

# Filcor Data Sheet



**Filcor (Expanded Polystyrene) is increasingly being specified for an ever-growing range of applications. The most common applications include use as a lightweight structural fill alternative to more traditional fill materials or as a lightweight void former in structural concrete.**

The versatility of Filcor means that any shape, size or profile can be manufactured with relatively short lead times. In addition, a range of materials of increasing compressive strengths are available to meet the loading requirements of the application, whilst also providing the most cost effective solution.

## Key Features

- A range of compressive strengths available
- Lightweight and easy to handle
- Available as standard sheets or blocks
- Can be profiled to customer requirements
- Provides a high degree of insulation
- Flame Retardant (FR) properties

## Installation

When installing Filcor EPS, the following points should be adhered to:

- Filcor should be positioned on a firm level surface, with joints between individual sheets/blocks, staggered where possible.

- If the depth of Filcor required exceeds the maximum individual sheet/block depth of 1200mm, then further layers can be added to achieve the total depth required. It is suggested that each layer is installed perpendicular to the previous one in order to distribute load as equally as possible.
- Where there is a requirement to cut the Filcor sheets/blocks, this can be carried out using a fine toothed saw, or alternatively a hot wire cutter for which Cordek offer a hire service.
- Installation in deep pits, confined spaces, unventilated areas or subterranean applications requires a suitable Health & Safety risk assessment to be conducted, following additional guidance provided by our product MSDS.
- Information on the procedure for installing Filcor is provided in the Installation Guide, available for download at [www.cordek.com](http://www.cordek.com). For additional support, please contact the Cordek Technical Department.

## Storage & Handling

All products are clearly labelled prior to delivery, with thin sheets (less than 200mm thick) wrapped in a protective polythene cover. Individual sheets/blocks can be manually handled and offloaded upon delivery, depending on their weight – please consult the table on the following page for the unit weight of each Filcor grade.

Expanded polystyrene must be stored and installed in areas with adequate ventilation.

For further information, please contact the Cordek technical team on 01403 799600, [techsupport@cordek.com](mailto:techsupport@cordek.com) or consult our website at [www.cordek.com](http://www.cordek.com).



## Storage & Handling (cont.)

When storing Filcor EPS sheets/blocks outside prior to installation, precautions to secure the product from windy conditions should be taken, for example ensuring that they are weighted down or secured, due to the relatively light nature of the product.

No further storage requirements are needed as the product is unaffected by both UV light and water.

## Product Size

Standard sheet/block 2400mm long x 1200mm wide x required depth\*

\*Each Filcor sheet/block can be manufactured to the required depth, with a minimum depth of 25mm and a maximum depth 1200mm dependent on grade.

## Physical Properties

	GRADE								
	Filcor 20	Filcor 45	Filcor 70	Filcor 90	Filcor 100	Filcor 120	Filcor 140	Filcor 160	Filcor 190
<b>Manufactured BS EN 14933:2007</b>									
<b>Physical Properties</b>									
Nominal Density (kg/m <sup>3</sup> )	15	20	25	30	35	40	45	50	55
Compressive Strength at 1% Strain (kPa)	20	45	70	90	100	120	140	160	190
Compressive Strength at 10% Strain (kPa)	70	100	150	200	250	300	350	400	500
Cross Breaking / Bending Strength (kPa)	115	150	200	250	350	450	525	600	750
Shear Strength in relation to Bending Strength (kPa)	55	75	100	125	170	225	260	300	375
Modulus of Elasticity (Et) kPa (Milan Duskov Eq 5.1)	5200	7700	10400	13400	16600	19900	23400	27000	30800
<b>Other Data</b>									
Max Depth of Concrete (assumed 25kN/m <sup>3</sup> ) to not exceed Compressive Strength at 1% strain (mm)	800	1800	2800	3600	4000	4800	5600	6400	7600
Coefficient of Linear Expansion	0.6 - 0.9 x 10 <sup>-6</sup>								
Coefficient of Friction (μ)	0.5								
Poisson's Ratio	0.12								

## Compressive Creep / Long Term Loading

The long term behaviour of Filcor is determined by compressive creep, which relates to the theoretical deformation over time.

Compressive creep will normally be considered for applications where continuous high loads are imposed on a structure supported by Filcor, e.g. building foundations, which are subjected to the full design load for extended periods of time.

This maximum allowable long-term stress information provided in the adjacent table is based upon Clause E.4 of BS EN 14933:2007 which states that "EPS products meeting the requirements of Table C.1 are expected to have a compressive creep deformation of 2% or less after 50 years, when subjected to a permanent compressive stress of 0.30 x 10% stress figure."

Filcor Grade	Max Allowable Long Term Stress kN/m <sup>2</sup>
20	21
45	30
70	45
90	60
100	75
120	90
140	105
160	120
190	150

## Thermal Properties

The thermal conductivity of Filcor is the rate at which heat energy passes through it and therefore the lower the value the better the material will insulate against heat loss (or gain). The reciprocal of thermal conductivity is called thermal resistance.

The table below indicates both the thermal conductivity and resistance values for the various grades of Filcor available.

	GRADE								
	Filcor 20	Filcor 45	Filcor 70	Filcor 90	Filcor 100	Filcor 120	Filcor 140	Filcor 160	Filcor 190
<b>Thermal Properties</b>									
Thermal Conductivity Value + W/m K	0.038	0.036	0.035	0.034	0.033	0.033	0.033	0.033	0.033
Thermal Resistance Value °C/W	26.32	27.78	28.57	29.41	30.30	30.30	30.30	30.30	30.30

## Flame Retardancy

All Filcor grades are manufactured with the use of a polymeric Flame Retardant (FR) additive. The addition of the FR additive during the manufacturing process has no detrimental effect on the physical characteristics of the material. The additive is polymerised within the molecular structure of the material and therefore is insoluble, preventing it from leaching out in to its surroundings.

When designing applications involving Filcor, it should be covered by a surface material or layer that has a suitable fire rating. The material / layer initially in direct contact with the fire will determine the overall behaviour of the installation in fire conditions.

Based upon the use of an FR additive, Filcor has a Euroclass E rating when tested in accordance with BS EN 13501-1.

## Water Absorption, Flotation and Moisture

Filcor is not soluble in water and its closed cell structure prevents the migration of water through the mass of the material. Absorption of water during submergence is relatively low (by % volume) and does not effect the mechanical strength of the material.

	GRADE		
	Filcor 20	Filcor 45 & 70	Filcor 90 - 190
Water Vapour Diffusion Resistance Factor ( $\mu$ )	20-40	30-70	40-100
Water Vapour Permeability ( $\delta$ ) mg/(Pa.h.m)	0.015 - 0.030	0.009 - 0.020	0.006 - 0.015
Water Absorption by Volume (Fully Submerged)	Approximately 4-8% over a period of seven days Approximately 8-10% after long term immersion		
Flotation Force	Approximately 9 kN/m <sup>3</sup> - To prevent flotation a force in excess of this should be applied		

## Chemical Resistance

Filcor is unaffected by water and aqueous solutions of salts, acids and alkalis. The use of adhesives, release agents and other commonly used construction chemicals in conjunction with Filcor should be considered to ensure compatibility prior to use.

Where resistance to Volatile Organic Compounds (VOC's) or hydrocarbons is required, the use of a suitably resistant protective membrane, such as the Cordek Puraflex Membrane is suggested. Typically, Filcor blocks / sheets can be either individually wrapped or encapsulated as part of a larger installation with the Puraflex Membrane, which has been tested extensively for resistance against a wide range of chemicals and contaminants.

Please consult the Cordek Puraflex VOC Membrane data sheet for further information.



## Environmental Attributes

Filcor is a lightweight expanded polystyrene (EPS) material with the following environmental credentials:

- Non-toxic
- Chemically inert
- Non-irritant
- Non-biodegradable
- Insoluble and non-hygroscopic

Filcor - All Grades	
Ozone Depletion Potential (ODP)	0
Global Warming Potential (GWP)	<5
BRE Global Green Guide Rating	A+*

\*Generic rating for EPS. Please consult [www.bregroup.com/greenguide](http://www.bregroup.com/greenguide) for density / grade specific information.

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DISCLAIMER: Information contained within this 'Technical Data Sheet' is for guidance only, and it is intended for experienced construction industry workers. It contains summaries of aspects of the subject matter and does not provide comprehensive statements of construction industry practice. As conditions of usage and installation are beyond our control we do not warrant performance obtained. Please contact us if you have any doubt as to the suitability of application. The information provided within this document is based on data and knowledge correct at the time of printing.

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