

**November 2005**

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## **Office Chairs - Seat Depth and Backrest Angles**

The Australian/New Zealand Standard 4438 *Height adjustable swivel chairs* has provision for chairs with variable seat depth, seat depth being defined as the horizontal distance between the front edge of the seat and the lumbar support point on the backrest. To be classified as chairs having variable seat depth, i.e. Type 1 or Type 2 chairs, the seat depth must be able to be varied over the full range from 380 mm to 480 mm.

The purpose of having adjustable seat depth is to enable adjustment of the chair so the one chair can be modified to provide a good ergonomic "fit" for persons of various stature. Persons with shorter than average thigh length should expect to be able to adjust the chair so that when seated they find that the backrest is appropriately placed to provide effective lumbar support for a comfortable and safe sitting posture to be maintained. Persons with longer legs would similarly expect to adjust the chair to provide an equivalent comfortable and safe sitting position. However, it is

very likely that all users of such a chair would expect to set the backrest in the same angular position to achieve this position of comfort.

Methods employed by chair manufacturers to achieve variation in seat depth include:

1. varying the rake angle of the stem supporting the backrest of the chair
2. provision of a horizontal slide within the seat mechanism such that the seat can be moved horizontally backward or forward independent of the backrest of the chair, or
3. use of an "L" shaped back support stem, the horizontal section of which is attached to the underside of the seat pan by means of some form of sliding clamp.

Of these systems the seat slide and "L" stem options are regarded as ergonomically sound but the first option, while it is by far the most common, is ergonomically ques-

tionable. This is because it is unlikely that the backrest angle will be optimum for all users, and particularly for those users whose requirements are close to the upper or lower ends of the seat depth adjustment range defined.

Some backrest attachment systems allow the backrest to pivot freely about a horizontal axis at the top of the back stem which does permit the backrest angle to be maintained as the rake angle of the backrest support stem is changed. However, to be effective the range of pivot angle must be as least as great as the range of back stem rake angle and this may not be achieved. While the provision of backrest pivot action is an improvement ergonomically over non pivoting backrests fitted to raking back stem systems there is some uncertainty as to the real value because it is unclear whether a backrest which is self adjusting, i.e. the actual angle adopted is determined by interaction between the users back and the backrest, can provide optimum back support, compared to a backrest for which the angle is preset and fixed in a position to provide that support.

A further category of chair mechanism known as synchronous mechanism is available in which some synchronisation is maintained between the angle of the backrest and the angle of seat inclination, such that if the seat is rotated backward by some angle, the backrest will automatically rotate backward by a greater or smaller angle determined by the "gearing ratio" of the mechanism. Furntech does not regard such mechanisms as having seat depth adjustment because, while the distance between the front edge of the seat and the lumbar support point can be var-

ied, this variation is only obtained if the seat inclination is changed. A similar argument would support a claim that chairs having a raking backrest support stem but not having backrest pivot action should also not be regarded as having seat depth adjustment.

These issues are not appropriately addressed in the scheme of ergonomic chair measurement provided in AS/NZS 4438, largely due to the fact that backrest angle is not defined within this measurement scheme so no ergonomically tolerable range of backrest angle can be identified. The issue of the ergonomic value of self-adjustable pivoting backrests which must also be tied to an acceptable definition of backrest angle also needs more consideration.

The approach taken by Furntech in measuring chairs for compliance with the ergonomic requirements of the Standard has been – with the stated exception of chairs with synchronous mechanisms - to ignore these anomalies and follow the definitions and methods directly as provided in the standard. However, our experience in the ergonomic assessment of office chairs has highlighted these anomalies and we will be recommending that they be addressed in any future revision of the Standard.



## The Standards Scene

The following is an update on the standards front.

The two Standards Australia committees dealing with Commercial Furniture CS 088 and Domestic Furniture CS 091 have now been combined into one committee, CS 088. This committee will now handle both Commercial and Domestic Furniture Standards (other than CS 003 which covers Safety Requirements for Children's Furniture).

The current topics on the **CS 088** agenda include:

**Review of *Furniture – School and educational – Functional, dimensional and marking requirements AS/NZS 4610.1***

AS/NZS 4610 parts 2 and 3 have already been released. The committee has received significant detail from the working group on possible changes to the size ranges for chairs and desks. This is now being considered.

**Adoption as an Australian Standard of *BS 5459.2:2000 Office pedestal seating for use by persons weighing up to 150 kg and for use up to 24 hours a day, including type-approval tests for individual components***

A chair standard for heavier people is needed and the committee considered this is the best option at this time. A draft for public comment is to be released soon.

**Adoption of AFRDI 109 *Chair component* Standard as an Australian Standard**

The AFRDI chair component standard is now being reviewed. AFRDI sought comment from members and is now collating these before presentation to Standards Australia.

**Adoption of AFRDI 126 *Monitor arm* Standard as an Australian Standard**

This AFRDI Standard has been submitted to the CS 088 committee for considera-

tion. A draft for public comment is to be released.

**Adoption of AFRDI 144 *Retail Spinners***

A draft (DR 05465 CP) has now been released for comment which close on 6 December.

**Work on *mattress and bed* standards for Australia**

A mattress working group has been established by Standards Australia. The group agreed to prepare a draft that includes the following;

- Durability and hardness
- Flammability and
- Mattress sizing

The working group will present a draft to CS 088 in February 2006.

**Review of a new standard for glass in furniture**

The draft has been reviewed by Furntech-AFRDI (developed by another Standards Australia committee, BD 007)

**Consideration of a standard for stability of TV Cabinets**

There have been a number of incidents reported recently relating to televisions tipping onto children hence the interest in this area.



The current topics on the **CS 003** agenda include:

### **Review of Bunk beds AS/NZS 4220**

Comprehensive review of the standard.

### **Review of Cots for household use AS/NZS 2172**

Comprehensive review of the standard.

### **Review of Portable Cots AS/NZS 2195**

Comprehensive review of the standard.

### **Review/preparation of a standard for High Chairs**

Development of new standard incorporating the requirements of several international standards.

Other standards topics include:

### **Preparation of an AFRDI Standard for Leather Descriptions.**

The planned release is early 2006.

## **Office Chairs with Arms**

If office chairs with arms are to be marketed as AFRDI certified then chairs must have been tested with the arms attached.

It is NOT acceptable to have a chair without arms AFRDI certified and then at some later date add arms or add arms as an option and still call the chair AFRDI certified without additional testing.

If the addition of arms becomes an option then the chair is required to be re-submitted for testing with arms.

Likewise if the arms are changed from one style to another then the new style is required to be tested on the chair.

## **Discounts to FIAA Members**

Furntech are now offering a 10% discount on most testing to FIAA members in addition to CFIAA and INPAA members. Becoming an AFRDI Member can attain further discounts. Please contact the Institute on 03 6326 6155 or [info@furntech.org.au](mailto:info@furntech.org.au) if you would like more information or wish to become an AFRDI Member.

The combination of industry association and AFRDI membership can yield discounts of up to 30%.

## **Chair Discounts**

Furntech-AFRDI now offer additional discounts on full testing of chairs.

This follows comment from members regarding the opportunity to have more chairs from their range AFRDI Blue Tick Certified.

A 33% discount will apply to the third and subsequent chairs submitted by a Company simultaneously for full testing to AS/NZS 4438 or AS/NZS 4688. AFRDI member discounts and 10% CFIAA/FIAA discounts also apply.

This makes the package even more attractive for companies wishing to submit a number of chairs together.

## **Christmas Holidays**

Furntech-AFRDI will close on Thursday 22 December and re-open Tuesday 10 January 2006.



## New Staff

We welcome the following staff to the Institute.

### Eric Paul – Testing Officer

Eric spent 22 years as a Technical Officer with TAFE Tasmania in the Engineering, Science and Electrical departments. He has also worked in the NATA registered mechanical testing laboratory attached to TAFE and spent a number of years working in a NATA laboratory in a civil engineering consultancy business. Eric holds an Advanced Diploma in Engineering.

### Robert Johnston – Standards Officer

The Institute has recently appointed a Standards Officer. The role of this new position will be to specifically work on standards development with initial focus on domestic and residential furniture.

Robert worked for many years in the manufacture of metal components for the automotive industries.

His experience includes the specification, manufacture and testing of metal components and associated problem investigations and the supervision of engineering design, quality assurance and metallurgical laboratory departments.

Robert has a Diploma of Applied Science in Metallurgy.



## New Furntech-AFRDI Members

We would like to welcome the following new members: -

Bevisco  
Seating Solutions  
Style Ergonomics

In addition we would like to thank those members who have recently renewed their membership.



## Draft Standard

The following new draft standard has recently been issued:

DR 05465 CP

Stand alone retail display devices (Retail Spinners)

For comment till 6 December 2005

A copy of this draft standard may be downloaded from the Standards Australia web site [www.standards.com.au](http://www.standards.com.au)

### What is Furntech-AFRDI Blue Tick?

Blue Tick is an undertaking where manufacturers or suppliers of furniture or components submit their products for testing and quality certification to recognised Standards. Companies whose products meet these requirements are listed on the Furntech-AFRDI website ([www.furntech.org.au](http://www.furntech.org.au)) which is used by many specifiers, manufacturers, buyers and sellers of furniture. Further details on Blue Tick may be found on our website or by contacting the Institute.



Blue Tick  
Product  
Certification



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Standards, Testing and Product Certification for Commercial, Domestic and Nursery Furniture in Australia and New Zealand