

## Packaging Optimization and Drop Tests

Packaging optimization is a waste prevention technique that eliminates unnecessary packaging by balancing the use of packaging materials with the protection each will provide. Simply put, an optimized package allows a product to be safely passed through the shipping environment while using the least amount of packaging material. The level of safety during shipment can be as simple as requiring that a product arrives showing no signs of damage, or it can require that the product and package meet a set of predefined national or international testing standards. In either case the benefits of optimization include reducing waste, using the smallest possible shipping package, and an overall savings in both materials and shipping costs.

For most users of stock packaging a level of optimization can be achieved by gaining an understanding of the product, shipping environment, and available packaging materials. Start by asking yourself the following...

- What is the product value?
- What are the physical characteristics (length, width, height, weight)?
- How fragile is the product?
- Is there an acceptable level of damage?
- What are the modes of transportation (air, truck, rail, boat, etc)?
- Is the package to be reused?
- What is the packaging budget?
- What packaging materials are available?
- What are the packaging properties and what is the best application for each?

Once you gain a basic understanding of the product and how it will be shipped, optimization can begin. Does the existing (or proposed) shipping package just meet your requirements, or does it provide a higher level of protection than required? Do you really need to use a double wall carton, or will a single wall carton get the job done? Does your product even need a carton or will a simple shipping bag work? Is any cushioning actually required? If yes, will half the amount still protect your product? This is a basic group of questions that gets you thinking about optimization. A simple way to test is to make a change to your shipping package and do a real life shipping test. Ship your product to a location where it can be returned. Once it comes back evaluate the product and package. Is the product damaged? Keep refining your package until you are using just the packaging material that is required.

If the goal is to have your shipping package comply with one or more of the national or international standards, then professional help will be required. Package testing can be used to help to ensure that your product can be safely passed through the shipping environment. It provides real life data that will help you determine if your shipping package is performing as intended. If not, it gives packaging engineers insight as to where problems lie, and aids in determining a solution. The American Society for Testing and Materials (ASTM) and International Safe Transit Association (ISTA) have developed a wide variety of testing standards with the goal of evaluating transport packaging. A testing lab will have the capability of running your packaged product through any number of these testing standards and provide real life shock/vibration data. ISTA has programs for both certificated testing laboratories as well as certified

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packaging laboratory professionals. ASTM has a listing of testing laboratories but states that they have not attempted to investigate, rate, endorse, approve or certify any laboratory. More information can be found at the following links.

ASTM:

<http://www.astm.com/cgi-bin/SoftCart.exe/LABS/index.html?L+mystore+ewbo7432+1115670780>

ISTA:

<http://www.ista.org/Certification/CertificationHome.htm>

Common package tests include drop and vibration testing in any number of configurations. In either case, an accelerometer which measures the deceleration of gravity in units called “G’s” is attached to the product and placed within the package being tested. In a drop test the package is simply dropped from a predetermined height and the resulting G level is measured. A vibration test subjects the packaged product through any number of vibration profiles by use of a vibration table and the resulting G levels are recorded. Packaging engineers who can determine the best course for optimization can then analyze this data and propose necessary changes.



Swing Arm Drop Tester



Vibration Table

For an example of how one Oregon business used optimization to reduce interior cushioning by 40%, [click here](#).

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