In a Word

Vehicle restraint systems made of concrete seem to have a wrong reputation. Due to the assumption concrete safety barriers are always hard and inflexible they appear to be dangerous for smaller vehicles.

After more than 25 years of development in the sector of precast concrete vehicle restraint systems the DELTA BLOC® safety barriers are standing in the forefront of safe restraint systems for passenger cars as well as for heavy goods vehicles. Thus the current product portfolio contains systems with the lowest impact severity level ASI A for optimal passenger safety as well as breakthrough safe barrier walls with the highest containment level H4b and non-moving rigid restraint systems with working width W1.

Vehicle Restraint System for added Safety on Public Roads

Concrete safety barriers were already being developed and deployed in the USA back in the 1950s with the intention of restricting the inevitable consequences of head-on vehicle collisions. In Europe, however, it wasn’t until the 1980s that the significance of restraint systems made of concrete for road traffic safety was realised. The introduction of European standard EN 1317 in 1998 ultimately provided the basis for systematic and comparable testing of vehicle restraint systems and for deployment in the most diverse application areas.

The level of technology provided by DELTA BLOC® today could have been only reached with highest effort and a maximum of commitment. With more than 100 crash tests undertaken thus far, DELTA BLOC® is setting standards worldwide for the development of highly-effective safety barrier systems for road traffic.

Yours

Thomas Edl, Managing Director
DELTABLOC International GmbH
All research, development and sales for DELTA BLOC® systems is concentrated within the headquarters at DELTA BLOC International GmbH. Five subsidiary companies in Germany, the Netherlands, France, Great Britain and Russia support these activities in their respective domestic market.

A company of the Kirchdorfer Industry Group
DELTA BLOC®
We develop safety.

▶ Successful with local production partners
▶ Safety in road traffic due to years of experience
▶ High tech restraint system due to continuous improvement

History

In 1985 the Austrian producer of prefabricated concrete MABA started producing concrete safety barriers. After implementation of the draft for EN 1317, parts 1 and 2, in 1993 the first impact tests with manned vehicles were conducted, starting in 1994 then with crash test dummies in remote controlled vehicles.

With inception of DELTA BLOC Europa GmbH as separate company in 2000, distribution was expanded into the neighbouring country Germany through licence partners. Seven licence partners have been producing modern, continuously improving DELTA BLOC® restraint systems since 2002.

Over the years DELTA BLOC Europa GmbH became one of the global leaders and licensors for tested vehicle restraint systems. Over 20 patents and utility patents as well as the development know-how from over 100 full scale crash tests conducted by well known test facilities have made DELTA BLOC® concrete safety barriers an internationally renowned high tech product.

Today, DELTA BLOC® is represented in over 30 countries through licence partners and subsidiaries. In this way a considerable contribution to road safety is made worldwide. With partners all over Europe, Africa, the Middle East, Russia and even Australia, over the last few years DELTA BLOC® has grown more and more to become an international company. For this reason in 2010 it was decided to rename DELTA BLOC Europa GmbH into DELTA BLOC International GmbH.

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Demands for new products depend on country specific regulations for the respective application areas, as well as on specific demands for certain projects.

DELTA BLOC® plans extensively together with its partners and they define common development goals for successful market cultivation.

DELTA BLOC® has been successfully developing vehicle restraint systems since 1985. In cooperation with technical universities they constantly expand their development know-how.

Impact tests are carried out on the prototypes to show, whether the system actually complies with the demands.

Applying the experience from more than 100 crash tests, DELTA BLOC® launches innovative solutions every year.
After successful impact tests, the new product is accepted into the DELTA BLOC® product range. The results of the impact tests give important key data for the planning of projects for road safety.

DELTA BLOC® supports project development and planning of partners. Besides the subsidiaries of DELTA BLOC® work on international large scale projects in new markets.

As soon the type of the restraint system and the amount of units for a project is fixed, the corresponding safety barriers manufactured by a licence partner in the respective country.

The DELTA BLOC® network currently consists of more than 30 partners worldwide. Due to production close to construction sites long-distance transports can be avoided, and the added value remains in the own country.

When realising the project, the licence partner delivers the safety barriers directly to the construction site and installs them.

The simple installation system of the precast units allows a high installation speed of up to 2500 m in an 8 hour shift.

Right after the installation, DELTA BLOC® safety barriers are ready for use without restrictions.

DELTA BLOC® restraint system units are maintenance free. This will keep running costs low. Upon heavy impacts, damaged elements can be replaced quickly and easily.
All vehicle restraint systems are tested in crash tests according to the European standard EN 1317. Before conducting the impact test, the containment level to be tested is defined based on the intended application of the safety barrier. For most containment levels two crash tests are necessary – one with a light passenger car and one with a heavy vehicle. During a crash, the passengers in a car undergo a severe acceleration of their bodies. Too high acceleration could lead to fatal injuries.

The test with the passenger car gives answers whether the measured acceleration is within the allowed range according to the standard. The test with the heavy vehicle proves that there will be no break-through in case of a serious impact.

### Performance Classes for Restraint Systems

<table>
<thead>
<tr>
<th>Containment capacity</th>
<th>Containment levels</th>
<th>Acceptance test</th>
<th>Vehicle total mass in kg</th>
<th>Impact speed in km/h</th>
<th>Impact angle in °</th>
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</thead>
<tbody>
<tr>
<td>low angle containment</td>
<td>T1 TB 21</td>
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<tr>
<td></td>
<td>T2 TB 22</td>
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<tr>
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<td>T3 TB 21</td>
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<td>TB 41</td>
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<td>TB 11</td>
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<td>higher</td>
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<td>very high</td>
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<td>H4b TB 81</td>
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Construction sites on highways and motorways are especially dangerous traffic areas. Carriage ways become narrower, must be changed or are even blocked completely. Drifting off the carriage way must be prevented especially reliably in these dangerous zones.

Temporary safety barriers by DELTA BLOC® offer maximum safety here – both for construction workers and for all road users.

Better working – Protection of Construction Sites with Temporary Safety Barriers by DELTA BLOC®

- adapted containment levels for all construction site situations
- sleek shape and low working width
- extremely low stress on passengers upon impact (ASI A with containment levels T1 and T3, ASI B for other containment levels)
- quick installation and removal
- easy to transport due to low element weight
- no damage to elements after slight impact
- fast replacement of damaged elements
- re-usable on other construction sites
- available upon short notice due to large stock
A steadily increasing traffic volume requires a higher level of road safety – especially on highways and motorways. Vehicle restraint systems with high containment levels are needed here, which are able to prevent a break through even of very heavy and fast vehicles. In this field, the elegant and reliable DELTA BLOC® safety barrier is exactly the right thing.

Constantly safe –
DELTA BLOC® Permanent Safety Barriers

- the right containment level for any application
- minimal space requirements (e.g. only 48 cm for the DB 80AS-E / H2 W1)
- low stress on passengers upon impact (DB 100S / ASI A)
- most systems without anchoring on the road surface
- application on the shoulder, on the central reservation and between carriage ways
- elegant New Jersey profile
- closed surface, offering highest safety, especially for motorcyclists
- fast installation
- no damage to elements after slight impact
- quick replacement of damaged elements after heavy impact
- very little maintenance
System Transitions

Safe Connection –
DELTA BLOC® System Transitions

Steel guard rails, in situ concrete systems and prefabricated concrete elements - there are many different vehicle restraint systems. The transition between these systems is ensured by DB SafeLink® system transitions by DELTA BLOC®.

Continuous Safety –
with DELTA BLOC® System Transitions

- tested according to EN 1317-4
- high containment level H2
- low working width
- fast installation
- transition to different types of safety barriers
Safety Barriers for Bridges

Safe against Falling – DELTA BLOC® Safety Barriers for Bridges

Bridges connect – but they can also be dangerous. High containment levels prevent even heavy vehicles from breaking through safety barriers and falling off the bridge.

Vehicle restraint systems for bridges must be suitable both for vibrations of the construction and temperature related expansion of the bridge.

DELTA BLOC® safety barriers for bridges comply with these criteria. Position fixation and expansion sets compensate construction movements, systems with high containment levels (H2 and H4b) reliably prevent falls. As the elements are not anchored on the bridge very little forces are transferred into the bridge structure in case of an impact.

Arrive safely – with DELTA BLOC® Bridge Systems

- highest containment levels – H2 and H4b
- low space requirements
- low passenger stress on impact
- not anchoring with bridge structure
- high-end solutions for bridge expansion joints
- fast installation
- prevents dropping parts, even after heavy impact
- fast replacement of damaged elements
- very little maintenance

As the elements are not anchored on the bridge very little forces are transferred into the bridge structure in case of an impact.
Traffic generates noise – and it needs safeguarding. DELTA BLOC® noise barrier walls offer a unique combination of reliable vehicle restraint system and efficient noise barriers.

**Keep the Noise down – DELTA BLOC® Noise Barrier Systems**

- combination of vehicle restraint system and noise barrier wall
- highest containment levels H2 and H4b
- very little space requirement
- low passenger stress on impact
- more efficient noise protection
- through close placement to the sound source
- variable heights, from 150 cm to 450 cm
- temporary application on construction sites due to unanchored installation
- not anchored with road surface
- no damage to elements after slight impact
- many architectural design solutions

**Live in Peace – with DELTA BLOC® Noise Barrier Systems**
Mission Statement & Vision

Mission

We develop and distribute innovative precast systems for infrastructure as a globally operating technology leader.

Vision

- We develop the right products for the right locations.
- We are creating products, which are working permanently with highest reliability.
- We create innovations that contribute to higher safety on roads.
- We develop safety.

Comprehensive Policy

- We create innovative solutions for our customers - actively and flexibly.
- We provide objectives and structures to rise the competence of our employees.
- We, our suppliers and our partners can assure highest quality due to our mutual experiences.
- We generate trust by having success.
- We assume responsibility in service for safety.
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