

**UBOX** - the anchor channel is intended to be used for connecting elements of the following structures: reinforced concrete, monolithic and prefabricated. Types of anchor channels Ubox: double-rows, single-rows, with active seal and bitubox, special.

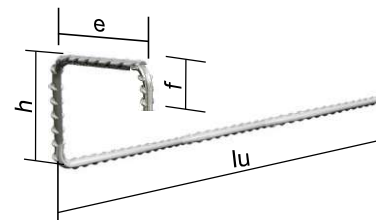
### FITTING ELEMENTS



### TECHNICAL DATA OF UBOX RSV

ARTICLE NUMBER	SKJØTEJERNKASSETT [mm]	STEEL ds [mm]	a [cm]	h [cm]	d [cm]	e [cm]	f [cm]	lu <sub>min</sub> [cm]	lu <sub>N</sub> [cm]
807-0815	RSV 80Ø8-150	8	15	15	8	8	7	30	40
807-0820	RSV 80Ø8-200	8	20	15	8	8	7	30	40
807-1015	RSV 80Ø10-150	10	15	15	8	8	7	38	50
807-1020	RSV 80Ø10-200	10	20	15	8	8	7	38	50
807-1215	RSV 80Ø12-150	12	15	15	8	8	7	45	60
807-1220	RSV 80Ø12-200	12	20	15	8	8	7	45	60

### UBOX RSV - flat category



\*  $lu_N = ds \times 50$  - Norwegian Standards

L standard = 1,25 m

Steel type: min. B500B

#### References:

Eurocode 2.

#### Health and safety:

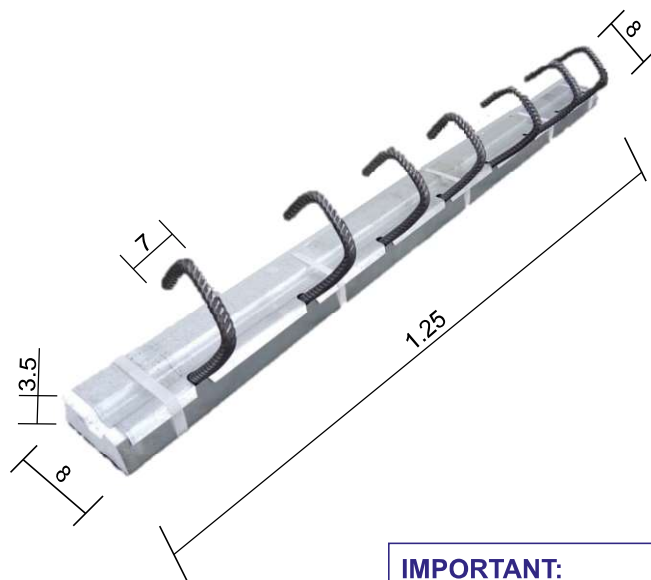
During installation the safety rules must be followed - protective gloves and clothes with long sleeves should be worn.

#### Storage:

Product should be kept in rooms that are protected from moisture and precipitation.

#### Transportation:

Metal sheets on the pallet with secured edges and wrapped in foil.



**IMPORTANT:**  
rebars can be bended only once

## TECHNICAL DATA OF UBOX RSH

ARTICLE NUMBER	SKJØTEJERNKASSETT [mm]	b [cm]	STEEL ds [mm]	a [cm]	h [cm]	d [cm]	$l_{u,min}$ [cm]	$l_{u,N}$ [cm]
808-0815	RSH 100Ø8-150	8	8	15	15	10	30	40
808-0820	RSH 100Ø8-200	8	8	20	15	10	30	40
808-1015	RSH 100Ø10-150	8	10	15	15	10	38	50
808-1020	RSH 100Ø10-200	8	10	20	15	10	38	50
891-0815	RSH 130Ø8-150	11	8	15	15	13	30	40
891-0820	RSH 130Ø8-200	11	8	20	15	13	30	40
891-1015	RSH 130Ø10-150	11	10	15	15	13	38	50
891-1020	RSH 130Ø10-200	11	10	20	15	13	38	50
891-1215	RSH 130Ø12-150	11	12	15	15	13	45	60
891-1220	RSH 130Ø12-200	11	12	20	15	13	45	60

892-0815	RSH 140Ø8-150	12	8	15	15	14	30	40
892-0820	RSH 140Ø8-200	12	8	20	15	14	30	40
892-1015	RSH 140Ø10-150	12	10	15	15	14	38	50
892-1020	RSH 140Ø10-200	12	10	20	15	14	38	50
892-1215	RSH 140Ø12-150	12	12	15	15	14	45	60
892-1220	RSH 140Ø12-200	12	12	20	15	14	45	60

894-0815	RSH 160Ø8-150	14	8	15	15	16	30	40
894-0820	RSH 160Ø8-200	14	8	20	15	16	30	40
894-1015	RSH 160Ø10-150	14	10	15	15	16	38	50
894-1020	RSH 160Ø10-200	14	10	20	15	16	38	50
894-1215	RSH 160Ø12-150	14	12	15	15	16	45	60
894-1220	RSH 160Ø12-200	14	12	20	15	16	45	60

896-0815	RSH 180Ø8-150	16	8	15	15	18	30	40
896-0820	RSH 180Ø8-200	16	8	20	15	18	30	40
896-1015	RSH 180Ø10-150	16	10	15	15	18	38	50
896-1020	RSH 180Ø10-200	16	10	20	15	18	38	50
896-1215	RSH 180Ø12-150	16	12	15	15	18	45	60
896-1220	RSH 180Ø12-200	16	12	20	15	18	45	60
896-1615	RSH 180Ø16-150	16	16	15	15	18	65	80
896-1620	RSH 180Ø16-200	16	16	20	15	18	65	80

898-0815	RSH 200Ø8-150	18	8	15	15	20	30	40
898-0820	RSH 200Ø8-200	18	8	20	15	20	30	40
898-1015	RSH 200Ø10-150	18	10	15	15	20	38	50
898-1020	RSH 200Ø10-200	18	10	20	15	20	38	50
898-1215	RSH 200Ø12-150	18	12	15	15	20	45	60
898-1220	RSH 200Ø12-200	18	12	20	15	20	45	60
898-1615	RSH 200Ø16-150	18	16	15	15	20	65	80
898-1620	RSH 200Ø16-200	18	16	20	15	20	65	80

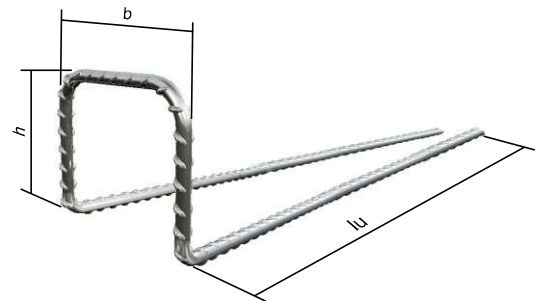
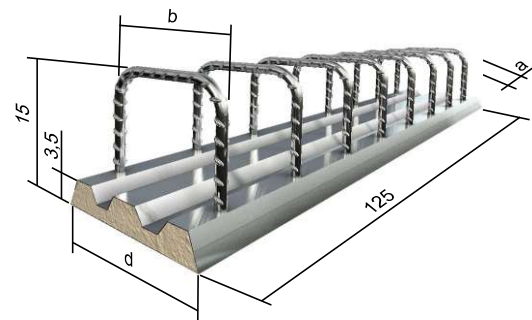
890-0815	RSH 220Ø8-150	20	8	15	15	22	30	40
890-0820	RSH 220Ø8-200	20	8	20	15	22	30	40
890-1015	RSH 220Ø10-150	20	10	15	15	22	38	50
890-1020	RSH 220Ø10-200	20	10	20	15	22	38	50
890-1215	RSH 220Ø12-150	20	12	15	15	22	45	60
890-1220	RSH 220Ø12-200	20	12	20	15	22	45	60
890-1615	RSH 220Ø16-150	20	16	15	15	22	65	80
890-1620	RSH 220Ø16-200	20	16	20	15	22	65	80

ARTICLE NUMBER	SKJØTEJERNKASSETT [mm]	b [cm]	STEEL ds [mm]	a [cm]	h [cm]	d [cm]	$l_{u,min}$ [cm]	$l_{u,N}$ [cm]
899-0815	RSH 240Ø8-150	22	8	15	15	24	30	40
899-0820	RSH 240Ø8-200	22	8	20	15	24	30	40
899-1015	RSH 240Ø10-150	22	10	15	15	24	38	50
899-1020	RSH 240Ø10-200	22	10	20	15	24	38	50
899-1215	RSH 240Ø12-150	22	12	15	15	24	45	60
899-1220	RSH 240Ø12-200	22	12	20	15	24	45	60
899-1615	RSH 240Ø16-150	22	16	15	15	24	65	80
899-1620	RSH 240Ø16-200	22	16	20	15	24	65	80

\*  $l_{u,N} = ds \times 50$  - Norwegian Standards  
 Standard L = 1,25 m  
 Steel type: min. B500B

**UBOX RSH** - "key profile" category.

Product meets all the requirements according to **EUROCODE 2**


**References:**

Ubox: Technical Approval  
**ITB AT-15-6287/2015 + Annex no. 1**  
 Eurocode 2.

**Health and safety:**

During installation the safety rules must be followed - protective gloves and clothes with long sleeves should be worn.

**Storage:**

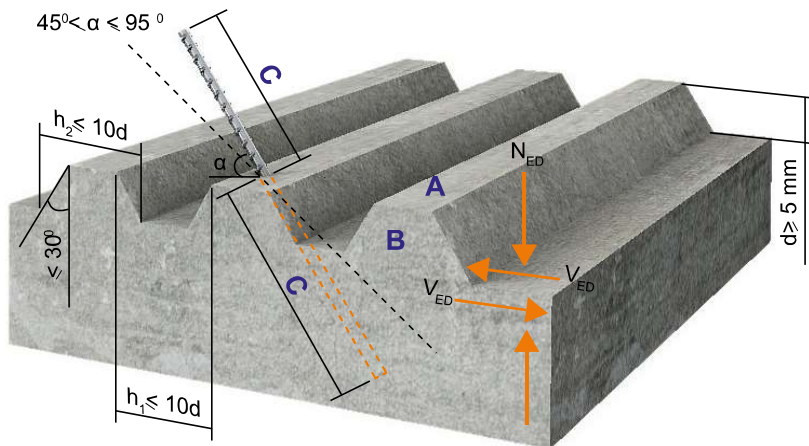
Product should be kept in rooms that are protected from moisture and precipitation.

**Transportation:**

Metal sheets on the pallet with secured edges and wrapped in foil.

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### CONTACT AREA - EUROCODE 2



TYPE OF SURFACE	$\mu$	$c$
very smooth	0,5	0,025 + 0,010
smooth	0,6	0,20
rough	0,7	0,40
with indentations	0,9	0,50

**c** - coefficient depends on roughness of contact area

**$\mu$**  - friction coefficient during abrasion

### CONNECTION WITH INDENTATIONS

**A - new concrete**

**B - old concrete**

**C - anchorage**

### LOAD CAPACITY IN CONTACT

EUROCODE 2 ( PN-EN 1992-1-1)

$$V_{rdi} = c * f_{ctd} + \mu * \sigma_n + \rho * f_{yd} (\mu * \sin \alpha + \cos \alpha)$$

**c** - factor depends on roughness of contact area

**$\mu$**  - friction coefficient during shear

**$\sigma_n$**  - stress perpendicular to contact area ( $\sigma_n = 0$ )

**$\alpha$**  - angle between the contact area and stapling reinforcement ( $45^\circ < \alpha < 90^\circ$ )

**$f_{ctd}$**  - designed tensile strength of concrete

**$f_{yd}$**  - reinforcement design tensile strength

$$\rho = \frac{A_s}{A_i}$$

**$\rho$**  - stapling reinforcement ratio

**$A_s$**  - cross-sectional area of reinforcement in contact area

**$A_i$**  - surface area of the contact area

### CALCULATION EXAMPLE

Concrete: C25/30 >  $f_{ctd} = 1,33 \text{ Mpa}$

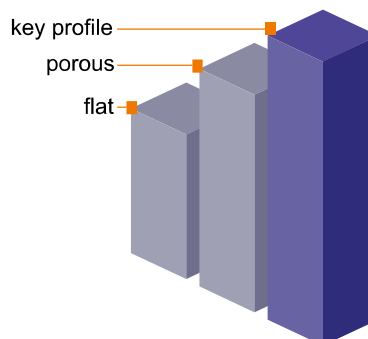
Reinforcement ratio 3% >  $\rho = 0,03$

**Very smooth contact**

$$V_{Rdi} = 0,20 * 1,33 \text{ Mpa} + 0,03 * 420 \text{ Mpa} * (0,5 * \sin 90^\circ + \cos 90^\circ) = 6,33 \text{ MPa}$$

**Stepped fugue**

$$V_{Rdi} = 0,50 * 1,33 \text{ Mpa} + 0,03 * 420 \text{ Mpa} * (0,9 * \sin 90^\circ + \cos 90^\circ) = 12,0 \text{ MPa}$$



### COMPARISON OF LOAD CAPACITY

Key profile transfers bigger load.