RASTO – RASTO XXL – TAKKO

Instructions for erection and use



HUNNEBECK

Contents

	Page
Product features	2
Overview	3
Components	4–13
Element dimensions	14–16
Element connections	17–20
Tying	21
Corners	22–24
T-Wall junctions	25
Stopends	25
Corners with oblique angles	26–28
Length adjustment	29
Column formwork	30–31
Brackets	32
Struts	33–36
Handling by crane	37
Transport and storage	38–39

Product features

Rasto is a frame panel formwork which can be handled either independently on crane (manual use) or as largearea units operated by crane. A crane is absolutely not required for this formwork up to element widths of 90 cm.

Using either Rasto largesized XXL-panels or preassembled panel units then, of course, a crane must be used for handling.

Rasto formwork is a frame panel system based on hotdip galvanized steel profiles and on a highgrade shuttering skin (14 mm thick) integrated in the frame structure.

The permissible fresh concrete pressure is 60 kN/m² for the standard one-storey high use, and 55 kN/m² for all height-extensions beyond the standard height of one panel (H = 270 cm). In this case, the allowable limit of deflections is assured in correspondence with the Standard DIN 18202.

10 different panel widths, ranging from 30 to 240 cm, may be used for trouble-free adaptation to nearly all shapes of structure.

Rasto panel heights of 270 and 300 cm allow for suitable adaptations to many wall heights. Additionally, further 120 cm high Takko panels of the same structural design can be used for extensions.

All vertical and horizontal panel joints are simply connected by means of the onepiece Rasto panel clamp. The panel joints are always clamped in a tight, tensionproof, flush-mounted and aligned manner.

Important remarks:

The following erection and application instructions contain details of the handling and correct use of the listed and illustrated products. The function-related instructions in this brochure must be accurately followed. Deviations from these require a separate proof of structural strength.

To ensure the safe use of our products, all the relevant safety rules and regulations of the national accident insurance institutions and public authorities must be complied with.

As a fundamental principle, only materials in immaculate condition have to be used. Damaged components must be taken out of circulation. As replacement parts for repairs, only original parts from the Hünnebeck company should be used.

The combined use of our formwork system with equipment from other suppliers may entail certain dangers and therefore requires additional checks.

The illustrations in these assembly instructions must be regarded as examples. It goes without saying that the regulations for occupational safety must be adhered to.

We explicitly reserve the right to make changes in the service of technical progress.

Overview



Rasto frame formwork system with the large Rasto XXL panel. Compatible with Takko formwork.

The overview gives an good impression of the various combinations of the Rasto system used together with the large Rasto XXL panel and the Takko formwork. A formwork system suitable for every task from low foundations up to 6 m high walls.



	Designation	Art. No.	Weight kg/pc.
	Rasto XXL 240 x 270 A Rasto panel with 6.48 m ² of shuttering surface for large-area shuttering. The use of this large panel reduces the number of ties and connectors and is therefore highly efficient. The panel can be used without difficulty horizontally or vertically. (In single-face use, the 4 large tie holes must be sealed with the M plug, Art. No. 479231.)	600 016	237.7
	Panel 90 x 300 ¹) Panel 75 x 300 ¹) Panel 65 x 300 ^{*1}) Panel 60 x 300 ¹) Panel 55 x 300 ^{*1}) Panel 50 x 300 ^{*1}) Panel 45 x 300 ¹) Panel 30 x 300 ¹) The shuttering panels with panel heights of 300 cm resp. 270 cm can be combined and connected with one another using the same connectors.	549 565 549 576 549 587 549 602 549 613 549 624 600 001	76.2 66.2 60.9 57.9 55.5 52.8 49.7 42.3
12 90 59	Panel 90 x 270 Panel 75 x 270 Panel 65 x 270* Panel 60 x 270 Panel 55 x 270* Panel 50 x 270*	531 312 470 002 482 431 470 013 482 420 482 410	69.1 60.0 55.9 53.2 50.9 48.4



Panel 90 x 270	531 312	69.1
Panel 75 x 270	470 002	60.0
Panel 65 x 270*	482 431	55.9
Panel 60 x 270	470 013	53.2
Panel 55 x 270*	482 420	50.9
Panel 50 x 270*	482 410	48.4
Panel 45 x 270	470 024	45.4
Panel 30 x 270	575 603	38.9
Formwork panels with a very low weight of		
roughly 30 kg/m ² and high loading capacity of		
60 kN/m ² of permitted concrete pressure.		

		ASTO — RA KKO	STO XXL
	Designation	Art. No.	Weight kg/pc.
			ing, por
12 90 3.5 116.5 150 30	Panel 90 x 150*) Panel 75 x 150*) Panel 65 x 150*) Panel 60 x 150*) Panel 55 x 150*) Panel 55 x 150*) Panel 50 x 150*) Panel 45 x 150*) Panel 30 x 150*) The 150 cm high panels are of the same structural design as the higher panels. Permissible concrete pressure: 55 kN/m ² (for height-extended panel applications).	549 565 549 576 549 587 549 598 549 602 549 613 549 624 600 001	41.4 35.9 32.8 31.1 29.8 28.2 26.5 22.6
Takko panels (Inner corner)	Takko panel 90 x 120 Takko panel 75 x 120 Takko panel 60 x 120 Takko panel 45 x 120 Takko panel 30 x 120 Formwork panels with a hot-dip galvanized steel frame, dimensioned for a concrete pressu- re of 60 kN/m². The 14 mm thick shuttering skin is coated on both sides and supported by three bar profiles. These profiles are equipped with a grip hole or handle for manual handling of the panels weig- hing a maximum of 38 kg.	583 508 583 519 583 520 583 530 583 541	38.0 33.5 29.2 24.0 18.7
	Inner corner 30/300 ¹⁾ Inner corner 30/150*) The 90° inner corner with the patented 2° of clearance for easing. After unlocking the corner stiffeners, the element becomes movable and can then be effortlessly removed from the concrete.	549 635 470 068 470 079	75.1 66.2 37.9

	Designation	Art. No.	Weight kg/pc.
	Takko inner corner 30 x 120 The 90° inner corner with the patented release mechanism. When the integral brace is re- leased, the 90° angle is redu-ced by 2°. The corner panel can then be effortlessly removed from the concrete.	583 552	30.6
	Takko inner corner 25 S This rigid all-steel inner corner with 25 cm leg length represents a low-cost alternative, mainly for foundation work with numerous corners.	600 042	33.7
Hinged corners	Hinged corner 15/300 ¹⁾ Hinged corner 15/270 Hinged corner 15/150* ⁾ For corners with obtuse angles from 90° to	554 856 481 963 482 203	54.2 49.2 27.8

On acute-angled corners, it can be used as an outer corner. It is connected to Rasto panels with the centering tension bolt.

180°.





	Designation	Art. No.	Weight kg/pc.
MP-panels	A multi-purpose panel with a continuous horizontal 5 cm tie hole module. For use in special applications such as wall offsets, corners with oblique angles and pilaster strips. Particularly suitable as formwork for concrete columns up to an edge-to-edge width of 55 cm (rectangular or square with a 5 cm module).		
	Rasto MP-panel 70 x 300*1)	549 131	68,9
	Rasto MP-panel 70 x 270	482 821	60.1
59 59 30	Rasto MP-panel 70 x 150*)	485 218	39.2
	Takko MP-panel 120	583 574	35,5

RASTO – RASTO XXL TAKKO

	Designation	Art. No.	Weight kg/pc.
Adjustment pieces	For the adjustment of wall thicknesses in corners (5 cm raster).		
	Rasto corner adjustment 5/270	479 540	19.4
	Rasto corner adjustment 5/150* ⁾	479 573	13.9
	Rasto corner adjustment 5/120	584 009	11.4
80	Waler 80 For a maximum 30 cm length adjustment or for stopends. The timber shuttering is fastened with the aid of the nail holes.	586 980	6.3
	Manto multi-purpose waler Can be used in the same way as the waler 80 (see above).	450 764	13.1
	Waler spanner (30 cm) Used together with the tension nut for connecting the waler 80 or Manto waler.	452 053	0.8
	Tension nut One is required for each waler spanner.	197 332	0.6

	Designation	Art. No.	Weight kg/pc.
Connecting pieces			
35	Rasto clamp With the Rasto clamp, the butt joints of the Takko panels are tightly closed and aligned flush and without offset in a single cycle. The locking screw is simply turned with a carpenter's hammer (no nimpact). This is kind to materials and low on noise.	489 000	2.9
	 R-outer corner clamp V The outer corner clamp V makes an outer corner out of two standard panels. It can also be used on column formwork and permits 4 to 6 cm length adjustments on outer corners. 	488 900	6.1
55	R-adjustable clamp Permits adjustment ranges up to 15 cm max. and connects panels with a tension- and com- pression-resistant, flush and aligned joint.	488 910	5.0
	Centering tension bolt Together with the centering nut, it combines Takko panels in a tension-resis-tant joint via the hole grid of the edge profiles. This joint is situated within the panels and facilitates the stacking of large-area elements.	479 264	0.9
	Centering nut 100 Used together with the centering bolt or in pairs with a tie rod for length adjustments.	469 566	0.8
29.5	Rasto MP-bolt Rasto MP-nut Connects MP- panels to form column formwork. For a complete joint, the Manto tie nut must also be used (see page 13).	485 435 485 457	0.6 0.5

RASTO – RASTO XXL TAKKO

	TA IIII TA	KKO	
	Designation	Art. No.	Weight kg/pc.
truts			
	Walkway bracket	469 810	13.5
	TK-railing post 90 cm wide walkway bracket can be connected both to the horizontal and vertical bar profiles of the Tak- ko/Rasto panels. The railing post is separate and is simply inserted.	193 220	4.5
	If connected to a horizontal panel, 1 waler bolt D 20 must be additionally ordered.	420 000	0.3
min.134	R-adjusting strut To support and align height-extended Takko/ Rasto formwork. The adjusting strut is best connected to the joint between panels. All the connectors are integrated.	564 381	20.5
The sea	Takko brace For supporting single-storey Takko formwork (≤1.20 m high). With the same integrated connecting elements as the R-adjusting strut.	588 110	10.9



	Designation	Art. No.	Weight kg/pc.
Parts for converting tubular steel props into inclined struts			
24.5	Strut base joint Suitable for connecting all tubular steel props, Alu-Top and BKS props.	566 369	7.7
35	R strut connector Connector for all tubular steel props, Alu-Top and BKS props as inclined struts for Takko/ Rasto formwork.	567 135	7.6
	Counter nut A / DB 260 / 300 (for Europlus props 260 and 300)	107 107	0.9
	Counter nut AS / DB 350 / 410 (for AS props and Europlus 350 and 410)	107 118	1.0
	Counter nut 350 EC / 450 DB (for Europlus props 350 EC uand 450 DB)	562 051	1.5
	Counter nut 400 EC / DC 550 (for Europlus props 400 EC and 300)	587 675	1.5
	Bolt and nut M12 x 30 (4 necessary) ¹⁾	005 210	0.1
Other accessories			
	RT crane hook For the crane handling of preassembled large- area Rasto units and the Rasto XXL panel. Max. loading capacity 5 kN. (See page 37)	584 167	8.2
45	Manto ratchet This tool is used for tightening and releasing tie nuts.	408 780	1.0
16	Edge tie fastener MR For module-independent tying outside the Rasto panel. For tie DW 15. Maximum permitted load F = 10 kN.	566 667	2.4

RASTO – RASTO XXL TAKKO

	Designation	Art. No.	Weight kg/pc.
13	Manto tie nut Easy to release under full tie load with the Manto ratchet or hammer.	464 600	1.3
	Tie nut 230 For tying through the length adjustment piece with a width of ≥ 8 cm.	048 344	2.4
	Tio rod 751	437 660	1 1
ame		024 387	1.4
	Tie rod 130 ¹⁾	020 481	1.9
	1 packet of Manto plugs K ¹⁾ 100 plugs for sealing the unused tie holes on the panels.	454 394	0.2
	FU tightener	568 357	3.6
	25 m punched steel tape¹⁾ When shuttering foundations, the FU tightener and the punched steel tape can replace the bottom tie (see page 21).	568 081	17.2
	R/M adapter Permits the connection of Manto formwork to a Rasto panel. (Connected with the Manto aligning clamp.)	478 708	2.3
124 2 m	RT-stacking angleFor stacking and transporting the Takko formwork panels.4 of these form a transport unit of up to 8 panels (minimum 2). Observe separate operating instructions.	587 734	8.7
	Set of transport tackle (4 pcs.) A number of 4 suspension straps ensures the safe transport of stacked-up Takko/Rasto panels by crane. Length of loop: 2 m. See also page 38.	600 917	2.0

The Takko/Rasto formwork system with a panel height of 120 cm

The Takko/Rasto formwork system consits of only 5 standard elements.









30



5

24-112

ŧ

30

ł

6

+12 + 24-+





Note:

The 90 cm, 75 cm and 60 cm wide elements are equipped with three additional holes to permit the simple tying of panels in a horizontal position.



The Takko/Rasto formwork system with a panel height of 150 cm



15

Element dimension



The Takko/Rasto formwork system with a panel height of 270 cm

The Takko/Rasto formwork system with a panel height of 300 cm



Element connection



The Rasto clamp not only joins the panels tension- and offsetfree, but also aligns the formwork elements flush. As this is a screw joint, it is also resistant to vibration.

Large-area assembled formwork elements can be transferred, set down and picked up again with ease by a crane.

The Rasto clamp is operated with a carpenter's hammer. The clamp is not struck but instead the pointed end of the hammer is inserted into the screw head like a spanner. This method is extremely labour-saving, gentle to materials and low on noise.

RASTO – RASTO XXL TAKKO





Formwork height 0.30 m to 0.90 m

Horizontal Rasto panels connected with adjustable clamps. Tying <u>example</u>: At the bottom with the FU tightener and at the top with the edge tie fastener MR above the panel (see page 21 "**Tying**").



Formwork height 1.20 m

Vertical 1.2 m Takko panels.



Formwork height 1.50 m to 2.40 m

Vertical plus horizontal or vertical Takko panels.

Formwork height 2.40 m

Horizontal Rasto XXL panel.







Formwork height 2.70 m

Vertical 2.70 m Rasto panel.



Formwork height 3.30 to 4.20 m

Vertical 3 m tall Rasto panels height-extended with horizontal panels.



Formwork height 3.00 m



Formwork height 4.80 m

Two horizontal large Rasto XXL panels laid one on top of the other.



Formwork height 5.40 m

Combination of two vertical 2.7 m tall Rasto panels.



Formwork height 5.70 m

Combination of a vertical 2.7 m panel and a vertical 3 m panel on top.





Tying



Rasto formwork is tied via the tie holes provided in the panels. Before insertion of the tie rod, the plug must be removed. Unused tie holes should be sealed with plugs.

Basto panel

When tying the panel joint, the tie plate (13 cm dia) of the Manto tie nut extends across sufficiently to the neighbouring panel.

If length adjustment pieces are used, tying is always effected through the adjustment piece. For adjustment widths > 8 cm, the tie loads are discharged via the large plate of tie nut 230.



On foundations it is often difficult to tie the formwork in the building pit.

The solution with the FU tightener and the punched steel tape represents a sensible alternative. The punched steel tape supplied in a continuous length is cut to size and laid beneath the horizontal Rasto panel.

The FU tighteners are inserted into the ribs of the horizontal Rasto panels.

The finger of the FU tightener is inserted into a hole of the tape and the formwork is adjusted with the threaded bolt.

The edge tie fastener MR positions the top tie above the Rasto panel. This means that it is easy to fit and remove and can be positioned independently of the hole module.

Detail of Edge tie



Corners

The inner corner of Rasto formwork, with the patented 2° of stripping clearance, has a leg length of 30 cm. The inbuilt corner stiffener ensures that the inner corner forms an exact right angle for concreting.



By simply disengaging the corner stiffener, the 90° angle can be eased by 2°. It is then possible to remove the inner corner from the concrete without difficulty.





The right-angled outer corner is always composed of two Rasto panels aligned and held together with outer corner clamps. The formwork can be adapted to wall thickness with the available elements of 30 to 90 cm and the 5 cm adjustment piece.

The number and arrangement of outer corner clamps and of the Rasto clamps on the first joint of the outer corner depends on the thickness and height of the wall being shuttered. See the table on page 24.

Corner stiffener unlatched

Arrangement of Rasto panels for wall thicknesses of 15 to 50 cm in 5 cm increments



System dimensions of the Rasto corner



For corners with different wall thicknesses, the same principles should be applied to panel arrangement. By using the 5 cm adjustment pieces it is possible to bridge gaps in the module of panel widths. Adjustment pieces in the panel joint (inside or outside) demand the use of the adjustable aligning clamp as the connector.



The adjustability of the corner clamp also makes it possible to fit adjustment pieces in the joint of the outer corner.



With 4 or 6 cm timber adjustment pieces, the formwork can be adjusted to corners with wall thicknesses of 24 or 36 cm.

5 or 10 cm overlap

Corners

Number and distribution of outer corner clamps on Rasto outer corners.

Note: The Takko outer corner (height 1.20 m) needs only <u>2 Outer corner clamp</u> !

	Wall thickness <u><</u> 30 cm	Wall thickness < 40 cm	Wall thickness <u><</u> 50 cm
Wall thickness ≤ 3.0 m	3 Outer corner clamps	4 Outer corner clamps	5 Outer corner clamps
Wall thickness < 4.5 m	6 Outer corner clamps	7 Outer corner clamps	9 Outer corner clamps
Wall thickness ≤ 6.0 m	7 Outer corner clamps	9 Outer corner clamps	11 Outer corner clamps



At T-wall junctions, system shuttering can be simply used up to a wall thickness of 40 cm. Adaptation is possible with the various panel widths and the 5 cm wide corner adjustment piece.



Stopends

The holes in the edge profiles of Rasto panels provide fastening means for stopends. By using the centering tension bolt and centering nut (or tension nut), the waler 80 or a correctly dimensioned piece of squared timber, for example, can be used to accommodate the stopend.



For wall thicknesses \geq 30 cm, at least 3 waler profiles must be fitted for a wall height of 2.7 m.











Corner adjustment piece

Oblique-angled corners

With the Takko hinged corner, it is also possible to simply shutter acute and obtuse angles within the system. The adjustment and application range extends from a minimum of 60° to a maximum of 150°.



As an alternative to this, a waler 80 can act as the tie bearing on the outer formwork. It also discharges the loads from length adjustment into the ties. With the two hinged corners 15 and 30 offered by the Rasto system, it is also possible to shutter non-right-angled (oblique-angled) building corners.

They differ in their leg lengths (15 or 30 cm) and in their possible adjustment ranges.

Hinged corner 30 can only be used as an inner corner.



The shuttering example shows a combination of hinged corner 30 (inside) and hinged corner 15 (outside).



On corners greater than 90°, the MP-panels in the outer formwork make tying easier.



The connector for the hinged corner 15 is always the centering tension bolt with the centering nut (3 for a shuttering height of 3.0 m).



An example of formwork with the hinged corner 15 in the outer and inner formwork. This combination is only possible in the obtuse angle range (\geq 90°).

Oblique-angled corners

The hinged waler 170 solves the tying problem on acuteangled corners ($\leq 90^{\circ}$). The walers hinged by a pin are fastened to the formwork with the tie bearing and a waler spanner (with tension nut) each at tie height.



Possible effective adjustment ranges of the hinged corners

Hinged corner 30

Hinged corner 15











The hinged corner 30 can be connected to the neighbouring panel either by using Rasto clamps or centering tension bolts .



Length adjustment



Adjustment to the required formwork length is effected by combining the various panel widths. Gaps in the module of the panel widths \leq 15 cm are bridged with a length adjustment piece positioned between the panels. Gaps up to 15 cm are bridged with the aid of 12 cm thick timber adjustment pieces. The ties must always be inserted through the adjustment piece. The panels are given tension- and compression-resistant joints with the adjustable clamp.



For larger adjustment widths up to 30 cm, use the waler 80. It should be fastened to the perforated ribs of the Rasto panels with 2 waler spanners (and tension nuts) in each case. Tying is also effected here through the adjustment piece.



The timber adjustment pieces to be provided on site (10 cm thick squared timbers + 21 mm thick shuttering skin) can be nailed on via the holes 1 in the waler.



Tie nut 230 When tying, make sure that the tie nut is sufficiently supported on the edge

max.15_{cm}

supported on the edge profiles of adjacent Rasto panels. For adjustments greater than 8 cm wide, the tie nut 230 with the large bearing plate should therefore be used.

Column formwork with MP-panels (Takko)

As a result of their high maximum permitted formwork pressure of 60 kN/m² and their ease of use, Takko panels are ideal for the shuttering of columns and foundation pads.



Four MP-panels set up in the arrangement shown above and connected with MP-bolts and MP-nuts create a variable form for square and rectangular columns. It is adjustable from 15 to 55 cm in 5 cm increments.



Column formwork with MP-panels (Rasto)

The MP (multi-purpose) panel with the continuous row of holes on the tying levels are used amongst other things as column formwork.

Four of these MP-panels, assembled in the manner depicted, create a variable form for square and rectangular columns. It can be adjusted in a 5 cm module from 15 cm to max. 55 cm.



Column formwork (Takko)

Even with standard Takko panels, it is possible to use Router corner clamps to quickly produce suitable formwork for columns and foundation pads. The panels can be arranged offset or in pairs in order to achieve the desired edge-toedge width with the available panel widths.



Column formwork (Rasto)

A column form made of standard Rasto formwork panels can be simply and quickly assembled for a wide range of dimensions with the aid of the outer corner clamp. By arranging the panels in pairs or offset, or by using an adjustment piece at the panel overlap, the form can yield column cross sections ranging in size from

20 cm to 85 cm max.



Number of corner clamps

Form	Panel width	
height	<u><</u> 60cm	≥ 60cm
1.20 m	2 x 4	2 x 4
2.70 m	4 x 4	5 x 4
3.00* m	5 x 4	6 x 4

Outer corner clamp





The use of a 5 cm corner adjustment piece (or another 5 cm wide infill piece) in the corner is another means of adjustment.



Brackets

For greater shuttering heights, a walkway bracket can be fitted to serve as a 90 cm wide concrete placement platform.

The horizontal distance between walkway brackets must not exceed 2.5 m. It is designed for scaffold class 2 to DIN 4420, Part 1, edition 12/90.





For connecting the walkway bracket to a horizontal Takko panel, use a waler bolt 20 (Art. No. 420 000).

It is hooked into the grid holes of the bar profiles of Takko panels. The permanently attached cotter pins prevent them from being accidentally detached. Wooden planks are secured with the inbuilt wooden strip. The inserted railing posts create a 100 cm high side protection barrier.



Struts



The Takko strut allows a single-storey formwork (shuttering height \leq 1.20 m) to be supported and aligned. The connection can be made at the vertical support profiles or at the panel joint.

The R-adjusting strut secures height-extended Takko formwork. It is always connected to the panel joints.

It comes with all the connecting pieces, which are permanently attached.

For 2.4 m high formwork, the distance between struts should not exceed 2.7 m.





The base plates have two drill-holes for fastening the adjusting strut to the foundation slab.



Struts

The R-adjusting strut aligns and secures single-storey Rasto formwork (up to a form height of ≤ 3.0 m). It comes with all the connecting pieces and is usually connected to the edge profiles of the panel joints. The formwork is aligned with the two tension- and compression-resistant spindles.





In exceptional cases (e.g. for column formwork), it may be necessary to connect the R adjusting strut in the interior of the panel. By using waler 80, which is fastened with 2 waler spanners (+ 2 tension nuts) to the ribs, it is possible to connect both the adjusting strut and the strut connector.

For formwork heights \leq 3.0 m, the distance between R-adjusting struts must not exceed 2.25 m.



To provide additional support to height-extended Rasto forms and for form heights \geq 3.0 m, the R-strut connector and the strut base joint permit the use of standard tubular steel props for this application.





The holes of the connection plate of the R-strut connector permits the connection* of all **HÜNNEBECK** tubular steel props.

In special cases, it is also possible to connect Alu-Top props or BKS aligning struts.

The fully assembled support is connected, as illustrated, to the panel joint of the Rasto form.



 $1.5 \mbox{ to } 5.5 \mbox{ m}$ (see loading table for tubular steel props).

Important!

The maximum permitted tensile loading of the tubular steel prop is always at least 15 kN.

The base plate of the strut base joint (like that of the R-adjusting strut) has 2 holes for attachment to the foundation slab.

Handling by crane



For the crane handling of large-area Rasto units, only the RT crane hook must be used.

This hook must always be used in pairs and has a maximum load-bearing capacity of 500 kg. In this way, formwork units of up to $25 \text{ m}^2(*)$ can be shifted with a single pair of hooks.



The RT crane hook must always be connected to a panel joint. With the fastening pin withdrawn, the hook is guided over the panel edge profiles and aligned with the top hole. When the fastening pin is fully inserted, the RT crane hook is ready for use.



Connected RT crane hook.

Caution!

The pin must be inserted as far as to the stop.



On the Rasto XXL panel, the connection point for the crane hook for individual panel handling is in the corner at the rail profiles. Units for crane handling must not comprise more than 3 Rasto XXL panels.



Always heed the following points:

Always use RT crane hooks in pairs. Insert the fastening pins as far as the stop. The angle of spread between crane ropes must not exceed 60°.

Only use materials in immaculate condition. Do not exceed the maximum loading.

Follow the RT crane hook's own operating instructions.

Transport and storage

RASTO Transport tackle

The four suspension straps of the transport tackle are attached to the four corners of the stacked panels as shown in the illustration. Their tight positions allow for loading and unloading the bundles as well as shifting them by crane .

At the bottom, the locking shoe has a safety spigot, rotating on a rubber socket, which has to be fixed to the corner of the lowest panel. It prevents incidental disengagement.

An equally effected distribution of the load is made sure by the automatic adaptation of the tackle to length conditions.

Suspension strap

Rasto / Takko panel

RASTO Transport tackle

<u>> 60°</u>

Technical specification:

Round slings consist of synthetic fibre straps with double sleeve made from textile.

Allowable loading capacity is stamped-in and marked by colour. A self-locking shoe (with galvanized safety spigot) is fastened to the end of the suspension strap (suitable for Takko/Rasto panels).

At the most, bundles with a **maximum of 10 panels** or **5 XXL panels** respectively, can be transported.

Loading capacity, statical, perm. F per single element 1000 daN when directly lifted.

It is **not** necessary to secure the packets of Takko/Rasto panels by steel straps additionally.

38

For purposes of transport and storage it is recommened to use the RT-Stacking Angle.

At the most 8 panels (min. number 2 panels) can be stacked by using one set of 4 stacking angles to form and handle transportable units. This solution is applicable to either transport & shifting on site (by crane) or transport by fork-lift truck in the warehouse (stock).

After this the second Takko-panel is to be placed on the supporting plates of the 4 stacking angles. Plywood face up (= at the top). The stacking unit formed in this way can now be filled up with further panels and transported.





The lowest panel has to be positioned in the specially shaped pockets of the 4 RT-stacking angles and secured by means of the securing pins. Plywood face must be down in this case. You should be aware that the corners of the panels fully rest under the plate of the stacking angles and all four securing pins are correctly in locking position.

The remaining Takko panels to be stacked are placed one after the other with plywood face up until the maximum number of eight panels (including bottom panel) will be completed.

Detail "X"

Unplug the securing pin for positioning the lowest panel (= bottom panel).







Note: Please pay attention to the separate Operating Instructions for using the RT-Stacking Angle.



Hünnebeck GmbH

P. O. Box 104461, D-40855 Ratingen, Germany Phone +49 (0) 2102/937-1, Fax +49 (0) 2102/37651 info@huennebeck.com, www.huennebeck.de