

Analysis software to meet the needs of the engineering analyst

Engineers worldwide are constantly seeking ways of cutting design times whilst optimising structural performance. The best way to achieve this is to use analysis software that specialises in providing cost-effective solutions for all aspects of analysis and design. LUSAS *Analyst* has been specifically developed for the engineering industry and is founded on the well proven technology of the LUSAS FE system. Regarded as a world leader in engineering analysis, LUSAS *Analyst* is rich in powerful and advanced features to meet your analysis needs and extend your design capabilities.

Powerful and cost-effective solutions



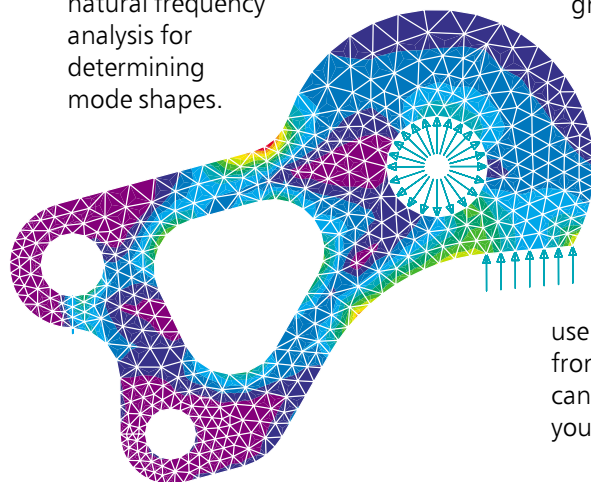
Quick and easy to use

The intuitive Graphical User Interface (GUI) gives easy access to the full range of powerful modelling and results processing facilities, together with on-line help. LUSAS *Analyst* runs on the full range of PCs and workstations giving complete freedom of choice. Because the same GUI is used across all PCs and workstations LUSAS *Analyst* has the same 'look and feel' on all computers. This enables you to easily change between computers and gives you the additional benefit of being able to work in a mixed environment of PCs and workstations if you wish.

Ideal for everyday analysis

LUSAS *Analyst* comfortably meets your everyday analysis needs. Unrivalled state-of-the-art element libraries and material models allow all types of engineering problem to be solved. Metals, plastics, foams, and rubbers can all be modelled. Isotropic and orthotropic models are available for linear static, linear buckling, and fatigue analyses plus natural frequency analysis for determining mode shapes.

State-of-the-art analysis software
LUSAS *Analyst* contains a comprehensive range of unrivalled engineering analysis facilities to cater for all types of engineering design. From simple 2D linear analysis of beams and plates through to advanced 3D nonlinear shell and solid modelling, LUSAS *Analyst* will help shorten your design and checking times giving reliable results every time. A policy of continuous development ensures that LUSAS *Analyst* stays at the leading edge of technology, so you will always be using state-of-the-art software to produce cost-effective designs.

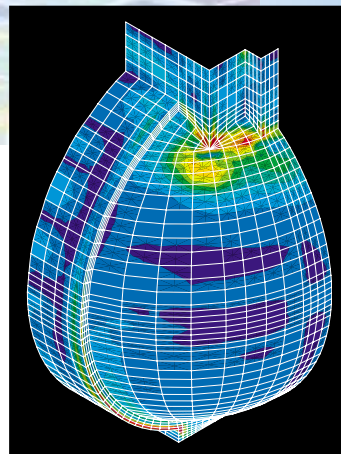


Better results in less time

LUSAS *Analyst* lets you do more in less time. All models are created with built-in associativity allowing rapid design changes to be made. Automatic meshing is available and for certain types of problem LUSAS *Analyst* will automatically solve to a user-specified accuracy using adaptive procedures. GUI results processing facilities allow extensive contouring, graphing and plotting for rapid interpretation of results.

Fully customisable

By using the advanced parametric language facilities, user-defined menus and forms can be added allowing specific repetitive analysis tasks to be performed with a minimum of user involvement. Complete analyses from modelling to results processing can be automated - and all tailored to your way of working.



Advanced analysis and design

Unlike some systems, LUSAS *Analyst* goes well beyond your everyday analysis needs. Advances in technology require advanced software solutions. LUSAS *Analyst* offers these solutions now to give you the edge over your competitors. An easy upgrade from LUSAS *Analyst* to LUSAS *Analyst plus* and associated options gives an extended element set, additional material models, Fast Iterative Solver Technology and access to advanced analysis capabilities. A software key system means that you can call us at any time for a key to unlock these powerful facilities so that you can tackle new analyses straightaway.



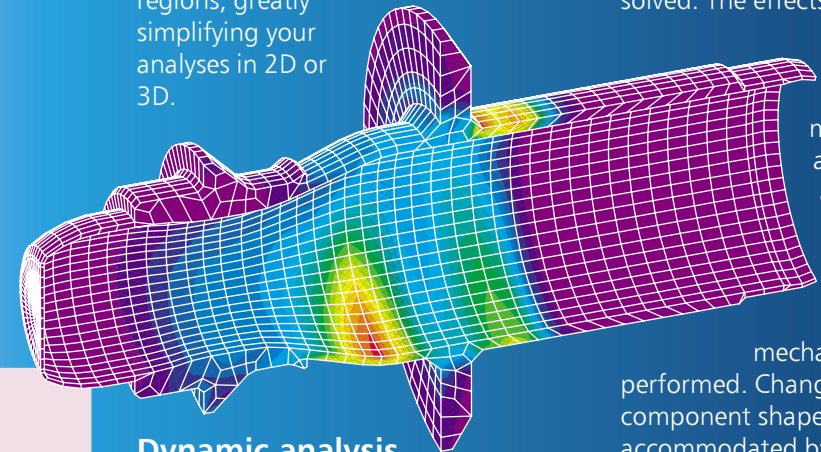
Comprehensive nonlinear analysis

LUSAS *Analyst* is also rightly regarded as the leader in nonlinear analysis with superior problem solving capabilities. Powerful facilities for geometric, material and boundary nonlinearity are available for problems involving large deformations, plasticity and collapse. Fully automatic load incrementation, automatic recovery from convergence failure and restart features are all designed to enable newcomers to nonlinear analysis to quickly become proficient in solving a wide variety of nonlinear problems. Results processing facilities provide automatic load-displacement graphs and viewing of yielded material.



Impact and contact analysis

For low or high speed impact and contact problems LUSAS *Analyst* leads the field. Contacting elements are automatically detected and specially developed 'slidelines' and 'slidesurfaces' handle the interaction that takes place at contacting regions, greatly simplifying your analyses in 2D or 3D.



Dynamic analysis

Forced response, vibration and transient dynamics problems can be solved quicker with LUSAS *Analyst* and, if you wish, interactively by calculating the response for selected loadcases using the results processing facilities. This gives shorter analysis times and reduced disk usage compared to a full transient dynamics assessment.

Thermal analysis

LUSAS *Analyst* has a powerful set of thermal elements and extensive facilities for both simple and advanced, steady state and transient thermal analyses. Problems involving heat transfer due to conduction, convection and radiation can all be solved. The effects due to phase change of material can also be considered. If material properties are significantly affected by temperature distribution then a semi-coupled thermal/mechanical analysis can be performed. Changes to the component shape can be accommodated by a fully coupled analysis.

Working from CAD data

Model information can be exchanged with a wide range of CAD systems using industry standard formats such as IGES and DXF, as well as directly with specific CAD systems using proprietary data exchange formats.



.... using well proven FE technology



Software Developments and Updates

A policy of continuous development ensures that LUSAS *Analyst* always contains the most up-to-date facilities to help you stay ahead of your competition. Our industrial and academic collaborative projects are continually advancing the frontiers of current FE technology giving both you and LUSAS *Analyst* an important competitive edge.



Quality assurance

The accurate and reliable results you get from LUSAS *Analyst* come not only from our continuous development program but also from our use of an automatic installation and testing system for each computer type and operating system. With our quality control procedures, designed to comply with ISO 9001, you can use each new improved version of LUSAS *Analyst* with the same confidence as the last.

Hot-line technical support

Should you need assistance help is no more than a telephone call away. Our dedicated support engineers are experts in providing sound modelling and analysis advice to engineering analysts in a friendly and informative manner which will help you meet deadlines and capitalise on your investment.

Consultancy services

If you need greater assistance than that available through the hot-line service, then our team of engineering consultants are here to help. Whether you have a difficult analysis to carry out, or need help with a peak workload, our rapid and cost-effective consultancy service will ensure you get the best out of your designs.

LUSAS

Analyst

A feature-rich engineering analysis system for general use consisting of :-

- **Advanced high-performance element library**

Including: Bars, thick + thin beams, plane stress/strain continuum, axisymmetric solid continuum, solid continuum, flat thin membranes, thick + thin plates, flat thick + thin shells, axisymmetric membranes, axisymmetric thin shells, generalised joint/springs/gaps.

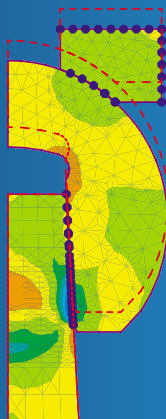
- **Advanced materials**
Including: Isotropic, orthotropic, anisotropic and rigidity models, temperature dependency.

- **Integrated GUI**

For: Linear static stress, linear buckling, natural frequency and fatigue analysis.

Other Software Available

- **LUSAS CAD Toolkit** for interfacing to other systems via DXF, IGES, and other proprietary interfaces.
- **LUSAS Composite** for advanced analysis of all types of laminated and composite components.



Training services

Our training services get you up-to-speed quickly, and ensure that you have sufficient knowledge of the relevant facilities in LUSAS *Analyst* to tackle the types of analysis that you want to do.

Find out more

Clients worldwide are benefiting from the commercial advantage that LUSAS *Analyst* gives. Contact FEA or your local distributor to ask for more details or arrange a demonstration.



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Distributors worldwide

LUSAS

Analyst plus

An extended, feature-rich engineering analysis system for more advanced analysis consisting of :-

- **All the features and elements of LUSAS *Analyst***

- **Extended advanced high-performance element library**

Including: Implicit elements - curved bars, curved thick + thin beams, curved thin semiloof shells, curved thick shells, curved solids (high order), axisymmetric solid continuum with non-axisymmetric loading. Explicit elements - plane stress/strain continuum, solid continuum.

- **Fast Iterative Solver Technology**

For: All types of linear static stress, nonlinear, dynamic and thermal analysis problems when used with the appropriate LUSAS *Analyst plus* option.

LUSAS *Analyst plus* Options

Nonlinear Analysis

- Large displacement, large rotation and large strain geometric nonlinearities
- Material nonlinearity including plasticity, concrete, damage, crushable foam, rubber, creep, phase change, temperature dependent and user supplied models
- Incremental, iterative (MNR or NR), line search and arc length solution procedures
- Follower forces, centripetal stress stiffening
- Slideline/slidesurface contact algorithms

Dynamic Analysis

- Spectral and Forced Response
- Modal or Rayleigh Damping
- Modal synthesis
- Transient Dynamics (Implicit and Explicit)
- Automatic time step selection
- Nonlinear Dynamics
- Time dependant materials and loading

Thermal Analysis

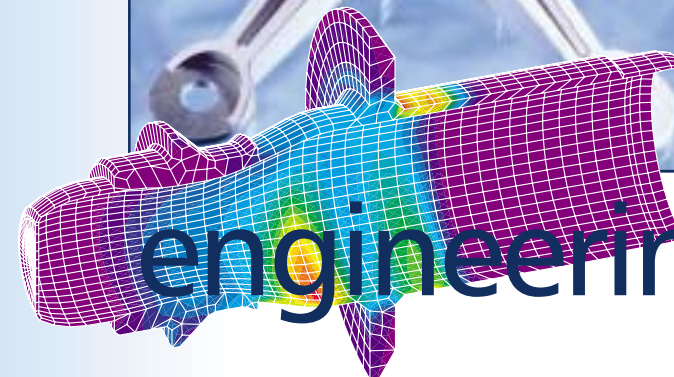
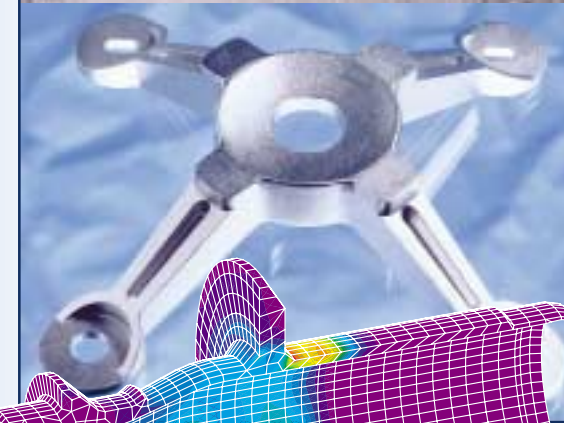
- Conduction/convection/radiation
- Steady state and transient
- Linear, nonlinear, and temperature dependant material models
- Automatic time steps
- Diffuse radiation using view factors
- Full or semi thermal/mechanical coupling
- Convection and nonlinear radiation boundary conditions

Local distributor

a specialist application using proven FE technology

LUSAS

Analyst



advanced engineering analysis