

CE MARKING

UK APPLICATION GUIDE



This Guide forms a link between the CE Marking and UK Building Regulations and construction practice.

VST PERMANENT FORMWORK SYSTEM

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Generic type of construction product and use

The VST Permanent Formwork System is a non-loadbearing permanent shuttering kit based on cement-bonded particleboard (CBPB) shuttering elements.

Basis of this Guide

This Guide gives information supporting the CE Marking to enable the product to be incorporated satisfactorily into the construction works according to UK requirements. This Guide must be read in conjunction with the CE Marking and its accompanying information.

It covers regulatory compliance and voluntary aspects where appropriate. The presentation by the manufacturer of the information underwriting CE Marking has been taken as valid and requiring no further corroboration in accordance with the Construction Products Directive.

A Declaration of Conformity against the relevant technical specification has been provided by the manufacturer and as a condition of the issue of this document the BBA requires the manufacturer to confirm the Declaration of Conformity at six-monthly intervals.

Users must satisfy themselves that the product's performance fulfils their requirements and that the product is being used correctly. Readers are advised to check the current validity of the CE Marking with the Application Guide holder and the validity of this document with the BBA website: www.bbacerts.co.uk

Part 1 Product Summary

1.1 VST Permanent Formwork System comprises a range of elements that are selected to construct formwork for specific projects. The non-loadbearing shuttering kit is based on cement-bonded particle board (CBPB) with regularly arranged steel clips. The incorporated finish is not part of the shuttering kit.

1.2 The shuttering kit comprises:

- panels with or without openings
- column elements
- lintel elements
- parapet and balustrade elements.

1.3 The main elements comprise inner and outer boards of 24 mm thick CBPB connected with steel clips as spacers. The dimensional characteristics of the elements are:

maximum height (m)	2.9
maximum length ⁽¹⁾ (m)	6.25
maximum thickness (mm)	300
approximate weight (kgm ⁻²)	85

(1) A 7.5 m length is available to special order.

Use

1.4 The CE Marking covers the formwork system for use in the construction of internal and external walls above and below ground which are loadbearing (structural) and non-loadbearing (non-structural), including those which are subject to fire regulations.

1.5 When used below ground, suitable waterproofing must be provided and be protected from damage by an impact-resistant layer.

Part 2 CE Marking – Overview


2.1 CE Marking includes technical information in the form of declared values. It enables a product to be legally placed on the market in any EC Member State. However, this does not necessarily mean the product will be suitable for all end uses in all Member States. A judgement must be made on whether the product is suitable for a particular intended use according to the relevant regulations.

2.2 Technical information given by the CE Marking and the related harmonised standard is indicated in this Guide by the prefix **CE**

2.3 BBA opinions on the suitability of the product in relation to UK regulations and construction practice relates to the information as given in the CE Marking and the manufacturer's declaration and are indicated by the prefix 

2.4 The CE Marking (see Figure 1) is affixed to the paperwork accompanying the product. The complete technical information is contained in the manufacturer's declaration of conformity and data sheet.


Figure 1 Typical CE Marking



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Austria

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07
ETA-07/0039
1301 - CPD - 0327



DELIVERY NOTE Only for walls, beams and columns


TRANSPORT Nr.:		ARRIVE ON SITE:	
SITE:		TIME:	
PLAN NUMBER:		SEMI - TRAILER:	
RACK NO.:		VST - WALLS / SLABS:	
Walls thickness ▶▶	17,5 cm	20 cm	21,5 cm
Rack 1			
Rack 2			
Rack 3			
Rack 4			
Free			
Free			
Free			
VST Nitra:		Customer:	
Name:	Date:	Name:	Date:
Signature and Stamp:	#REF!	Signature and Stamp:	#REF!


Formulár č. 0900

2.5 The CE Marking accompanying this product indicates that it was affixed by the Austrian company, VST Verbundschalungstechnik GmbH. The Marking includes the year in which the Marking was affixed. The CE Marking also gives the number of the ETA issued by OIB⁽¹⁾ in Austria, and the number of the Certificate of Conformity issued by TSUS⁽²⁾, the designation of the system and the nominal value of the wall thickness.

(1) OIB [Österreichisches Institut für Bautechnik (Austrian Institute for Building, Vienna)] is the EOTA body in Austria.

(2) TSUS [Technický a skúšobný ústav stavebný, n. o. (Building Testing and Research Institute, Bratislava)] is a notified body in Slovakia.


 2.6 The European Technical Approval ETA-07/0039 *VST Permanent Formwork System* is the harmonised technical specification and details of the relevant characteristics and appropriate test methods are given within it.


 2.7 The reference No Performance Determined (NPD) appears in the manufacturer's data sheets (and in this Guide). This indicates that the manufacturer has taken an option not to test certain performance aspects relating to the product (see ETAG 009 : 2002). Designers should be aware that the use of NPD, in some cases, can indicate that additional information is required for a product to be considered for use in a particular location.


Part 3 CE Marking – Detailed interpretation


Of the six Essential Requirements under the Construction Products Directive (CPD), the following are relevant to the UK in relation to permanent shuttering for concrete in the considered applications.


Essential Requirement 1 – Mechanical resistance and stability

 3.1 Walls constructed using VST Permanent Formwork are classified as a continuous type as described in ETAG 009 : 2002, Section 2.2, paragraph 1 *Continuous type*, meaning that the concrete is only penetrated by regularly arranged steel clips in the system and that the sum of the cross-sectional area of the clips is only a small percentage of the wall area.

 3.2 When the shuttering is filled with concrete as specified in ETA-07/0039, clause 4, efficient filling without bursting the shuttering, having voids or uncovered reinforcement in the concrete core is possible.

 3.3 When used, steel reinforcement can normally be installed during the assembly of the shuttering elements. Welded steel meshes with a grid size of 150 mm should be used to accommodate the pattern of the steel clips. The meshes are fixed with special spacers. Steel reinforcement bars can also be used.

 3.4 Walls constructed using the system may be treated as conventional plain or reinforced walls and should be designed and constructed in accordance with BS 8110-1 : 1997, BS 8110-2 : 1985 or BS EN 1992-1-1 : 2004 and BS EN 1992-1-2 : 2004. The nominal concrete cover to the reinforcement should be that appropriate to 'mild' exposure in accordance with BS 8110-1 : 1997, Tables 3.2 and 3.4, or as required for fire resistance in accordance with BS 8110-2 : 1985, Section 4, whichever is the greater. Alternatively, the recommendations given in BS EN 1992-1-2 : 2004 may be adopted.

 3.5 The concrete is not easily examined after casting, therefore, as specified in BS 8110-1 : 1997, Section 2, care must be taken to ensure full compaction of the concrete. Voids may be detected during concrete placement by tapping the CBPB with the palm of the hand and listening for a 'hollow' sound; particular attention should be given to basement walls and areas adjacent to formed openings. Compaction is best checked after the concrete has set by removing a 100 mm by 100 mm section of the CBPB leaf, viewing the concrete surface and, on completion, replacing the section of the leaf.

Essential Requirement 2 – Safety in case of fire

General


 3.6 During the design process, compliance of the walls constructed using the system with the relevant requirement of the following Building Regulations should be checked against sections on fire and fire spread of internal and external surfaces:


England and Wales – Approved Document B, Volumes 1 and 2

Scotland – Domestic and Non-Domestic Technical Handbooks, Section 2

Northern Ireland – Technical Booklet G.

Reaction to fire

 3.7 The reaction-to-fire classification of the CBPB is declared as A2-s1, d0 according to EN 13501-1 : 2007. This classification only applies to leaves with a thickness of 24 mm, with a mass of approximately 31 kg, with joints that are not bonded or sealed and without an air gap, fixed to a Euroclass A1 or A2 substrate.


 3.8 The plain concrete or reinforced concrete core of the walls constructed using the system and the steel clips can be classified as a non-combustible material.

Resistance to fire


 3.9 The European standard for resistance-to-fire classification of the walls constructed using the VST system with different wall thicknesses, is given in Table 1.

Table 1 Resistance to fire

Concrete core thickness (mm)	Wall thickness (mm)	REI (Class)
102	150	30
127	175	90
152	200	120
167	215	120
182	230	120
202	250	120
252	300	120

 3.10 The classification given in Table 1 does not take into account any additional protection provided by additional internal and external finishes. The use of the formwork with specified finishes will not reduce the fire resistance given in Table 1. Care should be taken to ensure that detailing at junctions and around openings adequately maintains the required period of fire resistance and that cavities formed in the completed walls are appropriately fire stopped.

 3.11 The fire spread classification of the internal lining can be taken as A2-s1,d0 (European class) with the conditions given in section 3.6, provided that additional lining is not applied.


 3.12 The external fire spread classification of the walls constructed using the system will depend on the surface finish applied on the external side.


Essential Requirement 3 — Hygiene, health and environment


 3.13 According to the manufacturer's declaration, the shuttering elements do not contain dangerous substances.

 3.14 The water vapour diffusion resistance factor (μ) of CBPB is declared to be 60.


 3.15 Water absorption and watertightness properties are declared as satisfactory in accordance with ETAG 009 : 2002, sections 5.3.3 and 5.3.4 respectively.

 3.16 In external walls, the risk of surface and interstitial condensation will depend on the external and internal finishes. During the design process, a condensation risk calculation in accordance with BS 5250 : 2002 should be carried out and, if necessary, an internal vapour control layer should be applied. The water vapour resistance factor for the concrete core can be taken from BS EN 12524 : 2000.

 3.17 Basement walls should be designed in accordance with the recommendations of BS 8102 : 1990 to ensure adequate protection from water from the ground. Waterproofing materials used must be compatible with CBPB and be continuous with the waterproofing used below the floor.

 3.18 Resistance to precipitation is provided by an external cladding system which must be designed and constructed in accordance with the relevant good practice described in the applicable codes and manufacturer's instructions.

Essential Requirement 4 — Safety in use

 3.19 The effective bond strength of the concrete to the shuttering and the resistance to impact load are declared satisfactory in accordance with ETAG 009 : 2002, sections 5.4.1.3 and 5.4.1.4 respectively.

3.20 The shuttering elements have a declared resistance to hydrostatic concrete pressure with a height of filling of 1.0 m and a concrete density of 2.5 kgm^{-3} under the conditions given in Table 2.

Table 2 Resistance to filling pressure

Characteristic	Result
Bending strength of CBPB, ⊥ and (to EN 310)	≥9 MPa
Modulus of elasticity of CBPB for bending, ⊥ and (to EN 310)	≥4.500 MPa
Distance of steel clips, horizontal and vertical, fixed with eight screws, 5 mm x 25 mm on each side (nominal value)	≥450 mm

Essential Requirement 5 — Protection against noise



3.21 The airborne sound insulation of the walls with different thickness is classified as shown in Table 3.

Table 3 Airborne sound insulation⁽¹⁾

Wall thickness (mm)	R_w (dB)
150	51
175	53
200	55
215	56
230	57
250	58
300	61

(1) The approximate values of the spectrum adaptation terms are $C = -2$ dB and $C_w = -5$.



3.22 'No performance determined' (NPD) for sound absorption.



3.23 Sound absorption properties of the internal surface of the wall can vary and will depend on the final finish applied.



3.24 Separating walls in dwellings and rooms for residential purposes in England and Wales are subject to pre-completion testing in accordance with Approved Document E, Section 1.

Essential Requirement 6 — Energy economy and heat retention

3.25 The declared values of the thermal resistance (R) of walls with a concrete core and CBPB leaves on each side are given in Table 4.

Table 4 Thermal resistance⁽¹⁾

Total wall thickness (mm)	Thermal resistance (m^2KW^{-1})
150	0.229
175	0.240
200	0.251
215	0.257
230	0.264
250	0.270
300	0.294

(1) The thermal resistance values are calculated to EN ISO 6946:1997 with a thermal conductivity of $\lambda = 0.26$ $Wm^{-1}K^{-1}$ and $\lambda = 2.30$ $Wm^{-1}K^{-1}$ for CBPB and concrete respectively.



3.26 The thermal transmittance of the completed wall will depend on the internal and external finishes used. Calculations for the U value for specific constructions and finishes should be carried out in accordance with BS EN ISO 6946 : 1997 and BRE report (BR 443 : 2006) *Conventions for U value calculations*.




3.27 The thermal-bridge effect of the steel clips in the concrete core can be ignored in the calculations. Openings in the wall and junctions should be designed carefully to limit additional heat loss and air infiltration. Detailed guidance can be found in the documents supporting the national Building Regulations.







3.28 The thermal insulation thickness of the external wall should be determined correctly to meet the requirements included in the national Building Regulations:

England and Wales – Approved Documents L1A and L2A

Scotland – Domestic and Non-Domestic Technical Handbooks, Section 6

-  3.29 To calculate thermal inertia, densities can be taken as 1300 kgm^{-3} and 2400 kgm^{-3} and heat capacities can be taken as $1500 \text{ Jkg}^{-1}\text{K}^{-1}$ and $1000 \text{ Jkg}^{-1}\text{K}^{-1}$ for CBPB and concrete respectively. These values are tabulated values in accordance with EN 323 : 1993 and BS EN 12524 : 2000.

Aspects of durability, serviceability and identification

-  3.30 Fixed objects or cladding systems must be fastened into the concrete core and not into the CBPB leaves.
-  3.31 As far as is possible, services should be arranged within the leaves of the shuttering elements. If ducts or services are incorporated in the area of the concrete core, then the effect on the stability, safety in case of fire and the building's physical characteristics of the wall must be taken into consideration. Horizontal slots in the concrete should be avoided wherever possible.
-  3.32 Although maintenance is not required for the system, regular checks should be carried out on the finishes to ensure damage is detected and repaired as soon as is possible.
-  3.33 Concrete walls constructed with the system will have a service life of not less than 60 years provided they are designed in accordance with sections 3.4 and 3.17. The CBPB formwork will have a similar service life provided it is protected from damage by external and internal finishes of the wall construction and such finishes are adequately maintained during the life of the building.

Attestation of conformity

3.34 The CE Marking has been affixed on the basis of compliance with the relevant requirements of ETA-07/0039. The attestation of conformity level associated with the CE Marking is system 2+. Attestation of Conformity is intended to ensure that the product is made and tested on a consistent basis. It involves tasks for the manufacturer and the certification body.

3.35 Tasks for the manufacturer are:

- factory production control
- further testing of samples taken at factory in accordance with a prescribed test plan
- Initial type-testing or assessment.

3.36 Tasks⁽¹⁾ for the certification body are:

- initial inspection of factory and the factory production control
- continuous surveillance, assessment and approval of the factory production control.

(1) These tasks have been carried out by TSUS (notified body number 1301). It has issued Certificate of Factory Production Control 1301-CPD-0327, 18 December 2007, for the VST Formwork System.

Part 4 Factors relating to UK Regulations

UK implementation of the CPD

4.1 Statutory Instrument 1991, No 1620. The Building and Building Construction Products Regulations 1991 as amended by the Construction Products (Amendment) Regulations 1994 (Statutory Instruments 1994, No 3051)

4.2 These Regulations implement Council Directive 89/106/EEC of 21 December 1988⁽¹⁾, modified by the Council Directive 93/68/EEC of 22 July 1993 and lay down the criteria for CE Marking of construction products. Where the stated performance values accompanying the CE Marking pass the minimum legal requirements for the intended use, if used appropriately and in satisfactory conditions, a product bearing CE Marking shall be presumed by the building control body to satisfy the relevant requirements unless there are reasonable grounds for suspecting otherwise.

(1) Known as the Construction Products Directive (CPD).

The Building Regulations 2000 (as amended) (England and Wales)

4.3 In the opinion of the BBA, the CE Marking indicates that the VST Permanent Formwork System, if used in accordance with the provisions of this Guide and the conditions associated with CE Marking, will satisfy or contribute to satisfying the various Building Regulations as listed below.

Requirement: A1	Loading
Requirement: A2	Ground movement
Requirement: A3	Disproportionate collapse
Comment:	Walls constructed using the formwork as defined by the CE Marking will have sufficient strength and stiffness to satisfy these Requirements. See sections 3.1 to 3.5 of this Guide.
Requirement: B2	Internal fire spread (linings)
Comment:	Internal linings of walls constructed using formwork have a reaction-to-fire classification of A2-s1,d0 Euroclass as defined by the CE Marking. See sections 3.7 and 3.11 of this Guide.
Requirement: B3(1)(2)(3)(4)	Internal fire spread (structure)
Comment:	Completed walls are shown by the CE Marking to have a resistance-to-fire class as given in section 3.9 of this Guide. See also section 3.10 of this Guide.
Requirement: B4(1)	External fire spread
Comment:	Walls constructed using the formwork can satisfy this Requirement provided the system is used in conjunction with suitable external finishes. See section 3.12 of this Guide.
Requirement: C2(a)	Resistance to moisture
Comment:	Walls constructed using the formwork can adequately limit the ingress of moisture from the ground provided the design is in accordance with section 3.17 of this Guide. See also section 3.15 of this Guide.
Requirement: C2(b)	Resistance to moisture
Comment:	Walls constructed using the formwork can adequately limit the risk of moisture penetration from precipitation and wind-driven spray. See section 3.18 of this Guide.
Requirement: C2(c)	Resistance to moisture
Comment:	The water vapour resistance factor accompanying the CE Marking should be used in calculations of the risk of surface and interstitial condensation. See sections 3.14 and 3.16 of this Guide.
Requirement: E1	Protection against sound from other parts of the building and adjoining buildings
Requirement: E2(a)	Protection against sound within a dwelling-house etc
Comment:	As defined by the CE Marking, walls constructed using the formwork can meet these Requirements. See sections 3.21 to 3.24 of this Guide.
Requirement: L1(a)(i)	Conservation of fuel and power
Comment:	The thermal-resistance information accompanying the CE Marking should be used in U-value calculations. See sections 3.25 to 3.28 of this Guide.
Requirement: Regulation 7	Materials and workmanship
Comment:	The CE Marking shows that the product is acceptable. See sections 3.30, 3.31 and 3.33 and Part 6 <i>Installation</i> of this Guide.

The Building (Scotland) Regulations 2004 (as amended)

4.4 In the opinion of the BBA, the CE Marking indicates that the VST Permanent Formwork System, if used in accordance with the provisions of this Guide and the conditions associated with CE Marking, will satisfy or contribute to satisfying the various Regulations and related Mandatory Standards as listed below.

Regulation: 8(1)(2)	Fitness and durability of materials and workmanship
Comment:	The formwork as specified under the CE Marking is deemed to contribute to a construction satisfying this Regulation. See sections 3.30 to 3.33 and Part 6 <i>Installation</i> of this Guide.
Regulation: 9	Building standards — construction
Standard: 1.1(a)(b)	Structure
Standard: 1.2	Disproportionate collapse
Comment:	Walls constructed with the formwork as specified under the CE Marking will have sufficient strength and stiffness to satisfy these Standards, with reference to clauses 1.1.1 ⁽¹⁾⁽²⁾ and 1.2.1 ⁽¹⁾⁽²⁾ . See sections 3.1 to 3.5 of this Guide.

Standard:	2.1	Compartmentation
Comment:		Walls constructed using the formwork, as shown by the CE Marking, can satisfy or contribute to satisfying the required fire-resistance durations, with reference to clauses 2.1.1 ⁽²⁾ , 2.1.4 ⁽²⁾ , 2.1.8 ⁽²⁾ , 2.1.9 ⁽²⁾ , 2.1.10 ⁽²⁾ and 2.1.11 ⁽²⁾ . See sections 3.9 and 3.10 of this Guide. Openings in walls can maintain the fire-resistance durations, with reference to clause 2.1.14 ⁽²⁾ . See sections 3.9 and 3.10 of this Guide. Junctions between walls can maintain the required fire-resistance durations, with reference to clause 2.1.15 ⁽²⁾ . See sections 3.9 and 3.10 of this Guide. Walls constructed using the formwork can satisfy the required combustibility requirement with reference to clause 2.1.12 ⁽²⁾ . See sections 3.7 and 3.8 of this Guide.
Standard:	2.2	Separation
Comment:		Walls constructed using the formwork, as shown by the CE Marking, can satisfy or contribute to satisfying the required fire-resistance durations, with reference to clauses 2.2.1 ⁽¹⁾⁽²⁾ , 2.2.2 ⁽¹⁾⁽²⁾ , 2.2.3 ⁽¹⁾⁽²⁾ , 2.2.4 ⁽¹⁾ , 2.2.5 ⁽¹⁾ and 2.2.6 ⁽¹⁾ . See sections 3.9 and 3.10 of this Guide. Openings in walls can maintain the fire-resistance durations, with reference to clauses 2.2.9 ⁽¹⁾ and 2.2.6 ⁽²⁾ . See sections 3.9 and 3.10 of this Guide. Junctions between walls can maintain the required fire-resistance durations, with reference to clauses 2.2.10 ⁽¹⁾ and 2.2.7 ⁽²⁾ . See sections 3.9 and 3.10 of this Guide. Walls constructed using the formwork can satisfy the required combustibility requirement, with reference to clauses 2.2.7 ⁽¹⁾ and 2.2.4 ⁽²⁾ . See sections 3.7 and 3.8 of this Guide.
Standard:	2.3	Structural protection
Comment:		Walls constructed using the formwork, as shown by the CE Marking, can satisfy or contribute to satisfying the required fire-resistance durations, with reference to clauses 2.3.1 ⁽¹⁾⁽²⁾ . See sections 3.9 and 3.10 of this Guide. Openings in walls can maintain the fire-resistance durations, with reference to clause 2.3.4 ⁽¹⁾⁽²⁾ . See sections 3.9 and 3.10 of this Guide. Junctions between walls can maintain the required fire-resistance durations, with reference to clause 2.3.5 ⁽¹⁾⁽²⁾ . See sections 3.9 and 3.10 of this Guide. Walls constructed using the formwork can satisfy the required combustibility requirement, with reference to clause 2.3.2 ⁽¹⁾⁽²⁾ . See sections 3.7 and 3.8 of this Guide.
Standard:	2.4	Cavities
Comment:		To limit the risk of fire spread in walls constructed using the formwork, detailing should address the need for sealing cavities at junctions and edges of openings, with reference to clauses 2.4.1 ⁽¹⁾⁽²⁾ , 2.4.2 ⁽¹⁾⁽²⁾ , 2.4.4 ⁽¹⁾ to 2.4.7 ⁽¹⁾ and 2.4.6 ⁽²⁾ to 2.4.9 ⁽²⁾ . See section 3.10 of this Guide.
Standard:	2.5	Internal linings
Comment:		Walls constructed using the formwork, as shown by the CE Marking, can satisfy the reaction to fire required by this Standard, with reference to clause 2.5.1 ⁽¹⁾⁽²⁾ . See sections 3.7 and 3.11 of this Guide.
Standard:	2.6	Spread to neighbouring buildings
Comment:		Walls constructed using the formwork, as shown by the CE Marking, can satisfy or contribute to satisfying the required fire-resistance durations, with reference to clauses 2.6.1 ⁽¹⁾⁽²⁾ . See sections 3.9 and 3.10 of this Guide.
Standard:	2.7	Spread on external walls
Comment:		Walls constructed using the formwork can satisfy this Standard, with reference to clauses 2.7.1 ⁽¹⁾⁽²⁾ and 2.7.2 ⁽²⁾ , provided the system is used in conjunction with a suitable external finish. See section 3.12 of this Guide.
Standard:	3.4	Moisture from the ground
Comment:		Walls constructed using the system can adequately limit the ingress of moisture from the ground, with reference to clause 3.1.1 ⁽¹⁾⁽²⁾ , 3.4.5 ⁽¹⁾⁽²⁾ and 3.4.7 ⁽¹⁾⁽²⁾ , provided the design is in accordance with section 3.17 of this Guide. See also section 3.15 of this Guide.
Standard:	3.10	Precipitation
Comment:		Walls can adequately limit the risk of moisture penetration from precipitation, with reference to clauses 3.10.2 ⁽¹⁾⁽²⁾ and 3.10.3 ⁽¹⁾⁽²⁾ . See section 3.18 of this Guide.
Standard:	3.15	Condensation
Comment:		The water vapour resistance factor accompanying the CE Marking should be used in calculations of the risk of surface and interstitial condensation, with reference to clauses 3.15.1 ⁽¹⁾ , 3.15.4 ⁽¹⁾ and 3.15.5 ⁽¹⁾ . See sections 3.14 and 3.16 of this Guide.
Standard:	5.1	Resisting sound transition to dwellings
Comment:		Separating walls constructed using the formwork as defined by the CE Marking can satisfy this standard, with reference to clauses 5.1.1 ⁽¹⁾⁽²⁾ , 5.1.2 ⁽¹⁾ and 5.1.3 ⁽¹⁾ . See sections 3.21 to 3.24 of this Guide.
Standard:	6.2	Building insulating envelope
Comment:		The thermal resistance information accompanying the CE Marking should be used in U-value calculations, with reference to clauses 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ , 6.2.4 ⁽¹⁾⁽²⁾ , 6.2.5 ⁽²⁾ . See section 3.25 to 3.28 of this Guide. (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2000 (as amended)

4.5 In the opinion of the BBA, the CE Marking indicates that the VST Permanent Formwork System, if used in accordance with the provisions of this Guide and the conditions associated with CE Marking, will satisfy or contribute to satisfying the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The formwork, as specified under the CE Marking, shows that the product is acceptable. See sections 3.30, 3.31 and 3.33 and Part 6 <i>Installation</i> of this Guide.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The system is acceptable. See section 3.31 of this Guide.

Regulation:	B4(1)	External fire spread
Comment:		Walls constructed using the formwork can satisfy this requirement provided the system is used in conjunction with a suitable external finish. See section 3.12 of this Guide.
Regulation:	C4(a)(b)	Resistance to ground moisture and weather
Comment:		Walls constructed using the formwork can adequately limit the ingress of moisture from the ground and from the weather, provided the design is in accordance with sections 3.17 and 3.18. See also section 3.15 of this Guide.
Regulation:	C5	Condensation
Comment:		The water vapour resistance factors accompanying the CE Marking should be used in calculations of the risk of surface and interstitial condensation. See sections 3.14 and 3.16 of this Guide.
Regulation:	D1	Stability
Regulation:	D2	Disproportionate collapse
Comment:		Walls constructed using the formwork as defined in the CE Marking will have sufficient strength and stiffness to satisfy these Regulations. See sections 3.1 to 3.5 of this Guide.
Regulation:	E3	Internal fire spread – linings
Comment:		Internal linings of walls constructed using the formwork have a reaction-to-fire classification of A2-s1,d0 Euroclass as defined by the CE Marking. See sections 3.7 and 3.11 of this Guide.
Regulation:	E4(1)(2)(3)(4)	Internal fire spread – Structure
Comment:		Completed walls are shown by the CE Marking to have a resistance-to-fire class as given in 3.9 of this Guide. See also section 3.10 of this Guide.
Regulation:	E5(a)	External fire spread
Comment:		Walls constructed using the formwork can satisfy this Regulation provided the system is used in conjunction with suitable external finish. See section 3.12 of this Guide.
Regulation:	F2(a)(i)	Conservation measures
Comment:		The thermal-resistance information accompanying the CE Marking should be used in U-value calculations. See sections 3.25 to 3.28 of this Guide.
Regulation:	G2(1)	Separating walls and separating floors
Comment:		Walls constructed using the formwork as defined by the CE Marking can meet this Regulation. See sections 3.21 to 3.24 of this Guide.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

4.6 Information in this Guide is intended to assist the Client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: *5 Installation (5.1) and 6 Health and safety (6.2 and 6.3).*

Part 5 Factors relating to UK home warranty providers

NHBC Standards 2008

5.1 NHBC accepts the use of the VST Permanent Formwork System, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 2.1 *Concrete and its reinforcement*.

Zurich Building Guarantee Technical Manual 2007

5.2 In the opinion of the BBA, the VST Permanent Formwork system, when installed and used in accordance with this Certificate, satisfies the requirements of the *Zurich Building Guarantee Technical Manual*, Section 4 *Superstructure*, Sub-section *Sound Insulation*.

Part 6 Additional factors

Installation



6.1 The installation of the VST Permanent Formwork System must be in accordance with ETA-07/0039, Annex 3 (see ETA-07/0039, Clause 4.2).

Health and safety

6.2 The elements do not pose any particular safety risks in use. However, care should be taken to ensure that all items fixed to the wall and which are subject to tensile forces are anchored to the concrete core. This refers in particular to items such as kitchen cabinets, hot-water boilers and handrails.

6.3 The supporting props for the walls must be sufficiently strong to maintain the wall's stability until the concrete has cured.

Part 7 Bibliography

- BS 5250 : 2002 *Code of practice for control of condensation in buildings*
- BS 8102 : 1990 *Code of practice for protection of structures against water from the ground*
- BS 8110-1 : 1997 *Structural use of concrete — Code of practice for design and construction*
- BS 8110-2 : 1985 *Structural use of concrete — Code of practice for special circumstances*
- EN 634-2 : 2007 *Cement bonded particleboards — Specification — Requirements for OPC bonded particleboards for use in dry, humid and exterior conditions*
- BS EN 1992-1-1 : 2004 *Eurocode 2 : Design of concrete structures. General rules and rules for buildings*
- BS EN 1992-1-2 : 2004 *Eurocode 2 : Design of concrete structures. General rules and rules for buildings. General rules. Structural fire design*
- BS EN 12524 : 2000 *Building materials and products — Hygrothermal properties — Tabulated design values*
- BS EN ISO 6946 : 1997 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*
- EN 310 : 1993 *Wood-based panels — Determination of modulus of elasticity in bending and of bending strength*
- EN 323 : 1993 *Wood-based panels — Determination of density*
- EN 13501-1 : 2007 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*
- ETAG 009 : 2002 *Guideline for European Technical Approval of non-loadbearing permanent shuttering kits/systems based on hollow blocks or panels of insulating materials and sometimes concrete*

Part 8 Terms and Conditions

Conditions

8.1 This Guide:

- relates only to the product that is named, described, installed, used and maintained as set out in this Guide;
- is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Guide;
- is valid only within the UK;
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;
- is copyright of the BBA;
- is subject to English law.

8.2 Publications and documents referred to in this Guide are those that the BBA deems to be relevant at the date of issue or re-issue of this Guide and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

8.3 This Guide will remain valid for an unlimited period provided that:

- the product, the manufacture and/or fabrication remain unchanged;
- the CE Marking remains valid;
- it is reviewed by the BBA as and when it considers appropriate: and
- the manufacturer confirms the Declaration of Conformity at six-monthly intervals.

8.4 In granting this Guide, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product or any other product;
- the right of the Guide holder to market, supply, install or maintain the product;
- the actual works in which the product is installed, used and maintained, including the nature, design, methods and workmanship of such works: and
- the accuracy and validity of the information relating to the CE Marking.

8.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Guide are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Guide or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Guide, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the installation and use of this product.

On behalf of the British Board of Agrément



Head of Approvals
— Engineering



Chief Executive

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