“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 nineteen 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 Plus, offered to the European Commission after the success of Vinyl 2010. Our Guide well illustrates how plastics products will help mitigate the effects of Climate Change. The BPF sponsored a 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

Graz Art Museum in Austria utilising an acrylic skin
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.
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 are lightweight:
- Easy to transport, manoeuvre and handle
- Fewer accidents

Plastics are easy to install:
- Lightweight
- Snap fit

Plastics offer design freedom:
- A limitless array of shapes possible
- Products can be coloured, opaque or transparent, rigid or flexible

Plastics promote energy efficiency in building:
- Plastics are low conductors of heat
- Tight seals achievable

E4 tent constructed from PVC fabric
Plastics are low maintenance:
- Plastics building products can be repaired.
- They do not need painting.

Plastics score highly in environmental assessments:
- Plastics materials are an efficient use of resources
- Rated highly in BRE’s ‘Green Guide to Specification’

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 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 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](http://www.bpf.co.uk)
Construction Products Association  [www.cpa.org](http://www.cpa.org)
Plastics Europe  [www.plasticseurope.eu](http://www.plasticseurope.eu)
Sustainable manufacturing in plastics a guide  [www.sustainablemanufacturing.co.uk](http://www.sustainablemanufacturing.co.uk)
BRE Green Guide to Specification  [www.bre.co.uk/greenguide](http://www.bre.co.uk/greenguide)
PVC Design  [www.pvcdesign.org](http://www.pvcdesign.org)

**Cellular PVC**
Cellular PVC Group Page  [www.bpf.co.uk/Members/Cellular_PVC_U_Group.aspx](http://www.bpf.co.uk/Members/Cellular_PVC_U_Group.aspx)

**Flooring**
European Resilient Flooring Manufacturers’ Institute  [www.erfmi.com](http://www.erfmi.com)

**Expanded Polystyrene**
EPS Group Website  [www.eps.co.uk](http://www.eps.co.uk)
European Manufacturers’ of EPS  [www.eumeps.org](http://www.eumeps.org)
EPS Briefing: A Specifier Briefing  [www.eps.co.uk/pdfs/epsSpecifier_briefing.pdf](http://www.eps.co.uk/pdfs/epsSpecifier_briefing.pdf)

**Pipes**
Pipe Group Website  [www.plasticpipesgroup.com](http://www.plasticpipesgroup.com)
The European Plastic Pipes and Fittings Association  [www.teppfa.com](http://www.teppfa.com)

**Windows**
Windows Group Website  [www.bpfwindowsgroup.co.uk](http://www.bpfwindowsgroup.co.uk)
Vinyl Plus  [www.vinylplus.eu](http://www.vinylplus.eu)
European PVC Window Profile and related building products Association  [www.eppa-profiles.org](http://www.eppa-profiles.org)
PVC Aware  [www.pvcaware.org](http://www.pvcaware.org)
British Fenestration Rating council  [www.bfrc.org](http://www.bfrc.org)

Pictures supplied by Architen Landrell  [www.architen.com](http://www.architen.com)
Details of Suppliers: BPF Members

Cellular PVC Group

Eurocell Profiles Ltd.
TEL +44(0)1773 842 100
FAX +44(0)1773 842 199
EMAIL info@eurocell.co.uk
WEB www.eurocell.co.uk

BCE Cellular Extrusions Ltd
TEL +44(0)1724 281 440
FAX +44(0)1724 280 241
EMAIL info@bcecellular.com
WEB www.bcecellular.com

Celuform Building Products Ltd
TEL +44(0)1622 719 199
FAX +44(0)1622 882 258
EMAIL customerservices@celuform.co.uk
WEB www.celuform.co.uk

Kestrel Building Products
TEL +44(0)1260 274764
FAX +44(0)1260 280462
EMAIL info@kbp.co.uk
WEB www.kbp.co.uk

Swish Building Products
TEL +44(0)1827 317 200
FAX +44(0)1827 317 201
EMAIL info@swishbp.co.uk
WEB www.swishbp.co.uk

Expanded Polystyrene (EPS) Group

Expanded Polystyrene Moulders

DS Smith Plastics Foam Products
TEL +44(0)1604596800
TEL +44 (0)7801860529
WEB www.dssmith-foamproducts.com
WEB www.dssmith-plastics.com

Energy Store Ltd
TEL +44(0)2890301500
FAX +44(0)2890301605
EMAIL info@energystore.com
WEB www.energystoretd.com

Hirsch Machinery
TEL +44(0)1485 520203
FAX +44(0)1485 520643
EMAIL mike.hirschuk@btinternet.com
WEB www.hirsch-gruppe.com

Inste Group
TEL +44(0)118 9328811
FAX +44(0)118 9328314
EMAIL info@instagroup.co.uk
WEB www.instagroup.co.uk

Jablite
TEL +44 (0) 8706003666
FAX +44 (0) 8706002555
EMAIL sales@jablite.co.uk
WEB www.jablite.co.uk

Moulded Foams Ltd
TEL +44(0)1443 441491
FAX +44(0)1443 441453
EMAIL enquiries@mouldedfoam.com
WEB www.mouldedfoam.com

Simiplipac Ltd
TEL +44(0)1202 694259
FAX +44(0)1202 600640
EMAIL info@simiplipac.co.uk
WEB www.simiplipac.co.uk

Springvale (GB) EPS Ltd
TEL +44(0)191 217 0101
FAX +44(0)191 217 0566
EMAIL sales@springvale.co.uk
WEB www.springvale.co.uk

Northern Ireland Springvale EPS Ltd
TEL +44(0)28 9334 0203
FAX +44(0)28 9334 1159
EMAIL sales@springvale.co.uk/nir
WEB www.springvale.co.uk

Sundolitt Ltd
TEL +44(0)141 887 1123
FAX +44(0)141 889 9878
EMAIL sales@sundolitt.co.uk
WEB www.sundolitt.com

Thermabead Domestic and General Insulation
TEL +44(0)1844543003
FAX +44(0)28 9334 1159
EMAIL sales@springvale.co.uk/ni
WEB www.springvale.co.uk

Warmfill Ltd
TEL +44(0)289042 8260
FAX +44(0)28 9042 4274
EMAIL sales@warmfill.com
WEB www.warmfill.com

Expanded Polystyrene Raw Materials Suppliers

BASF plc
TEL +44(0)161 485 6222
FAX +44(0)161 488 4258
EMAIL globalinfo@basf.com
WEB www.basf.co.uk

Ineos Nova
TEL +44(0)1793852358
EMAIL Tracey.grimmert@styroulution.com
WEB www.ineos-nova.com

Sunpor
TEL +44(0)1483 416224
EMAIL derek.markham@sunpor.com

Flooring and Sheet Manufacturers Group

Altro Floors
TEL +44(0)1462 460840
FAX +44(0)1462 480010
EMAIL gc.leo@altro.co.uk
WEB www.altro.co.uk

Fenner PLC
TEL +44(0)1482 626500
FAX +44(0)1482 626532
EMAIL paul.sexton@fenner.com
WEB www.fenner.com

Palram UK
TEL +44 (0)1302 380 780
FAX +44 (0)1302 380 788
EMAIL Ian.Wilson@palram.com
WEB www.palram.com

Polyflor Ltd
TEL +44(0)161 767 1111
FAX +44(0)161 767 1188
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WEB www.polyflor.com

Tarkett
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FAX +44(0)1622 854500
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WEB www.tarkett.com/

Pipes Group

Asset International
TEL +44(0)1623 273081
EMAIL sales@weholite.co.uk
WEB www.weholite.co.uk

Durapipe UK
TEL +44(0)1543 279009
EMAIL enquiries@durapipe.co.uk
WEB www.durapipe.co.uk

Geberit Sales Ltd
TEL +44 (0) 800 077 8365
WEB www.geberit.co.uk

George Fischer Sales Limited
TEL +44(0)20476 535535
EMAIL uk.ps@georgefischer.co.uk
WEB www.georgefischer.co.uk

GPS
TEL +44(0)1480 52121
EMAIL enquiries@gps.uk
WEB www.gps.uk

Hunter Plastics Ltd
TEL +44 (0)1622 852654
EMAIL info@hunterplastics.co.uk
WEB www.hunterplastics.co.uk

Hydro International
TEL +44 (0)1275 674979
WEB www.hydro-int.com/

John Guest Ltd
TEL +44(0)1895 449233
EMAIL www.johnguest.com/Page/home/contact.aspx
WEB www.johnguest.com

McAlpine & Co Ltd
TEL +44(0)141 882 3213
EMAIL info@mcalpineplumbing.com
WEB www.mcalpineplumbing.com

Marley Plumbing & Drainage
TEL +44(0)1622 858888
EMAIL customerservice@marleypd.co.uk
WEB www.marleyplumbinganddrainage.com/

Pipelife (UK)
TEL +44 845 241 9490
EMAIL info@pipelife.com
WEB www.pipelife.co.uk/uk

Polypipe Building Products
TEL +44(0)1709 770000
WEB www.polypipe.co.uk/uk

Polypipe Civils
TEL +44 (0)1509 615100
EMAIL civilenquiries@polypipe.com
WEB www.polypipe.com/civils

Polypipe Terrain Ltd
TEL +44(0)1622 795200
TEL +44(0)1622 795239
WEB www.polypipe.com

Rehau Ltd
TEL +44 (0) 1989 762600
WEB www.rehau.co.uk