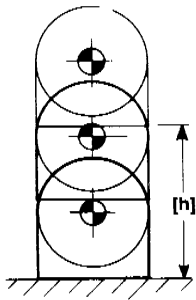


## STANDARD SHIPPING CONTAINER SHOCK TESTS

No matter what mode of transportation is used, shock represents the most serious threat to equipment reliability. The standard tests described here are intended to simulate the worst shock conditions that would be expected for shipping/handling environments. Selected tests from those shown here are included in packaging specifications and used for designing shipping container suspension systems.

The letter "h" in the diagrams depicts the drop height specified in the applicable packaging specification. Exceptions: in Test 7 and 11 an impact velocity will be specified; in Test 9 and 10 neither drop height nor velocity is specified.

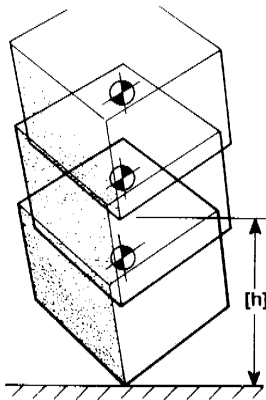
Test 1



### Flat Drop

Container shall be raised the specified vertical distance and allowed to fall freely to a concrete or similarly hard surface so that container strikes flat on the skids or surface involved.

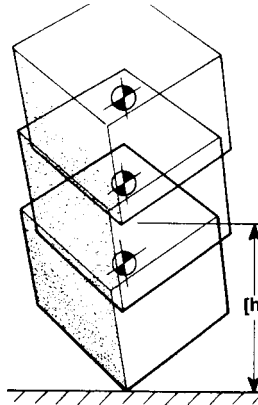
Test 2



### Corner Drop

Container shall be raised the specified vertical distance such that the container is suspended with the center of gravity vertically above the striking corner. Container shall be allowed to fall freely to a concrete or similarly hard surface, striking corner first. Cylindrical containers shall be dropped on each quarter.

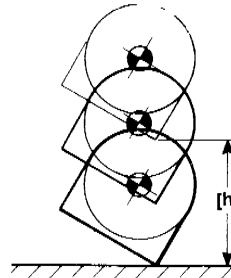
Test 3



### Corner Drop (special)

Container shall be raised the specified vertical distance so that it will strike at the greatest angle possible, still ensuring that the container will come to rest on its base. The test shall be repeated for each of the corners or quarters.

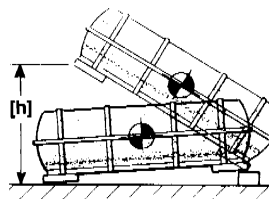
Test 4



### Edge Drop

Container shall be raised the specified vertical distance, such that the container is suspended with the center of gravity vertically above the striking edge. The container shall be allowed to fall freely to a concrete or similarly hard surface, striking edge first.

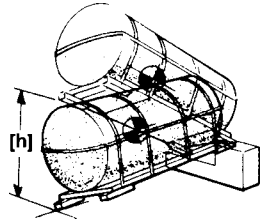
Test 5



### Edgewise Rotational Drop

Container shall be supported at one end of the base on a sill or block of specified height and at right angles to skids. The opposite end shall be raised to the specified vertical height and allowed to fall freely onto a concrete or similarly hard surface. If container size and center of gravity location prevent dropping from prescribed height, the greatest attainable height shall be the height of the drops.

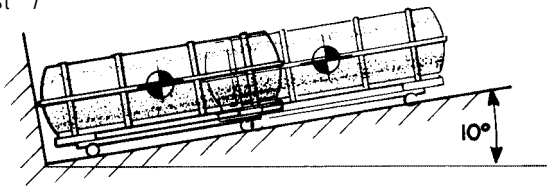
Test 6



### Cornerwise Rotational Drop

Container shall be supported at one corner of its base on a low sill or block of specified height. The other corner of the same end shall be supported by a higher sill or block. The lowest point of the opposite end shall be raised to the specified vertical height and allowed to fall freely onto a concrete or similarly hard surface. If container size and center of gravity location prevent dropping from prescribed height, the greatest attainable height shall be the height of the drops.

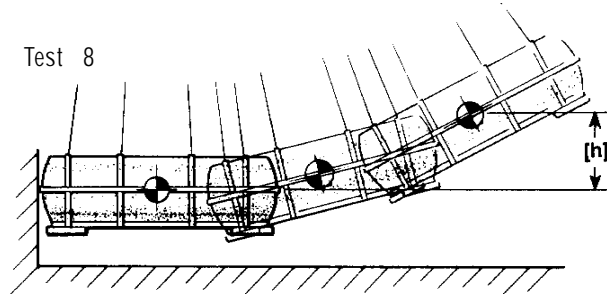
Test 7



### Inclined Impact

Test shall be in accordance with ASTM Standard Method D880, "The Inclined Impact Test for Shipping Containers," suitably modified to accommodate the container. Velocity at impact shall be as specified. The Pendulum Impact may be used in lieu of this test, and vice versa.

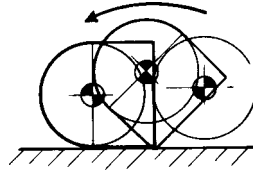
Test 8



### Pedulum Impact

Container shall be suspended by 4 or more ropes or cables 16 feet or more long. Container shall be pulled back so that the center of gravity has been raised the specified distance. Container shall be released, allowing the end surface or skid, whichever extends further, to strike on an unyielding barrier of concrete or similarly hard material that is perpendicular to the container at impact.

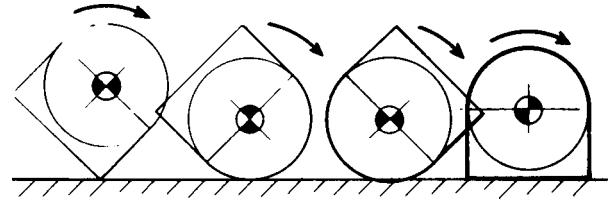
Test 9



### Tip Over Test

Container, erect on its base, shall be slowly tipped (in the direction specified) until it falls freely and solely by its own weight to a concrete or similarly hard floor.

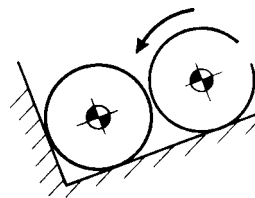
Test 10



### Rollover Test

Container, erect on its base, shall be tipped sideways until it falls freely and solely of its own weight to a concrete or similarly hard surface. This shall be repeated with falls from the side to top, from top to the other side, and from other side to the base, thus completing one revolution.

Test 11



### Rolling Impact Test (cylindrical containers)

Container shall be allowed to roll down an incline on its rolling flanges and shall strike a vertical, rigid, flat surface at a specified velocity.

## **An Invitation**

The numerous isolators presented in this catalog have been designed to cover a wide range of aerospace vibration and shock isolation problems. If there are questions concerning any of these products or this catalog, or if there is need of assistance for particularly difficult installations, do not hesitate to contact Lord. See page 103 for contact information. Many years of experience may be brought to the task to provide an optimal solution.

Additionally, Engineering Data Sheets for electronic equipment and for shipping container applications are included. Providing as much of this information as is possible will assist in the analysis of difficult installations.