



# K<sub>IC</sub> Fracture Toughness Testing Software

For Use With FastTrack™ 8800 Servohydraulic Testing Systems



**INSTRON**

*The difference  
is measurable*

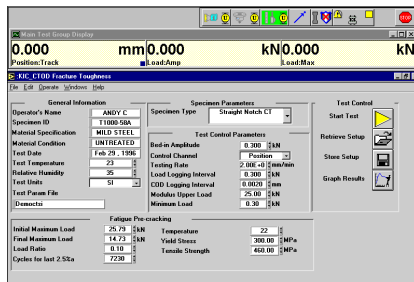
# Fast and Efficient $K_{IC}$ Testing to Accepted Standards

The FastTrack™ 2 fracture toughness testing software is a complete package for  $K_{IC}$  testing on pre-cracked brittle specimens, increasing laboratory efficiency and improving accuracy of test results. Operating within Windows® 95, 98, 2000, XP Professional and NT environments, the user interface is consistent with the other packages in the FastTrack 2 applications suite.

The  $K_{IC}$  program features:

- Test control and results to:
  - ASTM E399 for  $K_{IC}$  and E1290 for CTOD
  - BS7448-1991 for  $K_{IC}$ , CTOD and J
- Interactive results manipulation
- Report of test results and any invalidity parameters
- Universal ASCII format raw data

realtime graphics keeping the operator informed of the status of the test until it finishes. On completion, a printed and graphical report of the  $K_{IC}$  value is produced. The program indicates if the test meets the ASTM/BS standard and if not, cites the invalidity messages from the relevant standards.



## Ready for Testing in Minutes

Once the test parameters have been entered, the program automatically balances the transducers and sets up the initial test conditions. The  $K_{IC}$  test is then run, with

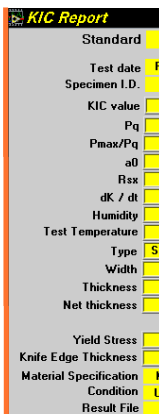
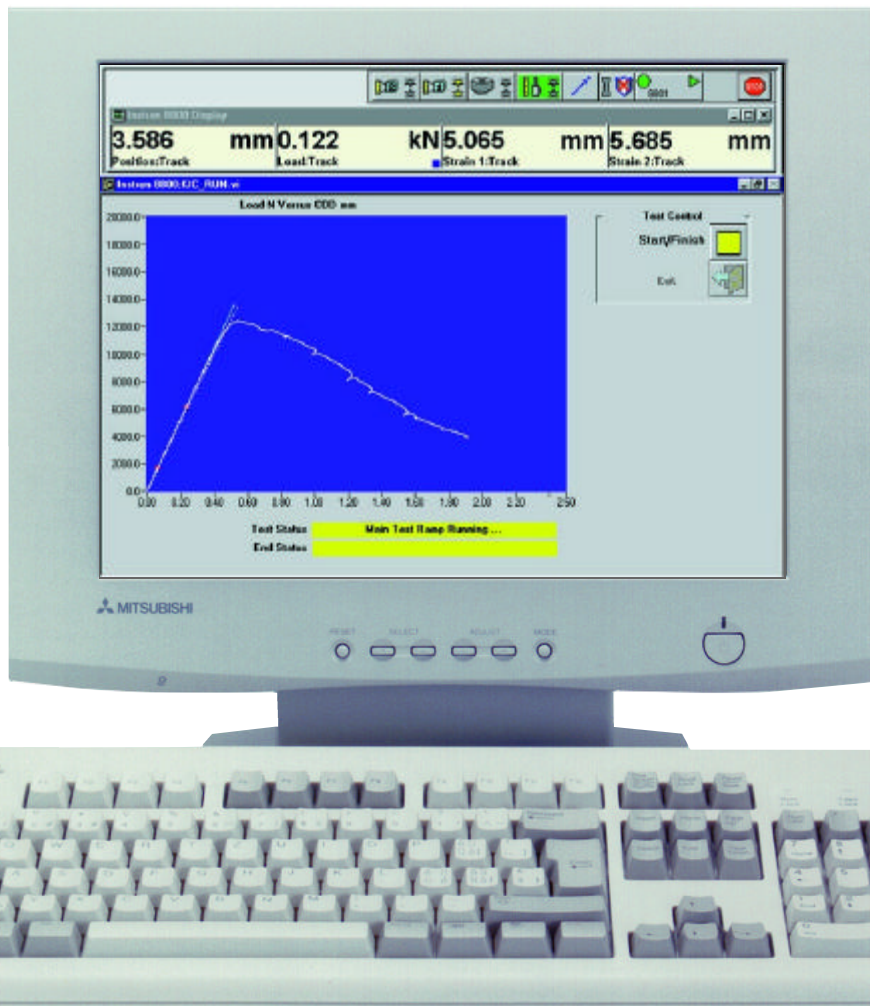
## Running a Test

The program conducts the  $K_{IC}$  test in a sequence of selected steps, each with its own set of realtime controls and graphics:

- Test parameter set-up - the system is driven to zero load and the COD (crack opening displacement) gauge is rebalanced

▲ Testing data is specified in a straightforward manner on a single page, or recalled from a file stored on disk.

During the test a realtime graphics display shows a plot of load versus COD gauge output to allow monitoring of the test status and progress.



▲ A summary report information is available depends on the sta

## FastTrack™ Software Suite

FastTrack is Instron®'s family of software applications for use with FastTrack 8800 testing systems. FastTrack applications work within the FastTrack Console environment or alongside the FastTrack 8800 Operator Panel. The FastTrack family includes:

- **MAX** for simple fatigue testing
- **WaveMaker** for more advanced fatigue applications
- **Merlin** for tension, compression and other static tests
- **K<sub>IC</sub>** for fracture toughness/CTOD applications
- **da/dN** for fatigue crack propagation testing
- **J<sub>IC</sub>** for unloading compliance testing
- **LCF** for low cycle fatigue testing
- **Random/spectral loading** for end-point data playback
- **RSPlus** for continuous data playback
- **Block Program** for simple block tests
- **LabVIEW Drivers** for programming FastTrack 8800 in the LabVIEW environment
- **Other applications** including stress corrosion and elastomeric tests

Data from all FastTrack applications can be freely exchanged with other Windows® programs.

Testing to failure under user defined conditions - the K<sub>IC</sub> test begins, switching to the desired control mode (either position or load control) to complete the test to specimen failure or at a pre-set limit

Sub-sized specimens can also be tested using the program, allowing K<sub>IC</sub> values to be determined for thin materials.

## Flexible Post-Test Analysis

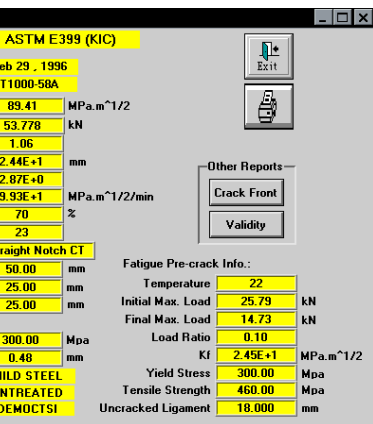
Once the test is completed, the data is stored and the calculations for K<sub>IC</sub> performed by the program. Summary reports and graphs from this or previous tests are available for display or printout. Test data reanalysis may be performed retrospectively allowing you to apply new test criteria to obtain maximum value

from your test data. For example, upper or lower modulus limits can be repositioned and new results calculated as many times as you wish.

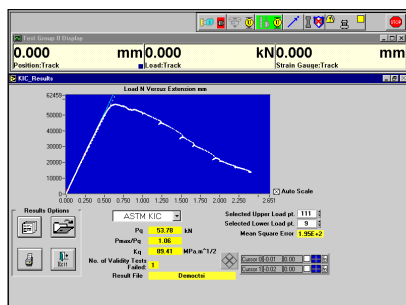
A summary report including the K<sub>IC</sub> value and all test and specimen information is available for each test, as well as a validity report highlighting any area of the ASTM or BS standards' criteria that has not been met.

## Range of Specimens

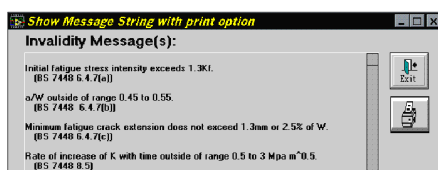
Straight notched compact-tension, stepped notched compact-tension and three-point bend specimens are selectable at the touch of a button. Having clicked on the appropriate specimen geometry, your individual specimen dimensions and parameters may be entered.



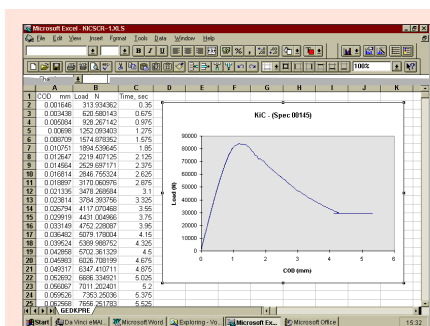
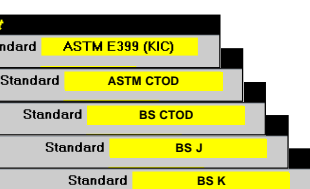
Results facilities include the flexibility to select the standard for the results calculation, for any test performed. The results displayed depend on the standard selected.



A validity report is available highlighting any area of the ASTM or BS standards' criteria that has not been met.



including the K<sub>IC</sub> value and all specimen information available for each test. The format of the report can be selected.



### Complete data flexibility

The FastTrack 2 K<sub>IC</sub> program stores all the data files in ASCII format for convenient analysis and presentation in the spreadsheet or scientific graphics program of your choice. You can quickly create documents such as customized test reports using any commercial Windows® 95, NT and 98 software such as Excel (including version 7.0), Word or MicroCal Origin graphics software.

## Specifications

### Control

- n Test procedure - in accordance with ASTM E399  $K_{IC}$ , ASTM E1290 CTOD, BS7448K, BS7448 CTOD and BS7448J
- n Control mode - position or load
- n Pre-test functions
  - User defined pre-loading cycle ensures correct specimen "bedding in"
  - Load or position controlled test to failure at a user defined rate
  - Variable logging rate on all data channels
- n Test termination - automatic on specimen break or pre-selected limit in load or extension
- n Realtime graph - load versus crack opening displacement

### Results and Data Handling

- n Results reporting - in accordance with ASTM E399  $K_{IC}$ , ASTM E1290 CTOD, BS7448K, BS7448 CTOD and BS7448J
- n Post-test results
  - User selectable upper and lower load points
  - Unlimited recalculation capability using new results and specimen parameters
  - Storage of measured crack lengths
  - Invalidity messages
  - Recalculation using new standards
- n Data storage format - ASCII
- n Max. data sample rate - 1KHz
- n Graphs - Load versus COD

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