3DXpert™

3DPRINTING EXERCISE X

3D Nesting

Tutorial_V1- Updated: 143DXpertv14_qa_14,0100,1592,863(SP1)

3D SYSTEMS

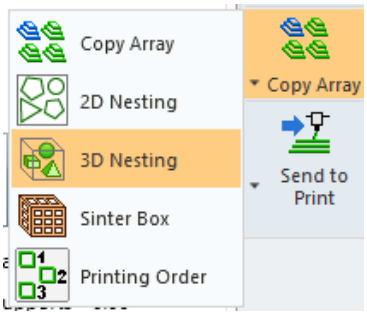
!	In this exercise, for training purpose we will use a sample training printer and material database. This printer and material are **not** suitable for actual printing.

Perform 3D Nesting operations on one or more parts to maximize the number of parts that can be placed in the 3D space of the tray.

When the calculation has finished, the system indicates the number of parts that are placed in the array.

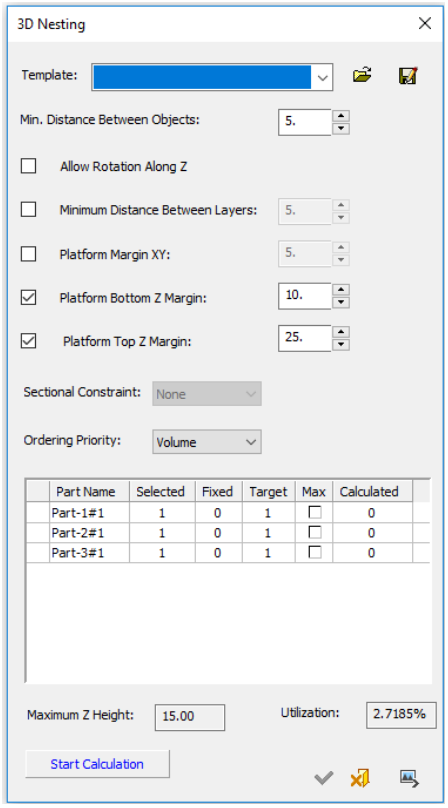
All the nested parts can be sliced together.

1. Unpack the file **3DP_3D_Nesting.ctf** and load the file **3DP_Project3.elt**.
2. Select 3D Nesting

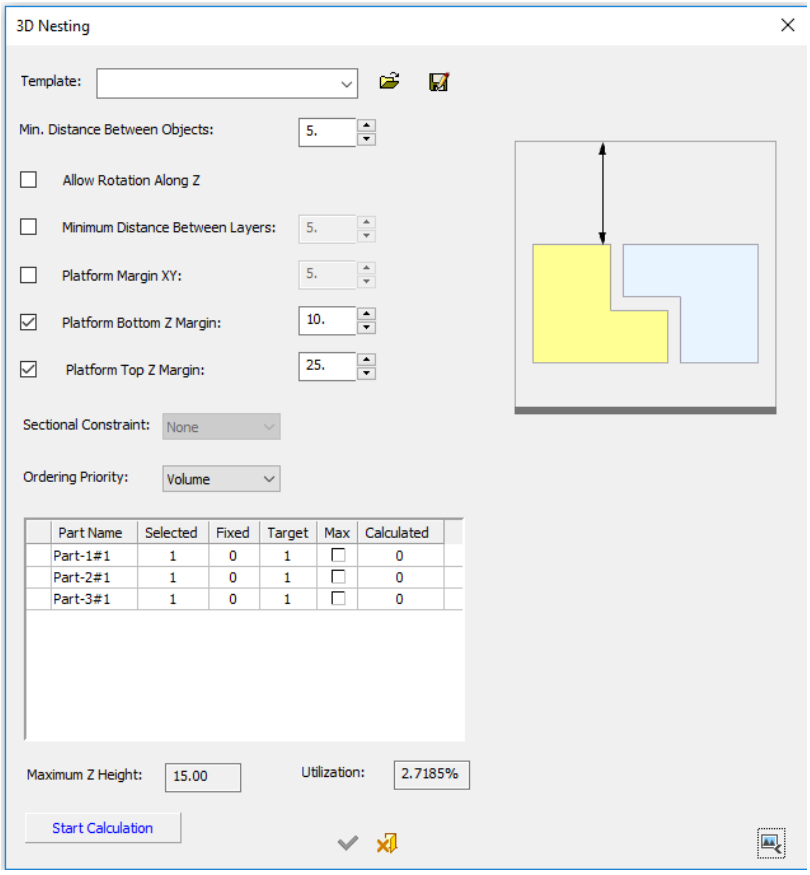


3. Select the three objects and exit via the MMB

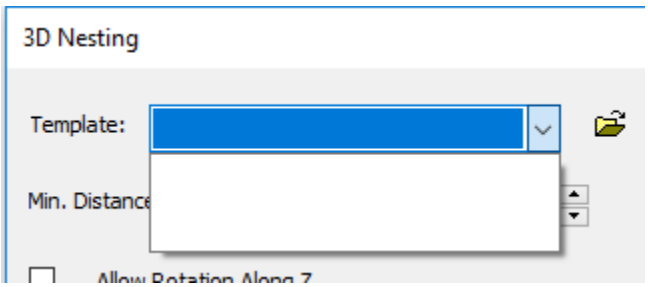
3D Nesting dialog collapsed:



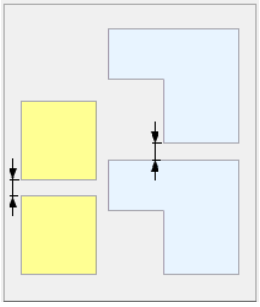
3D Nesting dialog expanded with description image:



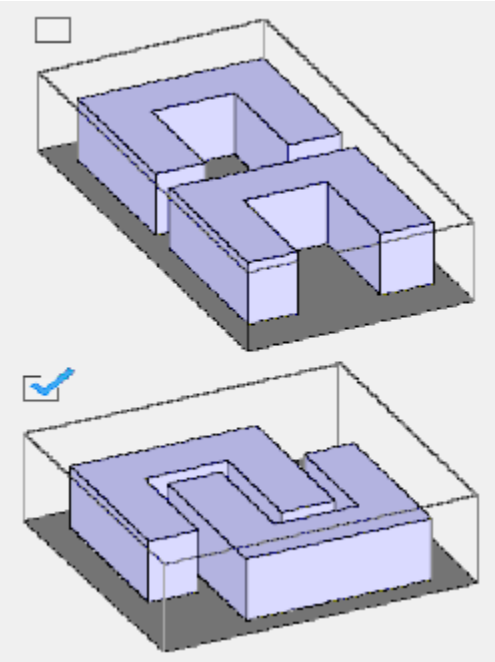
Note: The 3D nesting template (NTP file) with predefine values for the nesting operation is empty as we didn't save any template yet.



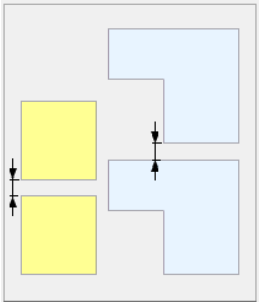
4. **Set Min. Distance Between Objects** to be 4 mm
   This value set the minimum distance between the nested parts.



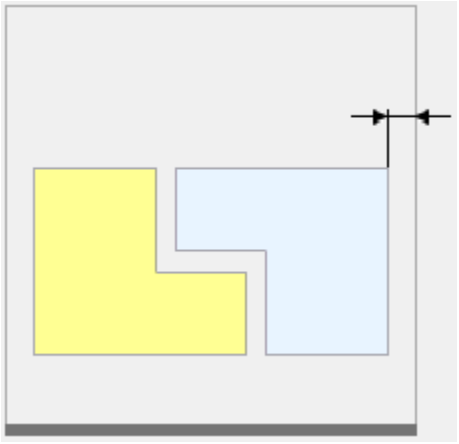
5. **Allow rotation Along Z**- When this checkbox is ON, we allow objects to be rotated about the Z axis to optimize volume efficiency by finding the best nesting orientation fit.
   This option is not relevant in our case



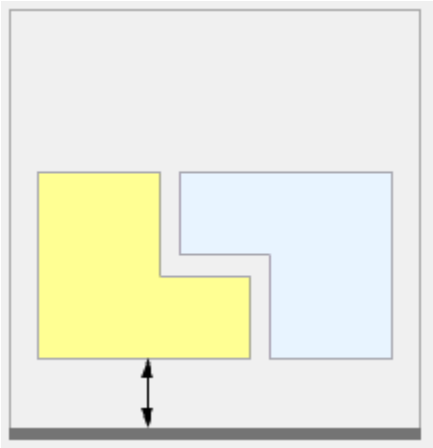
6. **Minimum Distance Between Layers**- When this checkbox is ON, we can set the minimum Z distance between the parts.
   Set the value to 5



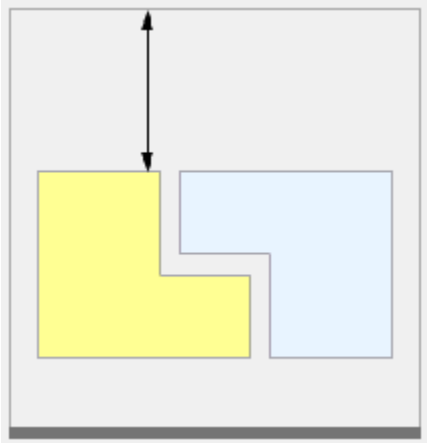
   When this checkbox is OFF, the value is grayed out and set to the Min. Distance Between Objects parameter value.
7. **Platform Margin XY**-Set the value to 5.
   When this checkbox is ON, set the X and Y margin inset width. Objects will not be placed within the set margin.
   When this checkbox is OFF, the value is grayed out and will be considered as 0.



8. **Platform Bottom Z Margin**-uncheck this option.
   When this checkbox is ON, set the bottom margin inset width. Objects will not be placed within the set margin.
   When this checkbox is OFF, the value is grayed out will be considered as.



9. **Platform Top Z Margin**-Set the value to 20
   When this checkbox is ON, set the top margin inset width. Objects will not be placed within the set margin.
   When this checkbox is OFF, the value is grayed out and will be considered as 0.



More Options:

Sectional Constraint-None

There are no additional constraints. This option is grayed out.

Ordering Priority-

Volume-The objects are placed by the largest volume first, descending to the smallest volume parts.

Height-The objects are placed by the largest Z extent first, descending to the smallest Z extent parts.

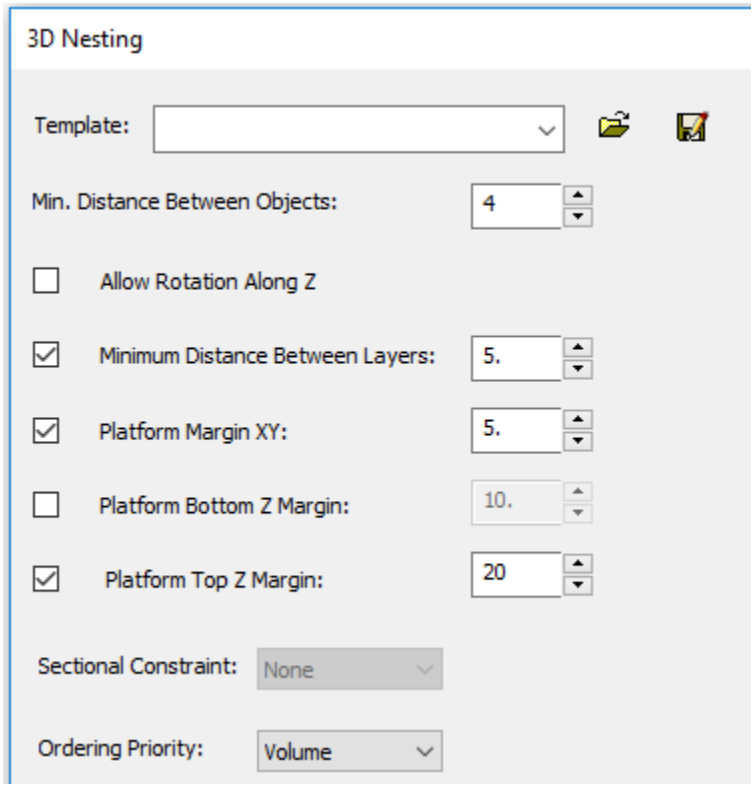
Random-The objects are placed in a random order.

Smallest Section-The objects are placed by the smallest XY section first, descending to the largest XY section parts.

Maximum Z Height-Displays the maximum bounding box height of the parts on the Printable Volume

Utilization-Displays a percentage of the nesting utilization

Make sure the values are as follow:



Let us now discuss the Table

Part Name	Selected	Fixed	Target	Max	Calculated
Part-1#1	1	0	1	☐	0
Part-2#1	1	0	1	☐	0
Part-3#1	1	0	1	☐	0

Part Name -The name of the part selected for nesting.

Selected -The number of selected instances of the same part.

Fixed -The number of instances of the same part that are in the build volume and are not selected

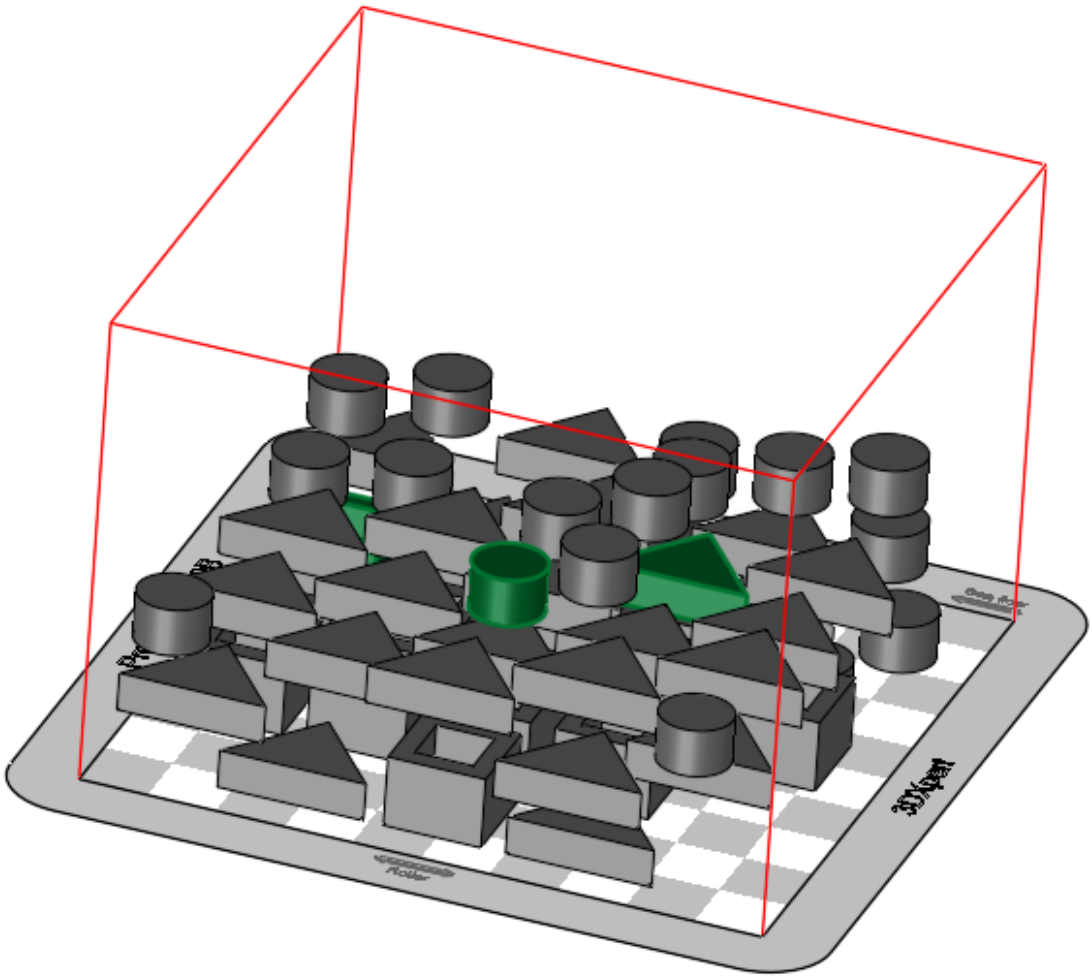
Target -The number of instances of the part that will be created within the Printable Volume.
Default = the value in the Selected cell.

10. Double-click the **Target** cell to manually set the required number of instances, of the specific part, to be created.
    When the nesting is calculated, the number of instances created is displayed in the Calculated cell.
    This cell is empty if the Max. cell checkbox is ON.
    When the Max checkbox is ON, the system fits as many instances of the part as possible into the Printable Volume
    Define the number of Target instances required as below:

Part Name	Selected	Fixed	Target	Max	Calculated
Part-1#1	1	0	17	☐	1
Part-2#1	1	0	15	☐	1
Part-3#1	1	0	25	☐	1

11. Select 'Start Calculation'
    Table result showing the number of Calculated instances:

Part Name	Selected	Fixed	Target	Max	Calculated
Part-1#1	1	0	17	☐	17
Part-2#1	1	0	15	☐	15
Part-3#1	1	0	25	☐	25



12. Check the Max option to Part -1 and run the calculation again

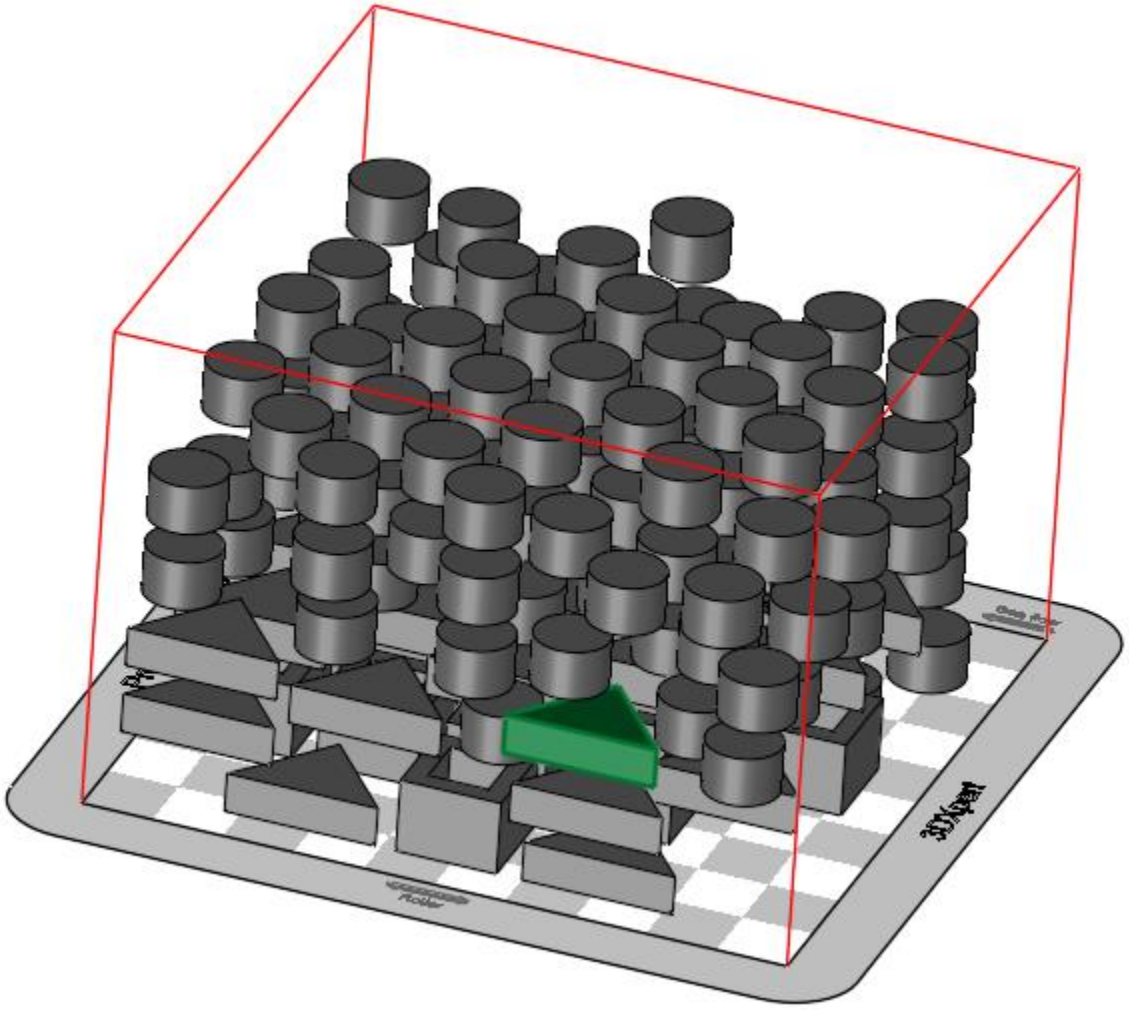
	Part Name	Selected	Fixed	Target	Max	Calculated
	Part-1#1	1	0		☑	17
	Part-2#1	1	0	15	☐	15
	Part-3#1	1	0	25	☐	25

When this checkbox is ON, fit as many instances of the part as possible into the Printable Volume

Result:

	Part Name	Selected	Fixed	Target	Max	Calculated
	Part-1#1	1	0		☑	110
	Part-2#1	1	0	15	☐	15
	Part-3#1	1	0	25	☐	25

See the Calculated column: it shows the number of instances that were created in the Printable Volume



End of Exercise.