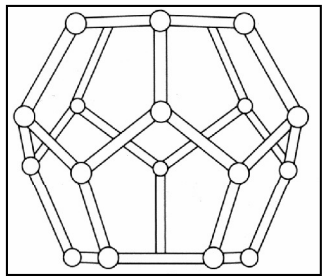
Zotefoams plc



Technical Information Sheet TIS 21
(previously BTI7)
Compliance of Azote foams with Buoyancy Standards and Specifications

Materials produced by Zotefoams plc have been independently tested against several buoyancy standards. The requirements of each of these standards vary. This document aims to give a summary of the test requirements of the various standards and information which of our products have been certified to these standards.

INTERNATIONAL MARITIME ORGANISATION (IMO) – SOLAS REGULATIONS

SOLAS 74 as amended, Regulations III/4 and 34.
The Life Saving Appliance (LSA) Code, Regulations I/1.2, II/2.2 and V/5.1
IMO Resolution MSC 81(70) Part 1

The above standard has two sections with different test requirements. These sections refer to approval for “Survival Craft” material and “Life Jacket” material. The certification only covers the foam and finished products of these categories have to be tested separately for approval. Materials suitable for as inherently buoyant material in life jackets have to pass the following tests:

Test	Pass requirement
Temperature cycling for 10 cycles between – 30 °C and + 65 °C	No internal structural changes or changes of mechanical properties.
Immersion in diesel oil	No damage (e.g. cracking, swelling, dissolution) or change of mechanical properties
7 day water absorption	Buoyancy loss no more than 16% for specimen previously subjected to diesel oil immersion and no more than 5% for all other specimen. No damage or changes of mechanical properties.

Table 1 Tests for inherently buoyant material suitable for use in life jackets

Materials suitable for as inherently buoyant materials in survival crafts have to pass more elaborate testing. These materials undergo the tests listed for inherently buoyant materials in life jackets as well as the additional tests listed below:

Test	Pass requirement
Immersion in high octane petroleum spirit	No damage (e.g. cracking, swelling, dissolution) or change of mechanical properties
Immersion in crude oil	
Immersion in marine fuel oil	
Immersion in kerosene	
7 day water absorption	Buoyancy loss no more than 16% for specimen previously subjected to fuel/oil immersion and no more than 5% for all other specimen. No damage or changes of mechanical properties.

Table 2 Additional tests for inherently buoyant material suitable for use in survival craft

Certificate of type approval

Lloyd's Register of shipping are authorised by the International Maritime Organisation to issue certification that materials have been tested and comply with requirements for inherently buoyant materials in life jackets or survival craft after the appropriate test reports have been submitted to them. Certificates are valid for 5 years. The following Zotefoams products have currently been tested by external test houses and approved for use in survival craft:

Material	Thickness tested	Type of approval	Certificate valid until
Plastazote® LD15	25 mm and 200 mm	Survival craft	July 2009
Plastazote® LD18	25 mm, 100 mm and 200 mm	Survival craft	August 2009
Evazote® VA25	25mm and 200mm	Lifejacket	April 2011
Evazote® VA35	25 mm and 100 mm	Survival craft	February 2008

Table 3 Foam grades approved for use as inherently buoyant material

Plastazote® LD24 has previously been approved for use as survival craft material but the certificate is currently expired.

EUROPEAN AND BRITISH STANDARDS FOR LIFEJACKETS AND BUOYANCY

BS EN 393:1994 (50 N Buoyancy)
BS EN 395:1995 (100 N Buoyancy)
BS EN 396:1994 (150 N Buoyancy)
BS EN 399:1994 (275 N Buoyancy)

These four standards are covering the specification of lifejackets and the materials used for their fabrication. The requirements for the inherently buoyant material, which are covered in clause 4.10.1 and 4.10.2 of these documents, are identical for each class of lifejacket. Certification of compliance with these clauses only covers the inherently buoyant material, i.e. our foam products. The finished product will have to undergo separate tests for approval, which vary in dependence of the overall buoyancy.

Tests for the inherently buoyant materials and pass conditions are summarised below:

Test	Pass requirement
Compressibility: Buoyancy measured after application of a 500 kPa force under water and 4 compressions. Samples are then dried, subjected to 500 compression cycles and buoyancy re-measured.	Buoyancy loss should not exceed 10%
Temperature cycling for 10 cycles between – 30 °C and + 60 °C	Volume loss should not exceed 5%

Table 4 Test requirements for inherently buoyant material for use in life jackets according to clause 4.10.1 and 4.10.2

The following materials have been tested by BSI and comply with these standards:

- Plastazote® LD24
- Evazote® VA35
- Evazote® EV50

These standards have recently (December 2006) been superseded by a new set of international standards. The life jackets covered by this standard are intended for use in work or recreational activities near water while the aforementioned SOLAS regulations cover buoyancy aids for seagoing vessels. The ISO 12402 series, which at the point of writing has only partially been accepted as a BS EN series, outlines material requirements and tests for lifejackets and the materials used in their manufacture. The test requirements for inherently buoyant materials include a wider range of tests than the above mentioned BS EN standards.

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