

Which tests predict DOA risk for your products?

Dead on Arrival (DOA) risk refers to the probability that your products will arrive damaged, non-functional, or unusable at their destination. Proper testing helps you identify which environmental factors pose the greatest threats during transport and storage. By understanding these risks through systematic testing, you can develop packaging solutions that protect your valuable products throughout the supply chain.

What does DOA risk actually mean for your products?

DOA incidents occur when products arrive damaged or non-functional due to transport conditions, resulting in immediate customer dissatisfaction, return costs, and potential safety hazards. These failures happen when packaging cannot protect against the physical stresses products encounter during shipping and handling.

Transport damage typically stems from vibration, shock impacts, temperature fluctuations, humidity exposure, and compression forces. Products face these challenges whether they travel by truck, ship, or air. Each transport method introduces different stress patterns that can affect sensitive components, delicate mechanisms, or precision-engineered parts.

The business impact extends beyond replacement costs. DOA incidents damage customer relationships, increase support workload, and can trigger regulatory investigations in sectors such as medical devices or defence equipment. For high-tech products containing sensitive electronics, even minor transport stress can cause latent failures that appear weeks after delivery.

Prevention matters because it protects both product integrity and business reputation. Companies that consistently deliver products in perfect condition build stronger customer loyalty and reduce operational overhead associated with returns processing and damage claims.

Which environmental tests reveal the biggest transport risks?

Vibration testing simulates the constant motion products experience during transport, while shock testing replicates sudden impacts from drops or rough handling. Temperature cycling and humidity exposure tests reveal how environmental conditions affect product performance and packaging integrity.

Vibration testing uses controlled frequencies that match real transport conditions. Road transport typically generates 2–200 Hz vibrations, while rail transport creates different patterns around 0.5–100 Hz. These tests identify loose components, fatigue failures, and packaging breakdown that occur during extended transport periods.

Shock testing applies sudden acceleration forces similar to package drops or impact loading. Standard tests simulate drops from various heights and orientations, helping you understand how products respond to handling incidents that commonly occur in warehouses and delivery situations.

Temperature cycling exposes products to heat and cold extremes they might encounter in uncontrolled storage or seasonal transport conditions. These tests reveal thermal expansion problems, condensation issues, and material degradation that can compromise product function.

Humidity exposure testing determines how moisture affects both products and packaging materials. High humidity can cause corrosion, mould growth, or electronic failures, while low humidity might create static discharge problems or material brittleness.

How do you choose the right packaging tests for your industry?

Industry-specific testing requirements vary significantly based on regulatory standards and application criticality. Medical devices need biocompatibility and sterility maintenance, electronics require ESD protection, and defence equipment must meet military specifications for extreme conditions.

Medical device packaging follows ISO 11607 standards for sterile barrier systems and ISO 4180 for transit testing. These requirements ensure products maintain sterility and functionality throughout distribution. Testing focuses on seal integrity, biocompatibility, and protection against contamination during normal handling and storage.

Electronics packaging emphasises ESD protection, moisture control, and mechanical shock resistance. IPC standards guide testing for electronic assemblies, while JEDEC standards address semiconductor packaging. These tests verify that sensitive components survive transport without latent damage that could cause field failures.

Defence and aerospace applications require compliance with MIL-STD specifications that cover extreme environmental conditions. Testing includes temperature extremes from -40°C to +70°C, altitude simulation, salt spray exposure, and enhanced shock resistance. These rigorous standards ensure equipment functions reliably in challenging operational environments.

High-tech manufacturing often combines multiple standards depending on product sensitivity and destination markets. Testing programmes typically include vibration, shock, temperature cycling, and humidity exposure tailored to specific transport routes and storage conditions.

What testing sequence gives you the most reliable results?

Effective testing follows a systematic progression from baseline assessment through increasingly challenging conditions. Start with product characterisation, then apply individual environmental stresses before combining multiple factors that simulate real-world transport scenarios.

Begin with baseline functional testing to establish normal product performance parameters. Document all critical functions, tolerances, and performance metrics before exposing products to any environmental stress. This baseline provides the reference point for evaluating test results and identifying degradation.

Apply individual environmental stresses sequentially to isolate specific failure modes. Test vibration first, followed by shock, then temperature cycling, and finally humidity exposure. This sequence helps identify which factors cause the most significant problems and allows targeted packaging improvements.

Combine environmental factors in realistic scenarios after individual testing is complete. Real transport involves simultaneous exposure to multiple stresses, such as vibration with temperature cycling or shock impacts in high-humidity conditions. These combination tests reveal interaction effects that single-factor testing might miss.

Validate packaging solutions using the same test sequence with products in their final packaging configuration. Compare protected versus unprotected results to quantify packaging effectiveness and identify any remaining vulnerabilities that need addressing.

How do you turn test results into better packaging decisions?

Test data analysis focuses on identifying failure patterns and correlating them with specific transport stresses. Look for threshold values where damage occurs, failure modes that appear consistently, and

environmental combinations that create the highest-risk scenarios.

Document all failure modes systematically, including when they occur, under what conditions, and how they progress. Photograph damage patterns and measure performance degradation to build a comprehensive understanding of product vulnerabilities. This documentation guides packaging design decisions and helps prioritise protection strategies.

Translate test findings into specific packaging requirements such as cushioning thickness, barrier properties, or structural reinforcement needs. Calculate protection levels needed based on test data rather than guessing or using generic solutions. This approach ensures packaging provides adequate protection without over-engineering.

Work with experienced packaging partners who understand how to interpret test results and implement effective solutions. Professional [packaging management](#) services help translate technical requirements into practical designs that balance protection, cost, and sustainability objectives.

Validate packaging improvements through repeat testing to confirm effectiveness. Compare new results against baseline data to quantify improvement and ensure all identified risks have been adequately addressed. This iterative approach builds confidence in packaging performance and reduces DOA risk.

Consider working with specialists who can provide comprehensive packaging analysis and implementation support. [Our team](#) combines testing expertise with practical packaging solutions to help you achieve reliable product protection. [Get in touch](#) to discuss how proper testing can reduce your DOA risk and improve customer satisfaction.

Hi, how are you doing?

Can I ask you something?

Hi! I see you're interested in reducing DOA (Dead on Arrival) risk for your products. Many companies in high-tech, medical, and defense sectors struggle with transport damage. Which best describes your current situation?

We're experiencing DOA issues now and need solutions urgently

We're planning ahead to prevent potential transport damage

We're researching testing options to understand our risks

That's a critical situation that needs immediate attention. DOA incidents can severely impact customer relationships and operational costs. What type of products are you primarily concerned about?

High-tech electronics or sensitive components

Medical devices requiring sterility maintenance

Defense equipment needing extreme condition protection

Other precision-engineered products

Smart approach! Prevention through proper testing and packaging design is much more cost-effective than dealing with failures later. What's driving your packaging optimization initiative?

Expanding into new markets or transport routes

Regulatory compliance requirements

Cost reduction and efficiency improvements

Sustainability and circular packaging goals

Understanding your testing needs is crucial for developing effective packaging solutions. Are you looking for guidance on which specific environmental tests would be most valuable for your products and industry requirements?

Yes, I need help determining the right testing approach

I know what tests I need but want packaging solutions

I'm exploring comprehensive packaging management services

Based on what you've shared, it sounds like you could benefit from our specialized packaging expertise. Our team combines testing knowledge with practical packaging solutions, from design and engineering to

complete packaging management. Let's connect you with someone who can provide specific insights for your situation.

Name

Email

Phone (optional)

Connect me with a packaging specialist

Perfect! Your information has been received. Our packaging specialists will review your requirements and reach out to discuss how we can help reduce your DOA risk through proper testing and tailored packaging solutions. Thank you for your interest in working with Faes!

Our team combines traditional Dutch craftsmanship with innovative packaging management services to deliver comprehensive solutions for high-tech, medical, and defense sectors.