trevira® CS

FIRE SAFETY

STANDARDS

FLAME RETARDANT

INTERNATIONAL FIRE TESTING

SAFETY

COMPARATIVE BURNING TEST:

This test shows how flame retardant Trevira CS textiles (left) melt only slowly after the ignition source is extinguished, while conventional textiles (right) go up totally in flames.

trevira® CS

Fire testing standards for home textiles

	STANDARD	APPLICATION	IGNITION SOURCE	KIND OF IGNITION	CLASSIFICATION CRITERIA	TEST SPECIMEN	BURN CLASSIFICATION	ACHIEVABLE FOR TREVIRA CS	REMARKS	TEST INSTITUTES
EU Europe	EN 1101 Test	Decorative fabrics / drapes	Gas flame	Edge ignition	Determination of ignition time	Textile fabric	Ignition times	No ignition	After-burn time < 5 sec.	
	EN 13772 Test	Decorative fabrics / drapes	Radiator und small burner	Radiation, edge ignition	Ignition, burning debris falling from test item, flame spread (1st-3rd marker thread)	Textile fabric				
	EN 13773 classification	Decorative fabrics / drapes	Test to EN 1101 and EN 13772				1 (highest requirement) 5 (lowest requirement)	1	certificate EN 13773_EN 1021 (see www.trevira.com)	
	EN ISO 11925-2 Test	Building products	Small burner	Surface and edge ignition	Flame spread ≤150 mm within 20 sec to 60 sec	Textile fabric				
	EN 13823 (SBI) Test	Building products	Sand bed burner	Heat load from burner located in bottom corner	Heat release, smoke development, flame spread on edge and burning debris /droplets	2 vertical textile fabrics, perpendicularly arranged				
	EN 13501-1 classification	Building products	Test to EN ISO 11925 and EN13823				Burn classes of building products A to E; smoke classes s1, s2, s3; droplet classes d0, d1, d2	B-s1, d0	General Building Inspectorate Approval ("Allgemeine Bauaufsichtliche Zulassung" - see www.trevira.com)	
	EN ISO 12952-1+2 Test	Bedding	Cigarette, gas flame	Dependent on test specimen	Ignition	Bedding (sheet, bedspread, blanket, pillow)	Ignition / no ignition	No ignition		
	EN 14533 classification	Bedding	Test to EN ISO 12952-1+2				A, B, C	A		
	EN 1021-1+2 Test	upholstery materials	Cigarette, gas flame	In fold between seat and back padding	Flame spread, damaged surface	Original upholstered furniture, or mock-up chair	Ignition / no ignition	no ignition	Foam density ≥ 30 kg/m^3 recommended	
AT Austria	EN 13773 classification	Decorative fabrics / drapes	Test to EN 1101 and EN 13772				1 (highest requirement) 5 (lowest requirement)	1	certificate EN 13773_EN 1021 (see www.trevira.com)	ÖTI Institut für Ökologie, Technik und Innovation GmbH der Stadt Wien, www.oeti.at
	ONORM A 3800-1 Test + Classification	Building products	B1 Schlyter burner	Surface ignition	Damaged surface, length remaining min. 40 cm	Textile fabric	Classes for: Combustibility (B), smoke formation (Q), droplet formation (TR)	B1, Q1, TR1	ONORM EN 13773 is legally prescribed for decorative fabrics / drapes, ONORM 3820 has been withdrawn	Prüf-, Überwachungs-und Zertzierungstelle der Stadt Wien www.wien.gv.at/forschung/laboratorien/
Österreichisches Normungsinstitut (ON) www.on-norm.at	ONORM B 3825	Upholstered furniture	Burner tube, gas flame	In fold between seat and back padding	Burn time, flame spread, after-burn time, after-glow time, fire side effects	Original upholstered furniture or mock-up chair	Flame retardant, normal ignitability, easily flammable	Flame retardant	Flame retardant foam, density ≥ 30 kg/m^3 recommended	IBS - Institut für Brandschutztechnik und Sicherheitsforschung, www.ibs-austria.at
CH Switzerland	EN 13501-1 classification	Building products	Test to EN ISO 11925 and EN13823				Burn classes of building products A to E; smoke classes s1, s2, s3; droplet classes d0, d1, d2	B-s1, d0	General Building Inspectorate Approval ("Allgemeine Bauaufsichtliche Zulassung" - see www.trevira.com)	EMPA, St. Gallen, www.empa.ch
Schweizerische Normen-Vereinigung (SNV) www.snv.ch	SN 198898 Test	Building products, textiles	Burner, gas flame	Edge ignition vertical	Burn- and glow- time, speed of flame spread, damaged surface area	Textile fabric				
	Guidance for fire department regulations of VKF, Part B: test specifications and classifications	Building products, textiles	Burner, gas flame / standardized measuring box for smoke density test	Edge ignition vertical	Degree of combustibility and fumes	Textile fabric	Fire index number BKZ indicating combustibility grade: 3 easily flammable, 4 flammable, 5 flame retardant, 6 non-flammable and smoke formation classification: 1 high, 2 medium, 3 low	BKZ 5.3		
DE Germany	DIN 4102-1	Buildings, building materials, light to heavy decorative fabrics	B2: Small burner B1: Fire chamber	Edge ignition Surface ignition	B2: flame spread ≤150 mm within 20 sec B1: average residual length ≥150 mm, smoke temperature max. 200 °C	Textile fabric Textile fabric	B3 easily flammable, B2 normal flammability, B1 flame retardant, A non-flammable	B1	General Building Inspectorate Test Certificate („Allgemeines Bauaufsichtliches Prüfzeugnis", (see www.trevira.com)	Holzforschung, München, www.holz.wzw.tum.de
Deutsches Institut für Normung e.V. (DIN) www.din.de	DIN 66084 classification	Upholstery fabrics, classification of upholstery in rolling stock	Paper cushion 100 g (Pa), gas flame (Pb), Cigarette (Pc)	In fold between seat and back padding	After-burn time, damaged surface	Original upholstered furniture or mock-up chair	Pa, Pb, Pc	Pa	Class Pa is achieved with the use of flame retardant foam. Tests according to DIN 54341 or EN 1021-1+2	Exova Warringtonfire, Frankfurt, Industriepark Höchst, www.exova.com MPA MaterialTestsanstalt Universität Stuttgart, www.mpa.uni-stuttgart.de Currenta GmbH & Co. OHG, Chempark, Leverkusen, www.currenta.de
ES Spain	EN 13773 classification	Decorative fabrics / drapes	Test to EN 1101 and EN 13772				1 (highest requirement) 5 (lowest requirement)	1	certificate EN 13773_EN 1021 (see www.trevira.com)	AITEX, www.aitex.es
Associación Española de Normalisación y Certificación (AENOR), www.aenor.es	UNE 23723-27	Building materials, decorative fabrics, upholstery materials, curtains	Radiator and small burner	Radiation and surface ignition	After-burn time max. 5 sec., damaged surface. flame spread, burning debris, droplets	Textile fabric	M0 non-combustible, M1 non-flammable, M2 flame retardant, M3 flammable, M4 easily flammable	M1	UNE EN 13773 applies for decorative fabrics / drapes	Leitat - Centro Tecnológico C/ de la Innovació, www.leitat.org AFITI Sede Central y Laboratorios, www.afiti.com LGAI Technological Center, S.A., www.appluscorp.com
FR BE LU France Belgium, Luxemburg	NF P 92-503-507	Building materials, decorative fabrics, upholstery materials, curtains	Radiator and small burner Brûleur électrique	Radiation and surface ignition	After-burn time max. 5 sec, damaged surface, flame spread, burning debris / droplets	Textile fabric	M0 non-combustible, M1 non-flammable, M2 flame retardant, M3 flammable, M4 easily flammable	M1		F.C.B.A., France, www.fcba.fr, L.N.E., France, www.lne.fr
Association Française de Normalisation	NF D 60-013 (Article AM 18)	Upholstery materials	Propane gas burner according to 20 g paper cushion	Surface ignition	Damaged side length (< 200 mm), loss of mass (<300 g)	mock-up chair including upholstery fabric, interliner and foam	Passed / not passed	passed	Trevira CS fabrics pass this test with appropriate flame retardant foam material	IFTH, France, www.ifth.org Centexbel Ghent, Belgium, www.centexbel.be
GB Great Britain	BS 5438, BS 5867	Textiles, curtains, decorative fabrics	Small burner	Surface ignition	Burn time, burn-in time, after-burn time, after-glow time, droplets	Textile fabric	Type A (low requirement), Type B (medium), Type C (high requirement)	Part 2, Type C		BSI Testing, www.bsigroup.com
British Standards Institution (BSI) www.bsi-global.com	BS 5852 Test	Upholstery materials	Cigarette, gas flame / crib 5, crib 7	In fold between seat and back padding Combustion of wooden crib of defined size	Flame spread, damaged surface, burn time	Original upholstered furniture or mock-up chair	Ignition / no ignition	No ignition	Trevira CS fabrics pass this test for the contract sector in combination with appropriate flame retardant foam materials of a density of ≥ 50 kg/m^3 (crib 5)and/or ≥ 90 kg/m^3 (crib 7). For the private sector the Consumer Protection Act Nr. 1324 prescribes the test on normally combustible foam. With Trevira CS a fireblocker must be used.	BTTG Testing Certification, www.bttg.co.uk SGS Leicester Whittle Estate, www.sgs.com Exova Warringtonfire Research, www.exova.com West Yorkshire Materials Testing Service, www.mat.wyjs.org.uk
	BS 7176 classification	Upholstery materials	Test to EN 1021-1+2 and BS 5852 crib 5, crib 7				Low, medium, high and very high hazard	High hazard		
	BS 476 part 7	Building materials	Pilot flame, radiant panel	Surface ignition	Flame spread	865 x 265 mm	Class 1, 2, 3, 4	Class 1	Test on calcium silicate board and PVA adhesive	
IT Italy	UNI VF 8456	Curtains	small burner	Edge ignition	After-burn time	Textile fabric	I (flame retardant), II (flammable), III (easily flammable), IV (ignitable), V (easily ignitable)	I		CSI S.p.A., www.csi-spa.com
Ente Nazionale di Unificazione (UNI) www.uni.com	UNI VF 8457	Home textiles	small burner	Surface ignition	After-burn time	Textile fabric	I (flame retardant), II (flammable), III (easily flammable), IV (ignitable), V (easily ignitable)	I		L.S. Fire Testing Institute s.r.l., www.lsfire.it
	UNI VF 9174	Home textiles / curtains	(gas flame) gas radiator	Surface ignition	Flame spread, after-glow time, damaged surface, fall of burning debris/droplets	Textile fabric	Level 1, 2, 3	Level 2		LAPI S.p.A., www.lapi-spa.it
	UNI VF 9175	Upholstery materials	small burner gas flame	In fold between seat and back padding	After-burn time	Original upholstered furniture or mock-up chair	Class 1IM to 3IM	1IM	In combination with upholstery of the same burn class	
IS DK SE NO FI Scandinavian countries	EN standards are applied (Europe)									Teknologisk Institut Beklædning og Textil, Denmark, www.teknologisk.dk
SIS, Swedish Standards Institute, www.sis.se Standards Norway, www.standard.no DS Danish Standards, www.ds.dk										Dansk Brand- og. Sikringsteknisk Institut, Denmark, http://en.dbi-net.dk SP Sveriges Tekniska Forskningsinstitut, Sweden, www.sp.se Sintef, Norway, www.sintef.no Swerea IVf, Sweden, www.swerea.se/ivf/ Møbellaboratoriet A/S, Norway, www.mobellab.no
NL Netherlands	NEN 6065	Curtains, decorative fabrics (building products)	Radiant panel	Radiation	Speed of flame spread	Textile fabric	Classes 1-5	Class 1		Efectis Nederland (former TNO), www.efectis.com
Nederlands Normalisatie-Instituut (NEN) www.nen.nl	NEN 6066	Building products	Conical radiator	Radiation	Production of smoke	Textile fabric	Smoke density DL; max	3,9 m^{-1}		Peutz, www.peutz.nl/faciliteiten/laboratorium-voor-brandveiligheid
RU Russia	GOST 30402-96	Building products: decorative fabrics, floor coverings, ceiling material	Radiator	Surface radiation	Critical density of heat stream	Textile fabric	Ignitability classes: V1, V2, V3	V1 (low flammability)	analogous ISO 5657	All Russian Institute For Fire Protection, www.pojtest.ru
www.runorm.com	GOST 30244-94	Building products: decorative fabrics, floor coverings, ceiling material	Small burner, fire shaft	Edge ignition	Damaged surface, average residual length 150 mm, smoke gas temperature max. 200°C	Textile fabric	low, normal, flame retardant, non-flammable	Flame retardant	analogous DIN 4102	
	GOST R 50810-95	Solar shading, curtains, door curtains	Propane gas flame	Surface and edge ignition	Flame spread , damaged length	Textile fabric	After-burn time max. 5 sec, no burn through to edges, no ignition of CO-pads, average maximum length of carbonization 150 mm, no flame spread > 1 mm	Passed	analogous IMO, FTP Code 2010, Annex 1, Part 7	
	GOST 12.1.044-89	Upholstery materials	Pilot burner and heater	Radiation und edge ignition	Development of smoke, flame spread, toxicity	Textile fabric	Coefficient of smoke formation: low D1, medium D2, high D3; flame spread indices: None, slow, rapid flame spread, toxicity: low, moderate, high, very high	Smoke development: medium (D2) Flame spread : slow Toxicity low (2)		
	NPB 257-2002	Furniture, bedding	Cigarette, small flame	Dependent on test specimen	Ignition	Textile fabric	Ignition / no ignition	No ignition	analogous EN ISO 12952	

Trevira
THE FIBRE COMPANY

Fire testing standards for home textiles

	STANDARD	APPLICATION	IGNITION SOURCE	KIND OF IGNITION	CLASSIFICATION CRITERIA	TEST SPECIMEN	BURN CLASSIFICATION	ACHIEVABLE FOR TREVIRA CS	REMARKS	TEST INSTITUTES
AE Arabian Emirates Emirates Authority for Standards and Metrology (ESMA), www.esma.ae	EN 13772 / EN 13773	Drapes, curtains	Radiator and small burner	Radiation, edge ignition	Ignition, burning debris / droplets, flame spread {1st - 3rd marker thread};	Textile fabric	1 (highest requirement) 5 (lowest requirement)	1		Dubai Municipality / Dubai Central Laboratory Department, www.dcl.ae
	EN 1021-1+2, BS 5852	Upholstery materials	Cigarette, gas flame, crib 5	In fold between seat and back padding; combustion of wooden crib of defined size	Flame spread , damaged surface, burn time	Original upholstered furniture or mock-up chair	Ignition / no ignition	No ignition	A suitable foam material is recommended for the respective standard	
AU NZ Australia, New Zealand Standards Australia, www.standards.org.au Standards Newzealand, www.standards.co.nz	AS / NZS 1530.2 and 1530.3	Building materials, components and structures	Vertical gas-operated ceramic panel, small gas flame to ignite burning gases from test specimen	Test item is moved progressively towards heat source	Ignitability index, flame propagation, heat release index, smoke release index	600 x 450 mm	Flame spread index ≤ 9, smoke index ≤ 8, heat index ≤ 10, ignition index ≤ 20	Passed		Australian Wool Testing Authority Ldt – trading as AWTA Textile Testing www.awta.com.au
CN China Standardization Administration of China (SAC), www.sac.gov.cn	GB 8624-2012 classification	building materials and products	Various	Varying, as a variety of tests are applied	Oxygen index (GB/T 5454, analogous ISO 4589), burning behavior (GB/T 5455)	Various as different tests are applied	Classes A to F	B1		Sichuan Fire Research Institute, www.scfri.cn/english
JP Japan Japanese Standards Association (JSA), www.jsa.or.jp	JIS L1091	Building products, curtains, furniture, bedding	45 ° micro burner, 45° coil test	Microburner	After-burn time, after-glow time, charred area, number of flame contacts with test specimen	100 x 200 mm	Passed / not passed	Passed		JFRA Japan Fire Retardant Assiociation, www.jfra.or.jp
KR Korea Korean Standards Association (KSA), www.ksa.or.kr/eng/	KOFEIS 1001, article 20 clause 2; ASTM E 662 (smoke density), ISO 5659-2 (melting materials)	Drapes, blinds, roller blinds, Wall coverings	45° coil test	Microburner (thin materials), Meckel Burner (thick materials)	After-burn time, after-glow time, charred area, number of flame contacts with test specimen	350 x 250 mm	Passed / not passed			FITI Testing & Research Institute, www.fiti.re.kr
TW Taiwan Bureau of Standards, Metrology and Inspection MOEA, www.taiwan.gov.tw	CNS 10285 L3196 A-1 + A-2	Home textiles	Gas flame 45°C	45° Test	After-burn time, after-glow time, charred area and length	350 x 250 mm	Class 1 and 2	Class 1		TTRI Taiwan Textile Research Institute, www.ttri.org.tw
US North America ASTM, American Society for Testing and Materials, www.astm.org California Bureau of Home Furnishing & Thermal Insulation, Consumer Product Safety Commission, www.cpsc.gov National Fire Protection Association www.nfpa.org	UFAC	Upholstery materials	Cigarette	In fold between seat and back padding		Small mock-up chair	Passed / not passed	Passed	Voluntary in the USA	Diversified Testing Laboratory, www.diversifiedtestinglabs.com
	California TB 116	Upholstery materials	Cigarette	Center and edge of seat surface, arm rest, upper back rest, in fold between seat and back padding		Normal chair or large mock-up	Passed / not passed	Passed		The Govmark Organization, www.govmark.com Southwest Research Department of Fire Technology, www.fire.swri.org
	California TB 117	Upholstery materials	10-mm-gas flame	45° test		50 x 150 mm	Section 1 (passed)	Passed	Mandatory in California, Illinois, Maine, Maryland, Massachusetts, Minnesota, Ohio	Underwriters Laboratory, www.ul.com
	California TB 133	Upholstery materials	18-kW-flame	Ring gas burner		Normal chair or large mock-up	Passed / not passed	Passed	Mandatory in risk areas in California, Illinois, Maine, Maryland, Mass, Minnesota, Ohio, North Carolina, City of Boston	United States Testing Corporation, www.ustesting.com Exova Canada Inc., www.exova.com
	BOF 14-1	Upholstery materials	18-kW-flame	Ring gas burner		Normal chair or large mock-up	Passed / not passed	Passed	Mandatory in risk areas in Boston	
	NFPA 701	Curtains and decorative fabrics	100-mm-gas flame	Flame envelops both sides of lower edge		150 x 400 mm	Passed / not passed (weight loss and dripping melt)	Passed	Mandatory in supervised areas. Also applies to tents, wall hangings and other vertically hanging fabrics	
	NFPA 260	Upholstery materials	Cigarette covered by linen cloth	In fold between horizontal and vertical panel covered with fabric	Ignition and length of charring	Textile fabric drawn up on two panels	class I, class II (= not passed)	Class 1 (passed)		
	NFPA 265	Wall coverings	40 and 50 kW gas burner	Fully lined fire test room		23 m^2	Passed / not passed, speed of heat release	Passed	Prescribed by Building Codes and Fire Codes in supervised areas	
	ASTM E 84	Flooring and wall coverings	Gas flame in Steiner tunnel	Flames along tunnel roof	Flame spread and smoke formation	7,3 m x 5 m	Flame spread index and smoke development index	Class A	Classification according to NFPA 101 Life Safety Code in Class A, B, C	
TR Turkey Turkish Standards Institution www.tse.org.tr	Turkey adopted legislation in the construction sector on the publication of technical specifications and national and EU technical approvals, on conformity verification systems and on reaction-to-fire aspects of construction products. The current Turkish structural codes are not based on a single source of codes (American, German, British Standards). Source: http://eurocodes.jrc.ec.europa.eu/doc/2013_12_WS_Balkan/presentations/CR_Turkey.pdf									

Fire testing standards for textiles for the transport sector

	STANDARD	END USE / APPLICATION	BURN CLASSIFICATION
Aviation Federal Aviation Administration, www.faa.gov	FAR/CS 25.853	Dividing curtains, seat upholstery, blankets	Passed
	ABD 0031	Dividing curtains, seat upholstery, blankets	Passed
Railway European Railway Agency, www.era.europa.eu International Union of Railways, www.uic.org The European Rail Industry, www.unife.org	EN 45545-2	Curtains, seat upholstery, bedding	HL 3 (for seats: use of an appropriate foam)
	DIN 5510-2	Curtains, seat upholstery, bedding	Pa, S4, SR2, ST2 (for seats: use of an appropriate foam)
	BS 6853	Curtains, seat upholstery, bedding	R≤ 0.5
	NF-16-101, 16102	Curtains, seat upholstery, bedding	F1
	UNI CEI 11170-1, -3	Curtains, seat upholstery, bedding	1 IM
	PN-K-02511, 02502	Curtains, seat upholstery, bedding	Passed
	UIC 564-2	Curtains, seat upholstery, bedding	Class A
Maritime (IMO) Marine Equipment Directive, www.mared.org	FTP Code 2010, Res. MSC.307(88), Annex 1, Part 7	Drapes, decorative fabrics	Passed
	FTP Code 2010, Res. MSC.307(88), Annex 1, Part 8	Upholstered furniture	Passed
	FTP Code 2010, Res. MSC.307(88), Annex 1, Part 5	Wall cladding	Passed
	FTP Code 2010, Res. MSC.307(88), Annex 1, Part 9	Bedding	Passed