

CEAST



DESIGN AND PRODUCTION OF INSTRUMENTS AND APPARATUS FOR QUALITY CONTROL OF MATERIALS

FRACTOVIS PLUS

Set name Un60
Material ID Ultranyl

Force [N]

Point	% F p	dir.
1384	94.1	BP

d [mm]	v [m/s]	E [J]
7.37	4.35	16.05

Energy	Energy	Em [mm]	Em [mm]	Pen [mm]	Ab [mm]	Break Type	Vvar [m/s]	S.D. %
3013.20	276.67	14.10	15.29	0.00	0.00	P	0.252	5.58

$$\sigma \cdot Y \cdot \sqrt{a} = K_{Ic}$$


FRACTOVIS PLUS

FRACTOVIS PLUS

code 7520.000, 7521.000,
7525.000, 7526.000



View of Fractovis Plus



Impact test on finished products with interchangeable special striker

SCOPE

The impact test is one of the most important mechanical tests on a material and serves to establish an understanding of the applicable "end-use" conditions.

"End-use" refers to the performance of the finished product or component and not the basic resin pellet. In particular, among the destructive mechanical characterizations of plastic products, the response of the component to impact conditions is just one of the several considerations to determine material behaviour and engineering application.

To perform impact tests with an energy rate higher than that obtainable using the pendulum, to break different specimen shapes or finished products, a drop weight instrument is necessary.

Therefore Ceast, leading the design of impact test instruments for fifty years, has improved its line of sturdy and flexible dart drop testers with the new "Fractovis Plus".

FIELDS OF APPLICATION

The new Fractovis Plus can perform :

- Coupon tests in order to carry out Charpy, Izod and Tensile Impact tests
- Biaxial impact tests on films, sheets, plates and pipes in accordance with the standards
- Component tests and impact tests on finished products (glass, helmets, bumpers, etc.) as the component design and the shape can influence the brittle or ductile performance of the material
- Non-instrumented and instrumented impact tests on specimens of different materials (polymers, ceramics and composites).

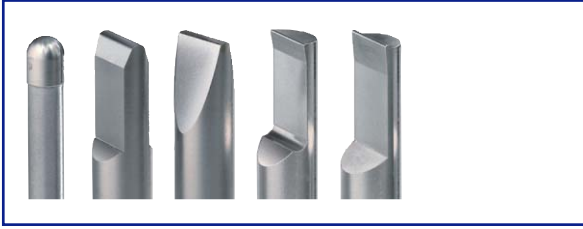
NEW CONCEPT OF MODULARITY

A main novelty of the "Fractovis Plus" is the "Upgrade" concept. In fact the instrument is pre-wired for easy connection of all options at a later date.

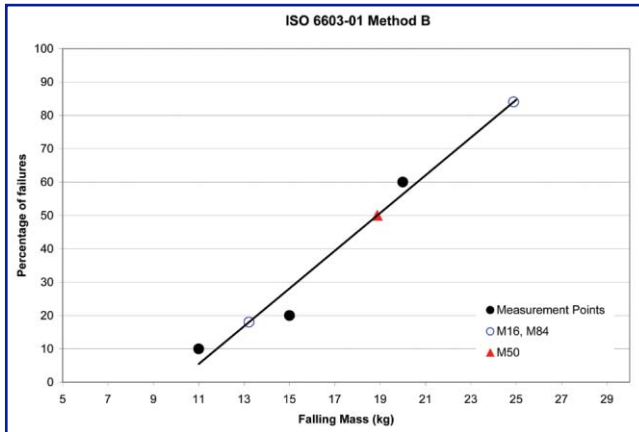
STANDARDS

Designed and built to meet the following standards:
ISO 179-2, ISO 180, ISO 3127, ISO 6603-1, ISO 6603-2,
ISO 7765-1, ISO 7765-2, ASTM D 256, ASTM D 2444,
ASTM D 3763, ASTM D 5628, ASTM D 6110,
ASTM E 23
and others equivalent.

STRIKERS



A variety of interchangeable strikers available to meet standard test specifications and custom applications

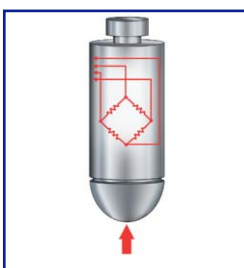


Statistical elaboration example of Non-Instrumented test according to ISO 6603-1 method B

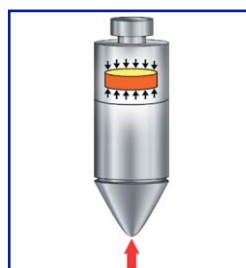


Example of Instrumented test curves

POSSIBILITY TO CHOOSE LOAD CELL SENSOR



Strain gauge striker



Piezoelectric striker

BASIC FEATURES

Ceast instruments are characterized by their versatility and their user-friendly interface.

The Fractovis Plus improves the user-machine interface in terms of simplicity with the new control panel so that the operator can manage the instrument to perform tests without any PC. This panel, equipped with a LC display and a soft-touch keyboard, provides instant access to the most widely used impact testing functions, including start/stop and reset drop position.

The test execution is fully automatic controlled by microprocessor. It is possible to run an Autocheck sequence at any time to check the instrument. All calibration parameters can be edited using the keyboard. The speed detection system, in order to record the striker speed just before the impact event, and the specimen clamping system, in order to clamp, automatically, rigid plastic specimens, are basic features of all the Fractovis Plus line.

Fractovis Plus offers also different types of strikers.

NON-INSTRUMENTED TEST

Non-instrumented impact tests are able to provide information on the quality behaviour of the material under the impact of a striker applied on the specimen.

INSTRUMENTED TEST

Instrumented impact tests provide full details of the impact event, from initial contact to final failure of the specimen by recording the force/time curve of the entire impact event.

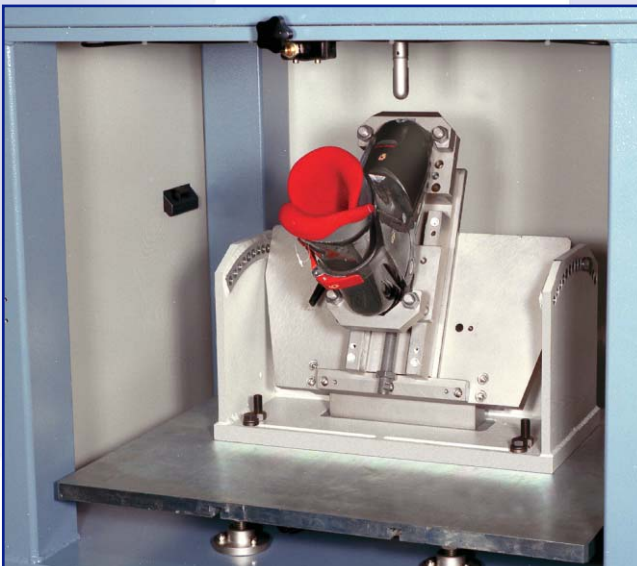
Instrumented impact technology is able to provide a valid method to evaluate the fracture toughness of a material; in fact, in accordance with linear elastic fracture mechanics and elastic-plastic fracture mechanics, it is possible to evaluate the energy release rate, respectively G_{IC} and J_c , intrinsic property of a material, which provides the most meaningful data to be used in the design of real components.

SAFE

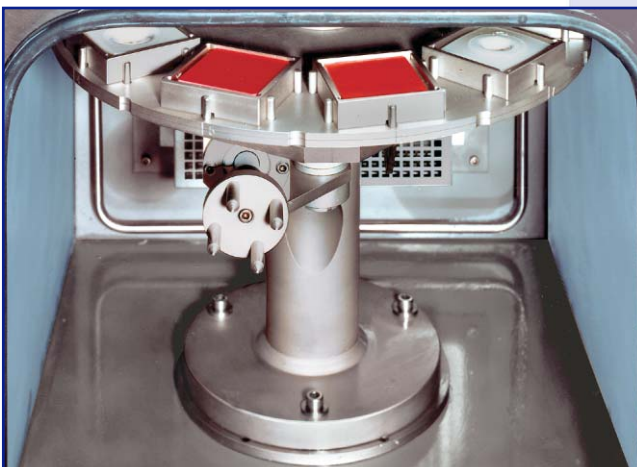
Due to the high energy involved during a test, Ceast has taken particular care of the safety features within the Fractovis. Micro-switches and protective circuits ensure that the operator performs the test in totally safe conditions. The instrument is built to comply with CE safety directives.



Adjustable height support and pneumatic clamping plate for pipes or similar finished products



Example of custom made clamping device



Pivoting support which can be rotated without opening the chamber door

FRACTOVIS PLUS STRENGTH

The Ceast Fractovis Plus is characterized by:

- Basic version pre-wired for easy connection of all options at a later date
- Automatic striker recovery system to ensure high speed and high accuracy repositioning
- Environmental chamber air circulation system in order to guarantee turbulent air flow and to provide uniform temperature distribution
- Fully automatic test execution controlled by CPU to provide highest level of flexibility, to manage the geometrical test parameters (striker and specimen dimensions), to control each test function (anti-rebound system, clamping device, striker lubrication, etc.) and to run the whole test in fully automatic mode
- User friendly man-machine interface with hierarchic menus and scroll lists
- Improved user accessibility to the test area in order to facilitate specimen positioning
- Anti-rebound system to prevent multiple impacts on the specimen; the system can catch the maximum applicable weight at the highest impact speed, preventing a second impact
- Striker holder designed to guarantee maximum rigidity, easier mass application and quicker striker change
- Reliable mass release system, according to Ceast tradition, with redundant sensors for maximum operator safety
- Removable panels for easier maintenance operations

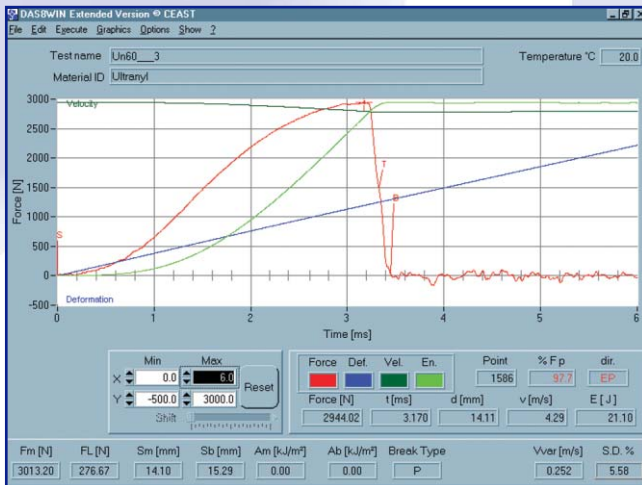
OPTIONS

- Automatic weighing system to self-identify the mass (load) applied on the striker
- Automatic striker lubrication system
- Special supports in order to carry out Charpy, Izod and Tensile Impact tests, pipe tests and a wide set of supports to carry out tests on film and sheet according to ISO and ASTM standards
- Pivoting specimens loader to test 10 specimens in rapid sequence
- Automatic specimen feeding system in order to perform tests in automatic cycle. This system has been designed to meet the ever increasing demand for automation from laboratories involved in intensive research and quality control testing on material at a rate between 60 and 120 tests per hour.

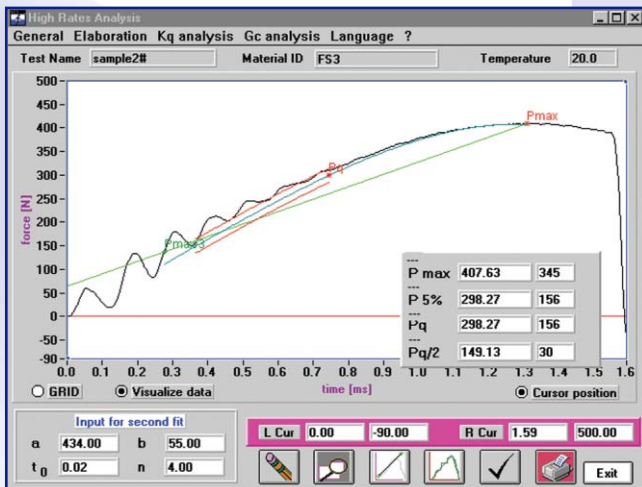
MAIN CHARACTERISTICS and OPTIONS

Code		7520.000	7521.000	7525.000	7526.000
Main Characteristics					
Drop height range [mm]		30 ÷ 1100			
Mass range [kg]		2 ÷ 70 (step 1 kg)			
Speed range [m/s]		0.75 ÷ 4.6			
Maximum speed with additional energy system [m/s] (option)		24			
Energy range [J]		0.6 ÷ 755			
Maximum energy with additional energy system [J] (option)		1800			
Test chamber inner dimensions (WxDxH) [mm]	Without thermostatic chamber	520 x 550 x 430	—	720 x 750 x 630	—
	With thermostatic chamber	350 x 350 x 300		550 x 550 x 500	
Specimen clamping system		Included			
Speed detection system		Included			
Test execution		Fully automatic, controlled by microprocessor			
Man-machine interface		Display and keyboard (optional PC connection)			
Options					
Additional energy system		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Thermostatic chamber		<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>
Antirebound system		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Striker lubrication system		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Automatic weighing system		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Light striker holder (2 to 6 kg)		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Heavy striker holder (6 to 70 kg)		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fixed height support		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Adjustable height support		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pivoting specimens loader		—	—	<input type="radio"/>	<input type="radio"/>
Automatic specimen feeding system		—	—	<input type="radio"/>	<input type="radio"/>
Technical Data					
Overall dimensions without additional energy (WxDxH) [mm]	Without thermostatic chamber	2650 x 905 x 720	—	2650 x 1065 x 850	—
	With thermostatic chamber	2650 x 905 x 850		2650 x 1065 x 1150	
Overall dimensions with additional energy (WxDxH) [mm]	Without thermostatic chamber	3100 x 905 x 850	—	3100 x 1065 x 850	—
	With thermostatic chamber	3100 x 905 x 850		3100 x 1065 x 1150	
Weight without additional energy [kg]	Without thermostatic chamber	500	—	600	—
	With thermostatic chamber	550		660	
Weight with additional energy [kg]	Without thermostatic chamber	600	—	700	—
	With thermostatic chamber	650		750	
Supply		230 V - 50 Hz – Singlephase (110 V - 60 Hz on request)			
Power [W]	Without thermostatic chamber	800			
	With thermostatic chamber	3500			
Paint		Grey RAL 7035 – Fuchsia RAL 4006			

■ Included
 ○ Optional



Single Test Curve



WLEFMHR Page

SOFTWARE FOR INSTRUMENTED IMPACT TESTS

Using the latest generation of Ceast Data Acquisition System, DAS 8000, instrumented strikers and dedicated software, D8EXTWIN, it is possible to generate the force/time curve of any impact event.

Below are listed Ceast software options to be used with Fractovis Plus for easy management of instrumented tests and for their advanced elaboration:

D8EXTWIN main module to manage instrumented impact tests and to analyze the results

WLEFMHR to determine the stress intensity factor (K_{IC}) and the energy release rate (G_{IC}) at high test speed

D8WFILT to analyze and eliminate plastic oscillation due to resonance vibrations

D8WTTA to analyze impact test results performed at different temperatures in order to evaluate the fragility index

DAS8CLW to perform instrumented striker static calibration.

WLEFMHR MODULE

Advanced software has been developed by Ceast R&D department in order to allow further analysis of instrumented impact results: **WLEFMHR**.

This software can be considered as a tool for the evaluation of data that can be used for design applications.

It is based upon a testing procedure developed by ESIS (European Structural Integrity society) TC4. A three point bending (SENB) specimen configuration, with a very acute notch, like a crack, is required for the test. The software is able to provide, automatically, the value of K_{IC} (stress intensity factor) and G_{IC} (energy release rate) elaborating the impact test results and provides, for R&D departments and institutes, an important tool for advanced analysis.

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

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

