

Plastics in Construction

A Guide for
Architects
and Specifiers



British Plastics Federation

“In the future,
there will be few
construction needs
that plastics and
advanced resins
cannot meet”

**Professor Jan Brouwer
(leading Dutch architect)
1992**



Introduction

This Guide has been produced by the British Plastic Federation to help architects and specifiers in both private and public sectors, together with civil engineers, to understand the key benefits brought by plastics building products to the construction sector.

The British Plastics Federation is certainly well qualified to present this information. Founded in 1933 it is the oldest plastics federation in the world and today, of its twenty two business groups, five represent the manufacturers of plastics construction products: Cellular PVC, Expanded Polystyrene, Pipes, Sheet and Coated Fabrics and Windows Groups

These BPF Groups have been responsible for developing the markets for plastics building products and are widely represented in British Standards Committees and hence CEN and ISO Committees for relevant products standards. Much of the information used by the industry in its marketing activities has been derived from information generated by the British Plastics Federation which has a strong record of sponsoring third-party, independent research at authoritative organisations such as the BRE.

The BPF is at the cutting edge in its understanding of how sustainability applies to construction materials as witnessed by its participation in the ground-breaking Voluntary Commitment, Vinyl 2010, offered to the European Commission in 2001. Our Guide well illustrates how plastics products will help mitigate the effects of Climate Change. The BPF is sponsoring the RIBA Lecture Programme on Smart Materials in UK Schools of Architecture in 2011.

The BPF is a member of the Constructions Products Association (CPA) and the European Plastics Converters Association (EUPC).



For more information about the BPF and its activities consult www.bpf.co.uk

Plastics in Construction

Construction represents the second largest market for plastics, consuming some 25% of all plastics consumed in the UK. The earliest commercially available plastics material was first developed in the UK and exhibited in 1862. Plastics have been used in construction applications since the 1930's.



Plastics are a family of some twenty different materials each with a different range of properties. Examples of plastics used in building are:

- Acrylic
- Composites
- Expanded Polystyrene
- Polycarbonate
- Polyethylene
- Polypropylene
- Polyvinyl Chloride

Chanel mobile art pavilion with a PVC-coated polyester roof and ETFE roof lights



The properties of these products can be enhanced by the incorporation of additives. These include:

- Blowing agents
- Colourants
- Fillers and reinforcing agents
- Flame retardants
- Plasticisers

Additives enable plastics raw materials to be tailor- made to suit the specific requirements of a wide range of building applications.



Allianz Arena, Munich, constructed with 2874 inflated ETFE rhomboidal shells

What are the Fundamental Benefits of Plastics in Construction?

Plastics are strong:

- Durable, knock and scratch resistant with excellent weatherability
- Do not rot or corrode.

Plastics offer design freedom:

- A limitless array of shapes possible
- Products can be coloured, opaque or transparent, rigid or flexible

Plastics are lightweight:

- Easy to transport, manoeuvre and handle
- fewer accidents

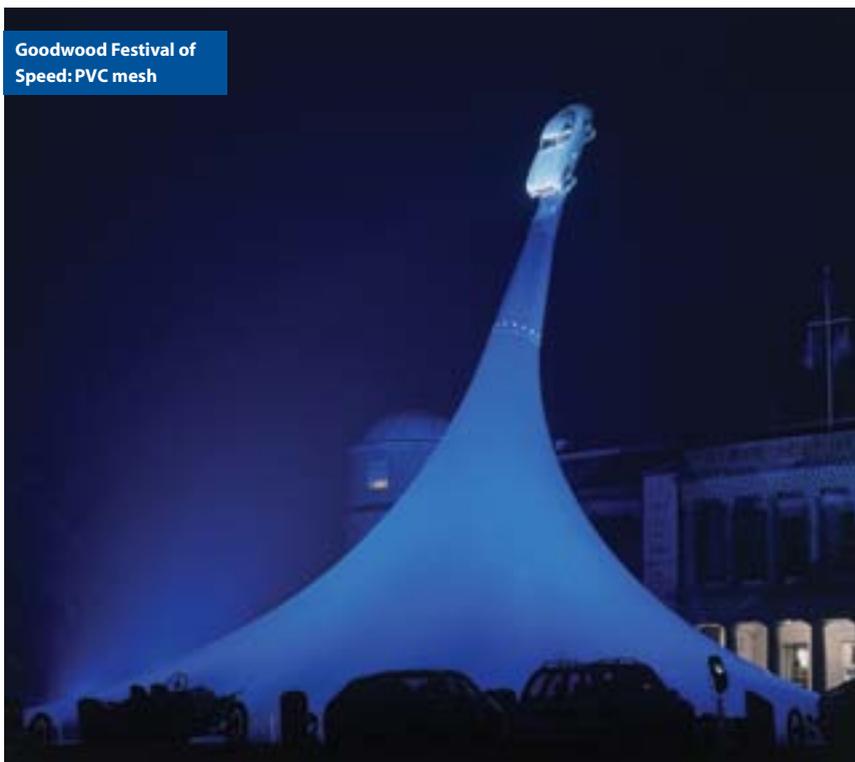
Plastics are easy to install:

- Lightweight
- Snap fit

Plastics promote energy efficiency in building:

- Plastics are low conductors of heat
- Tight seals achievable





Plastics are low maintenance:

- Plastics building products can be repaired.
- They do not need painting.

Plastics have a variety of waste management options available:

- Plastics building products can be recycled with low energy inputs and when this is not feasible can be used in energy from waste schemes.

Plastics score highly in environmental assessments:

- Plastics materials are an efficient use of resources
- Rated highly in BRE's 'Green Guide to Specification'

Plastics are cost-effective:

- Favourable whole-life costs
- Offer a combination of durability, quality, low maintenance and labour saving.

Specific Benefits of Key Plastics in Construction Applications



CELLULAR PVC PRODUCTS

Used extensively for cladding, roofline and rainwater goods:

- Extremely lightweight and can be assembled and put into put into position easily
- Can be sawn and nailed employing standard carpentry tools and skills
- Available in a range of colours and textures
- Highly suitable for exposed conditions and inaccessible locations
- Can be easily removed and recycled
- Offer the facility for ventilation
- Good load-bearing qualities
- PVC cladding is rated A+ in BRE's 'Green Guide to Specification'
- Low lifetime costs



EXPANDED POLYSTYRENE PRODUCTS

A material of choice for wall, roof and floor insulation.

Used for over 30 years for structure base infill:

- **Very low conductor of heat:**
 - Retains the heat in buildings
 - Maintains the low temperatures of refrigerated spaces
- **Extremely lightweight:**
 - Effectively 98% air captured within a 2% cellular matrix
 - Reduces health and safety risks associated with lifting heavy materials
 - Low cost in transportation
 - Easy to handle and install
- **High strength and structural stability:**
 - EPS has a unique structure enabling exceptional compressive strength and block-rigidity making it ideal as structure base infill for example in road, rail and bridge infrastructures.
- EPS stability does not deteriorate with age.
- Can be cut into many bespoke shapes.
- Resistant to water ingress.
- 100% recyclable.
- EPS insulation awarded A+ rating in BRE's 'Green Guide to Specification'



PLASTICS FLOORING

Plastics flooring products are manufactured in flexible PVC and Polyethylene and are used in domestic, commercial and industrial applications throughout the world:

- Durable with a long life:
 - Minimal wear and tear
 - Traffic and indentation resistance
 - Repair kits available
- Hygienic surfaces:
 - Impermeable and washable
 - Spills easy to clean up
 - Hospital flooring often made of plastics
- Huge design possibilities enabling rapid responses to changes in consumer fashion: a real boon to assist interior designers
- Sound reduction properties
- Recyclable
- Awarded A+ rating in BRE's Green Guide to Specification



PLASTICS PIPING SYSTEMS

Plastic Piping systems are widely used in Building, Construction, Civils and Utilities Industries.

Sectors covered include:

- Soil, waste, grey water and rainwater
- Hot and cold water for internal plumbing
- Radiators and surface heating /cooling
- Extract /air distribution systems
- Drainage and sewerage including manholes
- SUDS and Rainwater harvesting
- Land drainage
- Cable protection
- Pressure pipes for Water and Gas distribution

By using the appropriate plastics materials plastics piping systems are able to ensure products meet the requirements for each application. Benefits include:

- Long life
- Corrosion resistant
- Smooth bores
- Ease of jointing
- Strength through flexibility
- Long lengths
- Manufactured to British, European and International standards as appropriate
- Lightness for ease of handling
- Where appropriate plastic pipe systems meet the requirements for materials in contact with potable water.
- Where permitted by standards recycled material is used.

In most applications plastic systems have become the material of choice and the market leader.



Plastics Window Systems

Manufactured from rigid Polyvinyl Chloride (PVC) plastics windows were originally developed in Germany in the 1950's and became established in the UK in the 1970's.

- Recyclable with 254,814 tonnes of PVC recycled across Europe in 2010.
- Durable with excellent weatherability:
 - Life span of over 35 years
- A high level of thermal efficiency:
 - Low conductivity of PVC-U
 - British Fenestration Rating Council – The vast majority of A-rated windows are PVC-U
- Wide array of designs available with an extensive choice of colours
- An extensive choice of colours
- Low maintenance:
 - PVC-U windows can be repaired
 - No painting required
- Awarded A and A+ ratings for domestic and commercial windows respectively in the BRE's 'Green Guide to Specification'.



Useful Web Resources for Plastics in Construction

General

The British Plastics Federation www.bpf.co.uk

Construction Products Association www.cpa.org

Plastics Europe www.plasticseurope.eu

Sustainable manufacturing in plastics a guide www.sustainablemanufacturing.co.uk

BRE Green Guide to Specification www.bre.co.uk/greenguide

PVC Design www.pvcdesign.org

Cellular PVC

Cellular PVC Group Page

www.bpf.co.uk/Members/Cellular_PVC_U_Group.aspx

Flooring

European Resilient Flooring Manufacturers' Institute www.erfmi.com

Expanded Polystyrene

EPS Group Website www.eps.co.uk

European Manufacturers' of EPS www.eumeps.org

EPS Briefing: A Specifier Briefing www.eps.co.uk/pdfs/eps_specifier_briefing.pdf

Pipes

Pipe Group Website www.plasticpipesgroup.com

The European Plastic Pipes and Fittings Association www.teppfa.com

Windows

Windows Group Website www.bpfwindowsgroup.co.uk

Vinyl 2010 www.vinyl2010.org

European PVC Window Profile and related building products Association

www.eppa-profiles.org

PVC Aware www.pvcaware.org

British Fenestration Rating council <http://www.bfrc.org>

Pictures supplied by Architen Landrell www.architen.com

Details of Suppliers: BPF Members

Cellular PVC Group

Eurocell Profiles Ltd.

Tel +44(0)1773 842 100
info@eurocell.co.uk
www.eurocell.co.uk

BCE Cellular Extrusions Ltd

Tel +44(0)1724 281 440
info@bcecellular.com
www.bcecellular.com

Celuform Building Products Ltd

Tel +44(0)1724 281 440
customerservices@celuform.co.uk
www.celuform.co.uk

Deceuninck Ltd

Tel +44 (0)1249 816969
deceuninck.ltd@deceuninck.com
www.deceuninck.co.uk

Kestrel Building Products

Tel +44(0)1724 281 440
info@kbp.co.uk
www.kbp.co.uk

Swish Building Products

Tel +44(0)1827 317 200
info@swishbp.co.uk
www.swishbp.co.uk

Expanded Polystyrene (EPS) Group

Expanded Polystyrene Moulders

Hirsh Maschinenbau

Tel +44(0)1485 520203
www.hirsch-gruppe.com

Kay-Metzeler Ltd

Tel +44(0)1245 342101
www.kay-metzeler.com

Moulded Foams Ltd

Tel +44(0)1443 441491
www.mouldedfoams.com

Polimeri Europa UK Ltd

Tel +390252032098
www.polimeri.europa.com

S and B EPS Ltd

Tel +44(0)191 2500818
www.sandbeps.com

SCA Foam Products

Tel +44(0)1604 596800
www.scafoamproducts.co.uk

Simplipac Ltd

Tel +44(0)1202 694259
www.simplipac.co.uk

Springvale (GB) EPS Ltd

Tel +44(0)1457 863211
www.springvale.com

Northern Ireland Springvale EPS Ltd

Tel +44(0)2893 340203
www.springvale.com/ni

Sundolitt Ltd

Tel +44(0)1786 471586
www.sundolitt.co.uk

Thermabead Domestic and General Insulation

Tel +44(0)844 543 0043
www.dgi.org.uk

Warmfill Ltd

Tel +44(0)28 9042 8260
www.warmfill.com

Expanded Polystyrene Raw Material Suppliers

BASF plc

Tel +44(0)161 485 6222
global.info@basf.com
www.basf.co.uk

Ineos Nova

Tel 0179 385 2358
www.ineos-nova.com

Flooring and Sheet Manufacturers Group

Altro Floors

Tel +44(0)1462 480480
gcle@altro.co.uk
www.altro.co.uk

Fenner PLC

Tel +44(0)1482 626500
paul.sexton@fenner.com
www.fenner.com

Palram UK

Tel +44 (0)1302 380 780
lan.Wilson@palram.com
www.palram.com

Polyflor Ltd

Tel +44(0)161 767 1111
sjames@polyflor.com
www.polyflor.com

Tarkett

Tel +44(0)1622 854000
uksales@tarkett.com
http://www.tarkett.com/

Wardle Storeys Ltd

Tel +44 (0) 1254 583825
sales.blackburn@wardlestores.
co.uk
http://www.wsbl.co.uk

Pipes Group

Asset International

Tel +44 (0)1633 271906
postbox@assetint.co.uk
www.assetint.co.uk

Durapipe UK

Tel +44 (0)1543 279909
enquiries@durapipe.co.uk
http://www.durapipe.co.uk

Geberit Sales Ltd

Tel +44 (0) 1926 516800
www.geberit.co.uk

George Fischer Sales Limited

Tel +44 (0)2476 535535
www.georgfischer.co.uk

GPS

Tel +44(0)1480 52121
enquiries@gpsuk.com
www.gpsuk.com

Hunter Plastics Ltd

Tel +44 (0)20 8855 9851
info@hunterplastics.co.uk
www.hunterplastics.co.uk

Hydro International

Tel +44 (0)1275 878371
www.hydro-international.biz

John Guest Ltd

Tel +44 (0)1895 449233
www.johnguest.com

McAlpine & Co Ltd

Tel +44 (0)141 882 3213
www.mcalpineplumbing.com

Marley Plumbing & Drainage

Tel +44 (0)1622 858888
customerservice@marleyext.com
www.marley.co.uk

Pipelife (UK)

Tel +35 3 214 884700
karen.horgan@qpl.ie
www.qpl.ie

Polypipe Building Products

Tel +44 (0)1709 770000
www.polypipe.com

Polypipe Civils

Tel +44 (0)1509 615100
enquiries@polypipe.com
www.polypipe.com

Polypipe Terrain Ltd

Tel +44 (0)1622 795200
www.polypipe.com

Sustainable Drainage Systems Ltd

Tel +44 (0)1934 751303
info@sdslimited.com
www.sdslimited.com

Uponor Housing Solutions Ltd

Tel +44 (0)1455 550355
enquiries.uk@uponor.com
www.uponor.co.uk

Wavin Limited

Tel +44 (0)1249 766600
info@wavin.co.uk
www.wavin.co.uk

Windows Group

Windows System Companies

Deceuninck Ltd

Tel +44 (0)1249 816969
deceuninck@deceuninck.com
www.deceuninck.co.uk

Duraflex Limited

Tel +44 (0)8705 351351
info@duraflex.co.uk
www.duraflex.co.uk

Epwin Group Plc

Tel +44 (0)1242 243444
info@epwin.co.uk
www.epwin.co.uk

Eurocell Profiles Ltd.

Tel +44 (0)1773 842 100
info@eurocell.co.uk
www.eurocell.co.uk

LB Plastics Ltd

Tel +44 (0)1773 852311
www.sheerframe.co.uk

Profine UK Ltd

Tel +44 (0)1543 444900
info@profine-group.com
www.profine-group.com

Profile 22 Systems

Tel +44 (0)1952 290910
mail@profile22.co.uk
www.profile22.co.uk

REHAU Ltd

Tel +44 (0)1989 76 -2600
www.rehau.co.uk

Spectus Systems Ltd

Tel +44 (0)1625 420 400
contacting@spectus.co.uk

Veka Plc

Tel +44(0)1282 716611
sakesenquiry@veka.com
www.vekauk.com

WHS Halo

Tel 0121 749 3000
info@whs-halo.co.uk
http://www.whs-halo.co.uk

Fabricators and Installers

Lister Trade Frames Limited

Tel +44 (0)1782 391 900
Sales@listertf.co.uk
www.listertf.co.uk

Snowdonia (Windows & Doors) Ltd

Tel +44 (0)1352 758 812
www.snowdoniawindows.co.uk

Raw Materials and Additive Suppliers

Arkema Group

Tel 44 (0) 121 329 1300
Alsion.mayo@arkemagroup.com
www.arkema.com

Baerlocher UK Ltd

Tel +44 (0)161 764 3155
info@baerlocher.co.uk
www.baerlocher.co.uk

Chemson Ltd

Tel +44 (0)191 259 7000
sales.uk@chemson.com
www.chemson.co.uk

INEOS Chlorvinyls UK Ltd

Tel +44 (0)1928 561111
euro.sales.enquiries@ineoschlor.com
www.ineoschlorvinyls.com

Mitsui & Co UK plc

Tel +44 (0)20 7822 0321
dhicks@ldn.xm.mitsui.co.jp
www.mitsui.co.jp/tkabz/english/

Rohm and Haas (UK) Ltd

Tel +44 (0) 2476 654400
SAdams@rohmhaas.com
www.rohmhaas.com

Solvay Polymers Limited

Tel 01925 651 277
webmaster@solvay.com
www.solvay.com

Specialist Services

Foilit

Independent profile wrapping specialist
Tel +44 (0)1604) 706222
info@foilit.co.uk
www.foilit.co.uk

Groupco Ltd

Supplier of door and window fittings to the windows market
Tel +44 (0)1733 234750
sales@groupcoltd.co.uk
www.groupcoltd.co.uk

Renolit

Supplier of foil to the windows industry
Tel +44 (0)1670 718222
info@renolit.co.uk
http://www.renolit.com/

Schlegel UK

Weather seals and hardware for PVC windows and doors
Tel +44 (0)1462 815 500
schlegeluk@schlegel.eu.com
www.schlegel.co.uk

BPF House
6 Bath Place
Rivington Street
London
EC2A 3JE

TEL

020 7457 5000

WEB

www.bpf.co.uk

EMAIL

bpf@bpf.co.uk

The logo for BPF, consisting of the letters 'BPF' in a stylized, italicized, white font with a slight shadow effect, set against a dark blue background.