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Authorised and notified according to Article 10 of the Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products

MEMBER OF EOTA

European Technical Approval ETA-11/0346

Trade name:	RVK and TSS staircase connections
Holder of approval:	SB Produksjon AS Øran Vest N-6300 Åndalsnes Norway
Generic type and use of construction product:	Connections for precast concrete staircase and landing elements to the stairway walls.
Valid from: to:	25.01.2012 25.01.2017
Manufacturing plant:	SB Produksjon AS Øran Vest N-6300 Åndalsnes Norway
This European Technical Approval contains:	49 pages including 33 Annex which forms an integral part of the document

European Organisation for Technical Approvals

I LEGAL BASIS AND GENERAL CONDITIONS

1 This European Technical Approval is issued by SINTEF Building and Infrastructure, in the following called SINTEF, in accordance with:
- Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products[1], modified by the Council Directive 93/68/EEC[2] and Regulation (EC) Nº 1882/2003 of the European Parliament and of the Council[3]
- Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex of Commission Decision 94/23/EC[4]
- Common Understanding of Assessment Procedure (CUAP) for ETA request N° 06.01/25

2 SINTEF is authorised to check whether the provisions of this European Technical Approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European Technical Approval and for their fitness for the intended use remains with the holder of the European Technical Approval.

3 This European Technical Approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1 of this European Technical Approval.

4 This European Technical Approval may be withdrawn by SINTEF in particular pursuant to information by the Commission according to Article 5(1) of Council Directive 89/106/EEC.

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6 The European Technical Approval is issued by the approval body in its official language. This version corresponds fully to the version circulated in EOTA. Translations into other languages have to be designated as such.

[1] Official Journal of the European Communities N° L40, 11.2.1989, p. 12
[2] Official Journal of the European Communities N° L 220, 30.08.1993, p. 1
[3] Official Journal of the European Union N° L 284, 31.10.2003, p. 1
[4] Official Journal of the European Communities N° L17, 20.1.1994, p. 34

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product and intended use

1.1 Definition of the product

RVK and TSS staircase connections consist of double, extendable, hollow rectangular steel tubes type HUB made of cold worked structural steel S355 to be cast into prefabricated concrete staircase and landing elements. The smaller tube is sliding inside the other and form load carrying connections to stairwell walls. Annex 1 (fig. 1) illustrates the principle of the staircase connections.

The position of the inner tube of the RVK unit is adjusted through a slot in the surface of the staircase element. The units have a safety stop at the back of the inner tube to prevent overextension.

The TSS unit is identical to the RVK unit except for the TSS unit has no opening to the upper surface. The position of the inner tube is instead adjusted by two strings with different colour. The units have a control line marking the correct position of the sliding tube, and a hole for a locking bolt.

The design and main dimensions for RVK staircase connections are shown in Annex 2 (fig. 2 and table 1 and 2). Two sizes of the RVK unit are produced, with vertical load carrying capacity 40 and 100 kN respectively. The latest version of the units with distribution bars welded to the topside front of the units are denominated RVK 41 and RVK 101. An additional letter G indicate hot dip galvanized version.

The design and main dimensions for TSS staircase connections are shown in Annex 3 (fig. 3 and table 3). Correspondingly the following types of the TSS unit are produced: TSS 41, TSS 41 G, TSS 101 and TSS 101 G.

The additional product “Masticord bearing pads” is delivered for providing equal support load distribution and elastic support in order to reduce impact sound transmission. The pads are made of a homogeneous blend of ozone resistant rubber elastomers with a high strength random synthetic fibre cord. The bearing pads are 75 mm wide, 125 mm long and 6,5 mm thick. The hardness is 75shore.

As additional products the manufacturer also provides “Blockout box for RVK/TSS 41 and 101”. used to make recesses in the walls.

1.2 Intended use

The connection units are designed for connecting precast stairs and landing elements to the stairway shaft walls, and transferring vertical shear loads between the concrete components. The connections may also be used for support of slabs mounted between walls for other purposes. Standard units are used indoor in dry conditions. Connections made of hot dip galvanized steel may be used for external exposure according to the requirements for the individual projects.

The TSS unit is specially designed to connect precast stair- and landing elements where the final surface finish of the elements are made in the factory, for example terrazzo.

The working life of the connection units for the intended use is assumed to be at least 50 years when installed in the works, provided that the unit are subject to appropriate design and installation based upon the current state of art and the available knowledge and experience.

2 Characteristics of the product and methods of verification

2.1 Mechanical resistance and stability (ER1)

Design of load carrying capacity

Type and number of RVK or TSS-units shall be chosen in accordance with structural calculations for sufficient load carrying capacity in each case. The position of the units in stairs- and landings elements and the recess in the stairwell walls shall be accurately designed and specified in construction drawings.

The load carrying capacity and minimum thickness of the landings for full utilization of the capacity for type RVK and TSS are given in Annex 4 (table 4). Full utilization of the capacity requires standard reinforcement design of the regions around the RVK- and TSS units and minimum concrete strength class C35/45. Also required is a minimum corner distance and a minimum spacing of the units. Design guidance is given in Annex 5 with enclosed memos concerning reinforcement design and recommended reinforcement pattern.

The design of the concrete components must take into consideration that the components are pin point supported in the wall recesses. Structural design for upwards forces at the supports may be required in particular cases, and in such cases the support and the reinforcement around the units must be designed especially to handle such loads.

To ensure a good load distribution to the supports of stairs and landings, especially when using four or more RVK or TSS units per element, the units should be supported on a relatively thick and soft rubber pad. This provides also a good impact sound insulation.

Effects of horizontal forces caused by friction of the inner tube at the support shall be taken into account for design.

Transfer of horizontal forces are initially limited to friction resistance at the supports. This is usually sufficient for stabilizing stair and landing elements subjected to small accidental horizontal loads. In special cases the horizontal load distribution may be attended to by cast-in, adjustable bolts with rubber dampers at the end, which are pressed against the stairwell walls.

Joint width

Recommended joint widths between staircase and landing elements and the walls are 20 mm ± 10 mm for the RVK unit, and 30 mm ± 10 mm for the TSS unit. The joint width must not exceed 40 mm if the load carrying capacities indicated in Annex 4 (table 4) are used.

2.2 Safety in case of fire (ER2)

Staircases are normally escape routes during fire and are not supposed to be exposed directly to fire. High fire rating is usually required only for the stairwell walls themselves. The units may therefore often be used unprotected even though the fire resistance of the connection with open joint gap is limited.
Significant fire resistance may be achieved for RVK and TSS staircase connections by filling the joint between the stairs or landings and the wall with mortar. However, filling with mortar reduces strongly the possibility to achieve low impact sound transmission and thermal movement. An alternative is to protect the units in the joint between the stairs or landings and the wall with mineral wool around the RVK/TSS unit. The filling shall be sealed off with an elastic sealant to prevent the mineral wool filling from falling out. The filling shall cover the full element thickness.

2.2.1 Reaction to fire

Reactions to fire for steel products are classified as Class A1 according to EN 13501-1 without testing on the basis of EC Decision 1996/603/EC.

2.2.2 Resistance to fire

The connections having minimum 50 mm concrete cover will probably have at least the same fire resistance as normal concrete stairs and landings by filling the joint between the stairway components and the wall with mortar. This statement requires full scale tests for verification.

2.3 Hygiene, health and environment (ER 3)

No special environmental declaration has been worked out for RVK and TSS connections. The products do not contain any chemical substances listed on the Norwegian environmental authorities' observation list of compounds hazardous to human health or the environment, and are not regarded as emitting any particles, gases or radiation that have a perceptible impact on the indoor climate or that have any significant impact on health.

Note: In addition to the specific clauses relating to dangerous substances contained in this European Technical Approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Directive, these requirements need also to be complied with, when and where they apply.

Steel parts and concrete elements may be recycled under given circumstances. Alternatively they may be delivered to a public waste deposit site at the end of the working life.

2.4 Safety in use (ER 4)

For TSS a control line marks the correct position of the inner tube and a safety stop at the back of the inner tube ensures overextension.. A safety pin will prevent the inner tube from getting out of position.

2.5 Protection against noise (ER 5)

The impact sound insulation achieved by elastic support is depending on the stiffness of the bearing pads. The more elastic pads, the better sound reduction. Field tests have shown that an impact sound reduction of up to 25 dB is obtained by using a recommended design criteria equivalent to 1 mm compression of the pad from the dead load of the staircase.

Good values of the impact sound insulation assumes that the joint between the stairway components and the wall is open (not filled with mortar) or alternatively filled with mineral wool. To achieve the best sound reduction it is important that the stairway is not in direct contact with the walls at any places

2.6 Energy economy and heat retention (ER 6)

Not relevant

2.7 Aspects of durability, serviceability and identification?

Hot dip galvanized products shall have a minimum zinc thickness of 0,08 mm according to ISO 2081 / NS 1978. Black steel products are normally acceptable in dry stairways. Galvanized versions are recommended for stairs or landings stored outdoor for some time, for stairways that may be exposed to salt water and chlorides (for example parking facilities), and for outdoor stairways..

The durability of the product shall be declared with reference to the relevant intended use and the exposure conditions. For use in dry interior applications the durability may be regarded as satisfactory for standard uncoated steel connections, where concrete cover gives sufficient resistance against corrosion. Connections made of hot dip galvanized steel or stainless steel may be declared as applicable for normal external conditions or for special environmental applications which have to be assessed case by case.

2.8 Special conditions for use and installation

Recesses in stairway walls

The recess elevation in the walls must be measured accurately to minimize the need for vertical adjustments. Using the additional product "Blockout box" simplifies positioning of recesses with accurate measures in the wall elements.. The recommended level of the recess bottom is 20 mm below the inner tube (fig 2 and 3). Support materials in layers consisting of a standard steel support plate + elastic bearing pad + levelling steel sheets (shims) is recommended.

Installation

Staircase and landing elements are lifted into the shaft while the inner tube is retracted into the unit. When the precast element is in correct position the inner tube of the RVK is pushed out through the open slot at the upper part of the element.

The inner tube of the TSS unit is pushed out by pulling the extension string. A red and white control line will mark the correct position. If needed, e.g. at mistakes during erection, the inner tube can be retracted by the returning string. A safety stop at the back of the inner tube ensures that maximum cantilever is not exceeded. A safety bolt will prevent the inner tube from getting out of position.

Both the installation slot in the RVK units and the recess in the shaft wall are normally filled with mortar after erection. It is recommended to put some mineral wool around the steel unit in the joint before filling the grout into the recess.

The joint between the stairs and the wall shall normally not be filled, because this causes higher impact sound transmission. Filling the joint may be done when the stairway shaft are an active part of the stabilisation of the building, or in order to prevent dirt from gathering in the joint. An alternative to prevent dirt in the joints is to use an elastic sealant with a backing strip at the top.

The installation of the staircase connections, including concrete reinforcement and positioning, shall in general be carried out in accordance with the manufacturer's installation guide. All installation is done inside the stairway, without perforating holes in the walls.

3 Evaluation and attestation of conformity and CE marking

3.1 System of attestation of conformity

According to Decision 97/597/EC of 02.09.1997 the European Commission has decided that System 2+ of attestation of conformity applies. This system of attestation of conformity is defined as follows:

Certification of the conformity of the product by a notified certification body on the basis of:

(a) Tasks for the manufacturer:
  (1) initial type testing of the product;
  (2) factory production control;
  (3) testing of samples taken at the factory in accordance with a prescribed test plan.

(b) Tasks for the approved body:
  (4) certification of factory production control on the basis of:
    – initial inspection of factory and of factory production control;
    – continuous surveillance, assessment and approval of factory production control

3.2 Responsibilities

3.2.1 Tasks of the manufacturer

3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of the production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European technical approval.

The manufacturer may only use constituent materials stated in the technical documentation of this European technical approval.

The factory production control shall be in accordance with the Control Plan for RVK and TSS stair connections relating to the this European technical approval. The Control Plan is part of the technical documentation of this European technical approval, and is laid down in the context of the factory production control system operated by the manufacturer. The Control Plan is deposited at SINTEF.[5]

[5] The "control plan" is a confidential part of the European technical approval and only handed over to the notified body or bodies involved in the procedure of attestation of conformity. See section 3.2.2.

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.

3.2.1.2 Other tasks of manufacturer

The manufacturer shall, on the basis of a contract, involve a body (bodies) which is (are) notified for the tasks referred to in section 3.1 in the field of reinforcement steel products in order to undertake the actions laid down in section 3.2.2. For this purpose, the Control Plan referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the notified body or bodies involved.

3.2.2 Tasks of the notified body

The approval body (bodies) shall perform the

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

in accordance with the provisions laid down in the Control Plan relating to this European technical approval ETA.

The approval body (bodies) shall retain the essential points of its (their) actions referred to above and state the results obtained and conclusions drawn in written reports.

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the factory production control stating the conformity with the provisions of this European technical approval.

In cases where the provisions of the European technical approval and its Control Plan are no longer fulfilled the certification body shall withdraw the certificate of conformity and inform SINTEF without delay.

3.3 CE marking

The CE marking shall be affixed to the packaging or accompanying commercial documents. The letters „CE“ shall be followed by the identification number of the notified certification body and be accompanied by the following additional information:

- the name and address of the producer (legal entity responsible for the manufacture),
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate for the factory production control
- the number of the European technical approval,
- identification of the product

4 Assumptions under which the fitness of the product for the intended use was favourably assessed

4.1 Manufacturing

The European technical approval is issued for RVK and TSS staircase connections on the basis of agreed data/information deposited with SINTEF, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to SINTEF before the changes are introduced. SINTEF will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA, and if so whether further assessment or alterations to the ETA is necessary.

4.2 Installation

The RVK and TSS staircase connections shall be installed in accordance with detailed construction drawings worked out for the individual works, based on the structural design for the works according to applicable standards.

5 Indications to the manufacturer and supplier

5.1 Packaging, transport and storage

The RVK and TSS staircase connections must be transported and stored in such a way that the material is protected against salt due to the risk of corrosion.

During outdoor storage all openings in the beam and column units must be covered in order to prevent water or ice to enter the connections.

On behalf of
SINTEF Building and Infrastructure
Oslo, xx.xx.2011

Annex 1: Product description (principle) of RVK and TSS
Annex 2: Design and main dimensions for RVK staircase connections
Annex 3: Design and main dimensions for TSS staircase connections
Annex 4: Design load carrying capacity for RVK and TSS staircase connections
Annex 5: Design guide

Annex 1

Product description (principle) of RVK and TSS

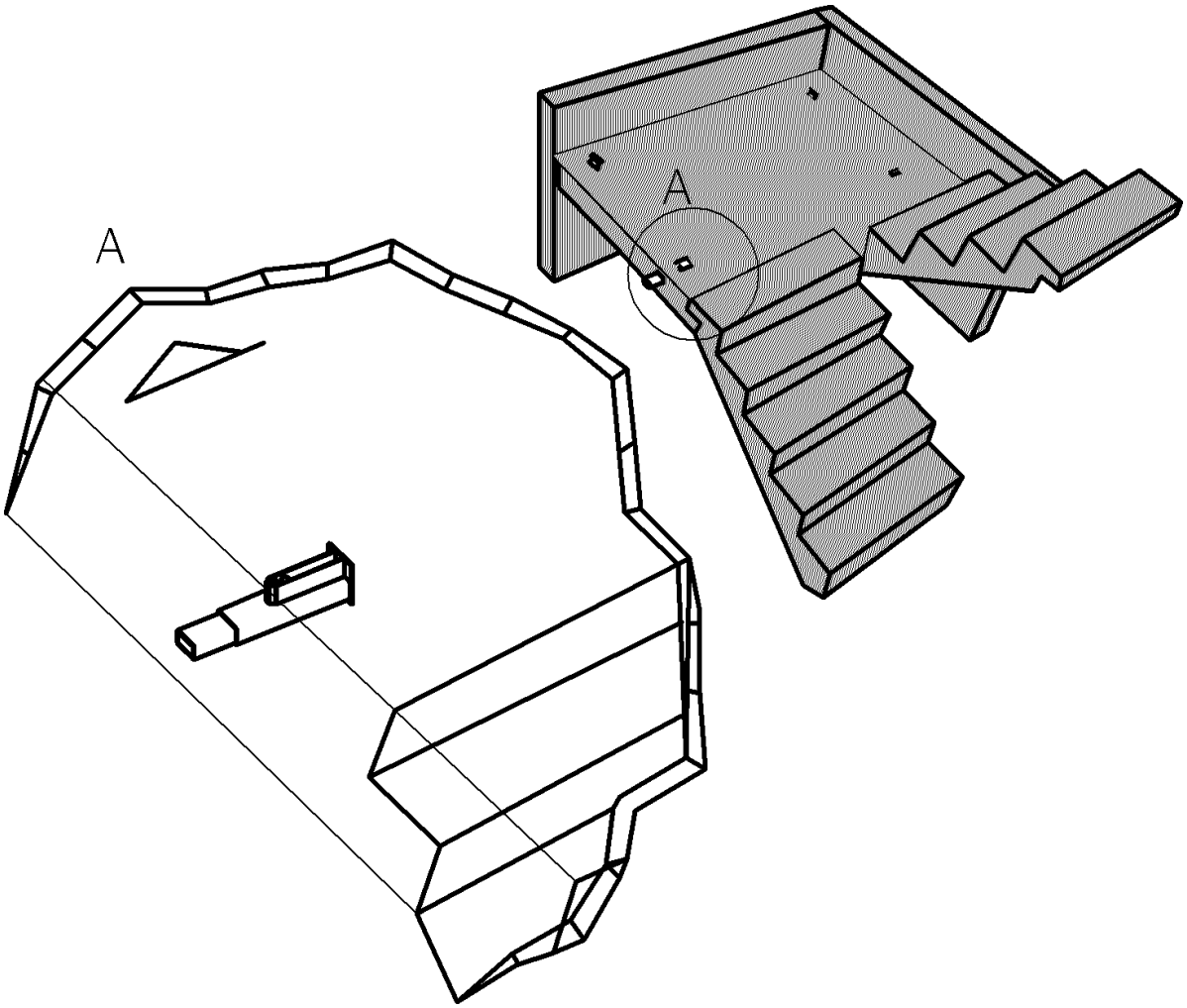

Fig. 1
Principle for RVK and TSS stairway connectors. The RVK connections have a sliding inner tube accessible from a slot at the surface of the stair or landing. The slot may be filled with mortar after installation. Type TSS has no slot and the position of the inner tube may be adjusted by two strings from the end of the unit. The inner tube form load carrying connections to stairway walls.

Annex 2

Design and main dimensions for RVK staircase connections

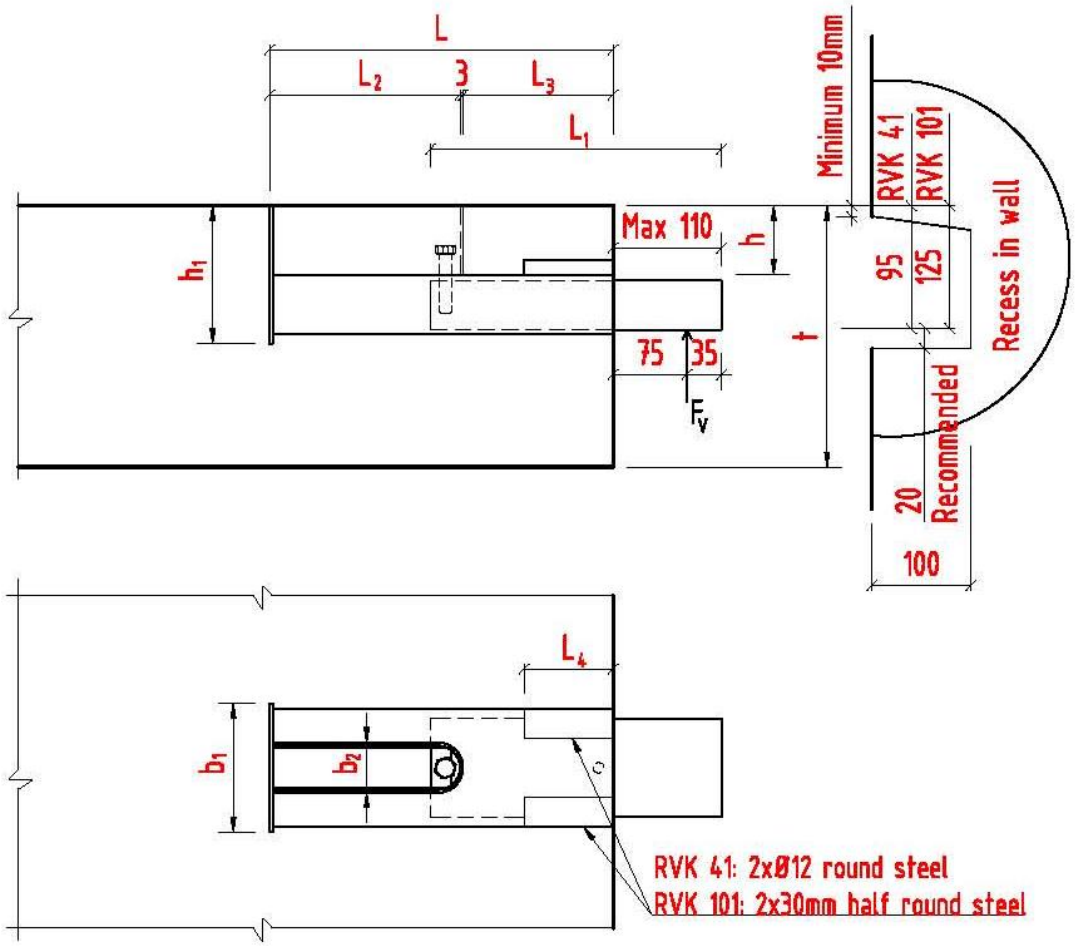

Fig. 2
Type RVK. Design and main dimensions. See also table 1 and 2.

Table 1
Main dimensions for RVK in mm

RVK	L	L_1	L_2	L_3	L_4	h	h_1	b_1	b_2
41	298	275	163	132	80	50	110	90	36
101	348	295	193	152	90	70	140	130	51

Table 2 Additional dimensions for RVK

RVK	Rectangular steel tube dimensions w/h/t (mm)		Free space between tubes (mm)	
	Outer tube	Inner tube	Verti cally	Horizon tally
41	80/50/4	70/40/4	2	2
101	120/60/4	100/50/6	2	12

Annex 3

Design and main dimensions for TSS staircase connections

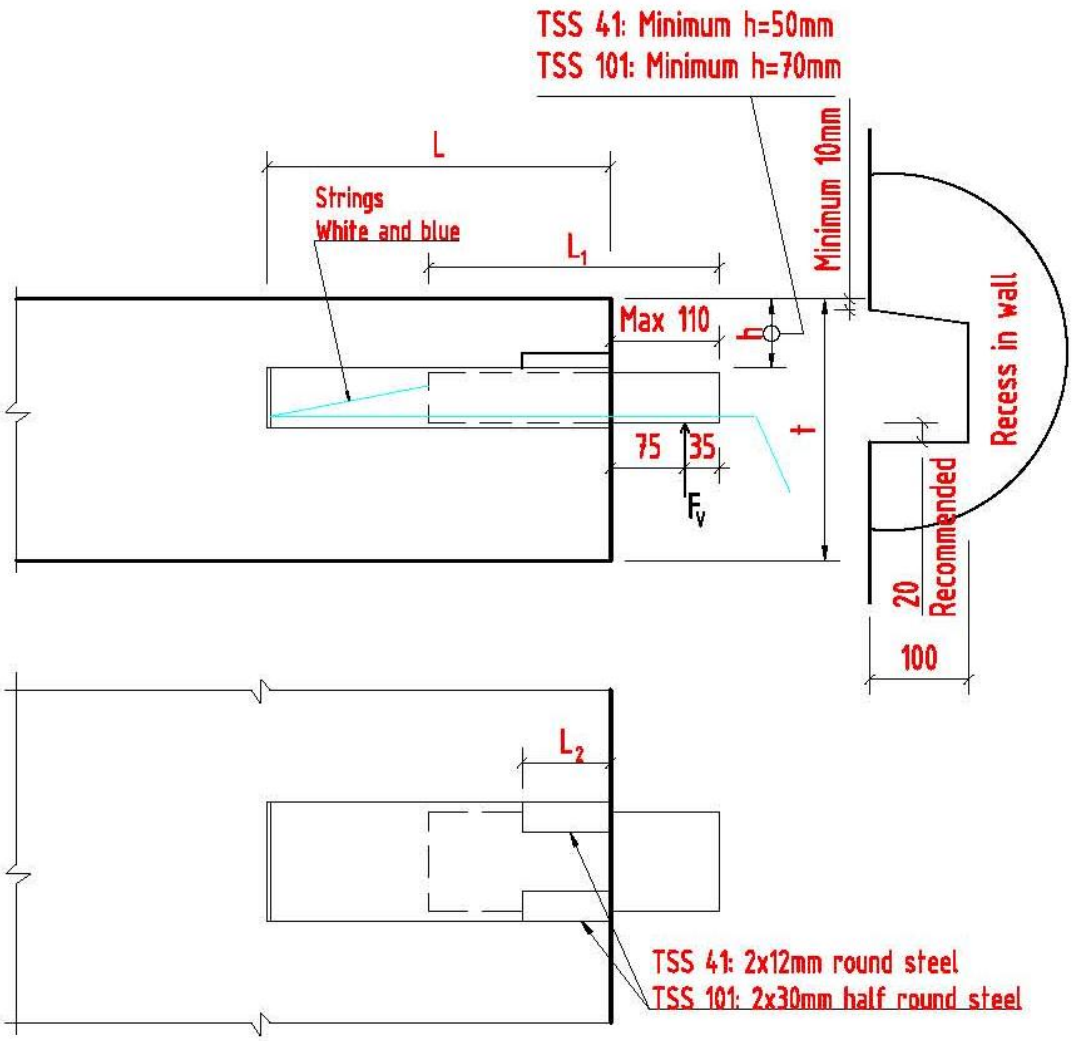

Fig. 3
Type TSS. Design and main dimensions. See also table 4.

Table 3
Main dimensions for TSS in mm

TSS	L	L_1	L_2	h	Rectangular steel tube dimensions w/h/t (mm)		Free space between tubes (mm)	
					Outer tube	Inner tube	Vert-ical	Hori-zontal
41	320	275	90	50	80/50/4	70/40/4	2	2
101	345	295	90	70	120/60/4	100/50/6	2	12

Annex 4

Design load carrying capacity for RVK and TSS staircase connections

Table 4
Load carrying capacity and minimum thickness of concrete landings for RVK and TSS.
Full utilization of the capacity requires standard reinforcement. minimum concrete strength class C35/45, and minimum corner distance and spacing of the units.

RVK/TSS	Max. vertical capacity V_{dv} in kN	Minimum landing thickness in mm	
		For max. capacity	To make sufficient space
41	40	150	150
101	100	265	200

Design guidance is given in Annex 5 with enclosed memos concerning reinforcement design and recommended reinforcement pattern.

Annex 5

Design Guide

The RVK/TSS connections are subject to three possible local failure modes:

- Combined moment and shear failure of the inner tube (ITY)
- Push off of concrete above the unit (POC)
- Local shear failure of the reinforced concrete slab (SF)

The capacity of the HUP tubes of steel quality S355 have been calculated according to Eurocode 3 with recommended parameters. The bending moments are calculated with maximum extension (110 mm), maximum gap (40 mm) and unfavourable tolerance on the position of the suspension reinforcement (5 mm). The calculation reveals that the ULS capacities of the inner tubes are only slightly above the nominal capacity of the units. 40 kN for RVK/TSS 41 and 100 kN for RVK/TSS 101 therefore represent the maximum capacity of the units irrespective of the slab thickness and reinforcement

The capacity against push off of the concrete above the steel unit is mainly related to the strength and detailing of the suspension reinforcement in the form of two spatial stirrups placed over the unit near the slab edge. **Design Memo 54 a-d** prepared by the manufacturer shows the capacity calculation and detailing of the stirrups for RVK 41 and 101 and TSS 41 and 101 respectively. The capacity check is based on recommended design parameters according to Eurocode 2 with reinforcement steel B500C applying a conservative model assuming a flexible outer tube. By this model the support reactions from the inner tube are transferred directly to the surrounding reinforced concrete without participation of the outer tube other than local transverse distribution, giving the maximum force in the suspension stirrups. The calculation reveals that the design strength of the standard suspension stirrups 2Ø8 mm for RVK/TSS 41 and 2Ø12 mm for RVK/TSS 101 are almost fully utilized when unfavourable position tolerances are taken into account. Testing of TSS 101 units in 265 mm thick concrete slabs with suspension reinforcement detailing as shown in Memo 54d show characteristic POC failure resistance with material safety factor higher than 1,5.

Local shear failure of the slab may occur, especially for slabs with minimum thickness (150 mm for RVK/TSS 41 and 200 mm for RVK/TSS 101). Recommended local reinforcement of the slabs and corresponding ULS design capacities are shown in **Memo 55 a-d** for RVK 41 and 101 and TSS 41 and 101 respectively. The memos define gradual decrease of the shear capacity with decreasing distances from the centreline of the units to the corner of slabs without distributed shear reinforcement and also absolute minimum corner distances.

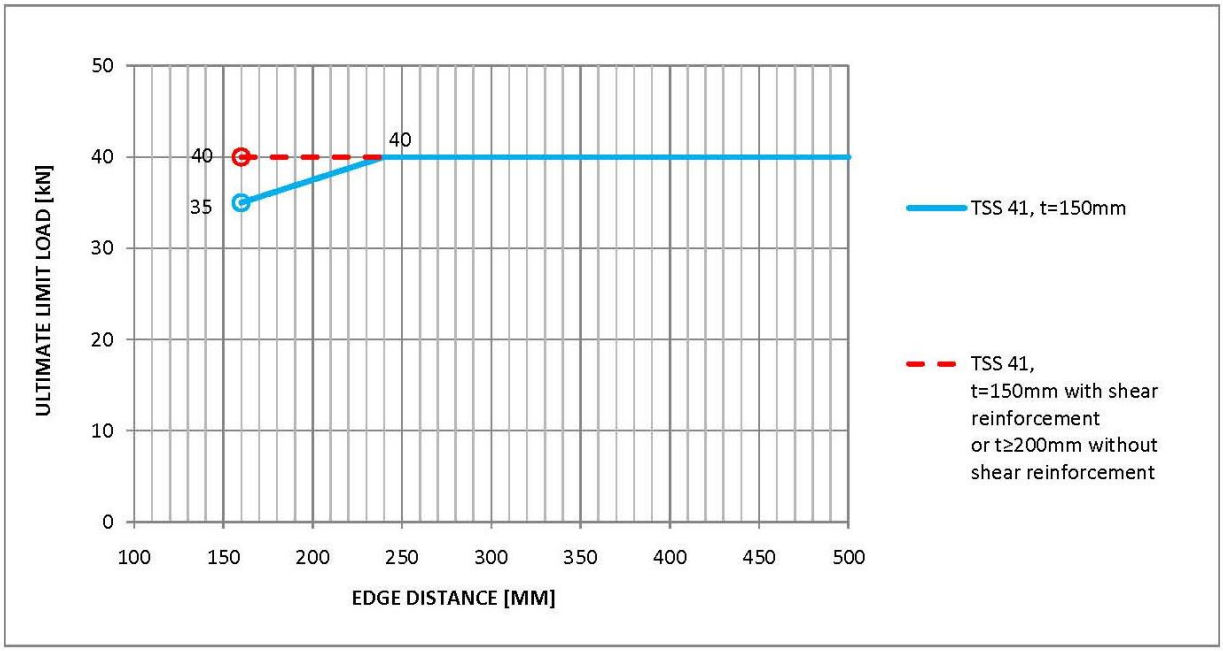

Fig. 4 a. Recommended ULS vertical shear capacity for RVK/TSS 41 in 150 mm thick slab.

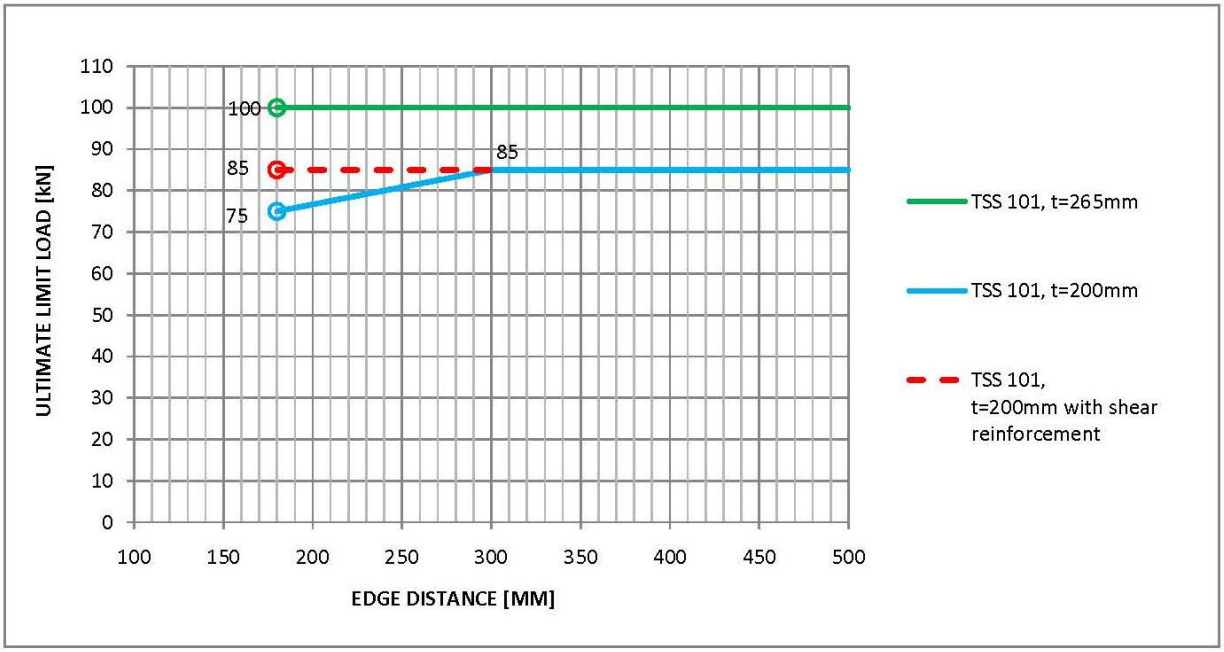

Fig. 4 b. Recommended ULS vertical shear capacity for RVK/TSS 101 in 200-265 mm slabs

The recommended shear capacities given in table 5 are based on interpretation of tests. The design shear capacity may also be estimated by the following simple model based on modification of the shear capacity equation 6.2.a in Eurocode 2:

$V_{Rd,c} = C_{Rd,c}\, k\, (100\, \rho\, f_{ck})^{1/3}\, b_{eff}\, d$ where
$k = 1 + \sqrt{(200/d)} \leq 2{,}0$, $C_{Rd,c} = 0{,}20/\gamma_{mc} = 0{,}2/1{,}5 = 0{,}133$
$b_{uff} = 3d + b_u + 6Ø$ $b_{eff,red} = b_{eff}/2 + c \leq b_{uff}$ c = corner distance
$\rho = A_{s,eff}/d\, b_{eff,red}$
$A_{s,eff}$ = Reinforcement normal to the slab edge near to the unit (including suspension stirrups)

Table 5

Recommended shear capacities

nit	RVK/TSS 41	RVK/TSS 41	RVK/TSS 101	RVK/TSS 101
Slab thickness	150	150	200	200
$A_{s,eff}$	6 Ø 8	6 Ø 8	7 Ø 12	7 Ø 12
Eff. Height (d)	116	116	164	164
Corner dist. (c)	≥ $b_{eff}/2$	160	≥ $b_{eff}/2$	180
$b_{eff,red}$	496	408	684	522
Ratio (ρ) %	0,521	0,634	0,705	0,924
Concrete (f_{ck})	35	35	35	35
$V_{Rd,c}$ (kN)	40	35	87 (85)	73 (75)

Calculation by the simplified formula of the local shear resistance of slabs with minimum thickness and minimum corner distance for RVK/TSS units 41 and 101 shows vertical support load capacity practically equal to the recommended values deduced from tests. (Values for RVK/TSS 101 in 200 mm thick slabs are rounded to the nearest 5 kN.)

The applicability of the formula indicate that the shear capacity can be corrected for different concrete strength classes by the factor $\eta_c = (f_{ck,actual} /35)^{1/3}$ (f_{ck} min = 30 MPa)

It also indicates that the spacing of the units without capacity reduction should be minimum 500 mm for RVK/TSS 41 and minimum 700 mm for RVK/TSS 101.

The POC capacity of RVK/TSS 101 in a 265 mm thick slab is lower than the shear capacity and is therefore decisive. The capacity of RVK/TSS 101 in slabs with thickness between 200 and 265 mm can be interpolated linearly. Likewise the capacity reduction for RVK/TSS 41 near slab corners may be omitted for slabs of thickness ≥ 200 mm.

Memoes

An extract of memos (technical manuals) from the manufacturer concerning reinforcement design and reinforcement pattern for RVK 41 and RVK 101 are given here in the following memos: Memo 54a Reinforcement design for RVK 41, Memo 54b Reinforcement design for RVK 101, Memo 55a Recommended reinforcement pattern RVK 41 and Memo 55b Recommended reinforcement pattern RVK 101.

The corresponding memos (technical manuals) for TSS units are almost identical and are not given here. A complete list of memos are given i table 6

Table 6
List of memos for TSS/RVK 41/101 (Technical manuals)

MEMOS in English for TSS/RVK 41/101	DATE	LAST REV.
Design RVK 41 and TSS 41	26.04.2011	19.10.2011
Design RVK 101 and TSS 101	26.04.2011	19.10.2011
Memo-52 Capacities and main dimensions RVK 41 and RVK 101	26.04.2011	17.06.2011
Memo-53 Capacities and main dimensions TSS 41 and TSS 101	26.04.2011	17.06.2011
Memo-54a Reinforcement design for RVK 41	26.04.2011	19.10.2011
Memo-54b Reinforcement design for RVK 101	26.04.2011	19.10.2011
Memo-54c Reinforcement design for TSS 41	26.04.2011	19.10.2001
Memo-54d Reinforcement design for TSS 101	26.04.2011	
Memo-55a Recommended reinforcement pattern for RVK 41	26.04.2011	04.07.2011
Memo-55b Recommended reinforcement pattern for RVK 101	26.04.2011	04.07.2011
Memo-55c Recommended reinforcement pattern for TSS 41	26.04.2011	19.10.2011
Memo-55d Recommended reinforcement pattern for TSS 101	26.04.2011	04.07.2011

All the memos are available through the manufacturers home site: http://invisibleconnection.no