3DXpert™ for SOLIDWORKS®

Lattice Design

Lattice – Evaluation

Tutorial V2 14,0200,1599,1024(SP2)

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Introduction

3DXpert for SOLIDWORKS includes tools for creating optimized structures, using Lattices and Infills.

In this document, we will describe the various Lattice types and the 3DXpert for SOLIDWORKS lattice Evaluation mode.

A Lattice is a structure of cells spread out in a defined volume. This enables to create an internal structure of the part (keeping its outer skin) that will save weight, material and printing time, while keeping the designed strength of the model.

3DXpert for SOLIDOWRKS offers various types of lattice structures. They are called Uniformal, Radial, Stochastic, Shaped Cell, Function Based and Solidify.
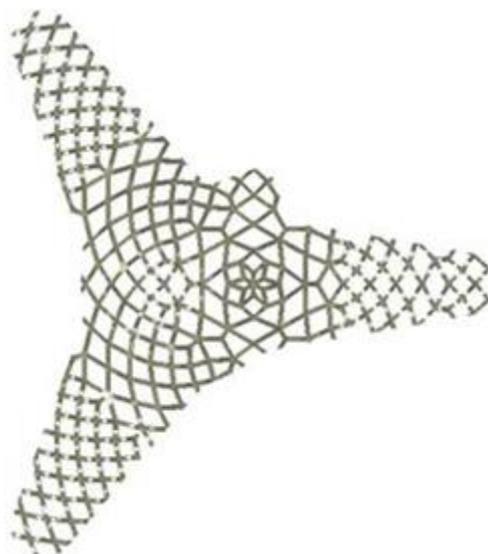
The Lattice Types available in 3DXpert for SOLIDWORKS

Uniformal Lattice - means that the structure and the size of the lattice's cell does not vary in the entire part's volume.
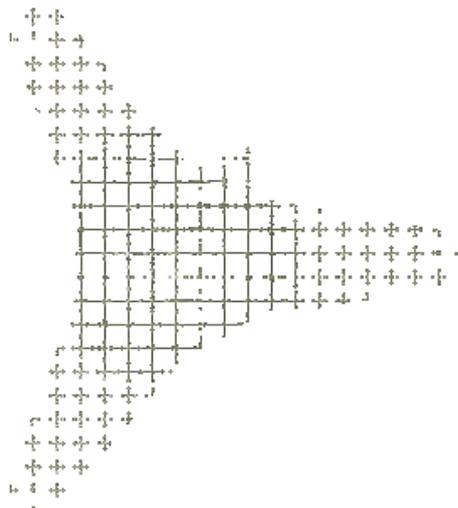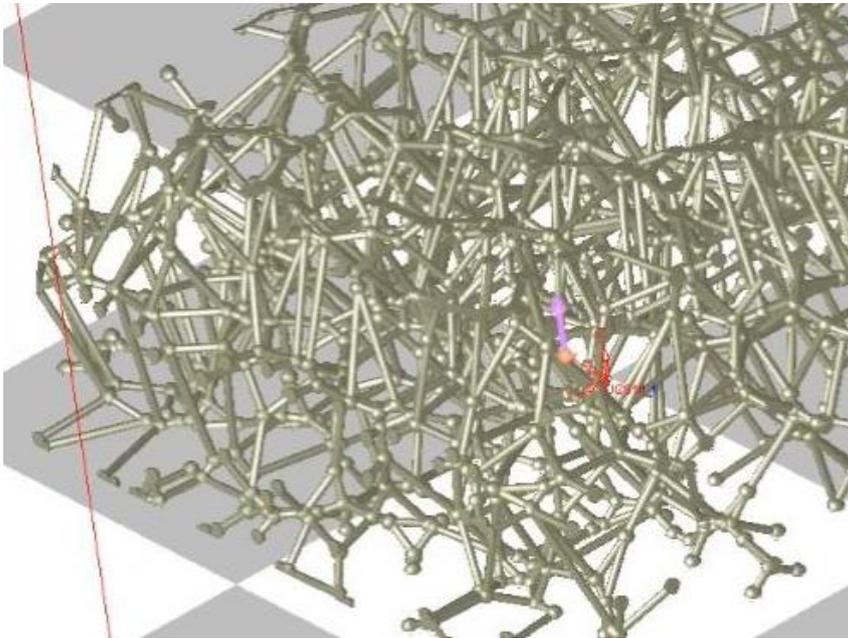

Uniformal Lattice

Radial Lattice – a structure where the cell size changes according to the diameter of the part.

Radial Lattice

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Stochastic Lattice - in this structure, the system virtually divides the part in a random way and connects the cells with lattice beams.

Stochastic structure is used for the filling of bone structure.

Stochastic Lattice

Shaped Cell Lattice - this option allows the user to create a lattice which is made of cells with a user defined shape and without connectors.

The result is a lattice of connected nodes with a defined cell size (the size of a node in XY and Z.)

There are predefined shapes that are suitable for this type. These have the postfix (Shaped Cell) in their name.
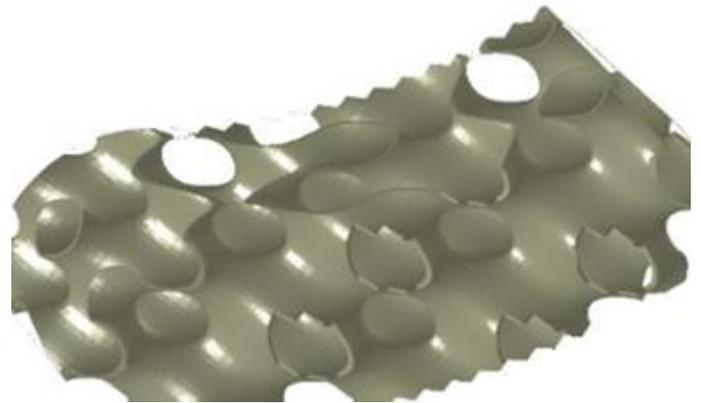

Shaped Cell Lattice

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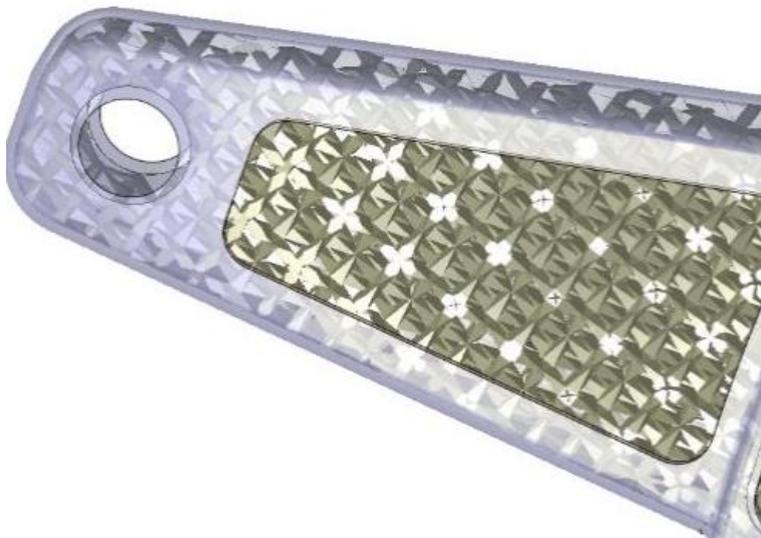
Function Based - this option allows the user to create a lattice, which is made of faces defined by a mathematical function.
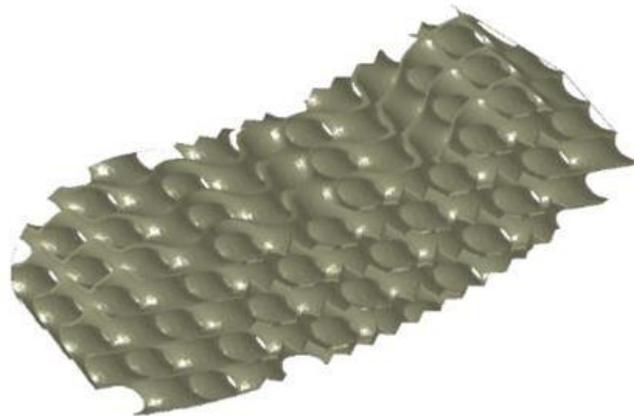
Three shapes are available: **Gyroid**, **Schwarz P** and **Schwarz D**. All are completely printable shapes and you can control the size of the cell and the thickness of the wall surface.
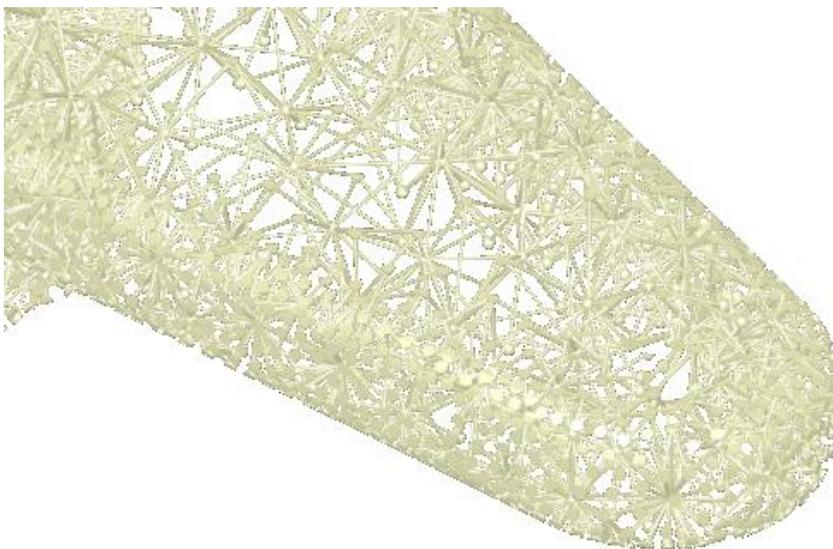

Gyroid

Schwarz P

Schwarz D

Solidify Lattice - this option allows user to create lattice build around a mesh of the volume of the selected object.

Solidify Lattice

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Working in Evaluation Mode

When working with a Standard license, you can create Uniformal Lattice, which you are able to slice and export to other software.

You can create additional Lattice types, however, in the Standard package, the additional Lattice types are available in Evaluation mode.

In Evaluation mode you can create, save, edit and view the additional Lattice types. However, you cannot slice or export them.

To enable slicing and exporting of the additional Lattice types, upgrade your 3DXpert for SOLIDWORKS to either the Professional Lattice Design ADD ON or the 3DXpert for SOLIDWORKS Professional package.

When invoking the Lattice tool with the Standard license, a blue Lock sign 🔑 appears next to all the options that are in Evaluation mode, which means that you can create, save, edit and view them.
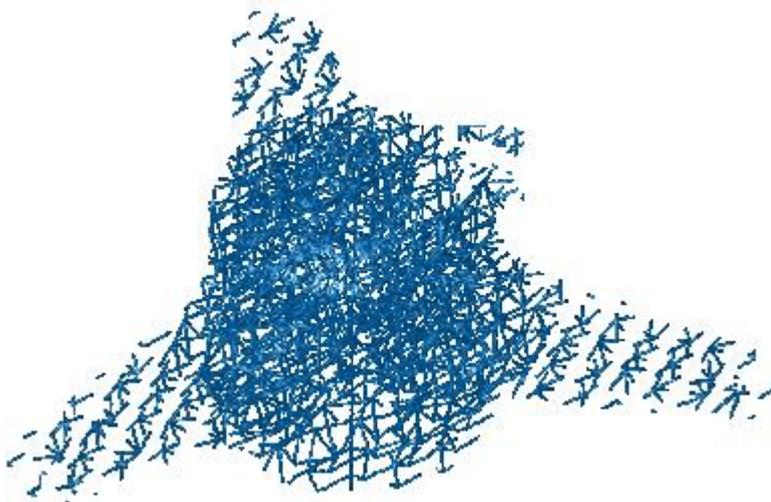
However, you cannot slice or export them:
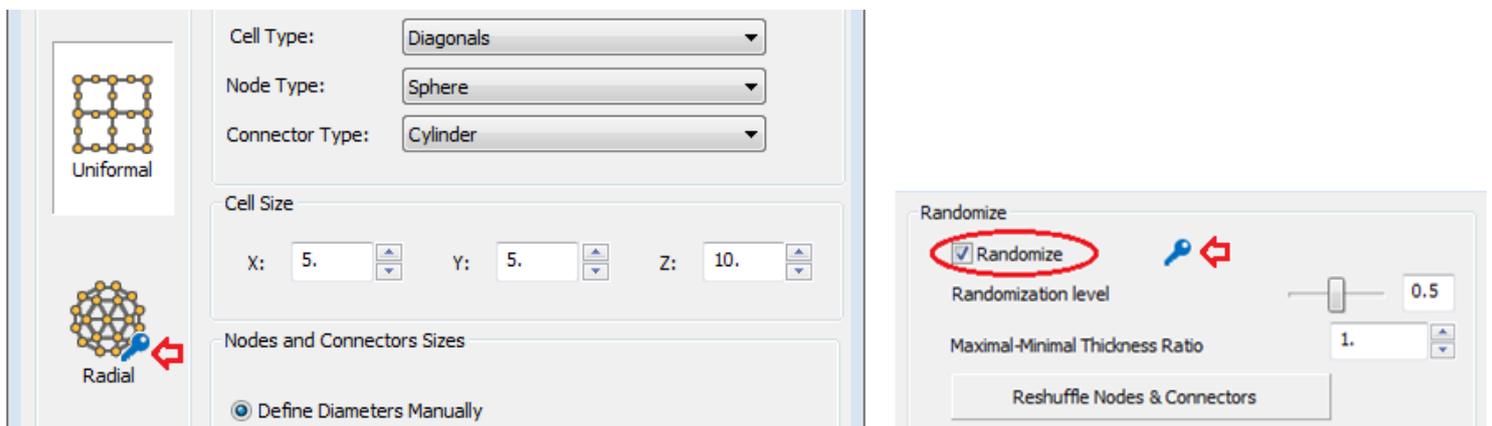
Whenever using an Evaluation feature, an "Evaluation Feature" note will appear at the bottom of the screen:
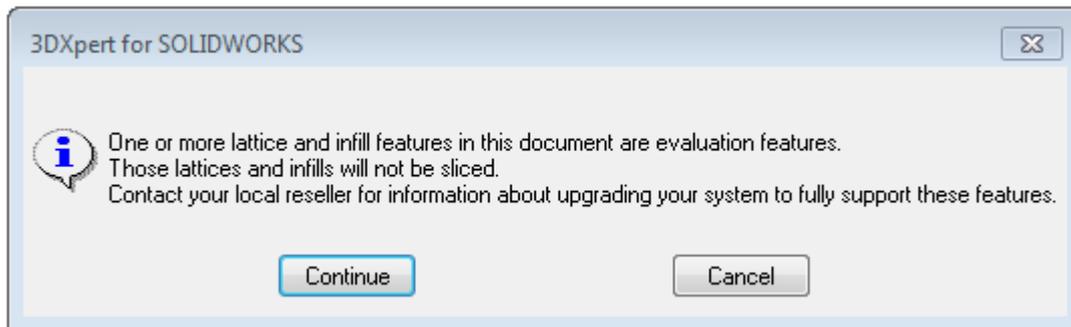
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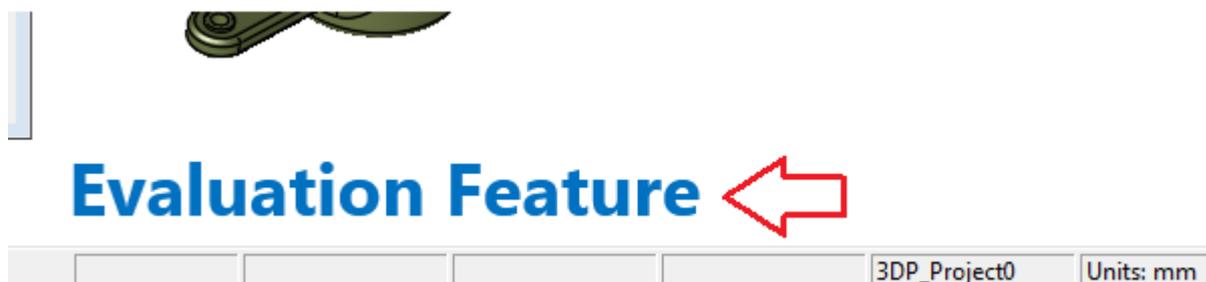
The Lattice that you create with Evaluation features is colored in blue, which indicates that the Lattice cannot be sliced or exported.

The Lattice feature is also colored in blue and the word EVALUATED is added in the prefix.
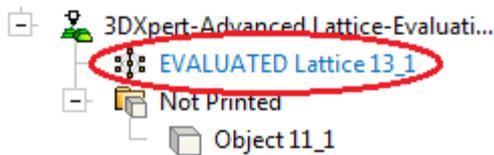
Attempting to slice Lattice that is in Evaluation mode, 3DXpert for SOLIDWORKS will show the following message:

End of Exercise.

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