Leading the field with the most technically advanced and proven barrier systems available.
Hill & Smith Innovative Solutions

Introduction

Hill & Smith Ltd – manufacture and supply specialist vehicle restraint systems throughout the world.

Hill & Smith are driving safety forward with a total solution, be it our FLEXBEAM VRS family of systems for use on highways, to BRIFEN the wire rope VRS used in over 30 countries worldwide or our OFFROAD industrial barriers protecting your property.

Hill & Smith, part of the HSROADS group of Hill & Smith Holdings PLC., which has vast experience in manufacturing vehicle restraint systems including:

• **Steel Barriers** - FLEXBEAM, FLEXBEAM PLUS and HI-FLEX are systems for highways, motorways and dual carriageways tested to EN1317

• **Wire Rope Barriers** – BRIFEN is world renowned for its wire rope system, again used on the highways and alongside steep inclines. Tested to EN1317, NCHRP350 and specialised Swedish standards.

• **Hybrid Impact Protection** – BRIFLEX incorporates steel barriers and wire rope to give the ultimate central reservation protection. Tested to EN1317 with a containment of H2 and a working width of W5.

• **Industrial Barriers** – Off Road systems for protecting your assets.

With a policy to supply quality of service, tested and proved products, the company has developed a strong reputation in the field of road safety.
Ensuring we continue to drive safety forward

“Our CE mark ensures that the installed product will perform as it was designed and tested, giving engineers and end users confidence when specifying our products. With these approved products we can offer the complete solution to overcome the problems encountered along the roadside...”

Hill and Smith has attained CE marks for the length of need systems within Brifen and the Flexbeam family ensuring we continue to drive safety forward.

The CE mark ensures that the installed product will perform as it was designed and tested, giving engineers and end users confidence when specifying our products.

With these approved products we can offer the complete solution to overcome the problems encountered along the roadside. When used with our tested transitions we ensure that when different products are required we can safely connect them together, whilst redirecting and containing an impacting vehicle safely. We also offer a range of terminals allowing complete end-to-end solutions, ensuring liability is held within one company.

Information for all of our products are available on our technical website. This website provides an easy-to-use graphical user interface which simplifies the management and publishing of Drawings & Technical Documents. These can be viewed, printed and downloaded from this site. Access can be gained through the link on our website - www.hill-smith.co.uk

In the interest of public safety Hill and Smith Ltd is a member of the European Union Road Federation (ERF) and the Vehicle Restraint Manufacturers’ Association (VRMA).
“Making an important contribution to road safety with installations in more than 30 countries throughout the world...”
The Brifen VRS is globally recognised and is increasingly specified by highway authorities including Britain, Australasia, the Middle East, Scandinavia, USA and South America.

A proven product, Brifen is making an important contribution to road safety with installations in more than 30 countries throughout the world.

Brifen has been tested to the two main approval standards – EN1317 and NCHRP350.

The speed of installation and lower lifecycle costs make Brifen VRS the preferred choice of many engineers.

Brifen has also gained CE marked approval for its EN1317 tested systems.

**EN1317 systems**

Under EN1317 we have systems to suit N2 and H1

<table>
<thead>
<tr>
<th>Containment/Working Width</th>
<th>System Ref.</th>
<th>Post Spacing</th>
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To allow connection to other barrier systems we have developed a transition (Britranz) which is fully tested to EN1317 and ensures it contains and safely redirects impacting vehicles.

There is also a simple arrangement to allow a transition between N2 and H1 systems.

We also offer terminals tested to P1 and P4 under EN1317 - these are available for both the 3 rope and 4 rope systems.

**NCHRP350 systems**

Brifen is available in several designs, all approved by the Federal Highway Administration (FHWA) as fully complying with NCHRP 350 TL-3 & TL-4 crash testing requirements. There are several types of end treatments also available, all of which meet FHWA compliance. These choices allow you to choose the system that best meets your specific needs.
Increased performance with fewer component parts

**Flexbeam is a family of systems designed to work together to ensure safe and compliant installations.**

It is an untensioned corrugated barrier system that offers a more economical solution to the installation process.

**Flexbeam VRS**

Flexbeam utilizes the ‘W’ beam profile mounted on ‘Z /S’ profile posts and has products to suit N2W2 / N2W3 / N2W4 / N2W5 single-sided and N2W2 / N2W3 / N2W4 double-sided. The systems can be installed on driven posts, surface mounted posts, in socketed posts or posts cast directly into concrete. Flexbeam can connect directly into Flexbeam plus without the need for a transition.

**Single-Sided**

<table>
<thead>
<tr>
<th>Containment/Working Width</th>
<th>System Ref.</th>
<th>Post Spacing</th>
<th>ISL</th>
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**Double-Sided**

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<td>N2W4</td>
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<td>N2W4</td>
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</table>
“Connects directly into Flexbeam without the need for a transition...”
A cost effective system even at low working widths

**Flexbeam+ is an evolution of Flexbeam which utilizes the ‘W’ beam profile mounted on ‘Z / S’ profile posts and has products to suit N2W1 / N2W2 / N2W3 single-sided.**

This system uses a stronger post than Flexbeam which allows post spacing to be wider, keeping the systems cost effective even at the low working widths.

The systems can be installed on driven posts, surface mounted posts, in socketed posts or posts cast directly into concrete. Flexbeam plus can connect directly into Flexbeam without the need for a transition and can connect to the range of Parapets from Varley and Gulliver on the Hi-flex range of systems by connecting to a Tranzflex transition.

**Single-Sided**

<table>
<thead>
<tr>
<th>Containment/Working Width</th>
<th>System Ref.</th>
<th>Post Spacing</th>
<th>ISL</th>
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<tr>
<td>N2 W3</td>
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</table>
High containment with standard components

This range has products to suit H1W3, H1W4 H2W1 and H2W5 single sided and H2W5 double-sided (Briflex).

The systems can be installed on driven posts (except H2W1), surface mounted posts, in socketed posts or posts cast directly into concrete. The single-sided systems are primarily used where increased protection is required, for example around bridge piers and gantries.

The H1 systems are designed to protect against impacting vehicles weighing 10,000kg and H2 is for 13,000kg vehicles. The double-sided H2 (Briflex) is for use in the central reservation where a higher containment is required over the usual N2 classification.

Approved transitions to EN1317 are available between all of our Hi-Flex systems and Flexbeam / Flexbeam Plus allowing seamless connections from end to end of the installation.

### Single-Sided

<table>
<thead>
<tr>
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<th>System Ref.</th>
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<td>H2 W1</td>
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<td>H2 W5</td>
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### Double-Sided

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<tr>
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</table>
“Versatile range of transitions for both barriers and parapets...”
Tranzflex is a range of transitions, which allow various products to be connected together whilst ensuring they contain and safely redirect impacting vehicles.

Within the range there are approved transitions into all of Varley and Gulliver parapets and between Flexbeam / Flexbeam plus and our Hi-Flex systems.

Using these approved transitions into Varley and Gulliver parapets, we can ensure that impacting vehicles are contained and safely redirected. When used with Flexbeam / Flexbeam plus and our terminals we can offer the complete end-to-end solution.

The transitions into the Hi-Flex range of systems are designed to safely transition between Normal Containment systems and High Containment systems again giving end-to-end solutions.

All transitions use standard components ensuring ease of installation and repair.

The UK’s premier manufacturer of both steel and aluminium bridge parapets to the civil engineering industry.
Flexible solutions for both P1 and P4 Terminals

**P1 Terminals**

For use on roads with a speed limit of less than 50mph, or departure ends on roads above 50mph (see TD19/06 for guidance)

There are two terminals in the FLEXBEAM range: one single-sided and one double-sided, both with a class code of D1.1.

**P4 Terminals**

For use on roads with a speed limit of 50 mph and greater (see TD19/06 for guidance)

We offer four P4 terminals:

- Trend with a class code of D1.1
- ABC with a class code of D1.1
- Euro ET with a class code of D1.3
- Euro BXT with a class code of D1.2

We also offer the TCB and OBB end terminals, which have been classed as P1 terminals.
Flexguard is a barrier which hangs beneath all other Flexbeam products, preventing motorcyclists from impacting the posts.

When the barrier is impacted by a vehicle, it is designed to fall to the floor. This does not affect the performance of the barrier and allows it to perform as designed.
NPSBS – Non-Proprietary Safety Barrier Systems (UK)

TCB

TCB is approved to EN1317 as N2W6 single and double-sided with a post spacing at 3.2m.

This type of barrier is the most frequently seen on the UK highways. It is a corrugated steel strip 310mm wide and mounted 610mm above ground on ‘Z’ shaped posts.

TCB absorbs impact by deflecting as a whole and assists the vehicle to decelerate, whilst guiding it back towards the carriage-way in a gradual and controlled manner.

This principle is best applied to long straight runs on motorways. It should not normally be installed on a radius of less than 120m.

There is no maximum installation length for TCB, but the approach/departure ends must be anchored at ground level to heavy-duty end posts or to full height anchors (a departure from standard is required).

The tensioner units consist of two M24 bolts installed in special steel brackets fitted into the rear corrugations of the main beam elements. These tensioner units are located at 70m intervals along the length of the barrier.

OBB/DROBB

OBB is approved to EN1317 as N2W4 and N2W5 single and double-sided with a post spacing at 1.2m and 2.4m respectively.

Open Box Beam is also suitable for use at the road edge or in the central reservation of motorways or high speed roads.

The strength of the barrier lies in the section of the rails, which are normally supplied in 4.8m and 2.4m lengths. These are connected together by fishplates which match the profile of the rail and sit inside, bridging adjoining beams.

There is no limitation on the length of run which can be installed, but both the approach and departure ends should be anchored at ground level to strong SHS posts, or to full height anchor frames (a departure from standard is required).

Due to the rigid nature of OBB some allowance must be made for the effects of temperature change, therefore a special expansion assembly must be fitted every 100m.

Heavier duty ‘Z’ section posts are used for mounting OBB in double height format (DROBB), where a potential hazard exists for vehicles with a higher centre of gravity and mass.
Untensioned Corrugated Beam (UCB) is an older generation safety barrier widely used for low impact, low speed applications such as car parks, residential areas and industrial sites to protect people, machinery and buildings inside and outside.

This very simple, untested system is often referred to as ARMCO and consists of a ‘W’ shaped corrugated beam, 3.2m effective, fixed to a concreted in or bolted down post that are readily available in various lengths - holed for single and double height beams.

We also offer Open Box Beam and Brifen Wire Rope as an alternative off road system.

We are a manufacture and supply-only company who provide speedy quotations and punctual delivery of orders.

‘Armco’

As manufacturers, we stock a large variety of ‘I’ posts and ‘Z’ posts to accommodate all situations. We are also able to produce posts and special length beams to meet your specific needs which can be quoted at the time of enquiry.

There is no minimum or maximum length required for ARMCO and it is often terminated using a D444 pedestrian end or Fishtail but there are other end terminals available.

We fully appreciate that not all projects run in a straight line and therefore we stock 90 degree and 135 degree corners but we are also able to curve beam to a minimum 6m radius.

Open Box Beam

OBB is a heavy duty system using beams either 2.4m or 4.8m long connected using fishplates which match the profile of the beam and can be mounted on to concrete in driven or surface mounted posts - using B17 clamp plates.

Although originally designed for the highway, it is now being used for off road applications where a more rigid and stronger system is required.

Brifen

Using Brifen Wire Rope for off road applications is becoming increasingly popular due to its aesthetically pleasing appearance.

We have previously supplied car manufacturers, show rooms and storage compounds to prevent theft and we can cover the rope in a plastic coating in a colour to suit it’s surroundings.

Although there is no minimum or maximum required length, it is far more cost effective on longer runs.
For further information on any of our products please call:
+44 (0)1902 499400