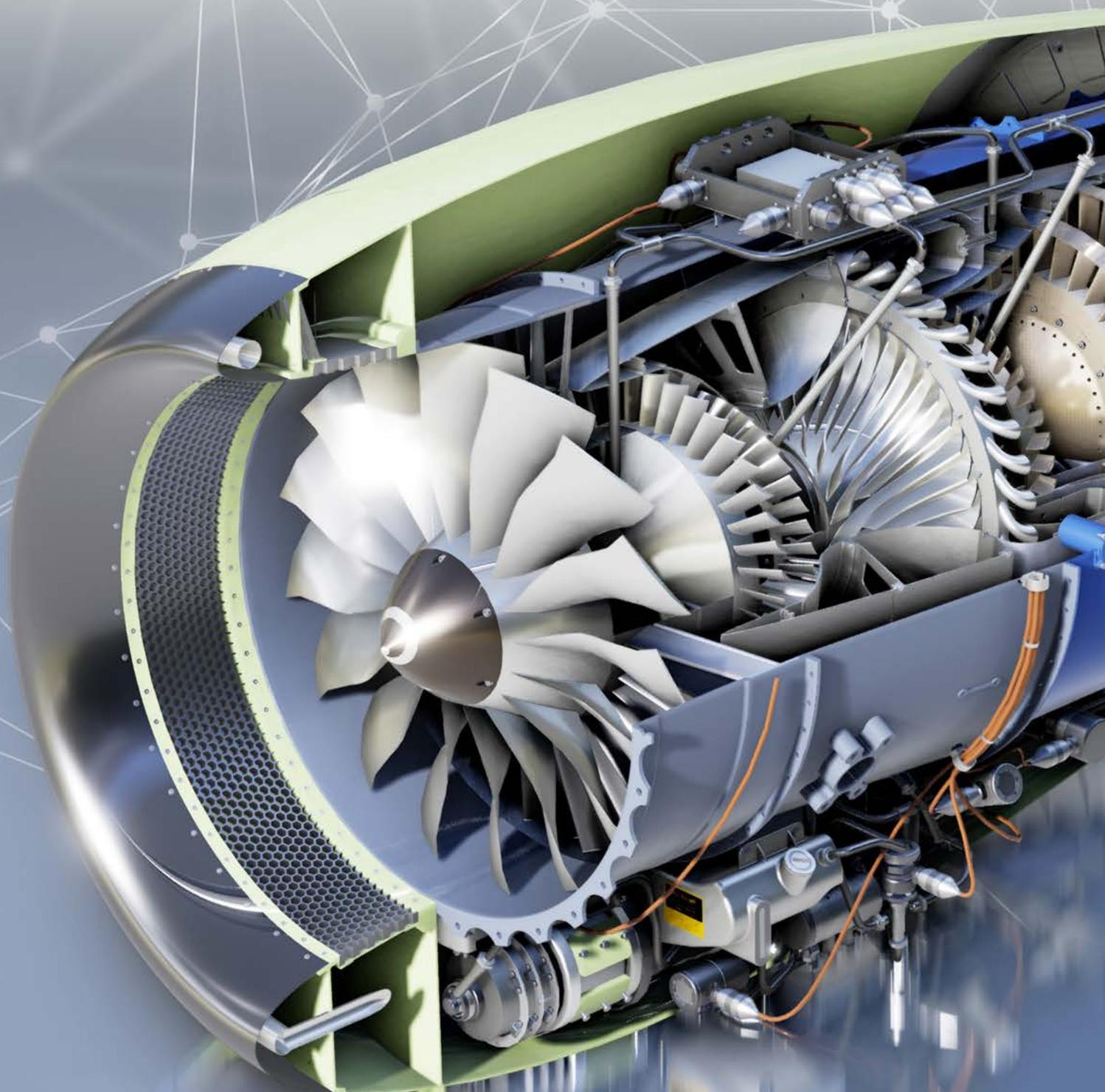


T-FLEX CAD 17 and Add-on Modules

CURRENT CHANGES



Version 17.0.80.0

T-FLEX CAD

1. **2D Projection.** The new **Local Section View** command has been added, separate from the **2D Projection** command (see the Release Notes document).
2. **Drawing.** The **Create Axis of Two Graphic Lines** mode of the **Axis** command now allows to create axis between two concentric arcs (see the Release Notes document).
3. **3D Sections.** Added the ability to **change dimensions of a cutting plane**, when creating a section by plane (see the Release Notes document).
4. **Variables.** Added the **tounit(,)** function, which allows to **covert variable's units of measurement** (see the Release Notes document).
5. **User Interface.** The **Rotate Normal to Selected Element** command has been updated (see the Release Notes document).
6. **User Interface.** Buttons for quick navigation to the **first and last page** are added to page tabs bar (see the Release Notes document).
7. **Drawing. Sketch. Three Points Arc** now allows selection of **collinear points**.
8. **Annotations.** Added the ability to customize the offset between real boundaries of text's bounding rectangle and the frame displayed, when editing a content of a multiline text, paragraph-text or table in the drawing window (**Document Parameters > Page > View > Text > Text frame size**).
9. **2D Projection.** Added the **Select Elements to Exclude from Break Region** automenu option in the projection's and drawing view's breaks editing mode.
10. **2D Projection.** Now, when creating an **Arbitrary View** projection, the default view point corresponds to the current position of active **camera** in 3D window.
11. **Work with files.** The **Copy Full File Path** command is added to contextual menus of **document tabs**, elements in the **Library Explorer** window and elements in the **Assembly Structure** window in the **Group by links** mode.
12. **Workplanes.** The **Open 2D Window** command is added to contextual menu of workplane. It opens the page of the selected workplane in 2D window.
13. **Workplanes.** The **Suppress** parameter is added to parameters dialog of workplane.
14. **Holes.** **Standard designations of inch threads** are now used in the hole diameter drop-down list.
15. **Arrays of 3D Elements.** The **Options** tab containing the **Dynamic preview** checkbox has been added to the bottom of the parameters window. So, you can now disable the dynamic preview, when creating and editing arrays.
16. **Materials.** If a material of a body is defined via a variable, then, upon changing a material via drag&drop or contextual menu command, the system will now suggest to **change the value of the variable**.
17. **3D Assemblies.** The **Keep Mate Transformations** command is added to contextual menu of mated elements. It saves mate transformations in the same way, as when deleting a mate with the **Keep position of mated elements** option enabled.
18. **3D Assemblies.** All commands related to mates in contextual menus of bodies and operations forming bodies are now grouped under the **Mates** item.
19. **3D Assemblies.** If a position of an object is defined by non-kept mate transformations, then it is now noted in the **Mate Transformations** tab of object's parameters dialog.
20. **Configurations and Variations.** You can now input a **comma as decimal symbol**, when changing values of variables in the **Model Configuration** window. The inputted comma gets automatically replaced by a point.

21. **Measure.** When measuring **relations between a straight line and a plane**, **projection angle** is now displayed in addition to **normal angle** displayed before. Difference between projection and normal angles is 90 degrees.
22. **Measure.** Added and enabled by default the **Don't Consider Auxiliary lines** checkbox in the **Contour Check** command.
23. **Measure.** Added the **Information** tab containing the summary of analysis results in the **Deviation Control** command.
24. **Purge.** The list of unused elements now contains **elements selection buttons** and provides information on **element's location**.
25. **User Interface.** **Crosshair cursor** is now affected by the **grid snap**.
26. **User Interface.** Added search boxes allowing to **find commands by name** in the **Ribbon** tab of the toolbars **customization** dialog.
27. **User Interface.** You can now enable the **Layer** column in the **3D Model** tool window.
28. **T-FLEX DOCs Integration Mode.** Options for managing **statuses** have been added into contextual menus of remarks saved into DOCs in the **Remarks** window.
29. **T-FLEX DOCs Integration Mode.** The ability to **control fragments' transformations via variables** is no longer disabled by saving the assembly into DOCs.
30. **T-FLEX DOCs Integration Mode.** A **material** assigned to an object of DOCs product structure is now applied by default, when creating bodies in object's file.
31. **Import.** Added support of **Creo 9, Inventor 2023, NX 2206**.
32. **Import.** Imported bodies now have the same **materials** as in the source file.

T-FLEX Dynamics

1. **Loads. Rotation.** Added the ability to define **angular speed via a graph**.

T-FLEX Gears

1. **Worm Gearing.** Added deviation calculation by **GOST 3675-81**.
2. **Cylindrical Gearing.** Increased model generation performance and changed positioning of models in fragments due to changes in prototypes. Upon editing gearings created in previous versions of the application, the system suggests to update the gearing in accordance with new prototypes. Update may result in loss of user geometry.

T-FLEX Electrical

1. **Cable Components.** Added the new command for creating **Splices** in harnesses (see the Release Notes document).
2. **Work with Purchased Components.** Added the ability to store purchased components data in the **Component Editor** (see the Release Notes document).
3. **Work with 2D Fragments.** Added the **Electric Components** option in the standard T-FLEX CAD command **Full Regeneration**. The option updates electric components in the current document, if components' documents were edited.
4. **Terminal Blocks.** Added the **Numbering in Order** button in the list of terminals. The button automatically assigns Tag Names.
5. **Insert Diagram.** Added the ability to **restore 3D representations of cable components** in target document using the **Connections** command after importing a diagram.
6. **Connection Lines.** If several pages are open simultaneously, then a CL with **breaks on multiple pages** will get **highlighted** on all visible pages upon moving the cursor over it.
7. **Connection Lines.** Moving the cursor over a CL now **highlights designations** attached to this CL and vice versa.
8. **Connection Lines.** When dragging an existing text attached to a CL along the CL by the anchor point marker outside the text content editing mode, the **orientation of the text** now changes automatically in accordance with the orientation of the CL.
9. **Connection Lines.** When dragging an existing text attached to a CL by the manipulator of text movement within the text content editing mode, the **anchor point marker** now follows the text along the CL.
10. **Connection Lines.** The **Copy Selected Text to Clipboard** command is added to contextual menu of text's anchor point on a CL, and the **Paste Text from Clipboard** command is added to contextual menu of CL.
11. **Connection Lines.** When editing designations on CL, you can now change **position of designation's text in relation to anchor point** via standard automenu options.
12. **Connection Lines.** Common **Alignment** and **Offset** parameters in the **Designations on Connection Lines** section of **Diagram Parameters** are replaced by separate parameters for **Tag Name and Text**, and for **Names of CL Inputs in the GCL**.
13. **Connection Lines.** The **<Adress> in line** option for **Break Designation Numbering Scheme** is added in the **Designations on CL/GCL Breaks** section of **Diagram Parameters**, so address of break point can now be provided as a single line.
14. **Connection Lines.** The **Rotate Labels on Vertical CL** option is added in the **Designations on CL/GCL Breaks** section of **Diagram Parameters**, so horizontal texts can now be used as break labels on vertical lines.
15. Changing **visibility** of designations in **Diagram Parameters** no longer affects designations, whose visibility was set **manually**.
16. **Cable Components.** The **Connections** command is added to the Ribbon. The functionality of the command called from the ribbon slightly differs from the functionality of the same command called from contextual menu of a connection line. The command called from the Ribbon considers all connection existing in the current document, instead of connections related to a particular CL.
17. **Component in 3D.** The command now allows selection of **bus bars** in diagram.

Version 17.0.72.0

T-FLEX CAD

1. **Symbols.** Added new symbols insertion dialog with **custom symbols support** (see the Release Notes document).
2. **View Arrow.** When editing an arrow **snapped to two 2D nodes**, automenu now contains options for **selecting a node to be edited**.
3. **3D Assemblies.** Added the **Consider contacts of mated elements** checkbox in the **Movement Parameters** tab of the **Move Mated Components** command. This checkbox can only be enabled, upon enabling the **Consider contacts checkbox**. When considering contacts of mated elements, keep in mind, that there is a risk of generating unnecessary contacts, which may lead to undesirable consequences.
4. **Sheet Metal.** Added the **Keep resulting body only** checkbox in the **General Parameters** tab of the **Convert Body to Sheet Metal** command. This checkbox appears upon enabling the **Keep Source Body** checkbox. When both checkboxes are enabled, the source body is not displayed on **flat pattern projection** (unfolded view).
5. **Databases.** All databases (**Threads, BoM Groups, Welds, Dimensional Tolerances, Dictionary**) are converted from **.accdb** to **.xml**. If you use custom **.accdb** databases, they will be automatically converted to **.xml** upon the first launch of the updated CAD.
6. **Measure.** Added the **list of lines to be checked** in the **Contour Check** command. Upon calling the command, lines can be added to the list using LMB. Calling the command with pre-selected lines automatically adds such lines into the list. Launching the check with empty list leads to checking all available graphic lines.
7. **User Interface.** Added the ability to display the **Transformation Matrix** column in the **Assembly Structure** window.
8. **User Interface.** Added the ability to display two infinite **lines (horizontal and vertical) intersecting** at the position of the **mouse cursor** in 2D windows (**Document Parameters > Page > View > Cursor > Cursor Type > Crosshair**). Colour of this lines may also be customized in the same section of document parameters dialog.
9. **Macros.** Added the **Execute macro when inserting a fragment** parameter in the **3D Fragment** tab of the **document parameters** dialog. Depending on its value, when using the **"Smart Fragment, macro"** insertion method, macros can be auto-executed **only for 2D, only for 3D** or **always**.
10. **Macros.** Added the **Offer Standard method of insertion** checkbox in the **3D Fragment** tab of the **document parameters** dialog. If the checkbox is enabled, then, instead of launching a macro immediately upon fragment's insertion, the system will invoke a dialog, where you can choose between executing a macro and standard insertion.
11. **T-FLEX DOCs Integration Mode.** Upon opening a **variation** in CAD, the corresponding **product composition** is now automatically displayed in the **Product Composition** window, and the **Variation** parameters of other variations' compositions are not overwritten.
12. **T-FLEX DOCs Integration Mode.** Upon opening in CAD a **variation** created in DOCs, corresponding **configuration and product composition** are now **created automatically** in the CAD document.
13. **T-FLEX DOCs Integration Mode.** Added the ability to select objects from DOCs, when **changing links** in the **Assembly Structure** window.
14. **Import.** Added support of **JT 10.6, Revit 2022, CATIA V5_6R2022**.

15. **Import.** You can now import **3D PMI** elements (annotations), when importing **CATIA, SolidWorks, Creo - Pro/E, I-DEAS, JT, NX – Unigraphics, PRC, Solid Edge, STEP** files. Added the **Recognize annotation elements** checkbox and the annotations' font drop-down list in the **import parameters** dialog.
16. **Export.** Added support of **Parasolid 34.1**

T-FLEX Gears

18. Added the **Worm Gear** command (see the Release Notes document).

T-FLEX Electrical

1. **Connection Points.** Added **limitations** of attached cable components' parameters. Limitations are taken into account in the **Diagram Check** (see the Release Notes document).
2. **Cable Components.** Updated the **Assembly Drawing of Cable Component** command (see the Release Notes document).
3. **Cable Components.** Added the **Sheath** command. Created sheathes are taken into account in **BoM**, as well as in the **Cable Components Check**.
4. **Connection Lines.** Added the **filled arrow tip** marker for **break points**.
5. **Connection Lines.** Lines coming from the side opposite to connection point do not overlap components anymore.
6. **Connection Lines.** Free break points of other connection lines can now be **added to an existing break**.
7. **Connection Lines.** **Maximum number of breaks** is increased to 10 000.
8. **Connection Lines.** Added **background clearing** for **middle alignment** of designations on connection lines.
9. **Connection Lines.** Added the ability to auto-assign common tag name for cable components included into the same connection (**Diagram Parameters > Designations on Connection Lines > Common Tag Name for CC in Connection**)
10. **Connection Points.** The command allowing to **Set Prototype** from **Component Editor** added to the contextual menu of selected connection points in the 2D window.
11. **Libraries.** Added **device** and **contactors** examples into the **Electrical diagram elements** library. Added the contactors folder into the **Contactors** library configuration.
12. **Libraries.** Added the **device with connection points connectors** into the **Electrical components** library.

Version 17.0.70.0

T-FLEX CAD

1. **Measure.** The new **Contour Check** command is added (see the Release Notes document).
2. **2D Projection.** Added the ability to create **local sections within the main projection.** (see the Release Notes document).
3. **2D Projection.** Added the **Radial Axes** checkbox (see the Release Notes document).
4. **LCS.** New options, **Format by Pattern** and **Save given orientation,** have been added to command's automenu (see the Release Notes document).
5. **Sheet Metal.** The **Measured** parameter has been renamed to **Length Reference,** options for this parameter have been renamed, the order of options in the list has been changed (see the Release Notes document).
6. **Sheet Metal.** New options have been added for the **Position** of flange in relation to baseline, the **Internal Dimension** option have been renamed to **By Inner Side,** the order of options in the list has been changed (see the Release Notes document).
7. **3D Annotations.** Added the **Display annotations over 3D model** checkbox in the system options dialog (see the Release Notes document).
8. **User Interface.** Added the **Invert Visibility** command (see the Release Notes document).
9. **2D Projection.** The **Delete unused projection elements** command is added to contextual menu of projection.
10. **2D Projection.** The **Explode Projection** command's dialog is added. It contains three options: **Explode projection and create drawing view;** **Explode projection, without creating drawing view;** **Explode projection, uniting objects into group, without creating drawing view.** If projection is created using the compatibility mode, contains breaks or cropped, first option is not available.
11. **2D Projection.** Added the checkbox allowing you to activate/deactivate the **Minimum Thread Height** option. The name of the option changed to **Minimum Height.** When the option is deactivated, thread lines are drawn in accordance with actual thread height.
12. **Drawing Views.** The **Automatically Update View Border** checkbox is added to the contextual menu of generic drawing views and detail views.
13. **Drawing Views.** The **Automatically Update Position of View Designation** checkbox is added to the contextual menu of detail views.
14. **Roughness.** Added the **witness line,** continuing the **arc** for roughness symbols attached to arcs.
15. **3D Section by Parallelepiped.** Added new options in the automenu - **Edit start position** and **Edit end position.** Depending on the active option, the parameters window displays **Transformations** for one of the opposite vertices of the parallelepiped. When using manipulators, the system automatically activates the option corresponding to the active manipulator.
16. **Sheet Metal.** The parameters window of the **Convert Body to Sheet Metal** command now shows **Radius individually** for each edge selected in the list of **Bend Edges.** The **checkbox** is added to the right side of the **Radius** input box. If the checkbox is enabled, then the common radius is applied to the selected edge. If the checkbox is disabled, then the radius of the selected edge is defined individually.
17. **Routing. Pipeline standards editor.** Added buttons for **moving a standard up/down the list.**
18. **Routing. Pipeline standards editor.** Added the ability to **copy** from one standard to another several parameter values or dependencies at once.
19. **Routing. Pipeline standards editor.** Added the **EN** icon.

20. **Loading Geometry.** The **Load Contents** command is added to the contextual menu of multiple selected fragments. Previously, the command appeared in the contextual menu for a single selected fragment. For the icons of the **Load Contents** column of the **3D Model** window, the selection of the content type by LMB is implemented.
21. **Measure.** The ability to measure **dimensions of a projection** (minimum X and Y coordinate, maximum X and Y coordinate, size along X and Y axis) is added.
22. **Measure.** The ability to measure **view arrows** and **view labels** on a drawing. Results include main **text** (view name), **coordinates** and, for arrows also **angle** between arrow and horizontal axis of a drawing page.
23. **Environment.** The system settings files are added to the **Environment**. Now it is possible to save library configurations, product editor data (T-FLEX Electrical module) and pipeline standards together with the environment file.
24. **Product Composition.** The ability to simultaneously edit multiple records in the **Product Composition** window using the **Parameters of Records** option in the context menu is added. The option appears when two or more records are selected.
25. **Product Composition.** In the **Columns** tab of the **Product Composition Parameters** window, the ability to sort records by columns is added. Sorting can be reset using the context menu of the selected column.
26. **Product Composition.** Added and enabled by default the ability to automatically correct the content of the product composition's **Quantity** column for elements of arrays, where number of copies in array is defined by a variable. If necessary, you can disable this option by disabling the **Auto-correct number of records based on arrays** in the **Properties** tab of the **Product Composition Parameters** window.
27. **Product Composition.** Added the **Include in assembly product composition** parameter in the **3D Fragment** tab of the **Document Parameters** dialog. This value of this parameter is applied by default, when inserting the current document into an assembly.
28. **T-FLEX DOCs Integration Mode.** Now, if the document is associated with a PES object, and the option **Update product structure automatically in case of document saving** in system options (T-FLEX DOCs tab) is enabled, then the document's product structure will be automatically updated before saving.
29. **T-FLEX DOCs Integration Mode.** If you change values of CAD **variables** linked to DOCs **configuration**, then the product composition saving dialog is opened upon saving.
30. **T-FLEX DOCs Integration Mode.** New option **Synchronize with T-FLEX DOCs** is now available in the **Full Regeneration** command. It allows to transfer from DOCs to CAD data defined by integration rules.
31. **Import.** Added support of **NX 2007 (2021 Dev.)**, **SolidWorks 2022**, **Solid Edge 2022**.
32. **Export.** The GLTF format is added to the **Export Scenario** command of **Exploded View** ribbon tab.

T-FLEX Analysis

1. **Thermal Contact.** Added **Celsius degree Second/Calorie** units of measurement ($^{\circ}\text{C}\cdot\text{s}/\text{cal}$).
2. **Mode Superposition Study.** The **Document Converter** is updated, so that upon conversion of old documents containing this type of study, the modern layout of the **Study parameters** dialog becomes available. The modern layout allows you to customize the **Frequencies Analysis Parameters** for old studies.
3. **Remote Mass.** The modal dialog of parameters for this type of load in dynamic studies now contains the **Moment of Inertia** parameters, which were previously available only in the **Parameters** tool window.

T-FLEX Dynamics

1. **Spring.** Added the **Continue creation with given parameters** checkbox in the **Options** tab of the command's parameters window.

T-FLEX Nesting

1. Added the **Convert splines to polylines** option in the **Parameters of Nesting Layout Export** dialog.

T-FLEX Gears

1. Added the ability to create **specification tables for bevel gears** on a drawing

T-FLEX Electrical

1. Added the **Create Connector** command allowing you to quickly create a connector for **connection point** by selecting two nodes.
2. **Devices.** Contactors can now be included in the device.
3. **Devices.** Added protection against accidental loss of the structure of the created contextual device, when calling another command.
4. **Connection Point.** Added automatic incrementation of the **Connector Value**.
5. **Diagram Parameters.** Added customization of the **Order of Tag Names Assignment** (right then down, down then right, right then up, up then right).
6. **Diagram Parameters.** Added the **<Page only>** option for **connection lines breaks numbering** scheme.
7. **Cable Components.** When editing cable components, **the entire route** of the selected conductor in the harness is now **highlighted** in the 3D scene.
8. **Terminal Blocks** can now be displayed "in the style of connectors": in the form of a table with a header and customizable columns.
9. **Terminal Blocks.** It is now possible to set prototype for multiple selected terminals at once.
10. Performance in some operations has been significantly improved.

Version 17.0.60.0

T-FLEX CAD

1. **Document History** is now tracked (see the Release Notes document).
2. **Route. Auto-routing** can now **simplify geometry** (see the Release Notes document).
3. **Route.** New buttons are added to the list of segments, allowing to **move the selected segment up/down the list** (see the Release Notes document).
4. **Drawing on a workplane.** The **Intersection with Workplane** mode of the **Project Elements** command is now improved (see the Release Notes document).
5. **Annotations.** The **Snap within Projection View** option is added to **Dimension** and **Leader Note** commands (see the Release Notes document).
6. **User Interface.** Added material libraries visibility control (see the Release Notes document).
7. **2D Projection.** The **Change Projection Placement** automenu option restored as it was in the T-FLEX CAD 16.
8. **2D Projection.** **Distance between the view and its designation** is added to the **Paper** tab of the **Document parameters** dialog.
9. **Detailed View.** Now the system **automatically selects a scale** of detailed view **based on 2D projection**, so that it is bigger than a scale of projection, if default scale parameters set upon launching the **Detailed view** command were not changed by the user.
10. **Constraints.** Dashed lines indicating a connection between elements caused by applying a constraint are now visible only when constraint is selected.
11. **Constraints. Selecting multiple elements** at once for assigning constraints can now be done using **rectangular frame**, lasso or cutting curve. The list of selected elements is displayed in the bottom part of the command's parameters window.
12. **Annotations.** The position of **technical requirements** and **unspecified roughness** now updates automatically upon changing size and orientation of drawing pages.
13. **Annotations.** The ability to choose between updating a **current page** and updating **all pages of a current document** is added to the **Update layout elements** command.
14. **Annotations. User Interface.** The **Change Section Direction** command is now available in the **dynamic toolbar** upon selecting a section designation.
15. **Apply Material.** The **Delete Face** option is added to the automenu.
16. **Surfaces.** Faces to be deleted by the **Delete Faces** command are now **highlighted** in the 3D scene upon selecting edges or loops.
17. **Sheet Metal.** The **By Outer Side** option is added to the **Bend position** drop-down list on the **Bend Parameters** tab of the **Sheet Metal Parameters** dialog.
18. **Sheet Metal. User Interface.** The **Flat Pattern Projection** command can now be called from the **Draw** tab of the ribbon.
19. **Routing.** Added the ability to specify **nominal diameter (DN)** and **material** of pipes in the **pipeline standards editor**.
20. **3D Assemblies.** Now updating a detail, created by unloading with the **Create Associative Part operation** option, in an assembly **transfers supplements into detail file**.
21. **Product Composition.** **Include in Product Composition** dialog called from fragment's parameters. The **Close** button is replaced by **OK** and **Cancel**.

22. **Product Composition. Include in Product Composition** dialog called from fragment's parameters. Values in the **Include** column taken by default from fragment's **Include in new Product Composition** parameter are now displayed in **square brackets**. Upon clicking **OK**, they are no longer default and, therefore, don't have brackets upon the next calling of the dialog.
23. **Product Composition.** The **Update reports/BOM on autosave** checkbox is added to the **3D Fragment** tab of the **Document Parameters** dialog.
24. **Product Composition.** The **Included Fragments** command's dialog now allows to assign product composition name for multiple selected elements at once.
25. **User Interface.** Added **back/forward** buttons for navigating the browsing history in **folder tool windows**.
26. **User Interface.** Added the ability to **paste** copied files in **folder tool windows**.
27. **User Interface.** The **Allow transparent editing commands** checkbox is added to the **Additional Options** tab of the **system options** dialog and enabled by default. Disabling the checkbox disables the **transparent editing of 3D elements**.
28. **User Interface. Selecting 3D elements.** The selector settings dialog can now be called from the filter toolbar within active commands.
29. **User Interface.** Added the ability to call the **external variables dialog** from contextual menus of fragments within a text.
30. **User Interface.** **Columns** in tool windows can now be **hidden/shown** using the **contextual menu** of column's header.
31. **Materials** are now automatically applied to bodies created by the **External Model** command.
32. **Exploded view scenario. Stages** can now be **grouped**.
33. **Performance.** The parameter limiting the **Maximum size of image for raster projections** in pixels is added to the **Performance** tab of the **system options** dialog. It limits the maximum dimension without affecting the aspect ratio.
34. **T-FLEX DOCs Integration Mode.** The **Title Block** tab containing the **Drawing Notes** command is added to toolbars of the model preview window in T-FLEX DOCs
35. **T-FLEX DOCs Integration Mode.** The **By default, synchronize fragments in opened documents** checkbox is added to the T-FLEX DOCs tab of the **system options** dialog.
36. **T-FLEX DOCs Integration Mode.** **Deleting an object from the scene in CAD** now automatically deletes the corresponding **component from the DOCs PES** without forced saving of the PES.

T-FLEX Gears

1. Added bevel gears deviation calculation by **ISO 17485, DIN 3965, DIN 3967** and **GOST 1758-81**.
2. Added calculation of bevel gears' 3D models by **thickness tolerance range**.

T-FLEX Electrical

1. Added **remarks in the list of elements** and links between component rows and these remarks.
2. Added **links to pages of a diagram** in connection lines' break designator labels for multi-page diagrams.
3. Added the **automatic search by name for a variable**, when specifying an output format of connection points' symbols.
4. Ensured **uniqueness of components' tag names** within a device.
5. Added the **automatic renumbering of device's components** by GOST.
6. Added the ability to **delete specific labels** from group connection lines' break designations.

7. Added the ability to switch between applying parameters of a diagram to symbols and applying parameters saved within a symbol's file.

Version 17.0.55.0

T-FLEX CAD

1. **User Interface. Ribbon.** Various **Worksurface**, **3D Node**, **3D Path** and **3D Profile** types can now be called directly from the new **Support Geometry** ribbon tab (see the Release Notes document).
2. **Loft.** The new **Automatic Contour Search** option is added to the automenu (see the Release Notes document).
3. **Surfaces. Extend by Law.** Height and angle of the resulting surface can now be defined by the graph in relation to the guide length (see the Release Notes document).
4. **Annotations.** The **Create rectangle with offset** option is added to the list of options applicable, when **paragraph-text** doesn't fit in **height** of the rectangle (see the Release Notes document).
5. **2D Projection.** Several projection types are now available directly from the ribbon (see the Release Notes document).
6. **2D Projection. Create Hatch by Spline** option is added to the **Local Section View** command's automenu (see the Release Notes document).
7. **2D Projection. Edit view outline** option is added to most of the 2D projection types automenus. It allows to draw a spline and use it as a clipping contour (see the Release Notes document).
8. **2D Projection. Standard View Set** dialog is now more graphical (see the Release Notes document).
9. **2D Projection.** Now it's possible to edit parameters of multiple projections at once (see the Release Notes document).
10. **2D Projection. Dynamic preview** checkbox is added to command's parameters (see the Release Notes document).
11. **2D Projection. Breaks and clipping contour** options are added to contextual menu of active projection's and drawing view's elements. These options handle visibility of an element on a view, clipping of an element, and taking an element into account when calculating break lines (see the Release Notes document).
12. **2D Projection.** All elements, which are added to the view after applying **breaks or clipping**, are now automatically excluded from break/clipping.
13. **2D Projection. Exit projection view context by Escape** option is added to the **Additional Options** tab of the **System Options** dialog. It's disabled by default.
14. **2D Projection. Expand projection boundaries** option added to **Document Parameters** for customizing the distance between projection lines and projection boundaries.
15. **2D Projection. Compatibility mode** checkbox added to command parameters. It allows to create projections in the T-FLEX CAD 16 format.
16. **2D Projection. Enter angle** option is added to the automenu of the **Edit breaks** command similar to the **2D projection** command itself.
17. **2D Projection.** When creating a **Section** projection based on **3D section**, list of **elements to project** is now automatically inherited from parameters of 3D section.
18. **Annotations. Leader Note. Stitching sign** is added to available **symbols on arrow**.
19. **3D Path. Offset Curve to Planar 3D Path.** Added trim by two points options.
20. **2D Fragment. Variables.** Editing variables in a copy of a 2D fragment doesn't affect other copies of the same fragment anymore.
21. **Array of 2D elements.** Unused 2D copies, which remain after lowering the number of copies in array's parameters, can now be deleted using the **Purge** command.

22. **3D Profile.** System performance is improved and document file size is reduced when handling profiles containing large number of lines.
23. **3D Node.** Option for hiding **manipulators**, when creating a 3D node, is added. Manipulators are now hidden by default in the drawing on workplane mode.
24. **Workplane.** New types of workplane **Based on LCS** are added: **YX, ZX, ZY**.
25. **Transition Surface. Circle – Radius and Angle.** Added the **Reverse Radius Direction** button.
26. **Cut.** Non-planar worksurfaces can now be used as cutting surfaces.
27. **Sheet Metal. Flange.** Added the **Internal tangent** option for flange length measuring.
28. **Weld. Cut by Nearest Guide Points** option is added to the **3D Weld By 3 Paths**.
29. **Light Source.** Modal dialog of light source parameters is reworked. **Common** parameters are moved to a separate tab and the **Suppress** option is added.
30. **Product Composition.** Added units of measurement support in **compound columns**.
31. **Geometry Analysis. Create Object** button added to the **Model Check** command. It creates link to detected incorrect geometry in the **Geometric entities** folder of the model tree.
32. **User Interface.** Added **dynamic toolbar** settings.
33. **Materials. Expression** input box added to the **Default Parameters** dialog allowing to set default material using variables.
34. **Materials.** Added the ability to get a **material** from a specific **library**, when assigning a material via variables. To do so, add a name of a library in angle brackets in front of a name of a material in a variable's expression: "**<library>material**".
35. **T-FLEX DOCs Integration Mode.** **T-FLEX DOCs Configuring** window can now be displayed in the T-FLEX CAD.
36. **T-FLEX DOCs Integration Mode.** If no document is active, the **T-FLEX DOCs Product Electronic Structure** window now displays the content of the PES dataset, which allows to open documents from the dataset without opening the **T-FLEX DOCs Product Electronic Structure** window.
37. **T-FLEX DOCs Integration Mode.** It is now possible to choose which file will be opened upon dragging an object from the PES database to the scene, if such object has several linked files.
38. **T-FLEX DOCs Integration Mode.** Changed syntax of links to DOC's Files dataset, when loading system files\prototypes from DOCs. The link should now begin with **<*T-FLEX DOCs*>**.
39. **Export. Polygonal mesh formats** export dialog is now non-modal, so you can navigate the model when setting export parameters.
40. **Import.** Added support of **Kompas 20, Inventor 2022** and **ACIS 2021.10** formats.
41. **Import/Export.** Added support of **Parasolid 34.0** format.

T-FLEX Electrical

1. The Components of any type can now be included into **Devise** component.
2. New **Selective Insert of Diagram mode** is implemented, which allows to select subset of components from parent diagram to be inserted into child diagram. After a component is selected, all linked through connection lines can be automatically selected, too.
3. **Long tables** can now be **split** into a few portions, with optional repeating of the table head.
4. While **deleting Break Designator label**, the choice is now available if to delete this specific label from this break or to delete whole break.
5. The control of using **bevels for joining Connection Lines to Group CL** is now available for cases when a few paths for connection are possible.
6. Additional representations for **Connection Line branching points** are added.
7. A **portion** of Device or Functional Block silhouette **under the crossing Connector symbol** can now be **automatically vanished**.
8. Three **new system attributes** are added into the **Component Editor**: Climatic Implementation, Placement Category, and Color Code (the last one for cable components only).
9. **Report generator. Wires Table**. Added the option to exclude the Tag Name of Terminator Connection Point from its Full Tag Name.
10. **Report generator. Wires Table**. Added the option to sort the report by "From / To" column.
11. **Report generator. Wires Table**. Added the capability to output the cable component Color / Color Code (report template customization required).
12. **Report generator. Connection Table**. Added the option to exclude Connection Points with no connection.
13. **Report generator. List of Elements**. Added the capability to output Cable Components.
14. **Report generator. Electrical BOM**. Added the capability to output component Tag Name into BOM (report template customization required).
15. **Tag Names of Cable Components** can now be generated **with no Family Name**.
16. New marker added for **disjoining a Connection Line from Group CL**.
17. While inserting a Component, new option added to **keep its representation as set within Component file** instead of scheme parameters applying.
18. When inserting a Diagram into new file, **applied Cable Components** are now also **inherited**.
19. When inserting a Diagram into new file, **3D Cable Components** are now **automatically created** based on Structural Elements.

Version 17.0.45.0

T-FLEX CAD

1. **Surfaces. Fill Hole.** The command has been reworked (see the Release Notes document).
2. **Measure.** When measuring **Holes** operation, a number of holes is displayed.
3. **Common Parameters of 3D Elements.** For bodies that are able to inherit visual parameters (bodies created by such operations as **Copy**, **Array** etc.) added the ability to set visual parameters independently (**Color**, **Material**, **Coating**).
4. **Sheet Metal. Flange.** Added the **External tangent** option for flange length measuring.
5. **Sheet Metal. Jog.** Added the ability to set custom **K-factor**.
6. **User interface. 3D model tree.** Changed the representation of threaded holes' parameters in the 3D model tree.
7. **User interface. Context menu.** **Cut** operation added to context menu for bodies.
8. **User interface. Library explorer.** Added the ability to display **Name**, **Subject**, **Category** and **Keywords** columns.
9. **T-FLEX DOCs Integration Mode. Synchronize fragments with T-FLEX DOCs** checkbox added in **Document Parameters** window and in the window for setting the parameters of opening document from the PES dataset.
10. **T-FLEX DOCs Integration Mode.** Additional geometry analysis commands are now available in the DOCs' preview window.
11. **Text Editor.** Added the ability to insert hyperlinks pointing to files of an arbitrary format. When following a link, either a file is opened by an application defined in operational system's settings or an application selection dialogue is called.
12. **Drawing. Last active option** (**Line**, **Rectangle**, **Circle by center**, etc.) is remembered when calling the **Sketch** command.
13. **Drawing. Dimensions.** Added the ability to select linear dimensions' representation with spacing between decades (123 456,78) in the **Dimensions** tab (for each page) of the **Document Parameters** window.
14. **Drawing. 2D Projection.** Added the ability to set **Line types** individually for each body when creating a 2D Projection.
15. **Drawing. 2D Projection.** Added **Hide Constructions** checkbox in the **Additional** tab of the **2D Projection Parameters** window. This checkbox is disabled by default, so construction entities are shown not only for the active view but for all views.
16. **Drawing. Construction Entities.** If **Hide Construction** option is enabled on the view toolbar, a dialogue suggesting to disable this option will popup upon calling any of construction entities creation commands.
17. **Drawing. Constraints.** Changed the logic of creating constrains which require selection of two objects (**Equal Length**, **Parallel** etc.). Such constrains are now based on properties of the first selection.
18. **Bill of Materials. Fit settings** window (when placing BoM on the main drawing sheet) now has the **Additional** tab with the **Duplicate Table Header in Subsequent rectangles** checkbox.
19. **Annotations. Text.** Text can be displayed in 3D view upon enabling **Show 2D annotations in 3D view** checkbox in the **Workplane Parameters** window.
20. **Import/Export.** Added support of **NX – Unigraphics 1980**, **Parasolid 33.1** and **Creo 8** formats.

T-FLEX Electrical

1. **Devices.** The devices can now include components of any type. This allows you to create visual images that fully reflect their composition and functionality.
2. **Connectors.** Splitted representation is available for a pair of connectors.
3. **Component editor.** A mechanism for automatic filling of parameter values from references to the names of other parameters has been added.
4. **Component editor.** A group addition of contacts to the prototype is implemented on **Links** tab.
5. **Cable components.** The command for cable components (CC) creation has been improved. Now you can immediately add the required number of wires or cables of the selected type to the harness, immediately replace the material of a group of conductors while simultaneously performing an express analysis of changes in conductor cross-sections, you can change the sequence of conductors in the harness and automatically renumber them, etc.
6. **Cable components.** Automatic blending of harness branch geometry is performed in the terminal points where they approach to 3D routes.
7. **Cable components.** Automatic determination of harness splitting point or its branch next to the array of connection points without the need to manually create auxiliary objects such as connectors has been introduced.
8. **Cable components.** Automatic processing of CC values inheritance is performed when splitting a group connection into two connections.
9. **Reports.** The report templates filled only with data from 3D scene were created. This saves time on manually excluding auxiliary diagram objects from these reports.
10. **Reports.** It is possible to display assembly products in the lists of elements (LE). For example, you can specify the housing, contacts, couplings and fasteners included in the connector and automatically display all components in LE.
11. **External diagrams.** When you insert a diagram from an external source into a document, a diagram preview window is displayed.

T-FLEX CAM

1. **Zone 3D milling.** In **Pencil** processing, the option (checkbox) **With transitions along trim bodies** has been added to the **Trim toolpaths** tab.
2. **Zone 3D milling.** In **Pocket Machining** processing the option **With transitions along trim bodies** was added to the **Trim toolpaths** tab.
3. **Zone 5D milling.** In the mode **Double Curvature Surface** without circular interpolation, the option **With transitions along trim bodies** has been added to the **Trim toolpaths** tab.
4. **Zone 5D milling.** In the **Double Curvature Surface** mode **Along Passes Offset** now works for all modes with selection of 2-3 paths or face (previously this offset was valid only for the **Pocket Machining** option).
5. **Zone 3D and 5D milling.** In the **Toolpath trimming** mode with the option **With transitions along trim bodies**, the ability to use a trim body, consisting of several unconnected regions, has been added.

Version 17.0.37.0

T-FLEX CAD

1. **2D Projection.** Added option to display scale over projection.
2. **2D Projection.** Added the ability to enable/disable the decoration of the break on the active view.
3. **Loft Trimming** guides by end sections has been moved to a separate **Trim** option. Added the ability to trim sections by end guides and at the same time sections and guides.
4. **Product Composition.** Added the ability to create reports with a variable set of columns.
5. **View Toolbar.** The **Hide Coordinate Systems** command has been added to the **View** toolbar for 2D view.
6. **Workplanes.** Added the ability to fix the center of the coordinate system at the global zero.
7. **Workplanes.** In the type of workplane **In coordinates**, the ability to transform the workplane by rotating it by 90 degrees and change LCS orientation has been added.
8. **Transformation.** Added the option **Set Positions of Source and Target Coordinate Systems**, which moves a group of objects from one LCS to another.
9. **Variations Table.** Significant work has been done on the command, the variations tables have been transferred to the work mechanism through the **Product Composition** and the **Report Generator**.
10. **Variations Table.** Added the ability to support output next to the size of tolerance fields.
11. **Variations Table.** Now, after editing the table in the drawing and its subsequent updating, the size of the table will not change.
12. **Variations Table.** Added the ability to create two variations tables.
13. **T-FLEX DOCs Integration Mode.** **Edit in Context** of the assembly command has been implemented, which allows you to transfer the loaded assembly to the contextual editing mode of the selected **Product Electronic Structure** object.
14. **Measure.** Added the ability to measure the distance between the centers of circles/arcs.
15. **Measure.** Added display of object geometry type.
16. **Import/Export.** Updated support for CATIA V5 to V5_6R2021.
17. **3D Path.** Added **3D Path by Function** command.

T-FLEX CAM

1. **5D zone milling.** When the **Maximum removal** flag is set, the corresponding value of **Number of passes** is displayed.
2. **5D zone milling.** In this milling (zigzag/loop) with the formation of layers using a 3D fragment, the **Depth** parameter is now taken into account only for the upper layer.
3. **3D zone milling.** For a 3D zone "surface of rotation" with specifying a part body as a 3D fragment, the ability to generate layers by changing the parameter of the wheel hub has been added.
4. **3D zone milling.** The mode of autodetection of the tool vector has been improved, taking into account angular correction, and the ability to use several passes in one layer has been added.
5. **3D zone milling.** The possibility of additional angular correction of the tool vector has been added.
6. **4D mode.** The reliability and flexibility of the algorithm has been improved.
7. **Cutting control.** Now, if an error occurs during the control process, a special message will be displayed.

Version 17.0.32.0

T-FLEX CAD

1. **Loft. Thin Wall** option has been moved in a separate tab and divided into **Outside, Inside, Symmetric, Different** types. For each type, the ability to trim by end sections has been added.
2. **Loft.** Added a new option to synchronize start points **By Minimum Twist**.
3. **T-FLEX DOCs Integration Mode.** In the **Product Structure** window, the **Open for editing command** is implemented, which loads the selected **Product Electronic Structure** object into the T-FLEX CAD working window in accordance with the settings of the configuration panel.
4. **Import/Export.** Added support for **Rhino 7** and **JT 10.5** formats.

Version 17.0.30.0

T-FLEX CAD

1. **2D Projection.** Large-scale reworking of the command (see the Release Notes document).
2. **User interface.** To simplify switching of pages with a large number of them, a button with a drop-down menu has been added to the page tabs bar (see the Release Notes document).
3. **Sketch.** Added new sketch commands – **Parallelogram**, **Slot** and **Slot by two center points**.
4. **2D texts.** Added the ability to set double lines for tables.
5. **2D texts.** Added the ability to insert images into a text field.
6. **Technical requirements.** Added the square root symbol (radical) for writing formulas in the technical requirements of the drawing.
7. **Copying the text parameters.** Added the ability to copy text parameters without the text itself.
8. **Hatch.** Added the **Hidden Lines** flag to the command parameters window.
9. **Paper orientation.** The drop-down list has been removed for the button. Now the orientation of the paper is done by simply clicking on the appropriate button.
10. **Page sizes.** The command added the button **Draw on Workplane** for quick transition to drawing after setting the size and position of the WP.
11. **Loft.** Updating the operation dialog, adding new functionality (see the Release Notes document).
12. **Divide.** Added the ability to select bodies to keep when dividing. The rest of the bodies are removed from the scene and the model tree.
13. **Hole.** Added ability to select base face search.
14. **Hole.** The model tree now displays the hole type, diameter and length.
15. **Workplane.** The command interface has been updated, the ability to create a workplane parallel to the current view point has been added.
16. **Workplane.** Added the ability to switch between tangents.
17. **Workplane.** Added the ability to reverse the normal of the workplane, i.e. the side on which the drawing will be done.
18. **3D Path.** Added the ability to select the type of 3D path from the command parameters window.
19. **3D Node.** Added the ability to create a 3D node in the geometric center of a face.
20. **Edge Blend.** Added the ability to exclude edges from blending when they are multiple selected.
21. **Cut.** Added the ability to control the direction of the section using a variable.
22. **3D Array.** Added hints in the status bar.
23. **Product Structure.** **Product Structure** has been renamed to **Product Composition**.
24. **Product Composition.** Added the ability to export to CSV.
25. **Product Composition, reports.** Added the ability to create additional pages with formats when generating a report.
26. **Product Composition, format attributes.** Now, when inserting a fragment of the format type, by default the attributes will be set as in the title block commands.
27. **Assembly Structure.** Significant speedup when working in the context of large assemblies.
28. **"Top-Bottom" Design.** In the context menu of an element face, the ability to **Draw on Face of Source Fragment** and **Show in Source Fragment Context** has been added.
29. **Transformation.** Added the ability to use the command to create mates for positioning objects without creating the mate itself.
30. **Mates.** Added a new type of mate - **Bond**, which allows you to move several bodies as a whole.

31. **Mates.** Added the ability to set the coincidence of fragments by their external 3D nodes.
32. **Mates.** Added the ability to move 3D fragments connected through 3D nodes raised from them and other construction elements.
33. **Mates.** Added the display of external mates and allowed degrees of freedom of a fragment in a separate folder in the model tree.
34. **Filters for selecting geometry type.** Added filter for selecting geometry type – **Normal to plane.**
35. **Full Regeneration.** Updated dialog for full document regeneration. Options for updating design elements have been added to the dialog. Now you can add your own items to the dialog for plugins.
36. **Measurement.** Added property **Center angle of arc**, calculated as the difference between start and end angles.
37. **Compound tolerances.** Now compound tolerances can consist of any number of tolerances, they have aligned cells, and identical cells with a type sign are combined into one common one.
38. **Dictionary.** Added the ability to search in the dictionary database.
39. **User interface.** Added the mode **Toolbar Wrap** to the drop-down list for selecting the display of controls in the parameters of commands and operations.
40. **User interface.** Added the ability to move selection buttons (rectangle\lasso\cutting curve) to custom panels and to the ribbon.
41. **Clipboard.** Added the ability to insert pictures from the clipboard into text and tables.
42. **Window "Information".** Added display of the number of faces, edges and vertices to the **Information** window for operations.
43. **View Toolbar.** Added the ability to enlarge/reduce the font in the 3D scene on the **View** toolbar.
44. **System options.** Added the ability to set transparency when dynamically highlighting the faces of bodies in a 3D scene.
45. **Document converter.** The document converter now displays the conversion progress and error information. You can search by the library tree, by the list of loaded files, by the assembly tree, by the conversion process, or by the log.
46. **Variables.** A new flag, **Use variables in database search conditions**, has been added to the document parameters in the new **Compatibility** tab. The flag is created to prevent recursion in old documents, in which the names of columns in the database could begin with '\$' and expressions like $\$A = \text{val}(5, \text{DBNAME. } \$ A)$ (where there was a field $\$A$ in the **DBNAME** database) were processed normally.
47. **Variables.** Now, when you enter a new variable in the operation field with syntaxes like "variable_name = number" or "\$variable_name = text", the system will automatically take the value after the equals symbol and create the variable itself.
48. **tgetv() function.** Added the ability to customize the date and time format.
49. **Materials.** Added a window for linking the materials of the document with the materials of the selected library.
50. **Materials.** Added additional parameters for orthotropic material.
51. **T-FLEX DOCs Integration Mode.** Added toolbars to the 3D model view window in T-FLEX DOCs. Available **Measurements, Remarks, Exploded View Scenario, View.**
52. **T-FLEX DOCs Integration Mode.** Added the ability to go to the T-FLEX DOCs directory when generating technical requirements through the **Title Block.**
53. **T-FLEX DOCs Integration Mode.** Added a dialog for selecting parameters for opening documents when dragging files from DOCs into the CAD window, similar to the dialog for local files. For files

available for checking out, the dialog will appear instead of the previous window with the question "Check out the file?"

54. **Quality Control.** Added check for spaces in description/part number.
55. **Import.** Support for import/direct reading of **SolidWorks 2021** files.
56. **Import.** Support for importing **3MF** format.
57. **Import/Export.** Added support for the new **NX Unigraphics 1953** format.
58. **Export.** Added the ability to export constraints to raster formats - **bmp, png, jpeg, tiff**.
59. **Tutorial.** Added tutorials on creating 2D drawing and 2D assemblies.

T-FLEX Dynamics

1. **Loads. Displacement.** Added the ability to use graphs to set the **Displacement** load in the **Dynamics** studies.
2. **Calculation of kinetic energy.** For **Body** sensors, the ability to calculate kinetic energy with the subsequent creation of the result in the form of a graph has been added.
3. **Analysis of contacts.** Added the ability to keep track of contacts for bodies with mates.

T-FLEX Analysis

1. **Studies parameters.** Added choice of solution options, taking into account the theory of thick and thin shells.
2. **Diagram parameters.** The dialog for selecting bodies or operations for displaying results with safety factors has been improved.
3. **Working with materials.** The work on unification of the document materials with the materials of the T-FLEX Analysis studies has been completed. Any material applied to a study is now a document material.

T-FLEX CAM

1. **5D milling.** In 5D positional "pocket" with the definition of a part body in the form of a 3D fragment, the ability to change the leading tool from layer to layer has been added.
2. **3D zone milling.** For a 3D zoned cylindrical "surface of rotation" with the definition of the body of the part as a 3D fragment, control of the leading tool is implemented both within a layer and from layer to layer.
3. **5D milling.** Added algorithm for 5D mode described above.
4. **3D fragment as part.** When using a 3D fragment as a part, the exact definition of the first (top) layer is implemented.
5. **5D milling.** Implemented the use of the "5-coordinate" mode with the "pocket" option.
6. **Bodies trimming.** Added body trimming to pocket with "2.5D plane" option.
7. **2.5D machining.** In **Wire-cut** and **Laser-cut** machining, the option **Continuous cutting** has been added.
8. **2.5D machining.** In **Wire-cut** and **Laser-cut** machining with image selection, the ability to select a part from which machining begins has been added.
9. **2.5D machining.** In **Wire-cut** and **Laser-cut** machining with image selection, the ability to select individual sections of closed contours in an arbitrary order has been added.
10. **Pencil milling.** The possibility of using a tool fragment with an upper cutting edge for pencil milling has been implemented.
11. **Moving on/off type.** In the moving on/off along the arc, the **Auto** position has been added to the arc direction switch. The cutters check is now only performed when the switch is in **Auto**, allowing you to manually set the arc direction if necessary.

12. **5D pocket, 5D zone milling, 3D spiral, stripping with fix. H crest.** Implemented the ability to use a tool with top rounding.
13. **Cutting control.** Implemented the ability to take into account the non-cutting part of the tool.
14. **Cutting control.** The possibility of using a parametric 3D fragment as a tool has been implemented.
15. **5D zone milling.** Implemented the ability to process chamfers with the upper or lower cutting edge of the tool.
16. **5D zone milling.** Added a switch for the direction of the "local stock".
17. **5D zone milling.** For 5D zone with the **Spiral** pass type, it is possible to define 3D paths with sharp breaks.
18. **5D zone milling.** For 5D zone with the **Spiral** pass type, the milling cutter can be tilted to a given angle.
19. **3D cutting-in, 5D cutting-in, start/return point and moving on/off with multiple choice of paths.** Now only the changed parameters are copied from the 1st toolpath to the rest.
20. **20. 3D zone "pocket" and "rotation surface".** The ability to select 2 non-closed 3D paths has been added, as well as the ability to effectively lengthen 3D defining toolpaths along a tangent.
21. **5D zone milling.** The possibility of simultaneous use of the transverse indentation "in size" and "in aisles" has been implemented.
22. **Auto-determination of the optimal tool vector.** Added the ability to auto-determine the optimal tool vector for each point of the toolpath.

T-FLEX Electrical

1. **Splitted representation.** The movement of an element in splitted representation (SR) from one sheet of the document to another is simplified. Now you can transfer the group without entering SR command.
2. **Cable components.** The association of connection lines (CL) with cores of a harness or cable when assigning a cable component (CC) is optimized; the marking of selected branch of connection in the diagram is added.
3. **Cable components.** The drop-down lists of wires in CC creation command behave more stably and logically: the last selected wires are placed at the top of the list.
4. **Cable components.** Now it is possible to remove a CC from the selected CL. To do this, **Delete** command group has been added to context menu of CL, in which you can select to delete a CL (with an assigned CC) or delete only a CC.
5. **Cable components.** The ability to edit the geometry of the harness at terminal point is added. **Move Branch Point** option has been added to the point context menu, which activates the transformation manipulator.
6. **Cable components.** In the commands for creating CCs, unnecessary windows for managing the list and binding type of cores coming out of the end of the harness or cable have been eliminated.
7. **Cable components.** It is now possible to use parallel 3D "usual" and common connection points (CCP) specified for a connector in **Component in 3D** command: when assigning a CC, the system asks what to use - CCP or CP. Depending on this, the display of harness connection to the connector in 3D scene changes.
8. **Cable components.** The cable joints can also be installed on separate single-core wires that are not included in the harnesses.
9. **Cable components.** Access to the parameters of additional components of CC is now possible from the context menu of their markers (**Parameters** option) in CC editing mode.

10. **Block diagram of CC.** The ability to hide block diagram of CC to use it as an invisible associative base of the harness drawing is added. To do this, **Parameters** tab with level, priority and layer settings has been added to **Parameters** command, called from the context menu of the block diagram.
11. **Block diagram of CC.** Automatic hiding of connectors from block diagram with the activated parameter "Excluded from reports" is available. Now, when you enable the display of connectors, **Only Included in Structure** checkbox is available, which is activated by default.
12. **Assembly drawing of CC.** It is possible to add any view of any fragment to assembly drawing of harness. To do this, select **From File** option on **Elements** tab in **Projection** command, and place the projection of the selected fragment on the harness drawing.
13. **Cable components.** The algorithm for calculating the length of a multi-core cable has been refined: now the length of the protrusion of individual cores from different ends of cable and its branches are completely taken into account.

Version 17.0.25.0

T-FLEX CAD

1. **Set center of rotation.** The command for setting the center of rotation of the scene has been changed.
2. **Mouse rotation speed.** Added the ability to set the mouse rotation speed as a percentage.
3. **Rotate the 3D scene with the middle mouse button.** Added the ability to rotate the 3D scene with the middle mouse button.
4. **Undoing of changes when canceling drawing on WP.** When canceling drawing on the workplane, it is now possible to discard the added changes.
5. **Drawing on the workplane. Rotate Normal to Selected Element** command now respects the plane's LCS.
6. **Spiral operation updating.** The operation now works on the basis of a helix 3D path, support for selecting multiple edges is available, adding the **Scale** option, integrating the command with new graphs.
7. **Possibility of using an array by table in a 3D scene.** Array by table is now included in the general list for creating arrays in a 3D scene.
8. **Face blending.** The reverse interface has been changed, you can now select paths, profiles and sets of edges as a spine.
9. **Helix 3D path.** Added a new type of spiral path - **Flat Helix 3D Path**.
10. **3D node at the intersection.** A set of operands can now be selected as the second element.
11. **Sweep.** Now, when you select a closed path, the **Start Point on Trajectory** checkbox is automatically turned on.
12. **Array by pattern.** Added the ability to select faces as a pattern.
13. **Transition surface.** Added the ability to automatically determine the extrema of the support curve, two guides and the discriminant graph.
14. **Extrusion.** Added **Simplify Geometry** option.
15. **3D Model window.** Added **Rollback** column.
16. **Product Structure, column property.** Added an option to sum unique values based on the number in the string concatenation drop-down list.

17. **Inserting tables from the prototype.** Added the ability to insert tables from a pre-created prototype.
18. **Highlighting of parameters of operations and commands.** Highlights for various operation parameters have been implemented.
19. **getv() function.** The function has been updated, now you can get the total length of all graphic lines on the specified page as follows: get("Name or page ID ", "IMAGES_LENGTH")
20. **Hyperlinks in texts.** Added the ability to link to drawing pages.
21. **Measurement.** Added the ability to measure threads.
22. **Workplane creation.** The command for creating workplanes has been moved to a new interface.
23. **Workplane creation.** Added the ability to rotate the position of a tangent surface 180 degrees.
24. **Workplane creation.** Added the ability to create workplanes perpendicular to the path by specifying an offset.
25. **User commands.** Adding the option **New Document from Template** to the list of actions.

T-FLEX Dynamics

1. **Interface.** A total **Calculation Time** counter has been added to the **Simulation Parameters** tab of the T-FLEX Dynamics module studies calculation command, which makes it possible to predict the time of recalculation or calculation of similar tasks.

T-FLEX Analysis

1. **Geometry optimization based on analysis results.** **Recalculate 3D Model** flag is now set automatically and closed for removal if the Analysis study is selected.
2. **Grouping materials in the LCS folder.** Implemented grouping of defining properties of anisotropic materials in the LCS folder.
3. **Copying the grid when copying the study.** The dialog for copying studies has been improved. Now you can separate the grid common for a group of studies in a study.

T-FLEX CAM

1. **Machining Manager.** Added the ability to activate machining by double-clicking the LMB.
2. **Machining Manager.** Added the ability to display rig bodies in the scene only for active machining.
3. **Machining Manager.** Added selection of multiple toolpaths when the <ctrl> key is pressed.
4. **Zone 3D milling.** For a completely "open pocket" with internal protrusions, added the ability to define using one face.
5. **Zone 3D milling.** The Smooth transitions option has been added to pocket and roughing machining.
6. **5D positional milling.** Automated input of a grid of tool orientation vectors for 5D positional milling.
7. **Interface.** Work with the interface has been done, the **CAM System Options** window has been updated.

T-FLEX Electrical

1. **Connectors.** When selecting a mating connector, it became possible to select it from the library.
2. **Elements of the scheme.** The **Open** option has been added to the context menu, which opens the document with the selected item in a separate window.
3. **Communication lines.** Added setting of image of overlapping lines of communication lines (**Document Parameters** command, section **Lines**).

4. **Communication lines.** In the menu of the point of intersection of communication lines, in which the display of the coupling is turned on, options for the image of the intersection of communication lines have been added.
5. **Cable components.** Now you can select several communication lines on the diagram for group assignment of wires or a bundle.
6. **Cable components.** Internal and external connection addresses are now shown in separate columns in the cable components (CC) dialog.
7. **Cable components.** In the context menu of communication lines with assigned cable components, an option has been added to delete cable products (**Delete - Delete CC**).
8. **Skeletal diagram.** Added the **Coefficient** parameter, which determines how many times the section will be reduced, the length of which exceeds the value entered in the **Auto Break** field.
9. **Model tree.** The Show in tree/assembly structure option has been added to the context menu of elements on the diagram, which expands the tree of structural elements to the required level and highlights the selected element in it.
10. **Model tree.** The **Show Schematic Elements** option has been added to the context menu of structural elements, which finds the selected element in the diagram and shows it large on the screen.