

What's new in CAEPIPE 3D+ V14.00?

(Release date: July 7, 2025)

We are excited to release CAEPIPE 3D+ Version 14.00 with **Wave Load Analysis**, a key advancement to elevate your piping system analysis. The addition of wave load analysis for piping systems in the stress analysis program marks a significant enhancement in the ability to evaluate the effects of dynamic marine environments on offshore and subsea piping infrastructures. This new feature enables engineers to simulate the impact of wave-induced forces and assess their influence on the structural integrity and performance of piping systems subjected to oceanic conditions. Wave loads are a critical consideration for subsea and offshore pipelines, as these systems are exposed to constant movement and varying wave heights, frequencies, and directions.



This release also includes new updates related to assessing piping loads applied to nozzles on **Fired Heaters** in accordance with **API 560 (4th Edition, 2007)** as well as to nozzles on **Air Cooled Heat Exchangers** in accordance with **API 661 (7th Edition, 2013)**.

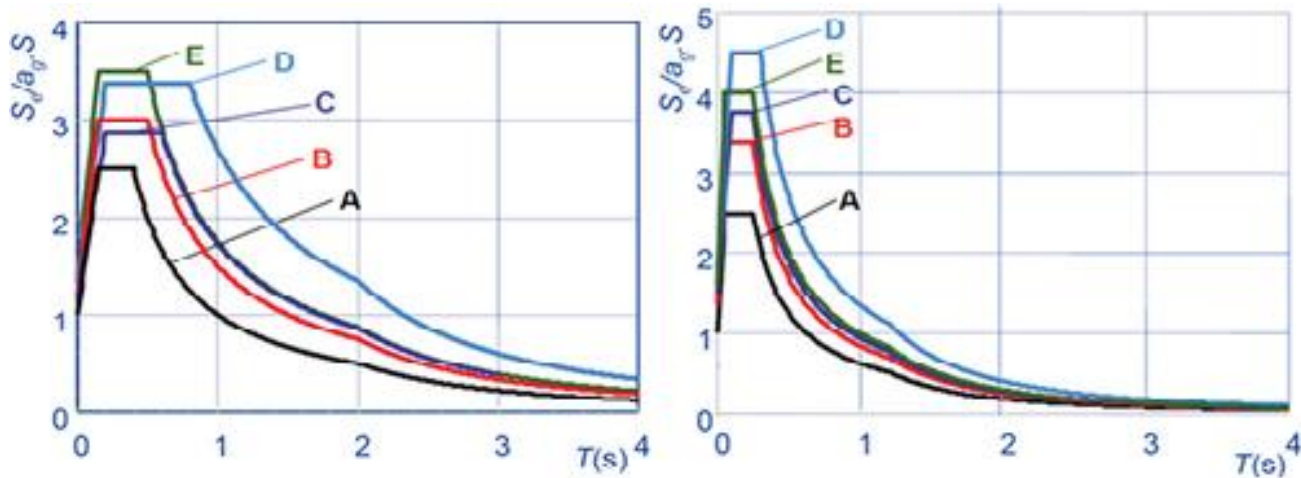


CAEPIPE 3D+

The Most Destructive "Bundled"
Pipe Stress Software



Additionally, a new feature is added to dynamically generate Elastic Response Spectrum and Design Response Spectrum in accordance with EN 1998-1:2004. With these enhancements, SST Systems Inc. continues to deliver robust, reliable tools for precise and compliant piping system analysis.



New Equipment Codes

- API 560 (Fired Heaters)
- API 661 (Air Cooled Heat Exchangers)

Updated Piping Codes

- ASME B31.3 (2024)

Refer to Piping Code Compliance section of CAEPIPE Code Compliance Manual for details on their implementation.



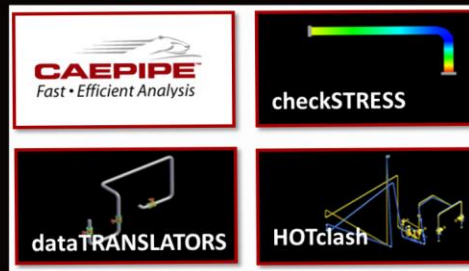
B31.3 - Process Piping
B31.3 - 2024

New Material Library

Material library for ASME B31.3 (2024) is added. Refer to Piping Code Compliance section of CAEPIPE Code Compliance Manual for details.

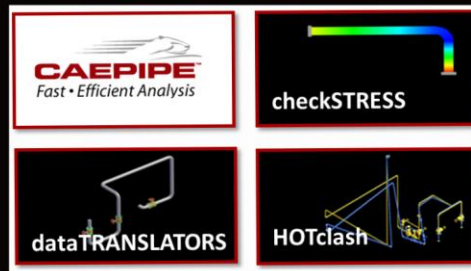
Enhancements

- New feature is added to generate "Elastic Response Spectrum" and "Design Response Spectrum" for both horizontal and vertical directions, as outlined in "EN 1998-1:2004". Refer to the section titled "Response Spectrum - EN 1998-1:2004" in CAEPIPE Technical Reference Manual and in CAEPIPE Code Compliance Manual.
- LISEGA Hanger Catalog is updated in line with LISEGA Catalog 2020. Refer to the revised catalog from the link https://www.lisega.de/wp-content/uploads/2016/06/US_Katalog_GESAMT_low.pdf.



Enhancements (continued...)

- The algorithm for identifying the Run and Branch elements has been updated. The new approach now uses the direction vectors of the connecting pipes at a branch connection, rather than relying on the Outer Diameters of the Run and Branch, to identify the Run and Branch elements at a branch connection.
- New feature is added to validate, issue error message and stop the analysis, when ASME B31J (2023) requirements are NOT met for a Branch SIF.
- New feature is added to validate, issue error message and stop the analysis, when the requirements as per Annexure H of EN 13480-3 (2017)/A2:2020 for SIF computation are not met.
- For all piping codes, a New option is added in Soil input for Buried Piping Analysis to compute Lateral Stiffness and Vertical stiffness of Soil with/without PUR Cushion using the procedure given in EN 13941-1:2019+A1:2021. Refer to the section titled "Buried Piping" in CAEPIPE Technical Reference Manual for details.
- When a Spring Hanger is input with "Connected to" node, CAEPIPE will output the Angulation of Hanger with respect to the vertical axis in the Hanger Report for Operating Load Case 1.
- New feature is added to prevent "Access Violation" error when the result "Support Loads" is selected for a Buried Piping model that has no physical supports.
- Friction at the Limit Stop is now calculated in the Limit Stop local y and z directions and stored internally. These local friction forces are then transformed into Global Coordinate System when LCS to GCS is turned ON under Limit Stop Loads.
- Non-linear algorithm for Limit Stop with friction defined is improved such that the sum of forces in the vertical direction is equal to the weight of the piping system, while the sum of forces in each of the two horizontal directions is equal to ZERO or Externally applied force in that direction, confirming static equilibrium of the total system.
- New feature has been added to restrict users from inputting a Yield Displacement Factor greater than 0.20 in the Analysis Options for Buried Piping Analysis.
- New feature is added to perform Batch run of MBF file and output the results in CSV format for CAEPIPE 3D+ as it was done for CAEPIPE earlier. See Appendix A in CAEPIPE User's Manual for details.
- New feature is added to output axial stress (Sa), bending stress (Sb) and torsional stress (St) in CSV format when Piping Code for Analysis is ASME B31.12 Part IP for Sustained Load case.
- Algorithm for Refining Layout (for Buried Piping / Dynamic Analysis) is improved. This improved algorithm will prevent addition of nodes when the remaining length of element is less than 1 Outer Diameter of the Pipe.

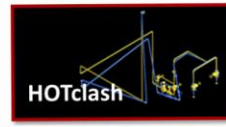


Enhancements (continued...)

- Resultant forces shown for Nozzle under Support Load Summary results are now computed by including Radial, Shear y and Shear z. Similarly, Resultant moments shown for Nozzle are computed by including Torsional, Circumferential and Longitudinal moments.
- In frequency analysis, a minor improvement in mode shape extraction algorithm has been implemented.
- MBF format is updated to be compatible with CAEPIPE Version 14.00. See Appendix A of CAEPIPE User's Manual for details.
- CAEPIPE User's Manual, Technical Reference Manual, Code Compliance Manual and Verification Manual have been enhanced and updated to be in line with the software version 14.00. These Manuals can be downloaded from the link www.sstusa.com/caepipe-docs.php

Bug Fixes

- Level Tags were not displayed correctly in the input dialog for support types such as Anchor, Constant Support, and Limit Stop. This occurred because the level tags were sorted in the display.
- Participation Factors under Frequency results were not displayed correctly when the model contained Spring Hangers or User Hangers with the vertical axis set to Global Z in Multi-level Response Spectrum Analysis.
- Printing Support Loads results for Multi-level Response Spectrum to a TXT file that has Limit Stop/Spring Hanger/User Hanger/Snubber/Guide/Generic Support issues "Access Violation" at random.
- X, Y and Z factors were output in Dimension Units while printing Spectrum Levels in TXT and CSV format. For example, X Factor of 1.0 was output as 25.4 in CSV and TXT output instead of 1.0 when the model is in SI units.
- For ASME B31.x codes with B31J turned ON, Axial SIF and Torsion SIF input by the User in the Bend input dialog were overwritten internally by the Axial SIF and Torsion SIF computed as per B31J.
- Changing a Piping Code that uses "Cold Modulus" to a Piping Code that uses "Hot Modulus" was not saving the Modulus option properly in the model file.



CAEPIPE Code Compliance Checks

Table given below lists the Piping Codes that are built into CAEPIPE 3D+ Version 14.00 for Code Compliance checks with their piping type and analysis type covered.

Sl. No.	Piping Code and Description	Metallic / Nonmetallic Piping	Above Ground	Buried Piping
1	ASME B31.1 (2024) - Power Piping	Metallic	Yes	---
2	ASME B31.1 (1967) - Power Piping	Metallic	Yes	---
3	ASME B31.1 (1973) - Power Piping	Metallic	Yes	---
4	ASME B31.1 (1977) - Power Piping	Metallic	Yes	---
5	ASME B31.1 (1980) - Power Piping	Metallic	Yes	---
6	ASME B31.3 (2024) - Process Piping	Metallic	Yes	---
7	ASME B31.4 (2022) - Pipeline Transportation Systems for Liquids and Slurries	Metallic	Yes	Yes
8	ASME B31.5 (2022) - Refrigeration Piping and Heat Transfer Components	Metallic	Yes	---
9	ASME B31.8 (2022) - Gas Transmission and Distribution Piping Systems	Metallic	Yes	Yes
10	ASME B31.9 (2020) - Building Services Piping	Metallic	Yes	---
11	ASME B31.12 IP (2023) - Hydrogen Piping	Metallic	Yes	---
12	ASME B31.12 PL (2023) - Hydrogen Pipelines	Metallic	Yes	Yes
13	ASME NM.1 (2022) - Thermoplastic Piping Systems	Nonmetallic	Yes	---
14	ASME NM.2 (2022) - Glass-Fiber-Reinforced Thermosetting-Resin Piping Systems (GRP/FRP)	Nonmetallic	Yes	---
15	ASME Class 2 (1980) - ASME Section III, Subsection NC - Class 2	Metallic	Yes	---
16	ASME Class 2 (1986) - ASME Section III, Subsection NC - Class 2	Metallic	Yes	---
17	ASME Class 2 (1992) - ASME Section III, Subsection NC - Class 2	Metallic	Yes	---
18	ASME Class 2 (2015) - ASME Section III, Subsection NC - Class 2	Metallic	Yes	---
19	ASME Class 2 (2017) ASME Section III, Subsection NC - Class 2	Metallic	Yes	---
20	ASME Class 2 (2021) - ASME Section III, Subsection NC - Class 2	Metallic	Yes	---
21	ASME Class 2 (2023) - ASME Section III, Subsection NC - Class 2	Metallic	Yes	---
22	ASME Class 3 (2017) - ASME Section III, Subsection ND - Class 3	Metallic	Yes	---
23	ASME Class 3 (2021) - ASME Section III, Subsection ND - Class 3	Metallic	Yes	---
24	ASME Class 3 (2023) - ASME Section III, Subsection ND - Class 3	Metallic	Yes	---



CAEPIPE 3D+

The Most Disruptive "Bundled"
Pipe Stress Software



Sl. No.	Piping Code and Description	Metallic / Nonmetallic Piping	Above Ground	Buried Piping
25	ISO 14692-3 (2017) - Petroleum and Natural Gas Industries - Glass Reinforced Plastics (GRP/FRP) Piping	Nonmetallic	Yes	Yes
26	EN 13480 (2020) - Metallic industrial piping	Metallic	Yes	Yes
27	EN 13941 (2019) - District heating pipes	Metallic	No	Yes
28	BS 806 (1986) - Construction of Ferrous Piping Installations for and in Connection with Land Boilers (British)	Metallic	Yes	---
29	DNV-ST-F101 - Submarine pipeline systems	Metallic	Yes	---
30	IGEM (2012) - Institution of Gas Engineers and Managers (IGEM) IGE/TD/12 Edition 2 (UK)	Metallic	Yes	---
31	Norwegian (1983) - Process design	Metallic	Yes	---
32	Norwegian (1990) - Process design	Metallic	Yes	---
33	RCC-M (1985) - Design and Construction Rules for Mechanical Components of PWR Nuclear Islands (French)	Metallic	Yes	---
34	RCC-M (2018) - Design and Construction Rules for Mechanical Components of PWR Nuclear Islands (French)	Metallic	Yes	---
35	RCC-M (2020) - Design and Construction Rules for Mechanical Components of PWR Nuclear Islands (French)	Metallic	Yes	---
36	RCC-M (2022) - Design and Construction Rules for Mechanical Components of PWR Nuclear Islands (French)	Metallic	Yes	---
37	CODETI (2013) - CODE DE CONSTRUCTION DES TUYAUTERIES INDUSTRIELLES (French)	Metallic	Yes	---
38	Stoomwezen (1989) - Dutch Power piping code	Metallic	Yes	---
39	Swedish (1978) - Swedish piping code	Metallic	Yes	---
40	Z183 (1990) - Oil Pipeline Systems (Canadian)	Metallic	Yes	---
41	Z184 (1992) - Gas Pipeline Systems (Canadian)	Metallic	Yes	---
42	Z662 (2019) - Oil & Gas Pipeline Systems (Canadian)	Metallic	Yes	Yes
43	NONE (for AWWA M11 applications, and for applications in aircraft, aerospace & defence industries)	Metallic	Yes	Yes

Download an evaluation version of CAEPIPE 3D+ from the link <https://www.sstusa.com/caepipe3d-software-download.php>.

Earlier versions' Release Notes are available at
<http://www.sstusa.com/caepipe-enhancements.php>