

AFRDI 151, RATED LOAD (RL)–A GUIDE FOR SPECIFIERS AND PRODUCT DESIGNERS

INTRODUCTION

This document is aimed primarily at specifiers and product designers. It's intended to offer guidance only- it doesn't examine the standard in detail and isn't intended to be a substitute for it.

For specifiers it aims to act as an aid to selecting the right certification option for the right application.

For product designers, it may be used as an aid to both selecting components and to performing simple prototype testing prior to sending a chair for full laboratory evaluation.

The guide doesn't provide the level of detail necessary for comprehensive engineering design. It will still be useful, however, if used as intended i.e. as a basic design brief.

It should also benefit those who may be faced with the task of choosing samples from an existing range of chairs—with a view to promoting the best of them for rated load testing. The ability to perform basic preliminary testing should enable those chairs clearly not strong enough to be quickly identified. While those chairs which may pass preliminary assessment are not guaranteed to pass a full laboratory evaluation, their chances are much improved.

From a structural perspective, only static loads have been disclosed in this guide (and then only approximately). Fatigue loads and cycles have not been included (the number of cycles involved in most fatigue tests is well into the hundreds of thousands and requires specialist equipment).

It should be noted that:

- Testing can be dangerous. Most tests involve large loads. It should only be undertaken if it can be performed safely.
- Testing a chair in the way described below does not guarantee the chair will pass a full laboratory evaluation.
- The approximate loads disclosed in this document are based on the July 2014 release of AFRDI 151. They may be modified with new releases.

The standard itself is not available for purchase.



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RATED LOAD – WHAT DOES IT MEAN?

The standard comes with four certification options:

- 135 kg
- 160 kg
- 185 kg
- 300 kg (typically for bariatric applications)

To give some sense of relativity between the new and the existing standard; AS/NZS 4688 is the current Australia/New Zealand standard for fixed height chairs and it comes in four levels: 3, 4, 5 and 6, where increasing number indicates increasing severity—both in terms of loads and the number of times they're applied (load cycles). In almost every test the loads and load cycles used in the 135 kg designated option are greater than those used in AS/NZS 4688 level 6. And each of the other Rated Load certification options is more severe again.

LOADING POINTS

All loads are applied approximately as specified in BS EN 1728:2001.

1 kN ≈ 100 kg

The 'median plane' is the plane that divides the chair into two symmetrical portions, front to back.

STRENGTH (STATIC LOADS)

SEAT LOADS

GENERAL

Loads are applied on the axis of the chair at the seat load point and approximately 80 mm from the front edge.

135 kg

The chair must be able to bear a seat loads of approximately 3.25 kN.



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160 kg

The chair must be able to bear a seat load of approximately 3.65 kN.

185 kg

The chair must be able to bear a seat load of approximately 4 kN.

300 kg

The chair must be able to bear a seat load of approximately 5.4 kN.

BACK LOADS

GENERAL

Loads are applied to the backrest in the median plane 300mm above the seat and approximately 50 mm either side of the median plane.

135 kg

The backrest must be able to bear a load of approximately 0.86 kN in the rearward direction.

160, 185 & 300 kg

The backrest must be able to bear a load of approximately 1.02 kN in the rearward direction.

ARM LOADS

GENERAL

Both horizontal and vertical loads are applied at the point along each armrest considered most likely to fail, but not less than 50 mm from each end of the arm structure.

At all test levels the arms must withstand vertical loading of approximately 1.2 kN and horizontal loading of approximately 0.9 kN.



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STABILITY

Stability tests are generally applied in accordance with the methods outlined in BS EN 1022:2005.

The various tests have been adjusted in proportion to the increase in stability requirements considered necessary for chairs being used by larger people i.e. the overturning tests in all directions have been made more severe.

IGNITABILITY/FLAMMABILITY AND DENSITY

The requirements for foam ignitability and density are the same as those of AS/NZS 4438 level 6. Mesh chairs are also subject to a similar ignitability test. Fabrics are not subject to any evaluation.

ERGONOMICS

There are no requirements for ergonomic/dimensional assessment in the Rated Load standard.

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