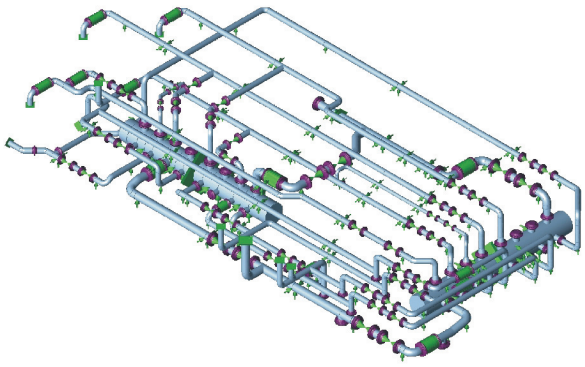
COMPUTATIONAL PIPE STRESS ANALYSIS CAESAR II™



Isometric View of a Caesar II Model

APPLICATIONS

CAESAR II from Intergraph evaluates the structural responses and stresses of piping systems to international codes and standards.

As a registered user we work with the latest software to provide comprehensive static and dynamic pipe stress analysis services.

Our qualified engineers develop pipe models for analysis, while clearly indicating areas of concern and providing an excellent idea of the piping system's flexibility. Colour coded stress models and animated displacements for any stress load case are available.

Besides the evaluation of a piping system's response to thermal, deadweight and pressure loads, CAESAR II analyses the effects of wind, support settlement, seismic loads and wave loads.

CAESAR II also allows for the detailed modelling of expansion joints and restraints such as anchors, guides and skids, as well as selecting the proper springs for supporting systems with large vertical deflections. Dynamic analysis capabilities include modal, harmonic, response spectrum and time history analysis.

INPUT INFORMATION

The pipe model has to be carefully built from scratch by accurately inputting all the parameters:

Pipe Diameter
Pipe Weight / Schedule
Mill Tolerance
Corrosion Allowance
Insulation Thickness

Ambient Temperature
Operating Temperature T1, T2, T3, etc.
Operating Pressure P1, P2, P3, etc.
Hydrostatic Test Pressure

Fluid Density
Insulation Material and Density

Pipe Material; elastic moduli are taken from databases.
Piping Code; allowable stresses are taken from databases.

MODEL INFORMATION

Pipe bends
Reducers
Rigids (i.e. valves, strainers, etc.)
Tees
Expansion joints

Restraints (i.e. anchors, supports, guides, hangers, etc.)
Displacements
Spring Hangers
Flanges
Nozzles

LOAD CASES

Analysis will be performed in order to assess Static or Dynamic Load Case stresses. Load cases can selected from the following:

Operating (OPE) Sustained (SUS) Expansion (EXP)
Occasional (OCC) Fatigue (FAT)

Evaluations for fatigue, wind and seismic loads, offshore and buried pipe are possible either individually or in combination.

PIPING CODES AND STANDARDS

Analysis can be made to the following international codes, specifications and standards:

ASME	American Society of Mechanical Engineers
ASME B31.1	Power Piping
ASME B31.2	Fuel Gas Piping
ASME B31.3	Process Piping
ASME B31.4	Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids
ASME B31.5	Refrigeration Piping
ASME B31.8	Gas Transmission and Distribution Piping Systems
ASME B31.9	Building Services Piping
ASME B31.11	Slurry Transportation Piping Systems
BS 806	British - Specification for design and construction of ferrous piping installations for and in connection with land boilers
BS 7159	British - Code of practice for design and construction of glass-reinforced plastic (GRP) piping systems for individual plants or sites
CAN Z662	Canadian - Oil & Gas Pipeline Systems
CODETI	French - Petrochemical
DNV	Norwegian - Det Norske Veritas
EN 13480	European - Metallic Industrial Piping
FDBR	German - Piping Code
GPTC / Z380	American - Guide for Gas Transmission and Distribution Piping Systems
HPGSL	Japanese - High Pressure Gas Safety Law
IGE / TD / 12	British - Institute of Gas Engineers
ISO 14692	International Organisation for Standardisation Petroleum and natural gas industries - glass-reinforced plastic (GRP) piping
JPI	Japanese - Piping Code
NAVY S505	Navy Piping Code
Norwegian TBK-6	Norwegian - Piping Code
PD 8010	British - Code of practice for pipelines
RCC- M	French - Nuclear Piping Code
Swedish 1	Swedish - Piping Code
Stoomwezen	Dutch - Piping Code
UKOOA	UK Offshore Operators Association

...and more as new versions of Caesar II are released.