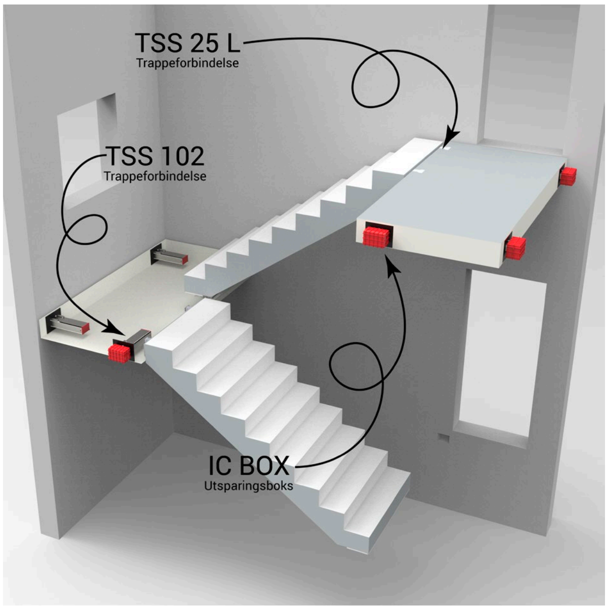
MEMO 31

MEMO 31	Dato:	04.02.2022	Sign.:	ELS
GUIDANCE RVK AND TSS	Siste rev.:	06.10.2023	Sign.:	ELS
	Dok. nr.:	K3-10/9	Kontr.:	SB

GUIDANCE TO IC STAIR CONNECTORS

The easiest way for fixing stair and landings.



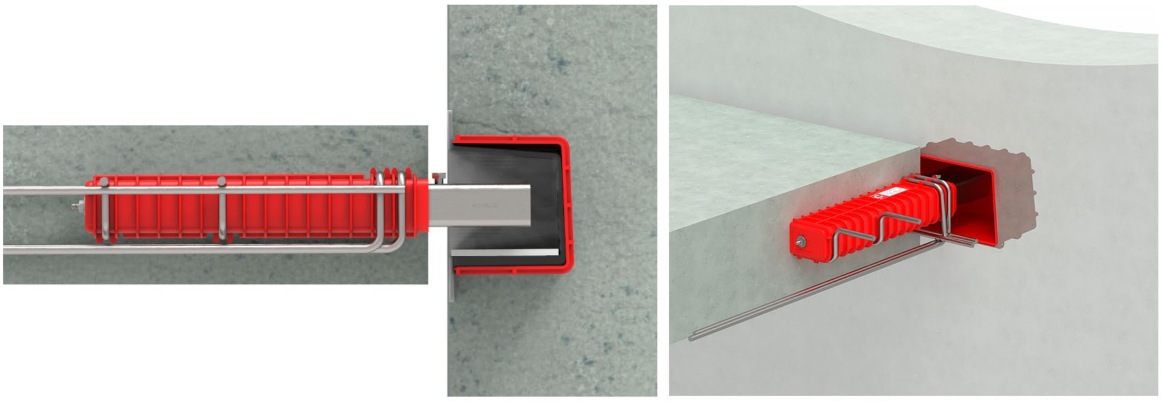
- Thinner slabs (20-25% reduce concert consumption)
- ETA tested and approved solution
- Fast installation
  - no shimming

- Good tolerances
- Fire protection
- Safe to install
- Rapid provision of access stairs

Demands for the stairs?

- Surface, terasso see below
- Sound transmission see memo 34
- Fire protection, see page 9 and memo 45

TSS or RVK



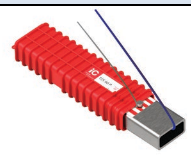
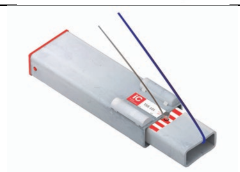
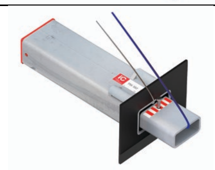
TSS

Inner sleeve pulled out with a wire (no visual marks in the surface of the slab).

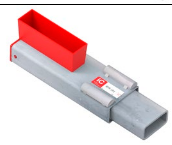
RVK

Inner sleeve adjusted through a slot in the surface of the staircase (the slot has to be grouted).

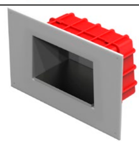
TSS for landing/wall.

Article no	Description	Capasity	
TSS 60 p	Slim design allows thinner slabs all the way down to ≥120 mm (full capacity 170 mm). Outer sleeve made of recycled HDPE.	57 kN	
TSS 101	Connector capacity up to 80 kN in a minimum 200 mm thick landing increasing to 100 kN for 265 mm thick landing.	100 kN	
TSS 102	Incorporates sound reducing rubber composite. Connector capacity up to 80 kN in a minimum 200 mm thick landing increasing to 100 kN for 265 mm thick landing	100 kN	

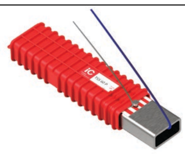
RVK for landing/wall.

Article no	Description	Capasity	
RVK 60 p	Slim design enables thinner landings and stair thicknesses ≥120mm (full capacity 170mm). Capacity up to 57kN. Recycled HDPE outer.	57 kN	
RVK 101	Standard connector capacity up to 80 kN in a minimum 200 mm thick landing, increasing to 100 kN for 265 mm thick landing.	100 kN	

IC Box .

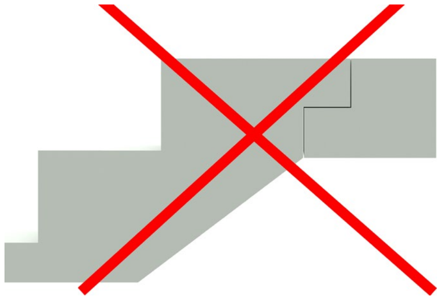
Article no	Description	Capasity	Bilde
IC Box	Recess box, out-block. Made of 100% recycled HDPE		
IC Box SRU	Recess box with sound reduction, Recycled HDPE.		

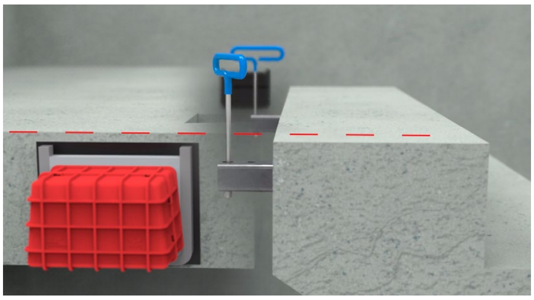
Connections for stair flight to landing.

Article no	Description	Capasity	
TSS 20 FA	Stairflight to landing connector with adjustment	20 kN	
TSS 25 L	Stair flight to landing connector with adjustment and lifting device.	25 kN	
TSS 60 p	Slim design allows thinner slabs all the way down to ≥120 mm (full capacity 170 mm). Outer sleeve made of recycled HDPE	57 kN	

TSS 25 L

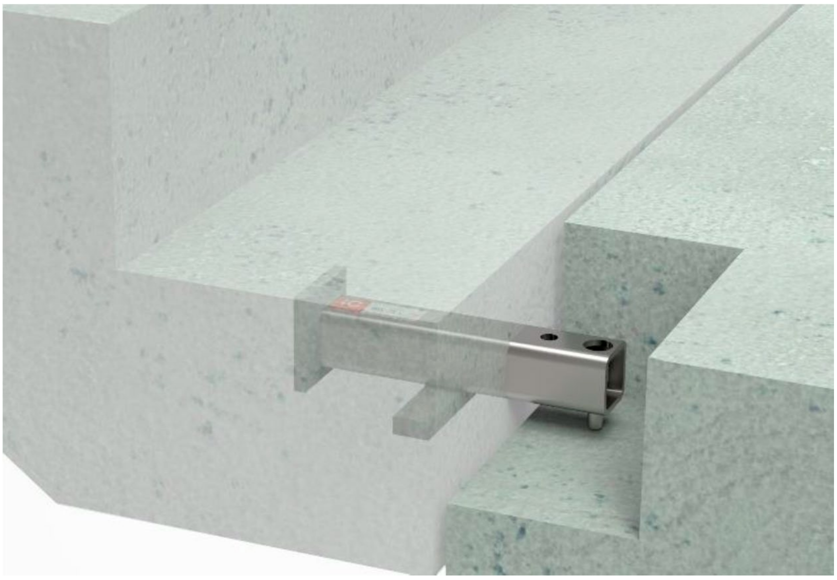
- Lift of element under production.
- Treads for wire loop lift during installation at site
- Stepless height adjustment during installation
- Saves stair shelfs
- Efficient installation on construction site, avoids shimming
- No need for local reinforcement





TSS 25 L

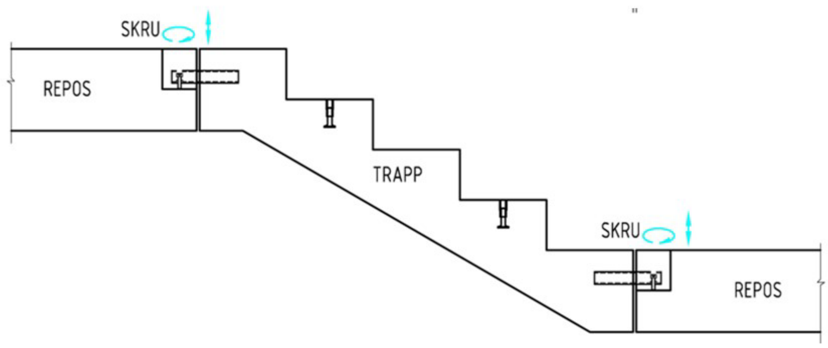
For more Information see: **Memo 65A**



TSS 20 FA

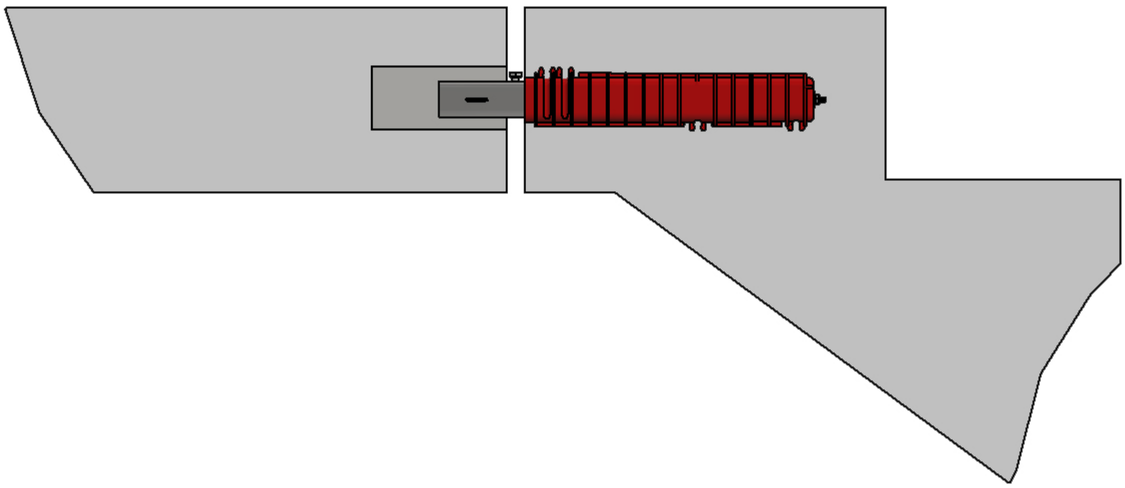
- Stepless height adjustment
- Saves stair shelfs
- Efficient installation on construction site, avoids shimming

For more information about TSS 20 FA see: **Memo 65A**



TSS 60 P

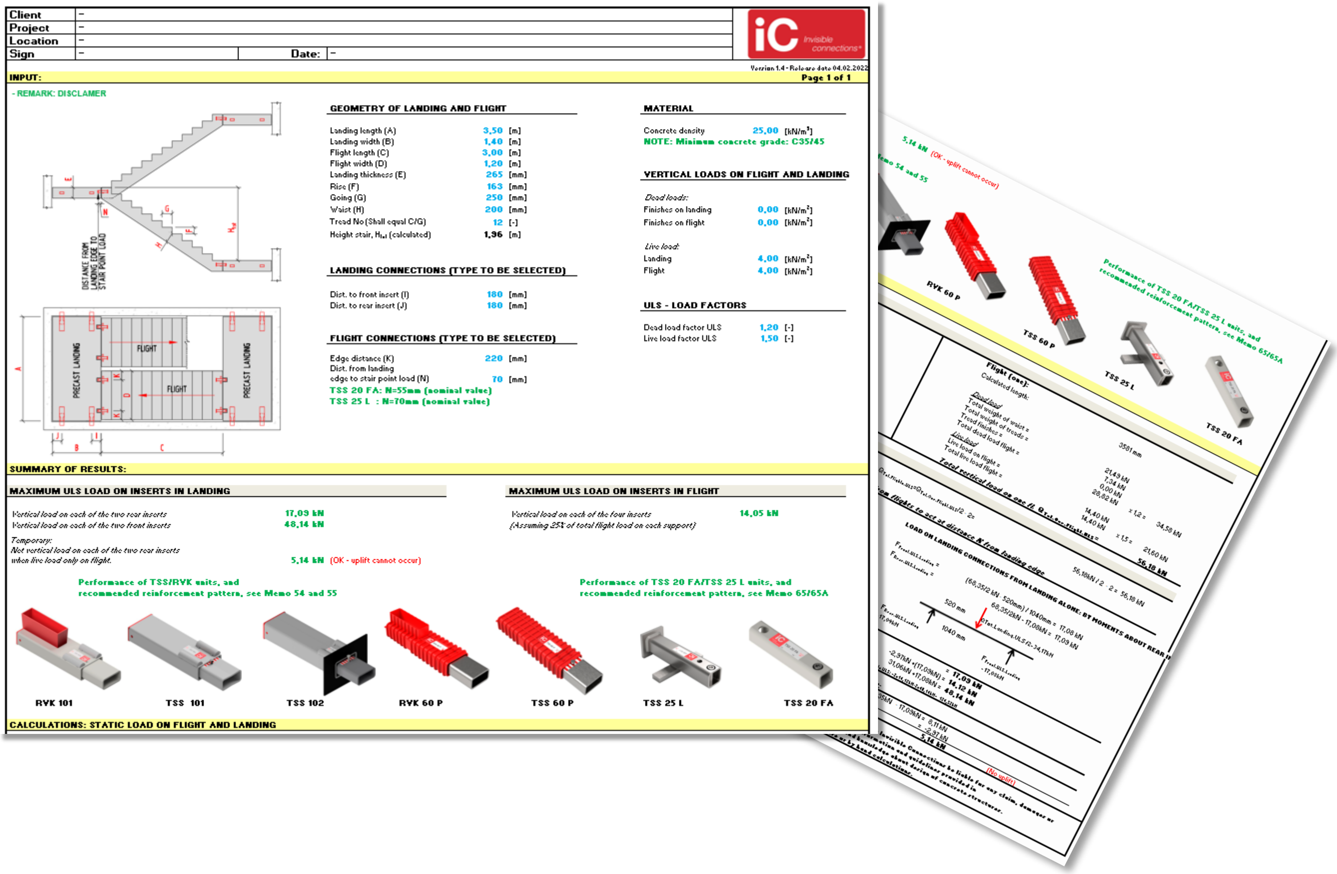
Can be used as connection between stair flight to landing.



Which model and capacity to choose?

Our bespoken calculation tool helps you to find correct model.
https://www.invisibleconnections.no/wp-content/plugins/download-attachments/includes/download.php?id=7626

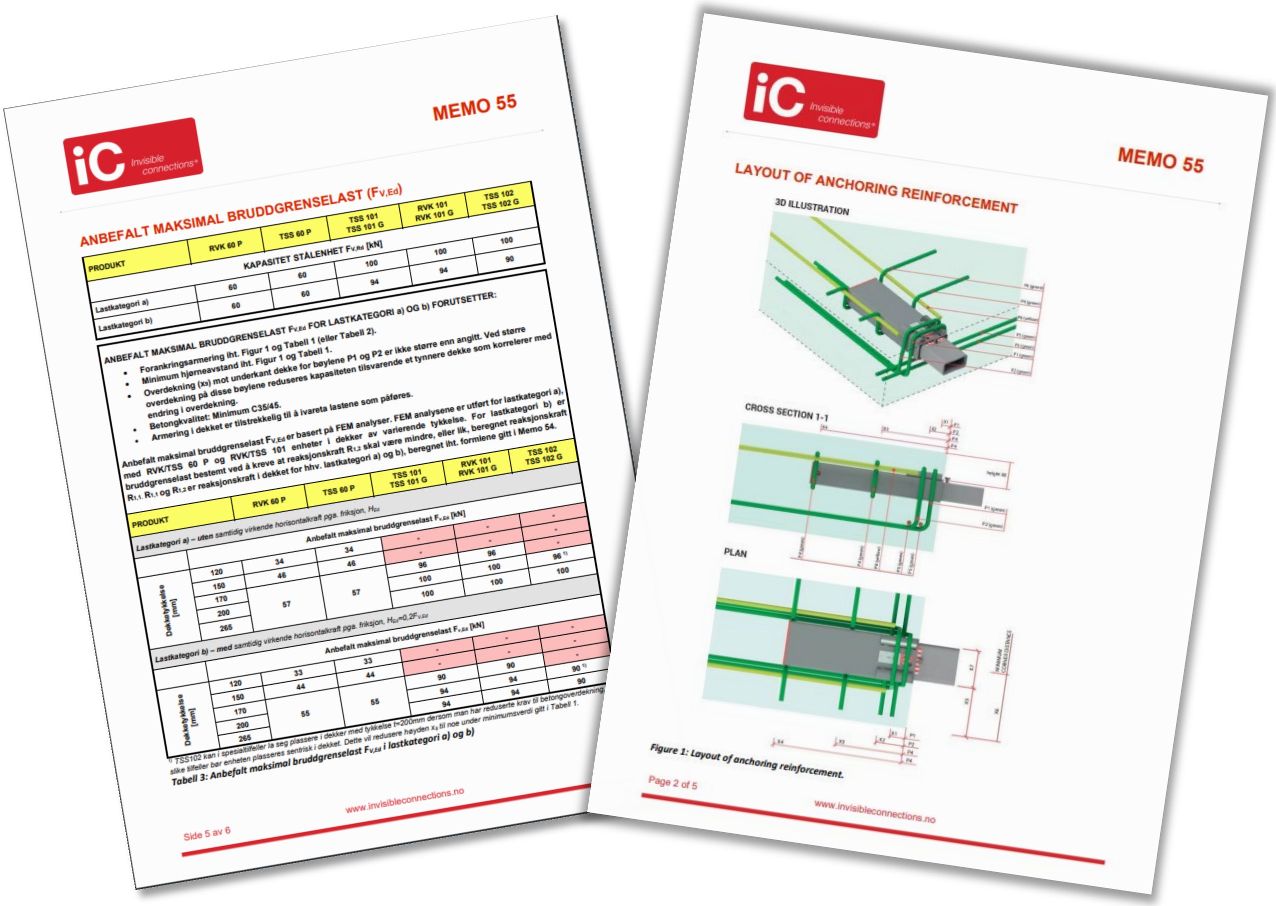
Tip! TSS/RVK should be located as close to the front edge as possible to avoid uplift/negative forces in the rear end of the element.

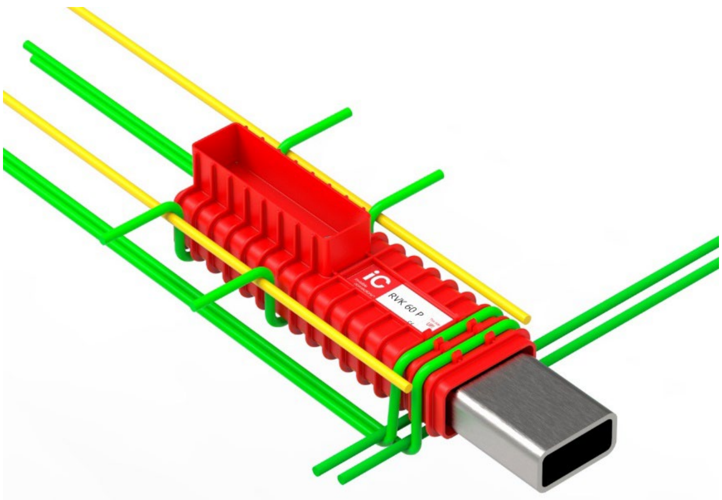


Reinforcement of stair connectors TSS/RVK landing-wall

Standardized local reinforcement for TSS/RVK, see **Memo 55**

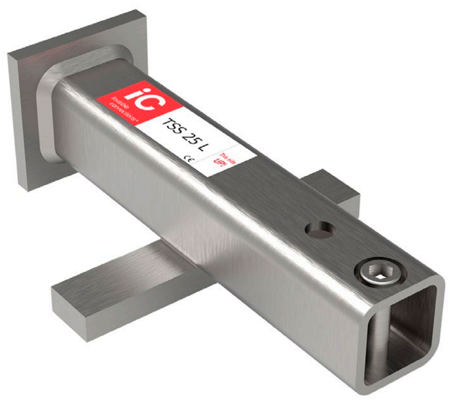
See also film «Stairs engineer» at IC akademi.



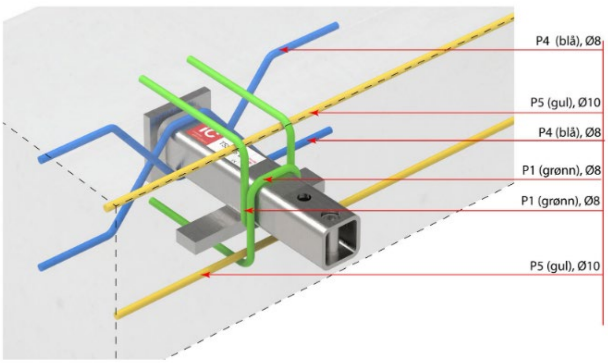


Reinforcement of connector star flight-landing

TSS 25 L, see Memo 65A

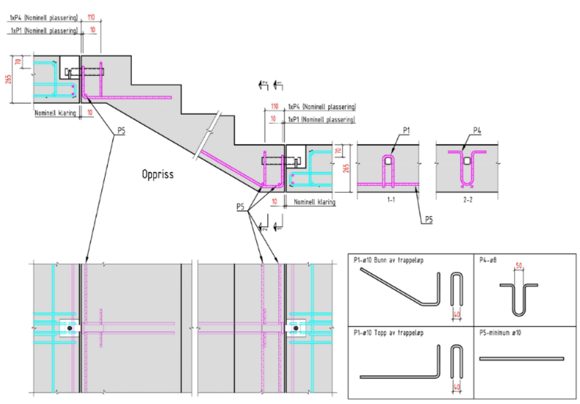


TSS25L no need for additional local reinforcement, the backplate and flat steel is enough
Vertical load 25 kN,
Lifting capacity 8 kN



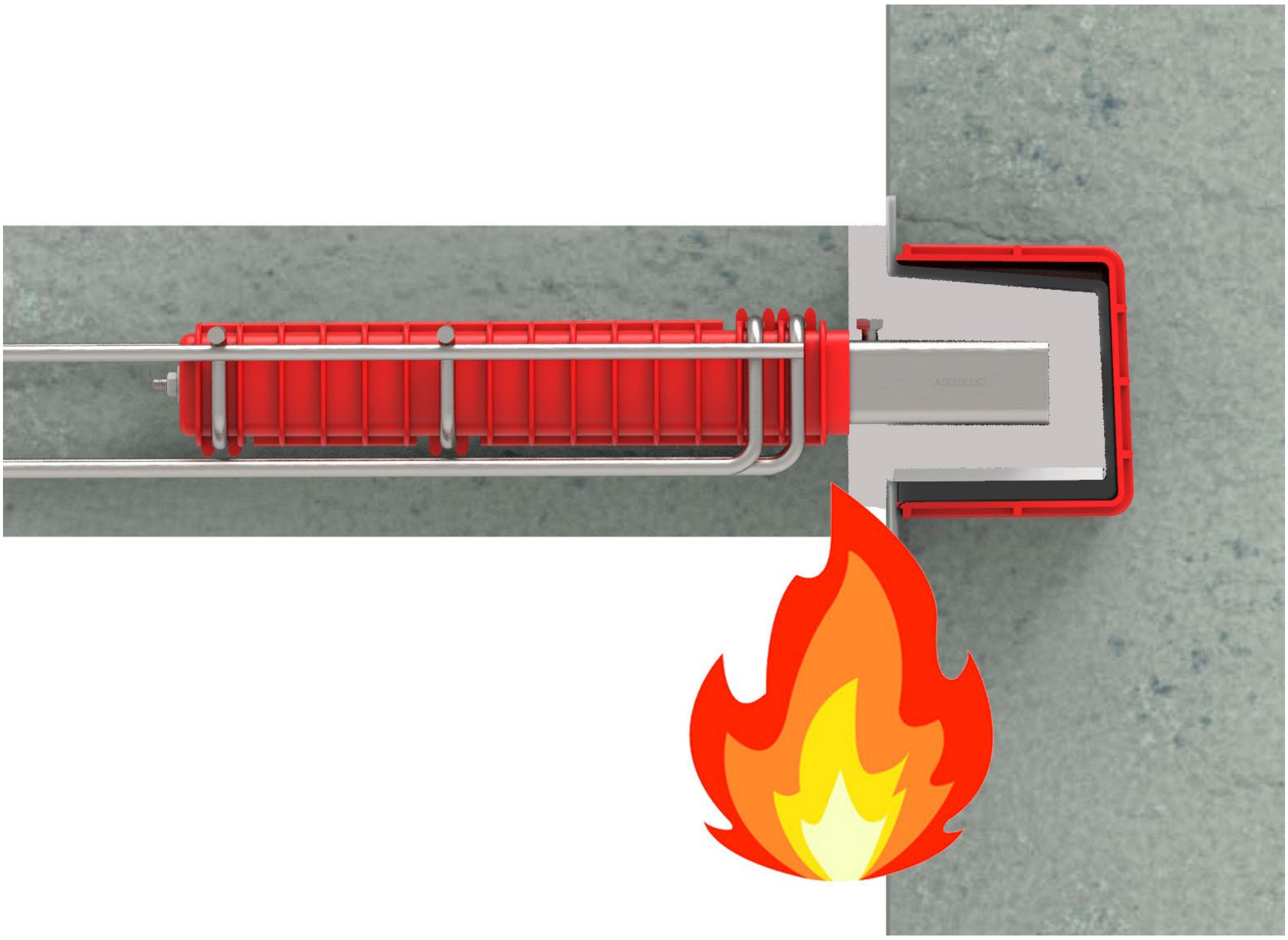
Picture illustrate additional reinforcement for **12 kN** lifting capacity.

TSS 20 FA, see **Memo 65**



Fire protection

See **Memo 45** and IC Academy for correct installation.



Fire protection is taken care of in a good way when using IC star connectors.
After installation the TSS/RVK will be completely covered with concrete.

Fire rating in accordance with Eurocode

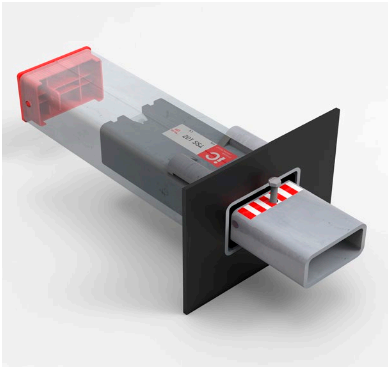
Required fire resistance	R30	R60
Minimum cover «C» mm	25	40

For more information se memo 45 **Fire protection**

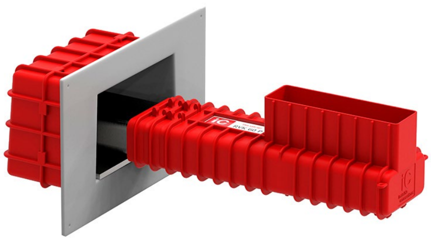
Impact sound insulation

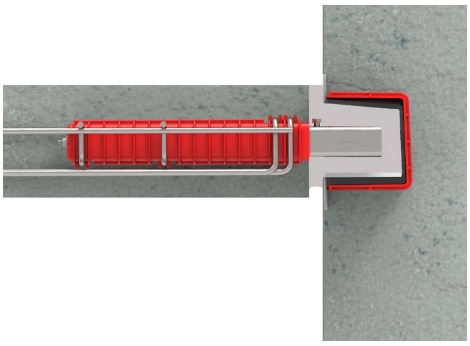
IC deliver several solutions for impact sound insulation, see **Memo 34** and IC Academy film stair engineer.

TSS102 with vertical rubber flange, reduce sound impact by 22-28 dB

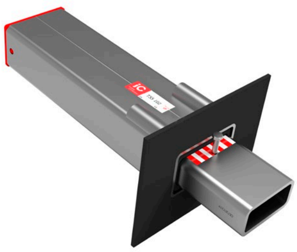


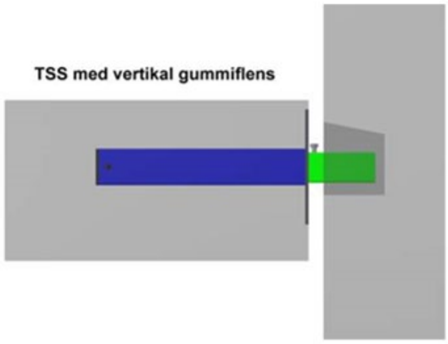
TSS/RVK with IC-Box SRU
Reduce impact sound by 8-23 dB





TSS/RVK with vertical rubber flange,
Reduce sound impact by 10-12 dB





Slab thickness and edge distances

See **Memo 55**

PRODUCT SERIES		RVK 60 P	TSS 60 P	TSS 101 TSS 101 G	RVK 101 RVK 101 G	TSS 102 TSS 102 G
***Load category a) - without** simultaniously acting horizontal design support reaction. H_{Ed}*						
	Recommended maximum ULS load $F_{v,Ed}$ [kN]					
Slab thickness [mm]	120	34	34	-	-	-
	150	46	46	-	-	-
	170	57	57	96	96	-
	200			100	100	96 [1)]
	265			100	100	100
Minimum edge distance: x_5 [mm]: x_6 [mm]: x_7 [mm]:		120 160 80	120 160 80	130 180 100	130 180 100	130 180 100

Drawings

At our webpage click *resources* and you will find drawings for each model in the most used formats
https://www.invisibleconnections.no/category/tegninger/#tss-og-rvk

Production

See Memo 20 and 32 for production procedure.
IC Academy fil stair production
https://www.invisibleconnections.no/category/ic-akademiet/

Installation

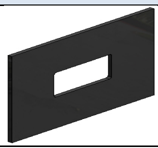
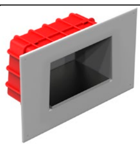
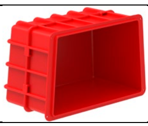
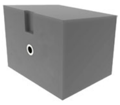
See IC Academy stair installation.
https://www.invisibleconnections.no/category/ic-akademiet/

Approvals

ETA
EN 1090
https://www.invisibleconnections.no/category/godkjenning/

Additional products

For more info see **Memo 41**

	Article no	Description
	GF 60	Vertical rubber flange 240x190x5
	GF 100	Vertical rubber flange 240x190x5
	GF 102	Vertical rubber flange 240x190x5
	Lokk 101	Cap for sealing storage and transport RVK101/TSS101
	Lokk TSS 102	Cap for sealing storage and transport TSS 102
		
	IC Box 100 SRU	IC Box 100 SRU recycled HDPE with sound insulation 170x115x100
		
	IC Box 100	IC Box 100 SRU recycled HDPE 170x115x100
	USK 100	Out block RVK/TSS
	USK 100 M	Out block with magnet RVK/TSS

REVISJON	
Date:	**Description:**
04.02.2022	Preliminary
18.02.2022	Updated
31.03.2023	Updated pictures of IC box 100 SRU
06.10.2023	Updated fireprotection