EOSPRINT 2

Overview of program versions

Software	Edition 05.21 SP3	Edition 11.21	Edition 05.22
EOSPRINT 2	2.10.1719.0	2.11.1386.0	2.12.1278.0

Overview of supported machines

Machine types:

- EOS M 100
- EOS M 290
- EOS M 290-2
- EOS M 300-4
- EOS M 400
- EOS M 400-4
- FORMIGA P 110 / FORMIGA P 110 Velocis
- FORMIGA P 110 FDR (previously listed as EOS P 110)
- Integra P 450
- EOS P 500

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München
Telefon: +49 (0)89 / 893 36-0
Telefax: +49 (0)89 / 893 36-285
Internet: www.eos.info

Version 2.12.1278.0

Overview of version compatibility with EOSYSTEM

EOSYSTEM Version	EOSPRINT Version 2.12	EOSPRINT Version 2.11	EOSPRINT Version 2.10
2.16	**supported (Ed. 05.22)**	not possible	not possible
2.15	supported	**supported (Ed. 11.21)**	not possible
2.14	supported	supported	**supported (Ed. 05.21)**
2.13	possible, but not tested	supported	supported
2.12	possible, but not tested	possible, but not tested	supported
2.11	possible, but not tested	possible, but not tested	possible, but not tested
2.10	possible, but not tested	possible, but not tested	possible, but not tested
2.9	possible, but not tested	possible, but not tested	possible, but not tested
2.8	possible, but not tested	possible, but not tested	possible, but not tested
2.7	possible, but not tested	possible, but not tested	possible, but not tested
2.6	possible, but not tested	possible, but not tested	possible, but not tested
2.5	possible, but not tested	possible, but not tested	possible, but not tested

supported: These software combinations are officially supported and were thoroughly tested. The cells with bold letters mark EOSYSTEM & EOSPRINT versions that were released with the same edition. The edition is specified in parentheses.

possible, but not tested: These software combinations are technically possible but were not tested and may therefore not be considered officially supported.

not possible: These software combinations are not possible, because EOSPRINT 2 rejects connections to EOSYSTEM versions more recent than itself.

Overview of version compatibility with EOSTATE Exposure OT

EOSTATE Exposure OT Version	EOSPRINT Version 2.12	EOSPRINT Version 2.11	EOSPRINT Version 2.10
1.9	**M 290, M 300-4, M 400-4 (Ed. 05.22)**	not possible	not possible
1.8	not possible	**M 290, M 300-4, M 400-4 (Ed. 11.21)**	not possible
1.7	not possible	not possible	**M 290, M 300-4, M 400-4 (Ed. 05.21)**
1.6	not possible	not possible	not possible
1.5	not possible	not possible	not possible
1.4	not possible	not possible	not possible
1.3	not possible	not possible	not possible

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

Overview of version compatibility with EOSTATE MeltPool

EOSTATE MeltPool Version	EOSPRINT Version 2.12	EOSPRINT Version 2.11	EOSPRINT Version 2.10
2.6	M290, M300-4, M400-4 (Ed. 05.22)	not possible	not possible
2.5	not possible	M290, M300-4, M400-4 (Ed. 11.21)	not possible
2.4	not possible	not possible	M290, M300-4, M400-4 (Ed. 05.21)
2.3	not possible	not possible	not possible
2.2	not possible	not possible	not possible
2.1	not possible	not possible	not possible
2.0	not possible	not possible	not possible

Overview of version compatibility with EOSTATE PowderBed

EOSTATE PowderBed Version	EOSPRINT Version 2.12	EOSPRINT Version 2.11	EOSPRINT Version 2.10
2.3	M290, M300-4, M400, M400-4, P500 (Ed. 05.22)	not possible	not possible
2.2	not possible	M290, M300-4, M400, M400-4, P500 (Ed. 11.21)	not possible
2.1	not possible	not possible	M290, M300-4, M400, M400-4, P500 (Ed. 05.21)
2.0	not possible	not possible	not possible

Overview of Material Set Changes

Affected Systems	EOS M 100, EOS M 290, EOS M 400-4

New Material Sets

System	Process product name	Version	Description
EOS M 100	W1_020_FlexM100	1.01	**Initial:** Enables job builds with material "EOS Tungsten W1" in 20µm layer thickness on EOS M100 systems (skip EOSPRINT Release EDITION 11.21 + 05.21 (SP3)).
EOS M 290	CM55_Ar_040_080_M291	1.00	**Initial:** Enables job builds with material "EOS ToolSteel CM55" in 40µm + 80µm layer thicknesses utilizing Argon as inert gas on EOS M290 400W systems.
EOS M 290	CM55_N2_040_080_M291	1.00	**Initial:** Enables job builds with material "EOS ToolSteel CM55" in 40µm + 80µm layer thicknesses utilizing Nitrogen as inert gas on EOS M290 400W systems.
EOS M 290	SuperDuplex_040_080_CoreM291	1.00	**Initial:** Enables job builds with material "EOS StainlessSteel SuperDuplex" in 40µm + 80µm layer thicknesses on EOS M290 400W systems.
EOS M 400-4	IN718_040_HiProM404	1.01	**Initial:** Enables job builds with material "EOS NickelAlloy IN718" in 40µm layer thickness on EOS M400-4 systems utilizing low angle support free part building and new "Aerospike" flow nozzle. Adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0.

Updated / Replaced Material Sets

System	Process product name	Version		Description
		new	previous	
EOS M 290	316L_040_080_CoreM291	1.21	1.20	**Update:** Extend exposure set library by including "EOS_..." exposure sets. Adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0. Version 120 not included in serial software.
EOS M 290	Al2139AM_060_CoreM291	1.10	1.00	**Update:** Optimized parameters to improve surface quality and powder handling to avoid overfilling of collector axis during job builds.
EOS M 290	Cu_020_CoreM291	1.02	1.01	**Update:** Enhance recoating speed during job builds for increased productivity.
EOS M 400-4	316L_040_080_CoreM404	1.20	1.11	**Update:** Extend exposure set library by including "EOS_..." exposure sets

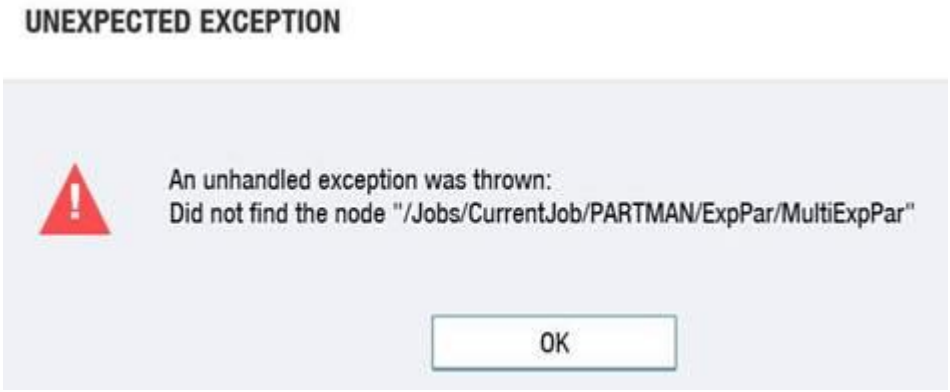
Important Information

- EOSPRINT 2 only supports 64-bit operating systems
- If EOSPRINT 2.12 is to be installed on systems on which EOSPRINT 2.0 or EOSPRINT 2.1 was already installed, a new license must be requested from EOS before installation.
- **EOSPRINT 2.10 was the last version that is tested with Microsoft Windows 7. Subsequent EOSPRINT versions may still work with Windows 7, but this is in no way guaranteed.**

Solved Items

- Item 166749: EOSPRINT is compatible with systems of type EOS M 100 beginning with HCS 1.8 as well as with FORMIGA P 110 (including Velocis) and FORMIGA P 110 FDR beginning with HCS 1.10. In earlier versions of EOSPRINT, when trying to connect to systems with an HCS version lower than 1.10, the connection was rejected with rather unhelpful error messages referring to a bad configuration and/or protocol error and/or a too new version given as "<malformed>". This has now been fixed, so that connections to EOS M 100 systems running HCS 1.8 are possible again. The connection to FORMIGA P 110 (including Velocis) and FORMIGA P 110 FDR is still correctly rejected, but the error message presented in this case has been improved.
  The unhelpful error messages were also given for unsupported machines running an HCS older than version 1.8, e.g. FORMIGA P 100. These connections are still not possible, but the error message will now clearly state that such the machine type is not supported.
  Machines running HCS 1.10 continue to be treated correctly.
- Item 170048: In some cases, when trying to trigger a single layer export at a z-height corresponding to a part segment boundary, the application crashed with a cryptic error message. The problem has been fixed.
- Item 156135: With Automatic Mode enabled on EOS M 300-4 or EOS M 290-2, the Energy Input Homogenization functions Power Reduction & Min Vector Time were not applied. This problem is fixed. This change is relevant to the building process.
- Item 158168: When setting a non-zero rotation angle for a part and then resetting it to 0.0°, it could happen with some angles that the part disappeared, and its bounding box was then displayed as "NaN". This has now been fixed.

- Item 158604: If a part was placed in the build area of a P system outside the recommended area marked by a red frame, this was not acknowledged with a corresponding message. In future, a message will appear in this case indicating that for optimum results the part should better be placed within the red frame.
- Item 159149: For colliding parts as well as for parts without connection to the building platform no warning was issued on task export. This has been fixed.
- Item 159952: When the feature Time Optimized Vector Scanning for contours was activated, it was not guaranteed that the contour vectors in successive layers were exposed in the same direction. The problem is now fixed. This change is relevant to the building process.
- Item 164588: For machine types EOS M 290, EOS M 100 and FORMIGA P 110 FDR build time estimations did not always take into account the actual measured recoating times on the machine, even if the empirical data was available. Instead, a default value was used. This may have resulted in less accurate estimates, depending on the size and geometry of the job. The issue has now been fixed.
- Item 163832: On multi-laser systems, if a specific laser was assigned to individual z-segments, then an error message like this often occurred during task export:

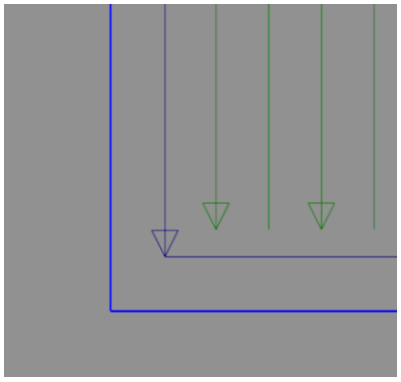
  

  The problem is fixed.
- Item 165534: The overlap functions specify layer-wise varying positions for the scan field boundaries, thereby increasing bonding for parts that are exposed by more than one laser. The Randomized overlap function is also designed to generate positions for the scan field boundary that are as different and unpredictable as possible from layer to layer, in order to avoid a visible overlap on the part surface. Nevertheless, the Randomized function is deterministic at its core to ensure repeatability of process results.
  If the Randomized overlap function is used in jobs with modified layer thickness (e.g., 20µm exposure sets in a 40µm material set), then it is no longer guaranteed that the scan field boundary in successive layers is positioned in a seemingly unpredictable manner, and distinct patterns may then emerge which also manifest themselves as a visible overlap on the part surface.
  This problem is of numerical nature and cannot be solved in a way that guarantees that the scan field boundary for arbitrary layer thicknesses within the same job will be at seemingly random positions. Therefore, a new overlap function Randomized2 was introduced that uses an actual pseudorandom number generator with constant seed. This ensures that the position of the scan field boundary is always truly pseudo-random, yet deterministic, regardless of the layer thicknesses used in the job. With this approach, however, it may happen that the scan field boundaries in some successive layers happen to be very close to each other.
  Therefore, we still recommend using the Randomized overlap function in most cases. Only in exceptional cases, when working with adjusted layer thicknesses and if patterns in the overlap emerge as a result, should Randomized2 be used.
- Item 169106: If exposure sets with pulsed wave emission were used in a job, but the target system did not support pulsed wave emission, the task could still be exported, but the target system would then expose with continuous

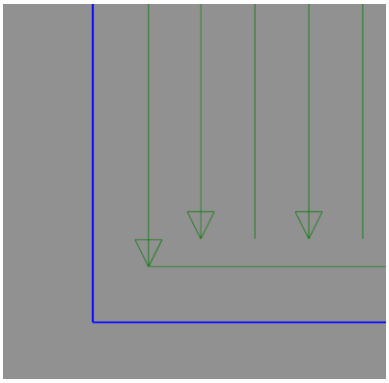
wave. The problem has now been fixed so that the attempt to export to a system that does not support pulsed wave emission is prevented with an appropriate error message.

- Item 170564: In Automatic Mode on EOS M 300-4 or EOS M 290-2 in combination with the scan field layout Swimlanes or Quadrants and exposure patterns with long vectors (e.g., NoPattern or Stripes with high stripe width) it could happen that the calculation time for preview, building time estimation and task export increased extremely and even the impression could arise that the application was frozen. The problem has been fixed.
- Item 128174: In previous versions, it was not possible to drag a part in the part list and drop it into a collapsed group. This is now possible.
- Item 153906: When repeatedly segmenting a part at the same position, two "empty segments" of zero z-extent were added with each click on APPLY. This problem is now fixed.
- Item 153976: On multi-laser systems, if you moved a part with manual laser assignment into an existing group whose parts also had manual laser assignment, then the group's laser assignment icon was not updated. Example: a group contains parts all assigned to laser 1, then you move a part assigned to laser 2 into the same group. The icon of the group should then be changed to M (for Multiple) - but this did not happen. The problem is fixed.
- Item 155735: The context menu entries **Set Invisible**, **Set Visible**, **Go To First Layer**, **Go To Last Layer**, and **Delete** were also selectable for segments, but remained without function. These context menu items are now disabled and grayed out to indicate that they are not applicable to segments.
- Item 156496: On the HATCHCORE page in the parameter editor, the Defocused setting was missing (only available for EOS M 290). The setting has been added.
- Item 156818: In previous versions it could happen that contour vectors in some layers were drawn in blue instead of green, which does not correspond to the EOSPRINT classic color scheme. The vectors are now drawn in the correct color.

Before EOSPRINT 2.12



EOSPRINT 2.12



- Item 156864: Although the total estimated building time displayed by the *BUILDING TIME* window was correct, the **Exposure Time per Layer** chart (only available with EOSPRINT Premium) always displayed perfectly utilized lasers if **Automatic Mode** was enabled on EOS M 300-4 or EOS M 290-2. This was the case even when the workload was obviously not well balanced. The problem is now fixed.
- Item 158163: After starting EOSPRINT any occurring balloon messages (e.g. "The loaded Material Set was migrated ...") were not displayed until switching forth and back between the windows of EOSPRINT and another (arbitrary) application. With this fix balloon messages of EOSPRINT are displayed unconditionally.
- Item 158580: The part position was not updated in the **PART PROPERTIES** after moving parts. This is now fixed.
- Item 158748: Sporadically it could happen that the collision check reported only one of two colliding parts as colliding. This problem has been fixed.

- Item 158952: For the machine type EOS M 290-2, the manual laser assignment was not possible via context menu as the menu entries were disabled. Manual laser assignment was only possible via the laser assignment icons in the elements view. This is now fixed.
- Item 159158: When closing the application, it could happen that the Eos.Eosprint.exe process hung and continued to run in the background (without user interface). The problem is fixed.
- Item 161298: When copying a group, according to **PART PROPERTIES** all parts within the new group had ID 0. This was wrong, because 0 is not a valid part ID (all part IDs start at 1) and because each part must have a unique part ID. The problem is fixed.
- Item 162449: Machine type Integra P 450 allows scan speeds of up to 12,700 mm/s. Previously, it was possible to set such high scan speeds for Integra P 450, but values above 6,000 mm/s no longer affected the build time calculation. This is now fixed.
- Item 168430: When activating the Process End Height in the *BUILD SETTINGS* window, the Process Start Height was automatically deactivated. The problem is fixed.
- Item 147643: In the diagram that allows configuration of the Power Reduction factor for Energy Input Homogenization, in some cases a small section of the diagram was cut off so that it was not fully visible. The problem has been fixed.
- Item 153153: There were sporadic cases in which icons in the user interface overlapped with vertical scrollbars. The problem is now fixed.
- Item 154040: When exporting a custom material set, the default file path for saving was an odd looking temporary folder. The default location is now the user's Documents folder.
- Item 157824: Trying to delete an exposure set that is assigned to at least one part results in an error message that states the total number of parts or segments that still have this exposure set assigned. In earlier versions this reported number could sometimes be higher than the actual number of parts or segments that still have this exposure set assigned. Now the correct number is displayed in all cases.

New Functions

- Item 133769: The Energy Input Homogenization methods Power Reduction and Minimum Vector Time can now be combined so that Power Reduction will only be applied to vectors that are not already affected by the Minimum Vector Time. This allows for increased build rates without having to sacrifice part quality.
- Item 136800: Laser Center Optimized Vector Scanning is a groundbreaking new scanning strategy that enables higher build rates as well as increased homogeneity of part properties across the entire building area.
- Item 150287: A new region **LAYER INFO** shows detailed exposure times for the currently selected layer (EOSPRINT Premium only).
- Item 151245: The geometry file format 3MF is now supported in its core specification.
- Item 109929: EOSPRINT keeps a temporary copy of the current job and all changes. When disaster strikes and EOSPRINT is restarted after having terminated unexpectedly, it will now offer to restore the last session.
- Item 55826: Connecting to machines and downloading their configuration data may appear a little bit faster now.
- Item 142983: Since version 2.5, EOSPRINT automatically reduces the meshes of part geometries in order to render them faster if necessary and thus ensure the usability of the application. The precision of the printed part is unaffected by this behavior.
  With complex parts, the mesh reduction could go so far that only boxes were rendered - in some situations, however, this behavior was distracting. Therefore, it is now possible to set the Minimum Level of Detail for the 3D rendering via the newly introduced **Settings** dialog box. The default has been set so that box renderings no longer occur.

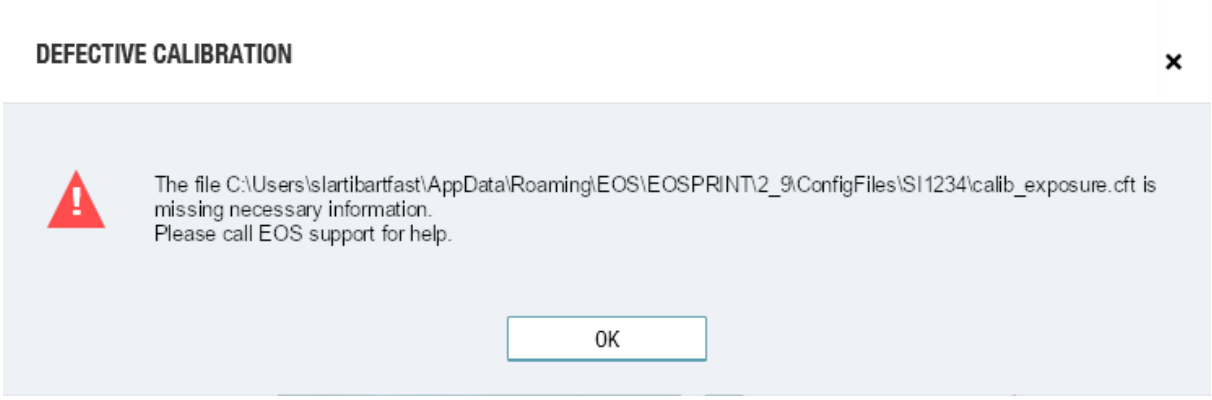
EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

- Item 153493: The *REFERENCE POINT* window has been revised. In particular, the grid on which various points on the part's base plate could be selected has been replaced by the most frequently selected options "Bounding Box: Center" and "Bounding Box: Bottom-Front-Left".
- Item 119670: The classification of parts as support or solid can now be changed manually via the **Part Info** area. This also affects copies of the same geometry within the same job, if applicable. It also enforces consistent exposure set assignment, so that support exposure sets are assigned only to support geometries and solid exposure sets are assigned only to solid geometries.
- Item 134431: In order to compare the exposure of two different job configurations, it is often necessary to have the 3D area configured identically in two separate EOSPRINT instances: the same layer, the same preview settings, looking at the same screen section, etc. To facilitate this, the Viewport has been introduced: Copy the viewport via the context menu in the 3D area and transfer it to another EOSPRINT instance to establish the exact same screen section in this instance as well.
- Item 160407: The Exposure Pattern presets ("Chess Quality", "NoPattern Speed" etc.) in the parameter editor were found to be of minor applicability and were thus removed in favor of clarity and transparency. Jobs created with previous versions of EOSPRINT that use such presets can still be built and the presets will still be applied.
- Item 150643: In the 3D view of EOSPRINT the so-called base plate was a rectangular surface that represents the maximum dimensions of a complex part in the X and Y direction on the building platform. For increased clarity the base plate was now replaced with an orthographic shadow of the part.
- Item 153465: For safety reasons the lower limits of the parameters for the recirculating filter system (RFS) version 2.0 and higher on EOS M 400-4 and EOS M 300-4 had to be changed. The parameters of customer material sets will be adjusted accordingly, if necessary. In this case a warning message will be issued and the values for 'Differential Pressure' and 'Gas Flow' must be checked in the workflow step **EXPOSURE** in the window *PROCESS SETTINGS* below the expander Machine Settings section 'Recirculating Filter System'.
- Item 160977: Shrinkage Compensation is now available for Integra P 450.
- Item 161580: The user interface now enforces consistent exposure set assignment, so that support exposure sets can only be assigned to support geometries and solid exposure sets can only be assigned to solid geometries.
- Item 163774: Automatic Mode for EOS M 300-4 and EOS M 290-2 is no longer experimental.
- Item 166590: EOS P 500 running HCS 2.15 (from software edition 11/21) requires a specific set of parameters for 2-roller-recoaters. With HCS 2.16 (from software edition 05/22) support for 3-roller-recoaters has been added. Therefore, EOS P 500 material sets of earlier versions are no longer compatible with the new ones. Accordingly, it is no longer possible to export with EOSPRINT 2.12 to EOS P 500 systems running an HCS version earlier than 2.16.
- Item 155389: The calculation time for jobs with very many parts (order of magnitude > 1000 parts) has been reduced.
- Item 161755: For technical reasons, every scan path must be divided into a number of discrete steps of constant duration. The smaller the duration of these steps, the more precisely the scan speed of a vector can be controlled. However, the number of time steps per vector is limited, so that in some cases a higher step duration must be set than the lowest supported by the scanner hardware. In the worst case, the effective exposure time of a vector can therefore deviate from the nominal exposure time by up to $\pm$140 µs. The scan path is neither shortened nor lengthened hereby and the time deviation is evenly distributed over the entire length of the vector, thus manifesting itself only in a slightly changed scan speed, not in a delay time at the beginning or end of the vector. But because the time deviation is absolute, it has a greater effect on short distances than on long ones. In unfavorable extreme situations, such as a scan path of only 0.1 mm length at the minimum scan speed of 50 mm/s, the deviation of the actual scan speed from the set scan speed can therefore reach up to 4%. However, with usual scan speeds and usual vector lengths the deviation is far below one per mil.
  In earlier versions of EOSPRINT, the step duration was determined solely on the basis of the set scan speed. As of this version of EOSPRINT, the vector length is also taken into account when calculating the optimum step duration. As a result, the scan speed can now be controlled more precisely for short to medium-length vectors at low scan speeds.

Specifically, the improvement affects M290 systems at scan speeds below 691 mm/s, EOS M 300-4 systems below 786 mm/s, and EOS M 400 / EOS M 400-4 systems below 1,382 mm/s, respectively.
This change is relevant for the building process.

Known Behavior

- Item 172024: Tasks exported with EOSPRINT 2.11 or 2.12 to a machine system with RFS 2 cannot be built there if the target system uses HCS 2.14 or earlier. As a workaround, the machine systems can be updated to HCS 2.15 or newer or you can export using EOSPRINT 2.10 or earlier. The problem is expected to be solved with EOSPRINT 2.13 (Software Edition 11.23).
- Item 97046: If a part is loaded in CLI format and there are gaps between the slices defined by this CLI, then when sliding through the part in the **PREVIEW** workflow, a gray contour is also displayed in the gaps. This only occurs in the preview - no actual exposure will be applied in this case.
- Item 118091: When EOSPRINT is started over a connection that is a chain of Citrix Cloud Desktop and Remote Desktop it might happen, that changing the size of the cloud desktop causes an error in EOSPRINT. As a consequence, it is possible that EOSPRINT can't be restarted.
  In this case the Remote Desktop connection has to be closed and started again. Afterwards EOSPRINT can be started again.
- Item 136044: In EOSPRINT 2.4 as well as in earlier 2.x versions, fine tuning parameters such as the global beam offset and the X/Y scaling could not be set machine-specifically. As a workaround, the fine tuning parameters were set via EOSPRINT 1. EOSPRINT 2 then merged these parameters stored on the machine with the default jobs into machine-specific material sets.
  Since EOSPRINT 2.5, machine-specific fine tuning parameters are no longer merged with the material sets. Machine-specific material sets and jobs based on such material sets can still be loaded in EOSPRINT 2.5 and newer. In rare cases, however, problems may occur and the loading is aborted with an error message indicating a defective calibration:



If you experience this problem, please contact the EOS service hotline and refer explicitly to this release note.

- Item 136858: The material sets for materials 1.2709 and 254 on EOS M 290 use an advanced downskin algorithm. This algorithm results in more time consuming calculations which affect task creation, preview and building time calculation.
- Item 139314: If automatic mode is activated in the *PROCESS SETTINGS* window for EOS M 300-4, and the scan field layout "Full Overlap" is selected and the laser retention "One Laser per Part" is selected, then the laser assignment is not determined on the basis of the laser utilization, but instead each part is assigned to the laser that is closest to the

center of the part bounding box.

- Item 140147: If Absolute Positioning is activated, the MULTIPLY tool does not take existing positioning points into account.

- Item 142489: Installation
  The user settings are not carried over to the new version. This means that machine connections must be carried over manually after installation as well as imported custom material sets.

- Item 142491: EOSPRINT 2.0 OpenJz-Files
  OpenJz files that were created with EOSPRINT 2.0 can no longer be loaded directly into versions of EOSPRINT greater than 2.7. In this case the OpenJz file should be loaded with EOSPRINT 2.7 and saved again. Afterwards the OpenJz file can be loaded in newer EOSPRINT versions.

- Item 142492: Performance limitations may occur on loading very large, complex parts as well as on loading a very large number of parts. Complex parts are consciously not fully rendered, instead they are shown in lower quality.

- Item 142493: The function for exporting parts in the .sli file format does not work for support geometries.

- Item 142495: When a single layer task export with Position Contour (Window EXPORT TASK – Single Layer Position Contour) for a part that uses an exposure set with a different layer thickness than the exposure set Position Contour is started, it might happen that an error message occurs. In this case the layer thickness of exposure set Position Contour has to be adapted.

- Item 142501: Remote desktop
  When starting EOSPRINT 2 via a remote desktop connection the Windows operating system selects an unfavorable driver for the initialization of the OpenGL context. This driver implements an outdated version of the OpenGL API and therefore does not work with EOSPRINT 2. EOSPRINT 2 has no influence on which driver is selected by the operating system.
  As a result, EOSPRINT 2 cannot be started over a remote desktop connection and the following error message is displayed:

  "Wrong OpenGL version: Installed version is 1.1, minimum required version is 3.3".

  To run EOSPRINT 2 over a remote desktop connection, there are three possibilities:

  1. For Nvidia GeForce graphics cards there is the possibility to download a tool that enables OpenGL support for remote desktop connections. The tool only works with Nvidia GeForce GPUs with R440 driver or newer. To download the tool a Nvidia developer account is required. See https://developer.nvidia.com/nvidia-opengl-rdp
  2. The application can be started in software rendering mode via the batch script swrender.cmd stored in the EOSPRINT 2 installation directory. The disadvantage of this solution is that in this case no hardware acceleration can be used, which leads to a significantly reduced speed, usability and graphic quality.
  3. The OpenGL driver is only selected when the application is started. Therefore, by starting EOSPRINT 2 before starting a remote desktop session, EOSPRINT 2 can be used with hardware acceleration. To also enable the start of the application via remote desktop you can write a script that ends the current RDP session and then starts EOSPRINT 2. This script can be executed via RDP, which first closes the connection and then starts EOSPRINT 2. If you connect via RDP again, EOSPRINT 2 is running with hardware acceleration.

- Item 142503: Loading CLI files:
  To ensure CLI files (ASCII and binary) will be loaded successfully and processed correctly, the following points must be considered:
  To create an empty layer, define a closed POLYLINE with zero area, inside the XY bounding box of the actual geometry. Defining a layer without any geometry command will lead to incorrect z heights of geometry data. Defining an empty layer this way does not affect exposure.
  EOSPRINT 2 does not support coordinate values (X/Y/Z) greater than 655.35 mm (after the raw value has been

multiplied with the value specified in the UNITS command).

- Item 156819: Jobs that were prepared with EOSPRINT 2.10 or earlier for export to an EOS M 100 system may suffer from powder outage in layers with external support (see Known Behavior item #140415 from release notes on EOSPRINT 2.10). The problem lay in the EOS M 100 material sets. It has been fixed for all material sets distributed with EOSPRINT 2.11, but jobs that were prepared with EOSPRINT 2.10 or earlier still contain the bad material sets and thus still have the problem. When loading such jobs in EOSPRINT 2.11 make sure to select the newest version of the material set from the "Material Sets" drop down list. This will resolve the issue - however, it will also drop all user changes that were applied to the predecessor material set.

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

Version 2.11.1386.0

Overview of version compatibility with EOSYSTEM

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2.7	possible, but not tested	possible, but not tested	possible, but not tested
2.6	possible, but not tested	possible, but not tested	possible, but not tested
2.5	possible, but not tested	possible, but not tested	possible, but not tested

supported: These software combinations are officially supported and were thoroughly tested. The cells with bold letters mark EOSYSTEM & EOSPRINT versions that were released with the same edition. The edition is specified in parentheses.

possible, but not tested: These software combinations are technically possible but were not tested and may therefore not be considered officially supported.

not possible: These software combinations are not possible, because EOSPRINT 2 rejects connections to EOSYSTEM versions more recent than itself.

Overview of version compatibility with EOSTATE Exposure OT

EOSTATE Exposure OT Version	EOSPRINT Version 2.11	EOSPRINT Version 2.10	EOSPRINT Version 2.9
1.8	**M 290, M 300-4, M 400-4 (Ed. 11.21)**	not possible	not possible
1.7	not possible	**M 290, M 300-4, M 400-4 (Ed. 05.21)**	M 290, M 300-4, M 400-4
1.6	not possible	not possible	**M 290, M 300-4, M 400-4 (Ed. 11.20)**
1.5	not possible	not possible	not possible
1.4	not possible	not possible	not possible
1.3	not possible	not possible	not possible

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

Overview of version compatibility with EOSTATE MeltPool

EOSTATE MeltPool Version	EOSPRINT Version 2.11	EOSPRINT Version 2.10	EOSPRINT Version 2.9
2.5	**M290, M300-4, M400-4 (Ed. 11.21)**	not possible	not possible
2.4	not possible	**M290, M300-4, M400-4 (Ed. 05.21)**	M300-4, M400-4
2.3	not possible	not possible	**M300-4, M400-4 (Ed. 11.20)**
2.2	not possible	not possible	not possible
2.1	not possible	not possible	not possible
2.0	not possible	not possible	not possible

Overview of version compatibility with EOSTATE PowderBed

EOSTATE PowderBed Version	EOSPRINT Version 2.11	EOSPRINT Version 2.10	EOSPRINT Version 2.9
2.2	**M290, M300-4, M400, M400-4, P500 (Ed. 11.21**	not possible	not possible
2.1	not possible	**M290, M300-4, M400, M400-4, P500 (Ed. 05.21)**	not possible
2.0	not possible	not possible	**M290, M300-4, M400, M400-4, P500 (Ed. 05.21)**

Overview of Material Set Changes

Affected Systems	EOS M 100, EOS M 290 400W, EOS M 300–4, EOS M 400-4

New Material Sets

System	Process product name	Version	Description
EOS M 290	Al2139AM_060_CoreM291	1.00	**Initial:** Enables job builds with material "EOS Aluminum Al2139AM" in 60µm layer thickness on EOS M 290 systems.
EOS M 290	H13N2_040_CoreM291	1.00	**Initial:** Enables job builds with material "EOS ToolSteel H13N2" in 40µm layer thickness running Nitrogen as inert gas on EOS M 290 systems.
EOS M 290	Haynes282_040_080_CoreM291	1.00	**Initial:** Enables job builds with material "EOS NickelAlloy Haynes® 282®" in 40µm and 80µm layer thicknesses on EOS M 290 systems.
EOS M 300-4	316L_040_080_CoreM304	1.00	**Initial:** Enables job builds with material "EOS StainlessSteel 316L" in 40µm + 80µm layer thicknesses on EOS M 300-4 systems. The material set includes additional exposure sets for "SkinCore" applications as well as laser dependent (L1+L2 and L3+L4) part assignment.
EOS M 300-4	IN625_040_CoreM304	1.00	**Initial:** Enables job builds with material "EOS NickelAlloy IN625" in 40µm layer thickness on EOS M 300-4 systems.

Updated / Replaced Material Sets

Machine type	Process product name	Version		Description
		new	previous	
EOS M 100	316L_020_FlexM100	2.03	2.02	**Update:** Compensation of insufficient powder amount calculation in exposure sets when layer thickness is a multiple of the general layer thickness by including SkipLayer functionality.
EOS M 100	CoCr_030_DevM100	1.10	1.00	**Update:** Compensation of insufficient powder amount calculation in exposure sets when layer thickness is a multiple of the general layer thickness by including SkipLayer functionality. Enables the usage of cone supports by including new exposure sets "_Default_SingleContourSupport" and "_Default_DoubleContourSupport".
EOS M 100	CPM00647_020_Platinum-Ruthenium	1.02	1.01	**Update:** Compensation of insufficient powder amount calculation in exposure sets when layer thickness is a multiple of the general layer thickness by including SkipLayer functionality.
EOS M 100	CPM11889_020_18KtYellow3N-KK	1.02	1.01	**Update:** Compensation of insufficient powder amount calculation exposure sets when layer thickness is a multiple of the general layer thickness by including SkipLayer functionality.
EOS M 100	SP2_020_DentalM100	1.12	1.11	**Update:** Compensation of insufficient powder amount calculation in exposure sets when layer thickness is a multiple of the general layer thickness by including SkipLayer functionality and updating support parameters. Removal of support exposure set with identical layer thickness as Infill exposure set. Version 111 not included in serial software.
EOS M 100	SP2_030_DentalM100	1.31	1.30	**Update:** Compensation of insufficient powder amount calculation in exposure sets when layer thickness is a multiple of the general layer thickness by including SkipLayer functionality. Removal of support exposure set with identical layer thickness as Infill exposure set.
EOS M 100	Ti64_020_FlexM100	1.10	1.01	**Update:** Compensation of insufficient powder amount calculation in exposure sets when layer thickness is a multiple of the general layer thickness by including SkipLayer functionality. Enables the usage of cone supports by including new exposure sets for "DoubleContourSupport".
EOS M 100	W1HiDo_020_FlexM100	1.01	1.00	**Update:** Compensation of insufficient powder amount calculation in exposure sets when layer thickness is a multiple of the general layer thickness by including SkipLayer functionality.
EOS M 100	XSP3_020_CoreM100	1.02	1.01	**Update:** Compensation of insufficient powder amount calculation in exposure sets when layer thickness is a multiple of the general layer thickness by including SkipLayer functionality and updating support parameters. Removal of support exposure set with identical layer thickness as Infill exposure set. Version 101 not included in serial software.
EOS M 100	XSP3_030_CoreM100	1.01	1.00	**Update:** Compensation of insufficient powder amount calculation in exposure sets when layer thickness is a multiple of the general layer thickness by including SkipLayer functionality and updating support parameters. Removal of support exposure set with identical layer thickness as Infill exposure set.
EOS M 290	Cu_020_CoreM291	1.01	1.00	**Update:** Modification in vector sorting algorithm for more efficient time optimization in "Exposure Pattern" "No Pattern" when using Up-Skin exposure.

EOS M 290	20MnCr5_040_CoreM291	1.01	1.00	**Update:** Safety relevant adjustment of the lower limit of "Differential Pressure" for "Recirculating Filter System (1.X)" according to Item 105766 in EOSPRINT Software release version 2.10.1715.
EOS M 300-4	AlSi10Mg_060_CoreM304	1.03	1.02	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0. Version 102 not included in serial software.
EOS M 300-4	IN718_040_CoreM304	1.02	1.01	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0.
EOS M 300-4	MS1_050_CoreM304	1.02	1.01	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0.
EOS M 300-4	Ti64_060_CoreM304	1.02	1.01	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0.
EOS M 400-4	20MnCr5_040_CoreM404	1.01	1.00	**Update:** Increasing the change interval of the particle collector bin, adjustment of "Gas Flow" velocity and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0 as well as adjustment of the lower limit of "Differential Pressure" for "Recirculating Filter System" by using Recirculating Filter System version 1.0 according to Item 105766 in EOSPRINT Software release version 2.10.1715.
EOS M 400-4	316L_040_080_CoreM404	1.11	1.10	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0.
EOS M 400-4	316L_040_FlexM404	1.01	1.00	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0.
EOS M 400-4	AlSi10Mg_030_FlexM404	1.01	1.00	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0.
EOS M 400-4	AlSi10Mg_080_HiProM404	1.01	1.00	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0.
EOS M 400-4	AlSi10MgAr_040_CoreM404	1.02	1.01	**Bugfix:** Enables a correct passivation behavior by using Recirculating Filter System version 2.0. **Update:** Modification in vector sorting algorithm for more efficient time optimization in "Exposure Pattern" "No Pattern" when using Up-Skin exposure. Safety adjustment of the lower limit of "Differential Pressure" for "Recirculating Filter System" by using Recirculating Filter System version 1.0 according to Item 105766 in EOSPRINT Software release version 2.10.1715, increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0.
EOS M 400-4	HX_040_FlexM404	1.11	1.10	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0.
EOS M 400-4	IN718_040_FlexM404	1.11	1.10	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0.
EOS M 400-4	IN939_040_CoreM404	1.01	1.00	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0.

EOS M 400-4	MS1_040_FlexM404	1.01	1.00	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0.
EOS M 400-4	Ti64_060_FlexM404	1.01	1.00	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0.
EOS M 400-4	Ti64Grade5_040_080_CoreM404	1.02	1.01	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0. Safety adjustment of the lower limit of "Differential Pressure" for "Recirculating Filter System" by using Recirculating Filter System version 1.0 according to Item 105766 in EOSPRINT Software release version 2.10.1715.
EOS M 400-4	Ti64Grade23_040_080_CoreM404	1.02	1.01	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0. Safety adjustment of the lower limit of "Differential Pressure" for "Recirculating Filter System" by using Recirculating Filter System version 1.0 according to Item 105766 in EOSPRINT Software release version 2.10.1715.
EOS M 400-4	TiCP_030_FlexM404	1.01	1.00	**Update:** Increasing the change interval of the particle collector bin and safety relevant adjustment of the lower limit of "Gas Flow" for "Recirculating Filter System" by using Recirculating Filter System version 2.0.

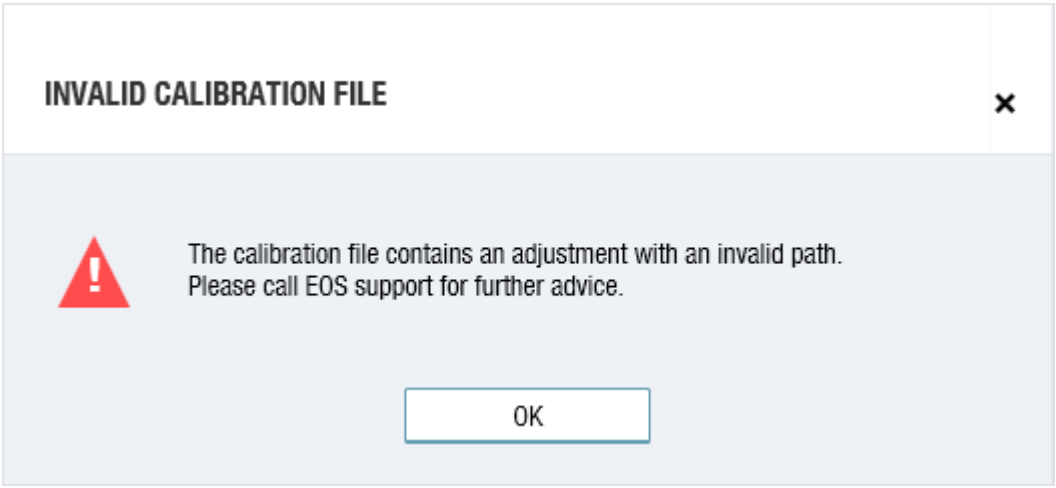
Important Information

- EOSPRINT 2 only supports 64-bit operating systems
- If EOSPRINT 2.11 is to be installed on systems on which EOSPRINT 2.0 or EOSPRINT 2.1 was already installed, a new license must be requested from EOS before installation.
- **EOSPRINT 2.10 was the last version that is tested with Microsoft Windows 7. Subsequent EOSPRINT versions may still work with Windows 7, but this is in no way guaranteed.**

Solved Items

- Item 148459: In earlier versions, tasks that were exported to machine systems of type FORMIGA P 110 FDR or EOS M 100 could have been corrupted during the transfer. This would then lead to the machine software freezing or crashing when loading the task on machine side or even to a crash while building. Tasks that were completely built on these systems are not affected by the issue. The problem is now fixed.
- Item 153714: Some of the building process parameters in a material set can be set machine-specifically via the UPLOAD FINE TUNING dialog. E.g. Global Beam Offset (GBO) and Scaling. Which parameters can be set machine-specifically is defined by the respective material set. The machine-specific fine tuning values are stored on the target machine with a unique key. This key is not visible to users.

  For some material sets, the key was not unique. Therefore, when selecting a material set while connected to a specific target machine that already had fine tuning values for another material set with the same key as the selected one, the following error was reported:



The problem was fixed by replacing the key of the affected material sets with a unique key. The following material sets were affected:
254_040_CoreM291 1.00
254_060_CoreM291 1.00
Ti64Grade23_040_HiPerM291 1.00
Ti64Grade23_080_CoreM291 1.00
Ti64Grade5_040_HiPerM291 1.00
Ti64Grade5_080_CoreM291 1.00

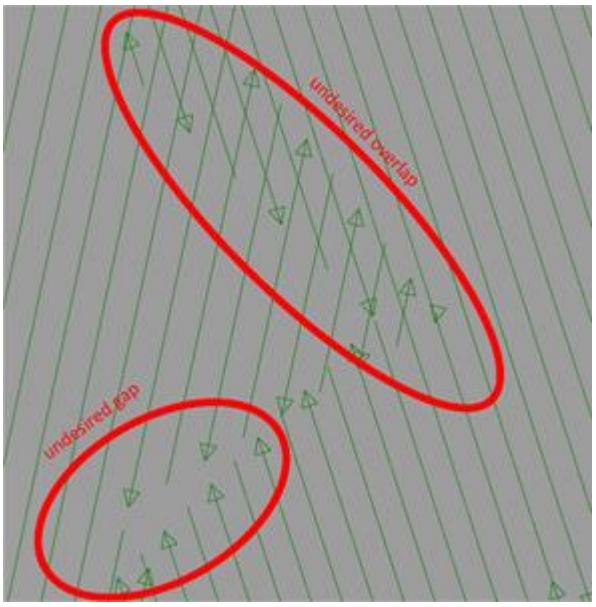
- Item 139607: No scan vectors were generated for parts with a part-specific beam compensation that nullifies the global beam compensation. With this fix, scan vectors will also be generated in this case.
- Item 141184: The Power Reduction feature for Energy Input Homogenization is configured by specifying the gradient of laser power for hatching vectors shorter than a full stripe width. Specifying a grid point at *n* mm hatch length in the gradient chart and then reducing the stripe width to less than *n* mm would lead to a crash of EOSPRINT when opening the Exposure Set Library the next time. This has been fixed. Jobs that were affected by this issue are fully functional in EOSPRINT 2.11.
- Item 148555: Occasionally, the program terminated without any error message during preview generation for Jobs with approximately 500+ unique parts (i.e. no part copies). The exact number of parts for which the bug occurred depended on both the job layout and the layer sequence of the generated previews. This problem has been fixed.
- Item 148710: EOSPRINT introduces very small delays at certain points in the exposure to compensate for the scanner's tracking error. In previous versions, these delays were not taken into account when estimating the building time. Each delay is only a few µs, but since there can be many such delays per layer, the times can add up. The problem has been fixed, and thus the estimated building time is now more accurate.

  The change may also affect the Minimum Vector Time feature used for energy input homogenization in stripe exposure. This feature predicts the exposure time of scan vectors in stripes using the same algorithms as the building time estimation and introduces delays if the user-defined minimum vector time is underrun. Since not all existing delays were considered in the building time estimation, the realized minimum vector time could be a few µs longer than specified by the user in the parameter editor. In general, this resulted in a slightly lower energy input than intended. Due to the now correct estimation of the exposure time, the minimum vector times and thus also the energy input match the values defined by the user.

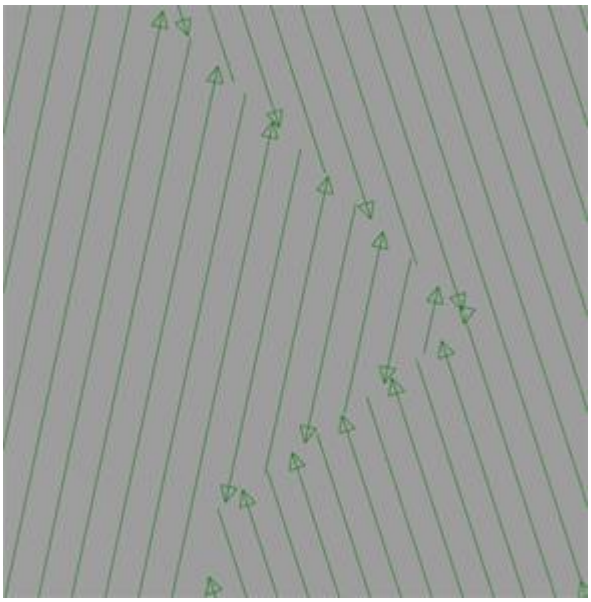
  This change is relevant to the building process. EOS considers the differences to be negligible, but no guarantee can be given for this.

- Item 139832: In previous versions, when using exposure type Core, undesired exposure gaps and/or exposure overlaps could occur at the seams between skin and core if layer skipping was activated and/or the bottom of STL geometries was not positioned at an exact multiple of its assigned layer thickness:

Before EOSPRINT 2.11



EOSPRINT 2.11



This has been fixed.

- Item 153350: In previous versions, warnings were issued during building time estimation as well as during task creation if the calculated exposure time of a layer exceeded a certain threshold. A separate warning was issued for each layer where the exposure time exceeded the threshold.
  Apart from the occurrence of the message itself, the behavior of the software was correct, i.e. the result of building time estimation and task creation was correct. However, the warning itself was unjustified and has therefore been removed completely.
- Item 153975: In earlier versions, when moving parts or groups from one group to another via drag & drop in the part list, this could cause EOSPRINT to crash. This is now fixed.
- Item 154858: A click on the **UPLOAD** button in the UPLOAD FINE TUNING dialog triggered an upload, even if some of the specified values were invalid. In fact, the invalid values were not accepted. Despite this, the dialog was closed and a balloon message was displayed indicating a successful upload and thus, giving the user the impression that his changes had been applied. When reopening the dialog, the currently effective values were displayed.

  Now the **UPLOAD** button is disabled as long as one of the values in the UPLOAD FINE TUNING dialog is invalid.
- Item 159583: When preparing tasks for machines calibrated with the EOSCalib software, EOSPRINT 2.10 did not take into account the rotational component of the calibration. The rotational component of the calibration was always set to zero in this case. This issue has now been fixed.
- Item 156975: In the Process Settings dialog of EOS M 290, the settings for 'Recoating' and 'Move to dosage' position were interchanged. I.e., the edit field labeled 'Recoating' set the speed for 'Move to dosage position' and vice versa. This has been fixed.

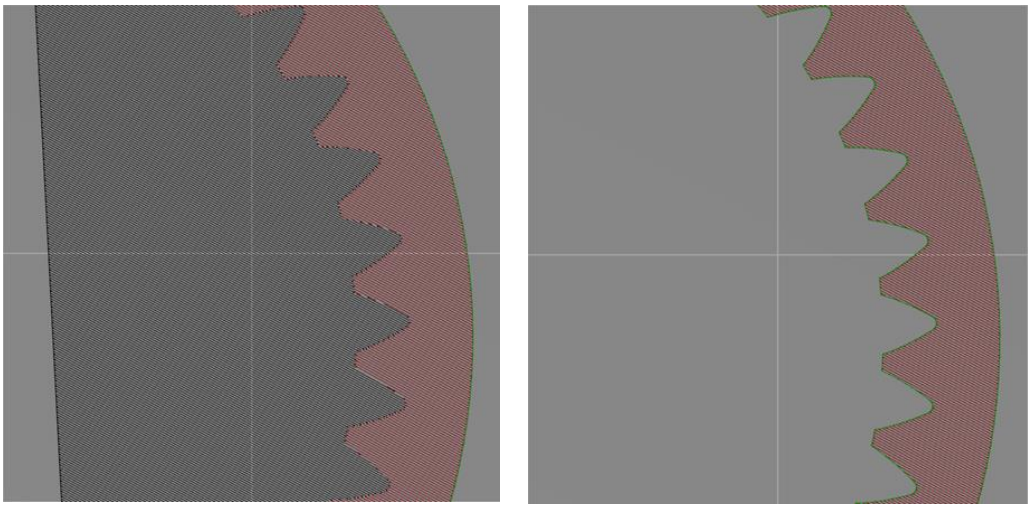
- Item 83509: If an STL contained complex vertices or edges this could lead to display errors in 3D. The exposure and final print were not affected. The problem persists, but now the tool **Check for Errors** will detect such problems and indicate it with an appropriate warning.
- Item 93975: Dragging a selection frame in the 3D view selects parts that are (partially) inside the selection frame. As long as the mouse button is not released, this selection is preliminary and any change to the size of the selection frame will change the selection accordingly.

  Pressing the CTRL key while selecting parts as described above should modify an existing selection so that parts which were previously deselected are selected and parts which were previously selected are deselected. However, the latter did not work. Any part selected with a selection frame while holding down the CTRL key remained selected even if the size of the selection frame was reduced so that the part lay completely outside. The selection now works as intended.
- Item 94622: In earlier versions, when expanding or collapsing a group in the part list by clicking on the arrow button to its left this would also select the group. The group is no longer selected in this case.
- Item 114399: If connected with an EOSPRINT Server the EOSPRINT Server Status dialog lists all recent jobs that were processed by that server. If the list is long, a vertical scroll bar appears.

  In earlier versions this scroll bar scrolled the whole dialog content including input fields and table headers instead of only the job list. Now only the table content is scrolled.
- Item 127231: In the UPLOAD FINE TUNING dialog, it was not possible to reset a value to N/A by pressing the **X** button if the currently entered value was invalid. The user had to enter a valid value first before pressing the **X** button. The **X** button now works as expected in all cases.
- Item 131369: In earlier versions, changing the name of a part in the part list was not considered a document change. Therefore, e.g., when closing the application or loading another job after having changed only the name of a part in an otherwise unchanged job EOSPRINT would not prompt the user to save his changes. This is now fixed.
- Item 134230: In earlier versions, when clicking **New Job** multiple times in rapid succession, EOSPRINT might sometimes freeze. This is now fixed.
- Item 134906: In very rare cases, when an STL geometry contained triangles with a z-extent of less than 10^{-5} mm, then it could happen that individual slices of the geometry were calculated incorrectly. The probability for this increased with the total number of such triangles as well as with decreasing layer thickness.

  As a result, the exposure was incorrect, too. However, in most cases, the defect was clearly visible in the preview, e.g., because it showed an unexpected exposure for areas outside of the actual geometry. See illustration below:

Before EOSPRINT 2.11 **EOSPRINT 2.11**



The problem has been fixed so that slicing is now correct even in the aforementioned cases. This change may influence the building process and thus the part quality.

- Item 136268: In earlier versions, when selecting an entry from the Part Info region the entry could not be copied via CTRL-C. Data was sent to the clipboard, but when inserting it (e.g. in Notepad), the entry's name was inserted twice instead of the entries name followed by the entries value (e.g., "Size Size" instead of "Size 8.03 MB"). This is now fixed.
- Item 136607: When loading multiple parts into EOSPRINT by dragging them from a folder and dropping them on the EOSPRINT window the part count underneath the part list would not update, thus showing the wrong number of parts. This is now fixed.
- Item 137518: Machine-specific fine tuning values such as Global Beam Offset (GBO) or Scaling affect the laser scan paths generated by EOSPRINT. Therefore, if these fine tuning values are modified after having exported a task to disk, then when trying to upload this task via **Export Existing Task**, a warning should be reported, that the machine configuration files of the selected machine have changed since the task was created. However, this warning was not reported. The problem has now been fixed.
- Item 137973: In rare cases when starting EOSPRINT or when clicking on UI controls in EOSPRINT an "Unhandled exception" error occurred with message "Collection was modified; enumeration operation may not execute".
  This error is now fixed.
- Item 138358: If automatic mode was activated in the PROCESS SETTINGS dialog for EOS M 300-4, and the laser retention "Several Lasers per Layer and Part" was selected, then it could happen, that the exposure type sequence defined by the assigned exposure set (e.g. DownSkin -> Infill -> Contour) was not respected. E.g., infill exposure could start before downskin exposure had been completed. This is now fixed.
- Item 138508: Uploading fine tuning values to a machine was not disabled when working with a machine flagged as 'Work Offline'. This has been fixed.
- Item 138913: Some of the process features that can be configured in the EOSPRINT parameter editor require machine support. When connected to a specific machine, EOSPRINT will check if it supports a feature and if it doesn't it will disable the corresponding user control. However, the generic machines (e.g., "EOS M 290" in contrast to "SI123") should always have all process features enabled.

  In earlier versions the 'Defocused' feature was disabled in all generic machines. This is now fixed.
- Item 138942: When selecting parts by clicking on them in the preview with single layer mode activated it could happen that instead of the clicked part a different part from an underlying layer was selected. This is now fixed.
- Item 140416: For the implementation of the software license protection, EOS uses the CodeMeter software from WIBU Systems. With version 7.20 of this software, WIBU Systems introduced a change to the so-called StationShare behavior, which resulted in EOSPRINT requiring license 101328:1039 twice per workstation instead of only once. The problem manifested in that EOSPRINT could be started, but when requesting a task export, a preview or a build time calculation, a missing license 1039 was reported.

  With CodeMeter version 7.21a the issue is resolved. EOSPRINT 2.11 automatically installs this version or updates an existing installation.
- Item 141584: When using the Z-direction overlap function *Randomized* several "Internal Error" events could occur while exporting a task or estimating the building time. The result of task creation and building time estimation was unaffected by these events.

  "Internal Error" events will no longer occur in EOSPRINT 2.11 when using Z-direction overlap function 'Randomized'.
- Item 141628: The Material Set *AlSi10MgAr_040_CoreM404 1.01* was missing in the list of material sets for machine type EOS M 400-4 machine. The missing material set has been added.
- Item 142490: In earlier versions when installing EOSPRINT the computer was restarted without the users consent after installing the Microsoft Redistributables. This no longer happens.

- Item 143264: Using a renamed or cloned Exposure Set led to internal errors if the new name had leading or trailing spaces. All leading and trailing whitespaces are now automatically stripped when renaming or cloning. This fixes the issue.
- Item 154312: In EOSPRINT 2.10 user defined exposure set colors were lost after restarting EOSPRINT. User defined exposure set colors are now retained.
- Item 143512: In earlier versions, changes to the color of an exposure set did not propagate properly to the color of cloned parts in the 3d view. This is now fixed.
- Item 144733: The commands "Go To First Layer" and "Go To Last Layer" from the context menu in the 3d view did not work as expected on parts that were cloned via "Multiply" or "Duplicate along X/Y-axis". For cloned parts these commands would go to the first or last layer of the cloned part, not the part on which the command was executed. This has been fixed.
- Item 147730: When grouping parts after a prior segmentation this could lead to an error with message "Object reference not set to an instance of an object". This has been fixed.
- Item 148575: Due to an error in the memory management for geometries, complex geometries could cause a very high memory consumption in earlier versions of EOSPRINT. As a result, the software crashed. This is now fixed.
- Item 148584: If a geometry was completely or partially below Z=0 mm in its original geometry coordinate system, then EOSPRINT automatically displaced it in Z during loading so that it was completely above Z=0 mm. No automatic displacement is applied any more.
- Item 153247: In previous versions the application could sporadically freeze on startup. Most part of the user interface was already displayed in this case, but the 3D area was still missing so that one could see, for example, windows or the desktop behind the EOSPRINT application. The application was unresponsive in this state. The problem has been fixed.
- Item 153518: The automatic grouping of parts and their supports caused an error with several parts/supports with names different only in the name extension (e.g. 'Box_p', 'Box_s' and 'Box_sup').
- Item 155841: EOSPRINT did allow to rename an Exposure Set to the name of another existing Exposure Set. This caused subsequent error messages and deactivation of hatch preview and task export. Now Exposure Sets have to be renamed to a unique new name.
- Item 121372: After setting all parts visible in a group that was set invisible, the group's visibility did not change from invisible to visible automatically. This has been fixed.
- Item 125506: In specific cases the glow that indicates part selection in the 3d view was not displayed or it was displayed in the wrong place. This is now fixed.
- Item 135224: For P systems it was not possible to scroll through the empty top layers of a job. This has been fixed.
- Item 137093: Clicking on an already selected part in the 3D view while holding down CTRL did not deselect the part. This is now fixed.
- Item 138368: When the input focus was on the layer slider, the Pos1/End keys did not correctly navigate to the first/last layer of the selected part. This has been fixed.
- Item 138431: When the input focus was on the part list, the Pos1/End keys did not correctly navigate to the first/last part. This has been fixed.
- Item 101230: When using SLI geometries sliced finer than the assigned exposure thickness (e.g. 20 µm slices for 40 µm exposure thickness), layer exposure had a consistent downward offset of one slice thickness unit:

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

If, for example, a part was placed on the build platform with zero z offset, instead of the expected mapping (SLI-layer [µm] -> job layer [µm])

`(40->40), (80->80), (120->120),` etc.,

the actual mapping was

`(20->40), (60->80), (100->120),` etc.

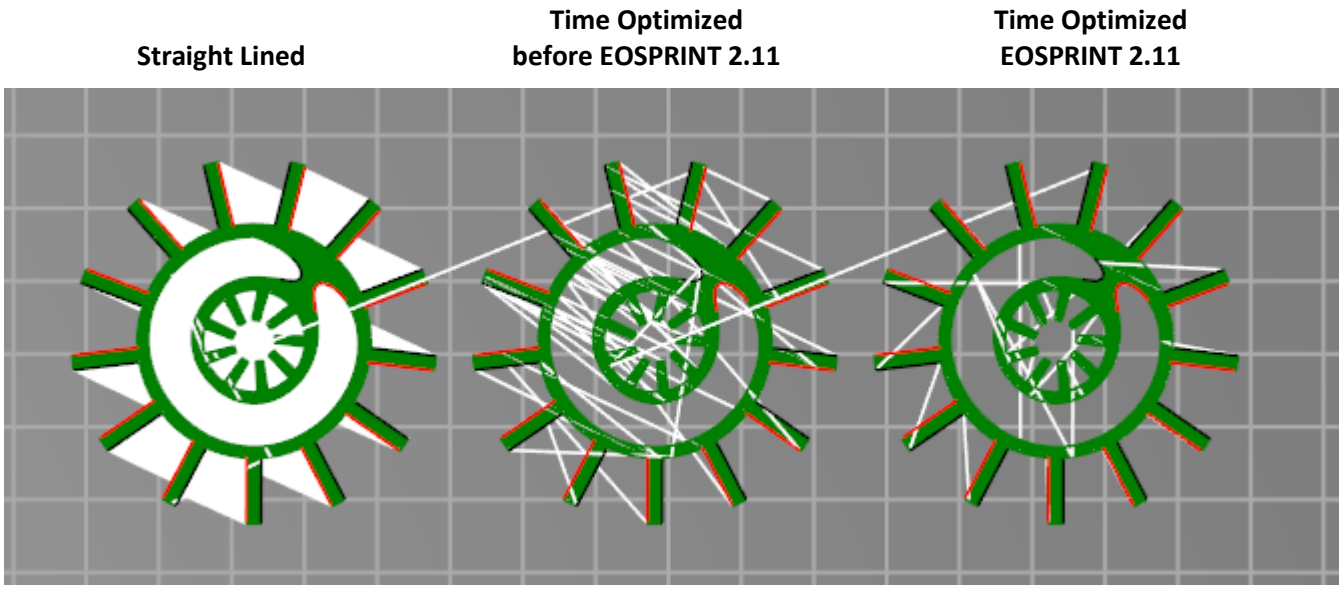
For CLI files sliced finer than the assigned exposure thickness a similar downward shift occurred, albeit not consistently over all layers. These issues have now been fixed.

- Item 134276: When connecting to machines of type EOS M 100 or FORMIGA P 110 FDR, the version of the machine software was not detected correctly. All systems were assumed to be using HCS 1.4.0.0, regardless of the actual version. The version of the machine software is now detected correctly.

New Functions

- Item 127768: EOSPRINT now supports the machine type EOS M 290-2.
- Item 133779: EOSPRINT now supports the machine type FORMIGA P 110 incl. Velocis. Requires HCS 1.10 or newer.
- Item 133764: Improvements to the Automatic Mode of EOS M 300-4:
  - Automatic scanfield adjustment maximizes the laser utilization for layouts Swimlanes and Quadrants. To use this feature, make sure you have disabled option "Manually Adjust Scan Field Size" under PROCESS SETTINGS / SCANNER SETTINGS.
  - Exposure Type Processing per part or per layer. Choose which one is best for your application: exposing infill, contour, edge of a part in one go, before moving on to the next part ("per part") or exposing the infill of all parts in a layer before exposing all contours and edges ("per layer").
- Item 133768: Pulsed Wave Emission is now available for all M systems running HCS 2.15 or newer.
- Item 126288: The Stacked Slide View collapses multiple columns of the parameter editor into one, making room for a bigger portion of the preview.
- Item 125965: When opening dialogs REFERENCE POINT, ABSOLUTE POSITIONING or HATCHING COORDINATE SYSTEM the corresponding reference point of each part will be rendered in the 3D view.
- Item 76871: A job's start and end process height can now be specified independently from each other. Earlier versions allowed only specifying both, start- and end process height, or neither.
- Item 107082: Manual Laser Assignment is now available for Z-segments, too.

- Item 116127: The exposure feature Time Optimized Hatch Sorting (available for Infill/Downskin/Upskin if Exposure Pattern is set to "No Pattern") has been improved to further reduce jump times:



  Note that jobs with material sets which were created with an earlier EOSPRINT version will retain their accustomed process behavior unless the user explicitly chooses to migrate to the new behavior. In order to do so, go to the corresponding parameter editor page in the Exposure Set Library and click on "Hatch Sorting: Time Optimized" even if it is already selected! This will migrate the job to use the new, improved algorithm.

- Item 147747: To reduce the number of clicks required for re-opening the most recently loaded job, the tool Open Recent Job will now pre-select it.

- Item 147039: EOSPRINT now supports connecting to remote machine systems through a NAT/VPN Gateway. No specific settings need to be applied for this - just connect as you would normally do.

Known Behavior

- Item 97046: If a part is loaded in CLI format and there are gaps between the slices defined by this CLI, then when sliding through the part in the PREVIEW workflow, a gray contour is also displayed in the gaps. This only occurs in the preview - no actual exposure will be applied in this case.

- Item 108380: When automatic mode is activated for EOS M 300-4, the EXPOSURE TIME PER LAYER chart displayed in the BUILDING TIME dialog does not reflect the actual laser utilization. In this case the workload distribution across the lasers appears better than it actually is.

  For a better understanding, this problem can be reproduced by placing differently sized parts in the four quadrants with automatic mode switched off. The imbalance is then correctly reflected by the EXPOSURE TIME PER LAYER chart. However, if you now switch on the automatic mode and set the scan field layout to quadrants, the parts are assigned to the same lasers as before, but the workload distribution appears to be more even in the chart.

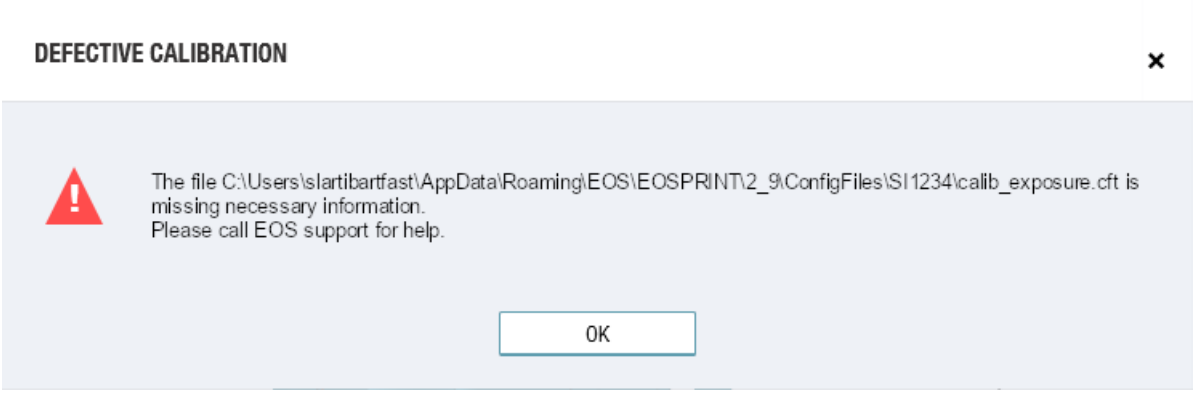
  The overall result of the building time calculation (exposure time/recoating time) is not affected by the problem and is therefore correct. Only the times in the BUILDING TIME PER LAYER chart are incorrect in the case described above.

- Item 118091: When EOSPRINT is started over a connection that is a chain of Citrix Cloud Desktop and Remote Desktop it might happen, that changing the size of the cloud desktop causes an error in EOSPRINT. As a consequence, it is possible that EOSPRINT can't be restarted.

  In this case the Remote Desktop connection has to be closed and started again. Afterwards EOSPRINT can be started again.

- Item 136044: In EOSPRINT 2.4 as well as in earlier 2.x versions, fine tuning parameters such as the global beam offset and the X/Y scaling could not be set machine-specifically. As a workaround, the fine tuning parameters were set via EOSPRINT 1. EOSPRINT 2 then merged these parameters stored on the machine with the default jobs into machine-specific material sets.

  Since EOSPRINT 2.5, machine-specific fine tuning parameters are no longer merged with the material sets. Machine-specific material sets and jobs based on such material sets can still be loaded in EOSPRINT 2.5 and newer. In rare cases, however, problems may occur and the loading is aborted with an error message indicating a defective calibration:



  If you experience this problem, please contact the EOS service hotline, and refer explicitly to this release note.

- Item 136858: The material sets for materials 1.2709 and 254 on EOS M 290 use an advanced downskin algorithm. This algorithm results in more time-consuming calculations which affect task creation, preview and building time calculation.

- Item 139314: If automatic mode is activated in the PROCESS SETTINGS dialog for EOS M 300-4, and the scan field layout "Full Overlap" is selected and the laser retention "One Laser per Part" is selected, then the laser assignment is not determined on the basis of the laser utilization, but instead each part is assigned to the laser that is closest to the center of the part bounding box.

- Item 140147: If Absolute Positioning is activated, the MULTIPLY tool does not take existing positioning points into account.

- Item 142489: During installation of a new EOSPRINT version the user settings of an older version are not carried over to the new version. This means that machine connections must be carried over manually after installation as well as imported custom material sets.

- Item 142491: OpenJz files that were created with EOSPRINT 2.0 can no longer be loaded directly into versions of EOSPRINT greater than 2.7. In this case the OpenJz file should be loaded with EOSPRINT 2.7 and saved again. Afterwards the OpenJz file can be loaded in newer EOSPRINT versions.

- Item 142492: Performance limitations may occur on loading very large, complex parts as well as on loading a very large number of parts. Complex parts are consciously not fully rendered, instead they are shown in lower quality.

- Item 142493: The function for exporting parts in the .sli file format does not work for support geometries.

- Item 142495: When a single layer task export with Position Contour (Window EXPORT TASK – Single Layer Position Contour) for a part that uses an exposure set with a different layer thickness than the exposure set Position Contour is started, it might happen that an error message occurs. In this case the layer thickness of exposure set Position Contour has to be adapted.

- Item 142501: Remote desktop
  When starting EOSPRINT 2 via a remote desktop connection the Windows operating system selects an unfavorable driver for the initialization of the OpenGL context. This driver implements an outdated version of the OpenGL API and therefore does not work with EOSPRINT 2. EOSPRINT 2 has no influence on which driver is selected by the operating system.

  As a result, EOSPRINT 2 cannot be started over a remote desktop connection and the following error message is displayed:

  "Wrong OpenGL version: Installed version is 1.1, minimum required version is 3.3".

  To run EOSPRINT 2 over a remote desktop connection, there are three possibilities:

  1. For Nvidia GeForce graphics cards there is the possibility to download a tool that enables OpenGL support for remote desktop connections. The tool only works with Nvidia GeForce GPUs with R440 driver or newer. To download the tool a Nvidia developer account is required. See https://developer.nvidia.com/nvidia-opengl-rdp
  2. The application can be started in software rendering mode via the batch script swrender.cmd stored in the EOSPRINT 2 installation directory. The disadvantage of this solution is that in this case no hardware acceleration can be used, which leads to a significantly reduced speed, usability and graphic quality.
  3. The OpenGL driver is only selected when the application is started. Therefore, by starting EOSPRINT 2 before starting a remote desktop session, EOSPRINT 2 can be used with hardware acceleration. To also enable the start of the application via remote desktop you can write a script that ends the current RDP session and then starts EOSPRINT 2. This script can be executed via RDP, which first closes the connection and then starts EOSPRINT 2. If you connect via RDP again, EOSPRINT 2 is running with hardware acceleration.

- Item 142503: Loading CLI files: To ensure CLI files (ASCII and binary) will be loaded successfully and processed correctly, the following points must be considered:

  To create an empty layer, define a closed POLYLINE with zero area, inside the XY bounding box of the actual geometry. Defining a layer without any geometry command will lead to incorrect z heights of geometry data. Defining an empty layer this way does not affect exposure.

  EOSPRINT 2 does not support coordinate values (X/Y/Z) greater than 655.35 mm (after the raw value has been multiplied with the value specified in the UNITS command).

- Item 156819: Jobs that were prepared with EOSPRINT 2.10 or earlier for export to an EOS M 100 system may suffer from powder outage in layers with external support (see Known Behavior item #140415 from release notes on EOSPRINT 2.10). The problem lay in the EOS M 100 material sets. It has been fixed for all material sets distributed with EOSPRINT 2.11, but jobs that were prepared with EOSPRINT 2.10 or earlier still contain the bad material sets and thus still have the problem. When loading such jobs in EOSPRINT 2.11 make sure to select the newest version of the material set from the "Material Sets" drop down list. This will resolve the issue - however, it will also drop all user changes that were applied to the predecessor material set.

Version 2.10.1719.0

This is a service pack release. For general information, software compatibility, known issues etc. see the release notes of the direct predecessor version (2.10.1715.0) in this document.

Solved Items

- Item 158161: Some of the material sets provided in EOSPRINT 2.9.1092.0 and EOSPRINT 2.10.1715.0 (i.e., the predecessor versions to this service pack) were defective. The defect was that in some of these material sets individual exposure sets were configured in such a way that a double exposure was applied for the DownSkin and/or UpSkin where a single exposure should have been applied or vice versa. This can lead to reduced dimensional accuracy and increased porosity in DownSkin/UpSkin.

  The following material sets were affected:

  EOS M 290:
  - 17-4PH_020_FlexM291 1.00
  - 254_040_CoreM291 1.00
  - 254_060_CoreM291 1.00
  - 316L_020_SurfaceM291 1.10
  - AlSi10Mg_030_FlexM291 2.01
  - AlSi10Mg_030_SpeedM291 1.20
  - AlF357_030_M291 1.00
  - AlSi10Mg200C_030_M291 1.11
  - CX_030_FlexM291 1.01
  - CX_030_HiPerM291 1.00
  - Cu_020_CoreM291 1.00
  - GP1_020_SurfaceM291 1.10
  - GP1_040_PerformanceM291 1.10
  - H13_040_CoreM291 1.00
  - HX_020_SurfaceM291 1.10
  - HX_040_PerformanceM291 2.13
  - IN625_020_SurfaceM291 1.00
  - IN625_040_PerformanceM291 1.10
  - IN625_040_PerformanceM291 2.00
  - IN718_020_SurfaceM291 1.00
  - IN718_040_PerformanceM291 1.02
  - IN718_040_PerformanceM291 2.11
  - IN939_040_HiPerM291 1.00
  - MS1_050_SpeedM291 2.00
  - PH1_020_SurfaceM291 2.01
  - Ti64_030_PerformanceM291 1.10
  - Ti64_060_SpeedM291 1.10
  - Ti64ELI_030_PerformanceM291 1.10
  - Ti64Grade23_040_HiPerM291 1.00
  - Ti64Grade23_080_CoreM291 1.00
  - Ti64Grade5_040_HiPerM291 1.00
  - Ti64Grade5_080_CoreM291 1.00
  - TiCP_030_FlexM291 1.00

  EOS M 300-4:
  - AlSi10Mg_060_CoreM304 1.01

- IN718_040_CoreM304 1.01
- MS1_050_CoreM304 1.01
- Ti64_060_CoreM304 1.01

EOS M 400:

- AlF357_060_FlexM400 1.01
- AlSi10Mg_090_FlexM400 1.02
- CuCrZr_080_CoreM400 1.01
- IN718_040_FlexM400 1.12
- MS1_050_FlexM400 1.00
- Ti64_030_FlexM400 1.00
- Ti64ELI_030_FlexM400 1.00

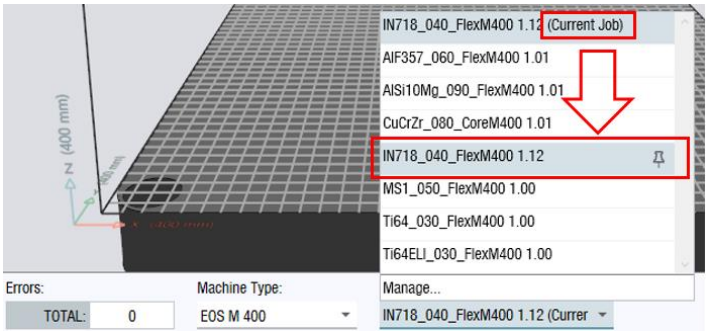
EOS M 400-4:

- 316L_040_080_CoreM404 1.10
- 316L_040_FlexM404 1.00
- AlSi10Mg_030_FlexM404 1.00
- AlSi10Mg_080_HiProM404 1.00
- HX_040_FlexM404 1.10
- IN718_040_FlexM404 1.10
- IN939_040_CoreM404 1.00
- MS1_040_FlexM404 1.00
- Ti64_060_FlexM404 1.00
- Ti64Grade23_040_080_CoreM404 1.01
- Ti64Grade5_040_080_CoreM404 1.01
- TiCP_030_FlexM404 1.00

The material set files provided in this service pack no longer have the aforementioned defect.

If EOSPRINT 2.9.1092.0 and/or EOSPRINT 2.10.1715.0 is already installed, it must first be uninstalled so that the incorrect files are replaced when the new version is installed. Note that the installation will not fail if you do not uninstall the old version first, but in this case the defective material sets will not be replaced.

Affected material sets that were used in a job created with EOSPRINT 2.9.1092.0 or EOSPRINT 2.10.1715.0 were embedded in this job and will thus be retained when loading it in a newer EOSPRINT version. To switch to the correct material sets here as well, load these jobs after installing the service pack. Then select the material set from the material set list that has the same name as the currently loaded material set but without the "Current Job" suffix (see screen shot).



This will exchange the material set in the job by the correct version provided with this service pack. Note that any customized settings you may have made in the Exposure Set Library or in the Process Settings dialog will be lost if not carried over manually.

Jobs that use material sets provided in an earlier EOSPRINT version than 2.9.1092.0 are not affected by the problem, even if they have been loaded and saved in EOSPRINT 2.9.1092.0 or EOSPRINT 2.10.1715.0 since then.

Version 2.10.1715.0

Overview of version compatibility with EOSYSTEM

EOSYSTEM Version	EOSPRINT Version 2.10	EOSPRINT Version 2.9	EOSPRINT Version 2.8
2.14	**supported (Ed. 05.21)**	not possible	not possible
2.13	supported	**supported (Ed. 11.20)**	not possible
2.12	supported	supported	**supported (Ed. 05.20)**
2.11	possible, but not tested	supported	supported
2.10	possible, but not tested	possible, but not tested	supported
2.9	possible, but not tested	possible, but not tested	possible, but not tested
2.8	possible, but not tested	possible, but not tested	possible, but not tested
2.7	possible, but not tested	possible, but not tested	possible, but not tested
2.6	possible, but not tested	possible, but not tested	possible, but not tested
2.5	possible, but not tested	possible, but not tested	possible, but not tested

supported: These software combinations are officially supported and were thoroughly tested. The cells with bold letters mark EOSYSTEM & EOSPRINT versions that were released with the same edition. The edition is specified in parentheses.

possible, but not tested: These software combinations are technically possible but were not tested and may therefore not be considered officially supported.

not possible: These software combinations are not possible, because EOSPRINT 2 rejects connections to EOSYSTEM versions more recent than itself.

Overview of version compatibility with EOSTATE Exposure OT

EOSTATE Exposure OT Version	EOSPRINT Version 2.10	EOSPRINT Version 2.9	EOSPRINT Version 2.8
1.7	**M 290, M 300-4, M 400-4 (Ed. 05.21)**	M 290, M 300-4, M 400-4	M 290, M 300-4, M 400-4
1.6	not possible	**M 290, M 300-4, M 400-4 (Ed. 11.20)**	M 290, M 300-4, M 400-4
1.5	not possible	not possible	**M 290, M 300-4, M 400-4 (Ed. 05.20)**
1.4	not possible	not possible	not possible
1.3	not possible	not possible	not possible

Overview of version compatibility with EOSTATE MeltPool

EOSTATE Melt-Pool Version	EOSPRINT Version 2.10	EOSPRINT Version 2.9	EOSPRINT Version 2.8
2.4	**M290, M300-4, M400-4 (Ed. 05.21)**	M300-4, M400-4	M300-4, M400-4
2.3	not possible	**M300-4, M400-4 (Ed. 11.20)**	M300-4, M400-4
2.2	not possible	not possible	**M300-4, M400-4 (Ed. 05.20)**
2.1	not possible	not possible	not possible
2.0		not possible	not possible

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

Overview of version compatibility with EOSTATE PowderBed

EOSTATE PowderBed Version	EOSPRINT Version 2.10	EOSPRINT Version 2.9	EOSPRINT Version 2.8
2.1	M290, M300-4, M400, M400-4, P500 (Ed. 05.21)	not possible	not possible
2.0	not possible	M290, M300-4, M400, M400-4, P500 (Ed. 05.21)	not possible

Overview of Material Set Changes

Affected Systems	EOS M 100, EOS M 290, EOS M 300-4, EOS M 400, EOS M 400-4

New Material Sets

System	Process product name	Version	Description
EOS M 100	SP2_020_DentalM100	1.10	**Initial:** Enables job builds for material "EOS CobaltChrome SP2" in 20µm on EOS M 100 Dental **Update:** Add new support exposure set in 20µm layer thickness "EOS_ExternalSupport" for improved dosing supply and rename existing 40µm support exposure set in "EOS_ExternalSupport_Fast"
EOS M 100	SP2_030_DentalM100	1.30	**Initial:** Enables job builds for material "EOS CobaltChrome SP2" in 30µm on EOS M 100 Dental **Update:** Add new support exposure set in 30µm layer thickness "EOS_ExternalSupport" for improved dosing supply and rename existing 60µm support exposure set in "EOS_ExternalSupport_Fast"
EOS M100	W1HiDo_020_FlexM100	1.00	**Initial:** Enables job builds with dense parts for material "EOS Tungsten W1" in 20µm on EOS M 100 R&D
EOS M 100	XSP3_020_CoreM100	1.00	**Initial:** Enables job builds and parameter editing for material "EOS CobaltChrome XSP3" in 20µm on EOS M 100 Dental
EOS M 100	XSP3_030_CoreM100	1.20	**Initial:** Enables job builds and parameter editing for material "EOS CobaltChrome XSP3" in 30µm on EOS M 100 Dental
EOS M 290	254_040_CoreM291	1.00	**Initial:** Enables job builds for material "EOS StainlessSteel 254 " in 40µm on EOS M 290 400W
EOS M 290	254_060_CoreM291	1.00	**Initial:** Enables job builds for material "EOS StainlessSteel 254 " in 60µm on EOS M 290 400W
EOS M 400-4	AlSi10MgAr_040_CoreM404	1.00	**Initial:** Enables job builds for material "EOS Aluminum AlSi10Mg" in 40µm running Argon as inert gas on EOS M 400-4
EOS M 400-4	IN939_040_CoreM404	1.00	**Initial:** Enables job builds for material "EOS NickelAlloy IN939" in 40µm on EOS M 400-4

Updated / Replaced Material Sets

Machine type	Process product name	Version		Description
		new	previous	
EOS M 300-4	AlSi10Mg_060_CoreM304	1.01	1.00	**Bugfix:** Correct parameters of contour definition in contour exposure and removal of second edge in "DirectPart" exposure sets. Set correct exposure order in automatic mode when using contour per layer and set laser assignment when using automatic mode for edge exposure
EOS M 300-4	IN718_040_CoreM304_101	1.01	1.00	**Bugfix:** Set correct exposure order in automatic mode when using contour per layer and set laser assignment when using automatic mode for edge exposure
EOS M 300-4	MS1_050_CoreM304_101	1.01	1.00	**Bugfix:** Set correct exposure order in automatic mode when using contour per layer and set laser assignment when using automatic mode for edge exposure
EOS M 300-4	Ti64_060_CoreM304_101	1.01	1.00	**Bugfix:** Set correct exposure order in automatic mode when using contour per layer and set laser assignment when using automatic mode for edge exposure
EOS M 400	AlSI10Mg_090_FlexM400	1.02	1.01	**Bugfix:** Add "_Default_DirectPart_MassiveParts" in exposure set library for parameter editing
EOS M 400-4	316L_040_080_CoreM404	1.10	1.00	**Bugfix:** Enables "Core" exposure in "_Default_DirectPart_SkinCore" exposure set **Update:** Modified exposure parameters for better surface quality
EOS M 400-4	Ti64Grade5_040_080_CoreM404	1.01	1.00	**Bugfix:** Correct Global Beam Offset to 0.1mm
EOS M 400-4	Ti64Grade23_040_080_CoreM404	1.01	1.00	**Bugfix:** Correct Global Beam Offset to 0.1mm

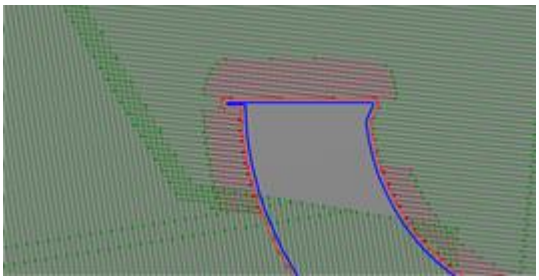
Important Information

- EOSPRINT 2 only supports 64-bit operating systems
- If EOSPRINT 2.10 is to be installed on systems on which EOSPRINT 2.0 or EOSPRINT 2.1 was already installed, a new license must be requested from EOS before installation.
- **EOSPRINT 2.10 will be the last version that is tested with Microsoft Windows 7. Subsequent EOSPRINT versions may still work with Windows 7, but this is in no way guaranteed.**

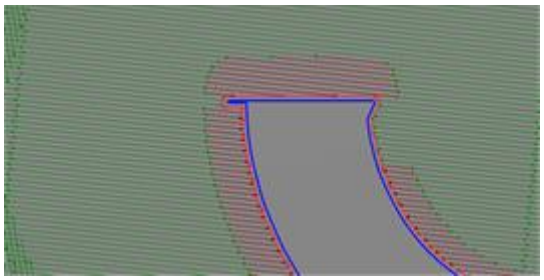
Solved Items

- Item 94371: Changes made in the BEAM COMPENSATION dialog under **EXPOSURE** were not reset by leaving the dialog via **CANCEL**. This has been fixed.
- Item 123739: If a part was assigned an exposure set with a Core exposure type where the option "Open to platform" was selected, then it could happen that the core hatching pattern spilled over internal part boundaries. See illustration before/after. This problem is now solved. This change may influence the building process and thus the part quality.

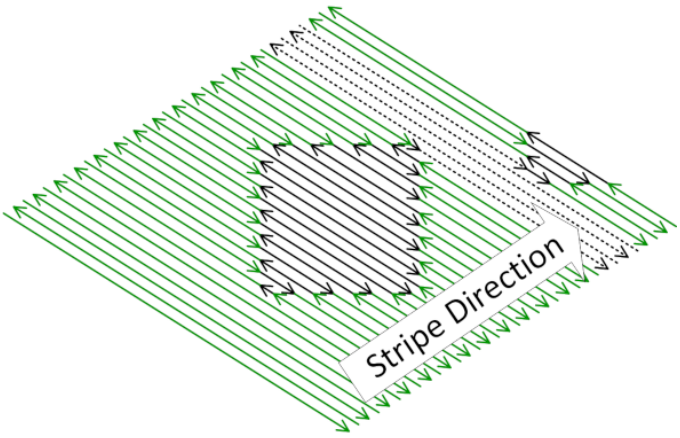
Before EOSPRINT 2.10



EOSPRINT 2.10



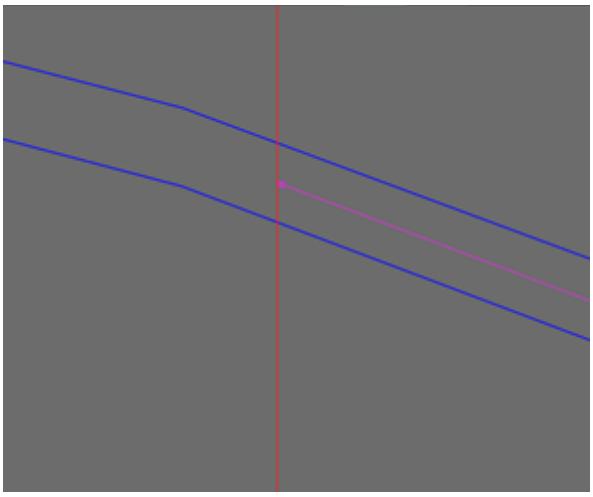
- Item 125378: When selecting the function **"Scroll to selected Part(s)"** from the context menu of a part segmented via **Cutting Plane**, EOSPRINT reported an "Unexpected Error". This behavior is now corrected.
- Item 128749: In rare cases, laser power & scan speed were not reset after a downskin exposure with the material sets 1.2709_040_HiPerM291, 254_040_CoreM291 and 254_060_CoreM291. In these cases, the exposure continued until the next power or speed change was requested and applied.
  The below illustration visualizes this behavior. The vectors are processed according to the indicated stripe direction. Green vectors denote infill, black vectors downskin. In the example, the laser power is not reset after the last downskin vector. Thus, subsequent (dashed) vectors are exposed with the same power as the downskin before. In the example, the problem persists until the next real downskin vector is reached, which sets the laser power again so that the subsequent vectors are exposed correctly.



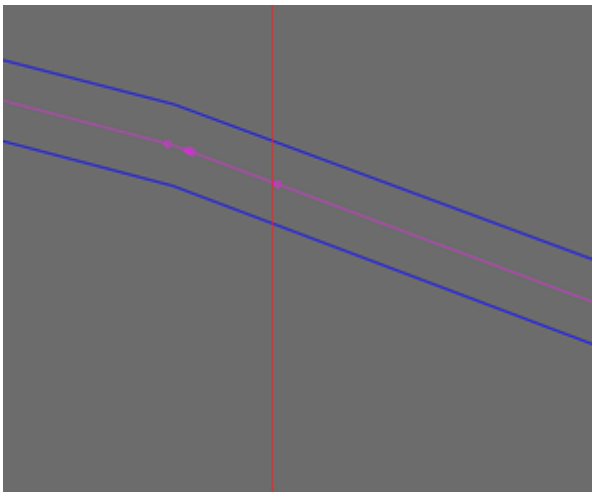
  The problem was not noticeable to EOSPRINT users, but a connected EOSTATE Exposure OT or EOSTATE MeltPool system would detect and report it during the building process. The problem is now fixed. This change may influence the building process and thus the part quality.
- Item 129015: In previous versions the standalone tool "EOSPRINT 2 Part Predeformation" was not available via the Windows 10 context menu on STL files. This has been fixed.

- Item 129568**:** If a part was moved in Z via the tool **Move**, it could happen that this also resulted in a very small movement in X and/or Y. This was caused by a rounding error in the user interface. This problem is now fixed.
- Item 134306**:** Sometimes the rotation gizmo was not shown on parts, so that you could not rotate parts via drag & drop in the 3D view. This problem is now fixed.
- Item 135241**:** There were sporadic job interruptions due to insufficient flow after a filter cleaning with a recirculating filter system (RFS) of version 2.0. The flow release band of all material sets was adjusted from ± 5 m^3/h to now ± 10 m^3/h to prevent this problem. Old jobs & material sets from previous EOSPRINT versions will be migrated automatically to apply this change. This change may influence the building process and thus the part quality.
- Item 135645**:** An "Unexpected Error" occurred when trying to group parts that were previously segmented using the tool **Cutting Plane**. The problem has been resolved.
- Item 135665**:** After importing a material set via the MANAGE MATERIAL SETS dialog, as well as in other rare situations, it could happen that no material set was selected. This put the application and the loaded job into an undefined state where various problems could occur. The issue has now been resolved.
- Item 136013**:** In the case of parts that were placed at least partially in the overlap of two lasers, it could happen that edge vectors ended at the split line although they should have been continued beyond it. Only edge vectors in the overlap were affected by this. The problem has been resolved. This change may influence the building process and thus the part quality.

Before EOSPRINT 2.10

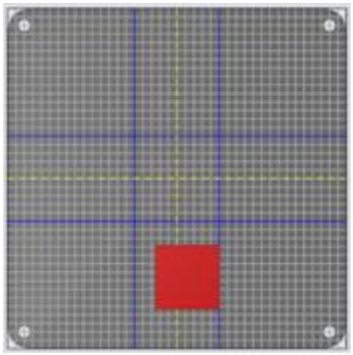


EOSPRINT 2.10

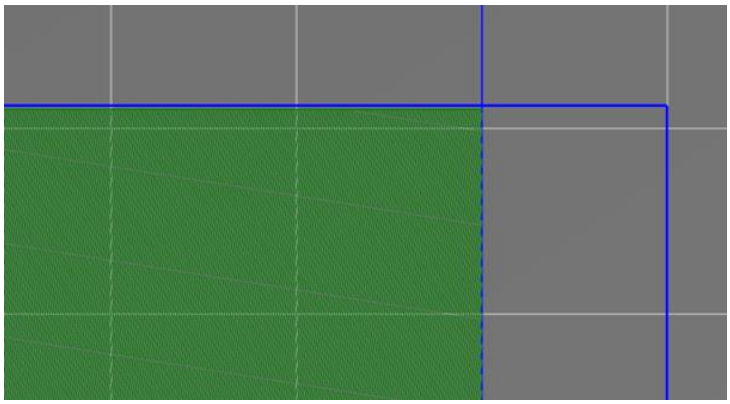


- Item 136250**:** In some cases EOSPRINT crashed when applying an automatic part exposure order with the tool **Part Exposure**. The problem is resolved.
- Item 73378**:** If a SLI or CLI file contained only a single slice, then this slice was not exposed. Jobs containing only such single-layer SLI/CLI could not be exported because EOSPRINT did not find any exposed layers. This problem is now fixed. This change may influence the building process and thus the part quality.
- Item 103771**:** Changes made via the REFERENCE POINT dialog in the **PLACEMENT** Workflow did not flag the job as modified. As a result, the job could not be saved via **SAVE**/Ctrl-S as long as only changes were made to the reference points. To save, one had to either **SAVE AS...** or make further changes, e.g. move a part to another position and back to its original position. This behavior is now corrected.
- Item 109713**:** When trying to import a material set for an unsupported machine type or to load a job containing such a material set, the user was presented an unhelpful message. The message has been improved.

- Item 112197: When trying to load a job that referenced an invalid machine type, the user was presented an unhelpful message. The message has been improved.
- Item 112257: When exporting a material set via the MANAGE MATERIAL SETS dialog, the exported material set is based on the same material as the original and should therefore share the same set of fine tuning values. Despite this, the fine tuning for such exported material sets had to be configured again in previous versions.
  For a better understanding, the problem can be reproduced in EOSPRINT 2.9 (and 2.8) as follows: Select any material set and apply any change to it (e.g. clone an exposure set). This is necessary because only modified material sets can be exported. Then connect to a machine with HCS 2.12 or newer and set the fine tuning of the machine for this material set via the tool **Upload Fine Tuning** in the workflow **EXPOSURE** of EOSPRINT. Then export the material set under a new name and import it again. Select the material set you just imported and then go back to the tool **Upload Fine Tuning**. The previously set fine tuning values should be displayed here, but instead defaults are displayed. For the original material set, the set fine tuning values are still displayed.
  The problem has been resolved so that the exported material set uses the same set of fine tuning values as the original material set.
- Item 113235: If EOSPRINT cannot load a job because it contains an invalid material set, it offers the user the possibility to select another valid material set instead and load the job with it. However, in this case EOSPRINT 2.9 loaded none of the jobs parts. The problem has been fixed so that after selecting a valid material set, the parts are now loaded at their correct position and all other job-specific settings (e.g. part-specific beam compensation, overlap settings for multi-head systems, etc.) are applied as well.
- Item 113257: If a part with manual laser assignment was placed very close to the scan field boundary of its assigned laser, it could happen that the part was scaled beyond this scan field due to the configured machine-specific shrinkage compensation. As a result, areas of the part that were now beyond the scan field boundary were not exposed.
  For a better understanding, the problem can be reproduced as follows in EOSPRINT 2.9 and earlier:
  Load a cube geometry into the building envelope of a multi-head system, e.g. the EOS M 400-4. Place the cube so that it abuts the scan field boundary marked in blue. In the illustration to the right, the red cube lies completely in the overlap area of lasers 1 and 4 and its right side abuts the boundary of the scan field of laser 4. Now manually assign the part to the laser whose scan field boundary it abuts (here: laser 4, bottom left). Connect to a real system and set a shrinkage compensation in the tool **Upload Fine Tuning**, so that the part is scaled beyond the scan field boundary. With reference to the example, e.g. an X scaling of 10%. Then look at the part in the preview. You will notice that the scaling has scaled the part beyond the scan field boundary and no vectors have been created for the portion of the area that can no longer be reached by the assigned laser.

  See illustration below:

  EOSPRINT will now detect such problems upon task export and issue an appropriate warning that also suggests possible solutions.

- Item 117774: When entering values in the **Move** tool that were greater than -0.1 but less than 0.0, the minus sign was lost during input. The reason for this was that the inputs are continuously validated and canonicalized, and in this process the input -0.0 was converted to its canonical form 0.0. Therefore, if one typed, e.g. -0.01, the sign disappeared after the second 0 and in the end 0.01 had been entered. The problem is now fixed.
- Item 119052: In EOSPRINT 2.9, opening the tool **Hatching Coordinate System** immediately created an entry on the undo stack, although the user had not yet made any changes. This behavior could be confusing when using the **Undo** function. The problem is now fixed so that undo entries will only be created if the user makes changes.
- Item 119637: If EOSPRINT was connected to a machine and the user marked a machine as "Work Offline" in the MACHINE MANAGEMENT dialog while the **Export** tool was still open, then it was still possible to export the task directly to the machine even though it had been declared as an offline machine. The export dialog now reacts immediately to the any change of the "Work Offline" flag and enables/disables affected EOSPRINT functions accordingly.
- Item 119638: The tool **Export Existing Task** in the workflow *EXPORT* was not deactivated if a machine was marked as "Work Offline". Thus, one could try to export a locally available task file to such an offline machine. If the machine was reachable, the task was also transferred, otherwise the transfer failed. The tool **Export Existing Task** is now consistently disabled if the selected machine is marked as "Work Offline".
- Item 120255: In sporadic cases, temp folders created by EOSPRINT were not deleted and remained in a state that made it impossible to delete the temp folders without first rebooting the system. The next time EOSPRINT was started before the system was rebooted, the application attempted to clean up the remaining temp folder but failed and therefore terminated itself immediately. Thus, it was impossible to start the EOSPRINT application again without first rebooting the computer. The problem has been fixed and EOSPRINT will start even if it cannot delete the left-over temp folders from previous sessions. In such event it would try to delete the temp folders at a later time.
- Item 121360: Under certain circumstances, it could happen that after undoing a part multiplication that was applied via the tool **Multiply**, the original part was not displayed at the same position as before. This was just a visualization error in 3D. When viewing the exposure in the preview, the part was in the correct position, thus making this problem irrelevant for the building process. The problem has been fixed so that the part position is now also correct in 3D.
- Item 121386: In previous versions it was not possible to move a part to the last position in the part list via drag & drop. This problem is now fixed.
- Item 122875: In previous versions it was possible to delete the currently loaded material set (CurrentJob) via the MANAGE MATERIAL SETS dialog if it was an imported material set. This put the application and the loaded job into an undefined state where various problems could occur. The problem has now been fixed so that the currently selected material set cannot be deleted.
- Item 126890: In the **Process Settings** for EOS M 290 the values for 'Recoating' and 'Move to dosage position' were interchanged on the user interface. As long as the values were not changed, this had no effect. Only for changes by the user, the value for a user-defined recoating speed had to be entered at 'Move to dosage position'. To adapt the speed of the movement to dosage position, the value at 'Recoating' had to be changed. This has now been fixed.
- Item 126893: If the original geometry file was deleted, moved or renamed after loading a part, then EOSPRINT (depending on its version) reported either an "Unhandled Exception" or that an "External component has thrown an exception". This problem has been fixed so that EOSPRINT now locks the loaded geometry files so that they cannot be deleted, moved or renamed as long as they are used in EOSPRINT.

- Item 127379**:** When a part is loaded into EOSPRINT, the geometry file is embedded into the job archive (.openjz). Any copies of the part created within EOSPRINT will then all reference the same embedded geometry. If you delete a part and all its copies from the job, the associated geometry is usually also removed from the job archive. In previous versions, if the same part was loaded again, or another part with an identical file name, then the old geometry remained in the job archive without reference, and the new geometry was referenced via its original file path. As long as the new geometry remained accessible under that original file path, there was no problem.
  However, if the geometry became inaccessible, e.g. because it had been moved or deleted, because access rights had changed, or because it was located on a network path that was no longer available, then as a result the entire job could no longer be loaded.
  This problem has now been fixed so that newly saved jobs always embed all required geometry files correctly. For jobs that have already been affected by this problem, a standalone tool has been created that can repair the job archive in certain cases. If you need this tool, please contact our service department.
- Item 128373**:** If a file (e.g. a part or a job) could not be loaded because the file path exceeded the length of 260 characters imposed by the operating system, then EOSPRINT reported the error with a vague reference to the file paths invalid form. The message has been improved so that it is now clear that the file path is too long. The new message also suggests possible solutions.
- Item 128961**:** Under certain circumstances, for parts that were placed completely in the overlap of several lasers, not all theoretically possible lasers could actually be assigned manually. Example: a part is located in the overlap of lasers 1 and 4, but EOSPRINT did not allow the manual assignment of e.g. laser 1. This problem has now been solved.
- Item 136245**:** EOSPRINT requires a valid material set for proper operation. If a new machine type is made available in EOSPRINT for which there are no released material sets available, then a so-called "Basic Usage" material set is supplied instead, which ensures proper operation for this machine type. Since there are now released material sets for EOS M 300-4, the Basic Usage Material Set for this machine type has been removed.
- Item 136548**:** If a job with incorrect laser assignment for one or more parts was loaded (e.g. laser 4 assigned, although the part could only be exposed by laser 1), then the incorrect laser assignment was not automatically corrected in some cases. The problem has been fixed.
- Item 76517**:** In previous versions, some parameter configurations of the exposure pattern Chess could cause only every second tile to be exposed. If this misbehavior occurs, it does so in every layer where the Chess parameter is applied, so it is easily noticeable in the preview. The problem has been fixed. This change is process relevant.
- Item 101829**:** In single layer mode, selecting parts via selection frames did not work reliably. Now, all parts are guaranteed to be selected when you drag a selection frame around them.
- Item 112855**:** In previous versions the vertical scrollbar of the "Material Sets" and "Machines" combo boxes did not appear in the usual look and feel of EOSPRINT 2. This has now been fixed.
- Item 117499**:** The Expand/Collapse All functions from the parts list context menu did not affect the segments of segmented parts in previous versions. Collapse All now also collapses the segments of parts and Expand All expands them.
- Item 121839**:** Jobs that were created in a newer version of EOSPRINT can usually not be loaded in older versions of EOSPRINT. The error message displayed in this case was misleading and has therefore been improved.
- Item 135576**:** When automatic mode was enabled for EOS M 300-4, the "Strong Platform Connection" option was not taken into account. The problem is now fixed. This change may influence the building process and thus the part quality.

New Functions

- Item 98732: In the *SEGMENTATION* workflow a new tool **Layer Parameters** has been added. Currently this tool allows to plan ahead different powder dosing factors for different z heights of a job, thereby eliminating the need for repeated manual adjustment of the dosing factor while the job is building. In future other z specific settings will be added to this tool (e.g. minimum layer time, filter cleaning).
  Z-specific dosing factor requires HCS 2.14 or newer on machine side.
- Item 115792: EOSPRINT can delegate the task export to an EOSPRINT Server. With this feature the productivity is increased, as EOSPRINT is no longer blocked during the task export. Note that the EOSPRINT Server is a separate product.
- Item 116295: Automatic laser assignment & exposure processing order in automatic mode for EOS M 300-4 have been revised to improve part quality while maintaining high laser utilization.
- Item 121142: In previous EOSPRINT versions, when power reduction was applied for the purpose of energy input homogenization in stripe exposure, the power was reduced linearly depending on the hatch length in relation to the stripe width, down to a theoretical minimum of 0 watts at 0 mm hatch length. It is now possible to set the intended power ramp via a graphical control and to specify a minimum limit for the power reduction.
  Power reduction as well as other energy input homogenization methods are located in the 3rd column of the EXPOSURE SET LIBRARY if exposure pattern is set to Stripes or Chess.
- Item 101089: The width of the scrollbars has been increased.
- Item 108030: The usability of the machine management window has been improved. The window can now be moved and all important table columns are visible at a glance.
- Item 108172: Part selection has been improved. Hold Shift while dragging a selection frame to select only parts completely enclosed by the frame. Hold down Alt to select parts that are currently hidden by other parts. Hold Ctrl to add to the current selection instead of creating a new. All keys can be combined.
- Item 108179: In the tool **Multiply** under workflow **PLACEMENT** the setting "Padding" has been renamed to "Spacing".
- Item 103814: A new section PART PROPERTIES has been added below the Elements tree (part list). It contains useful information about the selected or hovered part.
- Item 108025: If the option "Work Offline" is set for a machine in the MACHINE MANAGEMENT dialog, then the **Export** tool will display a warning that the underlying machine configuration may be outdated. Task export can be started anyway.
- Item 108041: After a successful material set import via the MANAGE MATERIAL SETS dialog, the material set is now selected automatically. In the case that the current material set has been modified the user must confirm the change of the material set to prevent data loss.
- Item 108182: When hovering the EXPOSURE TIME PER LAYER chart in the **Building Time** tool, a tooltip is now displayed that shows layer number, z height and exposure time per laser for the data point under the mouse cursor.
- Item 112252: The option "Lexicographical Order" has been added to the PART EXPOSURE ORDER section of tool **Part Exposure**.
- Item 113255: In previous releases of EOSPRINT balloon messages were displayed always on top. I.e. even if EOSPRINT was in the background, hidden by another window, the balloon messages would force their way into the foreground. This behavior has been changed so that the balloon messages are now only visible if EOSPRINT is visible.
- Item 98860: The behavior of the cube for view navigation in the top right corner of the 3D view has been changed. Arrow keys will move the view into the direction pointed instead of dragging the cube into that direction and thus moving it in the opposite direction. This behavior is more common in popular CAD/CAM suites and therefore we hope that this will make it easier to work with EOSPRINT.

- Item 106499: When using the tool **Cutting Plane** unselected parts are now displayed semi-transparent. This helps to see which parts will be affected by the segmentation operation.
- Item 108032: Part specific hatching origin must now either be turned on or off for all parts of a job via a new toggle in the tool **Hatching Coordinate System** in the workflow **EXPOSURE**.
  If turned off (default), the hatching coordinate origin for all parts is the lower left corner of the building platform. If turned on, the default hatching coordinate origin is the STL origin, but an individual hatching coordinate origin can be specified for each part separately.
- Item 108043: While synchronizing fine tuning values with the target machine when opening the tool **Upload Fine Tuning** in the workflow **EXPOSURE**, a message is now displayed to indicate that the operation is still in progress.
- Item 115913: The machine Integra P 400 has been renamed to Integra P 450.
- Item 124368: After the first connection to an EOS M 100 or FORMIGA P 110 FDR machine, subsequent connections to the same machine will now be a little bit faster.
- Item 124792: A button for resetting user defined exposure set colors to the default has been added in the *EXPOSURE SET LIBRARY* window. The button is located below the **OK/CANCEL** buttons and to the right of the button for individualizing exposure set colors.
- Item 125978: In the window *MANAGE MATERIAL SETS* a new material set can now also be selected via double click.
- Item 126682: In the section SCANNER SETTINGS of the tool **Process Settings** for EOS M 300-4, the setting "Balancing Package Size" has been removed. It may be reintroduced in later EOSPRINT versions.
- Item 126511: When using automatic mode for EOS M 300-4 with scan field layouts Swim Lanes or Quadrants it is now possible to manually adjust the position of the split lines and thereby the size of the swim lanes and quadrants respectively. This makes it possible to adapt the scanfield layouts to the distribution of the exposure area in the job in order to achieve better laser utilization.
- Item 127593: The new feature "Time Optimized" under paragraph "Vector Scanning" on CONTOUR pages in the EXPOSURE SET LIBRARY reduces jump times for parts with many separate contours (e.g., lattice structures).
- Item 134035: For EOS P 500 the exposure type Core has been added. It can be selected from the drop-down menu in the second column of the EXPOSURE SET LIBRARY.
- Item 136066: In the section SCANNER SETTINGS of the tool **Process Settings** for EOS M 300-4 the setting "Working Area Laser" has been renamed to "Scan Field Layout" and the setting "Segmentation of parts" has been renamed to "Laser Retention".
- Item 136193: In the section SCANNER SETTINGS of the tool **Process Settings** for EOS M 300-4 the setting "Package Overlap" has been introduced which allows to specify the number of hatch vectors that will be exposed by both lasers, when stripe exposure is passed from one laser to another.
- Item 137006: In the section SCANNER SETTINGS of the tool **Process Settings** for EOS M 300-4 the setting "Partition Length Support" has been introduced which allows to specify the cumulated length of support vectors after which exposure may be passed to another laser.
- Item 137688: The option "Time Homogenization" that was available under "Energy Input Homogenization" in the FEATURES section of the 3rd column of the EXPOSURE SET LIBRARY has been deprecated.
  Jobs that were created with an earlier version of EOSPRINT and that use Time Homogenization remain unchanged. I.e. the feature is still functional but can no longer be selected from the user interface.
  Its behavior can still be reproduced with the help of the "Minimum Vector Time" option. The Minimum Vector Time that is equivalent to the Time Homogenization, is calculated as follows:
  (Stripe Width + Stripe Overlap) / Laser Speed * 1000

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

Known Behavior

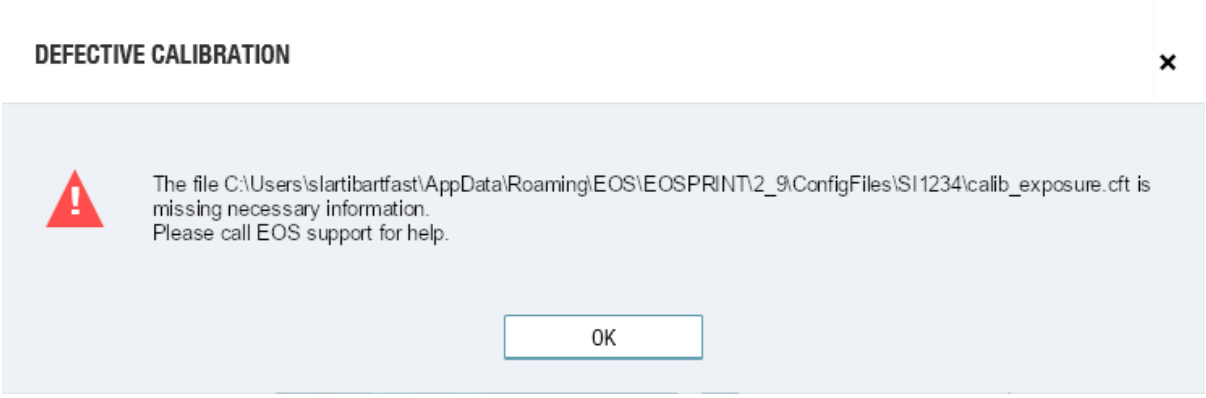
- Installation
  The user settings are not carried over to the new version. This means that machine connections must be carried over manually after installation as well as imported custom material sets.
- Restart after installation
  When installing EOSPRINT the latest Microsoft Redistributables are installed. After installation of the redistributables a restart is needed. This restart might be executed without user confirmation.
- EOSPRINT 2.0 OpenJz-Files
  OpenJz files that were created with EOSPRINT 2.0 can no longer be loaded directly into versions of EOSPRINT greater than 2.7. In this case the OpenJz file should be loaded with EOSPRINT 2.7 and saved again. Afterwards the OpenJz file can be loaded in newer EOSPRINT versions.
- Performance
  Performance limitations may occur on loading very large, complex parts as well as on loading a very large number of parts. Complex parts are consciously not fully rendered, instead they are shown in lower quality.
- Remote desktop
  When starting EOSPRINT 2 via a remote desktop connection the Windows operating system selects an unfavorable driver for the initialization of the OpenGL context. This driver implements an outdated version of the OpenGL API and therefore does not work with EOSPRINT 2. EOSPRINT 2 has no influence on which driver is selected by the operating system.
  As a result, EOSPRINT 2 cannot be started over a remote desktop connection and the following error message is displayed:

  "Wrong OpenGL version: Installed version is 1.1, minimum required version is 3.3".

  To run EOSPRINT 2 over a remote desktop connection, there are three possibilities:

  1. For Nvidia GeForce graphics cards there is the possibility to download a tool that enables OpenGL support for remote desktop connections. The tool only works with Nvidia GeForce GPUs with R440 driver or newer. To download the tool a Nvidia developer account is required. See https://developer.nvidia.com/nvidia-opengl-rdp
  2. The application can be started in software rendering mode via the batch script swrender.cmd stored in the EOSPRINT 2 installation directory. The disadvantage of this solution is that in this case no hardware acceleration can be used, which leads to a significantly reduced speed, usability and graphic quality.
  3. The OpenGL driver is only selected when the application is started. Therefore, by starting EOSPRINT 2 before starting a remote desktop session, EOSPRINT 2 can be used with hardware acceleration. To also enable the start of the application via remote desktop you can write a script that ends the current RDP session and then starts EOSPRINT 2. This script can be executed via RDP, which first closes the connection and then starts EOSPRINT 2. If you connect via RDP again, EOSPRINT 2 is running with hardware acceleration.
- SLI export function
  The function for exporting part data in the .sli file format is not supported for support parts.
- Single Layer Task export
  When a single layer task export with *Position Contour* (Window *EXPORT TASK* – **Single Layer Position Contour**) for a part that uses an exposure set with a different layer thickness than the exposure set *Position Contour* is started, it might happen that an error message occurs. In this case the layer thickness of exposure set *Position Contour* has to be adapted.
- If Absolute Positioning is activated, the MULTIPLY tool does not take existing positioning points into account.

- Loading CLI files:
  To ensure CLI files (ASCII and binary) will be loaded successfully and processed correctly, the following points must be considered:
  - To create an empty layer, define a closed POLYLINE with zero area, inside the XY bounding box of the actual geometry. Defining a layer without any geometry command will lead to incorrect z heights of geometry data. Defining an empty layer this way does not affect exposure.
  - EOSPRINT 2 does not support coordinate values (X/Y/Z) greater than 655.35 mm (after the raw value has been multiplied with the value specified in the UNITS command).
- If a part is loaded in CLI format and there are gaps between the slices defined by this CLI, then when sliding through the part in the **PREVIEW** workflow, a gray contour is also displayed in the gaps. This only occurs in the preview - no actual exposure will be applied in this case.
- When automatic mode is activated for EOS M 300-4, the EXPOSURE TIME PER LAYER chart displayed in the BUILDING TIME dialog does not reflect the actual laser utilization. In this case the workload distribution across the lasers appears better than it actually is.
  For a better understanding, this problem can be reproduced by placing differently sized parts in the four quadrants with automatic mode switched off. The imbalance is then correctly reflected by the EXPOSURE TIME PER LAYER chart. However, if you now switch on the automatic mode and set the scan field layout to quadrants, the parts are assigned to the same lasers as before, but the workload distribution appears to be more even in the chart.
  The overall result of the building time calculation (exposure time/recoating time) is not affected by the problem and is therefore correct. Only the times in the BUILDING TIME PER LAYER chart are incorrect in the case described above.
- When EOSPRINT is started over a connection that is a chain of Citrix Cloud Desktop and Remote Desktop it might happen, that changing the size of the cloud desktop causes an error in EOSPRINT. As a consequence, it is possible that EOSPRINT can't be restarted.
  In this case the Remote Desktop connection has to be closed and started again. Afterwards EOSPRINT can be started again.
- In EOSPRINT 2.4 as well as in earlier 2.x versions, fine tuning parameters such as the global beam offset, and the X/Y scaling could not be set machine-specifically. As a workaround, the fine tuning parameters were set via EOSPRINT 1. EOSPRINT 2 then merged these parameters stored on the machine with the default jobs into machine-specific material sets.
  Since EOSPRINT 2.5, machine-specific fine tuning parameters are no longer merged with the material sets. Machine-specific material sets, and jobs based on such material sets can still be loaded in EOSPRINT 2.5 and newer. In rare cases, however, problems may occur, and the loading is aborted with an error message indicating a defective calibration:

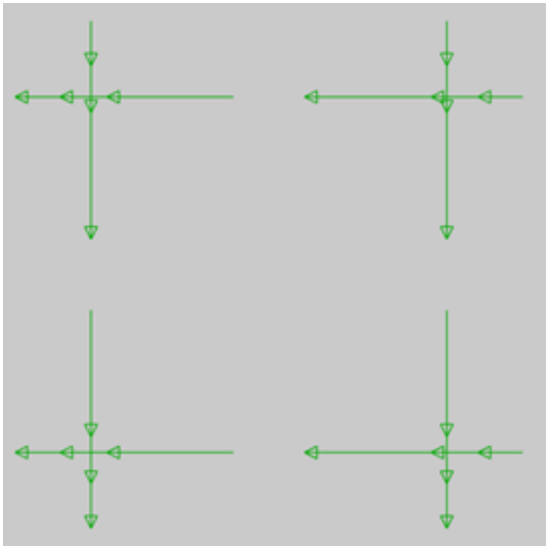


If you experience this problem, please contact the EOS service hotline and refer explicitly to this release note.

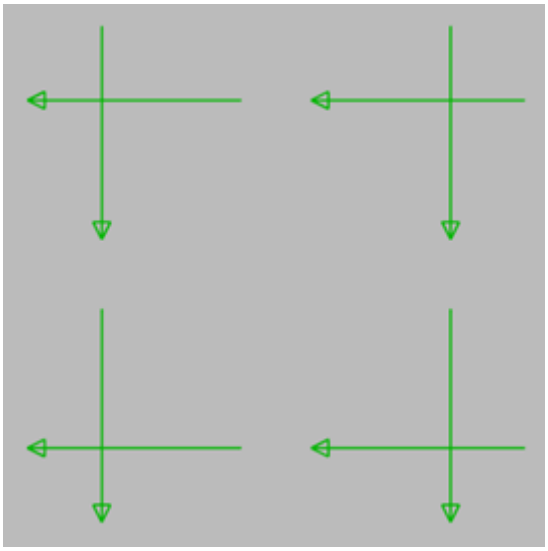
EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

- In EOSPRINT 2.4 and earlier, when slicing STL-based support geometries, the underlying triangulation could cause contiguous straight sections to be represented by multiple partial sections. As a result, multiple consecutive exposure vectors were generated instead of just one which led to an increased and potentially uneven energy input.
  Since EOSPRINT 2.5 this problem is solved. However, when switching from EOSPRINT 2.4 or earlier to EOSPRINT 2.5 or newer, it must be taken into account that the energy input in support geometries is potentially reduced by this change, which can lead to a proportionally reduced binding and stability.
  The effect of the optimization can be seen in the preview:

<= EOSPRINT 2.4



>= EOSPRINT 2.5



- The material sets for materials 1.2709 and 254 on EOS M 290 use an advanced downskin algorithm. This algorithm results in more time-consuming calculations which affect task creation, preview and building time calculation.
- If automatic mode is activated in the PROCESS SETTINGS dialog for EOS M 300-4, and the laser retention "Several Lasers per Layer and Part" is selected, then it may happen, that the exposure type sequence defined by the assigned exposure set (e.g. DownSkin -> Infill -> Contour) is not respected. E.g., infill exposure may start before downskin exposure has been completed.
- If automatic mode is activated in the PROCESS SETTINGS dialog for EOS M 300-4, and the scan field layout "Full Overlap" is selected and the laser retention "One Laser per Part" is selected, then the laser assignment is not determined on the basis of the laser utilization, but instead each part is assigned to the laser that is closest to the center of the part bounding box.
- Jobs that were exported with EOSPRINT 2 to EOS M 100 may suffer from powder outage in layers with external supports. Material sets for SP2 and XSP3 have been adjusted to mitigate the problem. For other materials it may be possible to work around the problem by increasing the dosing factor. However, a higher dosing factor may also result in the powder bin running full sooner, thus preventing full building height from being reached. EOS is working on this issue and expects it to be solved with the next software edition, scheduled for November 2020.

- For the implementation of the software license protection, EOS uses the CodeMeter software from WIBU Systems. With version 7.20 of this software, WIBU Systems introduced a change to the so-called StationShare behavior, which now results in EOSPRINT requiring license 101328:1039 twice per workstation instead of only once. The problem manifests in that EOSPRINT can be started, but when requesting a task export, a preview or a build time calculation, a missing license 1039 is reported.
  Currently there is no technical way for EOS to ensure correct behavior when version 7.20 or later is installed. Therefore, we recommend not to update the CodeMeter software for the time being and to stay on version 7.10b (released 2020-11-02) provided with this software package until the problem is solved.
  WIBU Systems is working on a solution to the problem, but it is not yet foreseeable when such a solution will be available and how it will be implemented. To the best of our knowledge, at the time of writing this release note, the current CodeMeter version 7.20b (release date 2021-05-10) does not contain any safety-critical changes that would require an update.

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

Version 2.9.1113.0

This is a service pack release. For general information, software compatibility, known issues etc. see the release notes of the direct predecessor version (2.9.1092.0).

Solved Items

- Item 158160: Some of the material sets provided in EOSPRINT 2.9.1092.0 (i.e., the predecessor version to this service pack) were defective. The defect was that in some of these material sets individual exposure sets were configured in such a way that a double exposure was applied for the DownSkin and/or UpSkin where a single exposure should have been applied or vice versa. This can lead to reduced dimensional accuracy and increased porosity in DownSkin/UpSkin.

  The following material sets were affected:

  EOS M 290:
  - 17-4PH_020_FlexM291 1.00
  - 316L_020_SurfaceM291 1.10
  - AlSi10Mg_030_FlexM291 2.01
  - AlSi10Mg_030_SpeedM291 1.20
  - AlF357_030_M291 1.00
  - AlSi10Mg200C_030_M291 1.11
  - CX_030_FlexM291 1.01
  - CX_030_HiPerM291 1.00
  - Cu_020_CoreM291 1.00
  - GP1_020_SurfaceM291 1.10
  - GP1_040_PerformanceM291 1.10
  - H13_040_CoreM291 1.00
  - HX_020_SurfaceM291 1.10
  - HX_040_PerformanceM291 2.13
  - IN625_020_SurfaceM291 1.00
  - IN625_040_PerformanceM291 1.10
  - IN625_040_PerformanceM291 2.00
  - IN718_020_SurfaceM291 1.00
  - IN718_040_PerformanceM291 1.02
  - IN718_040_PerformanceM291 2.11
  - IN939_040_HiPerM291 1.00
  - MS1_050_SpeedM291 2.00
  - PH1_020_SurfaceM291 2.01
  - Ti64_030_PerformanceM291 1.10
  - Ti64_060_SpeedM291 1.10
  - Ti64ELI_030_PerformanceM291 1.10
  - Ti64Grade23_040_HiPerM291 1.00
  - Ti64Grade23_080_CoreM291 1.00
  - Ti64Grade5_040_HiPerM291 1.00
  - Ti64Grade5_080_CoreM291 1.00
  - TiCP_030_FlexM291 1.00

EOS M 300-4:

- IN718_040_CoreM304 1.00
- MS1_050_CoreM304 1.00

EOS M 400:

- AlF357_060_FlexM400 1.01
- AlSi10Mg_090_FlexM400 1.01
- CuCrZr_080_CoreM400 1.01
- IN718_040_FlexM400 1.12
- MS1_050_FlexM400 1.00
- Ti64_030_FlexM400 1.00
- Ti64ELI_030_FlexM400 1.00

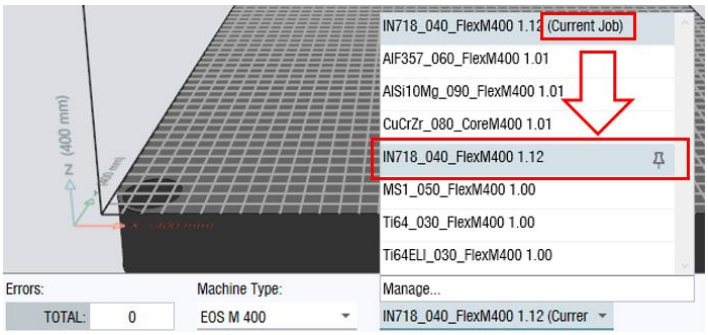
EOS M 400-4:

- 316L_040_080_CoreM404 1.00
- 316L_040_FlexM404 1.00
- AlSi10Mg_030_FlexM404 1.00
- AlSi10Mg_080_HiProM404 1.00
- HX_040_FlexM404 1.10
- IN718_040_FlexM404 1.10
- MS1_040_FlexM404 1.00
- Ti64_060_FlexM404 1.00
- Ti64Grade23_040_080_CoreM404 1.00
- Ti64Grade5_040_080_CoreM404 1.00
- TiCP_030_FlexM404 1.00

The material set files provided in this service pack no longer have the aforementioned defect.

If EOSPRINT 2.9.1092.0 is already installed, it must first be uninstalled so that the incorrect files are replaced when the new version is installed. Note that the installation will not fail if you do not uninstall the old version first, but in this case the defective material sets will not be replaced.

Affected material sets that were used in a job created with EOSPRINT 2.9.1092.0 were embedded in this job and will thus be retained when loading it in a newer EOSPRINT version. To switch to the correct material sets here as well, load these jobs after installing the service pack. Then select the material set from the material set list that has the same name as the currently loaded material set but without the "Current Job" suffix (see screen shot).



This will exchange the material set in the job by the correct version provided with this service pack. Note that any customized settings you may have made in the Exposure Set Library or in the Process Settings dialog will be lost if not carried over manually.

Jobs that use material sets provided in an earlier EOSPRINT version than 2.9.1092.0 are not affected by the problem, even if they have been loaded and saved in EOSPRINT 2.9.1092.0 since then.

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

Version 2.9.1092.0

Overview of version compatibility with EOSYSTEM

EOSYSTEM Version	EOSPRINT Version 2.9	2.8	2.7
2.13	**supported (Ed. 11.20)**	not possible	not possible
2.12	supported	**supported (Ed. 05.20)**	not possible
2.11	supported	supported	**supported (Ed. 10.19)**
2.10	possible, but not tested	supported	supported
2.9	possible, but not tested	possible, but not tested	supported
2.8	possible, but not tested	possible, but not tested	possible, but not tested
2.7	possible, but not tested	possible, but not tested	possible, but not tested
2.6	possible, but not tested	possible, but not tested	possible, but not tested
2.5	possible, but not tested	possible, but not tested	possible, but not tested

supported: These software combinations are officially supported and were thoroughly tested. The cells with bold letters mark EOSYSTEM & EOSPRINT versions that were released with the same edition. The edition is specified in parentheses.

possible, but not tested: These software combinations are technically possible but were not tested and may therefore not be considered officially supported.

not possible: These software combinations are not possible, because EOSPRINT 2 rejects connections to EOSYSTEM versions more recent than itself.

Overview of version compatibility with EOSTATE Exposure OT

EOSTATE Exposure OT Version	EOSPRINT Version 2.9	2.8	2.7
1.6	**M 290, M 300-4, M 400-4 (Ed. 11.20)**	M 290, M 300-4, M 400-4	M 290, M 300-4, M 400-4
1.5	not possible	**M 290, M 300-4, M 400-4 (Ed. 05.20)**	M 290, M 300-4, M 400-4
1.4	not possible	not possible	**M 290, M 300-4, M 400-4 (Ed. 10.19)**
1.3	not possible	not possible	not possible

Overview of version compatibility with EOSTATE MeltPool

EOSTATE MeltPool Version	EOSPRINT Version 2.9	2.8	2.7
2.3	**M300-4, M400-4 (Ed. 11.20)**	M300-4, M400-4	M300-4, M400-4
2.2	not possible	**M300-4, M400-4 (Ed. 05.20)**	M300-4, M400-4
2.1	not possible	not possible	**M300-4, M400-4 (Ed. 10.19)**
2.0	not possible	not possible	not possible

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

Overview of Material Set Changes

Affected Systems	EOS M 100, EOS M 290 400W, EOS M 300-4, EOS M 400-4

New Material Sets

System	Process product name	Version	Description
EOS M 290	20MnCr5_040_CoreM291	1.00	**Initial:** Enables job builds for material "EOS CaseHardeningSteel 20MnCr5" in 40µm
EOS M 290	316L_040_080_CoreM291	1.00	**Initial:** Enables job builds for material "EOS StainlessSteel 316L" in 40µm + 80µm
EOS M 300-4	MS1_050_CoreM304	1.00	**Initial:** Enables job builds for material "EOS MaragingSteel MS1" in 50µm
EOS M 300-4	IN718_040_CoreM304	1.00	**Initial:** Enables job builds for material "EOS NickelAlloy IN718" in 40µm
EOS M 400-4	20MnCr5_040_CoreM291	1.00	**Initial:** Enables job builds for material "EOS CaseHardeningSteel 20MnCr5" in 40µm
EOS M 400-4	316L_040_080_CoreM404	1.00	**Initial:** Enables job builds for material "EOS StainlessSteel 316L" in 40µm + 80µm
EOS M 400-4	AlSi10Mg_040_CoreM404	1.00	**Initial:** Enables job builds for material "EOS Aluminum AlSi10Mg" in 40µm
EOS M 400-4	Ti64Grade5_040_080_CoreM404	1.00	**Initial:** Enables job builds for material "EOS Titanium Ti64Grade5" in 40µm + 80µm
EOS M 400-4	Ti64Grade23_040_080_CoreM404	1.00	**Initial:** Enables job builds for material "EOS Titanium Ti64Grade23" in 40µm + 80µm

Updated / Replaced Material Sets

Machine type	Process product name	Version		Description
		new	previous	
EOS M 100	316L_020_FlexM100	2.02	2.01	**Bugfix**: Internal file structure was updated with no observable effect for the user and no effect on the building process.
EOS M 100	CPM00647_020_ Platinum-Ruthenium	1.01	1.00	**Bugfix**: Internal file structure was updated with no observable effect for the user and no effect on the building process.
EOS M 100	CPM11889_020_18KtYellow3N-KK	1.01	1.00	**Bugfix**: Internal file structure was updated with no observable effect for the user and no effect on the building process.
EOS M 100	Ti64_020_FlexM100	1.01	1.00	**Bugfix**: Internal file structure was updated with no observable effect for the user and no effect on the building process.
EOS M 100	W1_020_FlexM100	1.01	1.00	**Bugfix**: Internal file structure was updated with no observable effect for the user and no effect on the building process.

Important Information

- EOSPRINT 2 only supports 64-bit operating systems
- If EOSPRINT 2.9 is to be installed on systems on which EOSPRINT 2.0 or EOSPRINT 2.1 was already installed, a new license must be requested from EOS before installation.

Solved Items

- Item 107160: OpenJz files are basically ZIP files with defined content. For all ZIP files, the relative paths of the packed files must only be specified with forward slashes (/). However, some 3rd party applications have created invalid OpenJz files that violate this rule and specify file paths with backward slashes (\). EOSPRINT 2 was able to load such OpenJz files but attempting to save them again caused a crash.
  With this correction, EOSPRINT 2 rejects to load such files with a corresponding error message. Manufacturers of 3rd party applications that created invalid OpenJz files have been notified of their error and given the opportunity to fix it, so the problem should not occur again in the future.
- Item 107336: If a job file was deleted or renamed after it was loaded, EOSPRINT 2 crashed when saving the job.
  With this correction, when saving the job, it is saved under its original name.
- Item 109473: In a previously loaded job, a part that occurred only once in the job was deleted and then the job was saved. If the delete action was subsequently undone and the job saved again, the application crashed.
  With this correction the job is saved successfully.
- Item 116269: EOS Software uses the CodeMeter system from WIBU Systems AG to implement its licensing model. In September 2020 WIBU Systems has published a series of Security Advisories (WIBU-200251-01 - WIBU-200251-06), which indicate several security vulnerabilities in all CodeMeter versions prior to version 7.10a. With EOSPRINT 2.9 version 7.10a is installed, which fixes all known security vulnerabilities.
- Item 103631: Saving a job with a file name containing special characters sometimes caused an unexpected error.
  This correction informs the user that the file name contains illegal characters.
- Item 109523: In rare cases it could happen, that the progress of a task export seemed to stall after a certain layer height.
  With this correction the error is solved.
- Item 112574: If only parts in SLI and CLI format were loaded in a job, the bottom layer of each part was not exposed. However, this error did not lead to a reduced connection of parts to the building platform in metal systems, because the exposure of subsequent layers usually also melts material in earlier layers, and because each layer is exposed twice in early layers (setting "Strong platform connection").
  With this correction, the lowest layer is exposed for parts in SLI or CLI format.
- Item 86504: If the material set was changed before a job was loaded and then the **New Job** tool was used, then the user had to confirm the UNSAVED CHANGES DETECTED dialog even though there were no unsaved changes.
  With this correction, this message no longer appears in the described case.
- Item 93796: When exiting the application, changes in the third column of the *EXPOSURE SET LIBRARY* window were not considered, which could lead to data loss because these changes were not saved.
  With this correction a warning message now appears on exit, indicating unsaved changes and offering the possibility to save the changes or to cancel the exit action.
- Item 94370: If the global shrinkage compensation was changed, these changes could not be undone with **Undo**.
  With this correction these changes can be undone using **Undo**.

- Item 102701: With non-zero X/Y shrinkage compensation and absolute positioning activated, the baseplate (which is a projection of the part bounding box onto the part platform and only serves for visualizing the part position) moved away from the part. The effect could be increased by repeated drag-and-drop movements. Since this was a visualization problem, it had no effect on the building process.
  With this correction the shifting no longer occurs.
- Item 103194: In jobs that consist of only a single layer, it could happen that in some cases no exposure preview was displayed when scrolling through this layer by arrow keys.
  With this correction, the exposure preview is always displayed.
- Item 103621: Open POLYLINE elements are now available for the definition of CLI-Supports.
- Item 104337: The automatic grouping of newly added parts based on the file name suffixes (e.g., _p for part, _0m for support) did not work reliably.
  This correction causes new parts to be grouped correctly.
- Item 104347: If the **Scroll to selected part(s)** function was selected from the part context menu in the 3D view directly after starting the application or before the part list was opened for the first time, the part list was not opened automatically.
  With this correction the part list is opened automatically.
- Item 104797: If loading a job leads to a change of machine type, it could happen that an unhelpful message "Error" was displayed without further text during loading.
  With this correction, these jobs are loaded successfully without an error message.
- Item 104901: When scrolling through the layers of a job with the arrow keys, it could happen that a layer was skipped when scrolling up.
  With this correction, all layers are displayed.
- Item 105416: The tool **Slice STL and Check for Errors** is used to check the printability of mesh-based geometries and to visualize problems. This visualization was sometimes faulty for meshes that are missing one or more surfaces, so that the modelled body is not waterproof. For example, the missing surfaces were displayed, but in the wrong place.
  With this correction the problems are marked correctly.
- Item 105470: If an attempt was made to load a corrupt OpenJz file, an unhelpful message "Error" was displayed without any further text.
  With this correction an error message is displayed explaining why the OpenJz file cannot be loaded.
- Item 108174: Changes in the *BEAM COMPENSATION* window could not be undone.
  With this correction, changes can now be undone.
- Item 98617: After assigning an exposure set via the part list, the UNAPPLIED CHANGES dialog was erroneously displayed when changing the workflow step.
  With this correction, this message no longer appears.
- Item 103767: When scrolling through the layers of a job with the arrow keys, it could happen that the first layer of the job was skipped when scrolling down.
  With this correction, the first layer is always displayed.
- Item 103875: When non-zero X/Y shrinkage compensation was set, an invalid preview of the operation was generated during the multiplication of parts assigned to a positioning point (Absolute Positioning), with the multiplied parts being displayed at the wrong position. The problem had no other effects - in particular the parts were correctly multiplied when clicking Apply.
  With this correction the preview is correctly displayed.

- Item 104806: If the machine type was changed while the *CUTTING PLANE* window was open and a cutting plane was displayed in the installation space, the size of the cutting plane displayed in the 3D area was not adapted to the size of the installation space of the new machine type.
  In this case, this correction adjusts the size of the cutting plane.
- Item 108175: The expert view in the *SHRINKAGE COMPENSATION* and *BEAM COMPENSATION* windows and the Machine Adjustments column in the *UPLOAD FINE TUNING* window contain input fields that can be reset to N/A by clicking the X button. However, to reset this X button had to be clicked twice.
  With this correction the input fields are reset by clicking once.
- Item 123972: In rare cases it could happen that deleted parts did not disappear from the 3D view. If you then clicked on one of these parts, EOSPRINT reported an "Unhandled Exception".
  The issue has been resolved.
- Item 124010: If the last loaded or saved job was on a network path and you later click Load Job while this network path is not accessible, an error message appears, and no job can be selected.
  The issue has been resolved
- Item 124613: In order to ensure the usability of the application even when dealing with complex part geometries, EOSPRINT generates a reduced mesh for display in 3D if necessary. In rare cases it could happen that certain such part geometries caused an error in the mesh reduction routine so that the part could not be loaded.
  The issue has been resolved.
- Item 125691: If a job was loaded in which certain lasers were assigned to the parts, it could happen that automatic laser assignment was set for some parts after loading.
  With this correction, the laser assignment is taken over from the job.

New Functions

- Item 85347: To minimize porosity at strip boundaries, overlapping boundaries such as the exposure edge between InFill and DownSkin have also been optimized for exposure types.
  This change can influence the building process and thus the part quality.
- Item 26822: By default, for all parts of a job, the lower left corner of the building platform is used as the coordinate origin for hatching. As a result, the exact position of the exposure vectors within a part depends on its position in the building envelope. A slightly different position of the exposure vectors usually does not influence the part properties, but for special applications and for the certification of manufacturing processes it may be desirable to guarantee identical hatching for identical geometries.
  It is now possible to define an individual, part-specific coordinate origin. This way identical hatching can be guaranteed for identical geometries, independent of the X/Y position of the part.
  The Hatching Coordinate Origin feature is included in the EOSPRINT Premium module.
- Item 90601: Using the parameter editor in the *EXPOSURE SET LIBRARY* window, defocused exposure can now be enabled for EOS M 290 machines that support defocused exposure.
- Item 114247: Using the OpenJob XML it is now possible to specify a z-specified minimum duration for the exposure phase of selected layers of a job. It specifies the minimum time that must elapse between the start of the exposure and the start of the next recoating process. This is to counteract local overheating by facilitating the cooling of the layer. This function was created as an interface for third-party simulation tools but is generally available. The function is currently not accessible via the user interface. Please contact edn@eos.info if you need an OpenJob XML format specification to use this feature. The feature will be made accessible via the user interface with a future version of EOSPRINT 2.

- Item 93213: In addition to the estimate of the total building time for a job, the *BUILDING TIME* window now also displays a diagram showing the exposure time per laser and layer. This allows to see in which layers there is a lot of exposed area and in which there is little. For multi-head systems, this diagram also shows whether the exposure was distributed evenly over the available lasers.
  Please note that in multi-head systems, the exposure time of the individual lasers is displayed in a stacked manner, although the exposure is of course parallel. This increases clarity, because the data series of one laser cannot overlap those of another.
  The Exposure Time Per Layer Chart is included in the EOSPRINT Premium module.
- Item 95926: Machine connections can be exported/imported.
- Item 96879: In the second column of the *EXPOSURE SET LIBRARY* window, exposure type instances can now be cloned.
- Item 97934: Frequently used material sets can now be pinned to the top of the **Material Set** list for convenience.
- Item 100820: The width of the part list can now be changed by drag & drop.
- Item 100881: Drag & Drop operations such as part movement and camera movement can now be canceled by pressing ESC while the drag & drop operation is not completed (i.e., while still holding the mouse button).
- Item 105145: It is now possible to animate the exposure process.
  This feature is included in EOSPRINT Premium module.
- Item 105146: It is now possible to display laser jumps in the preview.
  This feature is included in the EOSPRINT Premium module.
- Item 105487: By default, every change to the exposure sets or process settings triggers a new preview. A new toggle "Auto Update Preview" in the second column of the *EXPOSURE SET LIBRARY* and in the *PROCESS SETTINGS* window now allows to disable the automatic update of the preview. Both toggles share the same state.
- Item 105493: Tooltips in the window *EXPOSURE SET LIBRARY* that notify about missing licenses now show the product code of all missing material licenses.
- Item 105494: All file chooser dialogs in EOSPRINT 2 used to share a common state, so the next time the dialog was opened, the last opened folder was shown again irrespective of the file type. File selection dialogs now have a separate state for each file type. For example, the next time a file selection dialog for part geometries is opened, the folder from which part geometries were last loaded or where part geometries were saved is displayed, and not the folder from which jobs were loaded in the meantime.
- Item 105766: For safety reasons the lower limits of the parameters for the recirculating filter system (RFS) had to be changed. The parameters of customer material sets will be adjusted accordingly, if necessary. In this case a warning message will be issued and the values for 'Differential Pressure' and 'Gas Flow' must be checked in the workflow step **EXPOSURE** in the window *PROCESS SETTINGS* below the expander *Machine Settings* section 'Recirculating Filter System'.
- Item 113370: For the EOS P 500 machine type, a red frame is now displayed on the building platform, which is a recommendation for part placement to ensure optimal results.
- Item 91055: It is now possible to invert the current part selection using the context menu.
- Item 29616: Using the **Cutting Plane** tool in the **SEGMENTATION** workflow step, several parts can now be segmented at once.
- Item 84428: When multiplying parts, a displacement can now be specified so that the parts are positioned with an offset to each other, which is advantageous for the recoating process.
- Item 86170: It is now possible to jump to the first and last exposed layer of a part via the context menu.

Known Behavior

- Installation
  The user settings are not carried over to the new version. This means that the connections to the machines must be added again after installation.
- Restart after installation
  When installing EOSPRINT 2.9 the latest Microsoft Redistributables are installed. After installation of the redistributables a restart is needed. This restart might be executed without user confirmation.
- EOSPRINT 2.0 OpenJz-Files
  OpenJz files that were created with EOSPRINT 2.0 can no longer be loaded directly into EOSPRINT 2.9. In this case the OpenJz file should be loaded with EOSPRINT 2.7 and saved again. Afterwards the openjz file can be loaded in EOSPRINT 2.9.
- Performance
  Performance limitations may occur on loading very large, complex parts as well as on loading a very large number of parts. Complex parts are consciously not fully rendered, instead they are shown in lower quality.
- 3D display
  Only every tenth layer is shown in the 3D view for part data in the .sli file format. Every layer is shown separately in the 2D view.
- Remote desktop
  When starting EOSPRINT 2 via a remote desktop connection the Windows operating system selects an unfavorable driver for the initialization of the OpenGL context. This driver implements an outdated version of the OpenGL API and therefore does not work with EOSPRINT 2. EOSPRINT 2 has no influence on which driver is selected by the operating system.
  As a result, EOSPRINT 2 cannot be started over a remote desktop connection and the following error message is displayed:

  "Wrong OpenGL version: Installed version is 1.1, minimum required version is 3.3".

  To run EOSPRINT 2 over a remote desktop connection, there are three possibilities:

  4. For Nvidia GeForce graphics cards there is the possibility to download a tool that enables OpenGL support for remote desktop connections. The tool only works with Nvidia GeForce GPUs with R440 driver or newer. To download the tool a Nvidia developer account is required. See https://developer.nvidia.com/nvidia-opengl-rdp
  5. The application can be started in software rendering mode via the batch script swrender.cmd stored in the EOSPRINT 2 installation directory. The disadvantage of this solution is that in this case no hardware acceleration can be used, which leads to a significantly reduced speed, usability and graphic quality.
  6. The OpenGL driver is only selected when the application is started. Therefore, by starting EOSPRINT 2 before starting a remote desktop session, EOSPRINT 2 can be used with hardware acceleration. To also enable the start of the application via remote desktop you can write a script that ends the current RDP session and then starts EOSPRINT 2. This script can be executed via RDP, which first closes the connection and then starts EOSPRINT 2. If you connect via RDP again, EOSPRINT 2 is running with hardware acceleration.
- Graphic cards supported - driver versions
  EOSPRINT 2 requires a graphics card that supports as a minimum OpenGL 3.3. If there are problems, EOS recommends updating to the latest version of the driver for the graphics card.
- SLI export function
  The function for exporting part data in the .sli file format is not supported for support parts.
- Single Layer Task export
  When a single layer task export with *Position Contour* (Window *EXPORT TASK* – **Single Layer Position Contour**) for a part that uses an exposure set with a different layer thickness than the exposure set *Position Contour* is started, it

might happen that an error message occurs. In this case the layer thickness of exposure set *Position Contour* has to be adapted.

- Exposure in the EOS M 300-4
  The following exposure features are used differently for the EOS M 300-4 compared to the EOS M 290:
  - The exposure sequence defined through the part order in the elements tree is not necessarily adhered to.
  - The setting 'Exposure Type Processing', 'Per Part' or 'Per Layer', in the window *PROCESS SETTINGS* in the expander *Exposure Settings* has no impact on the exposure.
  - The exposure is separated into different packages. The size of these packages can be set in the window *PROCESS SETTINGS* in the expander *Scanner Settings* (Parameter name in EOSPRINT 2: Balancing Package Size). This division into exposure packages results in a new type of exposure image for the EOS M 300-4.
  - When the Time Homogenization feature is used, the exposure order of the exposure types, which are defined by the order of the exposure types in the second column of the *EXPOSURE SET LIBRARY* window, may not be maintained. This means that for the hatch the Feature Time Homogenization is not considered in the laser synchronization. Therefore, the contour may be exposed before the hatch is fully exposed.
  - When activating the Strong Platform Connection feature in the *PROCESS SETTINGS* window the exposure vectors follow different rules than standard EOS metal machines. This can lead to single exposure work packages that are exposed twice.
- Loading CLI files:
  To ensure CLI files (ASCII and binary) will be loaded successfully and processed correctly, the following points must be considered:
  - To create an empty layer, define a closed POLYLINE with zero area, inside the XY bounding box of the actual geometry. Defining a layer without any geometry command will lead to incorrect z heights of geometry data. Defining an empty layer this way does not affect exposure.
  - EOSPRINT 2 does not support coordinate values (X/Y/Z) greater than 655.35 mm (after the raw value has been multiplied with the value specified in the UNITS command).

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

Version 2.8.2086.0

Overview of version compatibility with EOSYSTEM

Edition 04.19	Edition 10.19	Edition 05.20
X	X	X

Overview of version compatibility with EOSTATE Exposure OT

EOSTATE Exposure OT	EOSPRINT Version 1.11, 2.8
Edition 04.19	X
Edition 10.19	X
Edition 05.20	X

Important Information

- EOSPRINT 2 only supports 64-bit operating systems
- The *Automated Production Interface* feature is not supported by EOSPRINT 2
- If EOSPRINT 2.8 is to be installed on systems on which EOSPRINT 2.0 or EOSPRINT 2.1 was already installed, a new license must be requested from EOS before installation.

Solved Items

- Item 75727 : For a rare type of STL geometries, too much area was exposed in certain layers. This only occured for STLs exhibiting the following feature:

  - a number of single edge ridges all joined in one point (in a wheel and spoke like fashion),
  - all perfectly parallel to the x-y-plane,
  - each ridge being part of a closed loop of similar ridges,
  - the whole ensemble being the topmost part of the geometry (locally)

  Under these conditions, too much area was exposed if there was an exposed layer at exactly the same z-height as the feature described above.
  This change may influence the building process and thus the part quality.

- Item 77990 : If the Power Reduction Factor feature was used on an EOS M 400-4, the laser power was not correctly adjusted at the laser boundaries. With this correction, the laser power at the laser boundaries is now correctly applied for the whole hatch.
  This change may influence the building process and thus the part quality.

- Item 82609 : If a part with an identical part name to an already referenced part, then the absolute path of the newly loaded part was saved to the job file. With this change the part geometry data is used to detect whether the parts are identical. In this case the STL geometry that is stored in the openjz-file is used.

- Item 86489 : When trying to open an openjz-file in EOSPRINT2 by double-clicking on the file, e.g. in Windows Explorer, only EOSPRINT 2 was started.
  With this change EOSPRINT 2 is started and the Job is loaded into EOSPRINT 2.

- Item 90417 : If the Exposure Pattern 'NoPattern' was applied with the Time Optimized feature, the jumps of the scanner between the vectors were not executed optimally.
  This correction optimizes the jumps of the scanner between the exposed vectors.
  This change may influence the building process and thus the part quality.
- Item 92663 : Using EOSPRINT 2.8 with Software-Rendering works differently from previous versions. There are two options:

  1. Set the user or system level environment variable *MESA_GL_VERSION_OVERRIDE* to *3.3COMPAT*. Subsequently, starting the Eosprint2 executable with the command line option /swrender will start Eosprint2 in software rendering mode (same option as in previous versions).
  2. Run swrender.cmd (located in the same folder as the Eosprint2 executable), which sets and unsets *MESA_GL_VERSION_OVERRIDE* for the current process only and starts Eosprint2 in software rendering mode. Environment variables are not affected.

  Setting MESA_GL_VERSION_OVERRIDE is necessary for some OpenGL 3.2+ features used by Eosprint2.
  When third-party software is installed that might be affected by manipulating this environment variable, use option 2.
- Item 94300 : If a part was built with the feature 'Power Reduction Factor', the laser power, if it did not change in the first strip of the hatch exposure, was applied to all further vectors in the following strips for this part.
  With this correction the correct laser power is used for all strips of the part.
  This change may influence the building process and thus the part quality.
- Item 102583 : When importing a part geometry with triangle coordinates below the building platform (i.e. Z_min < 0), then in some rare cases where -0.5 mm < Z_min < 0 mm these parts were not moved automatically and thus were not in alignment with the building platform.
  With the correction parts, which are partially below the building platform, will always be aligned with the building platform.
  This change may influence the building process and thus the part quality.
- Item 101443 : For safety reasons the lower limits of the parameters for the recirculating filter system (RFS) had to be changed. The parameters of customer Material Sets will be adjusted accordingly, if necessary. In this case a warning message will be issued and the values for 'Differential Pressure' and 'Gas Flow' must be checked in the workflow step EXPOSURE in the dialog PROCESS SETTINGS below the expander Machine Settings section 'Recirculating Filter System'.
- Item 103572 : For ASCII-Format CLI files, geometry commands after the first $$HATCHES section inside a $$LAYER section were ignored for the rest of this layer. Consequently, the geometry defined by the ignored commands was neither displayed on screen nor exposed.
  With this change, subsequent geometry commands after the first occurrence of $$HATCHES inside the same $$LAYER are not ignored anymore.
  This change may influence the building process and thus the part quality.
- Item 103579 : For binary CLI files using the STARTHATCHESLONG command (132), all commands after the first hatches section were ignored, including all subsequent layers. Consequently, the geometry defined by the ignored commands was neither displayed on screen nor exposed.
  With this change, subsequent commands after the first occurrence of STARTHATCHESLONG are not ignored anymore.
  This change may influence the building process and thus the part quality.
- Item 102465: Machine specific default or adjustment values for the Global Beam Offset were displayed incorrectly for layer thicknesses >= 100 µm of the current material set and were written incorrectly when uploaded to a machine. For these layer thicknesses only the last 2 digits were considered (i.e. values for 160µm were treated as 60µm, 240µm as

40µm ...).
With this change the values for the Global Beam Offset are read and written correctly for all layer thicknesses.

New Functions

- Item 26659 : Starting from this release on, EOSPRINT 2 supports the machine type EOS M 100.
- Item 26666 : For EOS metal systems, it is now possible to activate the new support exposure function *Time Optimized* in the **EXPOSURE** workflow step using the tool EXPOSURE SET LIBRARY. The feature optimizes the exposure of the support vectors regarding the time needed.
- Item 47461 : The current dosage calculation method included fluctuations in the calculated dosing quantity of approximately 5 %. The variations arose from the rotation of the hatch vectors per layer. With this improvement, the dosage quantity should be calculated more consistently, especially for EOS M 290 machines.
- Item 56836 : In the workflow step **EXPOSURE** the new tool AUTO EXPOSURE SET ASSIGNMENT offers the possibility to define which Exposure Set should be assigned for specific part file name extensions such as _p or _0m. Furthermore, new assignment rules can be added.
- Item 71037 : With this release the layer slider in EOSPRINT 2 only slides into recoated layers. This especially improves working with a Material Set that contains multiple layer thicknesses.
- Item 72387 : The RAM needed for loading parts in EOSPRINT 2 is significantly reduced. Moreover, the performance working with SLI files is greatly improved.
- Item 79144 : This release introduces the possibility to restrict the use of a Material Set to one or more Print Domains. This restriction cannot be entered via the user interface.
- Item 85262 : With the release of Software Edition May 2020 (EOSPRINT 2 and EOSYSTEM versions required), it is possible to upload material-machine specific Fine Tuning values per Material Set to the selected machine.
- Item 85285 : For the EOS M 300-4 it is now possible to operate the new multi-laser exposure algorithms in 'Full Overlap' mode. This setting can be found in the **EXPOSURE** workflow step using the tool PROCESS SETTINGS below the expander Scanner Settings.
- Item 85347 : The improvements to minimize porosity at stripe boundaries have been optimized for Exposure Type boundaries such as between InFill and DownSkin.
  This change may influence the building process and thus the part quality.
- Item 86163 : In the 3D-Workspace as well as in the Elements Tree it is now possible to open a context menu with a mouse-right click. Functions include among others for example a manual laser assignment and part grouping.
- Item 87142 : In the tool Exposure Set Library in the workflow step **EXPOSURE** it is now possible to set the parameter Minimum Vector Time for Hatch Exposure Types. The parameter - Minimum Vector Time - can be found in the 3rd column of the dialog within the Expander Exposure Pattern and the heading Energy Input Homogenization.
- Item 91531 : With the context menu tool Part Predeformation it is now possible to consider the linear z-Shrinkage Compensation executed by the platform lowering of the EOS Polymer machines from the part predeformation.
- Item 97875 : The user interface of EOSPRINT 2.8 introduces in the upper right corner of the application the help button. Clicking the help button, the EOSPRINT 2 user manual will open in the standard web browser.

- Item 99257 : In the workflow step EXPOSURE, the Part Exposure Order tool was renamed Part Exposure while the following functions were added. The Part Exposure Order can now be sorted by Multi Laser Parts in such a way that parts which have to be exposed by two lasers are moved to the beginning of the exposure list. In addition, a manual laser assignment can be triggered, which aims to expose parts with a single laser if possible.

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

Known Behavior

- Installation
  The user settings are not carried over to the new version. This means that the connections to the machines must be added again after installation.
- Restart after installation
  When installing EOSPRINT 2.8 the latest Microsoft Redistributables are installed. After installation of the redistributables a restart is needed. This restart might be executed without user confirmation.
- EOSPRINT 2.0 OpenJz-Files
  OpenJz files that were created with EOSPRINT 2.0 can no longer be loaded directly into EOSPRINT 2.8. In this case the OpenJz file should be loaded with EOSPRINT 2.7 and saved again. Afterwards the openjz file can be loaded in EOSPRINT 2.8.
- Z-segmentation
  Z-segmentation makes it possible for the user to divide the parts in the Z direction and to assign different exposure sets to these segments of the parts. There is then a transition zone between the segments of the parts where the different exposure sets meet. This situation brings with it the following challenges:
  - The user must undertake a detailed analysis of the joint in transition zones.
  - The usage of different layer thicknesses requires expert knowledge to produce high-quality joints.
  - All the possible combinations of process parameters and layer thicknesses are not fully validated, the quality requirements for transition zones are the responsibility of the user.

  Furthermore, a cutting plane is inserted relative to the part. This means that the cutting plane no longer matches the height of the slider if the z co-ordinate of a part is not equal to 0.
- Performance
  Performance limitations may occur on loading very large, complex parts as well as on loading a very large number of parts. Complex parts are consciously not fully rendered, instead they are shown in lower quality.
- 3D display
  Only every tenth layer is shown in the 3D view for part data in the .sli file format. Every layer is shown separately in the 2D view.
- Remote desktop
  Due to the usage of OpenGL, EOSPRINT 2 only offers limited remote desktop support. EOS recommends using remote access software from, e.g., TeamViewer for remote access for performance reasons. During internal tests it was found that access via Microsoft Remote Desktop with EOSPRINT 2 already open did not result in any significant performance degradation. Starting EOSPRINT 2 with a remote desktop connection already open results in an error message that the OpenGL version installed is inadequate and the start process will therefore be canceled.
- Graphic cards supported - driver versions
  EOSPRINT 2 requires a graphics card that supports as a minimum OpenGL 3.3. If there are problems, EOS recommends updating to the latest version of the driver for the graphics card.
- SLI export function
  The function for exporting part data in the .sli file format is not supported for support parts.
- Single Layer Task export
  When a Single Layer Task Export with *Position Contour* (Window EXPORT TASK – *Single Layer Position Contour*) for a part that uses an Exposure Set with a different layer thickness than the Exposure Set Position Contour is started, it might happen that an error message occurs. In this case the layer thickness of Exposure Set Position Contour has to be adapted.
- Exposure in the EOS M 300-4
  The following exposure features are used differently for the EOS M 300-4 compared to the EOS M 290:
  - The exposure sequence defined through the part order in the Elements Tree is not necessarily adhered to

- The setting 'Exposure Type Processing', 'Per Part' or 'Per Layer', in the tool PROCESS SETTINGS in the expander *Exposure Settings* has no impact on the exposure
- The exposure is separated into different packages. The size of these packages can be set in the tool PROCESS SETTINGS in the expander *Scanner Settings* (Parameter name in EOSPRINT 2: Balancing Package Size). This division into exposure packages results in a new type of exposure image for the EOS M 300-4.
- When the Time Homogenization feature is used, the exposure order of the Exposure Types, which are defined by the order of the Exposure Types in the second column of the Exposure Set Library tool, may not be maintained. This means that for the hatch the Feature Time Homogenization is not taken into account in the laser synchronization. Therefore, the contour may be exposed before the hatch is fully exposed.
- When activating the Strong Platform Connection feature in the Process Settings dialog box the exposure vectors follow different rules than standard EOS metal machines. This can lead to single exposure work packages that are exposed twice.

➢ Loading CLI files:
To ensure CLI files (ASCII and binary) will be loaded successfully and processed correctly, the following points must be taken into account:

- Do not use open POLYLINE commands to define support structures. Support structures must be defined with the HATCHES command.
- To create an empty layer, define a closed POLYLINE with zero area, inside the XY bounding box of the actual geometry. Defining a layer without any geometry command will lead to incorrect z heights of geometry data. Defining an empty layer this way does not affect exposure.
- EOSPRINT 2 does not support coordinate values (X/Y/Z) greater than 655.35 mm (after the raw value has been multiplied with the value specified in the UNITS command).

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

Version 2.7.577.0

Overview of version compatibility with EOSYSTEM

Edition 10.18	Edition 04.19	Edition 10.19
X	X	X

Overview of version compatibility with EOSTATE Exposure OT

EOSTATE Exposure OT	EOSPRINT Version 1.11, 2.7
Edition 04.18	-
Edition 04.19	X
Edition 10.19	X

Important Information

- EOSPRINT 2 only supports 64-bit operating systems
- The *Automated Production Interface* feature is not supported by EOSPRINT 2
- If EOSPRINT 2.7 is to be installed on systems on which EOSPRINT 2.0 or EOSPRINT 2.1 was already installed, a new license must be requested from EOS before installation.
- With the release of EOSPRINT 2.7 the loading of eosjob-files (job format of EOSPRINT 1) is no longer supported. If eosjob-files have to be processed with EOSPRINT 2.7, EOS recommends the following workflow:
  - Open previous version of EOSPRINT 2 (EOSPRINT 2.2 to 2.6)
  - Load the eosjob file, the file will be converted to the openjz format
  - Save the openjz file in workflow step Export with 'Save as...'
  - Open EOSPRINT 2.7 and load the openjz - file

  In case a 'User-defined DefaultJob', uploaded to the machine with EOSPRINT 1, is to be used in EOSPRINT 2.7, the following workflow is recommended:
  - Open EOSPRINT 1
  - Open the Options - HWI window
  - Click on 'Load user default job...'
  - A Windows Explorer dialog opens, copy the path to the folder and open the path with a normal Windows Explorer window
  - Convert the Eosjob file to the openjz format as described above

Solved Items

- Item 79470: When calculating the building time for a job without parts EOSPRINT 2 has been closed.
  With this correction the building time is set to 0 s and EOSPRINT 2 remains active.
- Item 84177: If a laser has been explicitly assigned to a part and some areas of the parts bounding box are located outside the laser range, the assignment was automatically changed during the generation of the task. With this correction the laser assignment is not changed. The bounding box for this part can be seen in the PLACEMENT workflow step.
  This change may influence the building process and thus the part quality.
- Item 78838: In rare cases the calculation of the building time for EOS M 400-4 used the default value for the exposure time.
  With this correction the calculation uses the exposure time that has been measured by the machine.

- Item 78992: When the values for part specific and global beam offset nullify each other, no exposure data for the part were created. With this correction also in this case exposure data is created.
  This change may influence the building process and thus the part quality.
- Item 78963: If only one layer thickness was assigned to all parts, the value 999,000 mm was displayed in the EOSTATE Job Quality Report for the beam offset.
  With this correction, the value of the Global Beam Offset assigned to the used layer thickness is displayed as Beam Offset in the Job Quality Report.
- Item 72863: If a building task was exported in the EXPORT workflow step in the EXPORT TASK window using the export option Single Layer with the default setting z-Height 0 mm, the entire building task was exported to the machine because this setting is not a valid value.
  With this correction the parameter z-Height is automatically set to the next valid value and the task for a single layer is created.
- Item 75164: If a task was exported with EOSPRINT 2 to a machine, in rare cases it could happen, that even so a machine connection existed the message "CONNECTION TO MACHINE NOT POSSIBLE" was displayed.
  With this correction, the message is only displayed if there is no connection to the machine.
- Item 85349: The scanner jump time between two or more interrupted in-line vectors (Interruption e.g. through a hole) has been improved. This change may shorten the build time.
  This change may influence the building process and thus the part quality.
- Item 80200: When loading jobs that use exposure sets from 'Test Series' and were created with an EOSPRINT 2 version smaller than 2.5, the assignment of the exposure sets was lost.
  With this correction the assignment is preserved.
- Item 80649: The 'Minimum Layer Time' parameter in the PROCESS SETTINGS dialog box below the expander Machine Settings has been renamed to 'Minimum Exposure Time' and placed below the expander Exposure Settings.
  The functionality of the parameter has not been changed.
- Item 75904: If the build time was calculated using the EOS M 400 offline machine, no distinction was made between one-sided and two-sided coating.
  With this correction, the type of the recoating is taken into account for the build time calculation.
- Item 75590: If the name of a machine was entered with leading or trailing spaces, it was not possible to establish a connection to this machine.
  With this correction it is possible to establish a connection to these machines.
- Item 54423: Build jobs with various assigned layer thicknesses could cause an error in build heights that did not contain parts with the smallest layer thicknesses. More specifically parts whose bottom edge of the bounding box was not aligned with a multiple of their assigned layer thickness were not exposed at these build heights.
  This change may influence the building process and thus the part quality.

New Functions

- Item 89547: EOSPRINT 2.7 can be installed in parallel to previous versions of EOSPRINT 2. Furthermore, all future versions of EOSPRINT 2 will be installable in parallel to previous versions.
- Item 85344: Parts are no longer colored red after a shift along the z-axis. This is also valid for M-Systems.

- Item 75813**:** The standard overlap parameters for the EOS M 400-4 have been modified for this version. The new parametrization results in lower laser deflection, which in most cases should lead to a reduction in build time.
- Item 79905: For the EOS P 500 it is now possible to make job-specific adjustments to the process temperatures in the PROCESS SETTINGS dialog window. The following temperatures can be adjusted:
  - Process chamber
  - Unpacking chamber
  - Building platform
- Item 78359: In the workflow step **EXPOSURE** two new overlap functions, Randomized and Sawtooth, can be selected in the BUILD SETTINGS dialog box. These overlap functions can be applied to the EOS M 400-4 and EOS P 500 machine types.
- Item 72338: In the workflow step **EXPOSURE** it is now possible to save the material-specific fine tuning values Global Beam Offset and Global Scaling on the machine with the tool 'Upload Fine Tuning'. In previous versions of EOSPRINT 2 the material machines specific values had to be uploaded to the machine with EOSPRINT 1.
- Item 70991: The Elements list offers the possibility to change the view on the elements list between 'Exposure Order' and 'Parts and Support'
- Item 57978: EOSPRINT 2.7 supports the preparation of building tasks for Integra P 400 systems.
- Item 52780: For the EOS M 300-4 it is now possible to parameterize the new overlap exposure algorithms in the **EXPOSURE** workflow step using the tool **Process Settings**. Here the algorithms can be found below the expander *Scanner Settings*. In the workflow step **PREVIEW**, the option 'Laser' can be selected in the tool COLOR OPTIONS. By selecting this option, the vectors are colored depending on the laser used for the exposure.
- Item 47676: EOSPRINT 2 supports the new machine type EOS P 500. Furthermore, the tool EXPOSURE ORDER in the workflow step **EXPOSURE** offers the possibility to sort the part exposure order with the methods 'Against Flow', 'Inside Out' or 'Next by Midpoint'.
- Item 26997: With Edition 10/19, EOS is releasing a new licensing model – the PRINT DOMAIN based licensing model. As part of this launch, EOSPRINT 2.7 will introduce the EOSPRINT 2 Premium Module designed for Process Developers. The Premium Module is licensed with the separate license code 40221 and contains the following features:
  - Exposure Editor (2nd and 3rd column of Exposure Set Library): With this editor Exposure Sets can be edited and consequently optimized
  - Lock and Export Material Set (in the Material Set Manage dialog): This functionality allows locking a Material Set so that your self-developed parameters cannot be modified anymore and are protected from insight.

Known Behavior

- Installation
  The user settings are not carried over to the new version. This means that the connections to the machines must be added again after installation.
- Z-segmentation
  Z-segmentation makes it possible for the user to divide the parts in the Z direction and to assign different exposure sets to these segments of the parts. There is then a transition zone between the segments of the parts where the different exposure sets meet. This situation brings with it the following challenges:
  - The user must undertake a detailed analysis of the joint in transition zones.
  - The usage of different layer thicknesses requires expert knowledge to produce high-quality joints.
  - All the possible combinations of process parameters and layer thicknesses are not fully validated, the quality requirements for transition zones are the responsibility of the user.

  Furthermore, a cutting plane is inserted relative to the part. This means that the cutting plane no longer matches the height of the slider if the z co-ordinate of a part is not equal to 0.

- Performance
  Performance limitations may occur on loading very large, complex parts as well as on loading a very large number of parts. Complex parts are consciously not fully rendered, instead they are shown in lower quality.
- 3D display
  Only every tenth layer is shown in the 3D view for part data in the .sli file format. Every layer is shown separately in the 2D view.
- Remote desktop
  Due to the usage of OpenGL, EOSPRINT 2 only offers limited remote desktop support. EOS recommends using remote access software from, e.g., TeamViewer for remote access for performance reasons. During internal tests it was found that access via Microsoft Remote Desktop with EOSPRINT 2 already open did not result in any significant performance degradation. Starting EOSPRINT 2 with a remote desktop connection already open results in an error message that the OpenGL version installed is inadequate and the start process will therefore be canceled.
- Graphic cards supported - driver versions
  EOSPRINT 2 requires a graphics card that supports as a minimum OpenGL 3.3. If there are problems, EOS recommends updating to the latest version of the driver for the graphics card.
- SLI export function
  The function for exporting part data in the .sli file format is not supported for support parts.
- Overlap parameter settings for multiple head systems
  In EOSPRINT 2 the parameter settings for the overlap in multiple head systems are applied using the following logic
  - On adding a new job, the overlap parameter settings saved on the machine (parameters can be set using EOSPRINT 1.x) are applied to the job
  - If the overlap parameters are now adjusted for the specific job, this information is saved in the openjz file
  - On changing to a different multiple head machine, the job-specific setting is overwritten by the machine-specific overlap parameter settings.
- Adding parts to an existing job
  When adding parts to a job that already contains parts, it has to be taken care that the file names of the added parts differ from the ones that are already contained in the job. Otherwise if the file name is identical the absolute path of the added part is saved in the job.
- Exposure in the EOS M 300-4
  The following exposure features are used differently for the EOS M 300-4 compared to the EOS M 290:
  - The exposure sequence defined through the part order in the Elements Tree is not necessarily adhered to
  - The setting 'Exposure Type Processing', 'Per Part' or 'Per Layer', in the tool PROCESS SETTINGS in the expander *Exposure Settings* has no impact on the exposure
  - The exposure is separated into different packages. The size of these packages can be set in the tool PROCESS SETTINGS in the expander *Scanner Settings* (Parameter name in EOSPRINT 2: Balancing Package Size). This division into exposure packages results in a new type of exposure image for the EOS M 300-4.

Version 2.6.22.4896

Overview of version compatibility with EOSYSTEM

Edition 04.18	Edition 10.18	Edition 04.19
X	X	X

Overview of version compatibility with EOSTATE Exposure OT

EOSTATE Exposure OT	EOSPRINT Version 1.10, 2.6
Edition 10.17	-
Edition 04.18	-
Edition 04.19	✓

Important Information

- EOSPRINT 2 only supports 64-bit operating systems
- The *Automated Production Interface* feature is not supported by EOSPRINT 2
- If EOSPRINT 2.6 is to be installed on systems on which EOSPRINT 2.0 or EOSPRINT 2.1 was already installed, a new license must be requested from EOS before installation.

Solved Items

- Item 75205: When working with very complex jobs it could happen that after closing the application EOSPRINT 2 was still running in the background and the used memory was still allocated.
  With this correction EOSPRINT 2 is terminated as expected and the allocated memory is released.
- Item 79392: Bug in the vector preview visualization - the global, on the machine saved, Fine Tuning values Global Beam Offset and Global Scaling were only applied upon the initial machine connection for the generation of the *preview* vector data. After modifying the job (e.g. part movement, exposure parameter change) the material default values for Global Beam Offset and Global Scaling were used for the generation of the preview vector data. This bug has no influence on the part quality as the vector data generated for the task-file uses the correct Global Beam Offset and Global Scaling values.

  New Functions
- Item 76866: The Global Scaling as well as the Global Beam Offset can now be adapted on a per job basis in the workflow-step **EXPORT** in the tool **Process Settings**. The jobwise editability of the Global Beam Offset is limited to Exposure Set layer thicknesses already available in the Material Set and layer thicknesses that are unknown to the machine.

Known Behavior

- Installation
  The user settings are not carried over to the new version. This means that the connections to the machines must be added again after installation.
- Z-segmentation
  Z-segmentation makes it possible for the user to divide the parts in the Z direction and to assign different exposure sets to these segments of the parts. There is then a transition zone between the segments of the parts where the

different exposure sets meet. This situation brings with it the following challenges:
- The user must undertake a detailed analysis of the joint in transition zones.
- The usage of different layer thicknesses requires expert knowledge to produce high-quality joints.
- All the possible combinations of process parameters and layer thicknesses are not fully validated, the quality requirements for transition zones are the responsibility of the user.

Furthermore, a cutting plane is inserted relative to the part. This means that the cutting plane no longer matches the height of the slider if the z co-ordinate of a part is not equal to 0.

- Performance
  Performance limitations may occur on loading very large, complex parts as well as on loading a very large number of parts. Complex parts are consciously not fully rendered, instead they are shown in lower quality.
- 3D display
  Only every tenth layer is shown in the 3D view for part data in the .sli file format. Every layer is shown separately in the 2D view.
- Remote desktop
  Due to the usage of OpenGL, EOSPRINT 2 only offers limited remote desktop support. EOS recommends using remote access software from, e.g., TeamViewer for remote access for performance reasons. During internal tests it was found that access via Microsoft Remote Desktop with EOSPRINT 2 already open did not result in any significant performance degradation. Starting EOSPRINT 2 with a remote desktop connection already open results in an error message that the OpenGL version installed is inadequate and the start process will therefore be canceled.
- Graphic cards supported - driver versions
  EOSPRINT 2 requires a graphics card that supports as a minimum OpenGL 3.3. If there are problems, EOS recommends updating to the latest version of the driver for the graphics card.
- SLI export function
  The function for exporting part data in the .sli file format is not supported for support parts.
- Overlap parameter settings for multiple head systems
  In EOSPRINT 2 the parameter settings for the overlap in multiple head systems are applied using the following logic
  - On adding a new job, the overlap parameter settings saved on the machine (parameters can be set using EOSPRINT 1.x) are applied to the job
  - If the overlap parameters are now adjusted for the specific job, this information is saved in the openjz file
  - On changing to a different multiple head machine, the job-specific setting is overwritten by the machine-specific overlap parameter settings.
- Export of a task with a single layer
  When creating a task with **Export Options** set to Single Layer using the default setting 0 mm for the parameter z-Height, the complete task will be exported to the machine.
- Adding parts to an existing job
  When adding parts to a job that already contains parts, it has to be taken care that the file names of the added parts differ from the ones that are already contained in the job. Otherwise if the file name is identical the absolute path of the added part is saved in the job.

Version 2.6.21.68572

Overview of version compatibility with EOSYSTEM

Edition 04.18	Edition 10.18	Edition 04.19
X	X	X

Important Information

- EOSPRINT 2 only supports 64-bit operating systems
- The *Automated Production Interface* feature is not supported by EOSPRINT 2
- If EOSPRINT 2.6 is to be installed on systems on which EOSPRINT 2.0 or EOSPRINT 2.1 was already installed, a new license must be requested from EOS before installation.
- Changes for z-Height 0.000 mm
  - When setting the slider in the workflow-step **PREVIEW** to the z-Height 0.000 no exposure vectors are displayed.
  - To create a task using the *Export Option* Single Layer for the lowest possible layer, the parameter z-Height has to be set to the layer thickness of the used exposure set.
  - When setting the parameter Start height in the workflow-step **EXPOSURE** in the window *BUILD SETTINGS* in the area *Building Parameters* to 0 mm, no layer will be created for z-Height 0.000.

Solved Items

- Item 59899: If a job was loaded without a machine connection, in exceptional cases offsets could occur between the 3D depiction of parts and the exposure preview.
  The 3D depiction and the exposure preview are always identical with this patch.
- Item 68523: If a job containing the exposure type 'Stripes Quality' and the feature 'Time Homogenization' was built on an EOS M 400-4, in rare cases there could be delays between exposure areas. This situation could make it appear that not all 4 lasers were working at the same time.
  This incorrect behavior is corrected with this patch.
  This change may influence the building process and thus the part quality.
- Item 50435: If the features "Flow Optimization" and "Time Homogenization" were used together, only the feature "Time Homogenization" was applied.
  Both features can now be used simultaneously with this patch. If the features are used at the same time, the vectors within a part may be exposed in a different sequence.
  This change may influence the building process and thus the part quality.
- Item 67627: If EOSPRINT 2 was used to prepare data for several EOS systems, on changing the machine the settings for EOSTATE MeltPool Monitoring were not determined correctly and the settings from the previous machine applied. This situation could result in EOSTATE MeltPool Monitoring not acquiring any data and the display of the error message 'Trigger Not Set'.
  The settings are determined correctly on changing machine and EOSTATE MeltPool Monitoring acquires the data as expected with this patch.
- Item 67848**:** Parts that are partially or completely below the building area were moved onto the building platform during import. This movement was incorrect and resulted in incorrect part positioning.
  The parts are moved to the correct position with this patch.
- Item 70883: For exposure sets with multiple contours and geometries with several internal hollow spaces, the exposure sequence specified in the 2nd column in the parameter editor was not maintained sometimes.
  The specified exposure sequence is maintained with this patch.
  This change may influence the building process and thus the part quality.

- Item 68638: During the segmentation of a part, sometimes the segment boundaries were not aligned to a multiple of the layer thickness for the exposure set assigned. This problem was corrected automatically by EOSPRINT 2. However, it could occur that, despite the correction, the segment boundaries were not at a multiple of the layer thickness.
  The segment boundaries are set correctly with this patch. This patch is also applied to jobs that were prepared using earlier versions of EOSPRINT 2.
  This change may influence the building process and thus the part quality.
- Item 71192: If an OnPart, Down and standard contour were exposed in a contour with different parameter settings, the switching of the parameters between the contour types took place a few micrometers too early. As a result the part accuracy was lower.
  The switching between the contour types is now at the correct point and the part accuracy is increased with this patch.
  This change may influence the building process and thus the part quality.

New Functions

- Item 44135: For polymer machines the additional tool Part Predeformation is available. The tool deforms STL files as a function of their building area position to increase the accuracy of the parts. The following polymer machines are supported: EOS P 396 and EOS P 810.
- Item 71022: In the workflow-step **EXPORT** it is possible to generate a building task for a machine using **Export Task...** without an active network connection to the machine. In this way the building task can be calculated offline and then transferred to the machine in the **EXPORT** workflow step using **Export existing task...** once the network connection is active again.
- Item 70856: The settings from the *MOVE* and *ROTATE* windows have been combined in the new *TRANSFORM* window in the **PLACEMENT** workflow step. In addition, parts can also be copied to an exact position using this window.
- Item 70787: The points of origin of internal and external contours have been optimized. This change affects in particular the use of more than one contour. As such the points of origin, e.g. for a double contour are now no longer in the same place. The porosity close to the surface is reduced by this feature.
  This change may influence the building process and thus the part quality.
- Item 54876: The collision check between parts is no longer undertaken automatically. A collision check can now be initiated manually in the *COLLISION CHECK* window in the **PREVIEW** workflow step.
- Item 73185: It is possible to parameterize the building platform lowering when the recoater returns and one-sided recoating is used. The corresponding parameter **Platform Lowering** can be set in the workflow step **EXPOSURE** using the tool ***Process Settings***.
- Item 73188: I it is possible to change the fluidization method of the powder feed system for EOS M 400 and EOS M 400-4. Possible fluidization methods are – None, Pulsed or Continuous. The corresponding parameter **Dispenser Fluidization** can be set in the workflow step **EXPOSURE** using the tool ***Process Settings***.
- Item 73191: It is possible to set an upper and a lower limit of the building platform temperature which are used during the building process. If these limits are exceeded the building job is paused. The corresponding parameters **Upper Limit** and **Lower Limit** can be set in the workflow step **EXPOSURE** using the tool ***Process Settings***.
- Item 63342: The released versions 1.x of the Recirculating Filter System (RFS), as well as version 2.x which has not been released with edition 04.19 for EOS M 400 and EOS M 400-4 are supported. With EOSPRINT 2 job files can already be prepared for both filter systems.

Known Behavior

- Installation
  The user settings are not carried over to the new version. This means that the connections to the machines must be

added again after installation.

- Z-segmentation
  Z-segmentation makes it possible for the user to divide the parts in the Z direction and to assign different exposure sets to these segments of the parts. There is then a transition zone between the segments of the parts where the different exposure sets meet. This situation brings with it the following challenges:
  - The user must undertake a detailed analysis of the joint in transition zones.
  - The usage of different layer thicknesses requires expert knowledge to produce high-quality joints.
  - All the possible combinations of process parameters and layer thicknesses are not fully validated, the quality requirements for transition zones are the responsibility of the user.

  Furthermore, a cutting plane is inserted relative to the part. This means that the cutting plane no longer matches the height of the slider if the z co-ordinate of a part is not equal to 0.
- Performance
  Performance limitations may occur on loading very large, complex parts as well as on loading a very large number of parts. Complex parts are consciously not fully rendered, instead they are shown in lower quality.
- 3D display
  Only every tenth layer is shown in the 3D view for part data in the .sli file format. Every layer is shown separately in the 2D view.
- Remote desktop
  Due to the usage of OpenGL, EOSPRINT 2 only offers limited remote desktop support. EOS recommends using remote access software from, e.g., TeamViewer for remote access for performance reasons. During internal tests it was found that access via Microsoft Remote Desktop with EOSPRINT 2 already open did not result in any significant performance degradation. Starting EOSPRINT 2 with a remote desktop connection already open results in an error message that the OpenGL version installed is inadequate and the start process will therefore be canceled.
- Graphic cards supported - driver versions
  EOSPRINT 2 requires a graphics card that supports as a minimum OpenGL 3.3. If there are problems, EOS recommends updating to the latest version of the driver for the graphics card.
- SLI export function
  The function for exporting part data in the .sli file format is not supported for support parts.
- Overlap parameter settings for multiple head systems
  In EOSPRINT 2 the parameter settings for the overlap in multiple head systems are applied using the following logic
  - On adding a new job, the overlap parameter settings saved on the machine (parameters can be set using EOSPRINT 1.x) are applied to the job
  - If the overlap parameters are now adjusted for the specific job, this information is saved in the openjz file
  - On changing to a different multiple head machine, the job-specific setting is overwritten by the machine-specific overlap parameter settings.
- Export of a task with a single layer
  When creating a task with **Export Options** set to Single Layer using the default setting 0 mm for the parameter z-Height, the complete task will be exported to the machine.
- Adding parts to an existing job
  When adding parts to a job that already contains parts, it has to be taken care that the file names of the added parts differ from the ones that are already contained in the job. Otherwise if the file name is identical the absolute path of the added part is saved in the job.
- Memory is not released when EOSPRINT2 is closed
  It might happen that the memory is not released when the application is closed. In this case it is needed to kill the process using the Windows task manager.

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

Version 2.5.9.58707

Overview of version compatibility with EOSYSTEM

Edition 10.17	Edition 04.18	Edition 10.18
X	X	X

Important Information

- EOSPRINT 2 only supports 64-bit operating systems
- The *Automated Production Interface* feature is not supported by EOSPRINT 2
- If EOSPRINT 2.5 is to be installed on systems on which EOSPRINT 2.0 or EOSPRINT 2.1 was already installed, a new license must be requested from EOS before installation.
- Simultaneous use of features Flow Optimization and Time Homogenization
  The Parameter Editor offers for Hatches the possibility to use the features "Flow Optimization" and "Time Homogenization" simultaneously. If both features are selected, only the feature "Time Homogenization" is used. This behavior occurs in all previous EOSPRINT 2 versions.
- Changes for Task Export
  In previous versions of EOSPRINT 2 it was possible to enter values for Start and End Height that don't match the exact value of a single layer. This behavior has been changed so that from now on the exact value of the layer has to be entered. The exact value can be read off from the layer slider.
  This change comes in use for the following Workflow steps:
  - When creating a building task for a single layer in the window *EXPORT*
  - When creating a building task where Start and End Height are given in the window *BUILD SETTINGS*

Solved Items

- Item 63904: If an axisymmetric part, whose axis of symmetry goes through the origin, was printed and Edges were used, then in rare cases the end and the starting points of opposite Edges were connected.
  With this correction Edges of those parts are printed correctly. In addition the exposure time for Edges is optimized.
- Item 59227: If EOSPRINT 2 was connected to a machine on which an unknown material set was saved, in rare cases EOSPRINT 2 could stop responding during the automatic import of the material set.
  With this correction, unknown material sets are imported and can be used without limitations.
- Item 58445: If a part was segmented several times and it was then attempted to undo or repeat the segmentation, the user had to undertake the action to restore the original state more often than expected.
  With this correction, the segmentation is undertaken as expected on using UNDO/REDO.
- Item 55144: If a job containing support parts was loaded, the support parts could not be selected in the two-dimensional plan view.
  With this correction, support parts can also be selected in the two-dimensional plan view.

- Item 54549: When a Job for EOS M400-4 was created, where a part was partially placed below the platform, the manual laser assignment has been ignored. Instead the laser next to the exposure field was used.
  With this correction the manual laser assignment is used.
- Item 54677: When the laser assignment was changed, the modification of the Job was not stored. When this Job was reopened the changes got lost.
  With this correction the laser assignment is now correctly stored.
- Item 46884: The building time calculation for EOS M400-4 could differ up to four times from the correct result if for some parts the laser has been assigned manually.
  With this correction the building time calculation is done correctly, regardless if manual or automatic laser assignment is used.
- Item 48081: In rare cases EOSPRINT 2 crashed, when the segment of a part was selected and the height of the cutting plane was changed by modifying the value in the window *SEGMENTATION.*
  With this correction the crash does no longer occurs.
- Item 48504: When the 3rd column of the Parameter Editor was opened and the Exposure Pattern was changed, the text labels have not been correctly updated.
  With this correction the text labels are now updated and match the selected Exposure Pattern.
- Item 49723: When a part was rotated and it collided with another part, then the collision zones were marked in red. When the rotation was undone using the action Undo, then the previously red marked collision zones were still displayed.
  With this correction the collision zones are correctly displayed when the actions Undo or Redo are executed.
- Item 49902: If the connection to a machine was interrupted during loading of the material sets and afterwards a different machine was connected, then the previously loaded material sets were also displayed.
  With this correction after a successful connection to a machine only those material sets are displayed that exist on the connected machine.
- Item 50270: When the Parameter Editor was used to create Test Series and the creation was aborted clicking the "X", then, after reopening the Parameter Editor, the Test Series was still shown as a copy of the original Exposure Set.
  With this correction the Test Series is not visible when the creation was aborted.
- Item 46671: The window *MULTIPLY PARTS* was opened and a part was multiplied using the mouse. When the value for Padding was changed from the opened window, all copies of the part were rearranged.
  With this correction the value for Padding can be changed and the previous arrangement of the parts remains.
- Item 46688: The window *MULTIPLY PARTS* was opened and a part was multiplied in Z direction by entering a value. This change was not confirmed by clicking the **APPLY** button. Afterwards the part was multiplied using the mouse. In this case the value for "Part count Z" was not updated.
  With this correction the value for "Part count Z" is updated.
- Item 37641: Up to now, OpenJobs with Version 1.0 und 1.1 were not supported and couldn't be imported to EOSPRINT 2.

With this correction OpenJobs with Version 1.0 und 1.1 are supported with restrictions. The element "machine-id" is ignored and the machine type is determined by the used material.

- Item 45768: When the Exposure Preview for a single layer was selected, the entry points were incorrectly displayed as arrows.
  With this correction the entry points are correctly displayed as circles.
- Item 46266: In case a lot of messages had to be displayed in a short time, it could happen that EOSPRINT 2 crashed.
  With this correction a flood of messages is correctly handled.
- Item 46399: When changing for a segmented part the height of the cutting plane, the part became invisible.
  With this correction the part is correctly displayed when the segmentation is changed.
- Item 46499: When adding a new Positioning Point to existing and used ones, in the building space also the used ones were displayed in white color instead of green.
  With this correction Positioning Points are displayed in the correct color.
- Item 55377: For a part with a long name, that could not be completely displayed in the Elements Tree, the color code marker of the used Exposure Type was no longer visible.
  With this correction the color code marker of the used Exposure Type is always visible.
- Item 48061: After exporting a single layer, the Exposure Preview for other layers was no longer displayed.
  With this correction the Exposure Preview is correctly displayed after exporting a single layer.
- Item 46648: In message dialogs the button for the default action was not marked and the default action couldn't be executed using the Space or Enter Key. In addition it was not possible to switch between the buttons using the arrow keys.
  With this correction the default action is executed when the Space or Enter Key is pressed and it is possible to switch between the buttons using the arrow keys.
- Item 45772: When an error occurred while loading *.eosjob or *.eosjz files no detailed error message was displayed.
  With this correction a more detailed error message is displayed.
- Item 45773: When the single layer mode was selected and the Layer Slider was set to the "Show All" position, all parts in the building space became invisible.
  With this correction all parts in the building space are displayed when the Layer Slider is set to the "Show All" position.
- Item 45811: When using the Exposure Preview the displayed legend for the Exposure Strategy UpSkin showed a red color. But in the Exposure Preview itself, different shades of red are displayed, depending if the Exposure Strategy is used for a contour or an area.
  With this correction the legend shows the different shades of red.
- Item 30718: When a part was selected in **PLACEMENT** the Workflow Step and the part was deleted, the buttons for **Duplicate along X-Axis** and **Duplicate along Y-Axis** remained activated.
  With this correction the buttons are deactivated when the selected part is deleted.
- Item 30728: The Elements Tree was opened and a part was selected. When adding the part to a group and afterwards removing it from the group with the action Undo the buttons **Group** and **Ungroup** could still be selected.
  With this correction after executing Undo it is no longer possible to select the buttons.
- Item 30789: When a Job was loaded and this Job referenced a non-licensed Exposure Set, the Exposure Set was automatically changed to EOS_DirectPart without informing the user about this change.

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

With this correction the user is informed about the changes. Detailed information about the affected parts can be found in the log files of EOSPRINT 2.

- Item 50976: When opening an SLI-file that was already opened by another application a misleading error message was displayed.
  With this correction the user is informed that the file is opened by a different application.

New Functions

- Performance improvement during building task preparation
  As part of the process of the continuous improvement of the user experience, the building task calculation has been speeded up.
- Deletion of user-defined material sets
  User-defined material sets can be removed in the *MANAGE MATERIAL SETS* window. These sets are then no longer available in EOSPRINT 2 for the machine type.
- Loading part support files
  From this version of EOSPRINT 2 it is possible also to load part support files in the STL file format.
- Item 47152: The Exposure Strategies Stripes and Chess have been optimized to minimize the porosity at the stripe borders.
- Item 35791: Starting from this release on, the machine specific Fine Tuning is automatically updated in EOSPRINT 2. Due to this change it is no longer needed to create all material sets for each connected machine. With the implementation of this feature the workflow has been noticeably simplified.

Known Behavior

- Installation
  The user settings are not carried over to the new version. This means that the connections to the machines must be added again after installation.
- Z-segmentation
  Z-segmentation makes it possible for the user to divide the parts in the Z direction and to assign different exposure sets to these segments of the parts. There is then a transition zone between the segments of the parts where the different exposure sets meet. This situation brings with it the following challenges:
  - The user must undertake a detailed analysis of the joint in transition zones.
  - The usage of different layer thicknesses requires expert knowledge to produce high-quality joints.
  - All the possible combinations of process parameters and layer thicknesses are not fully validated, the quality requirements for transition zones are the responsibility of the user.

  Furthermore, a cutting plane is inserted relative to the part. This means that the cutting plane no longer matches the height of the slider if the z co-ordinate of a part is not equal to 0.
- Performance
  Performance limitations may occur on loading very large, complex parts as well as on loading a very large number of parts. Complex parts are consciously not fully rendered, instead they are shown in lower quality.
- 3D display
  Only every tenth layer is shown in the 3D view for part data in the .sli file format. Every layer is shown separately in the 2D view.
- Remote desktop
  Due to the usage of OpenGL, EOSPRINT 2 only offers limited remote desktop support. EOS recommends using remote access software from, e.g., TeamViewer for remote access for performance reasons. During internal tests it was found that access via Microsoft Remote Desktop with EOSPRINT 2 already open did not result in any significant performance degradation. Starting EOSPRINT 2 with a remote desktop connection already open results in an error message that the

OpenGL version installed is inadequate and the start process will therefore be canceled.

- Graphic cards supported - driver versions
  EOSPRINT 2 requires a graphics card that supports as a minimum OpenGL 3.3. If there are problems, EOS recommends updating to the latest version of the driver for the graphics card.
- EOSTATE MeltPool Monitoring
  This functionality is not supported by the current version of EOSPRINT 2.
- SLI export function
  The function for exporting part data in the .sli file format is not supported for support parts.

Version 2.3.14

Overview of version compatibility to EOSYSTEM

Edition 04.17	Edition 10.17	Edition 04.18
X	X	X

Important Information

- EOSPRINT 2.3.14 only supports 64-bit operating systems
- The *Automated Production Interface* feature is not supported by EOSPRINT 2.3.14
- If EOSPRINT 2.3.14 is to be installed on systems on which EOSPRINT 2.0 or EOSPRINT 2.1 was already installed, a new license must be requested from EOS before installation.

Solved Items

- Item 36062: If a part loaded was assigned to a group and this part was then to be segmented in the building area in the **SEGMENTATION** workflow step, this segmentation was not undertaken.
  With this correction, it is now possible to segment, in the building area, parts that have been assigned to a group.
- Item: 36941: If the 2D view was opened while editing a job and the editing of a new job started by selecting the ***New Job*** button, the building area view was not reset to the 3D view.
  With this correction, the building area view is reset to the 3D view on creating a new job.
- Item 37019:
  - On changing between machine types, e.g. from EOS M 290 to EOS M 400-4
  - On connecting to machines and then removing the machine
  - On changing the material set selected

  More and more memory was therefore used over time.
  With this correction, the memory is freed up again after the actions stated.
- Item 37141If an invalid value was entered in the Parameter editor for the layer thickness and then a different window selected, this value was apparently applied. However, internally EOSPRINT used the smallest permissible value.
  With this correction, the values are now checked as they are entered. On the entry of invalid values, the valid values are displayed to the user in a tooltip.
  The **APPLY** button is not available until a valid layer thickness is entered.
- Item 37360: If a new building task was created using an offline machine and this task was exported, the user was prompted to save the job and select a machine that is connected to EOSPRINT. The building task was exported after the

selection of the machine. Because the data for the building task change due to the selection of the machine, the user should be prompted to save the job again.
With this correction, there is now a further prompt to save the job after the selection of a machine.

- Item 37625: If a support part was loaded without an exposure strategy assigned, an exposure strategy was selected at random for this part.
  With this correction, the exposure strategy EOS Support is assigned to the support part.
- Item 38100: If a large number of copies of parts was entered, it took a very long time until these copies were displayed, depending on the complexity of the part.
  With this correction, the maximum number of copies to be made is limited to 100.
- Item 38134: If a part was rotated with the aid of the transformation tool while the *MOVE* window was open, occasionally the values NaN were displayed for the positions in the Target column. In addition, the error message *FAILED TO PARSE X TRANSLATION* was displayed.
  With this correction, the correct values are now displayed and the error message no longer appears.
- Item 38147: If a group of parts was rotated, the base plate was displayed incorrectly after the rotation.
  With this correction, the base plate is now displayed correctly.
- Item 38164: EOSPRINT 2 supports the character set Windows-1252. If a part with a name with unsupported characters was loaded, a migration dialog box opened where it was necessary to enter a new file name for this part. If the name of an existing file was entered as the file name, on accepting the dialog box there was an error message and the file was not saved.
  The change now provides a dialog box for entering the file name; here it is checked if a file with the name selected already exists in the destination directory. In this situation a red border is displayed around the field and a message refers to the existing file with the same name. It is not possible to accept the dialog box until a unique file name is entered or the dialog box is closed by canceling the action.
- Item 38257: If a part was multiplied using the mouse and this action was canceled by clicking anywhere in the building area, the transparent part copies were still visible in the building area.
  With this correction, the transparent part copies are now deleted as soon as the action is canceled.
- Item 38285: If a job was loaded and the building height changed, no preview was displayed for the areas of the part that protruded beyond the building height set. After subsequently increasing the building height, the areas of the part that lay between the building height set before and the new building height were not shown in the preview.
  With this correction, the preview is correctly updated.
- Item 38348: If parts were selected using the mouse with the aid of a selection box, the parts displayed under the transformation tool were not selected.
  With this correction, the user can now select, using a selection box, all the parts under the transformation tool.
- Item 38372: If parts were selected using the mouse with the aid of a selection box, the parts under the view navigator were not selected.
  With this correction, the user can now select, using a selection box, all the parts under the view navigator.
- Item 38587: If you rotate a part such that it collides with another part, EOSPRINT 2 reports this collision and offers to undo the rotation. If such a rotation was undertaken by drag and drop directly in the 3D area and the user decided to undo the rotation, the part was nevertheless not reset to its original position.
  The incorrect behavior described no longer occurs.
- Item 38648: After establishing a machine connection, EOSPRINT 2 automatically downloads the default jobs (.eosjob) from this machine and converts them into material sets (.eospar). If several default jobs with an identical identifier were found, the application stopped responding.
  With this correction, it is now possible to import several default jobs with the same identifier. These then appear as separate entries with an identical identifier in the material set list.

- Item 39662: If an existing exposure set was copied in the *Exposure Set Library* window, the exposure set copied was then assigned to a part and the process canceled using **CANCEL**, no exposure set was assigned to the part. It was then also not possible to assign an exposure set to the part afterwards.
  With this correction, the original exposure set is assigned to the part again if the action is canceled.
- Item 39981: EOSYSTEM supports the character set Windows-1252. To address this situation, EOSPRINT 2 refused to export to a machine and displayed a message about the invalid characters. Users often did not know how to solve this problem.
  With this correction, the user is now prompted to save the job with a new file name compliant with Windows-1252, before the building task is generated.
- Item 40014: For machines of type EOS M 400-4 the laser overlap was not displayed.
  With this correction, the laser overlap is now displayed.
- Item 40036: On moving groups of parts, the unclear error message
  Failed to Parse X Translation
  was displayed on occasion.
  With this correction, groups of parts can now be moved without errors.
- Item 40352: Laser assignment cannot be changed automatically for entire group
  If parts within the same group were assigned to different lasers (on EOS M 400-4), then it was not possible to change the entire group to automatic laser assignment with a single user action. Instead, the laser assignment had to be changed separately for each part.
  This behavior has now been corrected such that it is now possible to change an entire group to automatic laser assignment.
- Item 40693: Sequence of elements in the overview of parts changed if groups are copied
  The sequence within the group copied was changed on copying groups with subgroups and individual parts. For example
  - Group
  -- Part 1
  -- Group A
  -- Part 2
  -- Group B
  became
  - Group
  -- Group A
  -- Group B
  -- Part 1
  -- Part 2

  With this correction, the original sequence is also retained in the group copied.
- Item 40871: Modal dialog boxes always in the foreground
  If a modal dialog box was opened in EOSPRINT, this dialog box always remained in the foreground, even if the user changed to a different application, and therefore interfered with work in other applications.
  With this correction, the dialog boxes are sent to the background on changing to a different application.
- Item 41161: EOSPRINT 1 job with non-ASCII exposure set causes errors
  If a job created using EOSPRINT 1 was imported and the job contained an exposure set with non-ASCII characters, the job was not converted correctly. As a consequence, there were several error messages and it was not possible to start a task export, a preview or building time calculation.
  With this correction, the jobs are now converted successfully and can be used in EOSPRINT 2.
- Item 41281: Section navigation is always in the foreground
  If the section navigation was opened from the main window for EOSPRINT 2, the section navigation was always

displayed in the foreground, even if the user changed to a different application. As a consequence, the section navigation could cover parts of another application.
With this correction, the section navigation is sent to the background and no longer covers an application in the foreground.

- Item 41674: *MOVE* window: the value in the field for *Z-Axis* is always rounded to integer values
  In the *MOVE* window, the part was moved to a new position by entering integer values. The part was then moved again using the transformation tool, while the *MOVE* window was open. During this action, the value for *Z-Axis* in the *Current* column was displayed correctly with three places after the decimal separator, while the value for *Z-Axis* in the *Target* column was only changed in integer steps.
  With this correction, the values in the *Current* and *Target* columns are displayed with three places after the decimal separator.
- Item 41109: Collision warning if a part is selected
  If a part is moved such that it collides with another part, this situation is reported to the user as a warning and the user can decide whether to undo the movement of the part. If this action was not undone, the collision warning appeared again as soon as the user selected one of the colliding parts.
  With this correction, the collision warning only appears if one of the colliding parts is moved again and there is still a collision after the movement.
- Item 43922: EOSPRINT 2 appears to stop responding while saving a large job
  If a job with a large number of parts was saved, no feedback was provided to the user that EOSPRINT 2 was still busy. As a result the user could have the impression that EOSPRINT 2 had stopped responding.
  With this correction, it is indicated to the user that the system is busy.
- Item 44040: Dosing quantity calculation only takes into account data from the last laser
  For machines of type EOS M 400-4, only the parts exposed by the last laser were taken into account during the part geometry-dependent dosing quantity calculation. This situation could result in an excessively low dosing quantity.
  With this correction, all parts are now taken into account for the calculation of the dosing quantity.
- Item 44463: Job with part with very long file name cannot be loaded
  If a job containing a part with a file name longer than 260 characters was loaded, EOSPRINT 2 stopped responding.
  With this correction, it is possible to load jobs that contain parts with long file names.
- Item 44496: During the task export, some errors are not displayed to the user
  Some errors that occurred on creating a task, during the exposure preview or during the calculation of the building time were only displayed in the error list up to now. A window or balloon was not displayed to notify the user of these errors.
  With this correction, the errors are displayed to the user in a window or as a balloon message, depending on their importance.
- Item 44511: EOSPRINT stops responding on loading CLI files
  On loading CLI files with file names with more than 260 characters, EOSPRINT 2 could stop responding.
  With this correction, these files can now be loaded.
- Item 44840: Connect lost if a default job cannot be downloaded
  On establishing the connection, EOSPRINT 2 downloads the default jobs from the machine. In some cases corrupt default jobs on the machine could cause the establishment of the connection to fail such that it was no longer possible to transfer building tasks to this machine.
  With this correction, a message is displayed to the user if the download of individual default jobs fails, however the establishment of the connection is no longer interrupted.
- Item 44942: Wrong material selected if New Job is run several times in succession
  If **New Job** was clicked several times while the activity indicator was visible in the status bar, sometimes no material set was assigned to the job. This situation could result in the use of the wrong material set.
  With this correction, a new job is always assigned a material set and this is marked in the selection list with the suffix *(Current Job)*.

- Item 45065: Loading an Openjz file referencing a machine type that is not supported
  If an Openjz file referencing a machine type not supported by EOSPRINT 2 was loaded, there were display errors.
  With this correction, an error message is displayed to the user on loading the Openjz file; this message informs the user that a machine type that is not supported is referenced in this Openjz file and the loading of the file is canceled.
- Item 45550: Rotation with dialog box ignores collision
  On the rotation of parts in the *ROTATE* window in the **PLACEMENT** workflow step, no collision warning was displayed on the collision of parts. On the other hand, if the part was rotated directly using drag & drop in the 3D area, a collision warning was displayed correctly.
  With this correction, a collision warning is displayed, independent of whether the rotation was undertaken in the 3D area or via the *ROTATE* window.
- Item 45567: After rotation and undo, part no longer in the same place
  If a part was rotated with the aid of the transformation tool and then the rotation undone, the part was no longer reset to the original position.
  With this correction, the part is now reset to the original position.
- Item 45800: Wrong laser assignment after copying and pasting on EOS M 400-4
  If a part was assigned to a specific laser on the EOS M 400-4 and the part then copied to an area that the laser originally assigned cannot reach, the original laser assignment was retained.
  With this correction, the laser assignment is automatically reset after pasting the part.
- Item 46032: On loading a job, the error message *Failed to save settings* is displayed
  If the user tried to load a job several times in succession, on occasion the error message *Failed to save settings* could be displayed. Because EOSPRINT 2 loads the job and saves the settings saved in the job at the same time, on occasion the settings were not saved while a new job was loaded. In this situation, saving the settings for the last job loaded failed.
  With this correction, it is ensured that the settings from the new job are saved without an error message.
- Item 46549: *SELECT NEW MATERIAL SET FILE FOR <machine>* window displays too many material sets after changing the machine type
  On the changing the machine type, a list of all material sets installed was displayed in the *SELECT NEW MATERIAL SET FILE FOR <machine>* window. This list also contained obsolete material sets such that out-of-date parameters were used for building in some circumstances.
  With this correction, only the current material sets are listed in the selection dialog box.
- Item 46884: Building time calculation for EOS M 400-4 is incorrect if manual laser assignment is used
  The result of the building time calculation for machines of type EOS M 400-4 could differ from the correct result by up to a factor of 4 if parts were assigned manually to a laser. The problem did not occur with automatic laser assignment.
  With this correction, the building time is now calculated correctly also with manual laser assignment.

New Functions

- Item 2665: Absolute positioning (reference point calibration) for EOS M 290
  The "Absolute positioning" functionality makes it possible for the customer to build hybrid parts. With this type of building, an additional part is built on a conventionally produced part using additive manufacturing. With "Absolute positioning" it is guaranteed that the part added using additive manufacturing is correctly aligned with the part produced conventionally.
- Item 29587: Single layer exposure for hybrid structure
  It is now possible to export an individual layer of a job to the machine. The building task created in this manner can be used to position parts for a hybrid structure. For this purpose, the following options have been added to the *EXPORT TASK* window:
  - "Single Layer": A single layer at the specified z height is exported
  - "Single Layer Position Contour": Like "Single Layer", however the PositionContour exposure set is assigned to all parts in this layer

- Item 26961: DoE Setup Tool
  'Design of Experiments' (DoE) makes it possible to create exposure set test series with varying exposure parameters automatically. This feature makes it possible for users who want to develop their own process parameters to create a large number of exposure sets with little effort and to assign test parts to them. Test series can also be created in advance in Excel and copied to the DoE Setup Tool.
  Further information on this function can be found in the manual.
- Item 36658: Minimum layer time
  For systems that are operated with Edition 04/18, it is possible to set a minimum layer time. This parameter can be set in the **EXPOSURE** workflow step in the *Process Settings* windows using the **RECOATING** option.

Known behavior

- Installation
  The user settings are not carried over to the new version. This means that the connections to the machines must be added again after installation.
- Building process with support for parts
  Files for supports for parts cannot be loaded in the STL file format. Only files for supports for parts in the .sli and .cli file format can be used.
- Z-segmentation
  Z-segmentation makes it possible for the user to divide the parts in the Z direction and to assign different exposure sets to these segments of the parts. There is then a transition zone between the segments of the parts where the different exposure sets meet. This situation brings with it the following challenges:
  - The user must undertake a detailed analysis of the joint in transition zones.
  - The usage of different layer thicknesses requires expert knowledge to produce high-quality joints.
  - All the possible combinations of process parameters and layer thicknesses are not fully validated, the quality requirements for transition zones are the responsibility of the user.

  Furthermore, a cutting plane is inserted relative to the part. This means that the cutting plane no longer matches the height of the slider if the z co-ordinate of a part is not equal to 0.
- Performance
  Performance limitations may occur on loading very large, complex parts as well as on loading a very large number of parts. Complex parts are consciously not fully rendered, instead they are shown in lower quality.
- 3D display
  Only every tenth layer is shown in the 3D view for part data in the .sli file format. Every layer is shown separately in the 2D view.
- Remote desktop
  Due to the usage of OpenGL, EOSPRINT 2.3.14 only offers limited remote desktop support. EOS recommends using remote access software from, e.g., TeamViewer for remote access for performance reasons. During internal tests it was found that access via Microsoft Remote Desktop with EOSPRINT 2.3.14 already open did not result in any significant performance degradation. Starting EOSPRINT 2.3.14 with a remote desktop connection already open results in an error message that the OpenGL version installed is inadequate and the start process will therefore be canceled.
- Graphic cards supported - driver versions
  EOSPRINT 2.3.14 requires a graphics card that supports as a minimum OpenGL 3.3. If there are problems, EOS recommends updating to the latest version of the driver for the graphics card.
- EOSTATE MeltPool Monitoring
  This functionality is not supported by the current version of EOSPRINT 2.3.14.
- SLI export function
  The function for exporting part data in the .sli file format is not supported for support parts.

Version 2.2.15

Overview of version compatibility

Software	Edition 10.16 EOS M 290 (400W) / EOS M 400	Edition 04.17 EOS M 290 (400W) / EOS M 400 / EOS M 400-4	Edition 10.17 EOS M 290 (400W) / EOS M 400 / EOS M 400-4
EOSPRINT 2	2.0	2.0	n.a
EOSPRINT 2	2.1	2.1	2.1
EOSPRINT 2	2.2	2.2	2.2

Important Information

- Version 2.2.15 replaces all versions up to and including 2.1.42.
- A new license is required for version 2.2.15. This license is to be requested before installation.
- EOSPRINT 2.2.15 only supports 64-bit operating systems.
- The *"Automated Production Interface"* feature is not supported by EOSPRINT 2.2.15.
- If other programs are installed while EOSPRINT 2 is running and these programs also use the WIBU licensing system, EOSPRINT 2 will be closed.

Solved Items

- Item 31731: Incorrect indication of the building task name in EOSYSTEM and EOSTATE
  All building tasks exported using EOSPRINT 2.0 were displayed in EOSYSTEM and EOSTATE with the name job.openjob. The name of the building task is now correctly exported from EOSPRINT 2.2.15 and displayed in EOSYSTEM and EOSTATE.
- Item 32346: Application sporadically stopped responding after multiplying parts and subsequently opening the Move dialog box
  If parts were multiplied and then the "Move" dialog box opened in the *Placement* workspace, the application stopped responding sporadically.
  This incorrect behavior has been corrected.
- Item 31528: EOSPRINT 2.0 does not start despite valid license
  Due to an erroneous license check during program start, it was not possible to start EOSPRINT 2.0 despite valid licenses.
  This incorrect behavior has been corrected.
- Item 37320: Erroneous representation of file names for parts
  On exporting building tasks, text entries and path information were exported incorrectly on the usage of some special characters. This situation caused problems during the further processing of these building tasks in EOSYSTEM and EOSTATE.
  All text entries and paths are checked in EOSPRINT 2.2.15 for compatibility. If there is an incompatibility, an error message appears with a prompt to change the text entries so they are compatible.
  The character set Windows-1252 is allowed for file names. On naming or exporting a material set, the character set allowed is reduced to ASCII.
- Item 37853: Incorrect depiction of the beam offset in EOSTATE
  In EOSTATE the value set for the beam offset on building z-segmented parts and using variable layer thicknesses was always displayed as "0" for the part segments in a building task.
  Because this value could be a valid value for the beam offset, the value "-999" is now shown in EOSTATE on building z-segmented parts and using variable layer thickness. In this way it is clearer that it is not possible to assign a specific value for the beam offset.

EOS GmbH - Electro Optical Systems
Robert-Stirling-Ring 1
D-82152 Krailling / München

- Item 34182: Multiple machine connections to the same machine
  Due to an erroneous entry check (upper & lower case) it was possible to add the connection settings for a machine several times in the *"Machine Management"* window.
  It is checked whether the machine connection entered is already known. Multiple connection settings for a machine are therefore no longer allowed.
- Item 34197: Machine connection not possible sporadically
  On multiple sequential attempts to connect to a machine, the connection sessions were not closed correctly. As a consequence in some circumstances it was no longer possible to establish a connection to the machine.
  The connection sessions are now correctly terminated by EOSPRINT 2.2.15.
- Item 34247: It was not possible to enter an IP address in the *Machine Management* window
  Due to an incorrect entry check, it was not possible to enter an IP address in the *"Machine Management"* window.
  The incorrect entry check has been corrected; it is now also possible to enter an IP address.
- Item 34507: Erroneous building time calculation for materials with different layer thicknesses
  On the usage of materials with different layer thicknesses, on occasion there were deviations in the building time calculation.
  From EOSPRINT 2.2.15, different layer thicknesses are treated correctly in the building time calculation.
- Item 31666: Problems during the preparation of Job Quality Reports in EOSTATE
  On exporting a building task, incomplete metainformation (Global Beam Offset and Global Scaling) was exported, this meant it was not possible to prepare a Job Quality Export in EOSTATE.
  The metainformation is now exported correctly and completely.
- Item 33008: Hidden parts not taken into account on exporting a building task
  If a part was hidden in EOSPRINT 2.0 in the *"Elements"* overview of parts, it was not exported to the machine in the building task. Parts hidden in the building task are now also exported using EOSPRINT 2.2.15.
- Item 33368: Error message on loading file formats that are not supported
  On loading parts in file formats that are not supported, an unclear error message was displayed in EOSPRINT 2.0. The correct error message is displayed with EOSPRINT 2.2.15; this message states that the import failed due to an invalid format.
- Item 32655: Maximum value for differential pressure too low
  In the machine settings the maximum value for *"Differential Pressure"* was limited to 0.7 mbar; this limitation has been raised to 1 mbar with EOSPRINT 2.2.15. In this way the value has been harmonized with EOSPRINT1.x.
- Item 41950: Conversion of user-defined default jobs from machine not successful in EOSPRINT 2.1
  User-defined default jobs prepared using EOSPRINT 1.x were not detected by EOSPRINT 2.1 in the past, because it was not possible to identify the material designations unambiguously. As a consequence, conversion failed and the jobs were not available.
  From EOSPRINT version 2.2.15 the material designations are now identified. As such user-defined default jobs are then available as a material set in EOSPRINT 2.2.15 and can be selected.
- Item 41477: Customer-specific settings in the "Development Settings" in EOSPRINT 1.x not taken into account on the conversion of an eosjob to EOSPRINT 2
  In EOSPRINT 2.1 the machine settings, such as the platform temperature or recoating strategy, were not taken into account during the conversion of the default job. As a consequence it was not possible to use the converted default job for a building task.
  From EOSPRINT 2.2.15, these settings are taken into account on the conversion of the default job and therefore correct machine settings are generated.
  The following settings are affected.
  - EOS M 290:

  Platform Temperature
  Differential Pressure
  Recoater Speed

- EOS M 400 and EOS M 400-4, in addition to the EOS M 290 data:
  Fluidization Mode (cannot be edited using EOSPRINT 2.2.15)
  Recoater Strategy

➢ Item 41968: Indication of the "*Machine Settings*" also for EOSYSTEM versions earlier than Edition 10.17
In EOSPRINT 2.1, machine settings for building platform temperature and recoater speed on machines with EOSYSTEM earlier than Edition 10.17 were hidden.
From EOSPRINT 2.2.15 these machine settings can also be edited for machines with EOSYSTEM earlier than Edition 10.17.

➢ Item 41952: Message on connection to EOSYSTEM earlier than Edition 10.17 removed
The message about unsupported functions on connection to an EOSYSTEM version earlier than Edition 10.17 has been removed. The restrictions on EOS M 400-4 systems for "*Exposure Pattern*" and "*Flow Optimization*" are displayed in the related dialog boxes.

➢ Item 41953: Migration of EOSPRINT 2.0 jobs to EOSPRINT 2.1
If an openjz file created with EOSPRINT 2.0 was opened using EOSPRINT 2.1, the material in the file was converted to EOSPRINT 2.1 standards. During this conversion the limits for the following parameters were not adjusted and therefore retained their old values. These values are now adjusted.
In the process settings:
The maximum entry allowed for the "*Differential Pressure*" parameter is 1 mbar
In the parameter editor:
The maximum entry allowed for the "*Restriction Angle*" parameter is 90°

➢ Item 41967: Update of the configuration files on the selection of the machine
During each building task export, all the machine's configuration data were checked for changes. The inclusion of the building time calculation in this check caused, in most cases, the prompt to load the configuration data again and the export had to be started again.
From EOSPRINT 2.2.15 this message is only displayed if the machine configuration has been changed (e.g. by a service engineer).

➢ Item 39661: *Recoater Speed* for recoating and return interchanged
The values for "*Recoating*" and "*Return to starting point*" were interchanged in the "*Process Settings*" for the EOS M 400 and EOS M 400-4.
These values are now displayed correctly.

New Functions

➢ Item 2665: EOS M 400-4 support
EOSPRINT 2.2.15 now also supports the preparation of building tasks for EOS M 400-4 systems.

➢ Item 26998: Energy input homogenization
With the aid of the "Energy Input Homogenization" feature, EOSPRINT 2.2.15 makes it possible to reduce the overheating during the exposure of edge areas on part surfaces. With this feature the energy applied in these edge areas is dynamically adapted to the part geometry.

➢ Item 28189: Optimized dosing for EOS M 290, EOS M 400 and EOS M 400-4
If a building task is prepared for the machines mentioned above using EOSPRINT 2.2.15 or later and exported to a system with EOSYSTEM Edition 10.17 or later, the automatic dosing now functions more accurately. The geometry and position of the parts in the building area are included in the calculation of the necessary amount of powder for a layer. With the same positioning of the parts on the building area, an optimized dosing result is obtained in most cases. Many building tasks that could not be built in the past without interruption due to the amount of material required can now be built without interruption.
To use this feature, existing building tasks on the machine must be transferred again using EOSPRINT 2.2.15.

Known Behavior

- Installation
  User settings, e.g. machine connections or window settings from earlier versions are not applied during the installation of EOSPRINT 2.2.15.
  This means that, e.g, the connections to the machines must be added again after installation.
- Building process with support for parts
  Files for supports for parts cannot be loaded in the STL file format. Only files for supports for parts in the .sli and .cli file format can be used.
- **Z-segmentation**
  Z-segmentation makes it possible for the user to divide the parts in the Z direction and to assign different exposure sets to these segments of the parts. There is then a transition zone between the segments of the parts where the different exposure sets meet. This situation brings with it the following challenges:
  The user must undertake a detailed analysis of the joint in transition zones.
  The usage of different layer thicknesses requires expert knowledge to produce high-quality joints.
  All the possible combinations of process parameters and layer thicknesses are not fully validated, the evaluation of the quality requirements for transition zones is the responsibility of the user.
  Furthermore, a cutting plane is inserted relative to the part. This means that the cutting plane no longer matches the height of the slider if the z co-ordinate of a part is not equal to 0.
- Performance
  Performance limitations may occur on loading very large, complex parts. Complex parts are consciously not fully rendered, instead they are displayed in lower quality.
- 3D display
  Only every tenth layer is shown in the 3D view for part data in the .sli file format.
  Every layer is shown separately in the 2D view.
- Reference point calibration
  This functionality is not supported by the current version of EOSPRINT 2.2.15.
- Remote desktop
  Due to the usage of OpenGL, EOSPRINT 2.2.15 only offers limited remote desktop support.
  EOS recommends using remote access software from, e.g., TeamViewer for remote access for performance reasons.
  During internal tests it was found that access via Microsoft Remote Desktop with EOSPRINT 2.2.15 already open did not result in any significant performance degradation.
  Starting EOSPRINT 2.2.15 with a remote desktop connection already open results in an error message that the OpenGL version installed is inadequate and the start process will therefore be canceled.
- Graphic cards supported - driver versions
  EOSPRINT 2.2.15 requires a graphics card that supports as a minimum OpenGL 3.3. If there are problems, EOS recommends updating to the latest version of the driver for the graphics card.
- EOSTATE MeltPool Monitoring
  This functionality is not supported by the current version of EOSPRINT 2.2.15.
- SLI export function
  The function for exporting part data in the .sli file format is not supported for support parts.

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