

4SAFE®



4Safe

I syfte att skapa ett säkrare och tryggare vägräckessystem har Fracasso Spa skapat en ny räckesfamilj, 4Safe, det enda räckessystemet som kombinerar ett begränsat antal komponenter med en mycket hög säkerhetsstandard, flexibel användning och enkel installation.

Fördelar

- Samma komponenter för alla utföranden
- Lätt att montera
- Unikt koncept testad i klass H4 och överfört till alla räcken som hör till familjen
- Enkel att reparera, lagerhålla och hantera
- Begränsat antal komponenter
- Säker lösning för alla vägsystem
- Inga onödiga farligheter tack vare likartade övergångar
- Ingen kontakt mellan provdockans huvud och räckets vid kollisionstest

Specifikation

- Räcken tillverkade och certifierade enligt EN 1317
- 4Safe familjen är utformat och utvecklad enligt de högsta kraven (RPS 2009) utgivna av det tyska transportministeriet och godkända av EU
- Stålkvalitet S235-S275-S355JR i överensstämmelse med EN 10025
- Varmförzinkning enligt EN 1461:2009
- Bultar och muttrar tillverkade enligt EN ISO 898 - EN 20898 UNI 3740/6

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Fracasso aims to develop combinable road safety systems - able to create excellent passive safety conditions on road and highway networks - rather than single systems that meet specific contingent needs.

Fracasso "4Safe" family consists of a group of safety road barriers including single or multiple longitudinal elements with the same cross section, even if of different height and mounting different additional parts. Characteristic of this "4Safe" family is the 3n beam, the common element against which a vehicle crashes during a TB11 test.

The "4Safe" family barriers are all made with the same components according to the "4E" design line (4 elements), except for additional parts. Their working mechanism is the same for single components and for the whole system.

FRACASSO "4Safe" BARRIER COMPONENTS

The concept of Fracasso "4Safe" family means that design and production are based on the "4E" principle (4 elements) that is the use of only 4 main components: post, spacer, beam, bar.

- 3n Beam

The 3n three-wave beam has the same cross section and same position height off the road surface in all Fracasso "4Safe" family systems. The 3n beam is the element always coming into contact with the TB11 test vehicle.

The 3n beam is wide enough to restrain both light and heavy vehicles. In case of crash, the beam works mainly by traction and deflection.

- Preformed spacer

The spacer is directly placed between the 3n beam and the post. Its shape optimises behaviour during energy absorption.

- Post

The "C" section post is designed to combine a geometry with no sharp corners and a dynamic performance, especially in the side exposed to the traffic.

- Bar

The bar is the element - along with the 3n beam - designed to restrain heavy vehicles.

This element can be installed both as single and double element in case of barrier of higher restraint levels. It limits also cross barrier deformations.

"4SAFE" SYSTEM LOGISTICS

The barrier family concept has been used by Fracasso since the 80's for "3n" type systems. These systems are still highly efficient and successful due to their significant performance and the principle of reduction of the basic components.

Fracasso new family is an evolution of the previous systems - keeping the high performance and use versatility - with a limited number of components.

This provides benefits for all bodies using the "4Safe" system:

- Same components for all configurations
- Easy assembly
- Unique concept tested in class H4 and extended to all the products' family
- Cheap replacements, warehousing, handling
- Limited number of spare parts
- Safe solutions for all road systems
- Elimination of dangerous spots due to homogeneity of the connected systems
- No contact between dummy's head and safety barriers, during the crash test

Production regulations

Produced in accordance with European regulations EN 1317



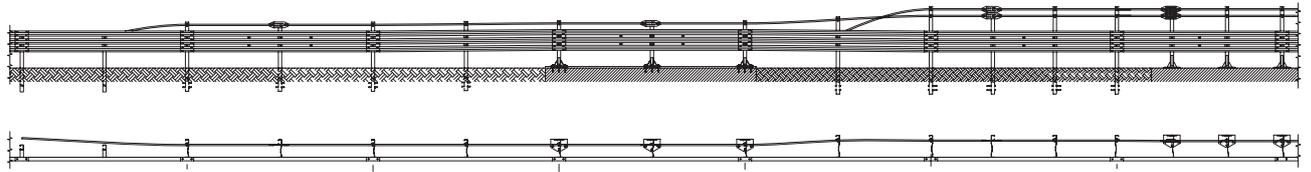
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TRANSITIONS/TERMINALS/CRASH CUSHIONS

The 4Safe family also includes the following special structures: terminals, transitions and crash cushions.

TRANSITIONS

The 4Safe barrier family includes fully compatible sections for the various containment levels preventing the use of special parts. As this is a progressive reinforcement system, the moving from one containment level to the next is carried on by the addition of a containment bar.



LAYOUT

Moving between the different levels is carried on by progressively reinforcing the barrier of lower restraint level or progressively softening the barrier of higher restraint level. Gap between barriers of non-consecutive level is not allowed. Transitions between systems with highly different reinforcements and performances is carried on by means of the mandatory transitions over all intermediate levels.

	H2 W5	H2 W4	NJ	H4B
H1	3n31447	A	B	
H2 W5		3n32539	C	
H2 W4			3n32645	3n32842
NJ				

A= 3n31447 + 4m (3n24872) + 3n23539

B= 3n31447 + 4m (3n24872) + 3n23539 + 3n32645

C= 3n23539 + 3n32645

TRANSITION MATRIX

The "4Safe" family completes the range through transitions of the main systems which are present in the market, anyway with behaviours and performance compatible with the 4Safe system, even if with different sections. Fracasso has developed progressive transitions complete with special connection pieces for these cases.

All Fracasso transitions are designed to guarantee the complete transmission of longitudinal forces and behaviour similar to that of two connected barriers. Tests are carried on according to EN 1317-4 norms using simulations with computational mechanics and FEM models that guarantee high adherence in real conditions.

TERMINALS

The twiny construction is a terminal tested as per EN 1317-4 class P2 standards. Its application is especially suited for 4Safe barriers, thanks to the continuity of the 3n longitudinal element. At the same time, it guarantees ground anchorage and transmission of longitudinal forces. In no case does it affect road barrier behaviour.

The twiny terminal is also available as a single twin-safe protection for trees or other obstacles on road sides.

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CRASH CUSHIONS

The group of 4Safe family accessories also includes a complete matrix of crash cushions, from class 60 to class 100, in sizes P, L and XL.

SPECIAL BARRIERS

In addition to guardrails on ground and for bridge, the 4Safe family includes a series of special structures designed for specific use.

In particular, the following safety structures:

- removable barriers using bridge guardrail construction technologies, designed for use on asphalt.
- protection barriers for bridge piles, combining high rigidity and containment capacity with progressive deformations for TB11 crash.
- Specific upgrade kits for pedestrians, cyclists and motorcyclists.

These were designed to meet road engineers' demands and offer safe special solutions without compromise. These solutions are also subject to tests carried on according to EN 1317-4 norms using simulations with computational mechanics and FEM models that guarantee high adherence in real conditions.

Production regulations

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EN 1317

