

CAESAR II[®] README

Product: CAESAR II

Version: 14 (14.00.00)

Date: December 2023

Description: CAESAR II is the industry leading pipe stress analysis program that evaluates the structural responses and stresses of piping systems according to international codes and standards.

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System Requirements

★ **IMPORTANT** Beginning with Windows 10, Microsoft enforces the Internet Host Table Specification RFC 952, which mandates that component hostname labels can contain only alphanumeric characters. Hostnames using underscores ('_') are not allowed. Refer to Microsoft KB 101785.

CAESAR II[®] meets the applicable requirements of Intergraph Smart[®] Enterprise Platform 2023.

NOTE The operating system compatibility details that follow refer to the latest released version of this software. Previous versions of the software may not work with newer operating systems.

Operating System	Compatibility Information
Windows 10 21H2 or later Professional & Enterprise (64 bit) Windows 11 21H2 or later Professional & Enterprise (64 bit)	These operating systems are tested by Hexagon.
Windows Server 2022	Only tested by Hexagon for the installation of network licensing systems.

Prerequisites

Microsoft .NET 4.8 or greater

Licensing

Intergraph Smart® Licensing 14.2.1.192 or later

Hardware

Processor: 3.0 GHz Intel Pentium IV or higher AMD Athlon dual-core processor or higher

Memory: 4 GB RAM or higher

Display: 1280X1024 or higher, with True Color

Video Card: 512 MB or greater video RAM, Open GL 1.1 or later, DirectX 11.0 or later, drivers updated with the latest manufacturer's drivers (Motherboard-integrated video cards not recommended for desktop systems.)

Remote Technologies

Citrix XenApp 7.22 required on Windows Server Enterprise 2019 or 2020

Version Compatibility

For up-to-date information on the software compatibility of this product in a standalone or integrated environment, please refer to the [Compatibility Matrix](#).

To review compatibility information for this product:

1. Go to the Compatibility Matrix (<https://compatibilitymatrix.hexagonali.com>).
2. Click **Product Search**.
3. In the **Product** list, select the product you want to view compatibility for.
4. In the **Version** list, select the version.

Special Instructions

CAESAR II is a Windows 10 and 11-based program. The input files created by Version 14 are not downward compatible with previous versions. However, Version 14 can read input files from any previous version.

Existing users should install this latest version in a different directory from any earlier existing version. CAESAR II displays the version number and build date in the lower right corner of the main window for your reference.

This version of CAESAR II should be started by using C2.EXE.

When you start the CAESAR II application, you should select or specify a job name (by selecting **File > New** or **File > Open**) before using any other module. Most of the modules function using the current working directory. If this information is not available, the module cannot run. You can select **File > Set Default Data Directory** to save this working directory in the registry.

Windows Language Pack Considerations

The CAESAR II language (such as Japanese or Chinese) is not the same as the Windows language. You must install a language pack. For more information, see *Recommendations for Windows 10 users* in the Windows support article [Why does some text display with square boxes in some apps on Windows 10?](#)

Post Installation Considerations

CAESAR II installs the *NETUSERC2.BAT* batch file in the CAESAR II program directory: If you install CAESAR II to a network drive, only the installing workstation has the proper .dll files installed and registered. Run this batch file on all other workstations that will run CAESAR II to ensure the .dll files are current and registered.

CAESAR II installs the following batch files in the CAESAR II System directory (...\\ProgramData\\Intergraph CAS\\CAESAR II\\<version number>\\System):

- *ACCESS2010.BAT* – Use this batch file to copy the MS Access 2010 template onto the active template used by CAESAR II.
- *ACCESS2007.BAT* – Use this batch file to copy the MS Access 2007 template onto the active template used by CAESAR II.
- *ACCESS2002-2003.BAT* – Use this batch file to copy the MS Access 2002-2003 template onto the active template used by CAESAR II. If you are using Access 2002/2003 already, you do not need to run this batch file.
- *ACCESS2000.BAT* – Use this batch file to copy the MS Access 2000 template onto the active template used by CAESAR II. If you are running Access 2000, run this batch file to use the appropriate template and to avoid having to convert database files individually.

For more information on installing CAESAR II, refer to the *CAESAR II Quick Reference Guide*.

Documentation

Use the **Help** menu to access the help for this product. You can also view documentation for this product online at Hexagon Documentation (<https://docs.hexagonali.com/>).

Printed documentation is not available for separate purchase.

Training

To access free eLearning, visit Hexagon University (<https://university.hexagonali.com/>).

To register for instructor-led training, call Training Registration at (800) 766-7701 in the U.S. Outside the U.S., call (256) 730-5400 or contact your local Hexagon office.

Customer Support

For the latest support information for this product, including solutions to known software issues, visit Hexagon Support (hexagon.com/support-success/asset-lifecycle-intelligence).

To open service requests outside the U.S., please contact your local Hexagon office.

New Features in this Version

Codes and Standards

Added support for the following piping code editions:

- ASME B31.12 - 2019 Hydrogen Piping and Pipelines, including Part IP Industrial Piping and Part PL Pipelines. (2587049)
- ASME B31.1 - 2022 edition (Power Piping). (3610861)
- ASME B31.3 - 2022 edition (Process Piping). (3258941)
- ASME B31.4 - 2022 edition (Pipeline Transportation Systems for Liquids and Slurries). (3710265)
- ASME B31.5 - 2022 edition (Refrigeration Piping and Heat Transfer Components). (3710266)
- ASME B31.8 - 2022 edition (Gas Transmission and Distribution Piping Systems) . (3710267)
- EN-13480-3:2017/A5:2022 (Metallic industrial piping - Part 3: Design and calculation). (3766708)
- API 617 - 2022 edition (9th edition) for equipment analysis. (3393801)
- ASCE 7 - 2022 edition for wind and seismic loads. (3394117)
- IBC - 2021 for edition wind and seismic loads. (3774779)

Material and Content

- Added fifth working range quadruple springs to the ANVIL hanger tables. Also added spring sizes 000 and 00 for the B-268 springs. (CR-TX-41601)
- Added the fourth and fifth size springs to the PSSI Group hanger tables. (CR-TX-41633)
- Added hanger tables for Rilco Manufacturing pipe supports. (CR-TX-41600)
- Added 119 material records for B31.12-2019 into the material database. Physical property data is from ASME B31.3-2018 and ASME BPVC Section II Part D-2021. Allowable stress data is from ASME B31.12-2019. (3702385)

Piping Input

- Updated the **Seismic Wizard** to support ASCE 7-22 and IBC 2021. (3728042, 3852605)
- Updated the **Allowable Stresses** auxiliary data tab to support B31.12 Parts IP and PL. (3728041, 3737557, 3737558)
- Updated **Use Alternative Rules for Stress Range Evaluation** on the **Configuration Editor** to support B31.12 Appendix B. (3811168)

Static and Dynamic Analysis

- Updated the **Wind Loads** tab (Static Analysis - Load Case Editor Dialog) and the **DLF/Spectrum Generator** to support ASCE 7-22 and IBC 2021. (3737461, 3737460, 3852605)
- Enhanced the software to consider the thermal bowing load when you define a value for **Thermal Bowing Delta Temperature** and define an operating temperature that is the same as or close to the

Ambient Temperature. A technical discussion for thermal bowing is also added to the help. (287351, 1068479)

- Piping codes that use ASME B31J can now use the **SIF Multiplier for Sustained Stress Index** option in the **Configuration Editor**. (3707958)
- Updated the **Dynamic Analysis** calculations for the B31.4, B31.4 Chapter IX, B31.4 Chapter XI, B31.8, and B31.8 Chapter VIII piping codes with multiple offshore and transportation code stresses. The changes affect time history analysis and spectrum analysis. (3652875)
- Updated the MDMT calculations to support B31.3-2022 edition. (3860286)

Equipment

- Updated the **API 617** (Centrifugal Compressors) component of **Equipment Analysis** to allow the **Allowable Load Multiplier** to be greater than 2.0 with manufacturer approval. (2922653)
- Updated the **NEMA SM23** (Steam Turbines) component of **Equipment Analysis** to allow the **Allowable Load Multiplier** to be greater than 2.0 with manufacturer approval. (3030196)

Output and Reports

- Stress reports for primary stress types (such as SUS, OCC, and HYD) now display sustained intensification factors (SSI) for metallic piping codes. (3529918)
- You can now create combined .pdf reports in the **Output Viewer Wizard** of the **Static Output Processor**. (3779193)
- The length of the company name displayed on output reports has been increased from 34 characters to 64 characters. (3628083)

Documentation/Help

- Added a new version of offline help for installations that do not have internet access to the online help. Offline help now opens in your default web browser. (3737360)
- Added a technical discussion for thermal bowing. (1068479)
- Added notes to **Advanced PCF Import (APCF)** and **Import PCF** about using Unicode UTF-8 when your region is set to Asian languages. This allows the proper import of .pcf files containing Asian characters. (2677410)

Fixes

Codes and Standards

- Changed the ISO 14692-2005 implementation when a stress type has no envelope. The stress reports now display the maximum between hoop stress and longitudinal stress instead of always displaying the hoop stress. (791407)

Material and Content

- Fixed an incorrect EN 10269:1999 material number for X2CrNiMo17-12-2. (TR-TX-35150)
- Fixed incorrect long bend radii variables for ½ and ¾ inch nominal OD pipe. (TR-TX-31070)
- Fixed incorrect gasket diameters for the ASME-2009 and ASME-2009M - Class 900 databases. (TR-TX-31730)
- Fixed an incorrect elastic modulus value in the B31.5 database. (TR-TX-41796)
- Fixed a small error in the recommended installation clearance for Pihasa spring hangers. (TR-TX-36028)

Piping Input

- Fixed an issue where block operation renumbering of a PCF-imported model reset coordinates of a block to (0,0,0). (TR-TX-40835)
- Fixed an error where the **Type** list for **B31J SIFs & Tees** sometimes did not display correctly. (TR-TX-41869)
- Fixed an issue where the **Coordinates** list reset to the top of the list after clicking in the graphic view. The **Coordinates** list now sorts in element order instead of node incremental order. (TR-TX-41669)
- Fixed multiple issues involving propagation of inputs in the **Allowable Stresses** auxiliary tab when using ISO 14692 with other piping codes. (TR-TX-25607, TR-TX-32246, TR-TX-36516, TR-TX-36461)
- Fixed an issue with flanges in the NC-3558.3 code where values were required for all flange yield strength fields SY1 through SY9 when temperatures T1 through T9 were not defined. (TR-TX-37306)
- Fixed an issue with **Set North Direction** not displaying the correct axis in **Special Execution Parameters** when switching between files. (TR-TX-36748)
- Fixed an issue where the software incorrectly used FRP type 2 filament as the ISO 14692-2005 default for bends. Type 3 is now the correct default. (TR-TX-33372)
- Fixed an issue where elements hidden by **Line Number** became visible when a legend was displayed. (TR-TX-14738)
- Fixed an issue with the **Equipment Limits** list operations toolbar where clicking in the **From Node** or **To Node** fields made other fields unavailable. (TR-TX-24674)
- Fixed issues with the status of checkboxes, roundtrip neutral file conversion, the **Allowables** list, and input echo for **Hand Lay** and **Appendix P - OPE Allowable Reduction**. (344039)

- Increased the maximum number of jobs to 200 for **Include Structural Input Files**. Added a note on the number of disconnections allowed for **Include Piping Input Files**. (3249205)
- Fixed an issue where B31J surface nodes did not renumber when renumbering all nodes. (3695582)
- Fixed an issue with import of Smart 3D/ SmartPlant Review .vue files. (3870011)
- Fixed an issue with importing a CADWorx .dwg file. (3533795)
- Fixed an occasional issue with the display of a **Guide** due to the incorrect use of CNodes. (2829910)
- Fixed an issue with unreadable small node numbers when printing **Piping Input** graphics to a .pdf file. (2919102)

Structural Steel Modeler

- Fixed an issue with section properties not updating after selecting a cross-section in the **Card Stack**. (TR-TX-34361)

Static and Dynamic Analysis

- Addressed a weight calculation issue for a specific static analysis load case set containing load cases with uniform loads (U1 through U9), the hydrotest load case (HYD), and the WW primitive. The model input also specified the insulation thickness and rigid elements, such as valves or flanges. To exclude the insulation weight from the total system weight for the hydrotest, the software incorrectly applied the uniform load-calculated weight (W) instead of the WW-calculated weight in the HYD load case for rigid elements. This caused an error when importing forces and moments from the HYD load case into **Equipment Analysis** modules. (TR-TX-39451)
- Fixed element viewer, time history, animation, and .tout file issues with the dynamic output processor. (TR-TX-33044, TR-TX-4700, TR-TX-8565, TR-TX-9496, TR-TX-34157, TR-TX-41631)
- Fixed an issue with incorrect node numbers of a reducer displaying in a D/t ratio warning message for the B31.8 and EN 13480 piping codes. (TR-TX-38724)
- Clarified the warning message that displays when you define a negative pressure. (TR-TX-41657)
- For the **Stresses (Multiple Code/Allow) Report**, the algorithm now uses the combination load cases to determine the governing code stress for transportation and offshore piping codes. (TR-TX-32504)
- For ISO 14692 dynamic harmonic analysis, fixed an issue where load cycles, such as occasional loads, were not defined and the OCC factor was zero. This prevented harmonic envelope calculations and resulted in allowable stresses of zero. (TR-TX-36517)
- For the Stoomwezen code, fixed an issue where the internal mill tolerance was incorrectly initialized to zero for reducing tee stress calculations if the mill tolerance was not specified in **Piping Input**. The software now initializes to the **Minimum Wall Mill Tolerance (%)** value defined in the **Configuration Editor**. (3275115)
- Improved the stress calculations for ISO 14692-2017 to exclude the calculation of ring bending stress and roping stress from the algebraic combination load cases. (3202560)

- Improved the load case deletion algorithm to avoid improper deletion of dependent load cases that are marked for modification. (3937966)
- Fixed an issue to automatically apply the Bourdon effect to FRP pipes in the calculation of the limiting force for the restrained pipe status. This change affects B31.4, B31.4 Ch. XI, B31.8 , and ISO 14692-2017. (4026281)
- Fixed a B31J issue where a surface node was missing from the analysis when two adjacent tees shared an element, and the tee definitions were on the shared element. (4077448)

Isometrics

- Fixed a **Generate Stress Isometrics** drawings issue of missing or duplicated load case annotations when both displacement and restraint annotations were requested at the same time. (3207112)
- Fixed an issue with Generate Stress Isometrics unexpectedly closing for models with node numbers longer than five digits. (3974663)
- Fixed an issue with creating isometrics when a model had a tee preceding a bend. (2310418)

Equipment and Components

- Fixed an incorrect calculation and a resulting error message when importing load cases into the **EN-1591 Flanges** module. (TR-TX-39451)
- Fixed an issue where API-610 Annex F did not display on reports for equipment with only one failing nozzle among a pair of nozzles. (3812496)
- Fixed an issue with an incorrect allowable stress value for the WRC 107 Pm+PI+Q load case. (3682034)

Output and Reports

- Fixed an issue with **Code Compliance Report** filtering which affected report accuracy. (TR_TX-39236)
- Fixed an issue with the **Flange Peq Report** where structural element nodes displayed even though flange checks do not apply to structural elements. (TR-TX-39796)
- Fixed an issue with the **Flange NC-3658.3 Report** where the column formatting for AB was sometimes too narrow and displayed asterisks instead of data. (TR-TX-27894)
- The software now formats static output reports to accommodate the displayed values, eliminating the display of multiple asterisks for a large value. (TR-TX-10671)
- Fixed an issue with the **Stresses Extended (Legacy) Report** when using the DNV 2017 code. (TR-TX-39792)
- Fixed an issue with the **Stresses Extended (Legacy) Report** did not display user-specified values for in-plane and out-of-plane SIFs when using the EN13480:17/A5:22 code. (3742103)
- Fixed an issue where the **Stresses Report** used the incorrect data for B31.8 Chapter VIII combination load cases to display failures. (TR-TX-36704)
- Fixed an issue where the **Restraints Report** incorrectly displayed large loads when the double-acting restraint with friction (such as X) was split into individual directions (such as +X and -X). (3537608)

- Added a note to stress and DNV reports to alert users that DNV-ST-F101 applies only to submarine pipeline systems and not to onshore pipeline systems. (2215856)
- Fixed an issue where the controls of the **Filters** dialog > **Line Numbers Tab** of the **Static Output Processor** were not available. (3900732)
- Fixed a B31J issue where a bend element reduced the length of the tee branch all the way to the surface of the header element, causing no display of data in the reports. (4089933)
- Fixed an issue with B31J flexibility calculations when the special execution option **Print Forces on Rigid and Expansion Joints** is cleared, causing elements to be incorrectly filtered out from the reports. (4087647)

External Interfaces

- Fixed an issue where .pcf file import did not correctly import non-English or Unicode text on restraint tags. (TR-TX-33562)
- Fixed an issue where the **CAESAR II Data Matrix** was not importing restraint data from a neutral file. (TR-TX-13985)
- Fixed a node formatting issue that could cause a bend internal node number to use the **To Node** of the element after neutral file conversions into and then out of CAESAR II. (TR-TX-39317)
- Fixed an issue with very small input forces or large negative input forces that caused the software to end when importing an .frc dynamic input file. (TR-TX-8629, TR-TX-16591, TR-TX-20875)
- Added an error message regarding high memory allocation when exporting load cases to Excel in the **Static Load Case Editor**. (2737368)
- In **Import PCF** and **Advanced PCF Import (APCF)**, fixed an issue with duplicate elements from combined .pcf files creating large elements. (3244207)
- Fixed an issue with negative node numbers in **Advanced PCF Import (APCF)** when importing a .pcf file into an existing CAESAR II model. (3675641)
- Fixed issues with North, South, East, and West restraints related to the **North Direction** setting in **Import PCF** and **Advanced PCF Import (APCF)**. (2560516)
- Fixed an issue with incorrect mapping of direction cosines for **Guide** and **LIM** (limit stop) restraints when using the **Data Export Wizard** to export to Microsoft Access database files. (3577527)
- Fixed an issue with missing data attributes in the text file created by the **Data Export Wizard**. (TR-TX-39307)
- Fixed naming and typographical issues with hanger and system units data when exporting model input to a text file in the **Data Export Wizard**. (3431757)
- Fixed issues with missing data when exporting to a Microsoft Access file in the **Data Export Wizard**. (3987681, 3748248)

Units

- Fixed a conversion error for custom nozzle stiffness units in the **Input Echo**. (TR-TX-5184)

- Fixed an issue with **Change Model Units** causing incorrect model unit conversions if more than one conversion was chosen without closing the dialog. (TR-TX-36629)
- Fixed a conversion error for the expansion coefficient of an API 650 flexible nozzle. (3584480)

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