



CFD Visualization & Analysis

Tecplot 360 is a suite of CFD visualization and analysis tools that can handle large datasets, automate workflows, and visualize parametric results. These tools allow you to quickly make engineering decisions and communicate your results with integrated XY, 2D, and 3D plots.

Analyze Complex Results

- Load Tecplot, Fluent, Plot3D, CGNS, OpenFOAM, CONVERGE, FVCOM, VTU data and over 22 other CFD, FEA, structural analysis and industry-standard data formats.
- Report and compare solutions in a multi-frame environment with multiple pages.
- Understand XY, Polar, 2D and 3D plots using unique linking capabilities.
- Animate and step through transient solutions with video player-style controls.
- Explore with interactive slice, isosurface and streamtrace tools.
- Automatically extract key flow features such as vortex cores and shock surfaces.

Explore Billion-Cell Models with SZL Technology

- Leverage multi-core desktop systems with multi-threaded capability.
- Dramatically improve performance using SZL format. Benchmark for 183M cell CFD++ solution: 7.3 times faster load time, 93% reduced peak memory usage, 50% smaller file.
- Analyze large datasets quickly and easily on a typical engineering laptop.

Verify Engineering Designs

- Assess your grid quality with 28 grid quality functions including aspect ratios, skewness, orthogonality and stretch factors.
- Validate computational output with experimental data in a single plotting environment.
- Interactively explore and sweep through flow field, check that flow features align to grid.
- Compare multiple models simultaneously, including fluid-structure interaction (FSI) visualization.

Communicate and Publish Reports

- Copy and paste images directly into Microsoft Office applications.
- Export professional, presentation-quality vector, and raster image formats.
- Present multiple, time-linked views of your plots within a multi-frame workspace.
- Create reports using multi-page layouts.
- Create animations for PowerPoint and the web.
- Use LaTeX to include formulae and mathematical notation on plots.

Automate Routine Tasks

- Automate workflows interactively or in batch with the Python API, PyTecplot.
- Record on-screen actions directly to executable Python code.
- Instantly apply plot style attributes and layouts to different sets of data.
- Leverage 100's of macro functions to automate common analysis and plotting tasks.

Tecplot 360 Includes*:

- **Chorus:**
Explore large parametric datasets composed of multiple solutions or experiments.
- **PyTecplot:**
Record scripts, link workflows together and benefit from the power of a Python API.
- **SZL Server:**
Securely access your remote data.

*Available to customers on maintenance.



Try
Tecplot 360:
tecplot.com/360



Tecplot 360™ Feature List

Analysis

CFD Analyzer: Examine grid quality, perform spatial integrations, generate particle trajectories, extract flow features and estimate numerical errors.

Function Calculator: Calculate over 90 grid and flow field functions. Calculate new variables using common math operations. Perform data normalization.

Integrations: Integrate over lines, surfaces, and volumes. Calculate volumes, areas, flow rates, forces, and moments. Apply weighting options to calculate total pressure. Integrate by zone or time strand.

Particle Paths: Integrate particle trajectories in steady and unsteady flows. Calculate paths of particles with mass and drag effects.

Feature Extractions: Detect and extract shock surfaces, vortex cores, flow separation and reattachment lines.

Error Analysis: Estimate the order of accuracy of your numerical solutions using Richardson extrapolation analysis.

Finite Element Analysis (FEA): Derive Von Mises stress/strain, principal stresses/strains, and vector magnitude. Plot the geometry with deformations and exaggerated deformations applied. Animate displacements.

Create, Alter and Transform Data: Alter data or create new data using mathematical expressions. Store mathematical expressions. Create mirror images of data. Create new data as subset of existing data. Write conditional expressions using the IF() function. Rotate and duplicate data around an axis.

Interpolate and Triangulate: Choose from linear, inverse-distance and kriging interpolation. Create grids composed of triangles defined by data points in a 2D plane.

Discrete Fourier Transform (DFT): Transform one-dimensional ordered linear data into the frequency domain for visualization and further analysis.

Exploration

Chorus: Included with Tecplot 360, this tool has a unique set of features that help you explore large datasets from multiple simulations.

Slicing Tool: Interactively slice 3D and surface data displaying mesh, contours, and vectors on the slice plane. Constrain the extent of a slice to user-defined ranges. Define and use up to eight different slice groups.

Iso-surface Tool: Change iso-surface values interactively. Define and use up to eight different iso-surface groups on one or more variables.

Streamtrace Tool: Interactively seed rakes of streamlines, streamrods and streamribbons in 2D and 3D. Specify lines to terminate streamlines. Display markers along streamlines spaced by vector magnitude. Auto seed streamtraces on a selected surface.

Contour Tool: Accurately control contour levels on a per-variable basis and leverage up to eight contour groups in a single frame. Interactively add or delete contour lines or levels to refine variable fine structure.

Curve Fits: Use least squares linear, polynomial, power, and exponential curve-fits. Use least squares curve-fit for linear combination of user-specified functions.

Exploration (cont.)

Data Blanking and Extraction: Set multiple constraints (masks) to blank display of data based on local field variables, functions of variables and grid indices. Omit zones or peel away surfaces to highlight specific details. Extract your blanked regions for further analysis.

Extraction Tools: Interactively define point or polyline sets to which 2D and 3D surface data is interpolated and extracted for display as a separate plot.

Unsteady Data: Load and explore time-dependent solutions with ease. Use video-like controls. Show multiple views of data through time. See current time step point value on XY plot with Time Marker. Synchronously step through and animate solution time across frames with Time Linking.

Time-series Probe: Extract single point or node over time and plot result in new frame as an XY line plot.

Extract Objects Over Time: Extract slices, iso-surfaces, streamtraces and points from polyline geometries in transient data.

Automation

PyTecplot: Tecplot's Python API gives you the ability to access your data directly and to control your workflows with one popular and easy-to-use language.

PyTecplot Recording and Connections: Record actions performed on-screen as directly runnable Python code. Play back Python in an active Tecplot 360 session (connected mode) or in batch mode (unconnected from the 360 GUI).

Configuration and Batch Files: Set custom defaults with configuration files.

Tecplot Macros: Use 1000's of macro functions including loops and other common programming functions. Run macros with the click of a button by registering them in the quick macro sidebar.

Collaboration

Cross-Platform Capability: Run Tecplot 360 on machines running Windows, macOS and Linux. Interchange Tecplot 360 macro files, layout files, stylesheets, color map files and data files between all platform types.

Extensible Data Writers: Build custom data exporters using the Tecplot Add-On Developer's Kit to write data in custom formats or use built-in tools to export Tecplot ASCII (*.dat) and binary (*.plt, *.szplt) file formats.

Working with Large Datasets

Parallel Processing (shared memory): Leverage all available CPUs/Cores for faster computing-intensive operations, such as streamtraces, slices and iso-surfaces.

Multiple Datasets: Create and display plots from up to 2048 different sets of data simultaneously.

Multiple Zones & Variables: Include up to 1 million segments/zones per dataset, up to 1 million variables (X, Y, Z, U, etc.) per data point.

Multi-Page Layout: Create up to 2048 separate plot pages per layout.

Plot Annotation

Text: Place text interactively on plot. Use all your system fonts with TrueType capabilities. LaTeX font support allows for complex formulae and Greek characters.

Geometries: Interactively create polylines, rectangular boxes, circles, and ellipses. Duplicate, reposition and resize geometries. Modify geometries interactively and read from a file.

Images: Import PNG, JPEG and BMP files into plots. Georeferenced images may also be imported to annotate models that represent geographic space.

Output Formats

Vector-based and Raster Plot Files: Export vector-based files in Postscript, encapsulated PostScript (EPS) and Windows Metafile formats. Export raster files in PNG, JPEG, BMP and TIFF formats. Configure image resolution independent of screen resolution.

Animations: Export to MPEG-4, Flash (SWF), WMV and PowerPoint-compatible AVIs or to a sequence of images for customized animations using FFmpeg (included).

Data Input

SZL Server: SZL Server is a lightweight data server that is installed on your HPC or remote file store (including cloud resources like Amazon's AWS).

CFD Formats: Tecplot, FLUENT CFF HDF5, CGNS, PLOT3D, OpenFOAM, ENSIGHT, VTK, HDF5, ANSYS CFX, FLOW3D, CONVERGE, FVCOM, ROMS, WRF, TELEMAT, EXODUS.

Data Formats: Excel (Windows only), comma- or space-delimited ASCII.

FEA Formats: 3D Systems STL, ABAQUS, ANSYS, LSTC/DYNA, MSC/NASTRAN, MSC/Patran.

Line, 2D, 3D, and Polar Plotting

Time and Dates: Display on any axis.

XY Features: Create scatter plots, line plots, bar charts, semi-log plots, log-log plots, error-bar plots, splines, curve-fits and more. Configure tick marks, symbols, legends and more. Work with multiple horizontal and vertical axes.

Mesh Plots: Display 1D, 2D and 3D grids. Color mesh lines by variable.

Contour Plots: Display contour lines, color the grid based on scalar values using smooth, banded, or whole cell coloring. Use multiple contour variables to view and analyze interrelationships among several variables simultaneously.

Vector Plots: Display 2D and 3D vectors on planes, 3D surfaces and in volumes. Display 3D vector components tangent to 3D surface. Specify length, color, line type and head style. Color by variable.

Polar Plot Features: Create polar line plots (r, theta). Configure angles in radians, degrees, or arbitrary units. Select between linear or logarithmic radius.

Fluid-Structure Interaction (FSI): Load structural analysis and CFD solutions simultaneously to see material deformation and fluid flow changes in one plot.