



Flame Retardancy (FR) White Paper

As a manufacturer and installer of flame retardant curtains for theatres and public venues, Theatre Star P/L takes its' role as a drape supplier to the Australian entertainment industry very seriously. We ensure that, whenever possible, fabrics supplied by us meet or exceed fire retardancy requirements of the Australian National Construction Code standards for Class 9b Buildings (Theatres etc).

Fire Retardant Vs Fireproof

These terms do not mean the same thing. Fire retardant fabrics will burn, but are designed to resist ignition, inhibit flame spread, and slow heat transfer, compared to fabrics with no fire retardant capacity. The very few fireproof fabrics are made of metal or ceramic fibre that will not support a flame.

Fire Compliance

Current building code fire retardancy requirements for theatre curtains is complex and ambiguous, even to people with OH&S experience. Definitions and explanations in the Australian National Construction Code (NCC) documentation can be interpreted in diverse ways.

At Theatre Star we take the approach of Occupational Health and Safety best practice - reduce risk wherever possible. The majority of the fabrics we stock and supply are fully certificated to AS1530 Part 2 & 3, with the lowest possible flammability, spread of flame and smoke development.

What is FR certification?

An FR certificate is a report from a testing authority. Sample fabric is tested to destruction and the certificate details the results of various tests, called indices. There is no pass or fail and the indices must be compared to the National Building Code (NCC) requirements for a Class 9b building (Theatres, Halls etc) - AS 1530 Fire Test to Building Material – Relative Standard.

AS1530.2: Methods for fire tests on building materials, components, and structures - Test for Flammability of materials.

AS1530.2 - Referred to as the 'Vertical Burn' test.

This test is required for theatre drapes as they are usually vertically installed. A vertical strip of the material is exposed to a flame for a prescribed period and the speed of extinguishing and the smoke development etc. is measured to give a Flammability Index. The score is a range from 0 to 100.

New South Wales requires part 2 certification.



AS1530.3: Methods for Fire Tests on building materials, components, and Structures – Test for Simultaneous Determination of Ignitability, Flame Propagation. Heat Release and Smoke Release.

AS 1530-3 - The "Radiant Heat" test.

Most often called for in upholstery situations and also applies to theatre drapes.

The test requires the material be placed in a chamber where a radiator generates intense heat.

The time the fabric takes to ignite, the flame to spread and extinguish, and the amount of smoke developed is measured, and given a score. The two indices most important are Spread of Flame and Smoke developed.



An acceptable result is usually considered - Spread of Flame '0' and Smoke Developed 5 or less, except for Proscenium drapes which require maximum '3' for Smoke Developed.

Part 3 certification is required for all states of Australia.

Fabric FR Types

Inherently Flame Retardant - IFR

IFR (Inherently flame retardant) fabrics are manufactured from fibres which require no chemical treatment to meet the testing standard results required.

The benefits of IFR:

- Continuous compliance to fire safety regulations.
- More environmentally friendly being chemical free finish.
- No leeching of chemicals in the handling of drapes by theatre staff or performers
- ***No expensive retreatment of our IFR fabrics is ever required.***

All wool fabrics are not IFR!

There is a miscomprehension that all wool fabric is naturally IFR. This is not the case. Much “wool” fabric used in theatre is a blend of wool with up to 40% of other fibre such as nylon or unknown, and/or has received a chemical treatment to achieve the required test results.

Theatre Star’s Infinity Wool is unique in that it requires no chemical treatments to attain the flame retardancy ratings required of the NCC. The secret is in the purity of the fabric (95% wool, 5% nylon) and the density of the weave.

Care and maintenance of IFR fabrics.

Curtains made from IFR fabrics should be kept dust free with regular vacuuming. They can be spot cleaned or dry cleaned, and wetted without affecting the inherently fire retardant status.

Original fabric labels should never be removed, and “retreatment” is not required for IFR fabrics.

BEWARE - We know of instances of companies approaching venues stating that all drapes need annual retreatment to remain compliant. This is creating unwarranted financial burden and inconvenience. If you have purchased curtains made from Inherently Flame Retardant (IFR) fabric, and they are correctly labelled, they do not require retreatment.

Fire Retardant (treated) - FR

Fabrics that are not inherently flame retardant can have a chemical treatment applied by the fabric manufacturer or topically. Topical application of fire retardant chemicals to curtains requires correct application and saturation of the fabric according to the chemical manufacturer’s instructions. To ensure the treatment is successful a sample of fabric should be sent to a certified testing authority to be tested and the result compared with the NCC requirements for Class 9b buildings.

Care and maintenance of FR Treated fabrics.

Curtains made from FR treated fabrics should be kept dust free with regular vacuuming. They can be spot cleaned with dry cleaning fluid and dry cleaned a maximum of 5 times. Wetting will affect the FR status of the drapes and may cause discolouration.

Original fabric labels should never be removed. If retreated, additional permanent labels detailing the FR treatment should be added.

Not Fire Retardant - NFR

Fabrics used for scenic painting generally have no fire retardant treatment as it can affect the painting process. Fire retardant is added to the final top glaze and rear of the cloth by the painter. Other fabrics can be fire retardant treated using commercial chemicals following the manufacturer’s guidelines.

Curtain Labels

Standard practice is all theatre drapes should have a curtain label permanently attached by the manufacturer. Original labels should never be removed.

Note 4 and 5 of the National Construction Code NSW Spec C1.10, states that each drape should have a permanently attached label which should include following information:

- The name of the manufacturer.
- Trade name and description of material's composition.
- Retardant treatment (if any), name of applicator and date of application.
- AS 1530 Part 2 and/or AS/NSZ 1530 Part 3 test number and
 - Flammability Index,
 - Spread of Flame Index
 - Smoke -Developed Index:
- Approved method of cleaning

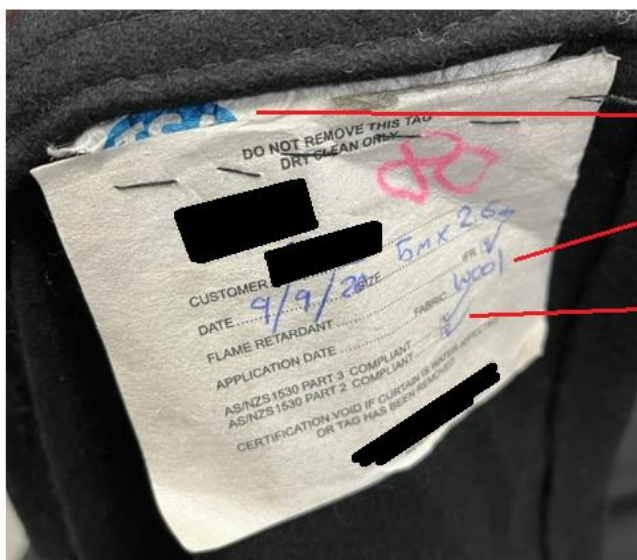
All this information is required as part of compliance with the code.

If labels are not present, there is no way of ascertaining the fire retardant status of the curtain.

Example of a compliant label.

Customer _____		Date _____	
Fabric	Infinity IFR Wool	Composition	95% Wool, 5% Nylon
Flame Retardancy Status			
☒ Inherently Flame Retardant		☒ Tested & certified per AS1530 Pts 2+3	
• Not chemically treated		Test#	16-002877
• No treatment ever required		Smoke developed	3
		Spread of flame	0
		Flammability	1
Care Instructions			
• Maintain in a dust free condition		• Refer to QR code for maintenance advice	
• Dry clean only		• Original labels should never be removed	

Example of a non-compliant label.



Missing the name of the manufacturer
- original tag removed

Missing Trade name and description
of material's composition

Missing AS 1530 Part 2 and, Part 3 test number

Missing Flammability Index, Spread of Flame Index
and Smoke-Developed Index

Example of FR Certificate AS1530 Part 2 & 3

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TEST REPORT

Client : Theatre Star P/L
3/10 Industry Circuit
Kilsyth VIC 3137

Test Number : 16-002877
Issue Date : 08/06/2016
Print Date : 10/06/2016

Sample Description Clients Ref : "Infinity Theatre Wool"
Woven fabric
Colour : Black
End Use : Curtains / Screens
Nominal Composition : 100% Wool
Nominal Mass per Unit Area/Density : 524g/m2
Nominal Thickness : Approx: 1mm

AS 1530.2-1993

Methods for Fire Tests on Building Materials - Components and Structures
Part 2: Test for Flammability of Materials

Date Tested	08/06/2016	
Flammability Index	1	
Spread Factor	Length	Width
	0	0
Heat Release Factor	1	1
Maximum height (d)		
Mean	1.9	1.8
Coefficient of Variation	22.1	14.8 %
Heat (a)		
Mean	4.4	4.8 °C.min
Coefficient of Variation	31.5	17.2 %
Number of Specimens Tested	9	9
Observation	Visible smoke	

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Client : Theatre Star P/L
3/10 Industry Circuit
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These test results relate only to the behaviour of the test specimens of the material under the particular conditions of the test, and they are not intended to be the sole criterion for assessing the potential fire hazard of the material in use.

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Example of FR Certificate AS1530 Part 3



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Test Number : 16-002877
Issue Date : 08/06/2016
Print Date : 10/06/2016

AS/NZS 1530.3-1999

Methods for Fire Tests on Building Materials, Components and Structures
Part 3: Simultaneous Determination of Ignitability,
Flame Propagation, Heat Release and Smoke Release

Face tested:	Face	
Date tested:	08/06/2016	
	Standard Error	Mean
Ignition time	Nil	Nil min
Flame propagation time	Nil	Nil sec
Heat released integral	Nil	Nil kJ/m²
Smoke mass released	0.0191	-1.3891
Optical density, d		0.0410 / metre
Number of specimens ignited:		0
Number of specimens tested:		6
Regulatory Indices:		
Ignitability Index		0 Range 0-20
Spread of Flame Index		0 Range 0-10
Heat Evolved Index		0 Range 0-10
Smoke Developed Index		3 Range 0-10

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These results only apply to the specimen mounted, as described in this report. The result of this fire test may be used to directly assess fire hazard, but it should be recognised that a single test method will not provide a full assessment of fire hazard under all fire conditions.

Ignition is initiated by a pilot flame that is held near, but does not touch the specimen material that does not ignite during the standard test may ignite if contacted with a pilot flame during the test.

The specimens were mounted to simulate use in an unsupported or free hanging mode. The results may be significantly different when mounted to simulate a wall cladding or upholstery application. To allow free movement of sample during testing all corners were folded away from the clamps.

Each test specimen was sandwiched between two layers of galvanised welded square mesh made from wire of nominal diameter 1.0mm and nominal spacing 12mm in both directions, stapled through at four points each 100mm from corner of the sample and the assembly clamped in four places.

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