EnginSoft is a premier consulting firm in the field of Simulation Based Engineering Science (SBES) with a global presence. It was founded in 1984, but its founder and initial employees had been working in SBES since the mid ‘70s. Throughout its long history it has been at the forefront of technological innovation and remains a catalyst for change in the way SBES and CAE technologies in general are applied to solve even the most complex industrial problems with a high degree of reliability.

Today, EnginSoft is comprised of groups of highly qualified engineers, with expertise in a variety of engineering simulation technologies including FEM Analysis and CFD, working in synergic companies across the globe. We are present in Italy, France, Germany, the UK, Sweden, Turkey and the U.S.A. and have a close partnership with synergetic companies located in Greece, Spain, Israel, Portugal, Brazil, Japan and the U.S.A.

EnginSoft works across a broad range of industries that include the automotive, aerospace, defense, energy, civil engineering, consumer goods and biomechanics industries to help them get the most out of existing engineering simulation technologies.

ITALY
+39 0461 9153 91

FRANCE
+33 1 41 2299 30

GERMANY
+49 2234 60386 10

UNITED KINGDOM
+44 2476 9971 60

NORDIC EUROPE
+46 46 286 89 00

TURKEY
+90 216 504 11 53

USA
+1 469 912 0504

www.enginsoft.com | info@enginsoft.com

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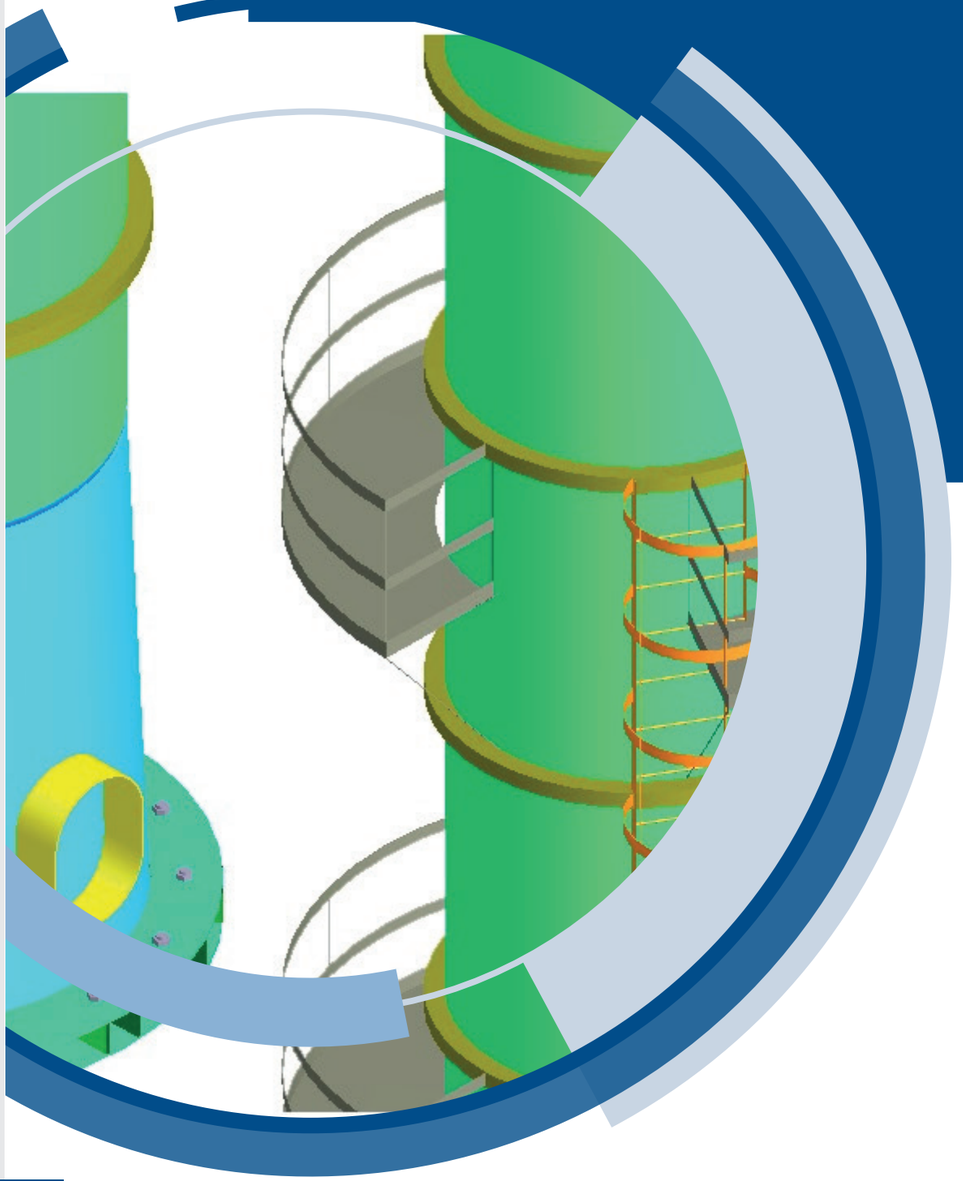
DATA SHEET



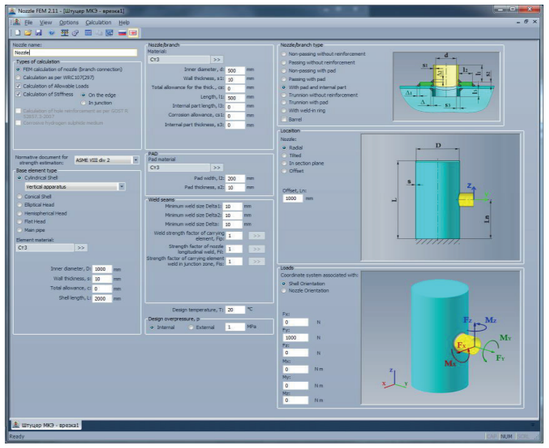
VPASS START-PROF

Nozzle-FEM:

Analysis of stress state, calculation of flexibilitiesS and allowable loads of nozzle junctions

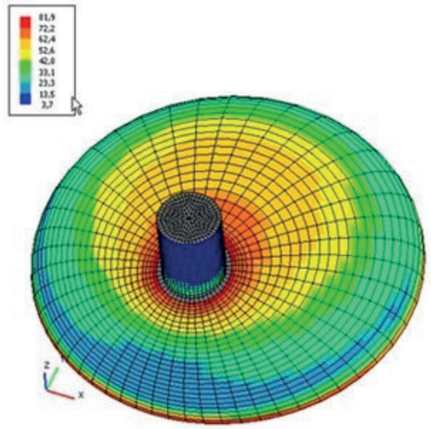
Nozzle-FEM is designed for stresses and flexibility calculation of nozzle-to-shell junctions using the Finite Element Method (FEM). The program also calculates nozzle's allowable loads and estimates strength of the nozzle's junctions for wide range of geometric configurations and operating conditions. Nozzle-FEM helps to provide higher level of the equipment safety along with reducing labour costs at the design stage. The program is recommended for designing and industrial safety review of oil and gas, refining, petrochemical, chemical, power and other industrial facilities.

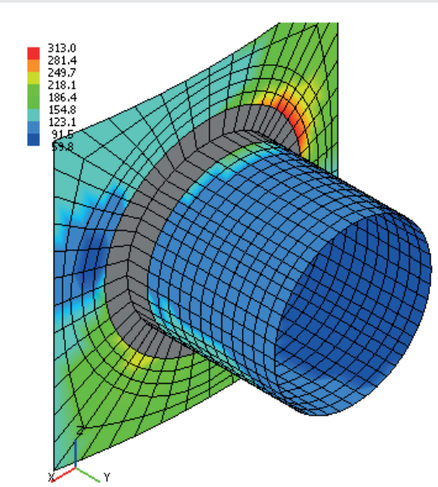
Unlike the universal FEM programs (ANSYS, NASTRAN, COSMOS, etc.), this program does not require special training and can be used by any mechanical engineer.

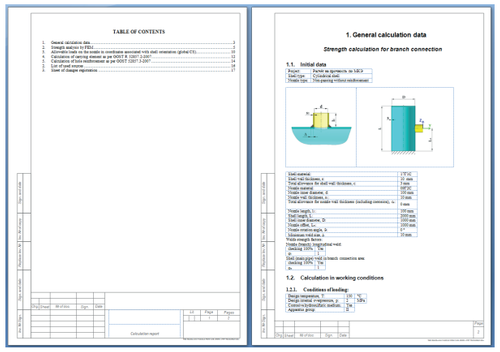


Nozzle FEM is a product

PSRE
NTP Truboprovod
Piping Systems Research & Engineering Co.







Nozzle-FEM: Analysis of stress state, calculation of flexibilities and allowable loads of nozzle junctions

The program performs stress analysis for nozzles (including trunnions) of arbitrary geometry connected to cylindrical and conical shells, as well as elliptic, hemispherical and flat heads. It takes into account vessel boundary restraints and loads on the nozzle from the adjacent pipeline. Both nozzle and shell membrane, bending and total stresses can be calculated. Calculation of the pipe branch connections is also implemented, enabling detailed stress analysis of non-standard tees and pipelines branch connections.

Along with stress and stability analysis the program also performs nozzle-shell junction flexibility calculation, as this flexibility can considerably influence vessel and piping stresses. During stress analysis of pipeline systems nozzle-vessel junctions are often simulated by anchor supports which leads to overestimation of stresses and tensions. In order to automatically create the appropriate non-standard support in the calculation model, the nozzle-shell junction flexibility calculated by Nozzle-FEM can be copied via the clipboard into the START Prof piping stress analysis program.

Calculated stresses can be estimated using different codes: ASME VIII Div.1,2; EN 13445-3; GOST R 52857.1-2007; JB 4732-1995; PNAE G-7-002-86 (for equipment and pipelines of nuclear power plants) for allowable stresses. Shell stress and stability analysis (according to GOST R 52857.2-2007) is also implemented, as well as reinforcement required of openings under internal pressure (GOST R 52857.3-2007). Nozzle-shell junctions working in corrosive hydrogen sulphide environment are analysed in accordance with GOST R 52857.10-2007.

Supplied database contains materials properties as per ASME II Part D, EN standards, GB-713-2008, JB 4732-1995, GOST R 52857.1-2007.