

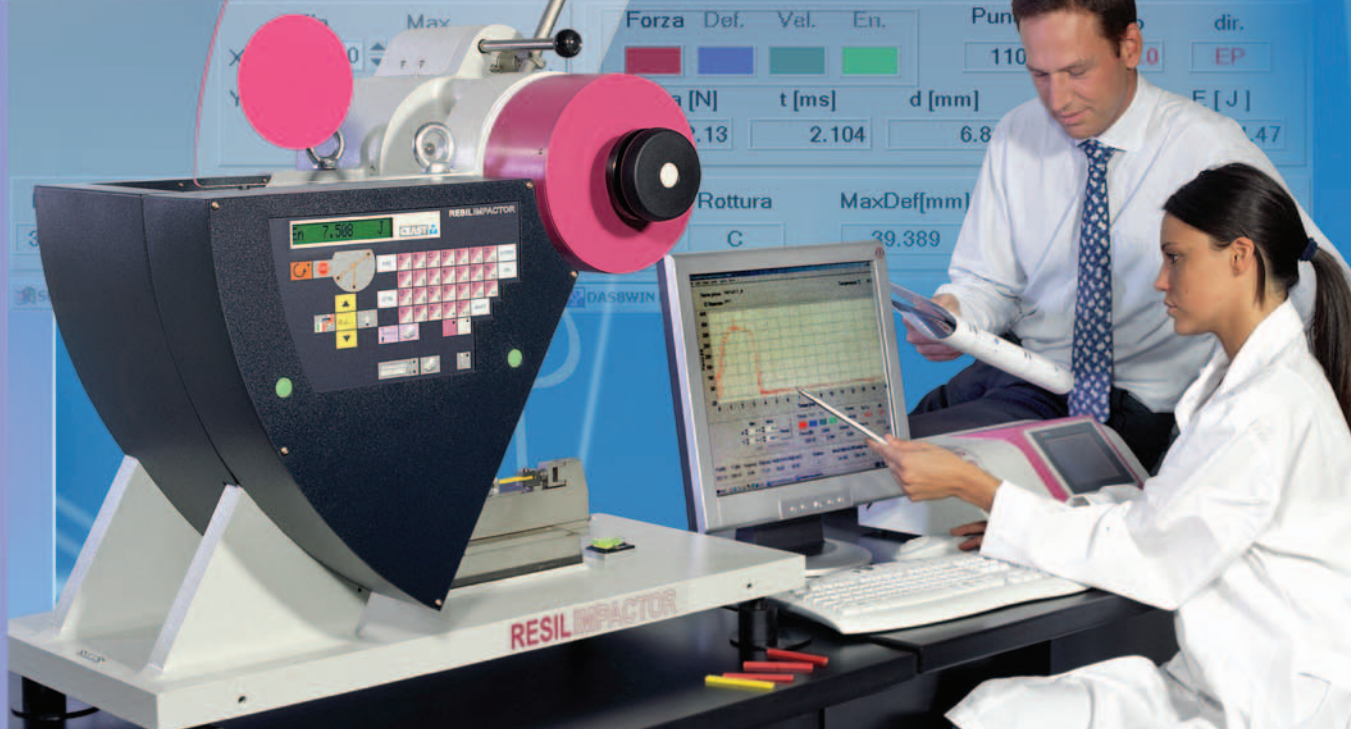
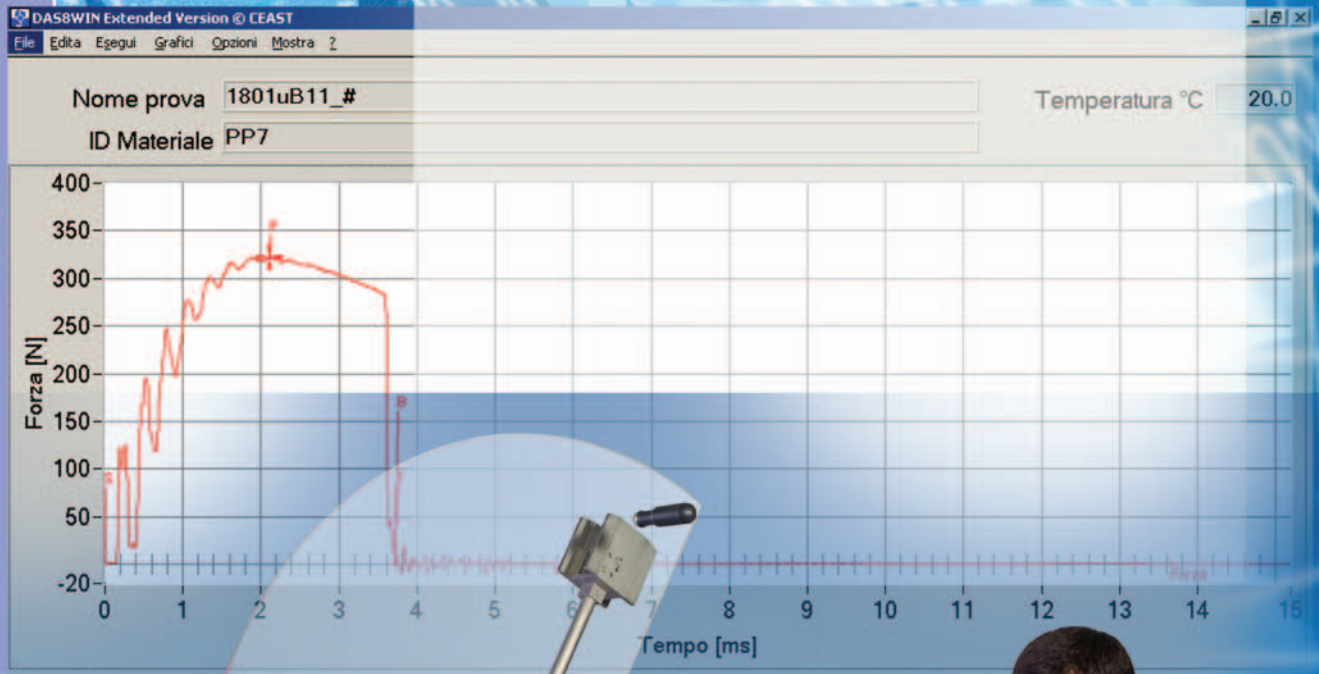
IMPACT FAMILY SOFTWARE

CEAST



progress in testing

the NEW advanced Software Visual•IMPACT



Software for test setup and management, including acquisition, storage and processing of impact data – designed for CEAST pendulums and falling weight instruments

Introducing the Visual•IMPACT software

The new Visual•IMPACT software is designed to control CEAST pendulums and falling weight instruments, managing tests and offering a user-friendly interface when using the DAS 8000 or DAS 16000 data acquisition systems. It records force and absorbed energy data related to impacts, visualizes and helps analyze the results and calculates resilience. The operator is guided through parameters setup by means of tables describing strikers and specimens that are filtered according to the test type and international standard selected. In the case of instrumented tests, many possibilities for data analysis and visualization are made available. The results are shown through comprehensive and customizable graphs and can be filtered by break type (only specimens with a selected break type are shown); working with groups of tests the software performs a statistical analysis, and the operator can pick and discard single test results. Different measurement units can be selected. It is possible to print reports and to export data totally or partially.

This software has been also designed to manage CEAST high-end automatic instruments: Reslvis (pendulum automatic system) and Automatic Fractovis Plus (falling weight automatic system). Multiple sets of tests can be programmed and run, controlling multiple specimen loaders, specimen conditioning cycles by environmental chambers and cryogenic units, optical and IR imaging options, and dimension-measuring devices. The automatic system includes of course impact data acquisition, analysis and storage.

The features of this program are:

Test parameters definition Fig. 1, 2

- A table, filtered according to the selected international standard, helps the operator choose the specimen to be used by displaying graphically the requested shape and dimensions; it is also possible to use customized specimens

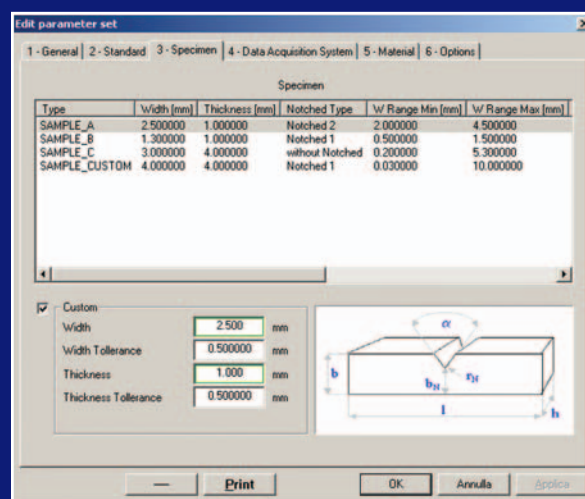


Fig. 1 Parameter table for specimen choice

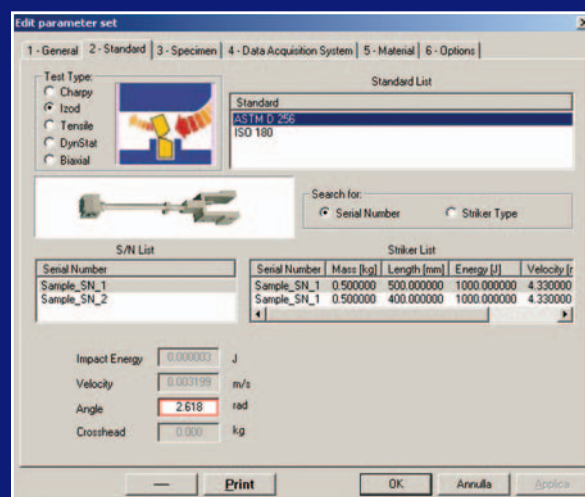
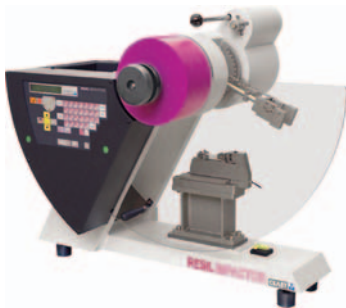


Fig. 2 Parameter table for hammer or striker choice according to test method

CEAST instruments managed by Visual•IMPACT software



CEAST Pendulum family
(Resil Impactor)



CEAST Automatic Pendulum family
(Resilvis)



Falling Weight family
(Fractovis Plus)

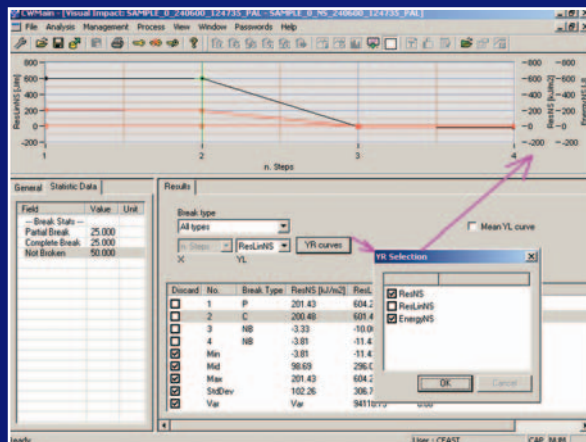


Fig. 3 Results visualization

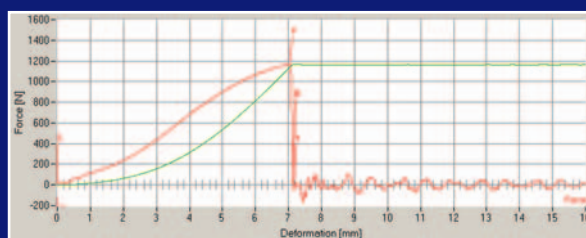


Fig. 4 Results visualization

- A table, filtered according to the selected international standard, assists in the hammer and striker choice, using either serial number (written in the certificate) or component description
- Subdivision of other parameters in several windows to help in parameters compilation

Performing tests

- Main settings of the instrument and test parameters can be displayed at any time
- Customizable graphs for test output visualization

Results visualization Fig. 3, 4

- Absorbed energy during impact and calculated resilience value (expressed in kJ/m^2 , in J/m and in BU units) are shown in graphs
- Statistical data from impacted specimens (minimum, maximum, medium value, standard deviation and variance) are shown
- The operator can discard or include again (in results visualization and in the test reports) selected specimens to study variations of statistical data
- Data can be filtered by break type (i.e. complete break, partial break,...)
- The operator can change specimen dimensions after test and recalculate test results

Data Export

- Data export in .txt or Excel format
- Customizable selection of fields to appear in exported file
- Print out of parameters and results to be exported

Other Features

- Possibility to connect a micrometer for direct acquisition of specimen dimensions
- Full management of Data Acquisition System (CEAST DAS 8000 or DAS 16000) for instrumented tests, with drivers for USB connection to PC

Languages

English, French, German, Italian, Japanese,...

Operating system

- Windows 95 – 98 – ME – NT – 2000 – XP
- Communication: Serial port
- Printer supported: All printers supported by Windows

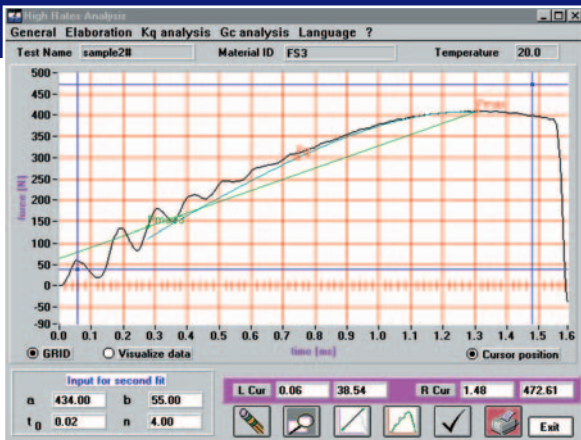


Fig. 5 WLEFMHR page

A number of optional software packages are available to expand the possibilities of the tests using pendulums and falling weight instruments:

- Fracture Mechanics analysis module for instruments equipped with instrumented hammers or strikers and connected to CEAST Data Acquisition System (DAS 8000 or DAS 16000)
- Other Modules to increase the operative capabilities of the testing laboratory

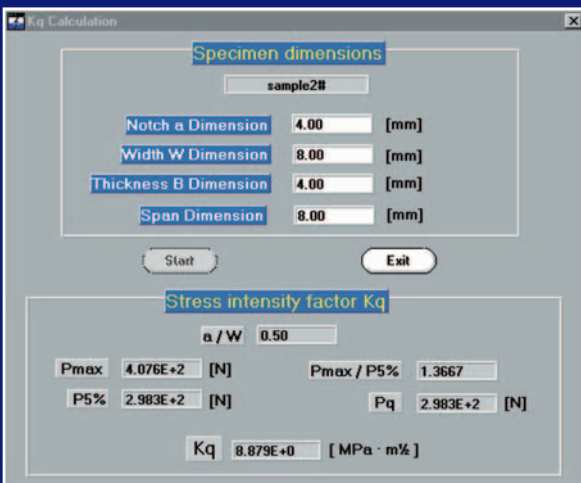


Fig. 6 Kq Calculation Panel

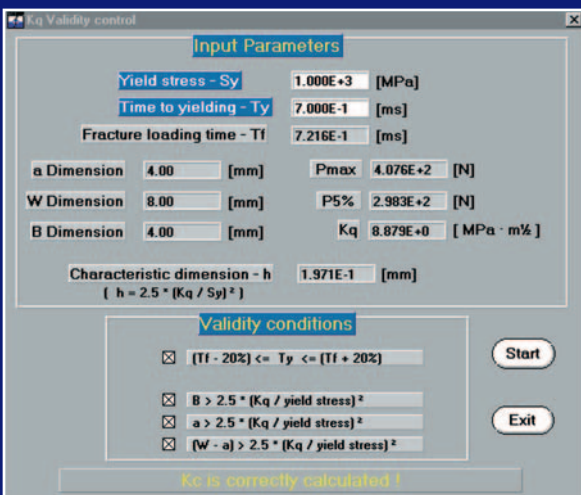


Fig. 7 Validity check panel

Fracture Mechanics Module

WLEFMHR - code 0700.413

Introduction

One of the main questions of materials application, particularly in safety-critical situations, concerns the conditions of crack initiation and propagation. Accidents can be avoided with advanced knowledge of a material's fracture characteristics. The group "Polymers and Composites" of ESIS (European Structural Integrity Society) studied and developed a procedure, based on Linear Elastic Fracture Mechanics, able to determine fracture toughness at high loading rates. This test method, accepted by ISO for standardization, determines the Critical Stress intensity Factor (K_{Ic}) and the Fracture Energy (G_{Ic}). The basic concept of these studies was to isolate a material's inherent fracture characteristics from the geometry and dimensions of the actual part. So the designer has a powerful tool for accurate determination of its fracture toughness, simply comparing the stress intensity factor of his part (computed with usual CAD tools and depending on shape and size) with the critical stress intensity factor obtained by this new method.

Software description

WLEFMHR is CEAST's implementation of the above test method: it determines fracture toughness starting from impact data obtained by instrumented strikers through a CEAST DAS 8000 or CEAST DAS 16000 system.

The main features of this program are:

- Display of the force-deformation curve
- Magnification of chosen part of curve
- Linear regression of chosen part of graph [Fig. 5](#)
- Determination of critical stress intensity factor - K_{Ic}
- Determination of fracture energy - G_{Ic}
- Work with the curve of each test to obtain the K_q parameter
- Determination of the value of U and BW Ø.

Fig. 6, 7

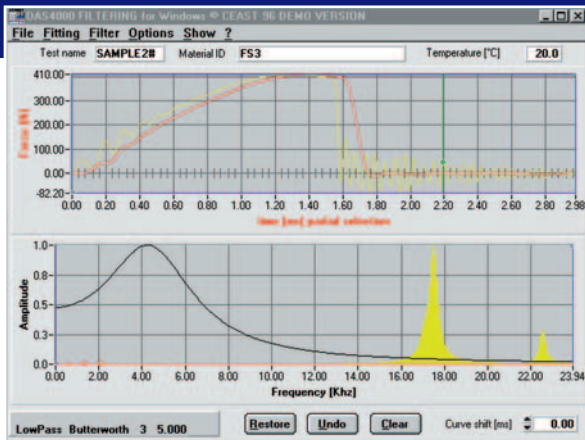


Fig. 8 D8WFILT dual windows

Other Modules

D8WFILT - code 0700.453

It is a curve filtering program, developed to analyze and eliminate the plastic oscillations caused by resonance vibrations of the measurement system.

The main features are:

Test evaluation

- Frequency spectrum of curve or selected part of the curve
- Four types of digital filters: Butterworth, Chebyshev, Inverse Chebyshev, Elliptic; in four applications: lowpass, highpass, bandpass, bandstop

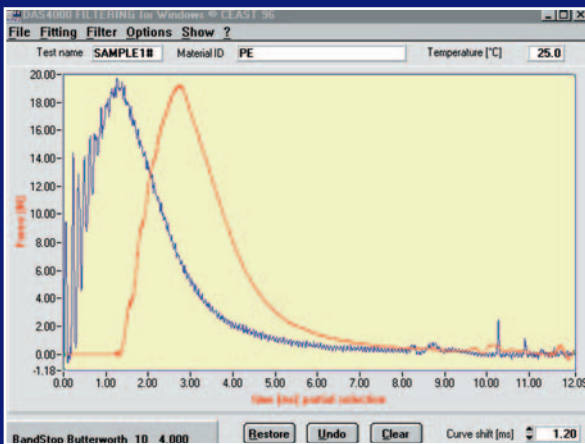


Fig. 9 D8WFILT overlaid window

- Original and filtered curve and their frequency spectrum in overlaid and dual window mode [Fig. 8, 9](#)
- Shift curve correction
- Fitting of curve or selected part of the curve using polynomial equations
- Magnification of specific parts of curve
- Recalculation of filtered curve and saving in a new test file
- Logarithmic and Linear scale options
- Full filtering history of selected curve can be viewed at any time.

D8WTTA - code 0700.452

This program was created to analyze the temperature transition phenomena of a material's fracture properties.

The main features are:

- Determination of the fragility index on up to 36 tests (set) for each temperature
- Possibility to load up to 200 points
- Automatic determination of the temperature corresponding to 50% brittle-ductile failure
- Cursor inspection of the TTA curve with visualization of numerical values [Fig. 10](#)

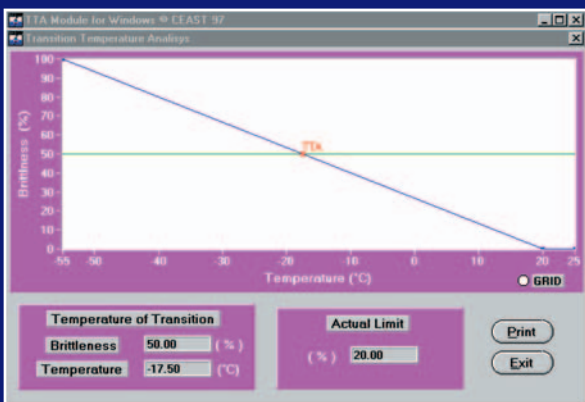


Fig. 10 D8WTTA transition temperature curve

DAS8CLW - code 0700.454

This program allows the customer to perform a static force calibration of strikers equipped with piezo-electric or strain-gauge transducers. This applies both to instrumented pendulum hammers and instrumented falling weight strikers.

The main features are:

- Calibration execution: static calibration using DAS 8000 or DAS 16000 hardware and accessories or inserting calibration data manually
- Visualization of the calibration curves
- Saving and loading of calibration files
- Immediate display of the striker voltage output.

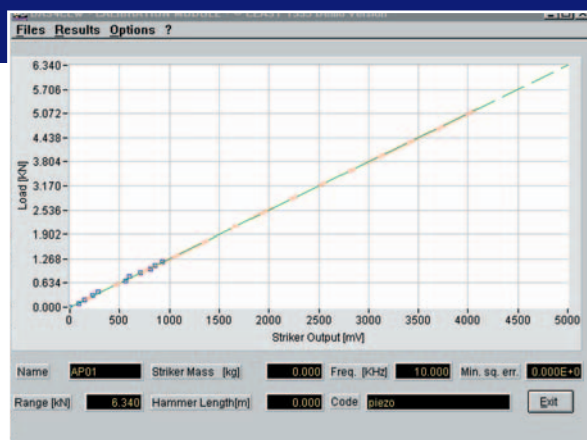


Fig. 11 Instrumented striker calibration curve

DAS8DYN - code 0700.455

This program allows the customer to perform a dynamic calibration of strikers, both with piezo-electric and with strain-gauge transducers. This applies to instrumented pendulum hammers.

The main features are:

- Calibration execution: dynamic calibration using DAS 8000 or DAS 16000 hardware
- Visualization of the calibration curves **Fig. 11**
- Saving and loading of calibration files
- Immediate display of the striker voltage output.



"Due to the continuous development policy of CEAST's Research and Development Department, changes may be introduced without notice"

These instruments are made
in compliance with CE health
and safety requirements



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