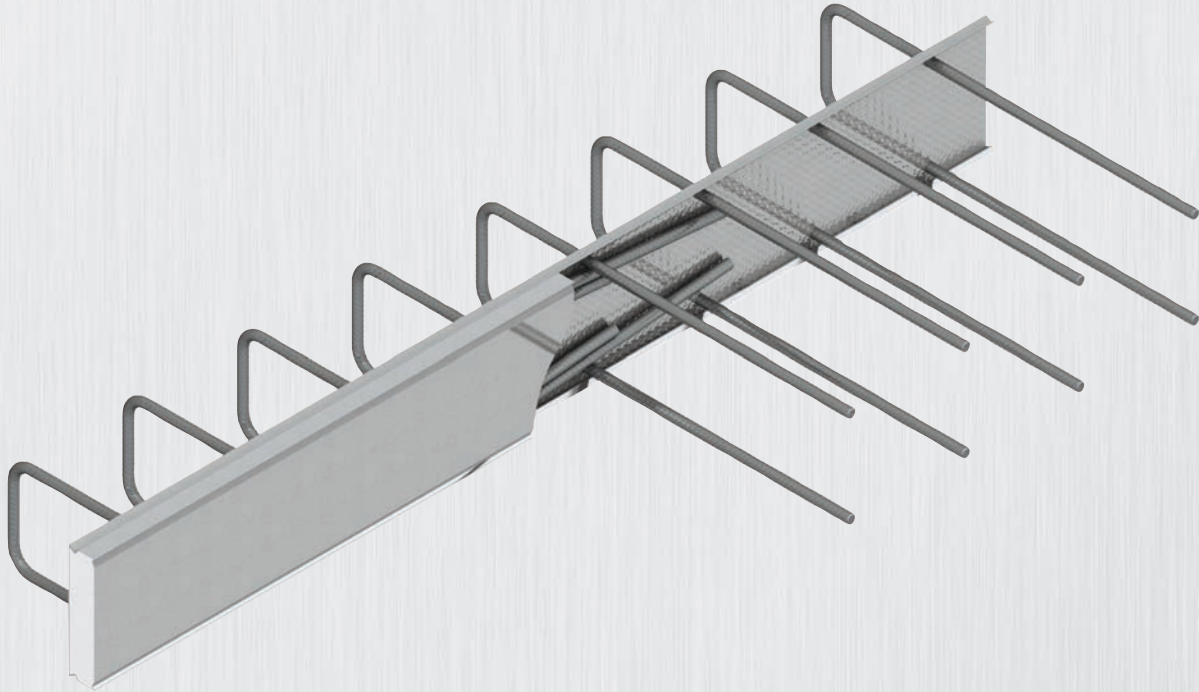


# KWIKASTRIP® REINFORCEMENT CONTINUITY STRIP



**HALFEN KWIKASTRIP**

KT 10-EE

CONCRETE

# Halfen Kwikastrip® reinforcement continuity strip



## Introduction

The concept of reinforcement continuity strip has been in widespread use throughout Europe for over 20 years and repeatedly demonstrates itself to be a simple, time saving and cost effective method of maintaining reinforcement continuity across construction joints in concrete.

The system comprises special pre-bent reinforcement housed in a purpose designed carrier casing – all of which is fabricated off site in a factory controlled environment.

On site, the entire unit is cast into the face of the wall. After the formwork is struck, the lid is removed to reveal the connection legs (or starter bars) laying inside the casing. These legs are bent out by the contractor, ready for lapping the main reinforcement of the subsequent pour.

The casing remains embedded in the wall, providing a rebate into which the concrete of the adjoining member is poured and eliminates the need for traditional preparation (i.e. scabbling) at the joint.

## Halfen

Halfen Limited is a leading supplier of building fixings and components, with manufacturing and marketing centres worldwide.

For over 75 years Halfen has maintained a position at the forefront of the construction fixings market, establishing a reputation for technological innovation, product reliability and customer service.



### Technical support including:

- Application advice
- Design guidance
- Software training
- Proposal drawings
- Working drawings
- Site visits

### Estimating support including:

- Budget quotations
- Priced alternatives
- Product schedules

### QA System including:

- BS EN ISO 9001: 2000
- Certificate of Conformity
- Design Warranty

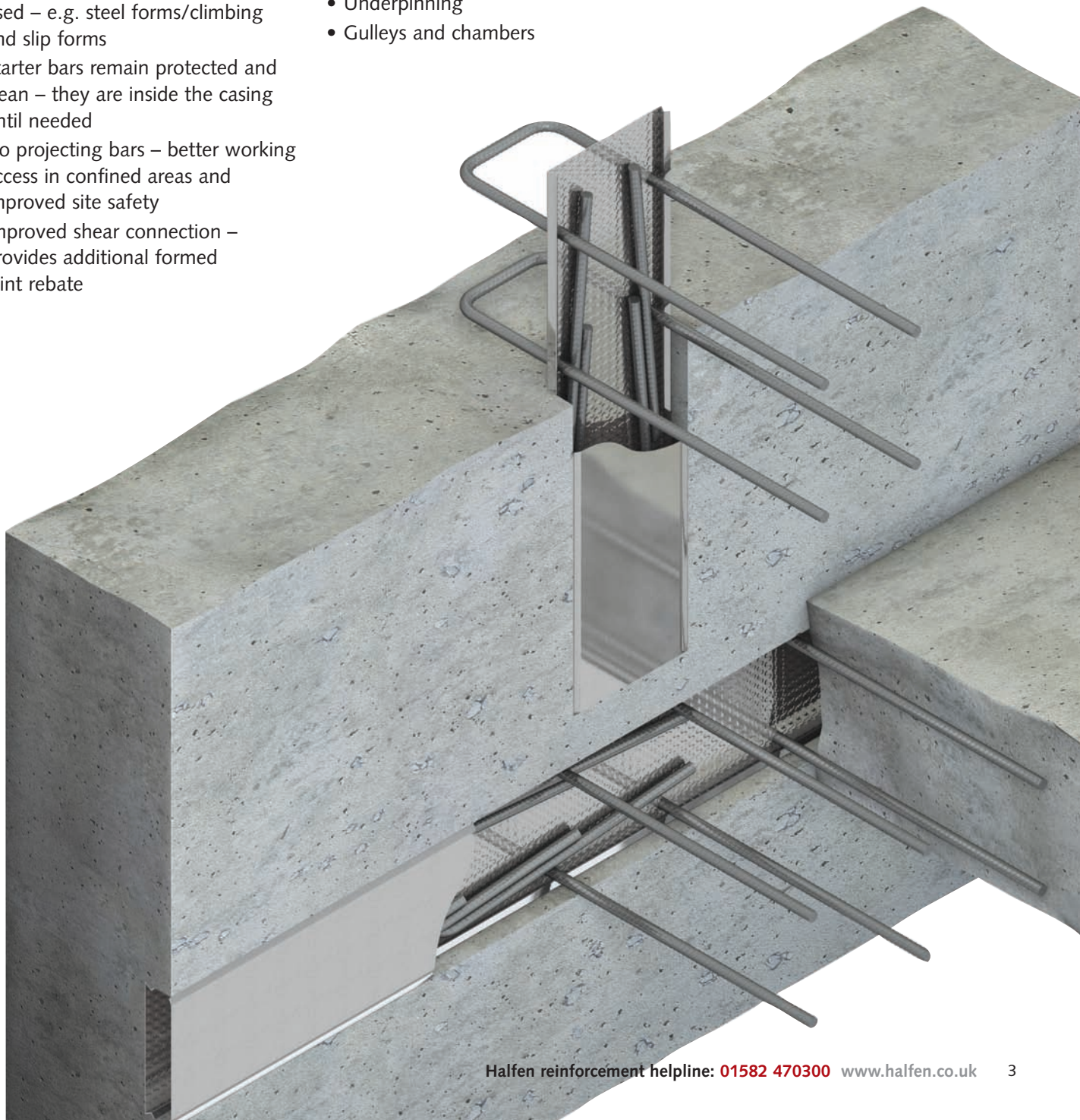
## Benefits

- Simplifies formwork design – bypasses construction joints
- Accelerates pour schedules – suits today's fast track build methods
- Easy to use – an answer to skills shortages of 'chippies' and steel fixers
- No formwork damage or wastage – no drilled holes in shutters/no wasted stop ends
- Enables 'system formwork' to be used – e.g. steel forms/climbing and slip forms
- Starter bars remain protected and clean – they are inside the casing until needed
- No projecting bars – better working access in confined areas and improved site safety
- Improved shear connection – provides additional formed joint rebate

## Application

Quite simply, any construction joint in concrete has the potential to be formed by this method. Normal applications include:

- Walls
- Floor slabs
- Staircase landings and flights
- Brick support nibs
- Corbels
- Pile caps
- Underpinning
- Gulleys and chambers



# Installation of Kwikastrip

The Kwikastrip unit is either nailed (through casing) to the shutter face, or the projecting anchorage reinforcement is securely wired back to the main reinforcement cage and the shutter offered up to it.

The Kwikastrip unit is therefore sandwiched in position between the shutter and the main reinforcement cage. The concrete is then poured and the entire unit is cast into the face of the concrete element/wall (see figure 1).

Stripping the shutter reveals the lid on the wall face. The lid is removed to reveal the connection legs (see figure 2), which should be bent out using the available straightening tool (see figure 3).

Anchorage is achieved via the reinforcement delivered projecting out of the casing. Lap is achieved via the bent out connection legs, which are spliced to the main reinforcement of the subsequent concrete pour (see figure 4).

## Straightening of bars

Reinforcement should only be straightened when the temperature of the steel is 5°C or above. Where the temperature of the reinforcement is below 5°C, reinforcement may be indirectly warmed to a temperature not exceeding 100°C but no form of direct heat treatment shall be applied to the reinforcement.

The available straightening tool (see opposite) enables the connection leg to be straightened correctly and efficiently.

The use of other implements (e.g. hammers, scaffold tubes) will result in adversely kinked starter bars and unacceptable work hardening of the reinforcement that may adversely affect performance of the system.

The straightening tool is a steel tube with a specially shaped end and an internal diameter only slightly greater than the diameter of the bar to be straightened. The tube wall thickness adequately ensures that the tube will not flex under load.



Figure 1



Figure 2

The length of the tube provides the necessary leverage to eliminate undesirable 'jerky' movements, otherwise caused as a result of too great a physical effort required by the operative.

The tube should be placed over the bar and located at the start of the bend. The end of the tube is specially shaped (see right) in order to minimise undesirable point contact of the tube on the bar and, more importantly, to provide continuous support to the outside of the bend during straightening.

The straightening operation should be smooth and progressive and the tube must be allowed to continuously 'slip' around the bend as it becomes straightened, so in its final 'rest' position, the tube should be in contact with the interface of the embedded case and the bar now projecting from it.

The tube should then be withdrawn and the bar checked for suitable alignment through the joint with due consideration to the intended concrete cover.

Typical counter-bending tool

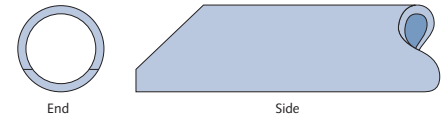


Figure 3

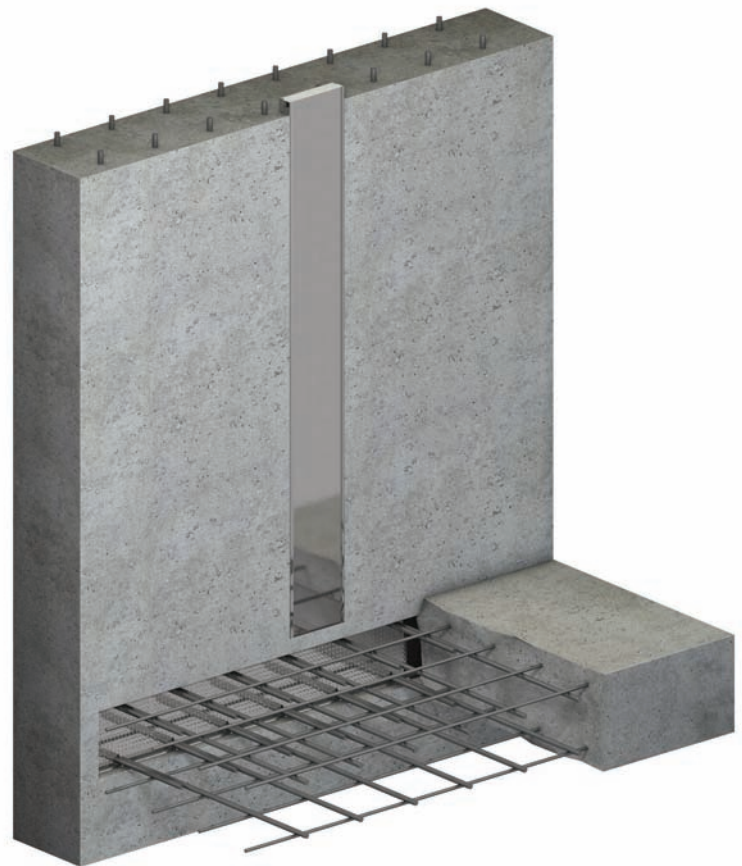


Figure 4

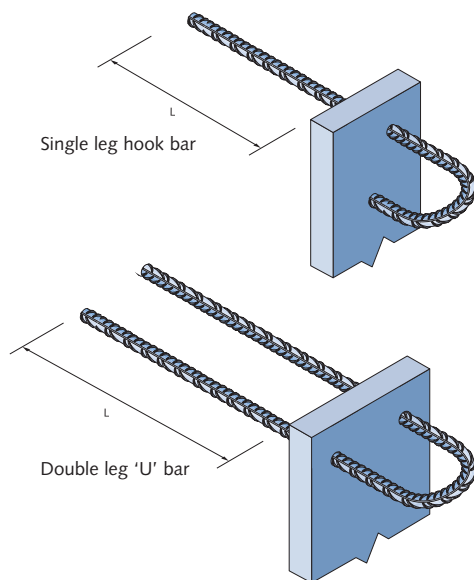
# Kwikastrip range and how to order

State only the quantity, Kwikastrip unit type, bar type and bar centres.

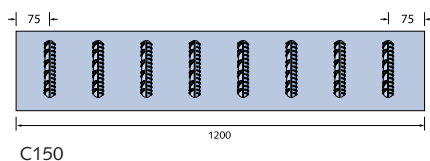
**e.g. 50 no. Kwikastrip M8.5S B12 C150 STD**

The engineer should confirm the application suitability of all dimensions.

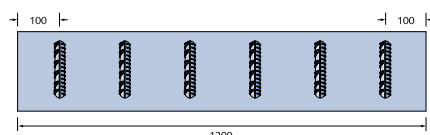
Kwikastrip is available off the shelf in casing lengths of 1200mm. This casing length is significant because the end distances to the first and last bars (75mm for 150mm centres and 100mm for 200mm bar centres) ensures that where the cases are butted to one another, the correct bar centres are accurately maintained, as is the cross sectional area of reinforcement through the construction joint.



Bar spacings



C150



C200

Unit type	Dimensions	Bar type	Bar spacings	Lap 'L'
M 8.5S		B12	C150/C200	500
M 15S		B12	C150/C200	500
M 17S		B12	C150/C200	500
M 19S		B12	C150/C200	500
M 22S		B12	C150/C200	500
M 25S		B12	C150/C200	500
M 12D		B16	C150/C200	650
M 19D		B16	C150 C200	600 650
M 22D		B16	C150/C200	650
M 25D		B16	C150/C200	650

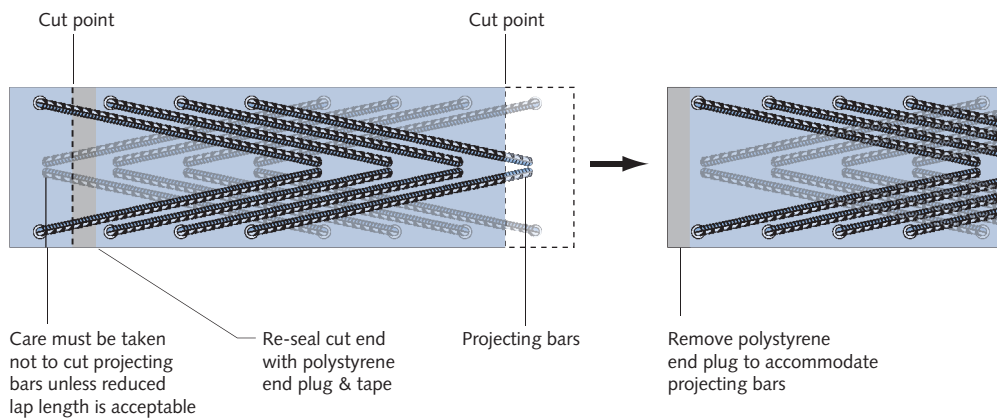
# Frequently Asked Questions

## Can Kwikastrip be cut on site?

*Where Kwikastrip needs to be cut to length, the case material can be cut with a hand-held cut-off saw. However, extreme care must be taken not to damage the pullout bars inside the case.*

We recommend removing one-bar sections from one or both ends of a Kwikastrip case to reduce the length of a unit. If more than one unit occurs in a run we suggest one-bar sections are removed from a number of units to achieve the required reduction in length.

When a case is shortened the remaining pullout bars will project from the cut ends. These can be overlapped into an adjacent unit by removing the polystyrene end seal. Please be sure to re-seal the cut ends with polystyrene or a strong formwork tape to prevent the ingress of cement grout.



### N.B Safety

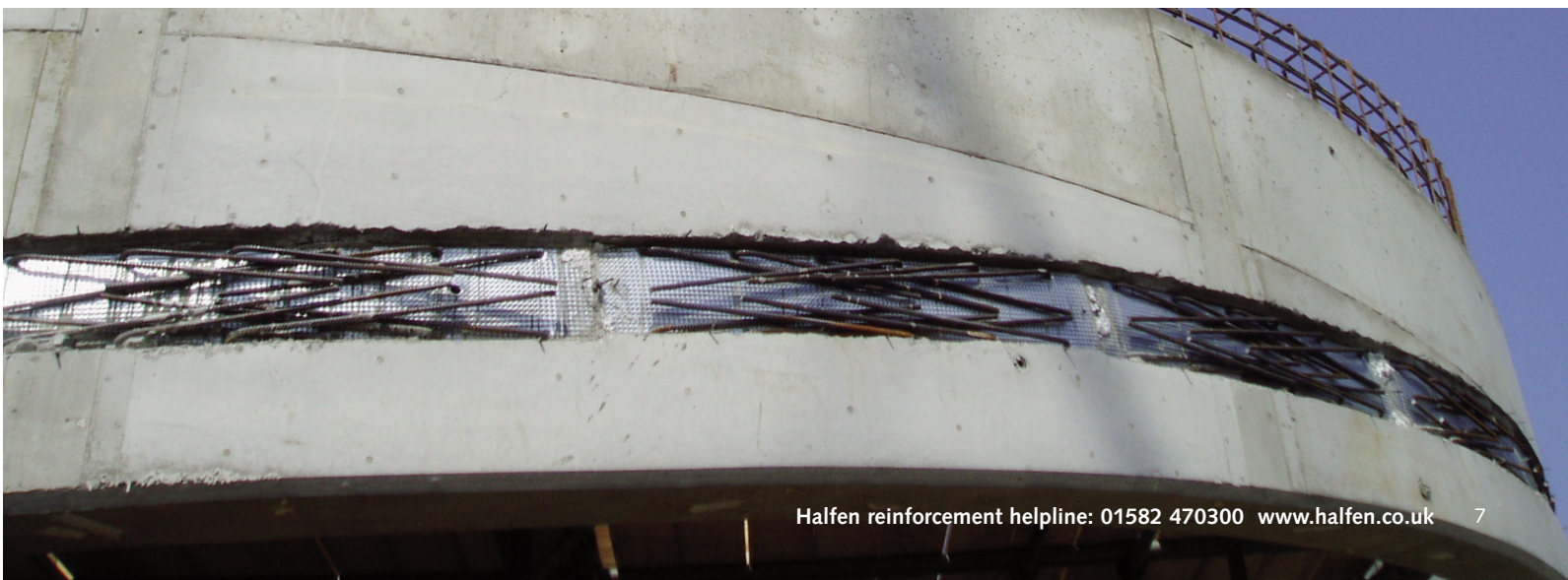
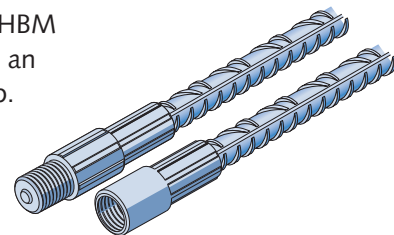
All safety regulations and tool manufacturer's instructions must be observed when cutting Kwikastrip. Cutting may leave sharp edges so suitable personal protection equipment must be used.

## What are the loading differences between Kwikastrip and traditional loose/unbent rebar?

Structural tests (by UK CARES) showed that the flexural and shear strength of construction joints formed with Kwikastrip are no less than those of traditionally formed construction joints.

## If Kwikastrip isn't feasible for my application, what can I use instead?

In these situations, the Halfen HBM threaded coupler system forms an ideal complement to Kwikastrip. Please ask for details.



# Technical approval

Kwikastrip was the first-ever product to attain Technical Product Approval by the UK CARES Certification Authority for Reinforcing Steels.

In the UK, due to the absence of any definitive British Standard covering the subject, it has historically been a matter of individual engineer opinion as to product application suitability. Such opinion had been reliant upon few factors; the manufacturer's data, elements of relevant British Standards 4449, 8666, and 8110, together with individually gained experience.

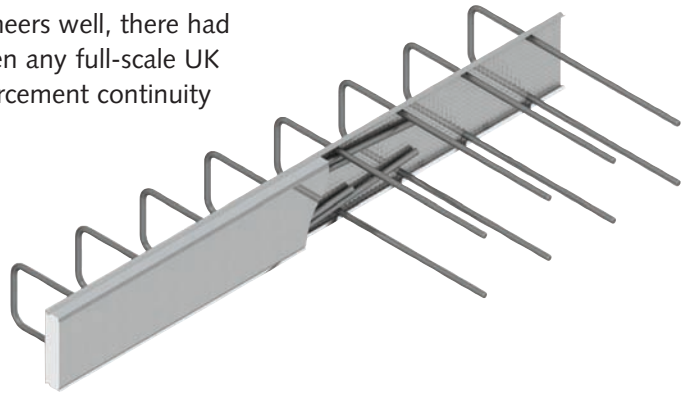
The most fundamental consideration had been the aspect of rebending high yield reinforcement, which is a prerequisite of the system.

Some concern is understandable, as BS8110 states that high yield reinforcement should not be re-bent or straightened without the engineer's approval.

As specialists, Halfen has been active for many years in regularly testing carefully selected reinforcement for its suitability to be rebent, and defining its subsequent performance once rebent. Whilst this information had served engineers well, there had never before been any full-scale UK tests for a reinforcement continuity

system in its application entirety (i.e. casing and reinforcement cast into concrete construction joints and those joints then subjected to load).

The UK CARES Technical Approval fills this void, and offers reinforcement engineers sound data by which they can design with increased confidence.



## Product testing



A copy of the Technical Approval Report can be downloaded from [www.halfen.co.uk](http://www.halfen.co.uk) or from [www.ukcares.co.uk](http://www.ukcares.co.uk)

Several wall/slab joints and column/nib constructions were formed in reinforced concrete, incorporating construction joints formed with Kwikastrap. These tests were full-scale in terms of bar sizes and member depths.

In all wall/slab specimens the continuity reinforcement was 16mm diameter deformed bar, chosen as being the largest bar size normally used in the Kwikastrap system and which imposes the greatest stresses on the surrounding concrete and the most severe demands on the reinforcement in relation to bending and straightening.

The series of reinforced concrete samples (some of which were cast in a manner simulating poor compaction) were subjected to various loading conditions representing high shear or high bending

moment. In all cases the samples exceeded the ultimate loads calculated from BS8110.

The structural tests showed that flexural strength and shear strength of construction joints formed with the Kwikastrap system are no less than those of equivalent traditionally formed construction joints.

The results of the comprehensive test programme, together with the quality of expert opinion within UK CARES, mean the approval is virtually equivalent to a British Standard.



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