



Australian Compliance Laboratory

Specialising in performance testing of dangerous goods packaging

A mock guide to:

Drop testing fibreboard boxes

For those wanting to internally test their dangerous goods packagings before laboratory analysis

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1 Mock drop testing procedures

1.1 Fibreboard box containing plastic inners containing liquids



1. Determine the drop height from Appendix A.
2. Fill 5 samples to their maximum capacity with antifreeze and seal tightly.
3. Chill the samples to $\leq -18^{\circ}\text{C}$.
4. Drop the samples once in each orientation from the test height. Refer to Appendix B for the orientations. Refer to Appendix C for conditions.
5. The inner packagings must not leak and be contained within the box.

1.2 Fibreboard box containing plastic inners containing solids



1. Determine the drop height from Appendix A.
2. Fill 5 samples to their maximum capacity and gross mass with polygranules and sand. Seal them tightly.
3. Chill the samples to $\leq -18^{\circ}\text{C}$.
4. Drop the samples once in each orientation from the test height. Refer to Appendix B for the orientations. Refer to Appendix C for conditions.
5. The inner packagings must remain sift-proof and be contained within the box.

1.3 Fibreboard box containing metal inners containing liquids



1. Determine the drop height from Appendix A.
2. Fill 5 samples to their maximum capacity with water and seal tightly.
3. Drop the samples once in each orientation from the test height. Refer to Appendix B for the orientations. Refer to Appendix C for conditions.
4. The inner packagings must not leak and be contained within the box.

1.4 Fibreboard box containing metal inners containing solids



1. Determine the drop height from Appendix A.
2. Fill 5 samples to their maximum capacity and gross mass with polygranules and sand. Seal them tightly.
3. Drop the samples once in each orientation from the test height. Refer to Appendix B for the orientations. Refer to Appendix C for conditions.
4. The inner packagings must remain sift-proof and be contained within the box.

1.5 Fibreboard box containing glass/porcelain inners containing liquids



1. Determine the drop height from Appendix A.
2. Fill 5 samples to their maximum capacity with water and seal tightly.
3. Drop the samples once in each orientation from the test height. Refer to Appendix B for the orientations. Refer to Appendix C for conditions.
4. The inner packagings must not leak and be contained within the box.

1.6 Fibreboard box containing glass/porcelain inners containing solids



1. Determine the drop height from Appendix A.
2. Fill 5 samples to their maximum capacity and gross mass with polygranules and sand. Seal them tightly.
3. Drop the samples once in each orientation from the test height. Refer to Appendix B for the orientations. Refer to Appendix C for conditions.
4. The inner packagings must remain sift-proof and be contained within the box.

1.7 Fibreboard box containing articles



1. Determine the drop height from Appendix A.
2. Fill 5 samples to their maximum capacity and gross mass with the articles and additional sand. Seal them tightly.
3. Drop the samples once in each orientation from the test height. Refer to Appendix B for the orientations. Refer to Appendix C for conditions.
4. The articles must remain contained within the box.

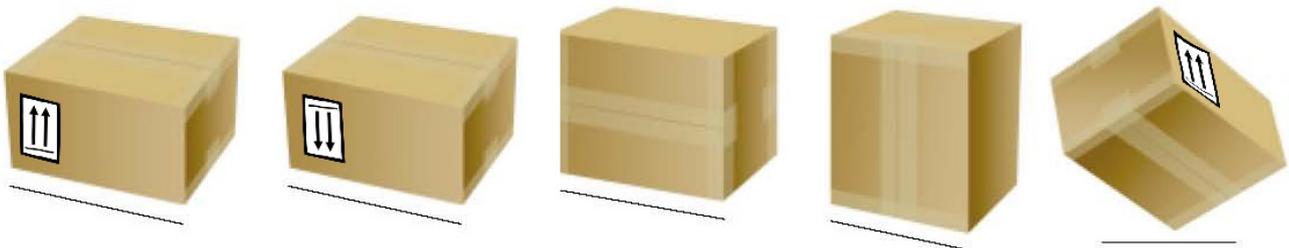
2 Appendices

2.1 Appendix A: Determine the drop height

Packing group	Drop height (metres)		
	I	II	III
Solid contents (powders, granules, articles)	1.8	1.2	0.8
Liquids contents $\leq 1.2\text{kg/L}$			
Liquid contents $> 1.2\text{kg/L}$	1.5 x SG	1.0 x SG	0.67 x SG

Where SG is the specific gravity of the liquid expressed as kg/L

2.2 Appendix B: Determine the drop orientations



1. Flat on the bottom
2. Flat on the top
3. Flat on the long side
4. Flat on the short side
5. On the bottom corner at the manufacturer's edge (the join)

2.3 Appendix C: A note regarding conditioning fibre packages

For in-house testing, it's okay to test fibreboard at ambient conditions. This deduction is made after considering clause 6.1.5.1.3 of the ADG Code which waives fibreboard conditioning when samples are retested.

However, it should be said that actual laboratory conditions test fibreboard at 23°C and 50% relative humidity. This is done after a 'drying' period where the fibreboard is left to pre-condition at approximately 25°C and 30% relative humidity.

3 Document information

3.1 General guidance

1. Mock testing on one package means nothing as it may give an out-lying result. You need to test on many samples to create reliable data. The more samples you test, the more reliable your data.
2. It's prudent to over-test your package before submitting. This can be achieved by exceeding the test requirements and/or performing many tests on one package.
3. The more measurement, control, and repeatability of your tests, the better.
4. The closer to laboratory conditions of your tests, the better.

3.2 The codes

The mock test methods in this document are modelled on those in the [Australian Code for the Transport of Dangerous Goods by Road and Rail \(ADG Code\)](#) and the [United Nations Recommendations on the Transport of Dangerous Goods \(UNRDG\)](#), Chapter 6.1.5.

3.3 ACL contact information

If you need more information then please contact us. We'd love to share our insights.

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3.4 Revision

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3.5 Disclaimer

This article is subject to ACL's [Disclaimer of Published Materials](#). Mock testing equipment, methods, and procedures may not be the same as those used in the laboratory and may produce different results. A passing result using these procedures may not result in a passing result in the laboratory. ACL is not responsible for any of the reader's results, observations, or interpretations arising from this article. Each packaging design may have special clauses or extra testing requirements. Readers should refer to the [ADG Code](#) for complete information.