

## Wavy Tail Inserts

Wavy Tail inserts are supplied factory finished and consist of a socket swaged to a wavy reinforcement bar. They are always the preferred option provided the length and edge distance fit the job detail.

Standard lengths  $h_1$  are shown below. For details of the range of short Wavy Tails or straight tails please consult Halfen Ltd.

The preferred lift is a  $\beta \leq 30^\circ$  shown below.

Materials: Mild steel – socket BZP, tail mill finish

Stainless – socket A4, tail mild steel mill finish

Safe working loads shown are after the application of a safety factor on test of 2 for 15 N/mm<sup>2</sup> concrete and 3 for steel.

Actual working load must be calculated as shown on pages 6 and 7.

Size, availability and anchorage reinforcement									
<b>How to order</b> insert type insert material thread size insert height Long/short <b>PC2 20257L</b>		<b>Wavy Tail inserts – Code PC</b> 				<b>Spacing of inserts/edge distance</b> <p>Dimensions are subject to cage or fabric reinforcement being used, as shown opposite.</p>			
Size	Order code Mild steel – BZP/ Stainless steel	Dimensions			SWL for 15N concrete strength	Minimum $e_r$	Minimum $e_z$	Normal reinf. main bar dia.	
		d mm	a mm	c mm	$h_1$ mm	mm	mm	mm	
Rd12	<b>PC2 12137L</b> <b>PC8 12137L</b>	8	15	22	137	500	37	300	10
Rd16	<b>PC2 16216L</b> <b>PC8 16216L</b>	12	21	27	216	1200	40	400	10
Rd20	<b>PC2 20257L</b> <b>PC8 20257L</b>	16	27	35	257	2000	50	550	12
Rd24	<b>PC2 24350L</b> <b>PC8 24350L</b>	16	31	43	350	2500	60	600	12
Rd30	<b>PC2 30450L</b> <b>PC8 30450L</b>	20	39.5	56	450	4000	70	650	16
Rd36	<b>PC2 36570L</b> <b>PC8 36570L</b>	25	47	68	570	6300	100	800	16
Rd42	<b>PC2 42620L</b> <b>PC8 42620L</b>	28	54	80	620	8000	120	1000	16
Rd52	<b>PC2 52880L</b> <b>PC8 52880L</b>	32	70	100	880	12,500	138	1200	20

Minimum  $e_r$  assumes cover to the reinforcement is acceptable to the designer: stainless steel may be needed if cover is limited.

Special minimum  $e_r$  may be agreed with Halfen Ltd on a job basis.

For recess former for Swivel Lifting Eye, see page 17.

For recess former for increased cover, see pages 15&17.

Lifting on site is usually the worst case due to higher crane factors and worse angle of lift ( $\beta$ ) – see calculation page 7.

For panels with a single layer of fabric, ie for vertical lift and no pitching, please consult Halfen Ltd.

### Summary calculations – details page ...

Yard, e.g. demould

$$F = \frac{G + (q \times A) \times f \times Z}{n}$$

Site, e.g. erection  
(usually the worst case)

$$F = \frac{G \times f \times Z}{n}$$

i.e. factors  $f$  and  $Z$  are usually worse on site

where:

$F$  = load per insert when lifting

$G$  = dead weight of unit

$q \times A$  = adhesion to the mould

$f$  = crane factor

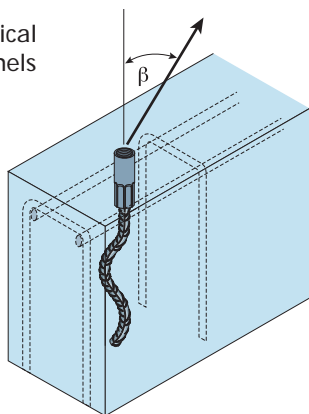
$Z$  = factor for angle  $\beta$

$n$  = number of inserts

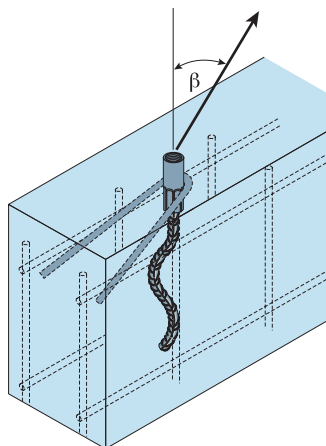
## Wavy Tail Inserts

The details on these pages show panels, but they could equally apply to other components. The loads shown assume the angle of lift, i.e.  $\beta \leq 30^\circ$  and normal reinforcement, such as a cage or two layers of mesh. For a single layer of mesh please consult Halfen Ltd. Erecting panels reduces the allowable load as shown below.

Typical panels



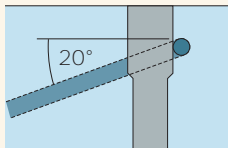
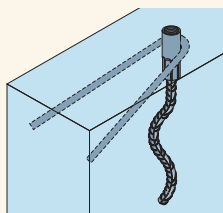
$\beta \leq 12.5^\circ$  Reinforcement cage  
Typically T12 bars full length and T8 stirrups at 150 mm centres



$\beta \leq 12.5^\circ$  Two layers of mesh  
Typically 8 mm wire, such as A252 and B503

### Lateral reinforcement for $\beta > 12.5^\circ < 45^\circ$

Where the lifting angle, is between  $12.5^\circ$  and  $45^\circ$ , additional reinforcement is required as shown below.



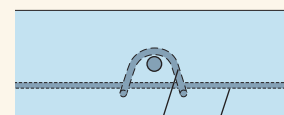
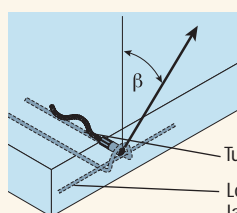
Detail shows position of lateral reinforcement

Insert dia.	reinforcement dia.	unbent length	Allowable SWL as table shown opposite
12	8	500*	
16	8	500*	
20	12	800*	
24	12	800*	
30	12	800*	
36	16	1500*	
42	16	1500*	
52	16	1500*	

\*  $e_z/2$  may increase slightly to accommodate these bars.

### Turning reinforcement for slabs

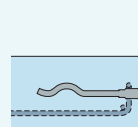
When turning/pitching additional reinforcement is required. Note:  $\beta$  must not exceed  $30^\circ$



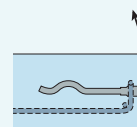
Turning reinforcement  
Longitudinal bars for larger sizes – see table

Insert dia.	Turning reinforcement dia.	unbent length	Longitudinal bars dia.	length
12	8	700		not required
16	8	1000		"
20	12	1200		"
24	12	1300		"
30	12	1500		"
36	16	1800		"
42	16	2000	16	600
52	16	2000	16	600

1. Even with the reinforcement shown above, the allowable SWL is 50% of that shown in the table opposite.
2. Swivel Lifting Eye is essential – Threaded Lifting Loop is not permitted.



permitted



Not permitted