



# FreeForm® Feature Comparison Chart

SensAble Technologies, Inc.®

<b>Modeling Product</b>	<b>FreeForm® Modeling™</b>	<b>FreeForm® Modeling Plus™</b>
<b>Software Version Number</b>	v11.0	v11.0
Items in <i>Red Italics</i> are new in this release		
<b>System Configurations</b>		
<b>Haptic Device</b>		
PHANTOM® Desktop™	✓	✓
PHANTOM Omni®	✓	
<b>Operating System</b>		
Microsoft® Windows XP (32 & 64-bit editions)	✓	✓
Microsoft® Windows Vista® (32 & 64-bit editions)	✓	✓
Microsoft® Windows 7® (32 & 64-bit editions)	✓	✓
<b>Voxel Modeling Features</b>		
<b>Construct Clay Features</b>		
Basic Shapes, Wire Cut ( <i>Enhanced</i> ), Spin, Inflate, Add Clay, Layer, Mirror, Buck, Toothpaste, <i>Pattern Piece</i>	✓	✓
Loft, Sweep, <i>Curve Network to Clay</i> , Pipe ( <i>Enhanced</i> ), Offset Piece, <i>Extrude to Plane</i>	✓	✓
<i>Extrude to Plane with Draft</i>		✓
<b>Sculpt Clay Features</b>		
Carve with Ball ( <i>Enhanced</i> ), Corndog ( <i>Enhanced</i> ), Scraper ( <i>Enhanced</i> ), Smudge, Attract, Spike	✓	✓
Smooth( <i>Enhanced</i> ), Smooth Area, <i>Smooth with Curve</i>	✓	✓
Carve with Cube, Carve with Angle, Carve with Loop, Carve with Razor, Carve with Knife, Custom Carve Tools, Limit to Depth	✓	✓
<b>Detail Clay Features</b>		
Ridge ( <i>Enhanced</i> ), Emboss with Curve ( <i>Enhanced</i> ), Emboss Area, Emboss with Image, Emboss Text, Emboss with Wrapped Image	✓	✓
<i>Variable Ridge</i> , Emboss with Curve with Falloff, Ridge, Variable Round Edge, Bevel Edge	✓	✓
<b>Deform Clay Features</b>		
Tug ( <i>Enhanced</i> ), Tug Area ( <i>Enhanced</i> ), Tug with Curve ( <i>Enhanced</i> ), Surface Fair	✓	✓
Shape, Deform Box, Slice Deform ( <i>Enhanced</i> ), <i>Lattice Deform</i>	✓	✓
<i>Shape with Ruler, Deform Box with Ruler, Lattice Deform with Ruler</i>		✓
<b>Select and Move Features</b>		
Select with Ball, Select with Profile, Lump Select, Mask, Separate with Curve/Plane, Reposition Piece, Reposition Origin, Paste Pattern, Add Selection to Buck	✓	✓
Select Clay with Box, Select Clay with Plane, <i>Select Objects with Box</i> , Align Piece, Reposition Selection, <i>Align to Path</i>	✓	✓
<i>Separate Solids/Patches, Separate with Patch, Select with Patch</i>		✓
<b>3D Curve Features</b>		
Select/Edit, Draw Curve, Fit Curve, Project Sketch ( <i>Enhanced</i> ), Split Curve, Copy from Reference Group, Join Curve, Mirror Curve, Plane Intersection Curve ( <i>Enhanced</i> ), Automated Split or Join Curve	✓	✓
Project Curve to Plane ( <i>Enhanced</i> ), Intersect Sketches, Copy from Sketch ( <i>Enhanced</i> ), Split Curve, Extend/Retract Curve, <i>Plane Intersection Curve to Mesh</i> , Offset Curve, Curve Helix ( <i>Enhanced</i> ), Sub-divide Curve Loop	✓	✓
<i>Plane Intersection Curve to Patch/Solids, Surface Intersection Curve to Clay and Patches/Solids</i> , Copy Curve from Solid Edge, Offset Curve Segment via Clay Normal, Smooth Curve, Flatten Curve, Axis Marker ( <i>Enhanced</i> ), Curvature Plots ( <i>Enhanced</i> )		✓



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<b>Plane Features</b>		
Create Plane ( <i>Enhanced</i> ), Reposition Plane ( <i>Enhanced</i> ), Orient Plane Flat to View, Import 2D Art to Plane	✓	✓
Orient Plane Through Three Points, Orient Plane to Curve, Copy Profile	✓	✓
<b>2D Sketch Features</b>		
Select/Edit, Move-Rotate-Scale, Freehand Curve ( <i>Enhanced</i> ), Curve by Control Points, Line, Arc, Round Corner, Circle, Ellipse, Rectangle, Trim, Mirror ( <i>Enhanced</i> ), Offset, Rectangular Array, View Flat to Sketch Plane	✓	✓
Pencil, Erase Pencil, Freehand Cyclic Curves, Extend/Retract Curve	✓	✓
<b>Mesh Features</b>		
Import, Convert to Clay, Decimated Export	✓	✓
Curvature Based Hole Filling on Import, Edit Mesh Selection, Edit Mesh with Curve Loop	✓	✓
Edit and Stitch Mesh, Slice Deform Mesh ( <i>Enhanced</i> ), Tug Mesh with Curve ( <i>Enhanced</i> )	✓	✓
<b>NURBS Surfacing Features</b>		
Create and Edit Patches ( <i>Enhanced</i> ), <i>Create Ring Patch</i> , Extend Patch, Trim Patch, Mirror Patch, Shape Patch ( <i>Enhanced</i> ), Stitch Patches, Refit Curves and Patches, Copy Patches from Piece		✓
Select All Patches, Find Folded Patches, Measure Fit of Patches to Clay, Environment and Zebra Mapping, Show Patch Normals, Patch Display Properties ( <i>Enhanced</i> )		✓
Semi-automatic Patch Creation, Auto-Surfacing		✓
Convert NURBS Patches to Clay ( <i>Enhanced</i> )		✓
<b>NURBS Solids Features</b>		
Wire Cut, Spin, Loft, Sweep, Mirror Solids, <i>Curve Network to Solid, Solid Booleans</i>		✓
Convert NURBS Solids to Clay ( <i>Enhanced</i> ), Stitch Patches into NURBS Solids		✓
Edit and Stitch Solid Workflow ( <i>Enhanced</i> ), <i>Sculpt and Refit Workflow</i>		✓
<b>Paint and Render Features</b>		
Voxel Paint - Paint Brush, Air Brush	✓	✓
Project & Wrap Image	✓	✓
mental ray® Rendering Engine	✓	✓



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<b>Import/Export File Formats</b>		
3D Import Formats - STL, OBJ, PLY, ZCP ( <i>Enhanced</i> )	✓	✓
3D Export Formats - <i>CLY</i> , STL, OBJ, PLY, ZCP, VRML ( <i>Enhanced</i> )	✓	✓
2D Import Formats - AI ( <i>Enhanced</i> ), PDF ( <i>Enhanced</i> ), DXF	✓	✓
2D Export - AI, PDF, DXF,	✓	✓
Export TextureKiln™, <i>Export Piece Position Data</i>	✓	✓
IGES Curves	✓	✓
Save Screen to BMP or JPG ( <i>Enhanced</i> ), Save Views to JPG ( <i>Enhanced</i> )	✓	✓
Actify® .3D	✓	✓
IGES & STEP Solids and Patches ( <i>Enhanced</i> )		✓
Native Parasolid® Solids and Patches ( <i>Enhanced</i> )		✓
<b>Object List Functionality</b>		
Fill Voids, Boolean Operations (Combine, Remove, Intersect), Match Origin, Notes, Add to Mask/Buck, <i>Search, Export</i>	✓	✓
<b>Dimensional Control</b>		
Haptic Guides, Ruler ( <i>Enhanced</i> )	✓	✓
Scale, Tug & Tug Area with Ruler	✓	✓
Dimension Parasolid Edges, Shape with Ruler, Deform with Ruler		✓
<b>Evaluation Features</b>		
Shading Clay - Flat, Smooth, Wireframe, High Quality, Transparency, Drop Shadows	✓	✓
Shading Reference Pieces - Flat, Smooth, Wireframe, High Quality, Transparency, Drop Shadows	✓	✓
Scalable Secondary Views	✓	✓
Piece Density	✓	✓
Mass Properties: Surface Area, Volume, Weight, Center of Gravity ( <i>Enhanced</i> )	✓	✓
Parting Line Color, Rainbow Color Draft Display	✓	✓
Cutaway View, <i>Dimensional Bounding Box</i>	✓	✓
Piece to Piece Fit Analysis, Surface Modification Analysis, <i>Intersection Analysis, Thickness Analysis</i>		✓
<b>Customization &amp; Utilities</b>		
Favorites Palette, Custom Color Schemes, Incremental Backup File Saving, Pop-Through Force Control	✓	✓
Hide/Show Curves, Fit to View, Perspective View	✓	✓
Toggle Touchable Mesh Objects	✓	✓
Hide/Show Patches and Solids		✓



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<b>Design/Prep for Manufacturability</b>		
Parting Line Tools - Definition, Exploration, Smoothness and Curvature Evaluations, Automatic Smoothing		✓
Undercut Evaluation and Fixing Tools - Parting Line (Undercut) Color, Automatic Draft Fixing, Fix Draft Selection ( <i>Enhanced</i> )		✓
Shelling		✓
Split Line Curve Definition & Joint Design		✓
Reference Import Solid Geometry from CAD		✓
<b>Mold Design</b>		
Split Mesh ( <i>Enhanced</i> )		✓
Offset Curve Segments		✓
Define a Pull Direction		✓
Insert Block Extents		✓
Planar Parting Line Sections		✓
Parting Surface Creation - Extruded, Shape Clay and Patches, Complex Transitional Parting Surface		✓
3D Offset Parting Surface		✓
Trim Parting Surface		✓
Multiple Component Creation		✓
Preview/Create Core & Cavity Inserts		✓