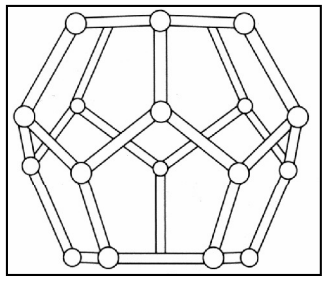
Zotefoams plc



Technical Information Sheet – TIS 12
(previously BTI3)
Compliance of Azote Foams with Fire and Flammability standards

INTRODUCTION

This bulletin reviews the performance of Zotefoams plc's products against various Fire and Flammability standards. The following are covered.

Standard	Country
SI-1324 (1988) amended by SI-2358 (1989)	UK
BS 5852	UK
FMVSS 302	Various
ABD0031 Issue C	Various
CAA 8 (section 2.2b)	UK
FAA.FAR 25.853.F.(Part 1(a)(1)(ii))	USA
JAA.JAR 25.853.F.(Part 1(a)(1)(ii))	UK/USA
UL94	USA
ISO 3582 (1978)	International
BS 4735 (1974)	UK
DIN 4102 (B1, B2)	Germany

FURNITURE AND FURNISHING REGULATIONS SI-1324 (1988) AS AMENDED BY SI-2358 (1989). REF: ALSO BS 5852

These regulations are aimed primarily at polyurethane and latex rubber foams for use in furnishing applications. Polyethylene and EVA foams are only dealt with by exclusion from the above classes.

All types of filling material are required to meet a 'relevant ignitability test'. For single filling materials other than PU or latex rubber foam the test is stated to be that specified in Part 1 of Schedule 2, i.e. BS 5852 Part 2 using ignition source 2 and the specified FR cover fabric. (This section is headed 'ignitability test for non-foam filling materials singly', but is interpreted as applicable from statements made in section 3).

Tests carried out by Rapra Technology Limited have shown that the grades listed below meet the requirements of BS 5852 : Part 2, using ignition source 2 and the specified FR cover fabric.

Plastazote® Foam	Evazote® Foam
LD24	EV50
LD33	VA35
LD45	
LD24 FR	
LD45 FR	

Where foam is used as a cover not as a filling it is subject to the requirements of Schedule 4 and Schedule 5 which require the material to comply with requirements of BS 5852: Part 1(1979) using ignition source 0 (smouldering cigarette) and ignition source 1 (butane "match" flame). The grades listed below have been tested and found to meet this requirement.

Plastazote® Foam	Evazote® Foam
LD45	EV50

FMVSS 302 - VEHICLE MANUFACTURERS' SPREAD OF FLAME TEST

This specification is widely used by the automotive industry as a requirement for materials used in vehicle construction. The test examines the rate of spread of flame along a sample of specified size, held horizontally by a clamp at one end. Flame spread should not exceed 100 mm (4") per minute for samples which must not exceed 12.5 mm (½") in thickness.

Most of Zotefoams plc's products will meet this requirement provided the foam thickness exceeds a minimum which is specified for each grade in the data sheets. For polyethylene grades (LD, HL, HD) the minimum ranges from 12 mm for Plastazote® LD24 to 3 mm for Plastazote® LD70 and other higher density grades. Evazote® grades (EV and VA) and Supazote® (EM) have an intrinsically superior FR performance in this test and minimum thickness to meet the requirements of FMVSS is typically 3 to 4 mm even at lower foam densities. The best performance is achieved with the FR grades, Plastazote® LD24 FR and LD45 FR, which self-extinguish even at 2 mm thickness.
For specific information, please refer to the data sheets.

UL94 (FIFTH EDITION, 1996)

This is an American standard for Tests of Flammability of Plastic Materials. Section 12 is a horizontal burning test for foamed materials, wherein samples of a defined size are supported horizontally on wire mesh and ignited at one end. Materials are classed as 94-HBF, 94HF-1 or 94HF-2 (or are unclassified). Essentially, an HBF rating requires a burn rate less than 40 mm/minute, whilst HF-1 and HF-2 require self-extinguishing < 2 secs and after-glow < 30 secs. HF-1 also requires that a cotton wool indicator placed under the test sample is not ignited by burning drips. Flame retardant grades have been tested by Underwriters Laboratories Limited to the UL94 specification with the following results:

- Plastazote® foam LD24 FR - Pass HF-1 at 3 mm and 12.7 mm thickness
- Plastazote® foam LD45 FR - Pass HF-1 at 3 mm and 12.7 mm thickness

A test report is available.

AVIATION STANDARDS

ABD0031 Issue C; CAA 8 (Section 2.2b); FAA.FAR 25.853 (Appendix F.Part 1(a)(1)(ii)); JAA.JAR 25.853 (Appendix F.Part 1(a)(1)(ii)). CAA 8, FAA.FAR and JAA.JAR are the UK, USA and joint versions respectively of the vertical burn test used to assess flammability for aviation applications.

Zotefoams plc is accredited by the Civil Aviation Authority (CAA) to carry out testing according to the CAA 8 requirement. The test, and specifications, of the CAA, FAA and JAA are identical. Flame retardant grades of Plastazote® foam, LD24 FR Charcoal and LD45 FR Charcoal have been formulated to meet CAA 8 (Section 2.2b), FAA.FAR 25.853 (Appendix F.Part 1(a)(1)(ii)) and JAA.JAR 25.853 (Appendix F.Part 1(a)(1)(ii)) test requirements, and all batches are tested to assure continued conformity.

ABD0031 Issue C is an Airbus specification which includes smoke and toxicity tests in addition to the vertical burn of CAA 8/FAA.FAR/JAA.JAR. Plastazote® foam LD24 FR Charcoal and LD45 FR Charcoal have both been tested against these additional requirements and found to comply. A test report (British Aerospace) is available.

ISO 3582 (1978); BS 4735 (1974)

These are equivalent test methods for assessing the horizontal burn rate characteristics of materials. Measurements of all Zotefoams plc's products have been made according to the test. Burn rate (as for FMVSS 302 - see Section 2) depends on foam type, foam density and foam thickness. Specific data is shown in the product data sheets.

DIN 4102 (B1/B2)

This German standard sets out the flammability tests necessary to achieve B1 or B2 classification for applications in building construction. The B1 test (DIN 4102 Pt 16) places four test samples in a vertical box configuration, and assesses residual material after ignition and burning and also measures temperature of the effluent gases.
A B1 performance (not easily flammable) has been achieved by Plastazote® foam LD24 FR Charcoal tested at 6 mm and 20 mm thickness, and by Plastazote® foam LD45 FR Charcoal tested at 6 mm thickness.

Note that tests were carried out using free standing foams, not attached to any substrate. The B2 test is less demanding, and is a vertical burn test carried out on a single sample.

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