



BUILD PROCESSORS

Updated to 3DXpert 15

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3DXpert and 3D Printing Formats

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

It can output using 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.

3DXpert Build Processors

The following list includes the Direct Build Process (slicer) options, available for 3DXpert.

Each slicer requires a license.

Item	Module	Description
3DX Slicer PROX DMP 320	3DP_SLICER_PROX	Full support for 3D Systems printers ProX DMP 320 and DMP 350 Series
3DX Slicer PROX DMP 100-200-300	3DP_SLICER_PROX_300	Full support for 3D Systems printers ProX DMP 100, 200, 300 and DMP Flex 100
3DX Slicer F500MLS	PKG_3DXPERT_F500_MLS	Full support for 3D Systems DMP 500 Series Multi Laser Head, with Auto Balancing of the heads
3DX Slicer PROX BPZ*	3DP_SLICER_PROX_BPZ *	Support 3D Systems ProX BPZ format (SLS 6100)
3DX Slicer SLI (EOS)	3DP_SLICER_SLI	Direct output to EOS SLI format
	3DP_SLICER_EOS	Direct output to EOS, using EOS SDK
3DX Slicer SND	3DP_SLICER_SND	Direct output to Sindaya
3DX Slicer SH3D	3DP_SLICER_SH3D	Direct output to Shining 3D
3DX Slicer MTT*	3DP_SLICER_MTT	Direct output to Renishaw format

	3DP_SLICER_MTTN*	Direct output to Renishaw, using Renishaw SDK (free with 3DX Slicer MTT)
3DX Slicer Additive Industries	3DP_SLICER_ADIN	Direct output to Additive Industries
3DX Slicer Aconity3D	3DP_SLICER_AC3D	Direct output to Aconity3D
3DX Slicer SLM	3DP_SLICER_SLM	Direct output to SLM, including binary SLM format
3DX Slicer DMG MORI**	3DP_SLICER_DMG**	Direct output to DMG MORI

* New/Updated for 3DXpert 15

** In Preparation

Glossary of Terms

CLI – CLI stands for Common Layer Interface. This is a universal format for the input of geometry data to model fabrication systems based on layer manufacturing technologies, such as 3D printing.

The slicing of each layer results in the bounding contour that has the shape of the model’s boundary or silhouette at that layer height. The result is a geometrical representation of the model, dictated by the layer height. Some machine vendors use CLI format and add to it their own, printer specific, information. CLI is commonly an ASCII file format.

SLI – SLI stands for Slice Layer Interface (SLI) and is an EOS file format. It is based on the binary version of the CLI format.

SDK – SDK stands for Software Development Kit. In general. It is a set of software tools and programs used by developers to create applications for specific platforms. SDK tools will include a range of items, including libraries, documentation, code samples, processes, and guides that developers can use and integrate into their own applications.

Auto Balancing – Automatic Balancing is available exclusively for **3D Systems multiple head printers (F500MLS)**.

With Automatic Balancing, the system calculates the operation of each laser head of the printer, automatically assigning each laser head to specific object(s), balancing print time against print quality, such that all the heads start and end at the same time. This calculation takes into account numerous elements, such as the printer type, number of heads, material, objects selected, parameter values, etc.

3D Systems Printers

The slicers for the 3D Systems single laser printers are included with 3DXpert, however, for each specific material to be used, an additional license is required.

These licenses are required to use the **certified** 3D Systems material databases that are supplied by 3D Systems.

These material databases were pre-configured by 3D Systems for the specific material and printer.

3D Systems Printers (Single Laser) and Materials

The following tables describe the materials (metal powders) which are available for each printer. Each material database requires a license.

Printer Name	Material Name	Use Cases
ProX®DMP 320A		
	3DX LaserForm Ti Gr. 1	Purest grade, light, corrosion resistant, biocompatible, ductile, for marine sporting goods, aerospace, medical
	3DX LaserForm Ti Gr. 23	Light, corrosion resistant, biocompatible, high strength, medical tools, implants, dental prosthetics
	3DX LaserForm Ti Gr. 5	Same as Gr. 23 but higher O2 and Fe content for improved strength
	XHP LaserForm Ti Gr23	Light, corrosion resistant, biocompatible, high strength, medical tools, implants, dental prosthetics & 90micron
	XHP LaserForm Ti Gr5	Same as Gr. 23 but higher O2 and Fe content for improved strength & 90 micron

3D Systems Printers/Materials - Continued

Printer Name	Material Name	Use Cases
ProX®DMP 320B		
	3DX LaserForm Ni718	High temperature, high strength, corrosion resistance typically aerospace
	3DX LaserForm Stainless316L	Extra low carbon stainless, functional prototypes requiring high corrosion resistance, sterilisable, food contact
	3DX LaserForm AlSi10Mg	Light, corrosion resistant, good conductivity, typical casting alloy
	3DX LaserForm Ni625	High corrosion resistance, high strength, sea water, aerospace, nuclear applications
	3DX LaserForm CoCrF75	High corrosion and wear resistance, engine, turbine, jewelry, medical and dental implants
	3DX LaserForm 17-4PH	General purpose stainless for functional prototypes in aerospace, medical, chemical
	3DX LaserForm Maraging Steel	High hardness tool steel, injection molding and tooling applications

Printer Name	Material Name	Use Cases
350A Series		
	3DX LaserForm Ti Gr. 1	Purest grade, light, corrosion resistant, biocompatible, ductile, for marine sporting goods, aerospace, medical
	3DX LaserForm Ti Gr. 23	Light, corrosion resistant, biocompatible, high strength, medical tools, implants, dental prosthetics
	3DX LaserForm Ti Gr. 5	Same as Gr. 23 but higher O2 and Fe content for improved strength
	XHP LaserForm Ti Gr23	Light, corrosion resistant, biocompatible, high strength, medical tools, implants, dental prosthetics & 90micron
	XHP LaserForm Ti Gr5	Same as Gr. 23 but higher O2 and Fe content for improved strength & 90 micron

3D Systems Printers/Materials - Continued

Printer Name	Material Name	Use Cases
350B Series		
	3DX LaserForm Ni718	High temperature, high strength, corrosion resistance typically aerospace
	3DX LaserForm Stainless316L	Extra low carbon stainless, functional prototypes requiring high corrosion resistance, sterilisable, food contact
	3DX LaserForm AlSi10Mg	Light, corrosion resistant, good conductivity, typical casting alloy
	3DX LaserForm Ni625	High corrosion resistance, high strength, sea water, aerospace, nuclear applications
	3DX LaserForm CoCrF75	High corrosion and wear resistance, engine, turbine, jewelry, medical and dental implants
	3DX LaserForm 17-4PH	General purpose stainless for functional prototypes in aerospace, medical, chemical
	3DX LaserForm Maraging Steel	High hardness tool steel, injection molding and tooling applications

Printer Name	Material Name	Use Cases
ProX®DMP 200B		
	3DX PS2585-18 AlSi12	Light, corrosion resistant, good conductivity, typical casting alloy
	3DX LaserForm CoCr - B	High corrosion and wear resistance, engine, turbine, jewelry
	3DX ST2709B Maraging Steel	High hardness tool steel, injection molding and tooling applications
	3DX PS4542A Stainless17_4PH	General purpose stainless for functional prototypes in aerospace, medical, chemical
	3DX LaserForm Ni625 (B)	High corrosion resistance, high strength, sea water, aerospace, nuclear applications
	3DX LaserForm 316L	Extra low carbon stainless, functional prototypes requiring high corrosion resistance, sterilisable, food contact

Printer Name	Material Name	Use Cases
ProX®DMP 100		
	3DX LaserForm CoCr - B	High corrosion and wear resistance, engine, turbine, jewelry
	3DX PS4542A Stainless17_4PH	General purpose stainless for functional prototypes in aerospace, medical, chemical

3D Systems Printers/Materials - Continued

Printer Name	Material Name	Use Cases
ProX®DMP 300B		
	3DX PS2585-18 AlSi12	Light, corrosion resistant, good conductivity, typical casting alloy
	3DX LaserForm CoCr - B	High corrosion and wear resistance, engine, turbine, jewelry
	3DX ST2709B Maraging Steel	High hardness tool steel, injection molding and tooling applications
	3DX LaserForm Ni625 (B)	High corrosion resistance, high strength, sea water, aerospace, nuclear applications
	3DX PS4542A Stainless17_4PH	General purpose stainless for functional prototypes in aerospace, medical, chemical

Printer Name	Material Name	Use Cases
ProX®DMP 200A		
	3DX PS2585-18 AlSi12	Light, corrosion resistant, good conductivity, typical casting alloy
	3DX LaserForm CoCr - B	High corrosion and wear resistance, engine, turbine, jewelry
	3DX ST2709B Maraging Steel	High hardness tool steel, injection molding and tooling applications
	3DX PS4542A Stainless17_4PH	General purpose stainless for functional prototypes in aerospace, medical, chemical

Printer Name	Material Name	Use Cases
ProX®DMP 300A		
	3DX PS2585-18 AlSi12	Light, corrosion resistant, good conductivity, typical casting alloy
	3DX LaserForm CoCr - B	High corrosion and wear resistance, engine, turbine, jewelry
	3DX ST2709B Maraging Steel	High hardness tool steel, injection molding and tooling applications
	3DX PS4542A Stainless17_4PH	General purpose stainless for functional prototypes in aerospace, medical, chemical

3DP SLICER PROX BPZ

This license enables 3DXpert to read from 3D Sprint, the 3D Systems validated materials data for 3D Systems ProX SLS 6100.

3DXpert exports the geometry, as well as laser and printer operation parameters to the 3D Systems ProX SLS 6100 format (BPZ file format). The output files are then loaded on the printer's software.

This solution is available for 3DXpert Basic, Standard, Professional and Ultimate.

3DX Slicer F500MLS

This license enables auto-balancing control for minimum printing time using the multi-head DMP Factory 500. Intelligent multi-laser control ensures best utilization and balancing of multiple print heads for high throughput production of multiple parts or large parts, up to the size of the full build volume. 3DXpert also ensures there is a perfect merging of volumes printed by different print heads, from the inner layers to the outer surface.

Build Processors for Non-3D Systems Printers

While the build processors for the 3D Systems printers are based on pre-configured Build Styles that feed the slicer with the various rules and contouring, hatching and laser parameters (for each technology), the build processors for non-3D Systems printers may require the definitions of these Build Styles.

In some cases, as for EOS, these Build Styles are generated 'on the fly' based on data from the printers. In others, the Build Styles should be configured. Wherever it is stated that 'Relevant 3DXpert Build Styles should be prepared by the customer', it is required to create Build Styles and define the various rules and contouring, hatching and laser parameters for each technology.

Following is a brief description of the available build processors.

3DX Slicer SLI (EOS)

The slicer for EOS includes two options:

1. Using EOS Validated Materials

This is relevant for the following EOS Printers: EOS M 290, EOS M 400, and EOS M 400-4.

In this option, if EOSPRINT is installed on the same computer (as 3DXpert), this allows using the EOS validated material database for the specific printers that are installed on-site. It is achieved by assigning technologies to objects in the standard 3DXpert methodology for any printer.

This solution generates an EOS Job file. The Job file is an EOS pre-slicing format, containing instructions for the EOS printer how to slice and with which laser parameters (actual slicing with the parameters is executed by the EOS software).

2. Working with Predefined 3DXpert Build Styles for EOS

This method is applicable if the EOS printer which is in use is not supported by EOS SDK, or there is no active EOSPRINT software on the same computer, or when users wish to create/use their own 3DXpert build styles for EOS.

In this method, 3DXpert creates the EOS SLI files. Material data is not retrieved from EOS software.

For more technical information, including the details on how to use both methods, see the dedicated 3DXpert EOS Guide.

3DX Slicer SND

Direct output to Sindaya.

The output files are in the generic CLI format, with additional Sindaya specific information.

Relevant 3DXpert Build Styles should be prepared by the customer.

3DX Slicer SH3D

Direct output to Shining 3D.

The output files are in the generic CLI format, with additional Shining3D specific information.

Relevant 3DXpert Build Styles should be prepared by the customer.

3DX Slicer MTT

Direct output to Renishaw, using Renishaw SDK (free with 3DX Slicer MTT).

The 3DX Slicer MTT item now includes both 3DP_SLICER_MTT and the new module 3DP_SLICER_MTTN. To work with 3DP_SLICER_MTT, prepare the relevant Build Styles, create a project and slice it. The output file (Send to Print) is in Renishaw native format.

The MTTN format uses the Renishaw SDK to create the Build Styles based on Renishaw's validated materials and also uses the Renishaw slicer to prepare the build data. Send to Print outputs the sliced geometry with hatching and laser parameters in Renishaw native format.

3DX Slicer Additive Industries

Direct output to Additive Industries.

The output files are in native AI (Additive Industries) format. Relevant 3DXpert Build Styles should be prepared by the customer.

3DX Slicer Aconity3D

Direct output to Aconity3D.

The output files are in native Aconity3D format. Relevant 3DXpert Build Styles should be prepared by the customer.

3DX Slicer SLM

Direct output to SLM, to ASCII or binary native SLM format. The result is a single file. Relevant 3DXpert Build Styles should be prepared by the customer.

3DP_SLICER DMG*

Release TBD. This license enables to export sliced geometry with hatching and laser parameters directly to DMG MORI's printers.

*In Preparation