recoastal® Permanent Formwork
Shuttering units to facilitate installation of construction joints in base slabs
Shuttering units comprised of finely meshed, trapezoidally-profiled, expanded metal, designed for creating construction joints in concrete base slabs.

Units are supplied to specific project-heights on site.

recostal® shuttering is also available with anti-leakage material and clamps to eliminate the need to weld rebars.

Product range
- recostal® 1000 units for slabs up to 750mm thick
- recostal® 2000 GT units for slabs up to 3000mm (with tie struts)
- recostal® 2000 GT Fabric Web units have a removable fabric material and solid foam insert, which is cut away after pouring and curing to reveal smooth concrete

Ancillary components
- Speed Edge Formwork
- Shuttering Strips
- Starter Packs
- recostal® Specials

The much stronger joint profile allows reduced rebar: for the same depth of slab, and area of rebar, the recostal® key profiled joint is typically twice the strength of the rough profiles, giving greater flexibility in joint positioning.

recostal® shuttering
- Key profiled c=0.50
- Highest bearing capacity
- Reduction of reinforcement

Hyrib shuttering
- Rough c=0.40
- Reduced bearing capacity
- More reinforcement required

Smooth timber wood
- Very smooth c=0.025
- No bearing capacity
- Power transmission only by reinforcement

**Construction joint base slab – key profiled**

Bearing capacity of joints according to EC2, 6.2.2 (DIN 1045-1)

Comparison of the results:

\[
V_{\text{Rd,c}} = \frac{c}{0.5} \times \left[ C_{\text{Rd,c}} \times k \times f_{\text{ck}} \times 0.8 \times k_{\text{p}} \right] \times b_{w} \times d
\]

Key profiled: c = 0.5
- \( V_{\text{Rd,c}} = 307 \text{ KN/m} \)
- required As = 31.42cm²/m

Rough: c = 0.40
- \( V_{\text{Rd,c}} = 307 \text{ KN/m} \)
- required As = 61.58cm²/m

Very smooth: c = 0
- Very low shear forces can only be transmitted with a very high degree of reinforcement combined with proof of the roughness coefficient.
Leakage material

Description
Leakage material is used at the bottom and the top of the main element within the body of the rebar mats. This can be supplied as a plain expanded metal sheet for site cutting and fitting. Alternatively bespoke leakage can be tailored pre-delivery.

Leakage types

- **Type 1.1 DFS - flat**
- **Type 2.1 DFS - with welded angle**
  - min. H2+2cm
- **Type 3.1 DFS - with base**
- **Type 1.2 DFS - flat, with cut outs**
- **Type 2.2 DFS - with welded angle and cut-outs**
  - min. H2+2cm
- **Type 3.2 DFS - with base and cut-outs**
  - min. H2+2cm

Leakage prevention strip DFS

- **Type 1.2 DFS - flat, with cut outs**
- **Type 1.1 DFS - flat**
- **Type 2.2 DFS - with welded angle and cut-outs**
- **Type 2.1 DFS - with welded angle**
- **Type 3.2 DFS - with base and cut-outs**
- **Type 3.1 DFS - with base**

![Diagram showing leakage prevention strip DFS](image-url)
Reco Clamp

Description
The Reco Clamp is designed to remove the need to weld the rebar. It is available in a combination of cover plate and U bolt sizes. Each combination being suitable for a range of reinforcing bar size combinations.

Key benefits
• Achieves a 4.0kN connection and removing the need to weld the rebar
• Choice of sizes available

Technical data
<table>
<thead>
<tr>
<th>SWL</th>
<th>4.0kN</th>
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<tr>
<td>Cover plate material</td>
<td>Steel S275 plate</td>
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<tr>
<td>Bolts</td>
<td>Grade 8.8 U</td>
</tr>
</tbody>
</table>

Minimum factor of safety on test results = 2:1
Applied torque (approx.) 28kN/M

Cover plate
Material: Steel S275
Bolts: Grade 8.8 U

Key benefits
• Achieves a 4.0kN connection and removing the need to weld the rebar
• Choice of sizes available

Typical detail
Reco Clamp standard positions

Dimensions

<table>
<thead>
<tr>
<th>Reco Clamp</th>
<th>Type option</th>
<th>Approx. cover sizes up to</th>
<th>Sizes (mm)</th>
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<td>M10 x 80 x 110</td>
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Description
The Reco Clamp is designed to remove the need to weld the rebar. It is available in a combination of cover plate and U bolt sizes. Each combination being suitable for a range of reinforcing bar size combinations.
**Description**
For slabs up to 750mm thick. The recostal® trapezoidal profile meets the demands for the highest category key profiled joint according to Eurocode 2.

**Key benefits**
- Ready to use
- Perfect fit
- Single rib or key profiled
- Self-supporting in one or two axial directions

**Dimensions**

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<tr>
<th>H</th>
<th>Unit length L = 2.25 m</th>
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<td>&gt; 30</td>
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**Dimensions**

- Single rib profile

![Image of recostal® 1000](image-url)
**Installation**

Fix shuttering units to the top and bottom reinforcement

Self-supporting up to heights < 30 em

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**Product combinations**

1. Waterproofing of joints with bentonite expanding seals BT 2025s or BigStop.
2. Waterproofing of joints with superject-injection hose.
recostal® 2000GT

Description
Self-supporting in all heights from 650 to 1500mm (3000mm with tie struts). The bearing capacity is clearly separated into a vertical and a horizontal direction. The load per surface resulting from the pressure of fresh concrete is carried by the trapezoidal profile and transferred to the vertical lattice supports. These supports bear the load and transfer it to the top and bottom end points.

Key benefits
- Perforated sheet reduces concrete pressure forces by approx 50%
- Self supporting, systemised method of CJ support, vastly reduces labour element of fixing and removing traditional stopends
- Key profiled joint gives potential for rebar savings
- Can be used with waterbars/waterstops
- Can be tailored to the exact dimensions required by site.
Installation
Fix shuttering units to the top and bottom reinforcement
Self-supporting up to heights < 30mm

Product combinations
1. Waterproofing of joints with bentonite expanding seals BT 2025s or BigStop.
2. Waterproofing of joints with superject-injection hose.
**recostal® 2000GT Fabric Web**

**Description**
To allow for smooth concrete at one or multiple levels in the permanent formwork. This is to facilitate a quality surface for the hydrophilic material to be fixed against.

recostal® 2000GT Fabric Web, featuring a removable fabric material and solid foam insert, is simply cut away after pouring and curing to reveal smooth concrete.

Any specified self-adhesive hydrophilic material can be accommodated.
**recostal® AFI**

A two-part shutter unit with ‘cradle’ to accommodate waterbars, designed either centrally or to your specific project requirement. Tie-bars are installed in the lower and upper elements to provide stability and loading capability during pouring.

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**GTF – system deflection**

Waterstop generally placed in the middle of Recostal but can be offset if required.

Example shown is for a unit height upto 1.300m. Above 1.300m the Recostal needs reinforcement struts as shown in Ischebeck Data Sheets for non water bar solutions.

The front lattice needs to be cut in the manufacture process.

The metal water bar is then welded into the cut lattice with welding points which are automatically produced in a machine to guarantee quality and tolerances. The compression load in the front truss is secured laterally by the weld. The product has been used successfully as a water bar stop end for over 10 years.
**recostal® GTF**

A self-supporting unit with centrally located metal water stop, fitted at the factory. The water stop is coated with contaflexactiv bentonite and with a protective, degradable film. This enables the use of recostal® in areas of dense rebar, where later removal of protective coatings is not possible.

Recostal Clamp arrangement fixed at maximum 660mm centres at the top and maximum 330mm centres at the bottom throughout. Centre designed to suit height of pour and positions in line with reinforcing bar centres.

**GTF – lattice elevations 1300mm**

The metal water bar is coated with a special contaflexactiv bentonite coating. The water bar has been tested and approved by MFPA Leipzig GmbH – a certified testing laboratory up to 50m water pressure.
recostal® Speed Edge Formwork for base slabs

Speed Edge Formwork is made from galvanised sheet metal and is used for shuttering base and floor slabs. Corners are easily installed by simply cutting the base of the 2.25m long units.

Key benefits
- Self-supporting
- No additional support required
- Fast installation
- No stripping required

Simple lap joints with 3-4 cm overlap
Fixing with stand or extra long nails
External corner: cut base and bend
**Dimensions**

Standard unit length 2.25 m

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<th>Height (cm)</th>
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**Statics**

The forces of the concrete weight (G) and the formwork pressure (H) are in balance. The only fixing required is nailing to prevent the formwork from moving sideways.

**Example of how Speed Edge Formwork reduces costs**

With recostal Speed Edge Formwork the circumference of the excavation can be reduced by approx. 1 m. This means: - less excavation - less backfill

**Example of cost saving**

**Excavation size:** 25 x 25 m

**Excavation circumference:** 100 m

Excavation: 100 x 2 x 1 = 200 m²
200 m² x 5 Euros/m² = 1000 Euros

Backfill and compaction: 200 m² x 7 Euros/m² = 1400 Euros

Total: 2400 Euros

The use of recostal Speed Edge results inconsiderable cost saving

**Alternative installation**

Instead of nailing, the blinding layer can also be concreted on top of the edge formwork base.
Shuttering Strips facilitate quick and easily installed openings of all sizes in base slabs and concrete floors. Shuttering Strips are perforated crosswise at every 50mm (the length of the opening is a multiplication of this size, e.g. 150 x 150mm, 200 x 300mm etc. The scaled profile ensures a good bond to the concrete.

Key benefits
- Easy to create openings in base slabs or in-situ/precast floor slabs (see next page)
- Perforated profiles ensure good bond

Simple installation
1. Unroll Shuttering Strip and cut to length with tin snips or angle grinder
2. Fold Shuttering Strip over the edge of a table at the required length and trim.
3. Fix the overlapping ends with tie wire or metal strips.

Openings straight from the roll
### Dimensions

**Type SF with scaled profile**

1 roll = 10 m

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**Type S with notched profile**

1 roll = 10 m

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### Also available ready to use for precast floor slabs

- Prior to concrete pour, the sides are unfolded on site
- All sizes with 50mm partitions
- All heights from 140, 160, 180 to 300mm
- With 70mm folded rim
- Unobstructed storage
- Unobstructed transport
- Designed to suit on-site conditions
- Precast floor slabs with installed openings are stackable
**recostal® RSH and VHQ Starter Packs**

Starter Packs consist of pre-bent reinforcement housed in a uniquely trapezoidal profiled corrosion resistant casing. The starter pack is then cast into the front face of the wall. After the formwork is struck, the backing is removed to reveal the starter bars inside. These legs are then bent out by the contractor and lapped onto the main reinforcement of the next pour.

The casing remains embedded in the wall, providing a trapezoidal profiled rebate into which the concrete is poured. This eliminates the need for traditional preparation at the joint.

**RSH Starter Packs**
RSH Starter Packs consists of a trapezoidally profiled box made from galvanized steel sheet. In the case of shear force loads acting in a transverse direction to the starter pack, the surface of the joint meets the demands of Eurocode 2 for the highest category ‘key profiled’. Type RSH can be used in wall to wall and wall to slab connections. Especially when placed horizontally, this type of continuity strip gives engineers the opportunity of calculating the shear forces. The casing is protected against corrosion.

**VHQ Starter Packs**
VHQ Starter Packs consists of a notched, galvanized sheet steel box. It’s clever use of single bars makes it ideal for multiple applications and all construction widths.

**Key benefits**
- Strong, robust galvanised sheet metal starter packs, dimensionally stable
- Cost and time effective installation, starter packs are simply nailed to the formwork
- Easy removal of the sheet metal covers due to their special design
- Trapezoidally profiled box for excellent bond
- Various possible combinations provide a solution for all common installation details

**Approvals**
A building inspectorate approval for the use of Starter Packs is not required.

Starter Packs Type RSH (for transverse stresses) meet the requirements of DIN EN 1992-1-1 for the highest surface category ‘key profiled’.

**Typical applications**
Starter Packs ensure time-saving installation of secure connections between steel reinforced concrete construction parts that are created with different pour sequences. Therefore, floor slabs, walls or staircases can be installed subsequently with rigid connections corresponding to the highest joint category ‘key profiled’.

The large variety of shapes offers the perfect connection for many different design situations; special types for specific solutions are also available. The standard range includes Starter Packs with 12mm and 16mm diameter and L=1.25m unit lengths. Unit lengths exceeding 1.25m, the production of special types and the combination with waterproofing systems as well as solutions for entire projects are available on request.
### Type RSH range

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<th>Bar diameter (mm)</th>
<th>Centres (mm)</th>
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<td>200</td>
<td>16</td>
<td>200</td>
<td>650</td>
<td>220</td>
<td>250</td>
</tr>
</tbody>
</table>

### Type VHQ range

<table>
<thead>
<tr>
<th>Type</th>
<th>Bar diameter (mm)</th>
<th>Centres (mm)</th>
<th>Lap length LA (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VHQ</td>
<td>12</td>
<td>150</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>200</td>
<td>500</td>
</tr>
<tr>
<td>VHQ</td>
<td>16</td>
<td>150</td>
<td>650</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>200</td>
<td>650</td>
</tr>
</tbody>
</table>
Technical details

- Trapezoidally profiled starter packs, joint category ‘key profiled’ according to DIN EN 1992-1-1, highest shear force bearing capacity
- Concrete reinforcement steel BSt 500 S or BSt 500 WR according to DIN 488, Ø = 8mm to 14mm (16mm)
- Diameter of bending rolls db > 6 Ds in the section of rebending
- 8 standard profiles, bar widths 100mm to 220mm, smaller or larger bar widths on request
- Standard unit length L= 1.25m, fixed lengths up to 2.5m on request

Increased corrosion protection
Type RSH is installed with a planned 25mm recess

Starter Pack with active waterproofing
Type RSH can be manufactured with an active bentonite coating on both sides for the application in construction joints exposed to water.

Graph for determining the production related required box width or maximum possible lap length
**Instructions for the diagram**

The diagram is intended to assist in determining the production related required box width and the maximum possible lap length.

Required unit length (cm): required $L = 2 = LS - 10$
Max. $LA$ for designated unit length: max. $LA = \frac{L + 10}{2}$

b. Production related required box width for starter packs with single bars. For starter packs with double bars the result is doubled.

**Example:**
Type SB (starter pack with double bars)  
$\phi 12$, $c = 15\text{cm}$, $LA = 50\text{cm}$  
required box width: $2 \times 6.8\text{cm} = 14\text{cm}$
**recostal® used single-sided for basement construction**

- **Expanded Metal Profile**
- **Hook Anchor**
- **Made of Two-Parts of DSI Mukusol Tie Bar**
- **Flanged Wing Nut**
- **Water Stop Type G**
- **System Formwork**

**Height of the Wall (4.27m)**

- **10cm Expanded Metal Overlap - No Profile**

**Concrete Reinforcing Steel Mesh - Centrally Positioned**

- **17.5 17.5**
- **14 11**
- **12.5**

- **225**
- **95 95**
- **95 95**

- **530**
- **430**

**E=**

- **Concreting**
- **Reinforcing Steel Mesh**
- **Reinforcing Steel Ex Works**

**Hook Anchors to Be Positioned on Site**

- **H530_B**

**Loose Reinforcement Mesh to Be Welded to Element A and B from the Backside to Reinforce the Horizontal Panel Joint**

- **Reinforcing Steel Ø 28mm Welded to Panel**

- **E=**

**System Formwork**

- **Flanged Wing Nut**
- **Expanded Metal Profile**
- **Concrete Reinforcing Steel Mesh**
- **Water Stop Type G**
Case Study

**Project:** Basement with single-sided retaining wall  
**Location:** Hanover Square, Central London  
**Contractor:** J Coffey Construction  
**Developer:** BJV Retail Developments  
**Product:** recostal® 2000GT  
**Due for completion:** 2018

**The challenge**
A challenging project in the middle of London, surrounded by other buildings in close proximity. The basement under construction required a single-sided retaining wall.

**The solution**
By using recostal® 2000GT as an ‘internal shutter’, the contractor avoided the use of conventional A-frames, thereby obviating any party wall complications – no loads were transferred to the surrounding party walls.

Inform UK provided on-site technical support as well as initial design drawings. recostal® 2000GT achieved faster controlled pours, allowing the hydrostatic pressure to come back in to the structure. The package supplied by Inform UK included a water coupler system allowing connection between the internal recostal® sheet and external shuttering. Water ingress along the tie rod was thus prevented. In addition wall thicknesses were controlled and the site footprint maximised.

**The result**
The project manager, Mr K. Kalapan said “the benefit of controlled pours rather than a conventional single sided solution, plus not needing to utilise ‘party walls’ in the process was very helpful.”
The Ischebeck Group
Founded in Germany over 120 years ago, Ischebeck is one of the world’s principal manufacturers of formwork and falsework systems. Renowned internationally for its Titan support system, the group has a long standing tradition of innovation and engineering excellence. Product quality is a hallmark of the group and the company’s manufacturing facilities are amongst the most advanced of their type.

Inform UK
Founded in 1982 Ischebeck Inform have, over the past 35 years, established ourselves as one of the leading suppliers of concrete reinforcement, accessories, and formwork systems to many areas within construction industry. An excellent choice of products are offered, all supported by first class technical support.

In 2006 Ischebeck Inform became part of the Ischebeck Titan Group, and together we were able to offer a greater choice of solutions to our customer base. Since this time, we have shared our extensive industry knowledge, expertise and collaborated on product development.

Inform UK innovations
Ischebeck Inform has a reputation of supplying truly innovative and specialist concreting products. Our team is dedicated to researching, carefully sourcing and testing products and technologies from around the world so we can offer you a range of solutions – from rapid slab construction with K-FORM UPVC Screed Rail to a whole new way of installing construction joints in base slabs and walls with our exclusive Recostal permanent stopend system. We bring you the most cutting-edge construction solutions that will help change the way you work.

Technical support
Focusing on your particular project requirements, we advise on best product selection and offer on-site support; our team is committed to ensuring that you maximise the benefits of choosing Ischebeck Inform.