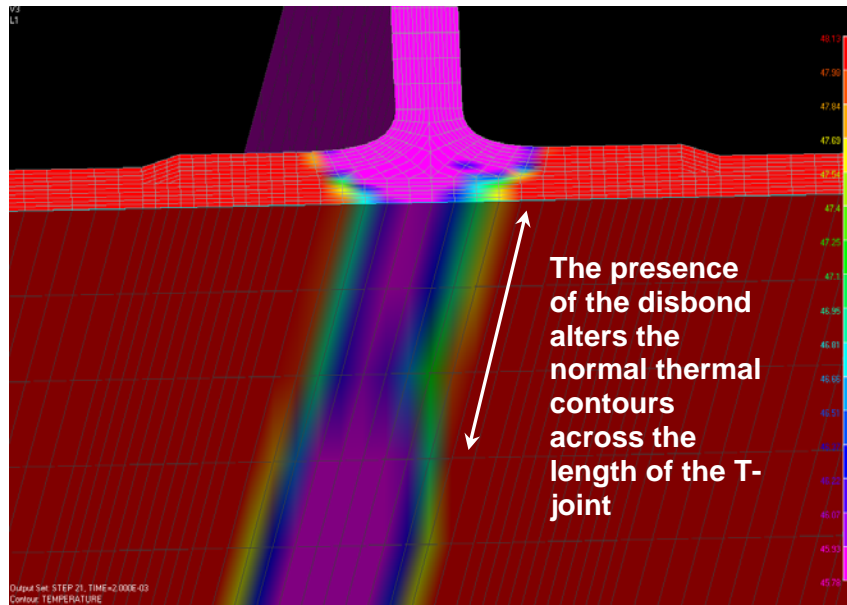
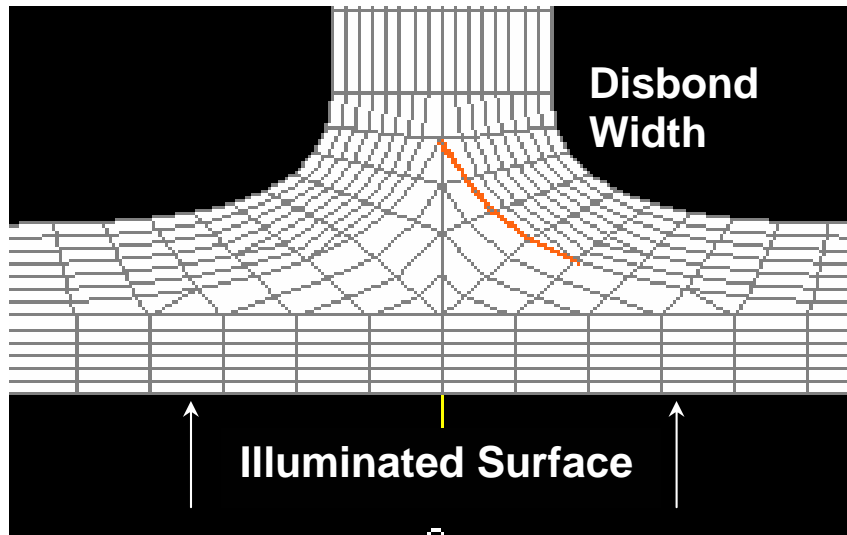


Aerospace Case Study (Monash University – Damage Assessment of Composite Structures)



Monash University of Australia (www.monash.edu.au) used thermography as a tool for damage assessment of composite structures. This non destructive evaluation technique utilizes heat transfer principles to detect subsurface defects. Thermography offers broad area scanning which, once defect location has been established, can be used in conjunction with small area scanning. This possibility considerably reduces inspection time.

NEi Nastran software was used to perform transient thermal analysis of finite element models as a simple numerical method that will allow defect detection sensitivity to be established well before even an experimental sample has been created.

This project produced a calibrated finite element model that accurately characterizes the process of heat transfer through a damaged composite sample. The response properties of this model were used to predict damage parameters for a complex non axis-symmetric geometry. Of particular interest were the T-joint structures of the type used in the aerospace field. Inspection of the region within the epoxy-laminate interface region is currently extremely difficult and hence of particular interest.

The use of the HEXENODE parameter in NEi Nastran's Hex brick elements counters the frequent problem of convergence encountered when modeling composite structures of typically high aspect ratios.

In thermography, where defects in extremely complex shapes have been difficult to predict, the use of finite element analysis can be expected to adequately model the thermal behavior.

NEi Software, Inc. is aggressively focused on commitment to the customer. Detailed documentation, customized on-site training, and comprehensive technical support ensures that you will see immediate return on your investment.

For more information about our company or our products, please contact:

Headquarters:

NEi Software, Inc.

5555 Garden Grove Blvd., Suite 300

Westminster, CA 92683-1886

USA

Phone: +1.714.899.1220

Fax: +1.714.899.1369

Email: info@neisoftware.com

Website: www.NEiSoftware.com

Europe:

NEi Software EMEA Office

The Old Barrel Store

Draymans Lane, Marlow

Buckinghamshire, SL7 2FF

United Kingdom

Phone: +44.0.1628.400.645

Fax: +44.0.1628.891.701

E-mail: emea@neisoftware.com

Website: www.NEiSoftware.com/emea

Asia:

NEi Software Asia Office

Shinjuku Park Tower

N30th Floor 3-7-1 Nishi-Shinjuku

Shinjuku-ku, Tokyo, 163-1030

Japan

Phone: +81.03.5326.3062

Fax: +81.03.5326.3001

E-mail: asia@neisoftware.com



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