



FreeForm® ClayTools® Feature Comparison Chart

SensAble Technologies, Inc.®

Modeling Product	ClayTools®	FreeForm® Modeling™	FreeForm® Modeling Plus™
Software Version Number	v2.0	v10.0	v10.0
Items in <i>Red Italics</i> are new in the latest releases			
System Configurations			
Haptic Device			
PHANTOM® Desktop™		✓	✓
PHANTOM Omni®	✓	✓	
Operating System			
Microsoft® Windows XP (32 & 64-bit editions)	✓	✓	✓
<i>Microsoft® Windows Vista® (32 & 64-bit editions)</i>	✓	✓	✓
Voxel Modeling Features			
Construct Clay Features			
Basic Shapes, Wire Cut, Spin, Inflate, Add Clay, <i>Layer</i> , Mirror, Buck (<i>new to ClayTools</i>)	✓	✓	✓
Loft, Sweep, Toothpaste, Pipe, Offset Piece		✓	✓
Sculpt Clay Features			
Carve with Ball, Corndog, Scraper, Smudge, Attract, Spike	✓	✓	✓
Smooth, Smooth Area	✓	✓	✓
Carve with Cube, Carve with Angle, Carve with Loop, Carve with Razor, Carve with Knife, Custom Carve Tools, <i>Limit to Depth</i>		✓	✓
Detail Clay Features			
Groove, Emboss with Curve, Emboss Area, Emboss with Image, <i>Emboss Text</i> , Emboss with Wrapped Image	✓	✓	✓
Emboss with Curve with Falloff, Ridge, Variable Round Edge, Bevel Edge		✓	✓
Deform Clay Features			
Tug, Tug area, <i>Tug with Curve</i> , <i>Surface Fair</i>	✓	✓	✓
Shape, Deform Box, <i>Slice Deform</i>		✓	✓
Select and Move Features			
Select with Ball, Select with Profile, Lump Select, Mask, Separate with Curve/ <i>Plane</i> , Reposition Piece, Reposition Origin, Paste Pattern, Add Selection to Buck (<i>new to ClayTools</i>)	✓	✓	✓
Select Clay with Box, Select Clay with Plane, Align Piece, Reposition Selection		✓	✓
3D Curve Features			
Select/Edit, Draw Curve (<i>Trace Mode</i>), Fit Curve, Project Sketch, Split Curve (<i>Enhanced: Parametric Split by User Input</i>), Copy from Reference Group, Join Curve, Mirror Curve, Plane to Clay Intersection Curve, Automated Split or Join Curve (including ability to heal curves)	✓	✓	✓
Project Curve to Plane, Intersect Sketches, Copy Curve from Sketch Plane, Split Curve (<i>Enhanced: Split into Equal Segments</i>), Extend/ <i>Retract</i> Curve, Offset Curve (<i>Enhanced: Offset Curve Segments</i>), Curve Helix, Sub-divide Curve Loop		✓	✓
Surface to Clay Intersection Curve, Copy Curve from Solid Edge, <i>Offset Curve Segment via Clay Normal</i> , Smooth Curve, Flatten Curve, Axis Marker			✓
Plane Features			
Create Plane, Reposition Plane, Orient Plane Flat to View, Import 2D Art to Plane	✓	✓	✓
Orient Plane Through Three Points, Orient Plane to Curve, Copy Profile		✓	✓
2D Sketch Features			
Select/Edit, Move-Rotate-Scale, Freehand Curve, Curve by Control Points, Line, Arc, Round Corner, Circle, Ellipse, Rectangle, Trim, Mirror, Offset, Rectangular Array (<i>new to ClayTools</i>), View Flat to Sketch Plane	✓	✓	✓
Pencil, Erase Pencil, Freehand Cyclic Curves, <i>Extend/Retract Curve</i>		✓	✓



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Mesh Features				
Import, Convert to Clay, Decimated Export		✓	✓	✓
<i>Curvature Based Hole Filling on Import</i> , Edit Mesh Selection, Edit Mesh with Curve Loop			✓	✓
<i>Edit and Stitch Mesh Workflow</i>			✓	✓
<i>Slice Deform Mesh, Tug Mesh with Curve</i>			✓	✓
NURBS Surfacing Features				
Select All Patches, Find Folded Patches, Measure Fit of Patches to Clay, Environment and Zebra Mapping, Show Normals				✓
Extend Patch, Trim Patch, Mirror Patch, Shape Patch, Stitch Patches, Refit Curves and Patches, Copy Patches from Piece				✓
Semi-automatic Patch Creation, Auto-Surfacing				✓
Convert NURBS Patches to Clay				✓
Split Mesh				✓
NURBS Solids Features				
Wire Cut, Spin, Loft, Sweep, Mirror Solids				✓
Convert NURBS Solids to Clay, Stitch Patches into NURBS Solids				✓
<i>Edit and Stitch Solid Workflow</i>				✓
Paint and Render Features				
Voxel Paint - Paint Brush, Air Brush			✓	✓
Project & Wrap Image			✓	✓
mental ray® Rendering Engine			✓	✓
Import/Export File Formats				
3D Import Formats - STL, OBJ, PLY, ZCP		✓	✓	✓
3D Export Formats - STL, OBJ, PLY, ZCP, <i>VRML</i>		✓	✓	✓
2D Import Formats - AI, PDF, <i>DXF</i>		✓	✓	✓
<i>2D Export - AI, PDF, DXF</i>		✓	✓	✓
Export TextureKiln™		✓	✓	✓
IGES Curves		✓	✓	✓
Save Screen to BMP or <i>JPG</i> , <i>Save Views to JPG</i>		✓	✓	✓
Actify® .3D			✓	✓
IGES & STEP Solids and Patches				✓
Native Parasolid® Solids and Patches				✓
Object List Functionality				
Fill Voids, Boolean Operations (Combine, Remove, <i>Intersect</i>), Match Origin, Notes, <i>Add to Mask/Buck</i>		✓	✓	✓
Dimensional Control				
Haptic Guides, Ruler		✓	✓	✓
Scale, Tug & Tug Area with Ruler			✓	✓
Dimension Parasolid Edges				✓



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Evaluation Features			
Shading Clay - Flat, Smooth, <i>Wireframe, High Quality, Transparency, Drop Shadows</i>	✓	✓	✓
Shading Reference Pieces - Flat, Smooth, <i>Wireframe, High Quality, Transparency, Drop Shadows</i>	✓	✓	✓
Scalable Secondary Views	✓	✓	✓
Piece Density		✓	✓
Mass Properties (<i>non-modal</i>): Surface Area, Volume, Weight, Center of Gravity		✓	✓
Parting Line Color, Rainbow Color Draft Display		✓	✓
Cutaway View		✓	✓
Piece to Piece Fit Analysis, Surface Modification Analysis			✓
Customization & Utilities			
Favorites Palette, Custom Color Schemes, Incremental Backup File Saving, Pop-Through Force Control, <i>Relocate Palette Stack</i>	✓	✓	✓
Hide/Show Curves, Fit to View, Perspective View	✓	✓	✓
Toggle Touchable Reference Pieces	✓	✓	✓
Hide/Show Patches and Solids			✓
Design/Prep for Manufacturability			
Parting LineTools - Definition, Exploration, Smoothness and Curvature Evaluations, Automatic Smoothing			✓
Undercut Evaluation and Fixing Tools - Parting Line (Undercut) Color, Automatic Draft Fixing, <i>Fix Draft Selection</i>			✓
Shelling			✓
Split Line Curve Definition & Joint Design			✓
Reference Import Solid Geometry from CAD			✓
Mold Design			
<i>Offset Curve Segments</i>			✓
Define a Pull Direction			✓
Insert Block Extents			✓
Planar Parting Line Sections			✓
Parting Surface Creation - Extruded, Shape Clay and Patches			✓
3D Offset Parting Surface			✓
Trim Parting Surface			✓
Multiple Component Creation			✓
Preview/Create Core & Cavity Inserts			✓