Packaging Requirement - Lithium Batteries

Navigating the 3m Stack Test

Introduction

Effective January 2025, a new requirement was introduced into the packing instructions for the air transport of lithium batteries that are packed with, or contained in equipment (PI 966-II, PI 967-I and II, PI 969-II, and PI 970 – I and II). This additional measure is for non-UN Specification packaging and is generally aligned with existing packaging requirements for the limited quantity provisions in the dangerous goods regulations.

The new requirement states:

> "Each package of cells or batteries or the completed package must be capable of withstanding, without damage to the cells or batteries contained therein and without any reduction of effectiveness, a force applied to the top surface equivalent to the total weight of identical packages stacked to a height of 3 m (including the test sample) for a duration of 24 hours.
> Note:
> *Capability may be demonstrated by testing, assessment, or experience.*"

Application and Compliance

The requirement specifies that the package must be "capable of withstanding" the weight of a 3-metre stack of packages. There is no formal requirement for special conditioning of the packaging materials; nor for a test to be conducted by an independent testing authority. Shippers may determine, or assert the package's "capability" through:

- **Testing**: i.e. conducting tests, or having tests conducted on representative packages.
- **Assessment**: i.e. an evaluation the existing packaging design and materials.
- **Experience**: i.e. direct experience that the packaging is capable.

It is the responsibility of the shippers to ensure their packaging and completed package complies with the dangerous goods regulations.

The majority of wholesalers and OEMs (original equipment manufacturers) of electronic equipment, which is packed with or contains lithium batteries, already use purpose designed packaging. This packaging, and the completed package, has been constructed and designed to withstand the normal rigours encountered in the transport of their goods.

e-commerce retailers, and shippers of individual packages of electronic items which are not in purpose designed inner and outer packaging may need to take more objective steps to determine a package's capability of withstanding the weight of a 3-metre stack.

The shipper should be able to provide, upon the request of the appropriate regulatory authority, the basis on which "capability" was evaluated. The regulations do not prescribe a specific method to

demonstrate compliance. Examples, of methods which may be used to assert the capability of the package and packaging are:

Testing:

- Conducting an objective 3-meter stack test of representative existing packages, as prepared for transport, for 24 hours. i.e. an e-commerce retailer of multiple products, may prepare a number of boxes to a 3-metre height, each with representative weights of their product lines and using typical cushioning material. Objectively, the retailer should be using the products with greatest density, or limiting the per-package weight to what was tested.
- Applying a weight to the top surface of an existing package, which is equivalent to the overall weight of a stack of similar packages that is 3m high (minus the equivalent height and weight of the bottom package) and leaving it for 24 hours.

Assessment:

- For packaging designed for a specific product - consult the original packaging designer or packaging manufacturer for their expert assessment on the capability of the package.

Experience:

- For many equipment manufacturers and their current warehousing or transport operations, existing packages are routinely palletized (i.e. between 1.5 metres and 6 ft tall) and are stacked (i.e. in excess of 3 metres).

For further questions or additional guidance, please contact dangood@iata.org