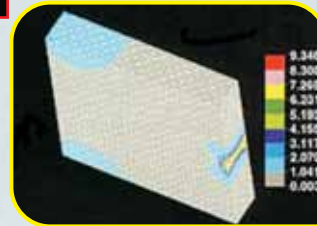
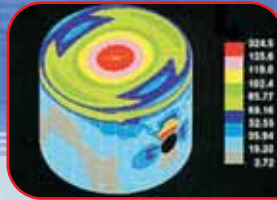
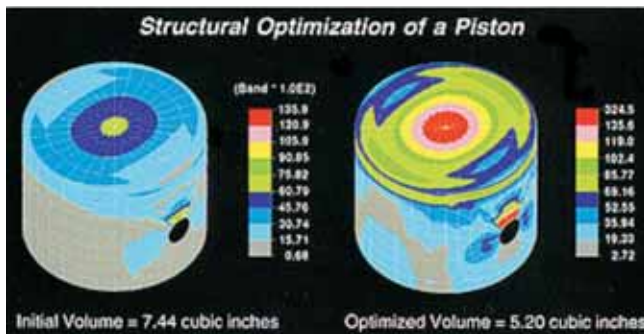


# NISA - OPT



## OPTIMUM STRUCTURAL DESIGN

NISAOPT is the most sophisticated family of computer programs available in the world for optimum structural design. The three programs in the NISAOPT family: STROPT, SHAPE, and SECOPT, are fully integrated with NISA II and DISPLAY III/IV. State-of-the-art methods are utilized at initial design, intermediate design, and optimum (final) design. Design sensitivity coefficients are also available.



## STROPT

- Minimization of material volume, mass, and weight for fixed geometry by changing thickness of shell, layer orientation angles and thickness of composite laminate and cross sectional dimensions of Beams/Bars
- Capabilities include:
  - Optimum design for multiple load cases and associated boundary conditions
  - Various optimization algorithms and design sensitivity analysis methods
  - Standard cross sections as well as generalized beam section
  - Design Sensitivity Coefficient (DSC) vs. Design variable number
- Constraints include: Displacement; normal, shear, principal, von Mises, octahedral, node & Gauss point stresses, AISC code; failure criteria; buckling load factor; natural frequency; amplitude under harmonic excitation
- Virtually no limits on the number of design variables and constraints

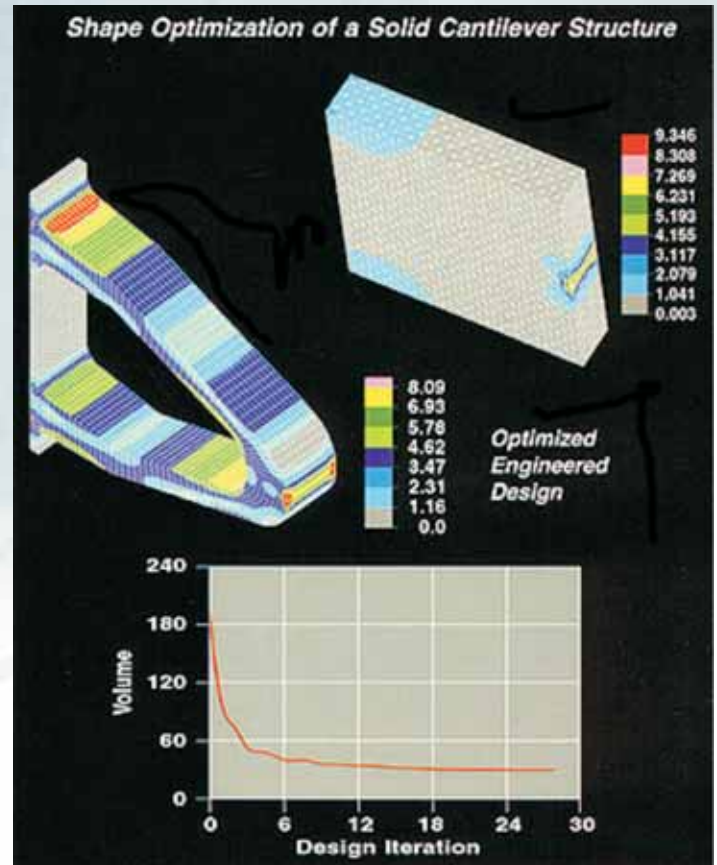
# NISA - OPT

## SHAPE

- Optimization of structural shapes fully based on initial finite element model, thus no need to model boundary by parametric curve
- Minimization of mass, volume, or material cost
- Constraints include: stress and displacement under multiple load cases and stiffness at nodes
- Any symmetry condition can be fully exploited in modeling
- Driving of the solution towards global optimum
- Entire shape of prescribed regions may be subjected to design variation
- The program may form and expand new holes and cut-outs within the system
- DSC contour plots
- The only commercially available program that allows removal of material for optimum shape by removing elements from both within the model and from the boundaries of the structure

## SECOPT

- Beam cross-section optimization of any prescribed general shape, including single or multiple connected cells
- Design variables can be thickness and side length
- Constraints can be imposed on section properties; and on requirements from design code and other considerations



Cranes Software International Limited is a leading provider of Computer Aided Engineering (CAE) services to the Automotive, Aerospace, Energy & Power, Civil, Electronics and Sporting Goods industries. Over 70 dedicated scientists, technology architects and software engineers providing NISA based solutions have helped major engineering companies reduce analysis turnaround time, improve user productivity, and ensure faster return on investments. The Company has its presence in 33 countries across the world and has a user base of more than 350,000.

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