

Bentley®
Advancing Infrastructure

 **CONNECT Edition**



AutoPIPE® CONNECT Edition

Design and Pipe Stress Analysis Application

AutoPIPE CONNECT Edition is Bentley's design and analysis application for calculating piping code stresses, loads, and deflections under static and dynamic load conditions to meet the highest nuclear standards. AutoPIPE's 3D hot clash detection capability alerts engineers to pipe movement when pipes heat up and prevents costly plant shutdowns. This functionality is also used to avoid piping failures during extreme loading conditions (like earthquakes). AutoPIPE also includes special features for advanced buried pipeline analysis, wave loading, fluid transients, and FRP/GRP or plastic pipe, as well as time-saving integration with STAAD.Pro®, SACS, and all plant design systems.

The CONNECT Edition

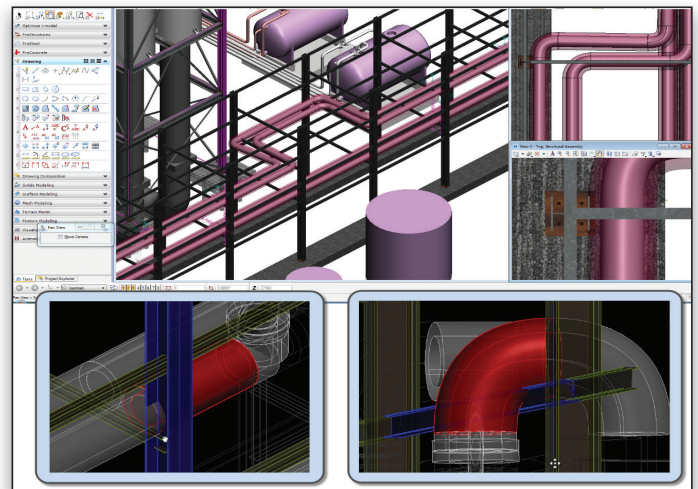
The SELECT® CONNECT Edition includes SELECT CONNECT services, new Azure-based services that provide comprehensive **learning, mobility, and collaboration** benefits to every Bentley application subscriber. *Adaptive Learning Services* helps users master use of Bentley applications through CONNECT Advisor, a new in-application service that provides contextual and personalized learning. *Personal Mobility Services* provides unlimited access to Bentley apps, ensuring users have access to the right project information when and where they need it. *ProjectWise® Connection Services* allow users to securely share application and project information, to manage and resolve issues, and to create, send, and receive transmittals, submittals, and RFIs.

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 AutoPIPE graphical select options, users can modify parameters across an entire range of points with one command. Graphical selection of ranges is also used to modify operations. Moreover, users can check, sort, or make changes to the input data quickly, using interactive grid spreadsheets like Excel. AutoPIPE features up to 99 undo or redo steps to correct mistakes, perform 'what-if' analysis, or to iterate quickly through design scenarios.

Advanced Analysis Features and Graphical Review of Results

AutoPIPE provides unique capabilities with 25 international piping codes, and includes ASME B31J for more accurate SIF for tees, pipe/structure interaction, fluid transient with closure time and relief valve utilities, advanced nonlinear load sequencing with support gaps and friction, and jacketed piping. Local stress calculation is available using AutoPIPE Nozzle. Once analyzed, users can click on the graphical model and instantly view stresses, deflections, forces, and moments. Color-coded results and



Hot clash detection avoids costly operation failures and plant shutdowns.

pop-up windows enable users to identify and investigate critical areas without reviewing all 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.

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.Pro and SACS, saving design time and providing safer, more-realistic engineered designs. Import 3D plant design CAD models from many other Bentley applications to save resource hours and ensure accurate pipe stress models.

AutoPIPE provides users with full read/write interoperability with Caesar II. Models and data can be read by Navigator or 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 also 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 so that AutoPIPE has been approved for use on the design of nuclear power installations.

System Requirements

Processor

Intel Pentium IV or higher

Operating System

Windows 7 –
Professional (32 or 64 bit)

Windows 8 –
Professional (32 or 64 bit)

Windows 10 –
Professional (32 or 64 bit)

Memory

512 MB recommended. Additional memory potentially improves performance, particularly when working with larger models.

Hard Disk

500 MB free disk space

Video Graphics Card

Any industry-standard video card that supports OpenGL 3D graphics

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AutoPIPE CONNECT Edition 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 more 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
- Structural steel modeling using structural databases for 17 countries
- Expansion joint modeling with tie rod assemblies
- Model import from AutoPLANT®, PlantSpace®, OpenPlant, MicroStation®, Excel, AutoCAD, Intergraph PDS, SmartPlant, Aveva PDMS, CADWORX, SolidWorks, Inventor, Plant 3D, CATIA, and PlantFLOW®
- Automatic stress isometric generation in DXF, DWG, or DGN formats with engineers mark-ups
- PIPELINK bi-directional integration with STAAD.Pro and SACS
- Model geometry data export into AutoPLANT®, MicroStation®, and AutoCAD
- Automated ring main wizard
- Automatic ASCE soil calculator

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 support for multiple years, including B31.1, B31.4, and B31.8
- ASME Sec. 3, Class I, II, and III (multiple years from 1972)
- European Standard Metallic Industrial Piping (multiple years) EN13480
- Multiple years: B31.4, B31.8, B31.4 Offshore, B31.8 Offshore and CSA_Z662 Offshore codes
- DNV OS F101 offshore code
- Canadian CAN/CSA-Z662 (multiple years)

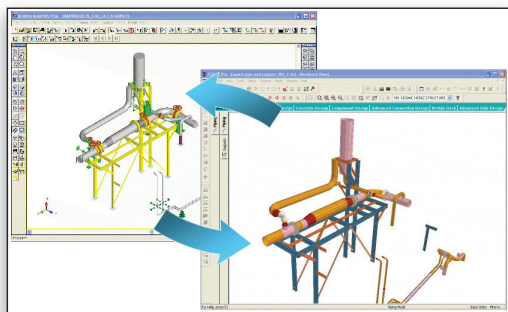
- British Standard BS 806, BS 7159 (GRP piping code)
- FRP ISO 14692
- ASME N755 HDPE Code Case
- Russian SNIP 2.05.06-85 Oil and Gas
- Swedish Piping Code (SPC) Method 2
- Norwegian Det Norske Veritas (DNV) and TBK 5-6
- Dutch Stoomwezen D1101
- Japanese KHK, MITI class 3, JSME NC1-PPC and General Fire Protection code
- French RCC-M and SNCT

Analysis

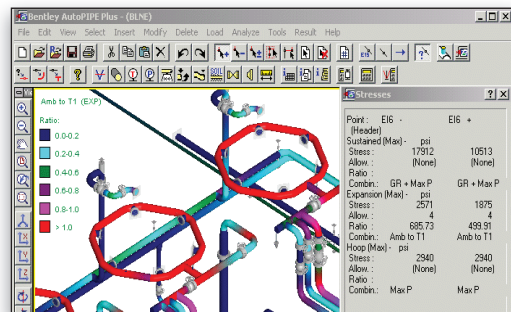
- ASME B31J calculations for improved SIF values
- Unlimited static analysis to examine different loading scenarios, including hot modulus for any combination of 100 thermal, 30 seismic, 10 wind, and 50 dynamic load cases
- Automatic generation of wind profiles per ASCE and UBC guidelines
- Wave loading and buoyancy for offshore applications
- Hydrotest analysis with locking spring hangers
- Linear and non-linear hydrotest analysis
- Fluid transient utilities for water and steam hammer plus relief valve load analysis
- 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
- 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



Bi-directional integration with STAAD.Pro for more efficient and accurate engineering designs.



Users can click on the graphical model to instantly view stresses.