

Training Course Proposal

Distribution Packaging Development and Evaluation



Presented by
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For: DYA client. This version is an example

Scope: A two-day training course covering shock, vibration, compression and atmospheric aspects of protective packaging. Minor emphasis on background theory, major emphasis on application and evaluation. Includes hands-on exercises to illustrate important points, performed in the client's on-site laboratory.

Training Course Outline

Day 1

Introductions and familiarity

Protective packaging background

- Hazards of distribution

- Shock, vibration, compression, atmospheric

- Basic formula: product + package = hazard

- Application challenges (client selected. Examples, electronics, medical, food, hazmat)

Basic dynamic theory

- Displacement, velocity, acceleration, dynamics

- Vibration

 - Basic harmonic motion, spring/mass, sine vibration, resonance, transmissibility

 - Random vibration, PSD/ASD, vibration fragility testing

 - Vibration damage sources

- Shock

 - Basic shock, free-fall dynamics, impact/rebound, velocity change

 - Damage boundary, fatigue damage boundary, shock response spectrum

 - Shock damage sources

Distribution environment hazards

- Scope and occurrence, sources

- Measurement and monitoring

- Quantification of hazards

- Available environmental data

Environmental measurement workshop – shock and vibration

- Focused Simulation – collect data and use to develop test protocol

Day 2

Development of protective packaging

- Packaging development process

- Dynamic performance –of non-fragile products and packages

- Cushioned package development

 - Material data, cushion curves, cushion vibration performance

 - Design variables, materials, static stress

- Design of corrugated containers for compression strength

 - Estimation of box compression test (BCT)

 - Applying environmental factors

...continued

Package test standards and protocols

ASTM test methods

ASTM D-4169 performance test

ISTA Procedures

1-5 Series, new developments, 7 Series

ISO 4180 series

Recommending the proper test protocol

Case study

Damage boundary, package development, package test

Product vibration, package development, package test

Design and lab exercise

Overall review, wrap-up

Deliverables: Presentations made in PowerPoint, use of selected videos, handout booklets with all slides for student notes, lab exercises, printable copies of all materials.