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09 Precast Panel Support and Restraint
The purpose of this magazine is to update all of our existing clients about our latest projects, challenges and innovations.

Information about CFS products can be found on our website www.cfsfixings.com

We encourage you please to save the environment and download our catalogue brochures, however we are happy to send paper copies on request. CFS colour coded product groups contains brochures, videos and software packages.
Stud Anchor System with ETA Approval and Design Software Schroeder Fix Pro

Stainless steel or electroplated threaded sockets are connected to the stud. Applicable for anchoring concrete elements with corrosion-resistance up to class IV. For fixing elements with axial and transverse loads. 3D Schroeder FixPro software is available for bespoke applications and dimensioning. Anchors are highly recommended for High Risk Construction Projects.

* NEW Schroeder Fix Pro Software includes Bolt Anchors. These threaded sockets can be used in lifting and fixing situation. The software provides verification for fixing situation. In order to obtain lifting capacities reduce the fixing capacity by a factor of 1.4.

CFS lifting and fixing elements are now available in REVIT!

Drawing Library  http://schroeder.partcommunity.com

* NEW Alternative reinforcement drawings and data are available on request.
Due to the outer leaf, insulation and inner leaf, Sandwich panel lifters must be cast directly in the center of gravity. CFS has developed a few solutions, which could help to achieve the correct lifter position.

<table>
<thead>
<tr>
<th>Lifter</th>
<th>110/75/170 panel wall thickness (mm)</th>
<th>Min. Edge Distance (mm)</th>
<th>Vertical 2 lifters (kN)</th>
<th>Lifter angled capacity (kN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPA-RD24</td>
<td>170</td>
<td>350</td>
<td>33.16</td>
<td>25.00</td>
</tr>
<tr>
<td>SPA-RD30</td>
<td>170</td>
<td>350</td>
<td>53.05</td>
<td>40.00</td>
</tr>
<tr>
<td>SPA-RD36</td>
<td>170</td>
<td>400</td>
<td>92.84</td>
<td>70.00</td>
</tr>
</tbody>
</table>

TSG anchors belong to our DEHA lifting anchor system. Sometimes referred to as Spherical head/ Mushroom head, they are used in conjunction with our DEHA clutch, which helps to transfer the loads to the surface of the concrete and protect the lifter.

Available: CFS Precast Catalogue p.p. 04-17

CFS has also developed design methods allowing lower edge distances and higher capacities. The concrete cone is now based on 1:1.5 proportion (1:3 in the past).

FSW Quick Lift Sandwich Panel Anchor

Our FSW anchor is specifically designed for lifting sandwich panels. It’s suspension point is close to the gravity axis thus allowing the element to be transported and erected in an upright position.

Available: CFS Precast Catalogue p.p. 05-16
Lifting a heavy yet small dimensioned element may require the use of 4 or more lifters. CFS offer balanced chains which will help to achieve statically determinate lifting.

Our turning and transportation device is designed so that large elements can be rotated about their centre of gravity making handling of the units simplified. Ideal for products such as pipes or culverts available in the weight range 1.3 t to 32 t. For anchor selection and applied reinforcement, please consult CFS for your particular application.

NEW High Load Rotating Eyes

Socket with recess former to achieve sufficient concrete cover

High capacity rotating eyes are one of the latest innovations. They are mainly used for high importance structures and almost twice exceeds standard rotating eye capacity. For use in buildings with increased concrete cover requirements, these rotating eyes can be recessed to the required depth.
Cast-in Channels

MOSO® MBA Channels are manufactured from, lean duplex steel 1.4362 which is technically superior to A4/A5 steels. MBA channels have better corrosion resistance, twice the yield strength and are 18 % more rigid than conventional stainless steel. They are temperature resistant with a higher fatigue strength.

PEC Standard galvanised and stainless steel cast-in channels

Toothed duplex stainless steel cast-in channels for longitudinal loads

Innovative Toothed Channel insert with debonding sleeves is suitable for GRC Flat Panel fixing applications. Sleeves are designed to allow movements in GRC, whereas channel enables vertical adjustment.

Testing cast-in channels of the SMD

At CFS we pride ourselves on our unique SKI channel designs. We recently carried out testing on a particular cast-in channel design for use with structural metal deck flooring. Special ski cast-in channels are usually designed with special frame for ease of application and additional reinforcement. We also used 3 different types of concrete: reinforced concrete, fibre reinforced concrete and Lytag. Test showed great shear values, reduced pull out capacity and different variations depending on the installation in parallel or transverse direction of the SMD.

For more information, please contact: vita@cfs-fixings.co.uk
The MOSO precast panel suspension system is an approved system, consisting of a cast-in part, a middle part and an upper part. The standard upper part is fastened to a vertical surface of the structure, or alternatively there is a fixing available to connect to the top of a slab. If a single point fixing is insufficient a double bolt version is available. The component cast into the facade was developed for slender precast concrete units.

CFS have developed a cost effective solution for precast cladding supports. Our unique shoe system is designed to be cast into the concrete panel and produced in a range of projections to suit different cavity widths. Precast Cladding Panel Support and Restraint Systems are quick and easy to install as well as more efficient than traditional angles, which use thicker sheet metal. Products are available in stainless steel A2, A4 and Duplex.

Panel shoes are tailored for unique projects. For bespoke design, please provide concrete backing structure dimensions, grade, cavity size, weight of the cladding panel, loads and required restraint capacities.

• Load range: 6.0 – 70.0 kN
• Material: approved stainless steel
• Certificate: technical approval.

Bespoke Panel Shoes

V&A Dundee
CFS is known as a high quality and reliable source for design and supply of brickwork & stonework support systems. Here at CFS, we consider our main strength to be our ability to custom design fixing systems and provide fast production when time constraints are critical. Both design and supply of CFS products are made in accordance with International standards and above all, within our client’s expectations.

Below are some essential considerations that need to be taken into account when choosing a support system.

**Quick Installation, height adjustment available with serrated rack plate**

Needs early stage planning, lower capacities than expansion Anchors

**Flexible Installation & higher capacities**

Longer Installation Time & possibility of hitting rebar

**Easy to install & high capacities**

Mola-bolts need isolating plastic bushes, Blind bolts are More expensive

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**New Products**

**BRICK SLIP SYSTEMS**

Our brick slip system allows the fixing of fully adjustable hanging lintels. We believe our system is the best on the market due to not being welded into place with no adjustment.

**Brick slip details**

Specifically, designed U-channel bolts to our bespoke bracket.

The bracket then slides into the soffit tray allowing left to right adjustment.

The U-channel bolted to the brick also has back and forth adjustment allowing you to line up the soffit correctly with the external brick face.
It was proved by latest fire resistance tests and made balcony connectors even more economical, easy to cut on-site and easier to design.

Key benefits
• Reduces heat loss and CO2 emissions
• EPS (Expanded Polystyrene Insulation) weatherproof, prevents condensation, damp walls, mould formation and structural damage
• Fire-proofing panels provide up to 120min (REI120) fire protection requirements
• High stiffness provided by U profiles
• Low deformation is achieved due to the stiffness of the U-profiles
• Special solutions: very high flexibility to adapt the stirrups to the specific installation case
• Flexible cutting of the TK on site
• All balcony connector G-types withstand positive and negative +/- VEd (Shear Forces) and +/- MEd (Bending Moments)
• Concrete cover can be reduced by using additional insulation saving time and costs
• No special solutions required for wall connection due to standard TKM/TKA balcony connector types
• CFS factory assembled for quick delivery in the UK
• Technical support and design available on request

CFS balcony connectors are available in various shapes to suite various of slab to slab or slab to wall connections.

References

Battersea Power Station 8000 Thermokorbs
Chelsea Barracks 300 Thermokorbs
Beatrix and the Ambassy Parkside living
Lombard Road 2800 Thermokorbs
THERMOKORB DESIGNING

The calculation software “AVI Thermotool” serves to design Thermokorb elements. This software consists of different modules which allow designing thermal insulations for a number of standard applications.

Thermotool provides for altogether seven modules for designing, each of them allowing calculating different installation cases.

- Rectangular Balcony
- Loggia Balcony
- Inner Corner Balcony
- Bracket Parapet
- Wall Cantilevered
- Outer Corner Balcony
- Wall Cantilevered

The modules Rectangular Balcony, Outer Corner Balcony, Inner Corner Balcony and Loggia determine moments and shear forces on the basis of the dimensions and loads of every component. The Bracket module enables entering moments and forces along all spatial axes. Furthermore the Cantilevered Balcony module allows Thermokorb designing for a balcony by entering moment and shear force.

At designing, every Thermokorb element will be defined individually. In this process, the user can either choose between automatic or manual allocation. The example on the right shows a hinged support in area no. 4, edge no. 5, for which type TKA is used. Area no. 5 is an opening, so no Thermokorb will be installed there. The areas 1 to 3 are fixed supports.

When calculating the components, the user is free to add extra columns in any position of the unsupported edges. The example on the right shows an outer corner balcony with three columns in freely chosen positions.
Thermotool uses the finite element method to determine the occurring moments and shear forces. At designing, the relevant internal forces are determined individually for every Thermokorb.

The example below shows an outer corner balcony (slab thickness 200 mm) with four Thermokorb elements and an unsupported section in one of the supports (edge 5). Every single Thermokorb is calculated individually.

In order to avoid a collision with the ribs in the corner, the determined rib height in position 3 is 130 mm while all other TKM Thermokorb elements have a rib height of 150 mm.

The internal force diagrams show clearly the distribution of moments and shear forces along the supports. The Thermokorb types are determined on the basis of these internal forces and the latter can also be used by the structural design engineer to design the reinforced concrete elements. A report can be created to prove that calculations have been made.