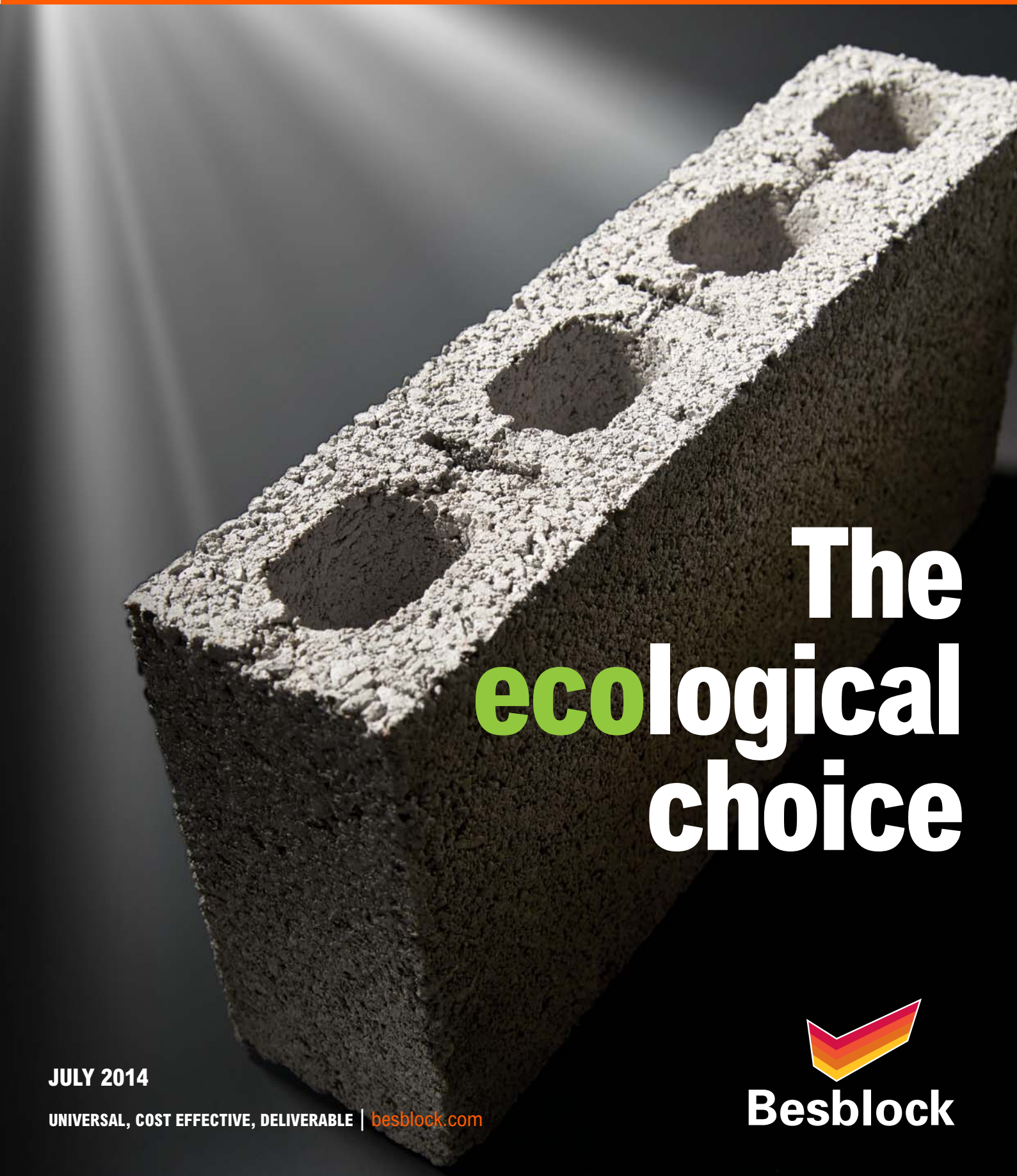
Besblock
STAR PERFORMER
UNIVERSAL, COST EFFECTIVE, DELIVERABLE

Besblock STAR PERFORMER
Building Regulations Part E&L Accredited

The multi-purpose energy saving block



The ecological choice

JULY 2014

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The Besblock Star Performer is a multi-purpose, one-block, on-site solution aimed essentially at the domestic housing market.

Multi-purpose applications

When using the Star Performer block, particularly for house building, a one-block solution is accomplished as the Star Performer meets the required criteria for:

Inner leaf of external wall

Sound resisting separating (party) walls

Infill units for beam and block floors

Use below damp-proof course level

ECO credentials

The product contains voids (24% of total block volume) which, when built, act as unventilated air cavities within the block, enhancing its thermal and acoustic performance.

24 % LESS aggregate in manufacture

% LESS water used in manufacture

% LESS energy used to cure the concrete

% INCREASED payload on delivery vehicles

BUILDING REGULATIONS 2010 (2013 EDITION)

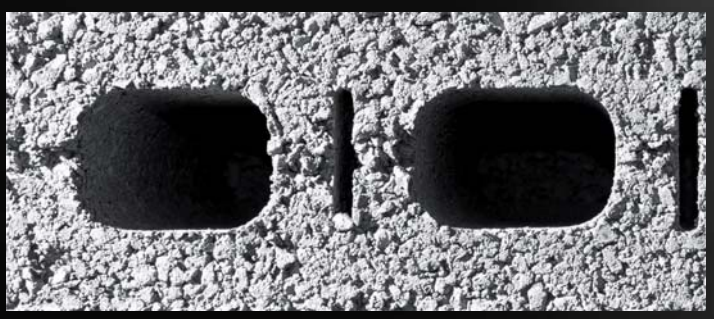
L1A TER / TFEE

CONSERVATION OF FUEL AND POWER IN NEW DWELLINGS

Thermal properties

The thermal properties closely resemble those of a solid medium density (F.B.A.) block, but when built into the wall, heat loss is shown to be greatly reduced at thermal junctions when the Star Performer block's bespoke Ψ and Kappa values are entered into the SAP calculation.

This has the distinct advantage of reducing the overall heat loss through the buildings envelope. A Ψ value summary for all junctions and junction detail drawings may be downloaded at www.besblock.co.uk



Technical specification

Unit weight @ 3% moisture (approx.)	14.5 kg
Weight laid / m^2 (approx.)	154 kg/m^2
Gross density of unit (approx.)	1554 kg/m^3
Net concrete density (approx.)	1900 kg/m^3
Effective lambda value	0.649 W/mK
Thermal resistance	0.154 m^2K/W
*Compressive strength	3.6N/mm^2: 7.3N/mm^2: 10.4N/mm^2
Bespoke Kappa value	95.5 k J(m^2K) plasterboard finish 126.1 k J(m^2K) gypsum finish
Void percentage (approx.)	24%
Moisture movement	0.5mm / m
Number per pack	9m^2 (90 blocks)
Thickness of concrete shell	27.5mm
Manufacturing category	BS EN 771-3:2011 Category 1 BS EN 1996-1-1 Group 1
Finishes available	Standard : Paint Grade

*Note: The compression test is taken over the whole bed area of the block including the void areas.

Section 1 – Thermal insulation external wall

Typical external wall U-values with brick outer leaf and internal finish of plasterboard on dabs.

Type of insulation	Lambda value of insulation (W/mK)	Cavity width (mm)	U-value (W/m^2K)
Full fill blown bead	0.033	100	0.27
Full fill blown bead	0.033	125	0.23
Full fill blown bead	0.033	150	0.19
Full fill mineral wool slab	0.032	100	0.27
Full fill mineral wool slab	0.032	125	0.22
Full fill blown mineral wool	0.037	150	0.21
Full fill mineral wool slab	0.032	150	0.19
Full fill blown mineral wool	0.034	100	0.28
Full fill blown mineral wool	0.034	125	0.23
Full fill blown mineral wool	0.034	150	0.20
PU / PIR board 50mm partial fill	0.022	100	0.28
PU / PIR board 75mm partial fill	0.022	125	0.22
PU / PIR board 100mm partial fill	0.022	150	0.18
Full fill "CavityTherm" 95mm PIR board	0.021	100	0.19
Full fill "CavityTherm" 120mm PIR board	0.021	125	0.16

For other U-values not covered in the table, please contact our Technical Services Department who will provide this information: technical@besblock.co.uk

Section 2 – Sound resisting separating walls: Approved Document E Building Regulations Part E1

Compliance with the Robust Detail Scheme demonstrates compliance with the relevant Building Regulations in England, Wales, Scotland and Northern Ireland, without the need for pre-completion testing.

Robust Detail (RD) constructions must be capable of consistently exceeding the performance standards given in Approved Document E to the Building Regulations of England and Wales, at the same time as being reasonably tolerant to workmanship.

The table below lists the RD's currently applicable to the Star Performer block when used in England, Wales and Northern Ireland only.

RD number	C.S.H. credits	Min cavity width (mm)	Cavity insulation	Parge coat required	Internal finish	Floor (flats)
E-WM-5	1	75	*75mm mineral wool. Max density 40kg/m^3 (optional)	Yes	Gypsum based board 8kg/m^2	E-FC-1 E-FC-12 E-FC-13 E-FC-14 E-FC-4 E-FC-5 E-FC-8 E-FC-9 E-FC-10 E-FC-11 E-FC-15 E-FC-16
E-WM-8	1	75	35mm Isover RD 35	No	Gypsum board 9.8kg/m^2	
E-WM-11	3	100	*100mm mineral wool. Max density 40kg/m^3 (optional)	Yes	Gypsum based board 8kg/m^2	
E-WM-17	3	100	100mm Isover RD Party Wall Roll or Isover Round The House Roll	No	Gypsum based board 9.8kg/m^2	
E-WM-26	1	100	100mm mineral wool roll quilt or batts of density range 12kg/m^3-25kg/m^3	No	Gypsum based board 10kg/m^3	
E-WM-19 MONARFLOOR BRIDGESTOP system. (Adjoining houses only)	4	100	*100mm mineral wool roll quilt or batts of max density 40kg/m^3 (optional)	Yes	Gypsum based board on dabs (8kg/m^3) on sand & cement render coat.	This system is for adjoining houses only. Not suitable for use in flats.

(1) The inner leaf of the external wall may be constructed of Star Performer blocks in all of the above RD.

(2)*The insulation within the party wall cavity is used to reduce convection of heat into the roof space to improve the dwellings emission rate. (Part L requirement)

Where the detail is marked*, the cavity insulation IS OPTIONAL. However if it is excluded the DER will increase.

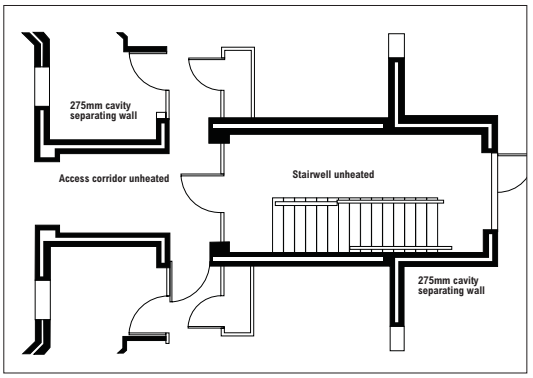
Note: RD specifications refer to separating (party walls) between dwellings. Walls separating living spaces within a flat or dwelling, from other parts of the same building that are not used exclusively with that flat or dwelling, e.g. separating walls forming stairwell walls, service corridors, and hallways etc., are not covered by RD protocol.

Regulation E1 requires that these walls have a Dn,Tw + Ctr rating of 45dB.

Whilst Approved Document E does not require that these walls be subject to on-site testing, the terminology Dn,Tw + Ctr does refer to an on-site test.

Building Control need to be satisfied that corridor and stairwell walls etc. comply with the requirements of E1, and building in accordance with an RD specification is one way of achieving this.

Flat/apartment heated



Building Regulation E2(a)

E2(a) refers to dwelling-houses, flats and rooms for residential purposes. It requires that walls within, between a bedroom or a room containing a water closet, and other rooms provide reasonable resistance to sound. (Exclusion: an internal wall separating an en suite toilet from the associated bedroom.)

Wall designation	Approved Doc wall reference	Requirement	Solution
Internal wall between a bedroom, or a room containing a water closet: and any other rooms.	Internal wall type C: Concrete block wall plaster or plasterboard on both sides	Rw 40dB	Single skin Besblock Star Performer plastered or dry lined both faces

Section 3 – Beam and block floors

The 7.3 N/mm² Star Performer block is suitable to act as infill units for beam and block flooring systems surpassing the minimum loading requirements stated in Table 1 BS 6399-1: 1996 for domestic and residential activities, and those required by the Precast Flooring Federation.

The Precast Flooring Federation require that blocks for use within floor beams should be of 7.3N/mm² compressive strength or capable of sustaining a central load applied via a 100mm² steel plate of 3.5kN on a span of 420mm.

The 7.3N/mm² Star Performer block is able to support a central point loading of 4.5kN on a 420mm span.

We are able to supply infill slip and cavity closer blocks to maintain coursing height if required.

See diagrams for guidance in use.

Guidance notes:

- Always specify blocks with 7.3N/mm² for this application.
- Where it is necessary to cut blocks to size always cut to and not beyond a bridge **(see fig 6).** If inconvenient use a Bescrete solid block 440 x 215 x 100 from which to cut portion size required.
- Where the block bears on, and forms part of the foundation wall, the laid flat compressive strength of the areas that are likely to be subject to load, assuming the bearing wall to be of 100mm thickness is:-

  1. 440 x 100 = 5.0N/mm² (see fig 7)

  2. 215 x 100 = 4.0N/mm² (see fig 8)

- Ensure that the floor is constructed and finished in accordance with the manufacturer's instructions.

Fig 6

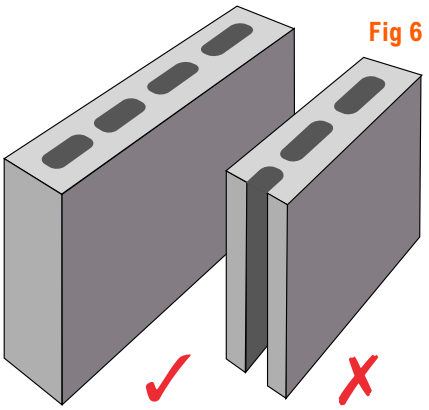


Fig 7

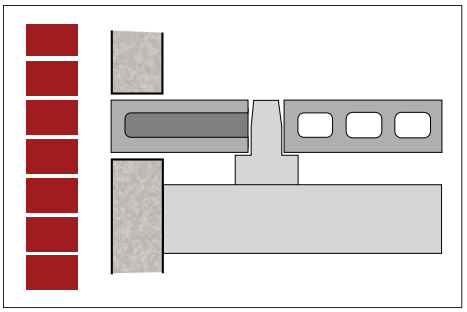
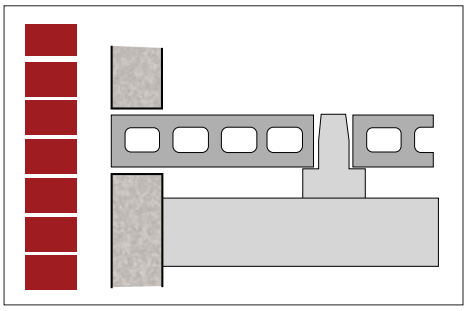


Fig 8



Section 4 – Star Performer in walls below damp-proof course

Introduction:

Star Performer blocks have been used below damp-proof course for many years where they have proved to be durable, efficient and economical. They permit fast on-site working since their dimensions are equivalent to six bricks.

Requirement:

Star Performer Blocks comply with the requirements of BS 5628: Part 3: 2005: table 12 and PD6697 Table 15 and as such are suitable for use below ground level damp-proof course.

Having a gross density of 1554kg/m^3 and being manufactured from dense aggregates to BS EN 12620 and having a concrete strength of 7.3N/mm^2, renders them suitable for use below damp-proof course in both the internal and external leaves of a cavity wall.

Where sulphate soils have been identified, Star Performer blocks can be used in up to and including class DS-3 equivalent sulphate soil classification (see table below).

Sulphate soil classification	Requirements
DS-1	Aggregate concrete blocks meeting the requirements of BS 5628: Part 3: Table 12 and PD 6697 Table 15. Star Performer blocks meet the criteria.
DS-2 and DS-3	Aggregate concrete blocks meeting the following requirements. **a)** Specified block strength 7.3N/mm^2. **b)** Blocks should be manufactured from dense aggregates to BS EN 12620. For this soil application specify the Star Performers to 7.3N/mm^2.

Mortar

A mortar containing 1:1:5-6 cement: lime: sand (or equivalent) or a general purpose mortar is commonly used below ground level.

Points to watch:

- ALWAYS lay blocks void down.
- Do not lay blocks flat.

Section 5 – Cutting and chasing the Star Performer

Ten per cent of all Star Performer blocks come with three in-built "splitter cores". These enable the block layer to easily achieve ¼, ½, or ¾ of a block. If cutting is required where splitter blocks are not selected from the pack, always use a mechanical cutter.

Likewise, where walls require chasing to accommodate service pipes etc. always use a mechanical cutter. The chases in the image (right) are typically 35mm wide.

It is quite acceptable to cut a chase through to the void within the block. Testing has demonstrated that this does not affect the block's structural integrity.

Section 6 – Fixing to cellular blocks

There is a common misconception within the industry that solid blocks will accept and provide a stronger and more rigid fixing than will cellular blocks (blocks containing voids).

As one of the UK's foremost manufacturers of cellular blocks we have long suspected that there is little physical foundation or evidence to support this theory.

Recent comparative tests have been conducted for both Tensile and Shear on 440mm x 215mm x 100mm Besblock Solid Medium Density blocks and Besblock Cellular Star Performer blocks. Standard M8 Anchor fixings were inserted into the blocks. In the case of the Cellular Star Performer block, the fixing passed through the 27.5mm shell, penetrating approx. 25.5mm into the void.

Tensile tests were conducted in accordance with the requirements of BS5080: Part 1: 1993.

Shear Tests were conducted in accordance with the requirements of BS 5080: Part 2: 1986.

The tests were conducted by Lucideon Ltd. Lucideon is a UKAS accredited laboratory.
The face size of the blocks tested was 440mm x 215mm.

Block type	Max Load (kN)	Max load (kg)
SUMMARY OF TEST RESULTS: TENSILE STRENGTHS OF FIXINGS INSTALLED INTO BLOCKS (MEAN of 5)		
100mm Cellular Star Performer	6.39	652
100mm Solid Besblock Medium Density	5.12	522
SUMMARY OF TEST RESULTS: SHEAR STRENGTHS OF FIXINGS INSTALLED INTO BLOCKS (MEAN of 5)		
100mm Cellular Star Performer	15.33	1556
100mm Solid Besblock Medium Density	15.16	1545

Full test report available on request

The strength of the concrete and its ability to retain fixings will depend on the concrete mix and its cement content. Very importantly however, the efficiency of the block machine and how it vibrates binding the concrete mix together, will determine the final strength and performance of the concrete product.

At Besblock we employ American Columbia block machines. These are world renowned for their unicontrolled vibration systems.

Where cellular blocks such as the Star Performer are being manufactured, case hardened steel core bars will be present in the steel mould box. When the vibration is applied to compact the concrete mix therein, the mix material will be forced against the outer constraints of the mould box, but also against the core bars within the mould, thereby receiving compaction from four sides.

As a result, the concrete contained in the cellular block will have a greater density than its equivalent in solid format, thereby providing greater strength.

Besblock STAR PERFORMER

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Section 7 – Technical services

We're pushing the boundaries on customer service

With the ever increasing complexity of the Building Regulations and the continual changes being made to them, Besblock has long realised the requirement that customer service should exceed purely the on-time delivery of a good quality building block. The product has many stringent regulations to satisfy in the thermal, acoustic and structural fields.

To enhance our customer service, Besblock Technical Services began in 1995.
Their purpose is to guide house builders through this labyrinth of regulations with a view to obtaining a "Pass" for the developer by the most cost effective of specifications.

As members of National Energy Services AND Stroma, we are fully qualified to offer:

- Full energy advisory service. Our assessors never adopt the fast and easy default method. They will give a great degree of thought in every case to how to meet the regulations by the most cost effective method. Where necessary, this will involve full discussions with you, the client.
- Full documentation for presentation to Building Control to get you started on site. This includes a Building Regulations check list, a SAP Data Sheet, full SAP Work Sheet and a Predicted Energy Assessment (PEA).
- Air Leakage Testing. When your project is complete, our fully qualified and BINDT (British Institute of Non Destructive Testing) approved test engineers are on hand to assess the Air Tightness of the finished building. Results are usually issued electronically on the same day as the test, enabling fast CML completion.
- AND FINALLY. Production of your EPC, conforming to the "as built" specification necessary for the "signing off" of your dwelling(s) before you can offer for sale/occupation.

For Air Leakage Testing book on line at www.besblock.co.uk or telephone Technical Services 01952 685000

Besblock
STAR PERFORMER

Better acoustic insulation

Greater thermal insulation

Smarter multi-purpose, one-block, on-site solution

Greener 24% less water, aggregate, and energy used in manufacture

If you would like further information about the Besblock Star Performer please contact us

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Besblock

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Intertek UKAS MANAGEMENT SYSTEMS 014