the project. The printer and materials are defined by a set of files, a database, which includes the exact technology parameters for each different printer and material.

The first step is to download the EOS printer and the specific material from the 3D Systems online web server.

1. Launch the 3DXpert Control Panel.

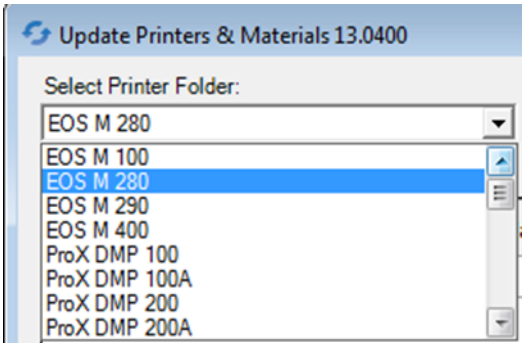


2. From the Main Menu press **3DXpert Printer/Material Updates**.



First download the printer and after that the relevant materials for this printer.

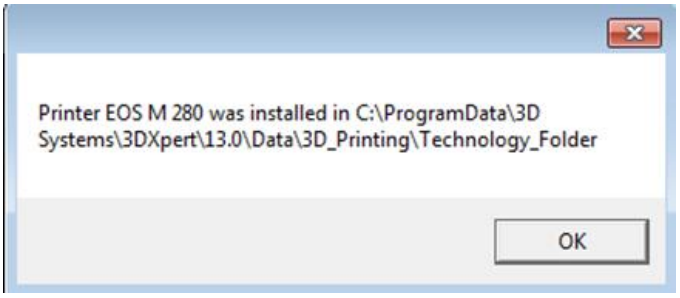
3. Select your EOS printer from the list of available printers:



Note that this list displays all the printers you can download, based on your 3DXpert license.

4. Selecting the printer to download, notice the single line appearing in the table – this line represents the Printer itself. Press the **Download** button:

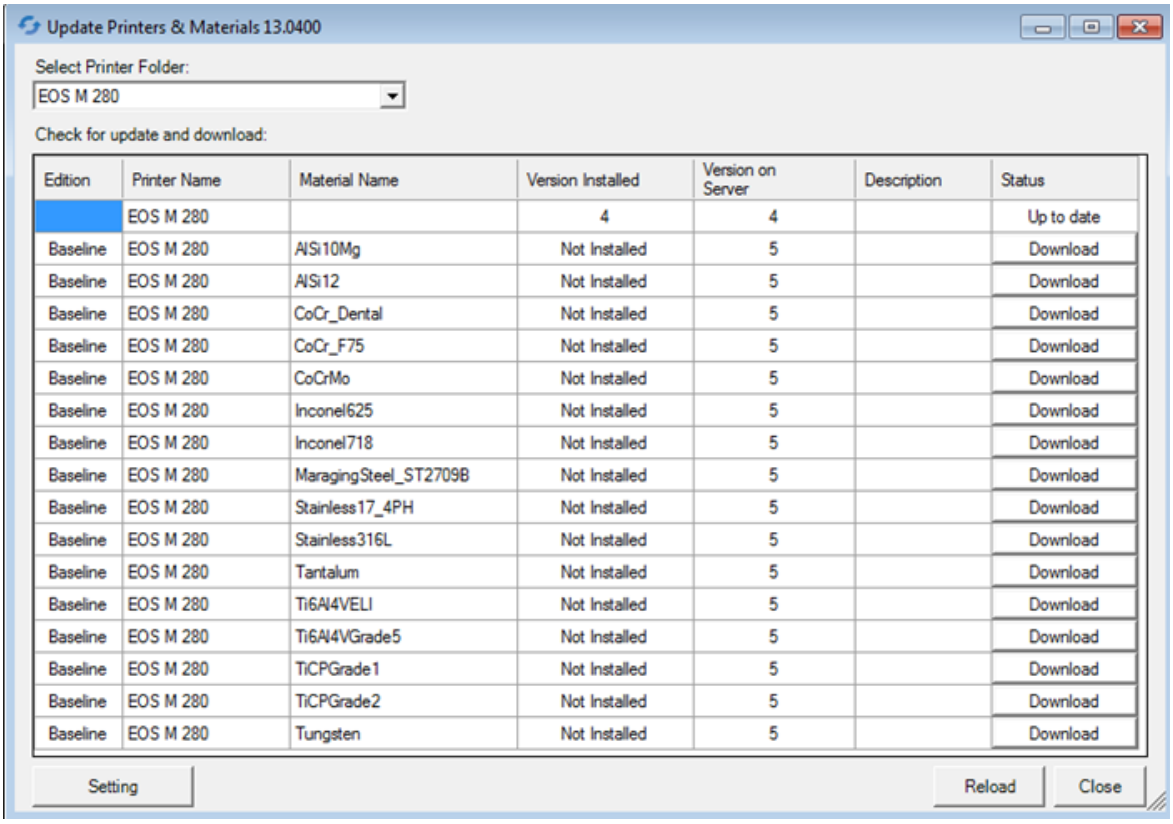
This creates the Printer folder on your 3DXpert installation.



In addition, the table is populated with the material database for EOS.

Now that you have downloaded the printer, you can start downloading the materials for it.

5. Press the **Download** button alongside the material(s) that you wish to use:

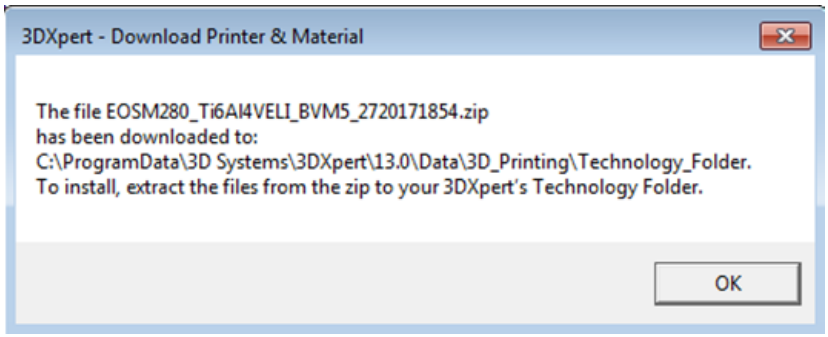


This downloads the material configuration files on your PC.

The default printer folder on your PC is located in the installation folder:

C:\ProgramData\3D Systems\3DXpert\13.0\Data\3D_Printing\Technology_Folder\<Printer Name>

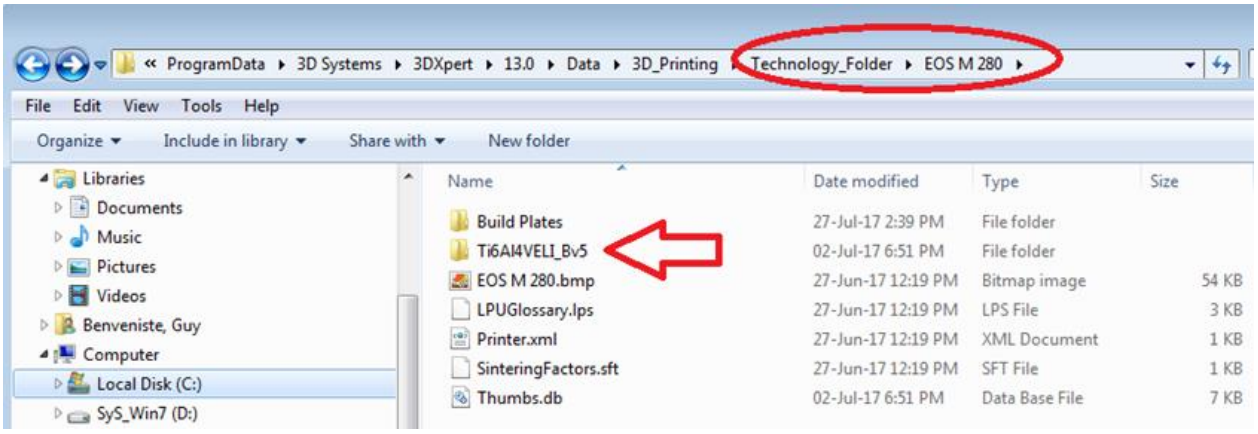
The files are zipped.



6. To install the material, extract the files and folder from the zip file into the EOS printer folder.

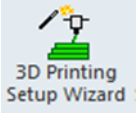
   Make sure that the extracted files keep the structure as in the zip file.

Here is how the installed material should look like.



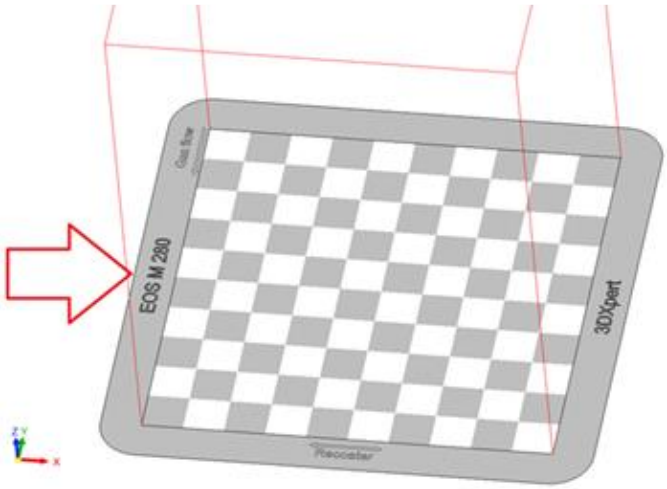
Creating a 3D Printing Project for EOS

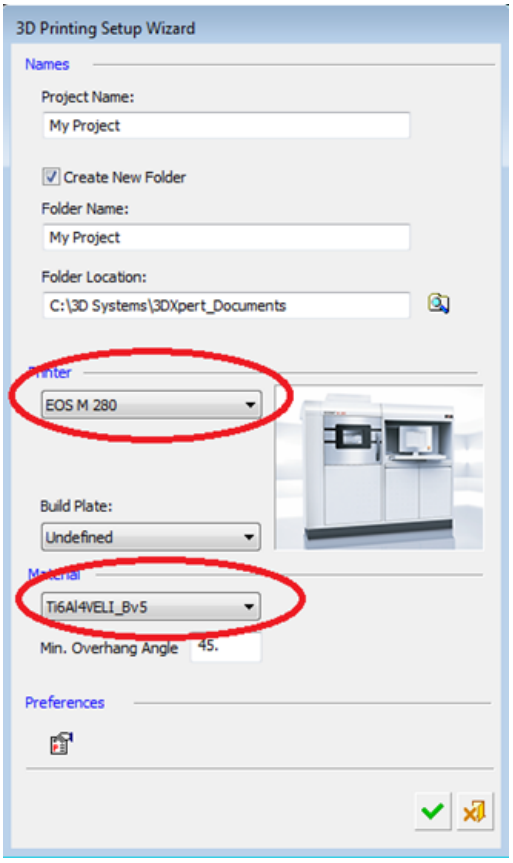
1. Create a new 3D Printing project.



2. In the 3D Printing Setup Wizard, select the EOS printer and material. The list of materials includes the materials which are installed under the printer folder. See the image below, right.
3. Press OK.

   3DXpert now opens up the project and creates the tray of the printer, based on the data defined in the Setup Wizard.





4. Next, load your component and prepare it for printing.
5. Position the part, create regions and add supports. Set the printing technologies for the part and supports.

Slicing for EOS

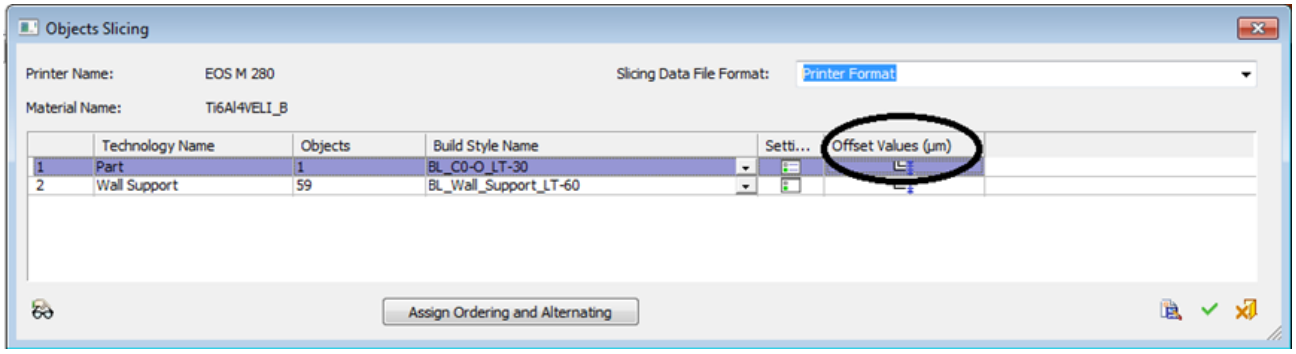
As noted above, 3DXpert creates SLI files that the EOS software can read.

The SLI files contain the following data:

- For each technology, except Wall Supports (i.e., for Part, Part Rough, Lattice, Solid Support etc.), the slicing data includes the boundaries of the relevant object. This boundary contour is also called C0, or outer contour.
- For Wall Supports, slicing creates hatching motions.

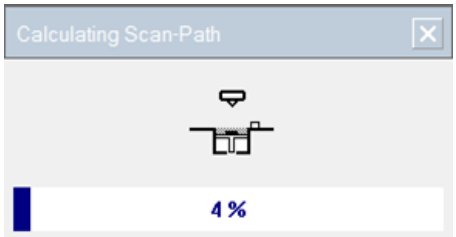
Enter **Calculate Slicing** to create the scan path. If you wish to keep the default offsets, just click the OK button to calculate.

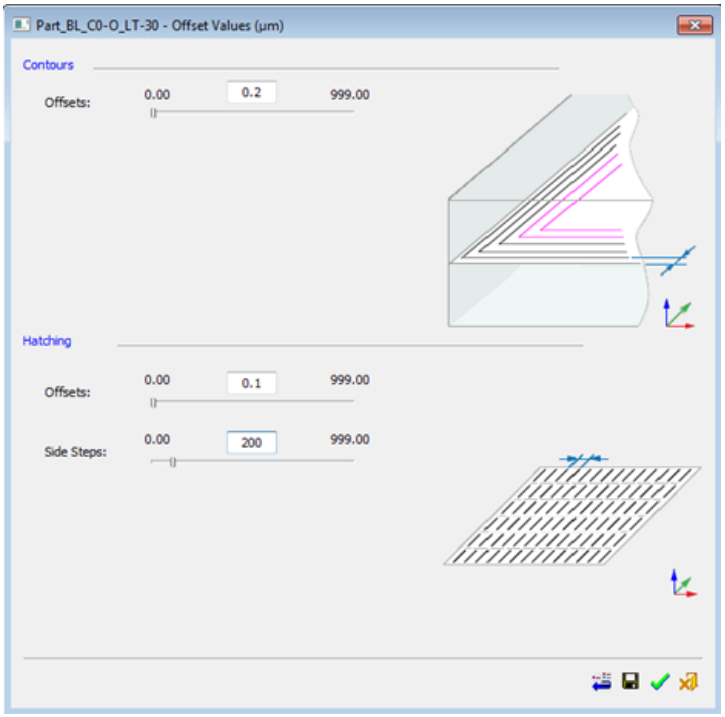
If you wish, you can set the offsets for the boundary and hatching for each of the technologies. Press the **Offset Values** button along the Technology Name that you wish to set.



Set the offset for C0 (boundary) or the offset and side step for hatching (remember that the hatching is relevant for wall supports).

When done press OK to close the Offsets dialog and press OK to calculate slicing.





Output to EOS

After calculation is complete, you can output the data to EOS.

Press the **Send to Print** button and OK.

This creates the output files in SLI format.

Each technology results in its own SLI file. 3DXpert creates a SLI file for each technology.

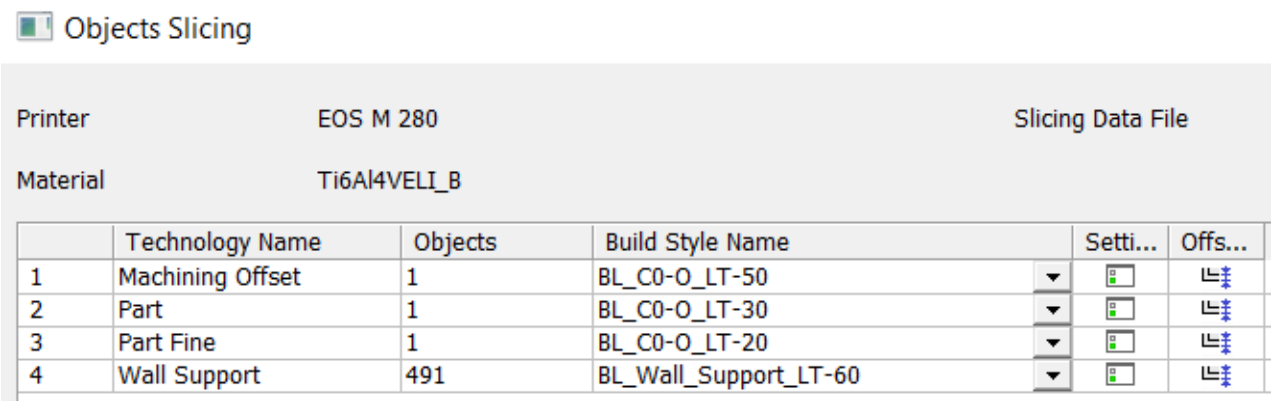
The SLI file name has the following format:

<Project_Name>_-_<Part_Name>_<Technology Name>_<Build Style Name>.sli

Remember that 3DXpert includes the unique **3D Zoning** capability. You can therefore set different technologies (scan path strategies) to different volumes of the part, without dividing the part into separate objects.

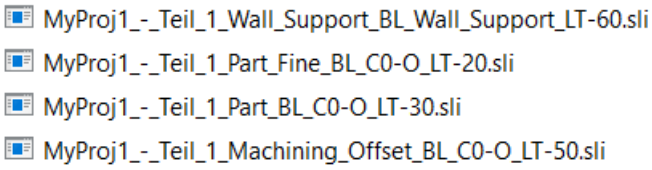
Each technology is translated for output to its own SLI file.

In the following example, the part is sliced with four technologies; three different part technologies (Part, Part Fine & Machining Offset) and one Support technology (Wall Support):



	Technology Name	Objects	Build Style Name	Setti...	Offs...
1	Machining Offset	1	BL_C0-O_LT-50		
2	Part	1	BL_C0-O_LT-30		
3	Part Fine	1	BL_C0-O_LT-20		
4	Wall Support	491	BL_Wall_Support_LT-60		

After slicing and Send to Print, the following SLI files are created:



The next step is to read each SLI file into the EOS software and assign (map) it accordingly.

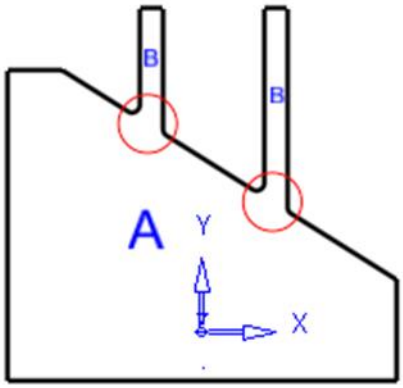
Until full automation is applied (in 3DXpert 13.0 SP5), it is the user's responsibility to define the overlaps and bricking split behavior between the different volumes.

3D Zoning Example

Suppose that as a 3DXpert user, you are required to work with two different printing strategies within a part. This approach has a major advantage as it is used to optimize the quality of the printed part, save printing time and ensure that its internal structure passes the necessary Quality Control verifications on each print.

To achieve all that, you may define two different printing strategies, illustrated for simplicity in the example shown below.

Assume that the part is positioned for printing as follows:



A = Solid very thick Part

B = Solid thin Part

Red area = a place that if not treated correctly by overlapping and bricking, will disqualify the printed part.

In order to define two different printing strategies within EOSPRINT, you have to split the part into three different objects. This also means that the three objects will be sliced separately, each with its own different strategy.

As a result, the volume marked above in red may not be printed properly from a metallurgy point of view, creating a weak merging area of technologies or even cracks, since this is where the different printing technologies meet.

Therefore, it seems that the only way to print this part is by a single strategy.

However, if we could export a set of contours to EOSPRINT (to define different zones in the part) and ‘tell’ EOSPRINT what to do with them (define different scanning strategies for each zone), the part could be kept as a single object, with different printing technologies for each zone. These contours should be automatically created with proper overlapping and bricking, and the resulting files should define which strategy is required or what type of geometry it is. This way, the right hatching technology can be applied in EOSPRINT.

With 3DXpert’s 3D Zoning, such a task is now easily attainable.

In 3DXpert you perform this by defining the different printing zones, with each one assigned the relevant 3D Printing technology.

Handling Wall Supports

General

When it comes to the printing of Wall Supports on EOS printers, 3DXpert offers a major advantage.

The width of a wall support is defined by the number of scan path motions (hatching) and in addition, it is dictated by the melt pool width.

3DXpert eliminates the need to set the widths for supports via EOSPRINT. Once the technologies are defined (this is done once), set the width of the support through the Wall Support creation dialog and assign the matching technology to the wall support.

This process is explained in detail below.

Setting up Wall Supports

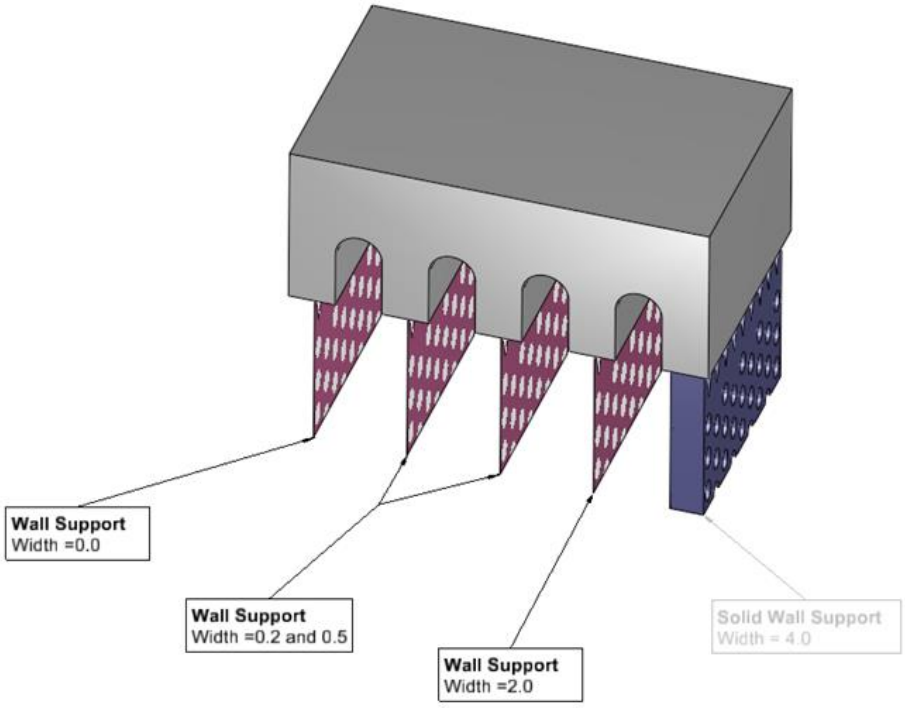
There are various parameters controlling wall support creation in 3DXpert.

One of them is the wall support thickness.

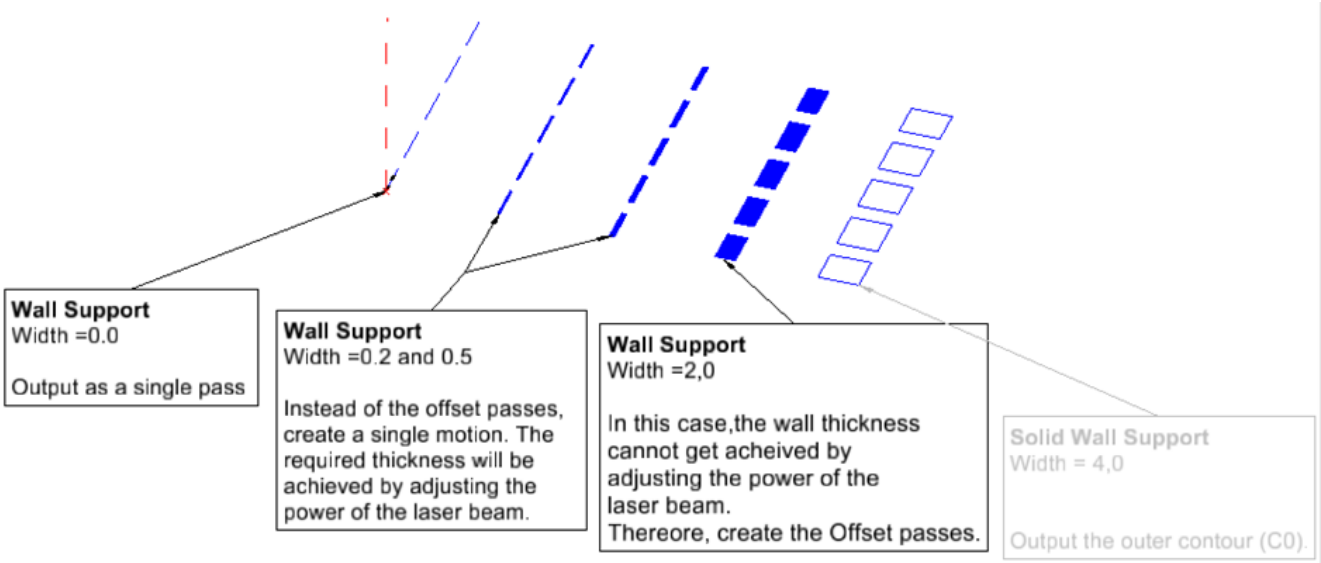
The first rule is that if you enter a wall thickness value of zero, this means that the system will create a single slicing motion along the wall's centerline.

If the thickness is greater than zero, then the slicer will produce parallel offset motions (hatching) until the defined thickness is reached. The number of offset motions is dictated by the defined thickness value and the lateral offset value (i.e., the melt pool width) set for the wall support hatching technology.

Consider the following example. This part is supported by walls with varying thicknesses. Note the different wall thicknesses (and solid wall support, only to complete the picture):



The following image shows the ‘default’ scan path result for EOS.



Notice that each wall has a different scan path thickness, but the strategy is the same (i.e., all thicknesses that are greater than zero, are created by offsets or hatching).

Now look at the labels attached to each wall support. The labels describe what we really wish to have (as an example) for each of the different thicknesses.

SLI and Technology

Before continuing with the settings, we should consider the following.

Currently, after slicing and Send to Print, an SLI file is output per each technology.

Therefore, by default, a single SLI file is output for all the wall supports created within the 3DP project, even if these wall supports have different thicknesses.

As a result, it will also not be possible to differentiate between wall supports with different thicknesses in EOSPRINT.

Furthermore, there is no way to know whether a wall is set with a zero thickness (one scanning motion), a small thickness (which may be printed on its centerline) or a larger thickness (which can only be printed by offsets).

In addition, we wish to distinguish between the different wall thicknesses already in the 3D Printing project (to know that these have to be considered when sending the data to EOSPRINT).

Therefore, in order to output a separate SLI file for each thickness, we want to assign a separate technology to each wall support that has its own thickness definition.

This has the additional advantage that it will be easier to recognize each different thickness already in the 3DP project tree.

Defining Wall Supports

This procedure can be performed on any 3DXpert project with wall supports.

Step 1 and **Step 2** below explain how to set up your 3DXpert project according to your requirements; this is usually done only once. **Step 3** explains how to apply the settings on any 3DXpert project.

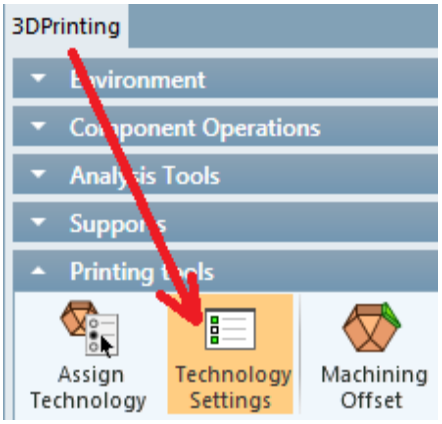
Note: The 3DXpert configuration files for EOS are supplied for various materials.

At present (3DXpert 13.0) the file **TechnologyList.xml** is the same one for all EOS printers and materials. Therefore, the procedure described in this document can be carried out only for one of the materials.

After you finish setting up the database for one material, you can copy it into the relevant folders of the other EOS printers and materials.

Step 1: Manage Technology Settings

1. Open a 3DP project that is set for an EOS printer and a corresponding material that contains a Wall Support.
2. Enter the **3D Printing** menu and click **Technology Settings**.

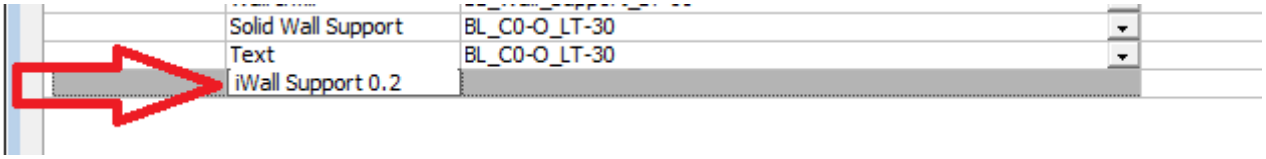


3. Define a new technology for each different thickness of the wall support (to which a separate SLI file will be created), in order for it to be handled separately in EOSPRINT.

   In this guide (and example), we assume that:

   a. For wall supports with a thickness of 0.2 and 0.5 mm, we need only the output of a single (mid) path (and again, control the actual thickness by means of the corresponding technology selection in EOSPRINT).
   b. For thicker wall supports (for example, 2mm), the offset lanes should be generated as set by default. In order to be able to distinguish this thicker wall support from a wall support with a thickness of '0' (and get two separate SLI files), we need to define a new technology designed for the thicker wall support.

4. In the last line, click the cell **<New Technology>** and enter the following 3 new technologies (3 times, each one with a different text, as follows):



   a. Wall Support 0.2
   b. Wall Support 0.5
   c. Wall Support > 2

7	Part Fine	BL_C0-O_LT-30
8	Wall Support 0.2	<None>
9	Wall Support 0.5	<None>
10	Wall Support > 2	<None>
	Skirt Support	BL_C0-O_LT-30

5. Assign the build style "BL_C0-O_LT-60" to the first two technologies (0.2 and 0.5).

   This build style is one of the default build styles supplied for EOS.

   Note: This build style is defined in such a way that it only outputs the contour curve (or C0) regardless of the wall thickness.

6. For the third technology, use the build style "BL_Wall_Support_LT-60", which also calculates the offset paths at thicknesses > 0.

7	Part Fine	BL_C0-O_LT-30
8	Wall Support 0.2	BL_C0-O_LT-60
9	Wall Support 0.5	BL_C0-O_LT-60
10	Wall Support > 2	BL_Wall_Support_LT-60
	Skirt Support	BL_C0-O_LT-30

7. Press the **Save** button (this also closes the Technology Settings tool).

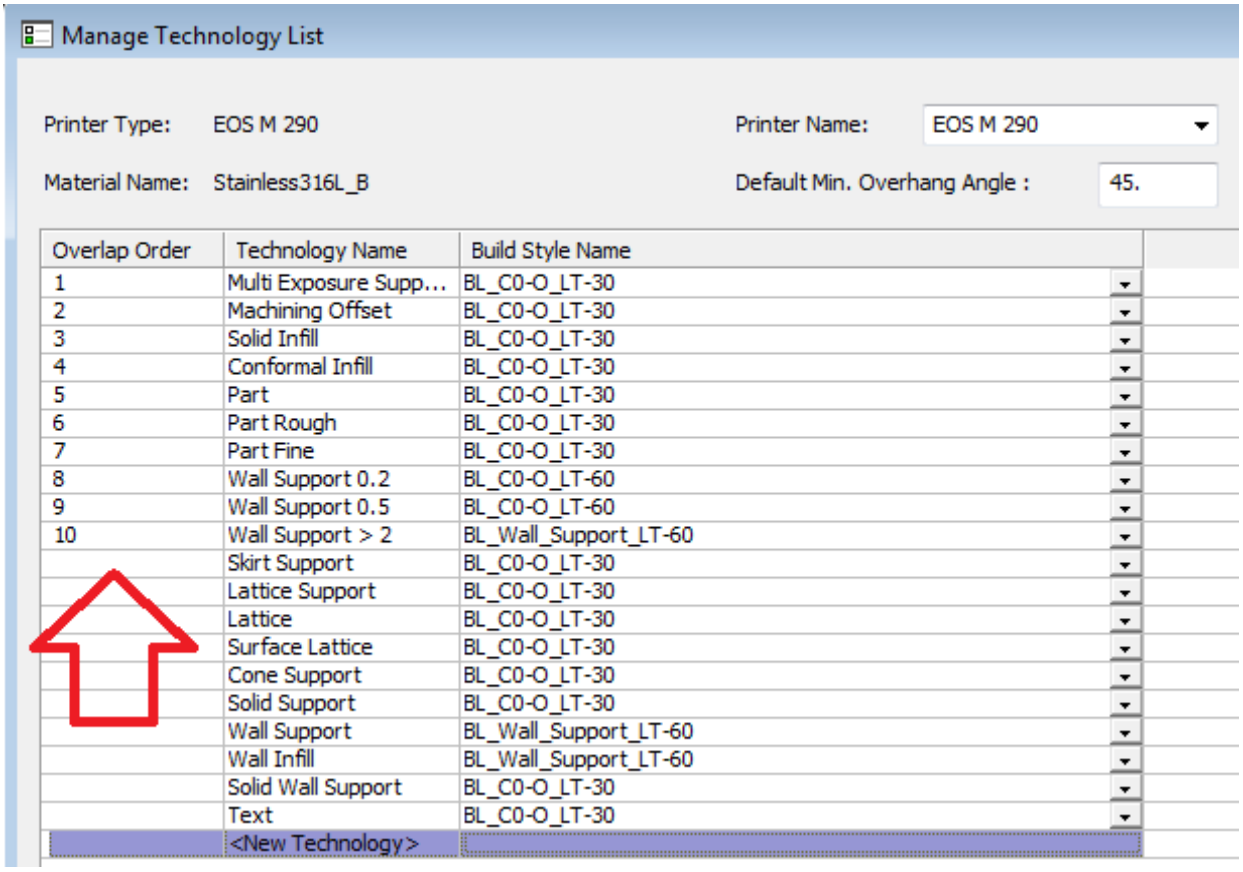
Step 2: Manage Technology List

As you may have noticed, the three new technologies which you have added are listed at about the middle of the table, and cannot be moved further down to be close to the 'Wall Support' technology.

This is because, as of now, you can only add technologies that are regarded as Part technologies and not for supports. This order (the order of the lines) is not important for this wall support definition.

However, this order does affect the overlap order (the overlap of the order is displayed in the left column), therefore make sure that the new technologies are not Part technologies, but rather are technologies for Wall Supports.

The arrow in the following image indicates the overlap order:



Overlap Order	Technology Name	Build Style Name
1	Multi Exposure Supp...	BL_C0-O_LT-30
2	Machining Offset	BL_C0-O_LT-30
3	Solid Infill	BL_C0-O_LT-30
4	Conformal Infill	BL_C0-O_LT-30
5	Part	BL_C0-O_LT-30
6	Part Rough	BL_C0-O_LT-30
7	Part Fine	BL_C0-O_LT-30
8	Wall Support 0.2	BL_C0-O_LT-60
9	Wall Support 0.5	BL_C0-O_LT-60
10	Wall Support > 2	BL_Wall_Support_LT-60
	Skirt Support	BL_C0-O_LT-30
	Lattice Support	BL_C0-O_LT-30
	Lattice	BL_C0-O_LT-30
	Surface Lattice	BL_C0-O_LT-30
	Cone Support	BL_C0-O_LT-30
	Solid Support	BL_C0-O_LT-30
	Wall Support	BL_Wall_Support_LT-60
	Wall Infill	BL_Wall_Support_LT-60
	Solid Wall Support	BL_C0-O_LT-30
	Text	BL_C0-O_LT-30
	<New Technology>	

The following steps describe how to manually edit the technology list of this material.

1. Open Windows Explorer and browse to the folder where the currently used material and printer are defined (i.e. those used in the project you are using to edit the material).

   In our example, we use the printer EOS M290 and the material Stainless316L_B which is located in the following folder:
   C:\ProgramData\3D Systems\3DXpert\13.0\Data\3D_Printing\Technology_Folder\EOS M 290\Stainless316L_B

2. Double-click the file **TechnologyList.xml** and note that Wall support technologies are set with '0' as their SubType.

```
  <?xml version="1.0" encoding="UTF-8"?>
- <Technology_List>
    <TechPair Code="21" SubType="0" TranslatedTechnology="Multi Exposure Sup
    <TechPair Code="3" SubType="0" TranslatedTechnology="Machining Offset" Te
    <TechPair Code="5" SubType="0" TranslatedTechnology="Solid Infill" Technolog
    <TechPair Code="6" SubType="0" TranslatedTechnology="Conformal Infill" Tec
    <TechPair Code="0" SubType="0" TranslatedTechnology="Part" Technology="Pa
    <TechPair Code="2" SubType="0" TranslatedTechnology="Part Rough" Technolo
    <TechPair Code="1" SubType="0" TranslatedTechnology="Part Fine" Technology
    <TechPair Code="8" SubType="0" TranslatedTechnology="Wall Support 0,2" Te
    <TechPair Code="9" SubType="0" TranslatedTechnology="Wall Support 0,5" Te
    <TechPair Code="10" SubType="0" TranslatedTechnology="Wall Support > 2" T
    <TechPair Code="15" SubType="3" TranslatedTechnology="Skirt Support" Techn
    <TechPair Code="13" SubType="3" TranslatedTechnology="Lattice Support" Te
    <TechPair Code="4" SubType="2" TranslatedTechnology="Lattice" Technology="
    <TechPair Code="7" SubType="2" TranslatedTechnology="Surface Lattice" Tech
    <TechPair Code="14" SubType="3" TranslatedTechnology="Cone Support" Tech
    <TechPair Code="11" SubType="3" TranslatedTechnology="Solid Support" Tech
    <TechPair Code="12" SubType="3" TranslatedTechnology="Wall Support" Techr
    <TechPair Code="17" SubType="3" TranslatedTechnology="Wall Infill" Technolo
    <TechPair Code="16" SubType="3" TranslatedTechnology="Solid Wall Support"
    <TechPair Code="31" SubType="4" TranslatedTechnology="Text" Technology="T
    <Angle AngleValue="45"/>
  </Technology_List>
```

3. We will therefore need to edit this XML file. Close Internet Explorer.

   When opening this file in a regular text editor, such as Notepad, notice that its representation is different. The formatting is correct, however, it does not allow for easy editing. You can correct the representation by opening the file in any XML Editor and saving it without any modification. You can download Microsoft's XML Notepad here: https://www.microsoft.com/en-us/download/details.aspx?id=7973

4. Now reopen the XML file with Notepad or any other text editor.

```
TechnologyList.xml - Editor
Datei  Bearbeiten  Format  Ansicht  ?
<?xml version="1.0" encoding="utf-8"?>
<Technology_List>
  <TechPair BuildStyle="BL_CO-O_LT-30" Technology="Multi Exposure Support" TranslatedTechnology="Multi Exposure Support" SubType="0" Code="21" />
  <TechPair BuildStyle="BL_CO-O_LT-30" Technology="Machining Offset" TranslatedTechnology="Machining Offset" SubType="0" Code="3" />
  <TechPair BuildStyle="BL_CO-O_LT-30" Technology="Solid Infill" TranslatedTechnology="Solid Infill" SubType="0" Code="5" />
  <TechPair BuildStyle="BL_CO-O_LT-30" Technology="Conformal Infill" TranslatedTechnology="Conformal Infill" SubType="0" Code="6" />
  <TechPair BuildStyle="BL_CO-O_LT-30" Technology="Part" TranslatedTechnology="Part" SubType="0" Code="0" />
  <TechPair BuildStyle="BL_CO-O_LT-30" Technology="Part Rough" TranslatedTechnology="Part Rough" SubType="0" Code="2" />
  <TechPair BuildStyle="BL_CO-O_LT-30" Technology="Part Fine" TranslatedTechnology="Part Fine" SubType="0" Code="1" />
  <TechPair BuildStyle="BL_Wall_Support_LT-60_SinglePath" Technology="Wall Support 0,2" TranslatedTechnology="Wall Support 0,2" SubType="0" Code="8" />
  <TechPair BuildStyle="BL_Wall_Support_LT-60_SinglePath" Technology="Wall Support 0,5" TranslatedTechnology="Wall Support 0,5" SubType="0" Code="9" />
  <TechPair BuildStyle="BL_Wall_Support_LT-60" Technology="Wall Support &gt; 2" TranslatedTechnology="Wall Support &gt; 2" SubType="0" Code="10" />
  <TechPair BuildStyle="BL_CO-O_LT-30" Technology="Skirt Support" TranslatedTechnology="Skirt Support" SubType="3" Code="15" />
  <TechPair BuildStyle="BL_CO-O_LT-30" Technology="Lattice Support" TranslatedTechnology="Lattice Support" SubType="3" Code="13" />
  <TechPair BuildStyle="BL_CO-O_LT-30" Technology="Lattice" TranslatedTechnology="Lattice" SubType="2" Code="4" />
  <TechPair BuildStyle="BL_CO-O_LT-30" Technology="Surface Lattice" TranslatedTechnology="Surface Lattice" SubType="2" Code="7" />
  <TechPair BuildStyle="BL_CO-O_LT-30" Technology="Cone Support" TranslatedTechnology="Cone Support" SubType="3" Code="14" />
  <TechPair BuildStyle="BL_CO-O_LT-30" Technology="Solid Support" TranslatedTechnology="Solid Support" SubType="3" Code="11" />
  <TechPair BuildStyle="BL_Wall_Support_LT-60" Technology="Wall Support" TranslatedTechnology="Wall Support" SubType="3" Code="12" />
  <TechPair BuildStyle="BL_Wall_Support_LT-60" Technology="Wall Infill" TranslatedTechnology="Wall Infill" SubType="3" Code="17" />
  <TechPair BuildStyle="BL_CO-O_LT-30" Technology="Solid Wall Support" TranslatedTechnology="Solid Wall Support" SubType="3" Code="16" />
  <TechPair BuildStyle="BL_CO-O_LT-30" Technology="Text" TranslatedTechnology="Text" SubType="4" Code="31" />
  <Angle AngleValue="45" />
</Technology_List>
```

In the three added technologies, change the value "SubType ="0" to “3” (rows highlighted in blue above):

```
"Wall Support 0.2" SubType="3" Code="8" />
"Wall Support 0.5" SubType="3" Code="9" />
gy="Wall Support &gt; 2" SubType="3" Code="10" />
```

At this stage, as we are already here, we can move the new technologies below the existing technology "Wall Support" (this has no real affect other than for clarity and is also considered later when you assign or edit these technologies).

Cut the three new lines and re-insert them under the line that contains the standard "Wall Support" (marked in blue).

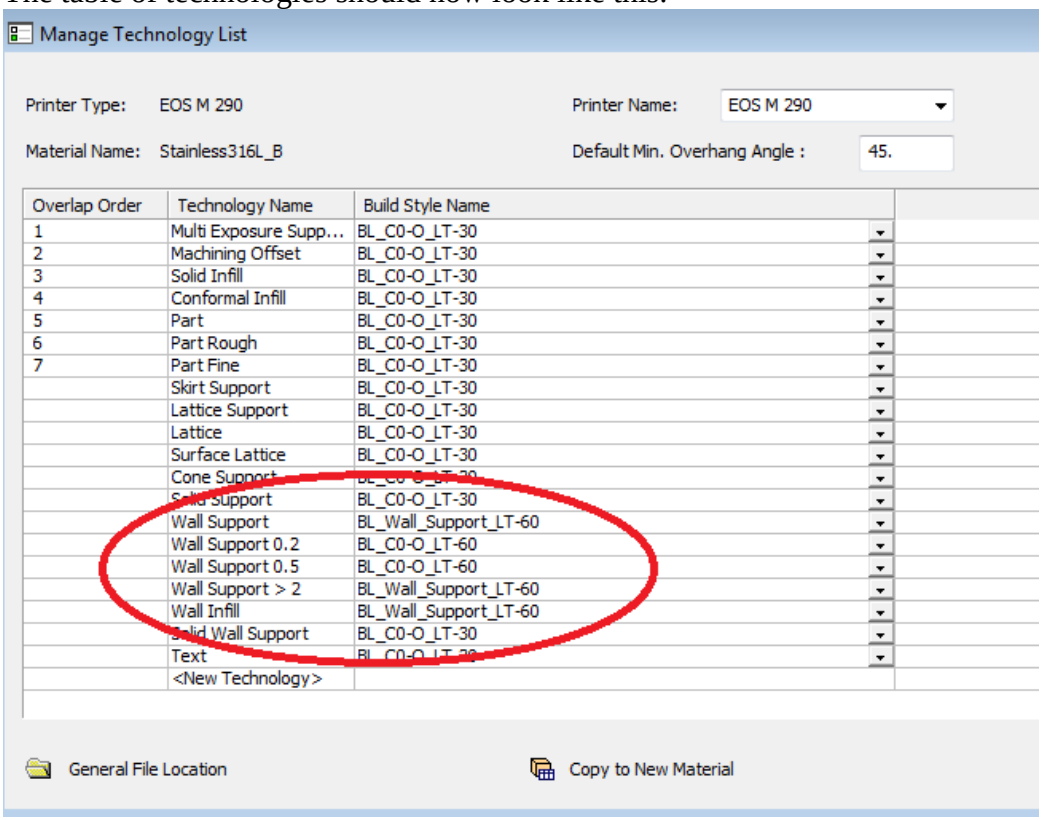
```
TechnologyList.xml - Editor
Datei  Bearbeiten  Format  Ansich
<?xml version="1.0" encod
<Technology_List>
  <TechPair BuildStyle="B'    rt" TranslatedTechnology="Multi Exposure Support" SubType="0" Code="21" />
  <TechPair BuildStyle="I     ranslatedTechnology="Machining Offset" SubType="0" Code="3" />
  <TechPair BuildStyle='    slatedTechnology="Solid Infill" SubType="0" Code="5" />
  <TechPair BuildStyle=     TranslatedTechnology="Conformal Infill" SubType="0" Code="6" />
  <TechPair BuildStyle=   Technology="Part" SubType="0" Code="0" />
  <TechPair BuildStyle=   nslatedTechnology="Part Rough" SubType="0" Code="2" />
  <TechPair BuildStyle=   slatedTechnology="Part Fine" SubType="0" Code="1" />
  <TechPair BuildStyle=   TranslatedTechnology="Skirt Support" SubType="3" Code="15" />
  <TechPair BuildStyle    ' TranslatedTechnology="Lattice Support" SubType="3" Code="13" />
  <TechPair BuildStyle    tedTechnology="Lattice" SubType="2" Code="4" />
  <TechPair BuildStyle=    TranslatedTechnology="Surface Lattice" SubType="2" Code="7" />
  <TechPair BuildStyle=    nslatedTechnology="Cone Support" SubType="3" Code="14" />
  <TechPair BuildStyle=",  anslatedTechnology="Solid Support" SubType="3" Code="11" />
  <TechPair BuildStyle="B  rt" TranslatedTechnology="Wall Support" SubType="3" Code="12" />
  <TechPair BuildStyle="B   all Support 0,2" TranslatedTechnology="Wall Support 0,2" SubType="3" Code="8" />
  <TechPair BuildStyle="B,   ll Support 0,5" TranslatedTechnology="Wall Support 0,5" SubType="3" Code="9" />
  <TechPair BuildStyle="B    &gt; 2" TranslatedTechnology="Wall Support &gt; 2" SubType="3" Code="10" />
  <TechPair BuildStyle="B    TranslatedTechnology="Wall Infill" SubType="3" Code="17" />
  <TechPair BuildStyle="B    ranslatedTechnology="Solid Wall Support" SubType="3" Code="16" />
  <TechPair BuildStyle="B    ology="Text" SubType="4" Code="31" />
  <Angle AngleValue="45" /
</Technology_List>
```

Finally, change the Code values from 8, 9, and 10 to (for example) 25, 26, and 27.

Save and close the XML file.

5. To see the changes in the Technology List, close the 3DP Project and load it again, then launch the Technology Settings dialog.

   The table of technologies should now look like this:

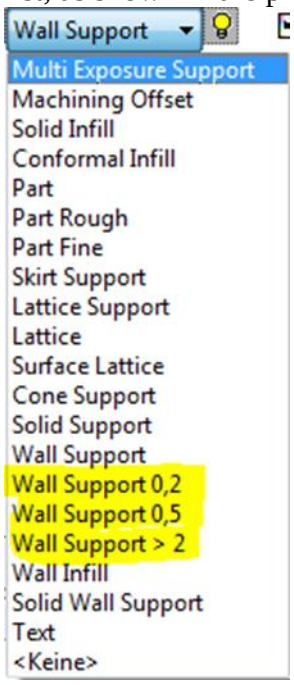


Overlap Order	Technology Name	Build Style Name
1	Multi Exposure Supp...	BL_C0-O_LT-30
2	Machining Offset	BL_C0-O_LT-30
3	Solid Infill	BL_C0-O_LT-30
4	Conformal Infill	BL_C0-O_LT-30
5	Part	BL_C0-O_LT-30
6	Part Rough	BL_C0-O_LT-30
7	Part Fine	BL_C0-O_LT-30
	Skirt Support	BL_C0-O_LT-30
	Lattice Support	BL_C0-O_LT-30
	Lattice	BL_C0-O_LT-30
	Surface Lattice	BL_C0-O_LT-30
	Cone Support	BL_C0-O_LT-30
	Solid Support	BL_C0-O_LT-30
	Wall Support	BL_Wall_Support_LT-60
	Wall Support 0.2	BL_C0-O_LT-60
	Wall Support 0.5	BL_C0-O_LT-60
	Wall Support > 2	BL_Wall_Support_LT-60
	Wall Infill	BL_Wall_Support_LT-60
	Solid Wall Support	BL_C0-O_LT-30
	Text	BL_C0-O_LT-30
	<New Technology>	

This completes the preparation work.

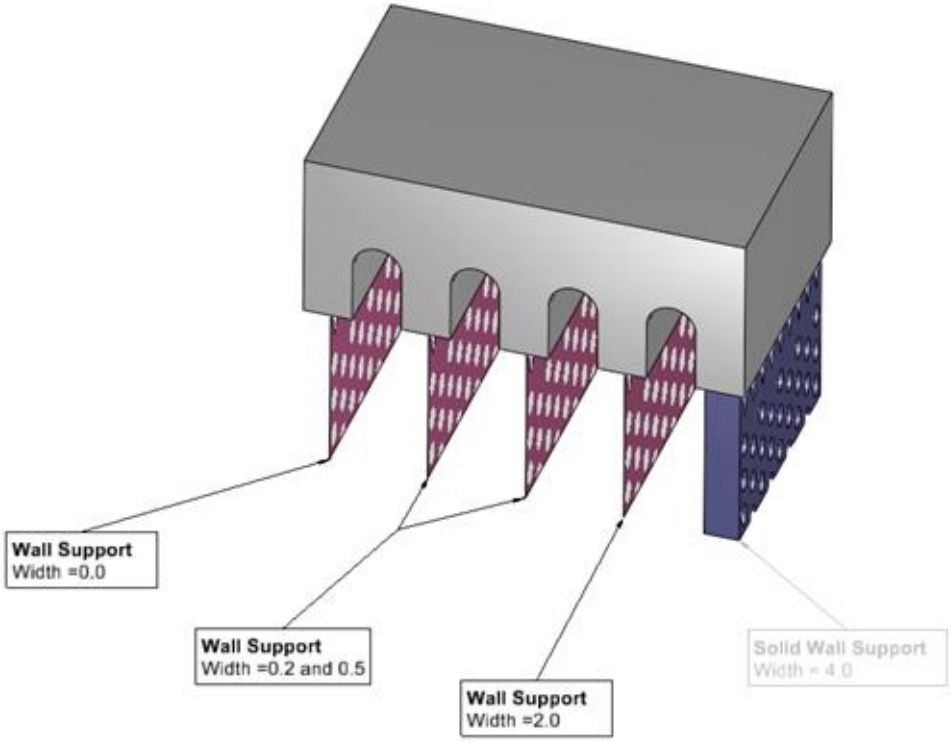
Now let us see how this can be applied in a 3DP project.

The new technologies, which you have created, are available through the technology selection list, as shown in the picture below:



Step 3: Applying the Wall Support Technologies in a 3DP Project

1. Open any 3DP Project that contains wall supports to be printed with different thicknesses.
2. For this example, we will use a project with the following settings:

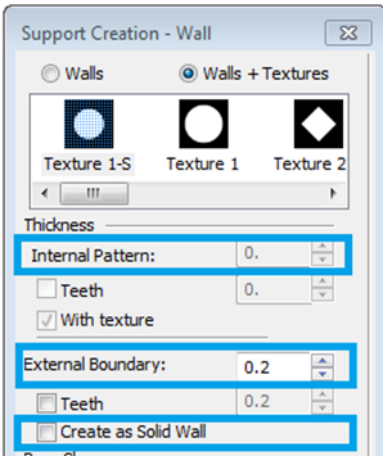


a. Wall Support with Width = 0 (left side)
   This wall support will get printed by a single laser motion.
b. Wall Support with Width = 0.2 (second from left)
   This wall is thin enough to be printed by a single laser motion with a matching laser beam strength.
c. Wall Support with Width = 0.5 (third from left)
   Same as (b).
d. Wall Support with Width = 2.0 (fourth from left)
   This wall is too wide to be printed by the single motion and a certain laser strength. Therefore, in this case, the offset lines are required. Still, we do want to distinguish this wall from a wall support with Width = 0 (as in (a)) when loading the data on EOSPRINT.
e. Solid Wall Support (right side)
   This support is less relevant for the discussion, but it is added here to 'complete the picture'. As it has its own technology, it will get its own SLI file, containing the outer contours of the support (C0).

3. To define the thickness for each support, open the Wall Support dialog and enter its thickness value (also where a single motion is required). This is recommended for consistency or in case you later wish to use a different printer, where the offsets will be required to create the wall in the defined thickness.

   Create or edit a Wall Support. For example, let us create a 0.2mm thick Wall Support.

   Note the following parameters on the dialog:



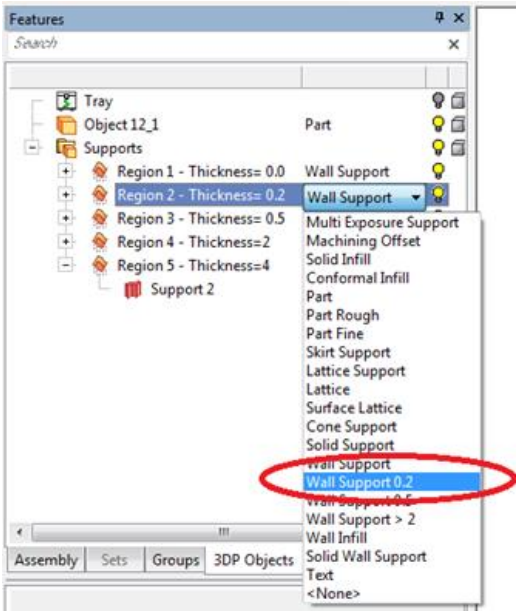
   a. Internal Pattern = 0
      No pattern defined here. Otherwise input the Thickness (example: 0.2)
   b. External Boundary = 0.2
      The required wall thickness.
   c. Create as Solid Wall
      This option is checked OFF, since we want a Wall Support here.

   Close the Wall Support dialog by pressing the OK button.

4. See the 3DP Objects tab. This support has been assigned with a standard Wall Support technology. If we keep this technology assigned to it, then the matching build style for this technology would be the standard wall support technology:

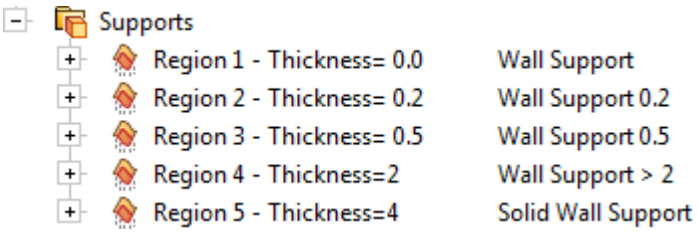
Solid Support	BL_C0-O_LT-30
Wall Support	BL_Wall_Support_LT-60

   This support, along with any other supports that have the same Wall Support technology, will be output to the same SLI file and hence it will not be possible to later assign different technologies in EOS.



   For this support, set the newly defined technology called ‘Wall Support 0.2’

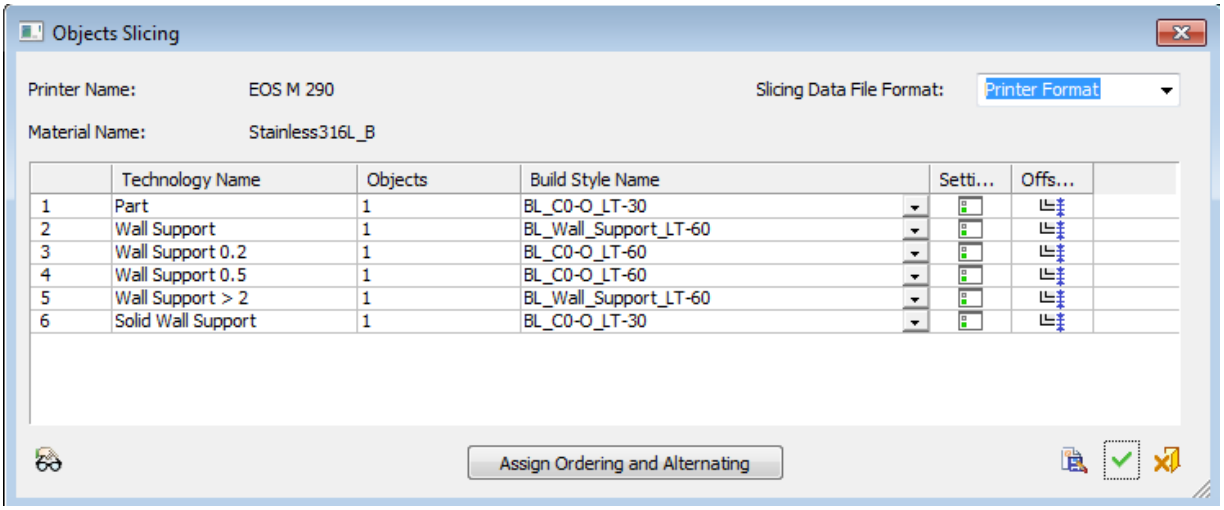
5. In the same way, define the rest of the Supports and assign the matching technologies to them.



6. Press **Calculate Slicing**.

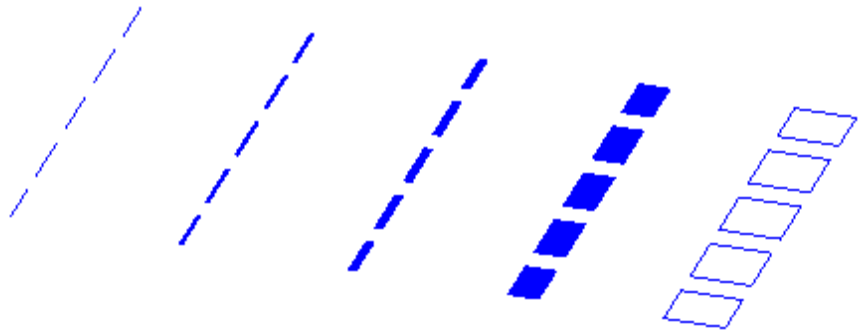
   See that all the relevant technologies are assigned.

   Notice that for all wall supports with thickness 0.2 and 0.5, the single scan path technology is used.

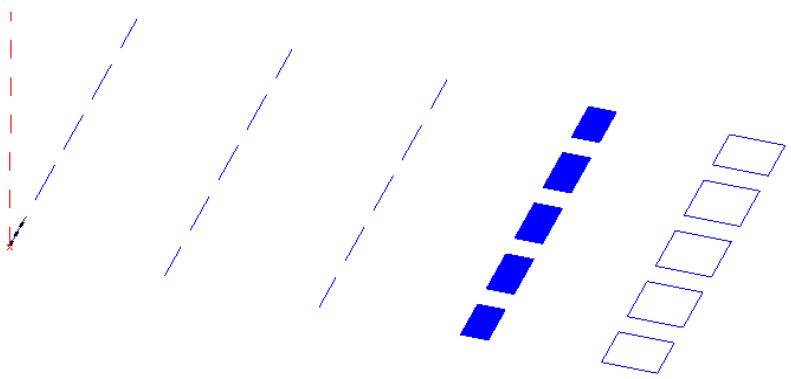


Once the calculation is over, check the results:

Previous Results (standard Wall Supports technology):



New Results:



Notice the single paths created for the inner wall supports, as we defined.

Press **Send to Print**.

Each technology is output as a separate SLI file and hence can be handled individually in EOSPRINT.

End of 3DXpert EOS Guide.