

VDA

Test Procedure for OEM Part Packagings
Annex TUL Test

4535

This non-binding recommendation defines the goal for standardisation of test procedures for finding a suitable packaging for handling, storage and transport.

The recommendation is the project result of the VDA Center of Competence (CoC) Packaging.

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Performance of Vibration Test

30 boards (L=2000 mm, W=100 to 150 mm) are placed on a level surface.

The distance between the boards is approx. 1000 mm. An approx. 10 mm wide chamfer is machined on the upper side of the boards.

For better adhesion of the boards, the use of full-surface rubber pellets (thickness 2-5 mm) on the underside is to be recommended.

The thickness of the boards for fork-lift trucks with solid rubber tyres is 15 to 20 mm.

For fork-lift trucks with inflatable tyres, the thickness is 40 to 50 mm.

In order to minimise the risk of damage for the packaging material, the test with heavy load units above approx. 1000 kg (e.g. engines / transmissions) is not performed on the vibration track and is replaced by abrupt setting-down of the truck forks incl. load unit.

With high-volume lightweight packagings up to approx. 150 kg, the package is secured with straps to prevent it from falling down when carrying out a TUL test with a fork-lift truck.

A fork-lift truck / panel car without suspension and with solid rubber tyres drives over the track twice at slightly faster than walking speed.



Figure 1: Package secured with strap

Fork-lift truck travel directions
Fork-lift truck



Aerial view of package



Figure 2: Profile of vibration test

Performance of Tipping Load Test

After the vibration test, tipping loads are simulated by drop tests. During the **drop tests**, one side of the package is lifted by approx. 20 cm with the tip of the fork of a fork-lift truck. The drop is then triggered by abrupt reversing of the fork-lift truck. The test is repeated with an adjoining side offset at 90° from the first side (see Figure 3, Record of the drop test).

Further tipping loads are simulated by lowering the package onto a 10 to 15 cm large cube. The cube is hereby placed under one corner of the package (see Figure 8, Tipping load). The test is repeated with a corner offset at 90° from the first side.



Figure 3: Tipping load