

# ISO 4180:2009-02 (E)

## Packaging - Complete, filled transport packages - General rules for the compilation of performance test schedules

---

| <b>Contents</b>  |   | <b>Page</b> |
|--|---|-------------|
| Foreword .....   |   | iv          |
| 1  | Scope .....   | 1           |
| 2  | Normative references .....  | 1           |
| 3  | Terms and definitions .....   | 2           |
| 4  | Distribution systems .....  | 2           |
| 5  | Hazards .....   | 2           |
| 6  | Tests .....   | 2           |
| 6.1  | General .....   | 2           |
| 6.2  | Appropriate application of tests .....  | 2           |
| 6.3  | Levels of intensity .....   | 3           |
| 7  | Determination of criteria for acceptance .....  | 3           |
| 8  | Selection of package attitude .....   | 3           |
| 9  | Compilation of test schedules .....   | 4           |
| 9.1  | Case 1: distribution system well defined and intensity of hazards determined .....      | 4           |
| 9.2  | Case 2: distribution system undefined and intensity of hazards unknown .....            | 4           |
| 10   | Case 1 .....  | 4           |
| 10.1   | Preferred test sequence .....   | 4           |
| 10.2   | Preferred test parameters .....   | 4           |
| 10.3   | Atmospheric conditioning (performed in accordance with ISO 2233) .....                  | 5           |
| 10.4   | Low pressure tests (performed in accordance with ISO 2873) .....                        | 5           |
| 10.5   | Horizontal impact (performed in accordance with ISO 2244) .....                         | 5           |
| 10.6   | Vertical impact (performed in accordance with ISO 2248) .....                           | 7           |
| 10.7   | Random vibration tests (performed in accordance with ISO 13355) .....                   | 9           |
| 10.7.1   | Mounting of package on the test vibration table .....                                   | 9           |
| 10.7.2   | Test power spectral densities (PSD) .....   | 9           |
| 10.8   | Stacking .....  | 11          |
| 10.8.1   | Stacking (performed in accordance with ISO 2234) .....                                  | 11          |
| 10.8.2   | Stacking test using a compression tester (performed in accordance with ISO 12048) ..... | 11          |
| 10.9   | Test simulating different hazards .....   | 12          |
| 11   | Case 2 .....  | 12          |
| 12   | Documentation .....   | 15          |
| 12.1   | Test specification .....  | 15          |
| 12.2   | Test report .....   | 16          |
| Annex A (informative) Methods of quantifying damage to a package and/or its contents ..... |   | 17          |
| Bibliography .....   |   | 18          |