



NSAI
Standards

Irish Standard
I.S. 419:2011

Fire safety requirements for components of furniture

NSAI have made this standard available as a FREE download as part of the Public Consultation on Furniture Fire Regulations by the Department of Business, Enterprise and Innovation

*Details on Latest Department News | 14th November 2019
<https://dbei.gov.ie/en/News-And-Events>*

I.S. 419:2011

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

<i>This document replaces:</i> I.S. 419:1988	<i>This document is based on:</i> I.S. 419:2011 I.S. 419:1988	<i>Published:</i> 8 August, 2011 1 January, 1988
This document was published under the authority of the NSAI and comes into effect on: 8 August, 2011		ICS number: 97.140
NSAI 1 Swift Square, Northwood, Santry Dublin 9	T +353 1 807 3800 F +353 1 807 3838 E standards@nsai.ie W NSAI.ie	Sales: T +353 1 857 6730 F +353 1 857 6729 W standards.ie
Údarás um Chaighdeáin Náisiúnta na hÉireann		

DECLARATION

OF

SPECIFICATION

ENTITLED

FIRE SAFETY REQUIREMENTS FOR COMPONENTS OF FURNITURE

AS

THE IRISH STANDARD SPECIFICATION FOR

FIRE SAFETY REQUIREMENTS FOR COMPONENTS OF FURNITURE

NSAI in exercise of the power conferred by section 16 (5) of the National Standards Authority of Ireland Act, 1996 (No. 28 of 1996) and with the consent of the Minister for Jobs, Enterprise and Innovation, hereby declare as follows:

1. This instrument may be cited as the Standard Specification (Fire safety requirements for components of furniture) Declaration, 2011.

2. (1) The Specification set forth in the Schedule to this declaration is hereby declared to be the standard specification for Fire safety requirements for components of furniture.

(2) The said standard specification may be cited as Irish Standard 419:2011 or as I.S. 419:2011.

3. (1) The Standard Specification (Fire safety requirements for components of furniture) Declaration 1988 and Amendment No. 1:1994 are hereby revoked.

(2) Reference in any other standard specification to the Instruments hereby revoked and to Irish Standard 419:1988 and Amendment No. 1:1994 thereby prescribed, shall be construed, respectively, as references to this Instrument and to Irish Standard 419:2011.

Contents

Page

DECLARATION	1
1 Scope	3
2 Normative references	3
3 Terms and definitions	3
4 Fire safety requirements for foam fillings	4
5 Fire safety requirements for non-foam and composite fillings	4
6 Fire safety requirements for covers	4
7 Composite test requirements	5
Annex A (normative) Ignitability test for polyurethane foam in slab or cushion form	6
Annex B (normative) Ignitability test for polyurethane foam in crumb form	7
Annex C (normative) Ignitability test for latex rubber foam	8
Annex D (normative) Ignitability test for non-foam filling materials singly	9
Annex E (normative) Ignitability test for composite fillings for furniture other than mattresses, bed bases, cushions and pillows	10
Annex F (normative) Composite test for ignitability of pillows and cushions with primary covers	11
Annex G (normative) Ignitability test for composite fillings of mattresses and bed bases	12
Annex H (normative) Ignition resistance test for inner cover (interliner)	13
Annex I (normative) Cigarette test	14
Annex J (normative) Match test	15
Annex K (normative) Match test for stretch covers	16

Schedule

Fire safety requirements for components of furniture

1 Scope

This specification deals with the fire safety requirements for components of furniture including upholstered furniture, mattresses, bed bases, cushions and pillows intended for private use in a dwelling, with particular reference to the type of filling material and cover material which may be used.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

I.S. 254:1983, *Flame resistance requirements for upholstery*

I.S. 418, *Ignitability requirements of mattresses tested with secondary ignition sources simulating unknown bedcovers*

I.S. EN 1021-1:2006, *Furniture - Assessment of the ignitability of upholstered furniture - Part 1: Ignition source smouldering cigarette*

I.S. EN 1021-2:2006, *Furniture - Assessment of the ignitability of upholstered furniture - Part 2: Ignition source match flame equivalent*

3 Terms and definitions

For the purposes of this Irish Standard, the following terms and definitions apply.

filling

main upholstery material contained by the outer cover and (if used) the inner cover

NOTE It can consist of several different materials including any inner cover nominally greater than 2 mm thick

flaming

undergoing combustion in the gaseous phase with the emission of light

inner cover

thin layer of material used between the outer cover and the upholstery filling

NOTE 1 Any inner cover greater than nominally 2 mm thick is part of the filling for test purposes.

NOTE 2 The term "interliner" is no longer used because it is non-specific and has been applied to different components within the composite.

outer cover

outer layer of the upholstery

smouldering

exothermic oxidation, not accompanied by flaming, (i.e. independent of the ignition source) and may or may not be accompanied by incandescence

4 Fire safety requirements for foam fillings

4.1 Where furniture contains:

- a) polyurethane foam in slab or cushion form, the foam shall comply with Annex A;
- b) polyurethane foam in crumb form, the foam shall comply with Annex B and be derived from foam which complies with Annex A;
- c) latex rubber foam, the foam shall comply with Annex C.

5 Fire safety requirements for non-foam and composite fillings

5.1 Where furniture other than mattresses, bed bases, cushions and pillows contain:

- a) a single non-foam filling material, this material shall comply with Annex D;
- b) composite fillings, each and every layer shall comply with the single filling requirements of Annex A, Annex B, Annex C or Annex D as applicable or else the composite construction together with any prime cover shall comply with Annex E provided that any foam itself complies with Annex A, Annex B or Annex C as applicable.

5.2 Where mattresses and bed bases contain:

- a) a single non-foam filling material, this material shall comply with Annex D;
- b) composite fillings, each and every layer of different filling material shall comply with the single filling requirements of Annex A, Annex B, Annex C or Annex D as applicable or else the composite construction shall comply with Annex G provided that any foam material meets the requirements of Annex A, Annex B or Annex C as applicable.

5.3 Where cushions and pillows contain:

- a) a single non-foam filling material, this material shall comply with Annex D;
- b) composite fillings, each and every layer of different filling material shall comply with the single filling requirements of Annex A, Annex B, Annex C or Annex D as applicable or else the composite construction together with any prime cover shall comply with Annex E provided that any foam material meets the requirements of Annex A, Annex B or Annex C.

5.4 However, where any non-foam filling(s) fail to comply with 5.3 a) or 5.3 b) above they can be used in cushions and pillows provided they are contained within a prime cover that protects them and in this case they shall comply with Annex F.

6 Fire safety requirements for covers

6.1 This clause applies to furniture other than mattresses, bed bases, pillows and cushions.

6.2 The permanent cover, or any cover or fabric to be used to provide or replace the permanent cover, shall either:

- a) comply with the match test in Annex J; or
- b) where the cover contains at least 75 % by weight of cotton, viscose, modal, flax, silk or wool used separately or together and not coated with polyurethane or a polyurethane preparation, it can be used where it does not comply with Annex J, but only where it is used directly over an inner cover which complies with Annex H.

6.3 Loose covers shall comply with the match test in Annex J.

6.4 Stretch covers shall comply with the match test in Annex K.

7 Composite test requirements

Where furniture other than mattresses, bed bases, pillows, and cushions includes upholstery, the upholstery shall comply with the cigarette test of Annex I.

FREE DOWNLOAD provided by NSAI as part of the Public Consultation on Furniture Fire Regulations

Annex A (normative)

Ignitability test for polyurethane foam in slab or cushion form

A.1 The foam shall be tested in accordance with the method set out in I.S. 254 using cover fabric corresponding to the specification set out in A.2.

A.2 The fabric shall be made of 100 % flame retardant polyester fibre. The construction of the fabric shall be woven to a plain weave. The yarn in the warp shall be spun to a linear density of 37 tex \pm 10 %. The yarn in the weft shall be spun to a linear density of 100 tex \pm 10 %.

The fabric shall be scoured and heat set.

The fabric shall be woven so as to have a finished fabric construction of

- a) 20,5 \pm 1 yarn threads per centimetre in the warp; and
- b) 12,5 \pm 1 yarn threads per centimetre in the weft.

Its mass shall be 220 g/m² \pm 5 %

A.3 The test rig as specified in 5.1 of I.S. 254:1983 shall have expanded steel platforms of not less than (28 x 6) mm mesh size. The test rig shall be placed on a metal tray of sufficient dimensions to collect any debris falling from specimens being tested. The rig and debris tray shall be mounted on a weighing balance with a remote readout having a full-scale deflection of at least (0 to 20) kg to an accuracy of 2 g.

A.4 The foam under test, cut to the specified dimensions is placed on the test rig, covered with the fabric specified in A.2 and tensioned with clips as set out in I.S. 254. An ignition source Grade 5 crib is placed in position. The mass of the complete assembly is determined ("initial mass"). The test shall be carried out in accordance with I.S. 254. In particular flaming or smouldering failure shall be determined against the criteria of clause 3 and clause 4 of I.S. 254:1983.

After flaming and smouldering has ceased, any debris which has become detached from the specimen shall be removed. The remaining mass of the assembly ("final mass") is then recorded.

A.5 Where failure against the criteria of clause 3 and clause 4 of I.S. 254:1983 has occurred but only by way of damage exceeding the limits defined in 4.4 c, 4.4 d and 4.5 of I.S. 254:1983 and provided that the resultant mass loss (initial mass less final mass) is less than 60 g the foam passes the ignitability test.

Annex B (normative)

Ignitability test for polyurethane foam in crumb form

B.1 The foam shall be tested in accordance with the method set out in I.S. 254 using cover fabric corresponding to the specification set out in B.2.

B.2 The fabric shall be made of 100 % flame retardant polyester fibre. The construction of the fabric shall be woven to a plain weave. The yarn in the warp shall be spun to a linear density of 37 tex \pm 10 %. The yarn in the weft shall be spun to a linear density of 100 tex \pm 10 %.

The fabric shall be scoured and heat set.

The fabric shall be woven so as to have a finished fabric construction of:

- a) 20,5 \pm 1 yarn threads per centimetre in the warp and
- b) 12,5 \pm 1 yarn threads per centimetre in the weft.

Its mass shall be 220 g/m² \pm 5%

B.3 The test rig panels shall be lined with the fabric specified in B.2. Sufficient crumb foam shall be placed upon the seat and back panels so that when the cover fabric piece is placed over them, both are stuffed to the density used in the furniture as intended. The test shall then be carried out in accordance with I.S. 254:1983 using ignition source Grade 2 as specified therein.

B.4 Where smouldering or flaming failure against the criteria of clause 3 and clause 4 of I.S. 254:1983 has not occurred or has occurred only by way of damage exceeding the limits defined in 4.4 c), 4.4 d) and 4.5 of I.S. 254:1983, the crumb foam passes the ignitability test.

FREE DOWNLOAD provided by NSAI as part of the public consultation on Furniture Fire Regulations

Annex C (normative)

Ignitability test for latex rubber foam

C.1 The foam shall be tested in accordance with the method set out in I.S. 254 using cover fabric corresponding to the specification set out in C.2.

C.2 The fabric shall be made of 100 % flame retardant polyester fibre. The construction of the fabric shall be woven to a plain weave. The yarn in the warp shall be spun to a linear density of 37 tex \pm 10 %. The yarn in the weft shall be spun to a linear density of 100 tex \pm 10 %.

The fabric shall be scoured and heat set.

The fabric shall be woven so as to have a finished fabric construction of;

- a) 20,5 \pm 1 yarn threads per centimetre in the warp and
- b) 12,5 \pm 1 yarn threads per centimetre in the weft.

Its mass shall be 220 g/m² \pm 5%

C.3 The foam under test, cut to the specified dimensions, shall be placed on the test rig, covered with the fabric specified in C.2 and tensioned with clips as set out in I.S. 254:1983. The test shall then be carried out using ignition source Grade 2 as specified therein.

C.4 Where smouldering or flaming failure against the criteria of clause 3 and clause 4 of I.S. 254:1983 does not occur, the latex rubber foam passes the ignitability test.

Annex D (normative)

Ignitability test for non-foam filling materials singly

D.1 The filling material shall be tested in accordance with the method set out in I.S. 254 using cover fabric to the specification in A.2 of Annex A.

D.2 The specimen comprising the filling material to be tested and the specified cover fabric shall be tested with ignition source Grade 2 as specified in I.S. 254:1983. Where the filling material is loose it shall be packed as indicated in B.3 of Annex B.

D.3 Where smouldering or flaming failure against the criteria of clause 3 and clause 4 of I.S. 254:1983 has not occurred or has occurred only by way of damage exceeding the limits defined in 4.4 c), 4.4 d) and 4.5 of I.S. 254:1983 the non-foam filling passes the ignitability test.

FREE DOWNLOAD provided by NSAI as part of the Public Consultation on Future Fire Regulations

Annex E
(normative)

**Ignitability test for composite fillings for furniture other than mattresses,
bed bases, cushions and pillows**

The composite fillings, covered with the primary cover, shall be built up on the test rig as described in I.S. 254. The covering fabric shall be that specified in A.2 of Annex A. The test procedure with the use of ignition source Grade 2 specified in I.S. 254:1983 and the criteria of failure shall be as specified therein.

FREE DOWNLOAD provided by NSAI as part of the Public Consultation on Furniture Fire Regulations

Annex F (normative)

Composite test for ignitability of pillows and cushions with primary covers

F.1 For pillows, the test specimen shall comprise the filling and the primary cover of the pillow. Where the filling is of a loose nature the specimens shall be prepared as set out for loose fillings in B.3 of Annex B. The test procedure using ignition source Grade 2 shall be as specified in I.S. 254:1983. Where smouldering or flaming failure against the criteria of clause 3 and clause 4 of I.S. 254:1983 has not occurred or has occurred only by way of damage exceeding the limits defined in 4.4 c), 4.4 d) and 4.5 of I.S. 254:1983, the composite pillow filling passes the ignitability test.

F.2 For cushions with primary covers, the test specimen shall be made up of filling, the primary cover and standard fabric as in A.2 of Annex A. Where the filling is loose, it shall be packed as set out in B.3 of Annex B. The test procedure using ignition source Grade 2 shall be as specified in I.S. 254:1983. Where smouldering or flaming failure against the criteria of clause 3 and clause 4 of I.S. 254:1983 has not occurred or has occurred only by way of damage exceeding the limits defined in 4.4 c), 4.4 d) and 4.5 of I.S. 254:1983 the composite cushion filling passes the ignitability test.

FREE DOWNLOAD provided by NSAI as part of the Public Consultation on Furniture fire Regulations

Annex G
(normative)

Ignitability test for composite fillings of mattresses and bed bases

G.1 The test specimen shall be prepared in accordance with I.S. 418. It should be constructed from the filling materials to be used or by removing existing ticking from a mattress or upholstered divan or bed base.

G.2 The specified test fabric as in A.2 of Annex A shall be used as the cover fabric. It shall be fitted so as to reproduce the tension in the original article where this is being tested.

G.3 The test shall be carried out according to I.S. 418 except using ignition source Grade 2 as specified in I.S. 254:1983. Smouldering or flaming failure shall be as defined in clause 3 and clause 4 of I.S. 254:1983.

FREE DOWNLOAD provided by NSAI as part of the Public Consultation on Furniture Fire Regulations

Annex H (normative)

Ignition resistance test for inner cover (interliner)

H.1 An inner cover which is a fabric that has been treated with a fire retardant chemical to reduce the ignitability of the upholstery shall, before it is conditioned in accordance with 7.1 of I.S. EN 1021-1:2006, be subjected to the following water-soaking procedure.

The inner cover shall be immersed in water of 160 mg/l \pm 20 mg/l hardness (expressed as calcium carbonate) containing 500 mg/l of non-ionic wetting agent using a liquor ratio of 1:20 in a flat bottomed dish at an initial temperature of 40 \pm 1 °C.

After 30 minutes, the inner cover shall be removed, rinsed in water of a similar hardness of 160 mg/l \pm 20 mg/l using a liquor ratio of 1:20 for 2 minutes and then dried by any method suitable for the type of inner cover fabric.

H.2 The inner cover, water-soaked or not as the case may be, shall be tested using cover fabric corresponding to the specification set out in H.3 and foam filling corresponding to the specification set out in H.4. The test shall be conducted using ignition source Grade 5 of I.S. 254:1983.

H.3 The fabric shall be made of 100 % flame retardant polyester fibre. The construction of the fabric shall be woven to a plain weave. The yarn in the warp shall be spun to a linear density of 37 tex \pm 10 %. The yarn in the weft shall be spun to a linear density of 100 tex \pm 10 %.

The fabric shall be scoured and heat set.

The fabric shall be woven so as to have a finished fabric construction of:

- a) 20,5 \pm 1 yarn threads per centimetre in the warp; and
- b) 12,5 \pm 1 yarn threads per centimetre in the weft.

Its mass shall be 220 g/m² \pm 5%

H.4 The filling material for the test shall be non fire-retardant polyurethane foam of slabstock type with a density of 21 kg/m³ \pm 1 kg/m³ and a hardness of 130 N \pm 10 N.

H.5 The criteria of failure shall be those specified in clause 3 and clause 4 of I.S. 254:1983.

FREE DOWNLOAD provided by NSRF as part of the Public Consultation on Furniture Fire Regulations

Annex I
(normative)

Cigarette test

The cigarette test shall be carried out in accordance with I.S. EN 1021-1.

FREE DOWNLOAD provided by NSAI as part of the Public Consultation on Furniture Fire Regulations

Annex J (normative)

Match test

J.1 Any covering fabric which has been treated with a fire retardant chemical to reduce the ignitability of the upholstery shall, before it is conditioned in accordance with 7.1 of I.S. EN 1021-2:2006 be subjected to the Water Soak Procedure in Annex D of I.S. EN 1021-2:2006.

J.2 The test shall be carried out in accordance with I.S. EN1021-2:2006. The filling material for this test shall be non fire retardant polyurethane foam of slabstock type with a density of $21 \text{ kg/m}^3 \pm 1 \text{ kg/m}^3$ and a hardness of $130 \text{ N} \pm 10 \text{ N}$.

J.3 The criteria for failure shall be those specified in clause 3 of I.S. EN 1021-2:2006.

FREE DOWNLOAD provided by NSAI as part of the Public Consultation on Furniture Fire Regulations

Annex K
(normative)

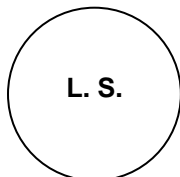
Match test for stretch covers

The test for stretch covers shall be conducted in the same way as for other cover materials except that the filling material over which the fabric is tested shall be a foam which passes the ignitability test in Annex A and which has a density of $25 \text{ kg/m}^3 \pm 1 \text{ kg/m}^3$.

FREE DOWNLOAD provided by NSAI as part of the Public Consultation on Furniture Fire Regulations

GIVEN under the seal of the National Standards Authority of Ireland

This 29th day of July, 2011



Enda McDonnell
Director of Standards

Maurice Buckley
Chief Executive

The Minister for Jobs, Enterprise and Innovation hereby gives his consent under Section 16 of the National Standards Authority of Ireland Act, 1996 to the above declaration.

Clare Dunne

8-8-2011

An Officer of the Department of Jobs, Enterprise and Innovation duly authorised under Section 15 (4) of the Ministers and Secretaries Act, 1924, to authenticate instruments (under the National Standards Authority of Ireland Act, 1996) made by the Minister for Jobs, Enterprise and Innovation.



National Standards Authority of Ireland

NSAI is the state standardization body set up under the National Standards Authority of Ireland Act 1996 to publish Irish Standards.

Revisions

Irish Standards are updated by amendment or revisions from time to time. Users of Irish Standards should make sure that they possess the latest versions.

NSAI's [Tailored updating service](#) is designed to meet your precise needs and is therefore the most efficient and cost-effective way of keeping ahead. For more details on the tailored updating service see:

[Standards.ie](#)

Tel.: +353 1 857 6730/1

Buying standards

NSAI and International publications can be accessed:

- at [standards.ie](#)
- by tel: +353 1 857 6730/1 or
- email: info@standards.ie.

Feedback on Standards

NSAI welcomes any comments on standards whether proposing an amendment, correcting an error or identifying an ambiguity. Please use the "About NSAI" and then "Contact us" buttons on the [NSAI.ie](#) home page to explain your comment.

Participation in developing Standards

NSAI Standards, whether of National, European or International origin, are drawn up by panels of experts. Persons with expert knowledge in any field where standardization work is taking place and who are interested in contributing to the work of the panels are welcome to make themselves known to NSAI. Please note that conditions apply. Click on the "Get involved in Standards Development" button in [NSAI.ie](#)

FREE DOWNLOAD provided by NSAI as part of the Public Consultation on Furniture Fire Regulations