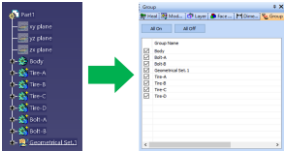
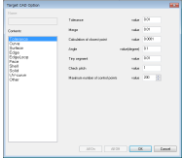
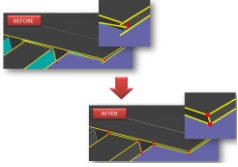
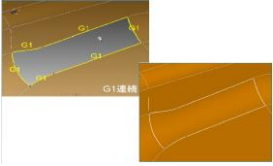
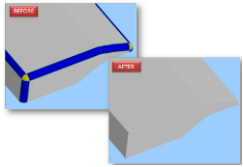
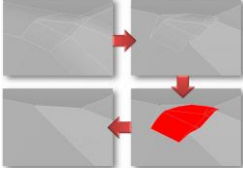
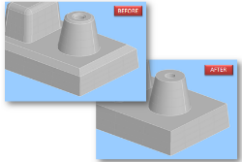
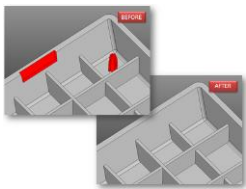
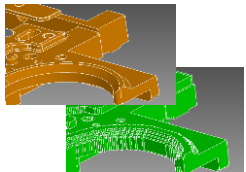
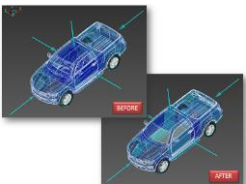
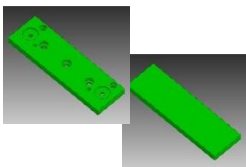
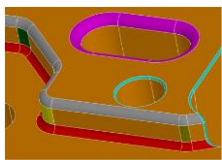
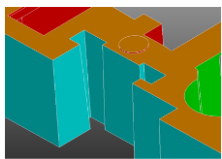
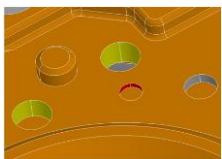
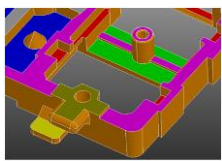
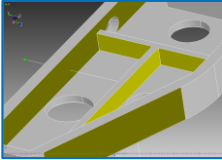
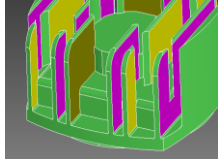
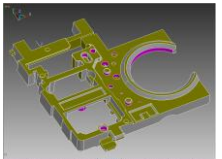
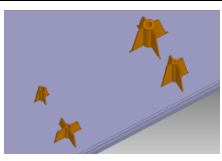
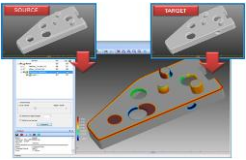
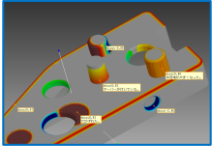
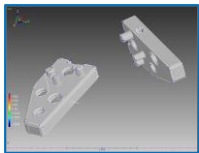
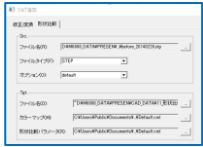


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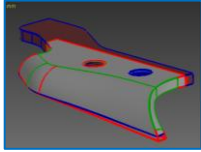
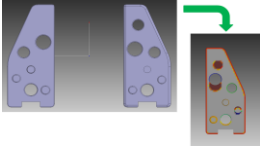
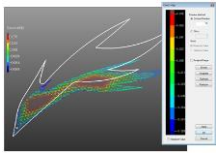
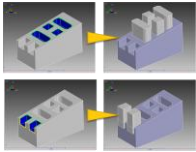
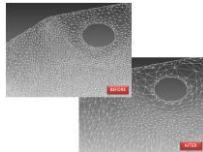
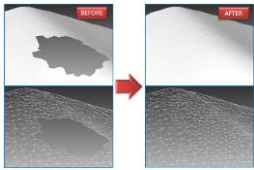
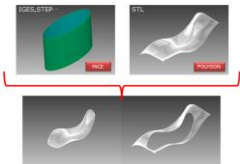
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| 1 | Import/Export | |
| | 1-1: 3D Model Import/Export Formats | For details, see "Import/Export" specifications. |
| | 1-2: Group Import/Export | |
| |  | It is possible to import the group information defined by CAD and output while retaining the group information. You can also check the list of groups on the group pane. |
| 2 |  | <p>Perform verification according to the PDQ (Product Data Quality: Model Data Quality) guidelines enacted by JAMA (Japan Automobile Manufacturers Association) and JAPIA (Japan Auto Parts Industries Association).</p> <p>There are also spGate original error checking items. Various error checking patterns can be constructed and used according to different purposes.</p> |
| 3 | Healing Functions | |
| | 3-1: Automatic Healing | |
| |  | Minor errors can be corrected automatically. |
| | 3-2: Manual Healing | |
| |  | <p>Severe errors are fixed manually.</p> <p>When a defect cannot be corrected, the erroneous surface can be removed, and a new surface that is tangent continuous to adjacent surfaces can be created.</p> |
| 4 | Simplification (Defeaturing) Functions | |
| | 4-1: Fillet Removal | |
| |  | Simple fillets and corner fillets are removed automatically by specifying the radius. |
| | 4-2: Partial Fillet Removal | |
| |  | Complicated fillet parts can be simplified progressively, when removing them automatically is difficult. Unlike working with a CAD system, gaps and holes generated during the process will not be an issue. |
| | 4-3: Chamfer Removal | |
| |  | Parts with chamfer (cone, plane) can be identified and removed automatically by specifying the angle. |

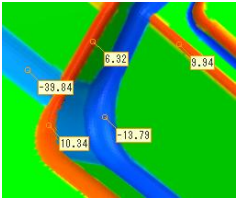
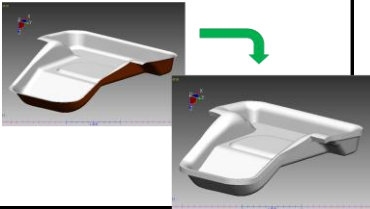
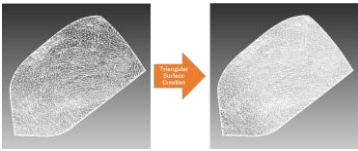
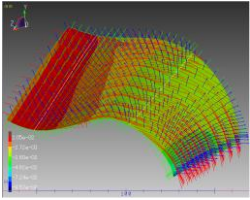
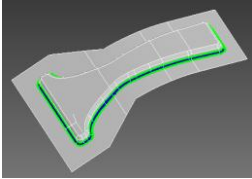
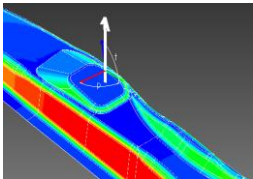
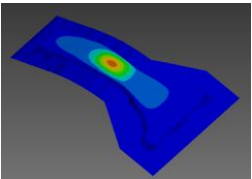
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| 5 | 4-4: Bosses and Cutouts Removal | |
| |  | Unnecessary boss features and cutouts can be removed by specifying a range. |
| | 4-5: Voxelization | |
| |  | Convert a complex 3D model into a voxelized model, which are a cluster of cubes. A 3D model is simplified and hence it can be used for analysis. |
| | Data Downsizing Functions | |
| 6 | 5-1: Hidden Faces Removal | |
| |  | This function instantaneously removes the faces hidden (invisible) when looked at from a specified direction. Even with data of about 10,000 faces, hidden faces can be removed within in a few seconds. By significantly reducing the size of CAD data, the model rendering time for CG use are shortened and the less data getting out means, more confidentiality is secured. |
| | 5-2: Remove Holes | |
| |  | Unnecessary holes can be deleted by specifying radius and diameter values. When creating polygon data from geometry data for analysis, etc., the number of polygons can be greatly reduced by deleting holes in advance. |
| | Feature Recognition (Identification) Functions | |
| | 6-1: Fillet Recognition | |
| |  | All fillets are be color-coded automatically. |
| | 6-2: Taper Recognition | |
| |  | By specifying the draft direction, faces are color-coded automatically according to each angle. |
| | 6-3: Hole Recognition | |
| |  | Every hole's diameter is calculated and color-coded automatically. |
| | 6-4: Height Recognition | |
| |  | By specifying the reference plane, all parallel faces are identified and color-coded automatically. |

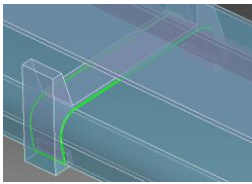
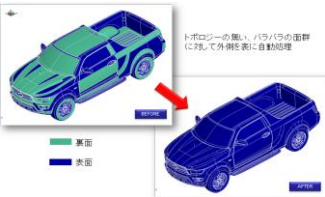
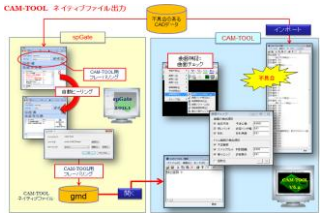


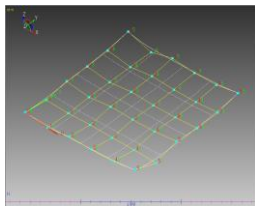
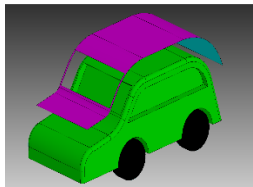
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| 7 | 6-5: Thickness Recognition | |
| |  | Parallel planes are color-coded automatically by plate thickness. |
| | 6-6: Gap Recognition | |
| |  | Parallel planes are color-coded automatically according to the size of each gap. |
| | 6-7: Analytics Surface Recognition | |
| |  | Primitive surfaces (plane, cone, cylinder, sphere, torus and spline surfaces) in a model are color-coded automatically. |
| | 6-8: Feature Recognition | |
| |  | Change the color of faces that are of similar shapes for the entire CAD model, automatically. Detects the parts that are of the same topology, irrespective of the size of faces, automatically. |
| | Model Comparison Functions | |
| | 7-1: Compare Models | |
| |  | Import CAD models before and after design changes (changes in hole location, boss location, fillet radius value, and the presence of draft angle, etc.) and use color map to review the details. |
| | 7-2: Gap Value Memo (Annotation) | |
| |  | Gap values and notes can be annotated by picking a location on color mapped parts. |
| | 7-3 : Align 3 Points | |
| |  | CAD models with different origins or coordinate systems can be aligned by specifying three points. |
| | 7-4: Batch Processing | |
| |  | You can run a batch process for reviewing design changes (by comparing differences in shapes). |

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| | 7-5: Compare Edges | |
| |  | <p>Edges are compared.</p> <p>The compared result can be observed as green, red, and blue curves.</p> |
| | 7-6: Mirroring | |
| |  | <p>Use this when comparing bilateral symmetry.</p> |
| 8 | Function to Unfold a 3D Model to 2D Model | |
| |  | <p>This is a function to unfold an outline from 3D surfaces to 2D drawings.</p> <p>Applications include a wide variety of fields such as graphic decal stickers for a motorcycle cowl and 3D logo stickers. You can run simulation with an elastic location suppressed or observe the final state of elasticity using the color map.</p> |
| 9 | Create Electrodes | |
| |  | <p>Create electrodes (solid) in pockets.</p> <p>For closed pockets, the electrode parts can be auto selected. (Electrodes can also be created for open pockets.)</p> |
| 10 | Polygon Mesh Editing Functions | <p>There are other functions such as "Remove Polygons," "Create Bridge," "Subdivide," and "Display Curvature" which are not mentioned below.</p> |
| | 10-1: Thin-Out | |
| |  | <p>Down sample the selected polygon mesh with the specified thinning rate.</p> |
| | 10-2: Fill Hole | |
| |  | <p>Not only will this function simply fill holes, there are various interpolation methods such as referring to the surrounding polygon mesh curvature, and filling in a virtual surface after creating it internally, etc.</p> |
| | 10-3: Cutting Polygon Meshes | |
| |  | <p>This function uses surface data (IGES, STEP, etc.) to cut polygon mesh data (STL).</p> |

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| 11 | 10-4: Display Curvatures | |
| |  | Shape distortion can be easily detected by color-coding curvature radii of the polygon mesh data. Curvature radius can also be annotated at a location of your choice. |
| | 10-5: Thicken polygons | |
| |  | Adds thickness to the polygon with the specified value. |
| | 10-6: Create Surface | |
| |  | Triangular polygons can be converted to surfaces and used as shape data. |
| | Functions for Pressed Mold Parts | |
| | 11-1: Check Curvatures | |
| |  | You can check "Principal curvature (Maximum)", "Gaussian curvature" and "Curvature (Specify direction)". |
| | 11-2: Modifying Concave Fillet | |
| |  | There are a couple of ways to modify concave fillets as a countermeasure to the problem of unmachined corner parts. 1. Offset concave fillets 2. Decrease the radius of concave fillets |
| | 11-3: Checking for Undercut (Negative Angle) | |
| |  | Check if an undercut (negative angle) exists in a specified direction. A direction with no undercut can also be determined automatically. |
| | 11-4: Deforming Surface Center | |
| |  | Move the center of a sheet in the Z direction to modify the shape of the entire model. This in turn leads to equalization of the pressure of an entire press mold part. |

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| 12 | Others | |
| | 12-1: Interference Checking Function | |
| |  | <p>Check for interferences and collisions between multiple parts with high accuracy.</p> <p>You can export interfering parts as IGES from spGate-Job-Manager. By importing interfering parts to CAD, they can be reviewed effortlessly.</p> |
| | 12-2: Correct Face Directions | |
| |  | <p>The outer side of a non-solid model, made of unmerged surfaces, is configured automatically as the front side.</p> |
| | 12-3: CAM-TOOL Support | |
| |  | <p>A 3D CAD model is healed of CAM-TOOL specific errors, so that there will be no issue when working in CAM-TOOL, and exported as CAM-TOOL native format (gmd).</p> |
| | 12-4: Batch Processing | |
| |  | <p>Use batch processing when translation takes time or when there are many translation tasks. A batch translation utility, spGate-Job-Manager, is included as a part of the standard package.</p> <p>"Hidden Face Removal" and "Compare Models" functions can also be processed in a batch.</p> |
| | 12-5: Training Manual | |
| |  | <p>Easy-to-understand training manual is included (approximately 120 pages), even a first-time user can easily learn the operation.</p> |
| | 12-6: Formula Surface | |
| |  | <p>By reading the formula file of the surface, you can create "Surface" and "point on the surface". You can also check the maximum gap between "CAD model" and "formula surface file".</p> <p>If you want to use your own formula file, Please contact the us.</p> |
| | 12-7: Face Offset | |
| |  | <p>Offsets the face according to the entered offset value.</p> |