A Zotefoams plc brand

T-FIT® Zotek F

PVDF UV Resistance

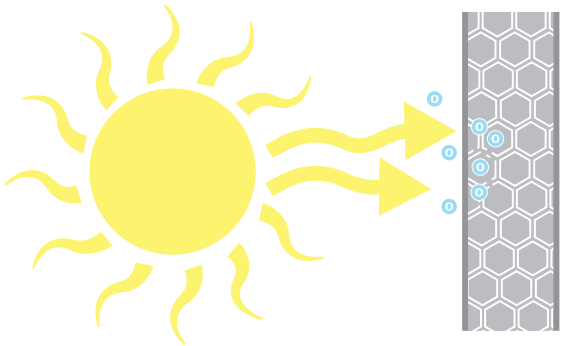
T-FIT® INSULATION

Fit to perform. **Fit** to last

ZOTEK® F and a leading competitor were subjected to 200; 400; and 600h accelerated UV exposure using a Xenon tester in rotation mode. Tensile strength was conducted on both exposed and non-exposed samples with ZOTEK F® demonstrating less than 4% loss of strength after 600h compared to a loss of 29% for the competitor.

Introduction

Ultraviolet (UV) Radiation is a form of electromagnetic radiation which makes up about 10% of the Sun's total radiation output. When polymers are exposed to UV radiation; a photo-oxidisation can take place within the polymer structure. This can often lead to degradation of the polymer due to the absorption of UV radiation; excitation of photons; and the generation of free radicals. Free radicals can then alter the structure affecting both the physical and mechanical properties of the material.



Degradation can occur in the following ways:

- Colour fading
- Embrittlement
- Surface cracking
- Surface powdering
- Shrinkage

The extent of this degradation depends on several factors:

- Intensity and duration of sun exposure
- Incident angle of radiation
- Ambient temperature and humidity
- Ozone level
- Effects caused by air pollution

UV degradation of polymers can be reduced through the use of Hindered Amine Light Stabilisers (HALS); UV absorbers; and UV blockers.

PVDF UV Resistance

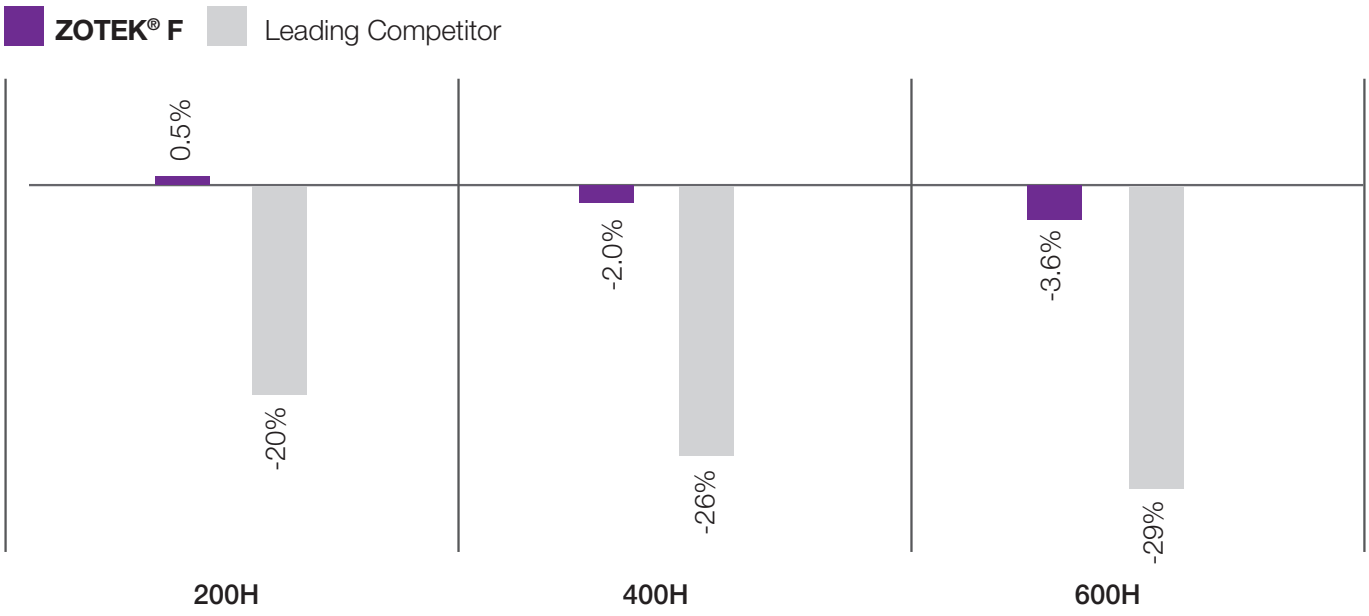
PVDF UV Resistance

PVDF is considered to have a good level of UV resistance and so therefore does not require the use of any UV stabilisers; absorbers; or blockers. This resistance is attributed to the strong Carbon-Fluorine bonds in the molecular structure. These bonds are the strongest carbon bond in chemistry (~30% stronger than Carbon-Hydrogen bonds) and provide resistance to photo oxidisation.

Test Data

ZOTEK F® and a leading competitor were subjected to 200; 400; and 600h accelerated UV exposure using a Xenon tester in rotation mode. Tensile strength was conducted on both exposed and non-exposed samples with ZOTEK F® demonstrating less than 4% loss of strength after 600h compared to a loss of 29% for the competitor.

Change in Tensile Strength after UV Exposure



Although accelerated ageing tests under controlled conditions are commonly performed, the relation between such tests and actual outdoor results is not clearly defined. The information given in this document should only be regarded as a guide.

Ageing periods which may affect the surface of foams do not necessarily affect the interior. Therefore, length of suitability of the material for a given application can vary widely depending on whether surface appearance or bulk properties are of main concern for the application.

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OHS 52538
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Environment
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Zotefoams Inc.
55 Precision Drive
Walton KY, 41094 USA
Tel: +1 (0) 859 371 4025
Free: (800) 362-8358 (US Only)
Email: t-fitusa@zotefoams.com

Zotefoams plc
675 Mitcham Road
Croydon, Surrey
CR9 3AL, United Kingdom
Tel: +44 (0) 20 8664 1600
Email: t-fitsales@zotefoams.com

T-FIT Insulation Solutions India Private Limited
810 Shapath V, S.G. Highway
Ahmedabad, Gujarat, 380015
Tel: +91 (0) 7433946464
Email: t-fitindia@zotefoams.com

Zotefoams T-FIT Material Technology (Kunshan) Co., Ltd
181 Huanlou Road, Development Zone,
Kunshan City, Jiangsu Pr. China 215333
Tel:+86 (0) 512 5012 6001-8001
Email: t-fitchina@zotefoams.com

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