What's New in CimatronE 11
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Modeling

Curves

Composite Improvements

Changes to the Composite Curve functionality in CimatronE 11 provide the following enhancements:

- Users can now flip the progression direction of the “first” and “last” edges of the curve, making it easier to add curves to any side of the composite curve.
- The “Max.Gap” can now be changed while editing the composite curve definition.
- Users can now remove reference curves that were used for the definition of the composite curve.

Benefits

- Enhanced user control
- Reduced design time

The user selected the edges but missed three edges at the beginning of the composite curve (shown in the red circle).

After clicking the Flip option, the user is able to add the desired edges.
Create Section Curve from Dynamic Section

When creating a dynamic section, the new Create Section Curve option creates an intersection curve of the section edges. This is particularly useful for thickness analysis and measurements.

Benefits

- Improved measurement capabilities
- Simplified user experience

While inside the Dynamic Section tool the user is able to create an actual section curve of the displayed section.

The result of three different sections created using the tool.
Line – By Direction to Reference Point

When creating a line in CimatronE 11, the user can define its length by using a reference point.

Benefits
- Enhanced user experience

To create a line of the same length as the height at the back of the model, the user clicks on the reference point to define the desired line length.
Improved Text Font Size

When looking to change the font size in CimatronE 11, the user is now able to either define the height of the text according to the spacing between two lines of text (existing option) or by the actual height of the text characters.

The user can now also change the font size when they are placing the text on the model (as well as when typing the text).

Benefits
- Increased user control

The text size can be changed when placing the text.

New options to define the text height.
Faces

Extend Improvements

Version 11 offers improved extend functionality. Users are now able to:
- extend faces, even if they are stitched to other faces,
- flip the direction of the extended face,
- add an angle,
- extend faces in non-active parts.

In addition, the multi-continuous option has been improved:
- The arrows better reflect the direction of the extension, leading to better results.
- There is now the automatic merging of edges in the Same Face option.

Benefits
- Increased user control
- Improved results
- Reduced design time

The user can flip between extending the edges of the green surface and extending the edges of the orange surface.

A new Draft Angle option enables extending the faces in various directions.
Trim and Split Object by Wire Improvements

In previous versions of CimatronE, trim or split by wire or curve could be performed on faces.

In CimatronE 11, users can now also select an object to be trimmed or split, providing a better result.

Benefits
- Improved results
- Reduced design time

The selection of the whole object to be taken into consideration in the Trim/Split operation.

The result of the Trim operation.
Composite Face Improvements

Enhancements to Composite Face in version 11 allow users to select faces that are not adjacent, as well as those that are connected by sharp corners. The system automatically identifies adjacent faces of the same type and merges them, in addition to merging edges. Results are also quicker and more accurate.

Benefits
- More accurate results
- Faster calculation
- Improved user experience

The user wants to merge the grey faces.

The enhanced composite tool allows the user to select all these faces (even those connected by sharp corners); the tool divides the faces into groups that can be merged.

The result.
Drive – Allow Multi-Faces in More Cases

CimatronE’s Drive function has been enhanced in version 11. The user can now select several closed sections in the multi-faces option that are taken into consideration in the creation of the drive. This is of particular use in the creation of tunnel gates.

Benefits
- Improved results
- Reduced design time

Three sections have been selected for the creation of the drive.

The result.
**Sweep to Reference Point**

When creating a surface using Sweep in CimatronE 11, the user can now define the surface’s sweep delta by using a reference point.

**Benefits**
- Enhanced user experience

To complete the parting surface, the user selects the new option in the Sweep tool. This enables the sweep to reach the end point (reference point) of an existing parting surface.
Modify by Sketcher – Option to Auto Stitch

A new option in CimatronE 11 allows the user to choose to re-stitch a face after modifying it by sketcher.

Benefits
- Reduced design time
- Enhanced user experience
- Simplified design

The stitch operation is performed automatically after approving the changes in the sketcher.
modify by boundary – remove islands

A new option within the Modify Boundary tool allows the user to easily remove islands.

Benefits

- Enhanced user experience

The islands on the grey surface are to be removed.

Using the tool’s new option, the surface is re-created without the islands.
Extend Planar and Cones

When extending planar and cones, the user is now able to select geometry from external parts that are non-activated. This is of particular use when creating parting surfaces.

Benefits
- Enhanced user experience
- Reduced design time

The assembly is activated and the designer is able to create the parting surface using geometry from the non-activated work part.
Warp Faces

The new Warp Faces tool assists the user in creating both internal and external parting surfaces, especially complex surfaces that cannot be easily designed with traditional surfacing tools.

The tool can create parting surfaces that mimic the surrounding geometry (both boundary and shape).

Benefits
- Reduced design time
- Improved results

The internal parting surface of a non-linear opening to be designed (marked by the green arrow).

The user picks the red surface, enabling the warp tool to close the opening by mimicking this red surface geometry.

Showing the creation of parting surfaces that mimic the surrounding geometry:

Showing the result from another orientation.
Solid

Extrude – Multiple Selection of Faces

There is often a need to extrude the geometry of several faces.

In CimatronE 11, users can now select and extrude multiple faces in the one operation. This functionality is particularly useful when creating forming punches or various mold components.

Benefits
- Reduced design time
- Improved results

Creating a forming punch by extruding multiple faces of the part up to a plane.
Extrude to Reference Face that Doesn’t Cover the Entire Extrude Area

In many cases, an extrude operation to a reference surface needs to be performed where the reference surface only covers part of the area to be extruded. In order to achieve this in previous versions of CimatronE, the user had to manually extend the reference surface before performing the extrude.

In CimatronE 11, there is no need to create any extensions. The system will automatically create the extrude according to the user’s preference, either as a natural continuation of the reference surface, or as a tangent.

Benefits

- Reduced design time
- Greater user control

The user wants to extrude the curve up to the orange surface.

The extrude is created without needing to first extend the orange surface.
Cut by Multi-Faces and Extensions

In many cases, a cutting operation needs to be performed where the intersecting surfaces do not cover the entire desired cutting area. To achieve the cut in previous versions of CimatronE, the user had to manually create additional geometry before performing the cut.

In version 11, the cutting can be completed automatically either by single or multi-face selection:

- Single face selection – the system will automatically create the cut according to the user’s preference, either as a natural continuation of the intersected surface, or as a tangent.
- Multi-face selection – the system automatically creates the cut by extending all of the surfaces in an optimal manner.

Benefits

- Reduced design time

*With Multi-Face Selection, the system extends (internally) the selected faces and performs the cut.*
Cut – Transfer Attributes

A new option in CimatronE 11 allows the user to automatically transfer an object’s attributes (e.g. colors, threads, hole attributes) to the part being cut.

Benefits
- Reduced design time

Cutting the grey box with the green and orange surfaces.

Using the new Transfer Attributes option to transfer the colors to the grey object.

The result.
New Cutting Object

New functionality brings together the different operations needed to define and create a cutting object. These operations include offsets, remove and extend, chamfers, and assign attribute.

This functionality is useful for design, as well as for the creation of customized catalog components.

Benefits
- Enhanced user experience
- Reduced design time

With the new Cutting Object tool, a cutting object (transparent object) is created on this lifter’s rod (based on its original shape), which includes various offsets and a chamfer to ensure a correct cut. The user can also exclude the green niche faces from the cutting object.
Shadow Taper

In CimatronE 11 only one click is required to create tapers on geometry with rounded surfaces. This can save significant time when the user is looking to create a taper for the purposes of a draft angle.

Benefits

- Reduced design time

The grey surfaces require a draft angle. Using the Shadow Taper, selecting the rounded surfaces resolves the issue.

The result.
Extend Object – Move Radial

A new option in the Extend Object functionality allows the user to move geometry around the radial in order to maintain a smooth connection between the surfaces.

Benefits
- Simplified design
- Reduced design time
- Improved results

The green face to be rotated around the axis.

The result shows the radial movement of the faces keeping the smooth connection between the green planar and the rounded orange surfaces.
Extend Object – Replace Face, Remove Target

A new option in the Extend Object functionality allows users to extend a face to the target face and then remove the target face automatically.

Benefits
- Simplified design
- Reduced design time

Replacing the rounded face with a planar one.

The result; the reference face is removed when the operation is completed.
**Extend Object – Move Linear, Define Delta by Two Points**

In CimatronE 11, the user can now define the extension by selecting two points – the origin and destination.

**Benefits**
- Reduced design time

The user wants to extend the orange pocket to reach the level of the green surface.

By using the new tool (marked in red), the orange pocket can be extended to the green surface by defining two points – a mid-point of one of the bottom edges of the orange pocket and the center point of the green surface.

The result.
Round Three Faces

Rounding the surface of an object can now be done with one click, with the rounding based on the object’s three sides. This is especially useful for ribs.

Benefits

- Reduced design time
- Enhanced results

The user selects the orange surfaces in order to round this area.

A smooth round is created between the two green neighboring faces.
Round – Define Radius Value by Reference

In CimatronE 11, the user can pick a reference geometry and use its curvature as the round or fillet radius parameter.

Benefits

- Reduced human error
- Enhanced user experience

The user selects the tool’s new option to create a round feature on the blue edge with the same round value as the grey surface. Activating the new option allows for the selection of the grey rounded surface; selecting it copies its value to the Global Radius to be used on the new created round.
Stopped Round

The user is now able to create a round on part of a selected edge. This is done by defining the distance from the ends of the edge.

Benefits

- Enhanced user control
- Reduced design time

Creating a round surface that begins and ends at a set distance from the edges.
Stopped Chamfer

In CimatronE 11, the user can create a chamfer on part of a selected edge. This is done by defining the distance from the ends of the edge.

Benefits
- Enhanced user control
- Reduced design time

Creating a chamfer that begins and ends at a set distance from the edges.
Drive with Draft Angle

In CimatronE 11, the Drive function in Solid has an additional option that allows the user to easily add a draft angle to the drive. This option is particularly useful for gates in a mold.

Benefits
- Greater flexibility in 3D shape creation
- Enhanced user control
- Reduced design time

Left – Without a draft angle. Right – An object created by the Solid–Drive using a draft angle.
The Assembly Setup assists users in defining and adjusting assemblies with pre-defined parameters that can be used for relation creation.

Improvements to the Assembly Setup include:

1. A new tree structure that aids in organizing and identifying pre-defined assembly parameters. In addition, users can view where the parameters are used in the assembly.

2. Additional parameter functionality: Parameters can be defined by formulas, catalog part dimensions, pre-defined lists, and data ranges.

3. The ability to import Assembly Setup parameters into the project without any loss of data: New parameters are automatically created or merged where possible.

4. An enhanced mold layout tab that includes additional pre-defined parameters and a diagram showing what each parameter represents.

Benefits:
- Significantly reduced design time
- Enhanced standardization
- Improved user experience
Assembly Mirror

Major enhancements to the Assembly Mirror functionality offer users dramatic time savings.

Enhancements include:

1. The structure of the assembly tree is now maintained for all mirror parts created in CimatronE, saving the user significant time when working with the assembly.

2. The system now automatically identifies which assembly components to mirror and which ones simply to rotate, and marks them in different colors.

There is also a legend showing the shapes and colors of the assembly in the mirrored and rotated parts.

Benefits

- Improved design times
- Enhanced user experience
- Reduced errors

Four lifter sub-assemblies are selected using the Assembly Mirror tool. One lifter sub-assembly is recognized as a rotated copy sub-assembly (shown in light blue). The other three lifter sub-assemblies contain one component (the lifter nose) which can’t simply be copied and rotated. For these lifter noses, mirrored components are created.
Add Component may use any UCS from any Assembly

When adding a component to an assembly, CimatronE 11 now allows the user to place it on a UCS from other sub-assemblies.

Benefits
- Simplified design
- Reduced design time

The user is able to place a catalog component on a UCS from the main assembly while a sub-assembly is activated.
Add Component Enhancement

In CimatronE 11, the user is now able to move the location of the added component by:

- rotating the component around a specified point
- defining placement orientation using a direction arrow
- shifting the component along its own or the assembly’s basic directions.

This functionality is particularly useful in the design of cooling channels.

Benefits

- Enhanced user control
- Reduced design time

By activating the new tool (shown in red), the cooling item is moved along its own Z-direction (shown by the blue arrow) and not along the Z-direction of the component it is placed on (shown by the red UCS).
Control Visibility and Style of Entities while in Assembly

Visibility

CimatronE 11 enables the user to hide and show entities within assembly components without activating those components.

Style

Users can now change the style (color, line width, line font) of entities within assembly components without activating those components.

Benefits

- Greater user control
- Reduced design time

Visibility: The main assembly is activated and the user selects one of the faces from the sub-assembly.

The user clicks on the Hide button to hide the picked face (instead of the entire sub-assembly).

Style: The main assembly is activated and the user selects four faces from four different sub-assemblies to be colored in blue.

Once the user clicks on the “Color” button only the selected faces are colored (instead of their sub-assemblies).
Assembly Cut – Transfer Hole Attribute while Cut

In CimatronE 11 the system automatically transfers the cutting object’s hole attributes when adding a component to the assembly and using the With Cut option, or when using the Assembly Cut tool.

Benefits
- Reduced design time

*Ejectors with hole attributes are added to the project.*

*After cutting the plate with the ejectors, the hole attributes are transferred to the holes.*
Associative Relocation of Components

A new option in the Relocate Component tool allows users to relocate a component while keeping the association of the original “Add” operation.

Benefits
- Enhanced user control

At an advanced stage of the design, the user relocates a component’s position using the Relocate Component tool while maintaining the parameters of the function (Add) that were used to place it.
New Activate Parent Assembly Option

The Activate Parent Assembly option has been added to the context menu in CimatronE 11. The user is now able to move up one level in the assembly from the active component or from a selected component. In addition, the Active Main Assembly option has been removed from the context menu.

Benefits
- Enhanced user experience
Re-Order in Assembly Tree

Within the assembly tree and electrode tree, the user is now able to re-order a sub-assembly or any component within a sub-assembly by dragging the item.

Benefits
- Enhanced user experience

Re-ordering the Parting sub-assembly: The Slider P.L. component is placed at the bottom of the list by dragging it with the mouse.
Show Added Part Name in Feature Tree

When adding a component to an assembly, the component's name now appears in the Add feature name in the Feature Tree.

Benefits

- Enhanced user experience
**Transparent Face When Using Place on Face**

In CimatronE 11, when adding a component and using the Place on Face option in the Add Component tool, the part’s face on which the component is being placed becomes transparent, providing the user with enhanced visualization.

**Benefits**
- Enhanced user experience
The new Auto Reference function in the Sketcher enables external references to be used in the Sketcher without the need to manually add them. Like any other references, these references can be used for dimensioning, constraints, and relations.

Benefits
- Simplified user experience
- Increased automation
- Reduced design time

While the Auto Reference tool is activated, the user draws a line in the sketcher to the center of the hole. The system automatically recognizes the center of the hole without the user needing to use the Add Reference tool.
Better Visualization of Constraints

In CimatronE 11, the user is better able to see the constraint line and constant icons are now visible at each point.

Benefits
- Enhanced user experience

The constraints that are about to be created upon selection are shown next to the cursor.
**XY Alignment**

New functionality in CimatronE allows for automatically constraining the selected point to the same x or y as the reference point.

It also allows for automatically constraining a line vertically or horizontally with only one click.

**Benefits**
- Enhanced user experience

The marked line to be positioned horizontally; selecting this line and using the new Horizontal/Vertical tool positions the line horizontally.

The result.

The same as above, but vertically.
Drafting

View Arrangement

Drag Views Without Going into Edit

In CimatronE 11, dragging a view is now possible without needing to edit it.

Benefits
- Greater user control

The section view is repositioned simply by dragging it without needing to go into edit mode. The section view is dragged while the Restrict Aligned View Dragging Direction is checked (bottom picture), which highlights the parent view and fixes its position.
Alignment Improvements

The alignment of views has been greatly simplified in CimatronE 11. The user now only needs to define the alignment direction and the view to align with.

In addition, the user has the option to limit the dragging of the view so it cannot move its parent view (a view it was derived from or aligned with).

Benefits

- Greater user control

Aligning of a view using the new Align Vertical (Y) option.

The result.
View Creation and Updates

Automatic Center Line for Pipes

In CimatronE 11, center lines are created automatically during view creation. The user can control the visibility of the center lines by using the View Attributes dialog box.

Benefits
- Dramatically reduced design time
- Simplified user experience

All axis/center lines are automatically created during view creation.
Section View Improvements

In the new version of CimatronE it is now possible to create a section view only of the area of the section line, rather than the entire model.

Benefits

- Enhanced user experience

A section view showing only the hole area.
Create a Section M-View from an M-View Section Line

In CimatronE 11 the user is now able to create a drafting view from an M-view section line that was created in the modeling environment.

Benefits

- Enhanced user experience

While creating a top view of the plate, the designer shows the M-View section line created in the modeling environment.

The user creates a section view by selecting the M-View section line, just like with a section line created in drafting.
Control Wireframe On/Off Per View

In CimatronE 11, a new option enables the user to show wireframe in individual views.

Benefits
- Enhanced drafting capability

The user can hide or show wireframes for each view separately.
Show Instance Folder in Part Filter

In the assembly tree of the Part Filter, instances of the same component are grouped together into a folder (the same as in the modeling assembly tree).

Benefits
- Enhanced user control

All Z 30 cap screws instances are organized under the same folder (same as in the assembly tree).
As-Is View

Same Visibility As In Model is a new option available in View Creation. It depicts in drafting how the model is displayed in the modeling environment. With this option, for example, a hidden component in the modeling environment will remain hidden in drafting.

Benefits
- Enhanced user control
A Set for Disassociated Entities

CimatronE 11 includes a new set under the Sets tab that holds “disassociated symbols”, such as dimensions and geo-tolerances that have been disconnected from the model (dimmed symbols).

Benefits
- Greater user control
Add Hole Attributes and Threads to Dimensions Automatically

When creating dimensions, hole and thread dimensions are now automatically recognized. These attributes will automatically appear as tolerances or dimension text, and will be associated with the model.

Benefits
- Improved integration between modeling and drafting

When creating dimensions, the system automatically recognizes threads and hole attributes.
BOM Improvements

CimatronE 11 allows the user to click and drag rows to change the order of the parts listed in the BOM Table Editor.

Benefits

- Enhanced user control

By dragging with the mouse, Cap Screw No. 108 is moved to after Cap Screw No. 103.
LOH and TOH Improvements

Improvements to the Table of Holes (TOH) in CimatronE 11:

1. The user is now able to reorder hole groups listed in the TOH.
2. The new Initial Letter option allows the user to automatically add a different letter prefix to each hole group. This option also allows for manual control of the prefix letters for specific holes or the entire group.

When creating and editing the Label of Holes (LOH), the user is now able to control the placement of the leader (either at the center or on the edge of the hole).

Benefits
- Enhanced user control

Initial letters are added to the labels and in the Hole No. column when settings are activated.
Recently-Used Text in Dimensions

In CimatronE 11, the system remembers recent text entered as a prefix, postfix or underfix of a dimension. This text can later be reused in other dimensions. The user also has the ability to create a predefined list of text options.

Benefits
- Enhanced user experience
- Reduced drafting time

Recently entered text is saved for future use.
**Snap to Similar Dimension**

In CimatronE 11, the user can align the dimension with another dimension in the same view.

**Benefits**
- Enhanced user control

*The user is able to align the dimension to another one by clicking on it while creating or editing a dimension.*
Other

Allow Setting any User Frame in the Preference

In CimatronE 11, the user can set any default frame for new drawings.

Benefits

- Improved user experience

This new option allows users to select a frame setting from any folder.
Major Supplier Catalogs Updated

CimatronE 11 includes comprehensive updates to major catalogs Hasco (mm) and Meusburger Mold and Die.

Several new catalog parts and configurations from these catalogs have been added. The existing catalog items have been updated with changes to the parts themselves, as well as modifications in details and reference numbers.

Benefits

- Easier to work with and order catalog parts
Wall Thickness Analysis

CimatronE features a new, embedded and accurate Wall Thickness Analysis. It allows the user to check whether an object’s walls are of the required thickness to ensure high product quality.

The analysis presents the differing thicknesses in the object, or a section of it, in a color map. Methods of 3D analysis it provides are Sphere Analysis and Ray Analysis. In addition it offers the user the ability to focus on particular areas to analyze sections of the object. The user can define the thickness ranges for the analysis to measure within.

Benefits

- Early identification of product quality issues
The Interference Check tool in CimatronE now includes an additional option – Cut Verification Check. This new capability helps the user check if holes were created for parts with cutting objects.

**Benefits**

- Reduced human error
- Confident design
- Enhanced quality

*All objects with a cutting object are taken into consideration.*

*The system detected a collision between the plate and the cap screw resulting from the user mistakenly using the Without Cut option.*
Body Integrity Analysis

The new Body Integrity Analysis provides users with information about a model’s geometry. It brings together the analysis tools, Open Edges, Non-Manifold Geometry, Tolerant Geometry, Self-Intersecting Body, and Knife Region.

Non-manifold geometry (also known as zero-thickness geometry) exists when edges or vertices in a solid model are not properly connected with adjacent geometry. An example of non-manifold geometry is where an edge has more than two adjacent faces. Non-manifold geometry is problematic and can cause errors in the model. The new tool indicates where non-manifold geometry exists in a solid part.

Tolerant geometry is formed when there is a distance between the edge of a face and the face itself. The tool indicates where the distance is larger than a specified tolerance.

A self-intersecting body is where faces of an object intersect faces of the same object. The tool identifies where this occurs.

Knife Region identifies when two faces meet and form a very sharp angle. Sharp regions might make the part difficult to mill and could impact on the quality of the final product. The user is able to set the angle by which the system can identify a knife region.

Benefits

- Enhanced user experience
- Improved machining quality
When open objects are measured in CimatronE 11, the system tells the user which results are approximated.

**Benefits**
- Improved user control

*Though the object is open, the system can approximate and show the volume of the open object in the measurement tool.*
Delete Analysis Marks

This new tool allows users to manually delete markings created by different analysis tools.

**Benefits**
- Enhanced user control
- Improved design time

*After splitting the face and assigning it to the correct splitting direction, the marking of the unassigned face is manually selected and deleted.*
General CAD

UCS by Direction

The creation of UCS’s in version 11 is enhanced with the new By Directions tool. UCS orientation can now be defined by specifying the direction of each axis using the Direction Arrow tool.

**Benefits**
- Enhanced user control
- Reduced design time

*The X and Y axis directions can be defined using the direction arrow pop up menu.*
PMI Improvements

CimatronE 11 features a new option for PMI, Highlight Leaf, which shows the user the part in the assembly that the PMI belongs to.

Deleting a PMI is now also available through the context menu (as well as by using the Delete button on the keyboard).

In addition, the user is now able to add free text to a coordinate label.

Benefits

- Enhanced user experience

The new PMI option highlights the part’s leaf ("core_1") in which the PMI was created.
Highlight Leaf – Show all Features Associated with the Entities

The existing Highlight Leaf option in CimatronE has been enhanced in the new version. By clicking on a particular geometry in a part, the user is shown a list of all the features that were involved in the creation of the geometry. Once the user has selected a feature, it is highlighted in the Features Tree.

Benefits
- Enhanced visualization
- Reduced design time

All features used to create the lifter’s nose are shown and can be edited.
Save Non-Associative Thread Values

In addition to the existing Associative and Free thread options, CimatronE 11 includes a new Non-Associative thread option which allows the user to change the thread catalog and thread type, regardless of the hole diameter.

Benefits
- Enhanced user experience
- Greater user control

*When selecting the Non Associative option, the Thread Catalog is available for selecting any thread type the user requires.*
Hole Attributes on Shafts

A hole attribute can now be assigned to a shaft. This allows the attribute to be transferred to a hole that will be created by that shaft.

Benefits

- Greater design capabilities

*The hole attribute is assigned to an ejector; the attribute will be transferred to the hole of the plates being cut by the ejector.*
Improve Check and Fix Visibility Control

The Check and Fix dialog box has been enhanced, and the user can now view each type of invalid entity separately (objects, faces and wire).

**Benefits**

- Enhanced user experience
Add ID_NUM Name as Pre-Fix in Export

When exporting data in SAT, IGES, STEP, Catia and Parasolid formats, the user is now able to add the ID_NUM as a prefix of the name of the part or sub-assembly.

Benefits
- Enhanced user experience
Icons for Assemblies and Part

All parts and assembly icons are now as visible in the assembly tree as they are in the browser.

Benefits
- Enhanced user visualization
Mold Design
New ECO Manager

There is no silver bullet when dealing with ECOs (Engineering Change Orders). However, CimatronE 11 offers a breakthrough ECO application that significantly boosts the user’s ability to manage changes effectively, allowing ECOs to be a source of revenue, rather than a burden.

The ECO Manager provides advanced and reliable analysis, implementation and documentation of an unlimited number of ECO changes at any stage of a job.

It significantly improves the user’s ability to assess and seamlessly incorporate changes into the model they have already undertaken work on (mending), saving them considerable time and eliminating frustration.

It also includes functionality for tracing and documenting changes’ history.

Benefits
- Dramatically simplified ECO management
- Significant time savings
- Reduced errors

The result of the analysis comparing two parts – the one being worked on and the new version received from the customer; it shows exactly where the changes were made.

The ECO Manager enables the user to track any number of changes in a project.
Lifter Design

Lifter Pocket

The new Lifter Pocket function enables the easy creation of pockets for lifters in a single operation. Lifter pockets can be created either as a parting surface or as an actual pocket on the core block. The system can create the pocket with either the cutting object of the lifter or the object itself.

Benefits
- Reduced design time
- Increased design flexibility

Pockets are created inside the cavity plate.

Pockets for the lifters are created as parting surfaces with a different split direction for each pocket.
Cut Lifter Improvements

Improvements to the Cut Lifter tool simplify the design process and reduce the design time, particularly for complex models.

The user is now able to tell the system to identify the parting surfaces to take into consideration when cutting the lifter.

There is a new option to manually cut the lifter head from within the tool.

Benefits
- Reduced design time
- Enhanced results

Complex lifters are created in a single operation using the enhanced Cut Lifter tool. The user can add the lifter parting attributes to the corresponding faces in the work part.
Wall Thickness Analysis

CimatronE features a new, embedded and accurate Wall Thickness Analysis. It allows the user to check whether an object’s walls are of the required thickness to ensure high product quality.

The analysis presents the differing thicknesses in the object, or a section of it, in a color map. Methods of 3D analysis it provides are Sphere Analysis and Ray Analysis. In addition it offers the user the ability to focus on particular areas to analyze sections of the object. The user can define the thickness ranges for the analysis to measure within.

Benefits

- Early identification of product quality issues

The Wall Thickness Analysis uses a color map to show the various wall thicknesses in the model.

The user analyses a section of the part to check for narrow or thick areas that can cause manufacturing problems.
MoldQuote Improvements

The ability of the MoldQuote tool to accurately reflect project costs has been significantly boosted in CimatronE 11. Additional project-related costing considerations have been included in the quote generation, and there is now full data integration between the quoting tool and work undertaken in CimatronE.

Users are able to use a new guide within CimatronE to directly feed design and programming data to the quoting tool. The data includes all the components from the mold project, whether catalog or customized parts (including inserts, lifters and sliders), as well as all the manufacturing data, such as for the drilling and milling operations and electrodes.

The provision of this data enables the preparation of comprehensive quotes that offer a realistic indication of the costs associated with any given project.

Benefits

- More accurate and comprehensive quotations
Mold Project Setup Wizard Improvements

The Mold Project Setup Wizard offers the user two new options:

1. Whether to create mold sub-assemblies (fixed side, movable side, ejection system), or only a parting sub-assembly. This is particularly helpful to users who use customized mold sets.

2. Whether to create an empty parting sub-assembly or to bring in an existing one.

Benefit
- Greater user control
- Enhanced user experience
Parting

Cap Internal Islands

This new functionality enables the creation of the internal parting surface in the click of a button, dramatically reducing users’ design time.

Users can now close internal islands by selecting geometry from a non-activated part. In addition, the system is able to detect any type of geometry (open or closed) to cap islands, automatically creating the parting surface.

Benefits

- Dramatically reduced design time

With one selection, the system automatically recognizes all the internal openings and caps them.
QuickSplit Improvements

Predefined Names for New Directions

When creating or editing a split direction, the user can type in a name for the direction or select a name from a pre-defined list.

Benefit
- Enhanced user experience

A customizable list of pre-defined names is available for the user when creating or editing a split direction.
Edit Direction Available from the Context Menu on a Face

Editing the split directions has been simplified in CimatronE 11, with the user able to select the option of Edit Direction by right-clicking on a face assigned to that direction.

Editing a direction can now also be done while editing a different direction.

In addition, using Edit Direction will not activate the part.

Benefit
- Enhanced user experience

The user can edit the split direction directly from the display area by using the Edit Direction in the context menu.
Easier Selection of Manually Defined Faces

A new option in CimatronE 11 allows any face to be added as a manually defined face to the split direction.

Benefit
- Enhanced user experience

*During the creation of a split direction, an area that will need a lifter is currently assigned to the direction by box; the system identifies and selects only the unassigned faces. Additional options in the tool allow for assigning any face to that direction.*
Allow/Ignore Manually Defined Faces

The user can now tell the system whether or not to ignore faces that were manually defined for other split directions. These faces can also be highlighted by the user for better visualization.

Benefit
- Enhanced user experience
Adding Parting Surface to Draft Angle Analysis

Complex parting surface parts may sometimes include undercuts that are hard to find and can cause problems as the user proceeds with their design.

When using QuickSplit, the Draft Angle Analysis can now take into consideration the attached parting surface.

Benefit
- Reduced errors
- Enhanced user experience

After completing the parting surface, the user checks for possible undercuts of a parting surface belonging to the cavity split direction by going into Edit Direction and using the draft analysis option.
New Stroke Option

The new Stroke option in QuickSplit limits the "motion" of the opening direction to a specified distance. It is used for analyzing faces that belong to lifters by defining the stroke (the motion distance of the lifter), where an unlimited distance would result in a collision.

Benefit
- Improved results
The new Parting Analytic Tools function brings together the analysis functions in QuickSplit in addition to other system analysis functions. The Tools can be accessed when outside of the QuickSplit environment.

Functions in the Tools include:

1. **Analyze Free Edges** – The system can detect and mark edges (or segments of edges) that do not "touch" other edges. This is useful for detecting parting surfaces that do not match neighboring active faces.

2. **Analyze by Split Direction and Parting Faces** – This analysis checks the integrity of the "sheet" of faces created by the active and parting faces of the split direction, and makes sure it is ready to be used to cut the active part (core, cavity, slider, etc.).

3. **Analyze Free Active Faces** – This analysis is useful for detecting missing internal parting surfaces by looking for active faces that do not have a neighboring parting surface.

4. **Analyze Partial Undercut** – The same as the QuickSplit analysis that shows faces that form a partial undercut.

5. **Mark Unassigned Faces** - The analysis marks unassigned faces in a model to ensure that the QuickSplit is correct. This is especially useful for locating small faces in complex designs.

**Benefits**

- Enhanced user experience
- Enhanced user control
Add a New Parting Surface Part When Adding a Work Part

When adding a work part in version 11, the parting surface part can now be automatically added and named.

**Benefits**
- Reduced design time
Parting Wizard Improvements

A new option in the Parting Wizard allows the user to choose between creating either a work part or a parting assembly.

Benefits
- Improved work flow between designers
- Greater user flexibility

The user selects the new Parting Assembly option in the Parting Setup Wizard.

A parting assembly is created with a layout part and the user adds a work part and a parting surface part to his project.
Add Parting Sub-Assembly

A new option under Layout Tools allows the user to load any sub-assembly to their project. CimatronE will then automatically assign that sub-assembly parting attributes.

Benefits

- Enhanced design
Cooling Design

Baffle Design

With the new Add Cooling Item With Channel tool (see next item), CimatronE 11 speeds-up the process of baffle creation. There is no longer a need to manually determine the appropriate length of each baffle – their length is automatically optimized according to the geometry of the work/active part. In cases where a baffle is defined with a standard length, the closest standard length will be selected.

The user can create a baffle table for manufacturing purposes containing information about the baffles in the project, such as baffle length, location, type and BOM ID.

In addition, the user is now able to view and control the safety offset and to use it for analyzing any gouges between cooling channels and other components.

Benefits
- Reduced design time
- Enhanced automation

Baffles are added to the project using the new Add Cooling Item With Channel tool. Each baffle length and its cooling channel are automatically adjusted to correspond with the shape of the part.
CimatronE 11 now offers a new method for designing cooling channels. When adding a cooling item such as a nipple or plug, the associated cooling channel is automatically created at the same time. The system also creates separate sub-assemblies for each type of cooling item.

The user can control the dimensions (length and width) of the channel, as well as viewing and controlling the safety offset and using it to analyze any gouges between channels and other components.

The depth of the cooling channel holes can also be adjusted according to the geometry of the drilled part.

**Benefits**
- Reduced design time
- Enhanced automation
Consider all Parts in Cooling Design’s Visual Analysis

The analysis offered by the Cooling Objects tool now takes into consideration all the parts, including parts outside the sub-assembly of the cooling part.

Benefits

- Improved results

Cooling is inspected before the plates have been cut by the work and the parting surface parts. The analysis can take into consideration all components in the mold project.
**Mark Cooling Circuit**

A new tool in CimatronE 11 assists the user in checking the integrity of cooling circuits by marking different cooling circuits in different colors.

In addition, the analysis recognizes different types of cooling items (plugs, nipples, etc.) and marks the holes created by them in different colors.

**Benefits**
- Enhanced design

Running the Analyze Cooling Item analysis marks all the cooling item faces according to the defined color code: Red for plugs, cyan for nipples, and green for baffles.

The user selected one face from a cooling channel and the system marks in blue all the faces that belong to this circuit.

After three more analyses, all four circuits are marked.
Ejector Design

Allow Ejector Pocket Without Set and Faces

A new option in the Preferences enables the user to choose whether or not to create a set for ejector pocket faces. (These faces are a duplication of the faces being cut by the ejectors. They can be stored in a special set for use in the NC environment.)

Benefits
- Enhanced user flexibility

The new option is located in a new leaf named “Ejector Pocket” under “Mold Base” in the Preference Editor.
Use Work Part Faces for Ejector Trim and Pocket

Sometimes the user wishes to design the ejectors before the active parts (core, cavity, etc.) are completed. A new option in the Ejector Trim and Ejector Pocket tools allows the user to cut the ejector and create its pocket using the work part faces and parting faces.

Benefits
- Concurrent design
- Reduced design time

The user wants to trim the ejectors before the plate has been cut. The new option allows the user to select the work part as the trimming object.

The result.
Cut Active – Keep Associativity

The Cut Active tool in CimatronE 11 offers the user improved identification of design changes that require updating, including:

- changes resulting from adding faces to the work part or parting surface part
- changes resulting from active parts that have been moved, such as inserts and lifters.

Benefits

- Improved results

After cutting the plate with the work part (top picture), the user finds out that he has to move the work part 4 mm for design purposes (middle picture). After moving the work part, the active part (the plate) is marked with a red exclamation mark (bottom picture).
New Moldex Version Integration

CimatronE 11 offers the latest version of Moldex3D embedded in CimatronE. This allows mold designers to utilize the most up-to-date tools in simulating and analyzing the injection molding process from within CimatronE, ensuring the optimal placement of injection points and increasing the quality of the manufactured part.

Benefits
- Enhanced mold flow analysis and simulation
- Improved quality
Mark any Part as Work Part

In CimatronE 11 the user has the ability to define any part as a work part, thereby allowing the part to participate correctly in the parting. This is particularly useful in cases whether the user didn’t use the Parting Wizard or the Add Work Part tool.

Benefits

- Greater user flexibility
Adding a Work Part on any UCS Inside a Layout Part

The system now recognizes any UCS that is created inside the layout part as a layout UCS, regardless of the tool that was used to create it. Work parts can be placed on any such UCS.

Benefits

- Reduced design time
Die Design
New Environment for Flexible Layout Design of Progressive and Transfer Dies

CimatronE 11 offers a new combined environment for the layout design for both transfer and progressive dies.

The user creates the forming shapes and then proceeds with the design of a progressive or transfer die, or a combination:

- If a progressive die, the user continues designing the strip.
- If a transfer die, the user continues with the new Transfer Shape tool.

The combined environment for the layout design offers the user a more flexible and simplified process.

Benefits

- Simplified and streamlined design
- Reduced learning curve for new users
- Enhanced flexibility
Separate Die Tool Design Environment

A new, separate die tool design environment allows several designers to more easily work on different parts and stages of the project concurrently.

If the user requires a progressive die, they can import the entire strip as one part or as an assembly and can control the position of the workCS. If the user requires a transfer die, they can import one forming shape or station or as many shapes or stations as they need.

Several forming shapes or stations can therefore be created on the one tool and several designers can work on the project concurrently.

Benefits

- More streamlined and efficient die design
- Reduced design time
- Concurrent die design by several designers

The new die tool design environment.
Transfer Shapes

Transfer Shapes is a new material utilization and nesting tool for transfer dies, helping to ensure the optimal utilization of the raw material. The tool enables the user to identify the most suitable market-standard sheet metal size required by the blank shape.

Benefits
- Cost savings
- Simplified design
- Reduced design time

The user is able to optimize the shape of the blank material to reduce scraps.
Springback Analysis

The springback effect often causes a lengthy and costly iterative process of design, tool manufacture, and trial on the shop floor.

CimatronE 11 addresses this challenge with its powerful Springback Analysis, which allows the designer to undertake iterations on their computer, rather than having to manufacture and test the tool on the shop floor.

The Springback Analysis estimates the effect of the springback considering the shape, constraints and material properties. An object showing the result of the springback deformation can be created as an STL model. Deform values are provided and are shown on a color map; these values can then be transferred to the Springback Deform in order to modify (compensate) the shape of the tool.

Benefits

- Reduced need for trial and error on the shop floor
- Time savings

Green – the model received from the customer. Red – the object (STL object) created by the Springback Analysis tool showing how the part will be manufactured with the springback deviation.

Springback deformation values are shown in a color map.
Springback Deform Improvements

Improvements to the Springback Deform tool allow the user to import data from the new Springback Analysis tool into the Springback Deform.

In addition, the user can change the scale factor and sides for selected points accordingly.

Benefits

- Enhanced springback compensation

The user imported the data from the Springback Analysis tool using the new Import Analysis option.
DieQuote Improvements

The ability of the DieQuote tool to accurately reflect project costs has been significantly boosted in CimatronE 11. Additional project-related costing considerations have been included in the quote generation, and there is now full data integration between the quoting tool and work undertaken in CimatronE.

Users are able to use a new guide within CimatronE to directly feed design and programming data to the quoting tool. The data includes all the components from the die project, whether catalog or customized parts (including the trimming and forming punches), as well as all the manufacturing data, such as for the drilling and milling operations and Wire-EDM.

The provision of this data enables the preparation of comprehensive quotes that offer a realistic indication of the costs associated with any given project.

Benefits

- More accurate and comprehensive quotations
Adding Stations on any UCS Inside a Layout Part

The system now recognizes any UCS that is created inside the layout part as a layout UCS, regardless of the tool that was used to create it. Stations can be placed on any such UCS.

Benefits
- Reduced design time
NC Strategies
2.5-Axis Milling

Pocket VoluMill

Undertaking effective high volume milling can be a challenge for tool shops.

Traditional strategies for volume milling generate a non-optimal toolpath that causes fluctuation in the material removal rate. When the material removal rate increases, wear and tear on the tool increases. Tool shops therefore lower the feed rate in order to prevent against tool breakage, resulting in an inefficient machining process.

In seeking to address this challenge, Cimatron has integrated VoluMill, a licensed product from Celeritive Technologies, into the latest version of CimatronE. VoluMill is a leading-edge technology that generates a high material removal rate, while maintaining a constant width of cut, with smooth, stress free motions, and cutting in sweet zones throughout, regardless of part shape. This results in a

- shorter machining time and
- longer tool life.

VoluMill supports:
- open pockets
- 2D rest milling
- slotting or side-mill

Benefits
- Significantly reduced machining time
- Prolonged tool life

A Pocket VoluMill toolpath showing milling of an open pocket area. The tool enters from the air with constant width, all-rounded cutting motions.

Pocket VoluMill provides an optimized toolpath for milling the floor of this packaging component that includes two bosses and three open areas. Despite the complex geometry the motions are constant width, all-rounded.
Pocket and Profile: Automated Machining of Vertical Walls

When looking to machine vertical walls in previous versions of CimatronE, users would need to select the relevant contours and choose the z-tops and z-bottoms.

Version 11 offers automated functionality in this regard that reduces the programming time required and eliminates the possibility of human error: The user selects a single vertical wall or multiple walls manually or by criteria (e.g. color), and the system automatically identifies the contours and z-tops and z-bottoms.

Varying z-tops and z-bottoms can be applied according to the nature of each wall, and the user can also select “z-top delta” and “z-bottom delta” so that the machining will start above or below the z-top and finish above or below the z-bottom if required.

Benefits

- Increased automation
- Reduced programming time
- Less chance of human error

The orange vertical walls are picked by criteria and the contours for the profile operation are automatically retrieved for those walls, as well as all relevant z-tops and z-bottoms, resulting in the shown multi-profile toolpath.
Profile: Smart Machining of Contour with Open Segment

New CimatronE functionality prevents air milling motions for open segments in profile: The toolpath is created only on the part’s walls, avoiding the open segment.

Benefits
- Reduced programming time

In this image the contour was selected by clicking the floor and indicating the open segment. The result is automatic profiling of the walls only.
**Automated Drill**

**Gun Drilling**

**Full Control Over Gun Drilling Operation**

Gun drilling is a delicate operation requiring specific settings in order to protect the tool from breaking when encountering differing geometry conditions while drilling.

CimatronE version 11 now offers the user full control over the complete drilling sequence. The user can define the drill’s spindle speed, spindle direction, feed rates and distances for all gun drilling scenarios.

CimatronE 11 offers a new dialog that provides the user with an enhanced visual understanding of the gun drilling process. The dialog shows the different drilling scenarios and their respective parameters.

**Benefits**

- Gun drilling with confidence
- Longer tool life
- Enhanced user control and experience

*The new Gun Drill Dialog.*
Change Feed Only when Intersecting Hole Already Drilled

Slowing the drill when it arrives at an intersection of other cooling channels or pockets helps prevent unnecessary strain on the tool.

In previous versions of CimatronE, the drill would slow down at all intersections, regardless of whether or not the cross-channel or pocket (intersection) had already been machined.

In the new version, the system automatically knows if the intersecting holes have been drilled and slows down only when they have, leading to improved machining times and a longer tool life. The user can control the distance the drill should slow down for.

Benefits
- Longer tool life
- Faster machining times
- Better drilling technology
- Simplified programming

Case 1

The gun drill does not need to slow down if starting with channels 1 and 2.

The gun drill slows down for channels 3, 4 and 5 at the red intersections, as channels 1 and 2 are already drilled.

Case 2

Here the gun drill does not need to slow down for channels 1, 2 and 3.

The gun drill slows down for channels 4 and 5 at the red intersections, as channels 1, 2 and 3 are already drilled.
Gouge and Collision Prevention

Collision Check While Drilling

Previous versions of CimatronE offered gouge checking in both finish and rough operations. This has now been extended to drilling operations, with a holder collision check against the part, actual remaining stock and clamps. When a collision occurs no toolpath is created and the log file indicates where the collision occurred.

Benefits

- Drilling with confidence
- Simplified programming
- Lower chance of error

A standard drill toolpath.

Considering the stock (shown in purple), which the holder now collides with, CimatronE detects the collision and no toolpath will be created.
Collision Prevention During Connections

Connection motions between drilling points should be as low as possible to save machining time. To facilitate this, CimatronE now checks whether the part, actual remaining stock or clamps may interrupt the tool’s smooth movement across the part when connecting between holes. The connection height will be optimized automatically to the correct height.

Benefits

- Drilling with confidence
- Simplified programming
- Shorter machining times
- Lower chance of error

The connection motions are not interrupted by the clamps, so the connection z-height is as low as possible.

To prevent collisions with the clamps, the connection z-height is automatically elevated.
Increased Drilling Productivity

Cycle to Perform Helical Profile

In some cases, such as drilling large-sized counter sink holes, there is a need to include profiling.

In CimatronE 11, a new cycle has been added for helical profile within the drilling environment.

Benefits
- Improved hole making quality
- Increased programming functionality

The orange section of the hole will be machined using the helical profile operation as part of the drill sequence for this hole.
More Control Over Drilling Order

Minimizing air motions can result in significant time savings. This can be achieved by optimizing the drilling order.

CimatronE now includes additional control for optimizing the drilling order when drilling several holes. This functionality can be used for 3-Axis and 3+2 positioning drilling. In 3-Axis, the drilling order can be optimized by cutter and sequence, and in 3+2 also by orientation.

Benefits

- Increased user control
- Reduced total operation time

When programming this drill operation, the user can either:

1. drill all holes (orange and cyan) in an orientation and then drill all holes in another orientation, etc., or

2. drill all orange holes in all orientations, and then all cyan holes in all orientations.
Allow Automatic Re-Grouping After Stock or Geometry Changes

In CimatronE, the stock is included in the automated drill’s grouping of surfaces. In previous versions, when a change in the stock was made, the hole would drop out of the defined group and the user would need to re-group and reprogram the drill.

In CimatronE 11, a change in the stock will not affect the group or hole.

Benefits

- Reduced programming time
- Faster implementation of manufacturing changes
- More flexibility on the shop floor

Plate with orange holes to be drilled, without stock defined.

Plate with stock shown. In CimatronE 11, no re-grouping will be required and the relevant sequences will fit automatically.
Simplified Programming

Work on Selected Geometry, Including by Criteria

Improvements in version 11 allow the user to easily select the area of the mold containing the holes that they wish to drill. They can select the area either by:

1. its geometry, or
2. criteria, such as color or set. This can be of particular use when importing colored geometry into CimatronE that has not been fully defined.

Benefits

- More effective use of templates
- Enhanced user control

The colors of the holes in this plate are according to a customer’s standard. Each color represents a different hole type. For example, the yellow, purple and red holes are all have a diameter of 18 mm.

However, each color represents a different drilling process:

- Yellow holes: Standard holes.
- Red holes: Accurate location.
- Purple holes: Accurate location and accurate diameter.

In CimatronE 11 it is possible to automatically define different automated drill procedures for each group by using the color criteria selection.
Drill Holes From Both Sides

In previous versions of CimatronE, two sequences were needed to drill both sides of a hole and manual fine-tuning was required.

In version 11, only one sequence is needed.

Benefits

- Simplified programming
- Safe programming (due to automation)

Two drills are positioned on both sides of this through gun drill hole, executed in one sequence.
Highlight Holes When Selecting Groups

When clicking on the name of a particular group in the Group and Sequence Manager, the holes of that group are now highlighted in the model. Conversely, when clicking on a hole in the model, all the holes in the same group are highlighted, as is the group name in the Group and Sequence Manager.

Benefits

- Enhanced user experience
- Simplified programming

The user has clicked on a group leaf (highlighted) in the Group and Sequence Manager and, as a result, the holes in the model are highlighted.
Reduced Number of Required Sequences

Add Midpoint “MD”

In order to generalize the system’s definition of a hole, CimatronE now labels the middle point “MD”. This is particularly useful for gun drilling when holes are being drilled from both sides. As a result, the same sequence will fit more hole variations from the same hole family.

Benefits

- Simplified initial programming and reduced initial programming time

The cooling channels in this mold are drilled from both sides. Naturally, the drilling from each side is until the middle of the channel (with a small overlap).

As seen in the sequence definition, the drill depth of the gun drill was easily defined as the MD point.
Add Stock at the Bottom “SB”

In previous versions of CimatronE, the system was not able to consider stock at the bottom of a part for drilling purposes, and users had to manually assign a depth value when there was stock at the bottom.

In CimatronE 11, the new “SB” parameter allows the drill to automatically recognize stock at the bottom of the part.

Benefits

- Drill with confidence
- Reduced programming time
- Enhanced automation

This component (orange) is drilled before it is machined. Purple represents the stock.

The sequence on the right is drilled until SB. The hole on the left can be drilled as a through hole to SB or as a blind hole to BT.
Add Total Hole Height “BT”

In order to generalize the system’s definition of a hole, CimatronE now labels the bottom of a hole “BT”. As a result, the same sequence will fit more hole variations from the same hole family. In gun drilling for example, intersections will not require special sequences.

Benefits

- Simplified initial programming and reduced initial programming time

All of these three blind holes can be drilled with the same sequence. Each hole has three segments and the depth of each segment can be limited by a range. New in CimatronE 11 is the total depth of the hole (SH=ST-BT) that can now also be constrained.
CimatronE 11 offers a new parameter that allows the user to define the sequence constraint as the distance between the stock at the top ("ST") and the bottom ("SB").

This is especially useful for limiting the total hole height to the length of the drill.

Benefits
- Enhanced user control
- Greater automation

All of these three through holes can be drilled with the same sequence. Each hole has two segments – the drill hole and counterbore hole, and the depth of each segment can be limited by a range. New in CimatronE 11 is the total depth of the hole (SH=ST-SB) that can now also be constrained.
Stock ("ST" and "SB") is Always Considered

In version 11, the system recognizes the stock at both the top ("ST") and bottom ("SB") – even if the stock does not exist – including changes to the stock from previous milling operations. As a result, the same sequence can be used to drill plates either with or without stock.

Benefits

- Simplified initial programming
- Reduced initial programming time
- Shortened drilling time

These three holes can be drilled using the same sequence, even though the ST and/or the SB are different.
Rough Operations

Rough VoluMill

Undertaking effective high volume milling on 3D stock shapes can be a challenge for tool shops.

Traditional strategies for volume milling generate a non-optimal toolpath that causes fluctuation in the material removal rate. When the material removal rate increases, wear and tear on the tool increases. Tool shops therefore lower the feed rate in order to prevent against tool breakage, resulting in an inefficient machining process.

In addition, milling 3D shapes can be a challenge due to:
- the constantly changing stock
- the need to consider the holder
- the need for the resulting stock with small stairs to be as close to the final product as possible.

In seeking to address these challenges, Cimatron has integrated VoluMill, a licensed product from Celeritive Technologies, into the latest version of CimatronE. VoluMill is a leading-edge technology that generates a high material removal rate, while maintaining a constant width of cut, with smooth, stress free moves between cuts, and cutting in sweet zones throughout, regardless of part and stock shape.

It incorporates existing CimatronE features, holder collision prevention, 3D stock update, and advanced between layers capability.

Benefits
- Significantly reduced roughing time
- Prolonged tool life

A Rough VoluMill toolpath with two main layers and extra between layers motions to achieve optimal stock removal in the shortest time possible. This is achieved by utilizing the advantages of VoluMill and the CimatronE advanced between layers capability. Also shown in transparent grey is the stock remaining from this VoluMill operation and from the VoluMill operation from the opposite side.
**Calculate Minimal Clear Length**

By knowing the minimal clear length, the user can employ the shortest tool possible in order to cut with a more robust tool and under better machining conditions, resulting in a faster feed rate.

In previous versions, the Calculate Minimal Clear Length functionality was available in finish operations only. In CimatronE 11, it is now also available in rough.

This functionality takes into consideration the stock that was removed in the previous motions of the current operation.

**Benefits**
- Faster machining due to use of the shortest possible tool
- Machining with confidence
- Faster and easier programming

The machining of this part was done by the tool shown, which is clearly too long. However, it fits the initial stock.

The actual required minimal clear length is calculated according to the continuously updated stock removal.

The NC Process Manager showing the minimal clear length value (103.00 in this example).
Finish Operations

Toolpath Quality

Prevent Waterfall

The waterfall effect occurs when the tool rolls over an outer edge of the selected geometry and falls behind it. The effect reduces the sharpness of the edge and leads to longer machining times.

The new version of CimatronE offers a high degree of accuracy in automatically creating finished toolpaths that prevent the waterfall effect, whereby the tool moves all the way to the edge of the part, without rolling beyond it. The system automatically defines those edges and the user has the flexibility to modify them if required.

Benefits

- Improved surface quality
- Simplified programming
- Shortened machining time by eliminating unnecessary motions outside the machined area

A spiral toolpath over the green surfaces including the waterfall effect.

A spiral toolpath in CimatronE 11 where the green faces are milled to their exact edge with no waterfall by letting the system automatically define the surfaces’ edges.

Note: The same behavior is also applicable for finish parallel.
Air Extension in Finish Parallel

Toolpath extensions serve to improve the sharpness of the edges, ensuring that the part is fully milled and that any surplus stock is removed. In addition, the tool changes direction outside of the part for each pass, preventing any unnecessary marks on the part.

When there are gaps in the part, the air extension facilitates smooth transitioning of the tool across without needing to cap the gaps.

In CimatronE 11, the user can achieve a smooth, natural toolpath extension, both tangentially and as extra passes.

Benefits

- Shortened programming time with the elimination of extra CAD work
- Improved surface quality
- Efficient removal of surplus stock

Note: All extensions are automatically gouge-checked.
Overlap in Finish Parallel

Overlap is required to ensure quality machining at the point at which differing toolpaths meet.

In previous versions of CimatronE, the creation of overlapping toolpath motions was achieved with the manual definition of boundaries in order to ensure they overlap. In version 11, new functionality helps to speed up and simplify the process with the system automatically extending toolpath motions in the required areas.

Benefit
- Faster and simpler programming

The user is faced with the challenge of completely machining the yellow pocket, yet it cannot be machined with the one 3-Axis toolpath from z-direction.

The yellow area is milled with three overlapping toolpaths, each with its own orientation. Note that the toolpaths didn’t require manual contour definition of boundaries.
Uniform Approach and Retract

In previous versions of CimatronE, approach and retract tool motions outside the part were not always uniform. As a result, these motions were not visually appealing and could cause a lack of consistency in the surface quality.

In the new version of CimatronE, the approach and retract motions are fully uniform, helping users to machine with greater confidence.

Benefits

- Machining with confidence
- Consistent surface quality

Approach and retract motions in versions prior to CimatronE 11 were sometimes not uniform.

In CimatronE 11, all approach and retract motions are uniform.
Optimized Toolpath for Sharp Edges

A toolpath that continues over the sharp edge of a part could lead to the edge being accidentally chopped off when the tool rolls over it.

In order to prevent this, previous versions of CimatronE split the toolpath over such an edge into two. Version 11 offers an enhanced solution, manipulating the toolpath over the edge so that the tool moves upwards at this point and rolls in the air, not on the part.

Benefits
- Enhanced surface quality
- Reduced machining time
- A more predictable toolpath
- Easier programming

The toolpath rolls over a part’s sharp edge, which could result in the edge being accidentally chopped off.

The toolpath over the sharp edge is manipulated, ensuring that the edge remains sharp. Note that the toolpath is continuous and does not need to be split into two regions as was the case before CimatronE 11.
Round Internal Corners in Finish Parallel (HSM)

Sharp tool motions in high speed machining (HSM) can cause the machine to vibrate and lead to reduced surface quality.

In finish parallel, sharp tool motions appear when machining internal sharp corners.

In such cases, version 11 includes toolpath rounding for finish parallel.

**Benefits**
- Smoother machining
- Prolonged tool and machine life
- Enhanced surface quality

The finish parallel toolpath of the core component with rounded motions over the internal corners.

A zoomed-in view.
Optimized Check Surfaces Offset

CimatronE 11 offers users the ability to automatically set the check surface offset in order to achieve an optimal toolpath.

Benefits

- Faster programming
- Particularly useful for novice users

When the Optimize Check Surface Offset box is checked, the system automatically sets the offset value for the check surfaces (the parameter is not shown in the grid).

When this box is unchecked, the Check Surface Offset parameter is shown and its value is set to the last used value.
Auto Milling Angle in Finish Parallel

When looking to create a toolpath for parallel milling, NC programmers manually determine the best milling angle to assign. This process can be time consuming and prevent the effective utilization of templates.

In CimatronE version 11, milling angles can now be assigned automatically.

As a result, only one procedure will be required to machine all regions of the part, each with its own milling angle.

Templates can also be used effectively for milling different regions of a part or different parts, with the data adapted automatically.

Benefits

- Shortened programming time
- Increased programming automation
- Effective use of templates

The parallel milling angle has been assigned manually, resulting in a non-optimal toolpath. The manual setting was the only option before CimatronE 11.

In CimatronE 11, the parallel milling angle is automatically assigned, resulting in an optimal toolpath.
Centralized Path in Finish Parallel

Creating centralized parallel toolpath motions can often assist in optimizing milling time, particularly by reducing the number of motions required to machine small parts, such as thin electrodes, thin walls and deep valleys.

The new version of CimatronE now offers motions that are automatically centralized to the machined area.

As a result, only one procedure will be required to machine all regions of the part, each with optimized, centralized passes.

Templates can also be used effectively for milling different regions of a part or different parts, with the data adapted automatically.

Benefits
- Shortened programming time
- Increased programming automation
- Effective use of templates
- Higher quality toolpaths

Four thin ribs, the green tops of which need to be milled. The toolpath in previous versions was not optimized, with two of the ribs requiring two passes to complete the job.

Each of the ribs is automatically milled with one optimized motion at its center.
Machine Only Desired Number of Layers

Sometimes there is a need to machine only the top layers of a region of a part in order to ensure that the sharpness of the part’s edges is optimized. This is especially applicable when machining thin walls, ribs or electrodes.

In previous versions of CimatronE, creating toolpaths localized to a region’s top layers was achieved manually.

In the new version of CimatronE, all this can be achieved automatically by setting parameters, which enables the effective use of templates. This functionality can also be used to automatically machine the remaining layers.

Benefits

- Significant savings in programming time
- Greater automation and effective use of templates
- Better results for electrodes, thin walls, ribs
- Achieve highest possible surface quality

One finish procedure that mills the top layers (in this case six) of both electrodes, even though their heights are different.
Multi Horizontal Levels

In previous versions of CimatronE, two procedures were needed to create toolpaths for horizontal area pre-finishing and finishing operations.

In version 11, this can be done in the one procedure.

Benefits
- Reduced programming time
- Simplified programming

A pre-finish and finish toolpath over the green area created with the one procedure.

Same toolpath shown from the side.
More Control Over Milling by Layers of Vertical Walls

In CimatronE 11, users can better control the machining of vertical surfaces.

There are now two options for the milling of vertical “part” surfaces:

- Machine the surfaces only (avoiding air milling), with an option to skip breaches.
- Machine until the procedure’s minimal Z (including air milling).

Milling will not take place on vertical “check” surfaces.

In order to achieve the same result in previous versions of CimatronE, the user had to manually define the surface offset or create additional check surfaces.

Benefits

- Shorter machining time by avoiding air milling
- Enhanced user control
- Better results
- Programming with confidence
- Simplified programming
Reduced Jumps in Cleanup

Mill by Strips is a new parameter option in cleanup that mills each strip optimally to reduce air jumps.

Jumps are reduced by the system not taking into account the “climb” condition. In many cases this is not a limitation as it results in acceptable machining conditions that shorten the cycle time.

Benefits
- Improved cycle time

Non-optimized milling with air jumps when the Mill by Strips option is not selected.

Optimized milling with reduced air jumps when the Mill by Strips parameter is selected.
Programming Productivity

Indication of Unreachable Area Due to Holder

Sometimes after calculating a toolpath, the user remains unaware that the toolpath was not created on some areas of the part owing to holder collisions.

The new version of CimatronE assists the user in identifying the unreachable areas of the toolpath early on in the programming process. The NC Process Manager provides automatic notification to this effect and the user is also able to see the unreachable area in a separate color. Having been made aware of the unreachable area, the user is then able to change the tool/holder or the procedure’s orientation, or to create a new toolpath. This functionality is available in finish, cleanup and pencil.

Benefits

- Programming with confidence
- Shorter programming time

The toolpath with some areas remaining unmilled owing to holder collision avoidance.

The holder prevent area.
Calculate Minimal Clear Length Enhancements

By knowing the minimal clear length, the user can employ the shortest tool possible in order to cut with a more robust tool and under better machining conditions, resulting in a faster feed rate.

In previous versions of CimatronE, calculating the minimal clear length was only available if the holder was ignored.

CimatronE 11 now allows the user to calculate the minimal clear length also when using a holder to limit the toolpath.

In addition, the user interface has been simplified to support all variations.

Benefits

- Greater flexibility with tool clear length optimization
- Machining with confidence
- Faster and easier programming

The portion of the grid showing the parameters that the user is able to check/uncheck.

The finish toolpath limited by the holder. To machine the complete part, it is necessary to increase the tool’s clear length to 120.00 (as shown in the NC Process Manager).
New Procedure to Create Contour Out of Any Cutter Combination in Cleanup

In previous versions of CimatronE, any geometry for cutter combinations could be used for cleanup (for example where the previous cutter was bull 30R1 and the current tool is a ball 20). However, such combinations may have caused air milling or areas that were left unmilled.

CimatronE 11 addresses this issue with a new procedure called Cleanup Contours Only, where its output is not a toolpath, but rather a contour of the tool-tip of the machining boundary for the current cutter.

This contour can be used as input for any NC operation with the current tool, such as any rough or finish operation. The user is thereby not limited to any cutter geometry combination or milling strategy.

Benefits

- Improved milling capabilities
- Efficient milling
- Enhanced user flexibility

The blue contours represent the 3D contour of the tool-tip for the current tool.

A toolpath using the contours-on from the previous picture, resulting in a finish by limit angle procedure.
### 5-Axis Milling

#### 5-Axis Production

CimatronE 11 offers enhanced gouge and collision check for 5-axis production.

There is a new option for automatic tilting that automatically optimizes the lead and tilt angles to create a smooth, collision-free toolpath.

A further option for tilting enables the removal of collisions that remain after the gouge check, resulting in safer programming.

In addition, the programming requirements for the user are now simpler, with an option to drop the tool to the check surfaces after transform/rotate.
5-Axis Swarfing Application

CimatronE 11 provides a range of new capabilities for swarf machining:

- A new option to minimize the change in the rotation axis ensures that the head of the tool moves less, enabling more flexible machining.

- New milling patterns allow the user greater control over the swarfing of corners and provide improved results. Milling patterns for inner corners include sharp, rounded and relief. Patterns for outer corners include sharp, round and loop.

- A new tilting option to adjust the fanning distance when the tool gets near to corners provides a smoother toolpath.

- A damping option lessens the impact of edges of swarfed surfaces, resulting in smoother machining.

The user interface has also been simplified for an enhanced user experience.
5-Axis Multi-Blade Application for Impellers and Blisks

Multi-blade machining has been enhanced in CimatronE 11, both with new functionality and the faster calculation of multi-blade toolpaths.

Machining performance has been boosted with better control over the lead angle, including setting the preferred, minimum and maximum values.

Linking motions are now more unified, with equal distance being maintained from the edge of the blade. The tilt along linking motions is also blended, resulting in smoother machine motions.

In addition, the user can specify a maximum angle step for the multi-blade toolpath and generate a smoother toolpath tilting motion.

The enhanced parameter setting for the lead angle (including the preferred, minimum and maximum lead angles), ensuring better control over the lead angle throughout the toolpath.

The toolpath over the impeller floor. Note the improved smooth linking motions beyond the edge which ensure minimal table rotations.
Machine Simulation

CimatronE 11 Machine Simulation includes enhancements to the user interface, such as a progress bar for the user to monitor the loading of the simulation, as well as the ability to group operations.

The Machine Simulation now includes three modes:

1. NC-based simulation – offers the fastest possible simulation.

2. Length-based simulation – a constant speed simulation along the entire toolpath.

3. Time-based simulation – takes into account the real feeds programmed for a realistic reflection of actual machining operations.
NC Programming
New Embedded Material Removal Simulator

CimatronE 11 includes a new, embedded material removal simulator that provides users with outstanding value:

1. Simulation of the material removal is highly accurate and reliable, as is the gouge and collision detection and the color-coded deviation distance map.

2. Visual representation is of the highest quality, whether it is of the entire stock or a zoomed-in view.

3. As an embedded tool there is a unified user interface and seamless data flow from CimatronE to the simulator. It can be viewed either as a window in the same session or as a standalone window. Data from the simulator is fed back into CimatronE; the toolpath motions are tagged where there is a gouge or collision and the user is then able to analyze these motions in the CimatronE Navigator.

4. The user has the option of selecting one of two simulation modes depending on their needs. The Standard mode is the default option, offering full capability – including 5-Axis continuous – and the most accurate simulation, taking the required amount of time to achieve the high quality results. The Turbo mode is for 3-Axis and is the fastest, with less accurate results; it provides the user with a general indication of whether there are likely to be any major problems in the material removal process.

Benefits

- Confident machining – highly accurate and reliable results
- High quality visual representation
- Integration ensures seamless data flow and the ability to analyze results
Parallel Execution of Procedures

CimatronE 11 automatically calculates NC procedures in parallel. The system can calculate two procedures in parallel in cases where they are not stock-related, with optimized CPU utilization resulting in faster process calculations.

Benefits

- Improved performance
- Better hardware utilization

The NC Execution Monitor shows several procedures, two of which are being executed in parallel.
When machining deep cavities, large cores or prismatic parts, it is common to use 3+2 axis positioning in order to be able to employ shorter and more robust tools and to achieve faster and better machining. However, it is often a process of trial and error to determine the optimal orientation.

In previous versions of CimatronE, this task involved cumbersome manual operations. In addition, modifying the UCS entailed switching between CAD and CAM.

CimatronE 11 provides dedicated functionality in this regard. It offers significant time savings by allowing the user to repeatedly experiment and preview the orientation of the tool and its holder prior to creating the UCS.

This functionality is available also within an open procedure.

Benefits
- Significantly reduced programming time
- Greater user control

The New UCS Creation dialog. Note the two options available – Normal to Face and Fixed Tilt Angle, and the two sliders to dynamically change the tool orientation. This dialog is available both outside and within an open NC procedure.

Finding a UCS normal to face in a prismatic part.

In this deep cavity, finding the best orientation that will prevent the holder from gouging can be very difficult. The new UCS Creation dialog allows the user to experiment dynamically in order to identify the best orientation and then create the new UCS accordingly.
Improved Mechanism to Determine if a Geometry Change Requires Toolpath Recalculation

In many instances, changing the part’s geometry will require the recalculation of the toolpath. Accordingly, whenever there is a change to the geometry, CimatronE automatically marks relevant procedures with a geometry modification notice (“G-flag”) in the NC Process Manager, indicating that toolpath recalculation may be needed.

In the new version of CimatronE, the mechanism has been fine-tuned, and a “G-flag” appears only when recalculation is definitely required.

This functionality can also reduce machine down time: When receiving a change and production is already underway, the machines will not have to remain idle for long while the programmer checks whether or not toolpath recalculation is necessary.

Benefits

- More efficient programming
- Program with confidence
- Reduced machine down time in case of changes

A toolpath based on the given geometry.

The bottom face was split into two faces (orange and cyan). However, this split operation does not really change the geometry of the part to be milled. Therefore, the procedure creating this toolpath will not result in a G-flag.
Modify Cutter Without Recalculating

It is quite common for a tool shop to change the cutting tool after the NC programming has been done. (The shop might, for example, find that the tool originally selected is unavailable.)

However, applying the new tool to existing toolpaths could lead to the part being gouged. Therefore, previous versions of CimatronE automatically required the recalculation of toolpaths when a tool was changed.

In the new version, the user is given the flexibility to choose whether or not to keep the existing toolpath motions when the tool has been changed, thereby preventing any needless recalculation. Depending on the nature of the tool and holder, the system issues a warning notice to assist the user in their decision.

Associated with this new functionality is the existing Motion Editor functionality, which can validate and modify the existing toolpath with the new tool.

Benefits

- Fast response to shop floor needs
- Significantly reduced programming time
- Enhanced user control

A finish toolpath using a short tool with the settings Ignore Holder and Calculate Minimal Clear Length. Note that the toolpath is complete and ignores the holder. The calculated clear length for this example is 176 mm.

The user has replaced the tool with one that has a longer clear length (to correlate with the 176 mm above), yet the toolpath remains without the need to recalculate.

Note this capability is relevant for any NC procedure.
NC on Assembly – Control the Selection and Visibility of Assembly Components in NC

In previous versions of CimatronE, the assembly structure was lost when imported into NC.

In version 11 users can easily select the parts and sub-assemblies to be imported by using the Components Chooser dialog, and the entire assembly structure is kept as read-only sets.

Using these sets the user can control the visibility of components and program accordingly.

This functionality is particularly useful when working with fixtures, molds and die sets with multiple components.

Benefits

- Greater user control
- Significantly reduced programming time

An assembly with two orange components mounted on grey tables. When exporting to NC, the assembly structure can be kept for selection and visibility purposes for easy management of NC operations.
In previous versions of CimatronE, several parameter twigs were grouped into basic and advanced options. The basic option shows fewer parameters and non-visible parameters receive default values.

In CimatronE 11, this option is now also available for the tool trajectory twig for finish procedures. This makes it easier to use basic settings, review key parameters, and reset others to default values. At any stage users can switch to the advanced setting in which they can view and modify the hidden parameters.

An additional change to the tool trajectory twig in the new version is the use of different colors for the Vertical and Horizontal parameters.

**Benefits**
- Reduced programming time
- Simplified programming
- Reduced programming errors
- Shorter learning curve and easier experience for new users

The basic mode is shown. As usual in CimatronE, parameters that are not shown have default values.

The advanced mode, where all parameters are shown. In order to reset parameters to their default values, the user switches to basic mode and then back to advanced.

Note: The Vertical Areas’ parameters are shown in dark grey.
Separate Stock and Holder Twigs

For ease of reference, the NC parameters now contain separate twigs for both stock and holder.

Benefits
- Enhanced user experience
Add “Multi Surface Groups” Check Box

The existing Multi Surface Groups functionality in CimatronE allows users to group together differing surfaces that contain similar offsets.

CimatronE 11 includes a new check box that gives the user the flexibility to choose whether or not to enable this functionality.

This is particularly useful for users undertaking relatively straightforward procedures who do not wish to use the Multi Surface Groups’ functionality, preferring a simpler interface.

**Benefits**
- Simplified user interface
- Shorter training for new users

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boundaries (Optional)</td>
<td>0</td>
</tr>
<tr>
<td>Internal Sharp Edges</td>
<td>0</td>
</tr>
<tr>
<td>Multi Surface Groups</td>
<td></td>
</tr>
<tr>
<td>Part Surfaces</td>
<td>2</td>
</tr>
<tr>
<td>Check Surfaces</td>
<td>1</td>
</tr>
<tr>
<td>Overlap Surfaces</td>
<td>0</td>
</tr>
</tbody>
</table>

Simple mode with the Multi Surface Groups box unchecked.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boundaries (Optional)</td>
<td>0</td>
</tr>
<tr>
<td>Internal Sharp Edges</td>
<td>0</td>
</tr>
<tr>
<td>Multi Surface Groups</td>
<td>v</td>
</tr>
<tr>
<td>No. of Part Surface Groups</td>
<td>2</td>
</tr>
<tr>
<td>Part Surfaces (#1)</td>
<td>2</td>
</tr>
<tr>
<td>Part Surfaces (#2)</td>
<td>5</td>
</tr>
<tr>
<td>No. of Check Surface Group</td>
<td>3</td>
</tr>
<tr>
<td>Check Surfaces (#1)</td>
<td>1</td>
</tr>
<tr>
<td>Check Surfaces (#2)</td>
<td>10</td>
</tr>
<tr>
<td>Check Surfaces (#3)</td>
<td>12</td>
</tr>
<tr>
<td>Overlap Surfaces</td>
<td>0</td>
</tr>
</tbody>
</table>

Expanded mode with the Multi Surface Groups box checked.
In previous versions of CimatronE, the bounding box for stock calculation could only be selected by surfaces. In version 11, the box can now also be selected by wireframe and points.

For example, the Quick Electrode application defines the blank size as wireframe and this wireframe can now automatically provide input for stock definition.

Benefits
- Enhanced user experience

A core with the stock as wireframe (shown as red dashes) that can be easily selected as input for a stock procedure.
Improved Criteria Definition for Geometry Selection

Criteria are a useful tool for automatic definition of geometry for use in NC procedures.

In addition to existing functionality, CimatronE 11 now allows users to create exclude rules as part of the criteria. For example, selecting all surfaces, but not the yellow ones. Another example, selecting all surfaces, excluding the “Clamp” set.

Benefits

- Increased automation
- Enhanced user experience

In order to create a finish toolpath for this core, the user needs to select all faces.

In order to create a rough toolpath for this core, the user needs to unselect the set named “Capping”.

This dialog shows how the user can select all faces but exclude the set named “Capping”. 
Cap Internal Islands

This new functionality enables the capping of holes, slots and pockets in the click of a button, reducing users’ design time.

Users can now select the surrounding faces, whether they are surfaces, solids or a combination.

Benefits
- Reduced machining preparation time

The part.

Capping electrode slot.

Capping pocket for an insert with two electrode slots.

NC on assembly – capping holes between two objects.
CimatronE 11 offers the option of automatically splitting the output program by tool, TP folder, procedure and orientation. This enables the user to address the differing work methods on the shop floor.

**Benefits**
- Increased output flexibility
- Enhanced user experience

The Post Process dialog with the Split Output Files box checked and the Split By dropdown menu showing the four options. Note: When applying this dialog when the Split Output Files box is checked, the post processing starts immediately without the GPP2 dialog opening; therefore, the G-Code Parameters are also shown here. When the box is unchecked, the G-Code parameters are only shown in the GPP2 dialog.
Superbox as Software

The SuperBox enables the automatic offloading of NC calculation tasks from all CimatronE seats in a network, thereby freeing up resources of individual work stations.

With the release of CimatronE 11, the SuperBox technology is now also available as software. Calculation tasks are offloaded to another workstation (that CimatronE is not installed on).

Benefits

- More productive NC programming
- Faster calculations

The CimatronE 11 SuperBox Manager dialog. Three procedures have been sent by the client (PC-ALOO-W7) to be executed on another PC (PC-FX58-W7), operating as a SuperBox.
Open Another NC File from Browser or by Double-Click

With CimatronE 11, users are now able to open another NC file simply by double clicking on the file name. This will automatically open another session of CimatronE with that file.

**Benefits**

- Enhanced user experience
Auxiliary Contours – Create as Composite

In previous versions of CimatronE, auxiliary contours could only be created as poly lines, which were cumbersome to edit and complicated to use for NC procedures.

New functionality in CimatronE 11 enables the creation of auxiliary contours as composite curves or smooth composite curves, and these contours can then be used as input for other NC procedures.

Benefits

- Reduced programming time
- Enhanced user experience
- Programming with confidence
CimatronE 11 offers connectivity to the Iscar Tool Advisor (ITA) online portal which recommends optimal tools and cutting conditions based on information provided by the programmer. These recommendations can then be loaded into CimatronE, ensuring the creation of optimal NC procedures.

Benefits

- Best utilization of Iscar cutters in NC procedures
- Enhanced user experience

By selecting the ITA option in the CimatronE cutter table, the ITA application is launched. After setting all the parameters, the ITA will recommend cutters as shown. These cutters can be imported to the CimatronE cutter table.
Improvements in Feed and Spin Calculator Dialog

The Feed and Spin Calculator dialog shows the relationship between different parameters involved in the milling process.

Enhancements to the dialog in CimatronE 11 include the ability to view and control the Chip Thickness value and the Side Step, thereby enabling the optimization of VoluMill toolpaths.

A new check box enables this new mode.

Benefits

- Enhanced user control
- Higher material removal rate and optimized VoluMill toolpaths

The enhanced Feed and Spin Calculator dialog. Note the Side Step and Chip Thickness box is checked, enabling the Chip Thickness and Side Step values to be shown. By clicking the lock shown next to the Side Step box, the Side Step value can be changed; other values will be changed accordingly.
Integration with Vericut

CimatronE 11 offers integration with Vericut, which is a software for the simulation of material removal, gouge and collision verification, and machine simulation.

Vericut can now be launched directly from within CimatronE, and the setup data from CimatronE can be automatically exported to Vericut.

Benefits
- Quicker and easier programming
- Enhanced user experience

Launching Vericut from within the GPP2 dialog in CimatronE. The Vericut icon is greyed-out until the post execution is complete.

Vericut appears automatically with all the relevant files – G-Code, tools and holders, part, stock, and relevant Vericut project.
Electrodes
Design

Create Electrode Using Solid Operations

Depending on the geometry, it can be faster to design electrodes in solid, rather than in surfaces. New functionality in CimatronE 11 simplifies the creation of electrodes using solid. The user can define the electrode without needing to select the burning surfaces on the part.

Benefits

- Reduced design time
- Simplified user experience

The user creates an electrode for the corner of the pocket. The extract electrode tool now allows the user to create an “empty” electrode (no burning faces are defined) and the user is able to create the electrode geometry using basic solid operations.
Electrode UCS Improvements

Existing functionality in CimatronE allows the user to easily flip the Z axis of the electrode (burning) UCS around the X or Y axes. In CimatronE 11, the user can now also easily flip the X axis.

Benefits
- Enhanced user experience
- Simplified design

The user is creating an electrode UCS and is able to flip its X axis.
New NC UCS

While CimatronE features an Electrode UCS for the burning operation, Cimatron identified a need for a separate UCS for use during the milling of the electrode. This new NC UCS allows the user to position the electrode in a specific way during the milling process.

Examples of where the NC UCS might come in handy include:

- The user wants to locate the NC UCS at the electrode’s top point, which is never used for the Electrode UCS.
- The user wants to mill the electrode when the longest dimension is on the X axis of the machine, regardless of the burning orientation.

Benefits

- Enhanced user flexibility
- Prevention of errors
- Easier programming
General Visibility Control on Tree

CimatronE 11 provides centralized control for hiding/showing the blanks and holders of all electrodes.

Benefits
- Enhanced user experience
- Increased design productivity

The core with all the electrodes participating in the EDM process. Because there is too much information on the screen, it is impossible to work in this mode and in previous versions of CimatronE users had to manually hide the holder and blank for each electrode.

The dialog showing that the blanks and bases are hidden and that the extensions are shown.

The result.
Holder Set

In CimatronE 11, all holder geometries are automatically grouped in a set. The user is thereby able to hide or show the geometries and to easily use them in NC (usually as check surfaces).

Benefits

- Reduced programming time
- Enhanced user experience
- Increased automation

A Holder set, including all the holder faces, is created when the user adds a holder to the electrode.

The user has exported the electrode to the NC environment to create the toolpaths in order to machine it. While defining the check surfaces for the procedure, the user selects the Holder set so all the surfaces belonging to the holder will be defined as check surfaces.
Offset Base from Blank

In most cases, the blank is the same size as the base of the electrode. However, there may be occasions when the user wants the blank to be larger than the base, often for reasons of accuracy. To facilitate this, CimatronE 11 has a new parameter, Base Offset, that allows the user to specify the offset between the base and the blank.

Benefits
- Enhanced user flexibility
- Simplified programming
- Increased automation

During the creation of the base, the user can create an offset between the base and the blank enabling the sides of the base to be machined.
Keep Last Blank Size

In CimatronE 11, the dimensions of the electrode’s blank are kept between uses.

Benefits

- Enhanced user experience

The last blank size dimensions are kept by the system and are used in the creation of the next electrode.
Rounding of Base

In CimatronE 11, the edges of an electrode’s base can now be rounded automatically using the new parameter in the Blank function.

Benefits
- Enhanced user experience
- Increased automation

While creating the base, its corners can be rounded (to avoid injury) while maintaining the chamfer marking.

Top view of the base.
Mark Component Burn Faces

A new option when extracting an electrode allows the user to color the burn faces on the machined part.

There is also an option to create sets of those faces.

Benefits
- Quicker preparation of the part for machining

The user activates the option in the Preferences Editor to create a set for the burn/extracted faces and to color these faces green.

Burn faces of four electrodes are colored green and are placed under the new Extracted Burn Faces set.
Electrode Wizard Enhancement

An enhancement to the Electrode Wizard offers new options for selecting components:

1. **Add Component** – the part is simply added to the assembly.

2. **Duplicate Component** – the system creates a duplicate of the original component for the user to work on.

3. **Import Component** – the system creates a new part and imports the geometry into it.

**Benefits**
- Enhanced electrode design

The enhanced Wizard offers greater flexibility when starting an electrode project.
Geometry Analysis Automatic Coloring

Automatic Coloring is a new analysis tool that applies colors to various geometries of the electrode according to shape and functionality, and defines single-color sets accordingly. For example, sets will be created for the burning area, extension and base.

For the electrode designer, the single-color sets validate the electrode design. For the electrode manufacturer, they enable the automatic and clear selection of the appropriate geometry to be used in NC templates.

Benefits
- Electrode design validation
- Enhanced automation
- Effective use of templates

The electrode shown was automatically colored by the Automatic Coloring tool.

The Sets table shows the color legend.
**Automation in Finish**

**Auto Milling Angle in Finish Parallel**

When looking to create a toolpath for parallel milling, NC programmers manually determine the best milling angle to assign. Depending on the part, programmers may need to create several toolpath procedures, each with the desired milling angle. This process can be time consuming and prevent the effective utilization of templates.

In CimatronE 11, milling angles can now be assigned automatically. In addition, only one procedure will be required to machine all regions of the part, each with its own milling angle. Templates can also be used effectively for milling different regions of a part or different parts, with the data adapted automatically.

This new feature results in the quick creation of optimized toolpaths and significant time savings for the programmer.

**Benefits**

- Increased programming automation
- Effective use of templates

The parallel milling angle has been assigned manually, resulting in a non-optimal toolpath. The manual setting was the only option before CimatronE 11.

In CimatronE 11, the parallel milling angle is automatically assigned, resulting in an optimal toolpath.
Centralized Path in Finish Parallel

Creating centralized parallel toolpath motions can often assist in optimizing milling time, particularly by reducing the number of motions required to machine small parts, such as thin electrodes, thin walls and deep valleys.

In past versions of CimatronE, motions did not take into account the geometry of the part and manual manipulation was needed in order to achieve centralized motions. The new version of CimatronE now offers motions that are automatically centralized to the machined area.

Benefits
- Simplified programming
- Higher quality toolpaths

Four thin ribs, the green tops of which need to be milled. The toolpath in previous versions was not optimized, with two of the ribs requiring two passes to complete the job.

Each of the ribs is automatically milled with one optimized motion at its center.
Machine Only Desired Number of Layers

Sometimes there is a need to machine only the top layers of a region of a part in order to ensure that the sharpness of the part’s edges is optimized. This is especially applicable when machining copper electrodes, thin walls or ribs.

In previous versions of CimatronE, creating toolpaths localized to a region’s top layers involved splitting regions by contours, manually measuring the top area and defining it as a z-bottom. This would have to be done manually for each top layer region that was to be milled.

In the new version of CimatronE, all this can be achieved automatically by setting parameters, which enables the effective use of templates. This functionality can also be used to automatically machine the complement layers.

Benefits

- Significant savings in programming time
- Greater automation and effective use of templates
- Better results for electrodes, thin walls, ribs
- Achieve highest possible surface quality

One finish procedure that mills the top layers (in this case six) of both electrodes, even though their heights are different.
Multi Horizontal Levels

In previous versions of CimatronE, two procedures were needed to create toolpaths for horizontal area pre-finishing and finishing operations.

In version 11, this can be done in the one procedure by automatically shifting the toolpath of the horizontal area upwards.

Benefits

- Reduced programming time
- Simplified programming

![A pre-finish and finish toolpath over the green area created with the one procedure.]

![Same toolpath shown from the side.]
In previous versions of CimatronE, the bounding box for stock calculation could only be selected by surfaces. In version 11, the box can now also be selected by wireframe and points.

For example, the Quick Electrode application defines the blank size as wireframe and this wireframe can now automatically provide input for stock definition.

**Benefits**
- Enhanced user experience

An electrode with the blank as wireframe. The Automatic Coloring tool colored the blank as red as seen in the Sets dialog.

In NC, the stock was defined as Bounding Box and the input was the blank wireframe (selected as criteria).
General
User Interface

Interactive Display-UCS

CimatronE 11 includes a new Interactive Display-UCS that aids the user in controlling the view of the model (zoom, pan and rotate).

It brings together all the ZPR functionality into the one tool, including basic views, automatic window, and rotation and zoom, without needing to use the keyboard.

It also offers quick access to new and existing display tools. Existing tools include Dynamic Section, Rotate To Plane, Center Of Rotation, ZPR Lock, Rotate By Angle, and Last View and Next View. New display tools include the ability to flip the view 180 degrees and to display either the default isometric view or the isometric view flipped 180 degrees.

Benefits
- Enhanced user experience

The UCS offers quick access to all of the ZPR functionalities, as well as allowing the user to easily control the display/model movements using the UCS axes and bulb.
Dynamic Spinbox

The Spinbox increment abilities have been improved with the user now able to use one of four increments. The user can control the increment values, with different values for distance and angular parameters.

Benefits
- Enhanced user experience

Using the Spinbox, the user is changing the increment to quickly reach the desired Delta size.
Copy Style

Copy Style is a new function that provides the user with the ability to copy an entity’s color, line width, line style and opacity to another entity.

Benefits
- Simplified experience
- Enhanced user experience

Coloring the green faces of the pocket using the Copy Style tool: The user selects an orange face so the system can identify its properties, and then applies these properties to change the color of the green faces to orange.
Search Tool in Customize Keyboard

A new powerful search functionality in the Customize Keyboard enables the user to:

1. Find any command – even if they don’t know its exact name – in order to create a shortcut for it.
2. Search by the shortcut key combinations listed in order to find an existing command and its category.

Benefits

- Reduced time
- Enhanced user experience

The user searches for the shortcut for changing the display to isometric view.
Display

ZPR Improvements

Enhancements to the ZPR tool offer the user the following capabilities:

1. To zoom in to and out from the model by holding down the Ctrl key while scrolling with the mouse wheel.

2. To define the center of rotation, allowing the user to rotate the model around a specific point of their choice.

3. To use the arrows on the keyboard to rotate the model, with each click representing 90 degrees (or 15 degrees while holding down the Shift key).

4. To use the Ctrl key together with the arrows on the keyboard to pan the model.

5. Rotate To Plane – more efficient rotation of the model in relation to the correct position.

6. The new ZPR Lock button enables users to undertake all ZPR operations without needing to use the keyboard.

Benefits

- Enhanced user control
- Smoother and quicker user experience
Improved Performance and Quality

CimatronE 11 offers performance improvements in many operations, such as loading, saving, importing geometry, ZPR, and others.

Benefits

- Enhanced system responsiveness
- Enhanced user experience
- Reduced file size
Data Management

Browser Improvements

The CimatronE Explorer browser has been improved. It now features clearer icons and full support of the standard Windows folders, such as the Favorites folder.

Benefits

- Enhanced user experience

*Pictures of parts are displayed in the browser for quick identification.*
Delete Unused Files in a Folder

A new Delete Unused Files option in the browser automatically looks for files that are “unused” by a selected assembly – i.e. files that are not connected to the assembly in the folder that the assembly resides in. The user can then delete or highlight these files.

Benefits
- Enhanced user experience

The user has deleted the cap screws from the project, but they still exist in the folder. The new tool automatically identifies all files in the folder that are not used by the selected assembly (including BAC files), which the user can then delete.

The result.
CimatronE 11 – General

Improved Load/Save Performance

CimatronE 11 takes advantage of multi-core architecture to offer a reduction of up to 70% in save times and up to 60% in load times for large assemblies.

Benefits

- Time savings
CimatronE 11 allows the user to open several NC documents from their current session.

**Benefits**

- Enhanced user experience
Show File Properties of Components in the Assembly

In CimatronE 11 the system can show the file properties of any assembly component by using the Properties command from the context menu.

Benefits
- Enhanced user experience

The new Properties option opens a window showing the part’s properties.
CTF

Unpack to Here

A new Unpack To Here option in CimatronE 11 unpacks and places files in the same folder where the CTF is located.

Benefits

- Better user experience

The user has received a CTF file and unpacks the compressed file into the same folder in which the CTF file resides.
Compressed CTF for Drafting Files

The size of CTFs in CimatronE 11 has been significantly reduced for CTFs containing several drafting files of the same model.

Benefits
- Reduced file size
Data Interface

Drag DI Files into CimatronE

The user is now able to import a file by dragging it into the CimatronE window. The file is automatically imported with the default setting.

Benefits
- Enhanced user experience

Dragging a STEP file directly into CimatronE.
Import UCS Data from IGES

A new option when importing an IGES file into CimatronE allows the user to also import its UCS data.

Benefits
- Better results
**Improve Import Performance**

There is a significant improvement in the performance levels of CimatronE 11, with a reduction in the loading time of up to 40% when importing a file from native formats (SolidWorks, Creo Elements/Pro, CATIA, Siemens NX) into the program.

**Benefits**
- Reduced design time
Sets

Exclude Option in Set by Criteria

CimatronE 11 features a new Include/Exclude option for criteria sets. It enables the user to use criteria that exclude specific entities.

For example, criteria that selects all the surfaces, but not the yellow ones.

Benefits

- Enhanced user capabilities

Creating a set that includes all orange faces, except for the ones belonging to the (electrode’s) holder set.
Single Color Criteria Sets

CimatronE 11 offers enhanced visualization of single color criteria sets, with the color now shown in the sets tab in addition to the name of the set.

The user can change both the color of the set and the color of the entities in that set, simply by clicking on the color in the sets tab and choosing any color.

In addition, the system offers a mode in which the user can see the set name to which an entity belongs simply by hovering the mouse button over the entity.

Benefits
- Enhanced visualization
- Enhanced user experience

The user has created sets for green and orange entities and wants to change the colors of the blue faces to green.

By selecting the blue faces and using the Apply Color option through the green set, the faces are changed to green.

The result.
Import Sets

New capability in CimatronE 11 enhances the creation of customized sets by enabling sets from different files to be imported into the current file.

Benefits
- Enhanced user experience
In CimatronE 11, the user is now able to create 3D PDF documents that include parts and assemblies from CimatronE.

This allows customers and affiliates to easily:

- view these parts and assemblies without needing to have CimatronE installed
- use Acrobat Viewer extended tools, such as measurements, sections, dimensions and comments, for collaboration purposes
- create advanced PDF reports with additional relevant data
- export 3D data to PRC files.

Benefits

- Increased communication and collaboration with customers and affiliates
**Cimatron Site Manager**

The new Cimatron Site Manager enables IT administrators to manage and monitor their organization’s installed CimatronE stations, including the ability to update stations remotely with ongoing product updates.

In addition, the Site Manager serves as an Internet enabler (proxy) server, allowing stations that are not connected to the Internet to receive ongoing product update notifications.

**Benefits**

- Ensures the ongoing use of up-to-date technology
- Greater centralized control
- Enabler for stations with no Internet connection
Installation

Ability to Uninstall Service Packs and Patches

CimatronE 11 provides the user with the option of uninstalling service packs and patches according to their preference.

Benefits
- Enhanced user control