

WEDGE PEEL IMPACT TEST

Adhesives ISO 11343



WHY WEDGE PEEL IMPACT TESTING ON ADHESIVES IS IMPORTANT?

The use of high-strength structural adhesives in the automotive industry has grown as manufacturers have become aware of their advantages over conventional joining techniques. These new bonding materials are rapidly replacing mechanical fasteners to join structural frame assemblies, body panels and hem-flanges, metals, composites, rubber, glass, windshields and other components. Improved aesthetics, soft feel surfaces, quieter interiors, reduction in spot welding and reduced manufacturing cost with a strong increase of durability are just a few of the advantages achieved.

Increased use of these adhesives in industry, especially in safety-critical areas, makes it necessary to ensure the high performances and structural integrity of the bonds under real life conditions. For instance, impact forces in a crash test may cause failure in bonded areas resulting in serious injury to vehicle passenger.

ARE YOU PREPARED TO OVERCOME THE ISO 11343 CHALLENGE?

ISO 11343 is a standardized Wedge Peel Impact test method, used to measure the resistance of high-strength structural adhesives to cleavage fracture at various speeds and user-defined temperatures.

The impact test consists of a wedge with a defined shape and mass, being driven at a defined velocity into the adhesive bond securing two metallic surfaces causing the bond to fracture and the adherends to peel apart. The adherends are made from aluminum or steel, the metal substrates most commonly used in the automotive industry. The test provides the data necessary to calculate the dynamic resistance to cleavage, which is defined as the force per unit of width necessary to bring an adhesive joint to failure. This vital information can be used to aid manufacturers in the research and development of new adhesives. When a suitable product has been established, both manufacturer and end-user can implement a quality control program utilizing baseline data from the impact performance tests to provide ongoing process validation and quality control.

REAL-LIFE TESTING SCENARIOS

When performing these wedge peel tests, we recommend using the Instron 9450 Drop Tower equipped with thermostatic chamber and accessories dedicated to ISO 11343. These include a vice with a high performance Strain Gauge force sensor embedded, both symmetric and asymmetric wedges per ISO requirements and a dedicated striker. The 15kN force sensor has been designed to provide high accuracy results in impact events of few milliseconds.

The Data Acquisition System with a sampling frequency up to 4MHz and software are critical for proper data collection and automatic results analysis.

The thermostatic chamber enables the user to test at low and high temperatures and experiment with different material compositions, cure conditions and climatic temperatures to optimize product performance and comply with government regulations. Real life testing scenarios can be simulated within the range from -40°C to +80°C, very typical climatic conditions for the automotive industry.



9450 SPECIFICATION TABLE

Energy range	J ft-lb	0,59 - 1800 0,44 - 1330
Impact velocity	m/s ft/s	0,77 - 24 2,53 - 78,7
Drop height	m in	0,03 - 29,4 (equivalents) 1,18 - 1160 (equivalents)
Mass range	kg lbs	2,00 - 70,0 4,41 - 154
Machine dimensions (w x d x h)	mm in	1015 x 866 x 3180 40 x 34 x 125,2
With thermostatic chamber (w x d x h)	mm in	1015 x 1150 x 3180 40 x 45,3 x 125,2
Test area dimensions (w x d x h)	mm in	700 x 720 x 570 27.5 x 28.3 x 22.4
With thermostatic chamber (w x d x h) ²	mm in	550 x 540 x 500 21,6 x 21,3 x 19,7
Machine weight	kg lbs	775 1708
With thermostatic chamber ²	kg lbs	925 2039
Electrical supply	-	220-240V 50/60Hz 100-120V 50/60Hz
Compressed air supply	bar psi	6 to 10 72,5



www.instron.com



Worldwide Headquarters
825 University Ave, Norwood, MA 02062-2643, USA
Tel: +1 800 564 8378 or +1 781 575 5000

European Headquarters
Coronation Road, High Wycombe, Bucks HP12 3SY, UK
Tel: +44 1494 464646