Bentley®
Advancing Infrastructure

PRODUCT DATA SHEET

AutoPIPE®

Design and Pipe Stress Analysis Application

AutoPIPE is Bentley's pipe stress analysis application for calculating piping stresses, loads, and deflections under static and dynamic load conditions. The software enables you to increase your productivity and improve quality control with an intuitive modeling environment and advanced analysis capabilities. AutoPIPE includes special features for advanced buried pipeline analysis, operational (hot) clash detection, wave loading, fluid transients, and FRP/GRP or plastic pipe, as well as time-saving integration with other Bentley and third-party applications such as SmartPlant, Aveva E3D, Autodesk Plant 3D, PDS, and CAESAR II. AutoPIPE automatically determines the optimal pipe support locations to satisfy the design requirements with the most cost-effective solution, without sacrificing quality or safety.

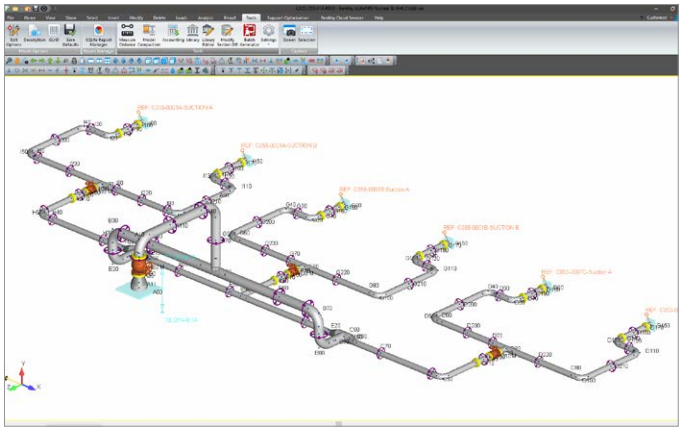
UNIQUE, OBJECT-BASED GRAPHICAL USER INTERFACE

The OpenGL CAD graphical user interface enables users to easily create and modify the pipe stress model. Users can simply point and click to insert, modify, or delete components. After each operation, the model display updates for instant visual feedback. With the AutoPIPE graphical select options, users can modify parameters across an entire range of points with one command. Moreover, users can check, sort, or make changes to the input data quickly, using interactive grid spreadsheets like Excel and display geometric and loading data in color plots for easier review and checking.

AutoPIPE features up to 99 undo or redo steps to correct mistakes, perform what-if analysis, or iterate quickly through design scenarios. Once analyzed, users can click on the graphical model and instantly view stresses, deflections, forces, and moments. Color-coded results and pop-up windows enable users to identify and investigate critical areas without reviewing all of the batch output data. View up to 1,000 load combinations with the on-screen results grid, which provides interactive filtering, sorting, and printing of maximum result values.

ADVANCED ANALYSIS FEATURES

With AutoPIPE's Support Optimizer, you can save significant amounts of design time and thousands of dollars while achieving the most optimized supports without sacrificing safety and quality. The application quickly evaluates multiple design alternatives and provides you with optimal support configuration. AutoPIPE provides 25 international piping codes and includes built-in ASME B31J for more accurate flexibilities/SIF for tees. Advanced capabilities such as pipe/structure interaction, fluid transient analysis, advanced nonlinear load sequencing with support gaps and friction, jacketed piping, and flange analysis module (including ASME VIII Div 1 and 2). You can also export to AutoPIPE Nozzle or AutoPIPE Vessel for local stress calculation.



Determining the optimal arrangement for pipe supports automatically using Support Optimizer.

INTERFACE WITH OTHER BENTLEY APPLICATIONS

AutoPIPE provides an integrated design between piping and structural analysis. It automatically transfers pipe support loads and imports complete structures to and from STAAD® and SACS, saving design time and providing safer, more realistic engineered designs. AutoPIPE allows you to import 3D plant design CAD models from other Bentley applications to save resource hours and ensure accurate pipe stress models.

Models and data can be read by MicroStation® alongside any CAD model to support early engineering decision-making, perform 3D hot-clash detection, and reduce design iterations. AutoPIPE also generates fully dimensioned stress isometrics with custom data and comments highlighting pipe stress changes. AutoPIPE is integrated with ProjectWise for global collaboration of engineering and CAD data files on major projects.

QUALITY ASSURANCE

AutoPIPE undergoes the most demanding quality and testing regime. Our programs and procedures follow the requirements of 10CFR Part 50 Appendix B, 10CFR Part 21, and ASME NQA-1 qualifying AutoPIPE for use on the design of nuclear power installations.

SYSTEM REQUIREMENTS

MINIMUM: Microsoft Windows 10 or 11 64-bit Professional with 4 GB hard drive and 4 GB memory recommended. Any industry-standard video card that supports Open GL 3D graphics.

RECOMMENDED: Adobe Acrobat Reader 10.0 or higher.

AutoPIPE At-A-Glance

MODELING

- Single line, wire-frame, and solid render drawing modes
- CAD style single, double, or quad view ports
- Vertical axis (Y or Z) can be switched on the fly
- On-screen distance calculator for accurate coordinate checks
- Built-in valve actuator for accurate valve modeling
- Segment management: reverse, split, join, and re-order segments
- CAD line class and line numbers
- Connectivity checker to avoid model disconnects
- English, metric, SI, and user-defined units
- Extensive ANSI/ASME, DIN, EN, JIS, GD, GB, GOST, and GRP/FRP standard piping component and material libraries
- iTwin® Design Review
- Structural steel modeling using structural databases for 17 countries
- Expansion joint modeling with tie rod assemblies
- Model import from AutoPLANT®, OpenPlant®, MicroStation, Excel, AutoCAD, Intergraph PDS, SmartPlant, Aveva E3D, CADWorx, SolidWorks, Inventor, Plant 3D, and CATIA
- Automatic stress isometric generation in DXF, DWG, or DGN formats with engineers' mark-ups
- Bidirectional integration with STAAD.Pro® and SACS
- Machine learning support arrangement optimization
- Model geometry data export into OpenPlant, MicroStation, and AutoCAD
- Automated ring main wizard
- ASCE Soil calculator with auto soil point discretization

DYNAMIC ANALYSIS

- Time history dynamic analysis with ground motion
- Mode shapes, accelerations, and natural frequencies
- Harmonic load analysis
- Uniform and MSRS response spectrum and shock spectra
- Multiple spectrum enveloping
- NRC spectra and code case N411 (PVRC) damping and spectra
- NUREG.CR-1677, CR-6441, and CR-6049 benchmarks
- Automatic mass discretization
- Missing mass and ZPA correction

PIPING CODES

- ASME B31.1, B31.3, B31.4, and B31.8 (support for multiple years)
- ASME Sec III, NB, NC, and ND (multiple year from 1972)
- ASME B31.12 hydrogen piping and pipelines
- ASME B31E support for seismic design
- European standards EN13480 metallic (multiple years), EN14692 nonmetallic
- ASME B31.4 Ch IX, B31.8 Ch VIII, DNVGL-ST-F101, CSA-Z622 offshore (multiple years)
- ASME B31.J (2017) SIFs and Flexibilities
- CAN/CSA-Z662 (multiple years)

ANALYSIS

- ASME B31J calculations for improved SIF values
- Unlimited static analysis to examine different loading scenarios, including hot modulus for any combination of 100 thermal, 30 seismic, 10 wind, and 50 dynamic load cases
- Automatic generation of wind profiles per ASCE and UBC guidelines
- Wave loading and buoyancy for offshore applications
- Hydrotest analysis with locking spring hangers
- Linear and nonlinear hydrotest analysis
- Fluid transient utilities for water and steam hammer plus relief valve load analysis
- Automatic flange analysis to ASME VIII Div. 1 and Div. 2, ASME III App XI, and ANSI Check
- Automatic spring hanger sizing from 27 manufacturers
- State-of-the-art nonlinear support gap, friction, yielding, and soil interaction with advanced features of seismic wave propagation, overburden and settlement loads, and stresses to ASCE, AWWA, and ASME
- Thermal stratification bowing analysis
- Thermal transient analysis (TTA), fatigue, and high energy/leakage design for ASME Class 1
- Seismic static and response spectra load generator to IBC, Euro, ASCE, Indian, Spanish, Mexican, and Chinese standards
- Ec/Eh ratio applied to expansion stresses for any piping code
- Integrated flange loading analysis per ASME VIII
- Div 1 and 2, ASME III App XI, and ANSI B16.5
- Nozzle flexibility analysis per API 650 App. P
- ASME Class 1, WRC 297, and Biljaard methods

INPUT AND RESULTS

- Results saved to Microsoft Access MDB file for post-processing
- Report Manager driven by SQLite Results Database
- Custom Microsoft Excel and Word reports and text reports
- Automatic or user-defined load combinations grid
- Automated batch processing
- Maximum intermediate stresses
- Reference point for manufacturer equipment loading reports
- Rotating equipment calculations to API 610, NEMA and API 617, and user-defined standards
- Results can be filtered and sorted by stress, deflection, or load criteria

Bentley
Advancing Infrastructure

FIND OUT MORE AT BENTLEY.COM

1.800.BENTLEY (1.800.236.8539) | Outside the US +1.610.458.5000 | **GLOBAL OFFICE LISTINGS** bentley.com/contact