

Schöck Bauteile GmbH

Vimbucher Strasse 2
D-76534 Baden-Baden
Germany

Tel: 00 49 72 23 967-0 Fax: 00 49 72 23 967-450
e-mail: schoeck@schoeck.de
website: www.schoeck.de



Agrément Certificate
05/4277
Product Sheet 1

SCHÖCK ISOKORB RANGE OF THERMAL INSULATION COMPONENTS

SCHÖCK ISOKORB LOADBEARING THERMAL INSULATION FOR CONCRETE FLOORS

This Agrément Certificate Product Sheet⁽¹⁾ relates to Schöck Isokorb Loadbearing Thermal Insulation for Concrete Floors, a thermal break units comprising polystyrene insulated concrete blocks between reinforcing steel bars with plastic sleeves and fire resistant top and bottom pads to form a thermal break between a balcony and an internal floor, whilst transferring load and maintaining full structural integrity.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

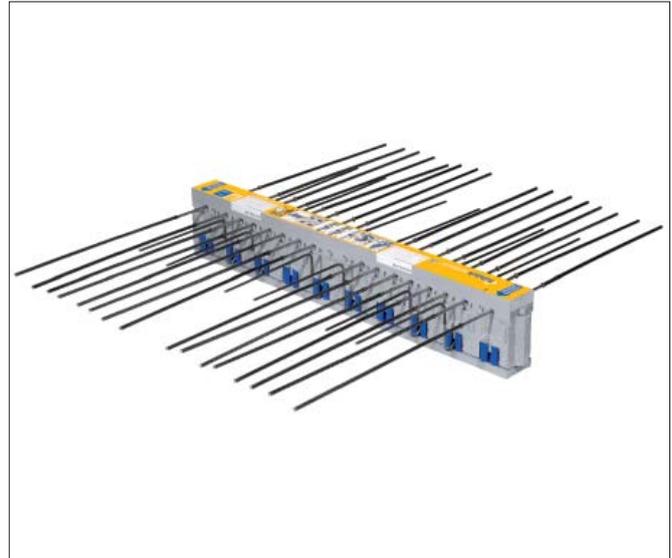
KEY FACTORS ASSESSED

Structural aspects — the products have adequate strength to resist the loads associated with permanent loading (see section 6).

Thermal performance — the products contribute towards the overall thermal insulation of the building envelope by reducing cold bridging between internal and external elements (see section 7).

Behaviour in relation to fire — testing indicates that the fire protection plates incorporated in the products will provide up to 120 minutes resistance (see section 9).

Durability — under normal service conditions, the products will have a service life of at least 60 years (see section 11).



The BBA has awarded this Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Brian Chamberlain
Head of Approvals — Engineering

Claire Curtis-Thomas
Chief Executive

Date of Second issue: 26 June 2014

Originally certified on 5 December 2005

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

British Board of Agrément
Bucknalls Lane
Watford
Herts WD25 9BA

©2014

tel: 01923 665300
fax: 01923 665301
e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk

Regulations

In the opinion of the BBA, Schöck Isokorb Loadbearing Thermal Insulation for Concrete Floors, if installed, used and maintained in accordance with this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement: A1	Loading
Comment:	The products have sufficient strength and stiffness to sustain and transmit the design loads in accordance with sections 6.2 to 6.7 of this Certificate.
Requirement: B3(1)	Internal fire spread (structure)
Comment:	The fire protection plates incorporated in the products will provide up to 120 minutes fire resistance. See section 9.3 of this Certificate.
Requirement: L1 a(i)	Conservation of fuel and power
Comment:	The products contribute towards the overall thermal insulation of the building envelope and contribute to a building meeting the Target Emission Rate by reducing cold bridging between internal and external elements. See section 7.1 of this Certificate.
Regulation: 7	Materials and workmanship
Comment:	The products are acceptable. See section 11.1 and the <i>Installation</i> part of this Certificate.
Regulation: 26	CO₂ emission rates for new buildings
Regulation: 26A	Fabric energy efficiency rates for new dwellings (applicable to England only)
Comment:	The products contribute to meeting this Regulation. See section 7.1 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation: 8(1)	Durability, workmanship and fitness of materials
Comment:	The products comply with the requirements of this Regulation. See section 11.1 and the <i>Installation</i> part of this Certificate.
Regulation: 9	Building standards applicable to construction
Standard: 1.1(a)(b)	Structure
Comment:	Reinforced concrete walls and floors incorporating the products have sufficient strength and stiffness to sustain and transmit the design loads in accordance with sections 6.2 to 6.7 of this Certificate, with reference to clauses 1.1.1 ⁽¹⁾⁽²⁾ to 1.1.3 ⁽¹⁾⁽²⁾ .
Standard: 2.3	Structural protection
Comment:	The fire protection plate incorporated in the products will provide up to 120 minutes resistance (medium), with reference to clauses 2.3.1 ⁽¹⁾⁽²⁾ to 2.3.3 ⁽¹⁾⁽²⁾ . See section 9.3 of this Certificate.
Standard: 3.15	Condensation
Comment:	The products can contribute towards a construction meeting the requirements of this Standard, with reference to clauses 3.15.1 ⁽¹⁾⁽²⁾ and 3.15.4 ⁽¹⁾⁽²⁾ . See sections 8.1 to 8.3 of this Certificate.
Standard: 6.1(b)	Carbon dioxide emissions
Standard: 6.2	Building insulation envelope
Comment:	The products contribute towards the overall thermal insulation of the building envelope and contribute to a building meeting the Target Emission Rate by reducing cold bridging between internal and external elements, with reference to clauses 6.2.0 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾ and 6.2.4 ⁽²⁾ . See section 7.1 of this Certificate.
Standard: 7.1(a)(b)	Statement of sustainability
Comment:	The product can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6 and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard. In addition, the product can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 ⁽¹⁾⁽²⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾], 7.1.6 ⁽¹⁾⁽²⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾] and 7.1.7 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾]. See section 7.1 of this Certificate.
Regulation: 12	Building standards applicable to conversions
Comment:	All comments given for these systems under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012

Regulation: 23	Fitness of materials and workmanship
Comment:	The products are acceptable. See section 11.1 and the <i>Installation</i> part of this Certificate.
Regulation: 29	Condensation
Comment:	The products can contribute towards a construction meeting the requirements of this Regulation. See sections 8.1 to 8.3 of this Certificate.
Regulation: 30	Stability
Comment:	The products have sufficient strength and stiffness to sustain and transmit the design loads in accordance with sections 6.2 to 6.7 of this Certificate.

Regulation:	35(1)(2)(3)	Internal fire spread structure
Comment:		When incorporating the fire protection plates, the products will provide up to 120 minutes fire resistance. See section 9.3 of this Certificate.
Regulation:	39	Conservation measures
Regulation:	40	Target carbon dioxide Emissions Rate
Comment:		The products contribute towards the overall thermal insulation of the building envelope and contribute to a building meeting the Target Emission Rate by reducing cold bridging between internal and external elements. See section 7.1 of this Certificate.

Construction (Design and Management) Regulations 2007

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

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 3 *Delivery and site storage* of this Certificate.

Additional Information

NHBC Standards 2014

NHBC accepts the use of Schöck Isokorb Loadbearing Thermal Insulation for Concrete Floors, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards, Chapter 7.1 Flat roofs and balconies*.

Technical Specification

1 Description

1.1 Schöck Isokorb Loadbearing Thermal Insulation for Concrete Floors (see Figure 1) are a range of components within a thermal break unit comprising high-density polystyrene, incorporating plastic-sleeved, high-density pairs of high-strength concrete bearing blocks. The number of blocks varies between 4 and 18 to every 1 metre length depending on load requirements. An arrangement of stainless steel, straight and bent bars are passed through the EPS moulding and bearing blocks to act as tension and shear reinforcement and form continuity between the balcony and floor construction. The product also incorporates fire protection plates at top and bottom.

1.2 Details of the components within the product are:

steel reinforcement bars — stainless steel ribbed reinforcement bar (to German steel grade B500B NR), is used to pass through the products with high-yield ribbed reinforcement bar (to German steel grade B500B) used as continuity steel to lap onto floor and balcony reinforcement. Both bar types are either cut-stump or press-welded together to form a full-strength butt joint

insulation — expanded polystyrene moulding (Polystrol Hardfoam or with Neopor), forms part of the thermal break. The thermal break is generally 80 mm wide except for the XT range, where the width is increased to 120 mm

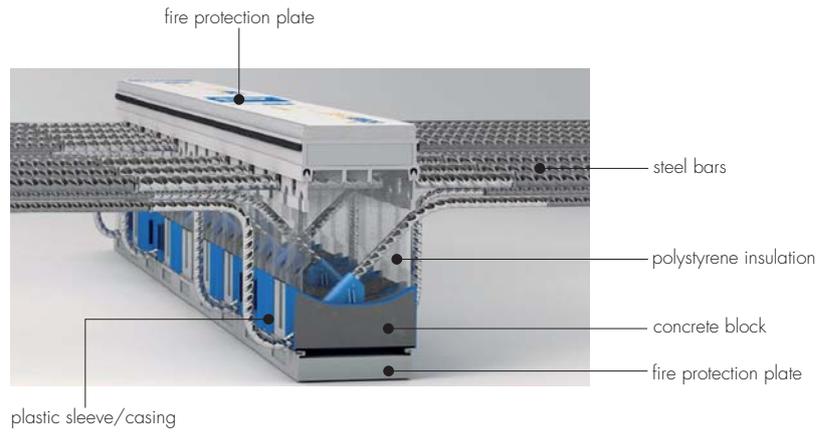
concrete pressure bearing block (K, KF, KX, Q and XT range products only) — containing high-strength, fibre-reinforced concrete and housed in thrust-force bearing blocks of either 87 mm long or 119 mm long. Produced in pairs and consisting of an outer plastic sleeve of PE-HD plastic (see Figure 1)

plastic sleeve/rigid moulding — used on K, KX, KF, Q and XT product range and manufactured from extruded PVC bonded to the top and bottom of the thermal break using Dorus MS 294 adhesive. The top moulding contains slotted holes in each side to receive the stainless steel reinforcement bars. A fire safety strip manufactured from Roku-strip and bonded to sides of upper PVC rigid moulding provides additional fire protection to reinforcement

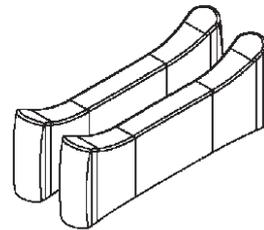
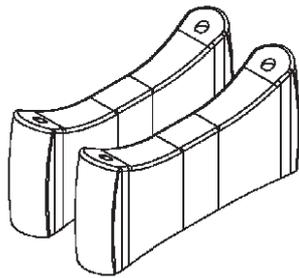
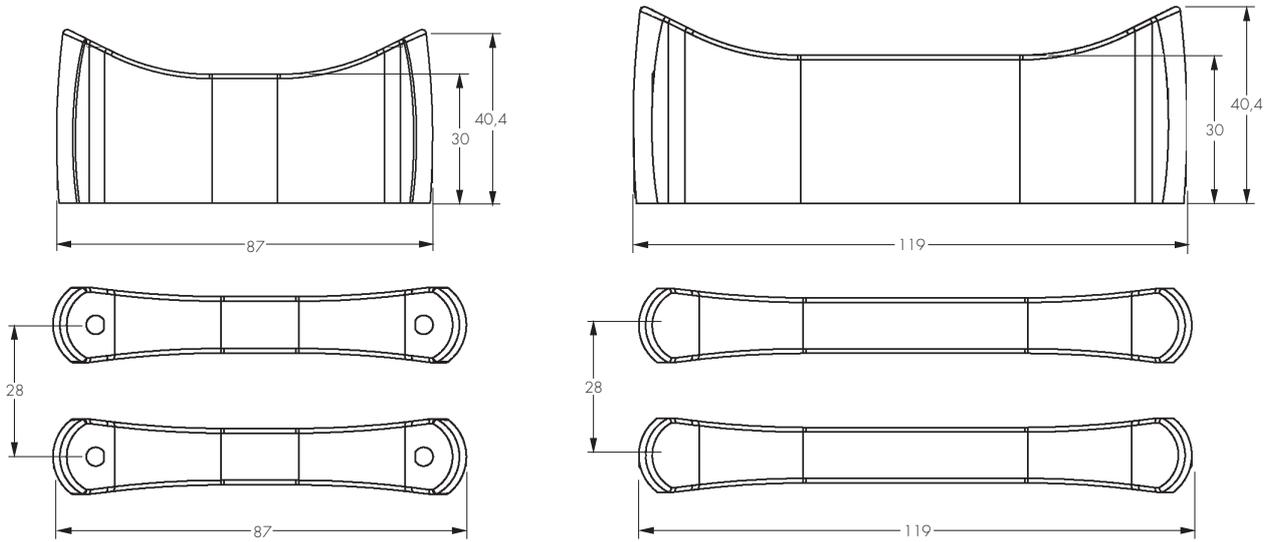
fire protection plates — manufactured from glass-fibre cement-bonded board complying with DIN 4102-2 : 1977, provided to top and bottom of thermal break when required.

1.3 The product range covered by this Certificate is listed in Figure 2.

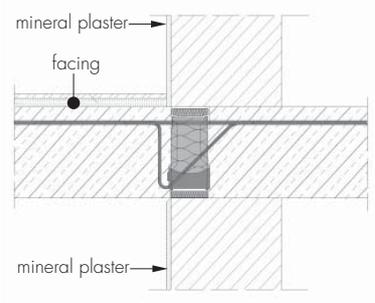
Figure 1 Typical Schöck Isokorb detail



Typical cross section

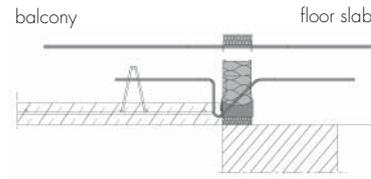


Concrete bearing blocks
(dimensions in mm)



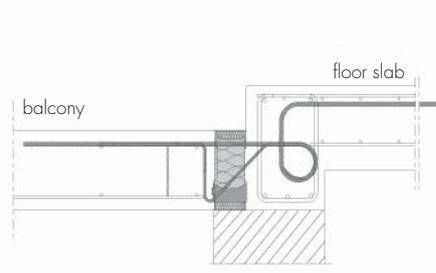
type K

For in-situ reinforced cantilever balcony for transferring bending moment and shear force into concrete floor.



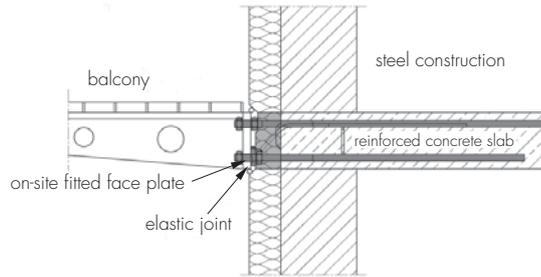
type KF

For precast concrete cantilever balcony for transferring bending moment and shear force into concrete floor



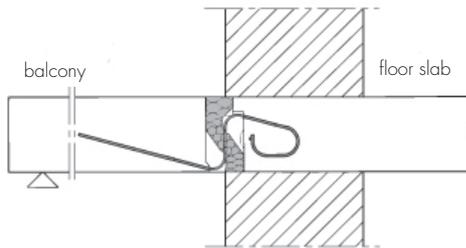
type KX-HV

For cantilever balcony with step-up for transferring bending moment and shear force into concrete floor.



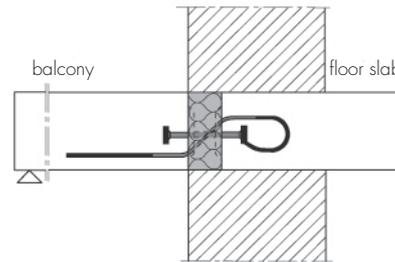
type KS

For cantilever steel balcony for transferring bending moment and shear force into concrete floor.



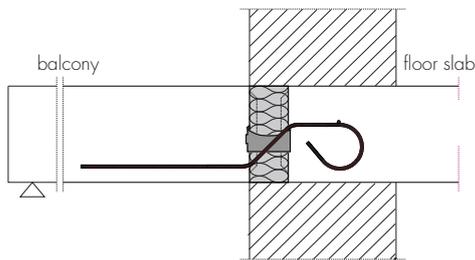
type V

For in-situ concrete balcony with flexible joint, plus additional end support using podium or columns for transferring lateral and shear forces into floor slab.



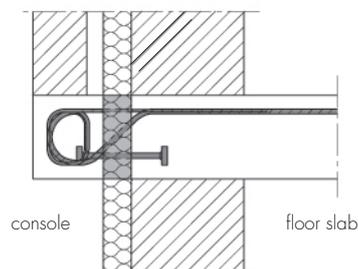
type QP

For in-situ concrete balcony with flexible joint, plus additional end support using podium or columns for transferring shear forces into floor slab where stress and height are critical.



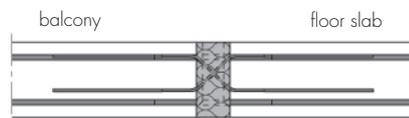
type Q

For in-situ concrete balcony with flexible joint, plus additional end support using podium or columns for transferring shear forces into floor slab where stress and height are critical.



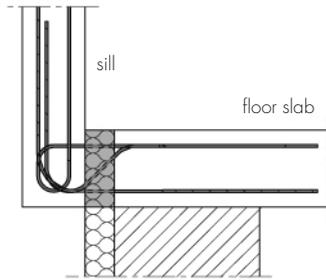
type O

For reinforced concrete corbel for transferring bending moment and shear force.



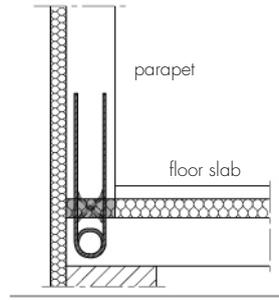
type D

For in-situ concrete balcony within same area as main floor requiring transfer of positive and negative bending moment and shear force.



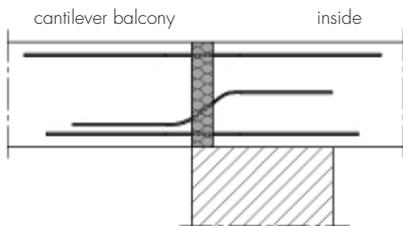
type F

For providing insulation between protruding balustrades and transferring bending moment and shear force.



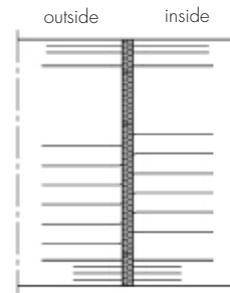
type A

For parapet for transferring and negative bending moment and shear forces.



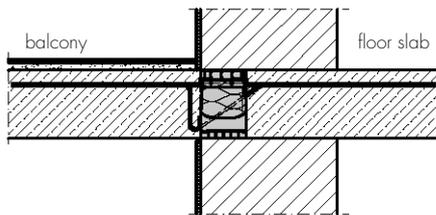
type S

For in-situ concrete balcony to carry bending moment and shear force into floor without use of thrust blocks.



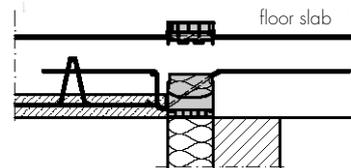
type W

For balcony wall transferring moment and shear force into internal structural wall.



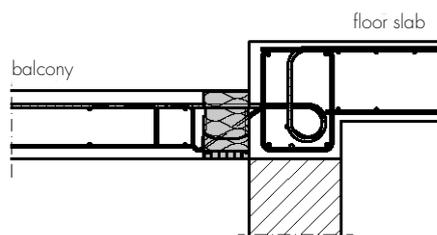
type KXT

For in-situ reinforced cantilever balcony for transferring bending moment and shear forces into concrete floor.



type KFXT

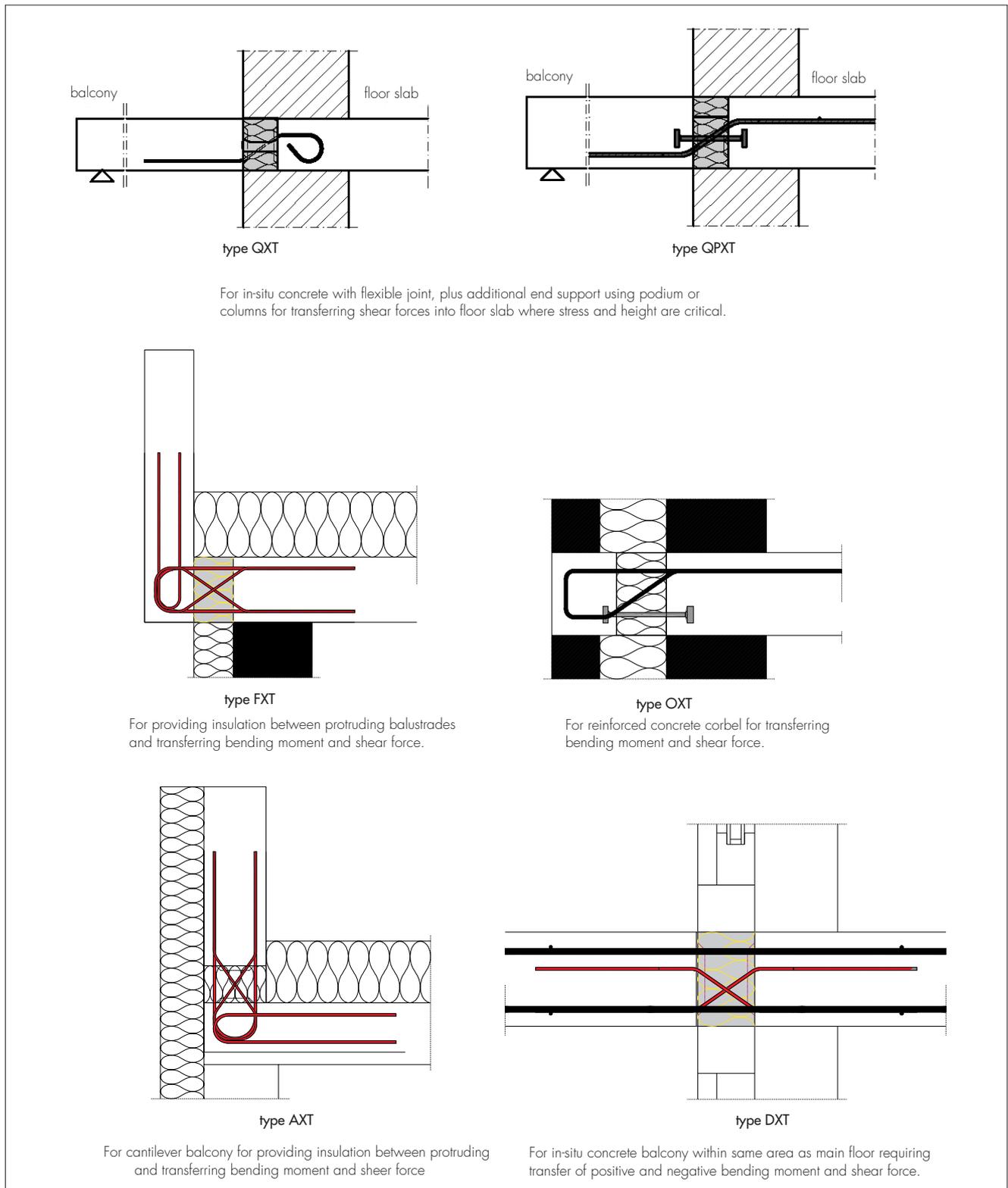
For precast concrete cantilever balcony for transferring bending moment and shear forces into concrete floor.



type KXT-HV

For cantilever balcony with step-up for transferring bending moment and shear forces into concrete floor.

Figure 2 Schöck Isokorb range (continued)



2 Manufacture

2.1 The incoming components are bought in to an agreed specification and completed for final assembly. The process involves welding and cutting of bars and templates used to form the units and assembled using hot melt adhesive.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Schöck Bauteile GmbH has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2008 by DEKRA Certification GmbH (Certificate 31112676).

3 Delivery and site handling

3.1 The units are normally supplied to order on wooden pallets shrink-wrapped in foil containing full or part orders. A label is affixed to each product bearing the BBA Certificate number, a batch number, production date, information on product type, diameter of reinforcement and full installation instructions.

3.2 During offloading care must be taken to avoid bending reinforcement or damaging the expanded polystyrene moulding. Packages must be stored undercover and away from direct sunlight or contact with solvents or other harmful chemicals.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Schöck Isokorb Loadbearing Thermal Insulation for Concrete Floors.

Design Considerations

4 Use

4.1 Schöck Isokorb Loadbearing Thermal Insulation for Concrete Floors allows full transfer of load from an external balcony into the main structure whilst providing a thermal break to reduce heat loss to the outside. The product is used primarily in reinforced concrete structures and is designed to form integrally with the floor construction.

4.2 The units have the capability to transfer tensile, shear and compressive forces via the steel reinforcement and the thrust-force bearing blocks through to the supporting structure.

5 Practicability of installation

The products must be installed by competent trained builders in accordance with the Certificate holder's Installation Manual.

6 Structural aspects

6.1 Ultimate tensile strength of stainless steel, used in the product range is in accordance with German Standards and can be taken as $500 \text{ N}\cdot\text{mm}^{-2}$ for reference 1.4571 stainless steel, and $700 \text{ N}\cdot\text{mm}^{-2}$ for reference 1.4362 stainless steel. Ultimate tensile high-yield steel ribbed reinforcement (but welded to the stainless steel reinforcement) and shear reinforcement can be taken as $500 \text{ N}\cdot\text{mm}^{-2}$. Test result data can also be obtained from the Certificate holder to verify specified tensile resistance figures.



6.2 The minimum strength grade of concrete used in the balcony must be C32/40 with a minimum strength grade of C25/30 in the supporting floor slab.

6.3 The quantities of tensile and/or shear reinforcement to be provided within each of the units, to resist the balcony or other direct loads, must be calculated by a suitably qualified and experienced individual in accordance with BS 8110-1 : 1997 or BS EN 1992-1-1 : 2004 (Eurocode 2). All tension reinforcement should be 20 mm diameter or less and shear or lateral reinforcement 14 mm diameter or less. The Certificate holder is able to provide design data on request.

6.4 The maximum tensile rod spacing is generally 300 mm but must not exceed the requirements given in BS 8110-1 : 1997 or BS EN 1992-1-1 : 2004 (Eurocode 2).

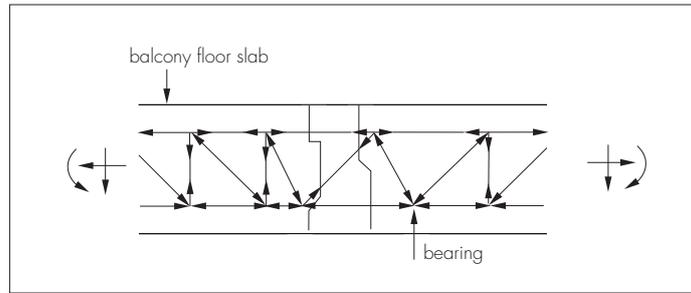
6.5 The anchor length of steel reinforcement should be in accordance with BS 8110-1 : 1997 or BS EN 1992-1-1 : 2004 (Eurocode 2).

6.6 Calculations should be carried out to ensure that the ultimate compressive force on individual pairs of concrete pressure-bearing blocks does not exceed 34.4 kN and the concrete adjacent to shear reinforcement bends is not overstressed. The Certificate holder's advice should be sought in this respect.

6.7 The cut-stump or press welding between stainless steel and continuity high-yield reinforcement is carried out under strict factory control and in accordance with German Standards. In-house testing is regularly carried out to ensure strength parameters are achieved.

6.8 The mechanism of structural resistance of the K, KX, KF and XT units in a framework model form is shown in Figure 3.

Figure 3 Typical framework model



6.9 Tension reinforcement forming each of the units should not be bent on site, but remain straight.

6.10 Site welding must not be undertaken under any circumstances.

6.11 The precamber of the balcony formwork should be specified by the engineer in charge. Note that deflection calculations should take into account the requirements for drainage of the balcony.

7 Thermal performance

7.1 The psi (ψ) value of junctions incorporating the product should be determined in accordance with BS EN ISO 10211 : 2007 and BRE Report 497 : 2007 and using dimensions of the components and values for the thermal conductivity ($W \cdot m^{-1} \cdot K^{-1}$) of:

- EPS (Neopor) 0.031
- steel reinforcing bar 50
- stainless steel 15

7.2 The effect of thermal bridging at the junction between the balcony and the wall must be minimised. The performance of this junction will be dependent upon other elements not covered by this Certificate and a suitable assessment of all junction details should be carried out. Example ψ values are given in Table 2 and have been calculated using computer models with the thermal conductivity values given in Table 3.

Table 2 Example ψ values

Connector type	ψ value ($W \cdot m^{-1} \cdot K^{-1}$)
K50 ⁽¹⁾	0.200
KXT50 ⁽²⁾	0.153

- (1) This ψ value has been estimated from a wall construction of a 115 mm thick outer skin, 215 mm thick inner leaf, insulation 100 mm thick, a 50 mm wide cavity and the Isokorb unit is 200 mm high, the balcony slab 200 mm thick and the inner floor slab 225 mm thick. The thermal conductivity (λ) values given in Table 3 can be taken for the component parts of the connector.
- (2) This ψ value has been estimated from a wall construction of a rendered 115 mm thick outer skin, 215 mm thick inner leaf, insulation 140 mm thick, a 10 mm wide cavity and the Isokorb unit is 200 mm high, the balcony slab 200 mm thick and the inner floor slab 225 mm thick. The thermal conductivity (λ) values given in Table 3 can be taken for the component parts of the connector.

Table 3 Thermal conductivity values⁽¹⁾

Material	Thermal conductivity value ($W \cdot m^{-1} \cdot K^{-1}$)
Steel	50
Concrete slab	2.100
Masonry	1.100
Wall insulation	0.040
Plaster	0.700
Floor screed	1.400
Bearing concrete	0.760
F90 material	0.143
Stainless steel	15
Neopor (Isokorb)	0.031
Timber	0.170

- (1) Boundary conditions:
 - inside: $t_{ai} = 20^{\circ}C$ $R_{si} = 0.13 \text{ m}^2 \cdot K \cdot W^{-1}$
 - outside: $t_{ae} = 0^{\circ}C$ $R_{so} = 0.04 \text{ m}^2 \cdot K \cdot W^{-1}$.

8 Condensation

Surface condensation



8.1 Junction temperature factors and hence risk of surface condensation should be assessed in accordance with section 7.1 and BRE Information Paper IP 01/06.

8.2 As an example (for domestic situation excluding a humid environment), using the Isokorb K50 and KXT50 units, calculations provided by the Certificate holder indicate R_{Si} values of 0.911 and 0.932 respectively.

Interstitial condensation

8.3 Junctions should be designed and constructed to minimise the risk of interstitial condensation.

9 Behaviour in relation to fire

9.1 The use of the products, when incorporating top and bottom fire protection plates and PVC rigid moulding, will not introduce any additional hazard in respect of behaviour in a fire situation if installed in accordance with the Certificate holder's instructions.

9.2 The nominal cover to reinforcement should be that appropriate to 'mild' exposure in accordance with BS 8110-1 : 1997, Table 3.4 and Figure 3.2, or as required for fire resistance in accordance with BS 8110-2 : 1985, Section 4, or BS EN 1992-1-1 : 2004, Section 4 (with reference also to BS EN 1992-1-2 : 2004), whichever is the greater.



9.3 Top and bottom fire protection plates will provide up to 120 minutes fire resistance.

9.4 Test results have indicated that the products incorporating the fire protection plates are capable of achieving up to 120 minutes loadbearing capacity, 120 minutes integrity and 120 minutes insulation.

10 Maintenance

Once in service, the products are protected by other construction materials, therefore, maintenance is not envisaged.

11 Durability



11.1 Balconies constructed with Isokorb products will have a service life of not less than 60 years.

11.2 Reinforcement, forming part of each product, should be provided with nominal concrete cover as stated in BS 8110-1 : 1997, Table 3.3, or BS EN 1992-1-1 : 2004, Section 4, and with reference to BS 8500-1 : 2006, to meet durability requirements, depending on conditions of exposure.

Installation

12 General

It is important for designers, planners, contractors and/or installers to ensure that the installation of Schöck Isokorb Loadbearing Thermal Insulation for Concrete Floors is in accordance with the Certificate holder's instructions and the information given in this Certificate.

13 Procedure

13.1 The following procedure applies to the K and KXT range of products. Top and bottom reinforcement is laid and fixed to standard detailing requirements, leaving sufficient space to insert the Isokorb unit.

13.2 The Isokorb product is seated within the reinforcement and its position checked for correct alignment, and wired to the top and bottom reinforcement. The nearest distribution bar must butt against the pressure pad, or alternatively an additional 8 mm diameter reinforcing bar should be used.

13.3 A final position check is made prior to pouring concrete.

13.4 During pouring, the concrete should be evenly distributed around the product. Care should be taken when using vibrators not to dislodge the product.

14 Investigations

An examination was made of data relating to existing approval documents for the DIBt Zulassung Nos Z-15.7-86 and Z-15.7-86-2, including:

- test report for endurance and static load test by TUM and MPA Karlsruhe
- advisory opinion on fire behaviour by IBMB
- advisory opinion on modification and expansion of DIBt Zulassung Nos Z-15.7-86 and Z-15.7-86-2 by DBG
- advisory opinion on modification and expansion of DIBt Zulassung Nos Z-15.7-239 and Z-15.7-240 by DIBt.
- test report for fire resistance by MFPA Leipzig GmbH.

Bibliography

BRE Information Paper IP 01/06 *Assessing the effects of thermal bridging at junctions and around openings.*

BRE Report 497 : 2007 *Conventions for calculating linear thermal transmittance and temperature factors*

BS 5250 : 2002 *Code of practice for control of condensation in buildings*

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*

BS 8500-1 : 2006 *Concrete — Complementary British Standard to BS EN 206-1 — Method of specifying and guidance for the specifier*

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 — Structural fire design*

BS EN ISO 6946 : 2007 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

BS EN ISO 10211 : 2007 *Thermal bridges in building construction — Heat flows and surface temperatures — Detailed calculations*

DIN 4102-2 : 1977 *Fire behaviour of building materials and building components; Building components; Definitions, requirements and tests*

DIBt Zulassung Nos Z-15.7-239 and Z-15.7-240

15 Conditions

15.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- 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.

15.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

15.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

15.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

15.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

15.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.