

# DROP TOWER IMPACT TESTING

High Velocity Three-Point Bending Test



The mechanical properties of plastic materials are sensitive to loading rate and the fracture toughness under dynamic loading has received considerable attention because it often concerns the failure of structural materials during their service life.

## THREE-POINT BENDING APPLICATIONS

Static three-point bending tests investigate the deformation and failure behavior however for a complete mechanical characterization of the materials it is necessary to analyze the response under dynamic conditions. This is because the force-deformation curve depends on the speed with which the load is applied (the strain rate). As the strain rate increases, the modulus of the material increases and so does its yield point.

To simulate the behavior of a material under dynamic conditions it is therefore necessary to have and validate data at high strain rates. For the high velocity three-point bending test, an instrumented impact drop tower equipped with an insert of a given shape attached to the tup can be used. The specimen is suspended on two cylindrical supports and the insert strikes it in its center. During the impact, the load is recorded by the sensor (piezoelectric or strain-gauge) embedded in the tup. The load-time curve is then processed to obtain a force-deflection curve.

## FEATURES AND BENEFITS

- Impact energy from 0.3J up to 1.800J
- Minimum single mass from 1 kg
- Frictionless linear guidance system to minimize loss of energy and improve data reproducibility
- Innovative 23" touch screen Dashboard with embedded Data Acquisition
- Performs impact tests according to international standards: Impact puncture, CAI, Wedge-peel, Tensile impact, Charpy, Izod tests
- Instrumented tup to acquire the force vs displacement during each single-impact event allowing the analysis of the failure

- Performs impact test according to internal and industry standards up to 24 m/s
- Safety enclosure of the test area to protect the operator from flying debris
- System and Bluehill Impact Software for a quick set up, simple and error-free testing
- Thermostatic chamber to condition test coupons or components from -70°C to +150°C
- High resolution data acquisition chain ensures the accuracy of the force measuring system. The full chain – data acquisition and tup – is verified with a procedure according to ISO 7500
- Optional extended support base accommodates wide range of large components



**9440**



**9450**

Energy range	J ft-lb	0.3 - 405 0.22 - 299	0,59 - 1800 0,44 - 1330
Impact velocity	m/s ft/s	0.77 - 4.65 2.53 - 15.3	0,77 - 24 2,53 - 78,7
Drop height	m in	0.03 - 1.10 1.18 - 43.3	0,03 - 29,4 (equivalents) 1,18 - 1160 (equivalents)
Mass range	kg lbs	1.00 - 37.5 2.2 - 82.7	2,00 - 70,0 4,41 - 154
Machine dimensions (w x d x h)	mm in	985 x 610 x 2620 38.7 x 24 x 103	1015 x 866 x 3180 40 x 34 x 125,2
With thermostatic chamber (w x d x h)	mm in	985 x 695 x 2620 38.7 x 27.4 x 103	1015 x 1150 x 3180 40 x 45,3 x 125,2
Test area dimensions (w x d x h)	mm in	490 x 450 x 565 19.3 x 17.7 x 22.2	700 x 720 x 570 27.5 x 28.3 x 22.4
With thermostatic chamber (w x d x h) <sup>2</sup>	mm in	370 x 300 x 495 14.6 x 11.8 x 19.5	550 x 540 x 500 21,6 x 21,3 x 19,7
Machine weight	kg lbs	340 749	775 1708
With thermostatic chamber <sup>2</sup>	kg lbs	550 1213	925 2039
Electrical supply	-	220-240V 50/60Hz 100-120V 50/60Hz	220-240V 50/60Hz 100-120V 50/60Hz
Compressed air supply	bar psi	6 to 10 72.5	6 to 10 72,5

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