



Saving lives with
passive safe columns
in accordance with the
revised EN 12767 standard



Hydro offers passive safe aluminium
lighting columns and traffic poles
for your urban and rural roads
and for the high speed network

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Notation EN 12767

Since August 2019 the notation

100HE3 is replaced by, for example **100-HE-C-S-NS-MD-0**

100NE3 is replaced by, for example **100-NE-B-R-SE-MD-0**

100 Impact speed

The numbers 100, 70 or 50 that are mentioned refer to the impact speed of a vehicle in km/h in a high speed test.

HE Energy absorption category

The energy absorption category indicates the behavior of the column in the event of a collision.

- **HE column** slows the vehicle most quickly after a collision.
- **NE column** does not significantly reduce the speed of the vehicle after a collision.
- **LE column** behaviour lies naturally between that of an HE and an NE column.

C Occupant safety level

The safety level for the occupant(s) is made clear with the letters **A, B, C, D** or **E**. Previously this was indicated with the numbers 1 - 4. The best safety level for the occupant(s) is A. Class A is only achievable for such items as deformable bollards and not lighting columns, sign posts or signal poles.

S Backfill type

The backfill type has a major influence on the performance of a column and must correspond to the practical situation in which the column is installed.

- **Type S (soil)** Installation in the ground
- **Type R (rigid)** Installation in concrete or retention socket
- **Type X (other)** Not defined because X differs per manufacturer and is therefore never the same.

NS Collapse mode

The collapse mode indicates how the column behaves in the event of a collision.

- **NS (No Separation)** column remains a whole and connected to its location after a collision.
- **SE (Separation)** if shearing of the column after a collision is necessary to achieve the correct energy absorption category.

MD Direction class

The direction class indicates the angle at which a passive safe column performs.

- **MD column (Multi Directional)** is not sensitive to impact angle and can be hit from all driving directions.

- **SD column (Single Directional)** can only be safely hit from one direction 20°.
- **BD column (Bi Directional)** also performs for traffic coming from the opposite direction (20° and 160°).

0 Risk of roof indentation

A collision with a column can result in the formation of a dent in the roof of the vehicle, with risks for the occupant(s).

- **Class 0** poses little or no risk for the occupant(s). This is the safest class. Result of the test is a dent of maximum 102 mm (4 inches) deep.
- **Class 1** poses a great risk to the occupant(s). Result of the test is a dent of minimum 102 mm (4 inches) deep, without specifying a maximum.

In the UK, urgent advice is given for risk of roof indentation class 0 (see National Annex, table NA.1 Performance class recommendations). In the USA they even go a step further; class 1 is not allowed there.

Not all performance properties always have to be filled in. This depends on the designer because in some cases the properties in a category may have no interest or impact on a project or multiple choices are allowed. In that case an applicant can insert 'NR' (No Requirement) for those codes. An example:

100-NE-NR-NR-SE-MD-0

The classes for **Occupant safety** and **Back fill type** have not been specified here.

If passive safety is not applicable (for example outside the barrier-free zone or behind a crash barrier) you can opt for performance class **0** or No Performance Determined **NPD**.

Passively safe according to EU standard

Passive safety is a complex matter and insights in this area are changing. This brochure from Hydro helps you to understand the renewed EN 12767 regulations for passive safe columns, sign posts and traffic signal poles and to make the right choice so that you make your infrastructure safer and more sustainable.



European standard

In Europe, lighting columns must comply with the standard EN 40 and supporting structures for traffic signs and traffic lights with the standard EN 12899. In the event of passive safety, a test must be carried out in accordance with the EN 12767, which was revised in 2019. As soon as the manufacturer has had low-speed and high-speed crash tests conducted by an accredited test institute in accordance with EN 12767, the Notified Body can assign the safety class. If no crash tests are carried out, the product is automatically assigned to class 0.

Revised EN 12767

In the revision of the passive safety standard the notation of the performance classes has changed. In the old standard EN 12767:2007, a performance class consisted of a combination of impact speed, energy absorption category and occupant safety level. In the revised standard EN 12767:2019, backfill type, collapse mode, direction class and risk of roof indentation have been added.

Since the 1970s, Hydro has been conducting crash tests for columns



What is the safest choice?

With every road situation this depends on the presence of obstacles (pedestrians, cyclists, trees, etc.) and the speed limit of the road itself. If you want to make a safe choice easily, then placing a crash barrier is often a solution. However, a crash barrier is a costly solution and is not always desirable in the environment. A more cost effective and attractive alternative is the installation of passive safe products.

Aluminum passive safe columns from Hydro

- Limit the risk of personal injury after a collision
- Increase road safety
- Certified in accordance with the European standard
- Often naturally possess the necessary passive safe qualities class
- All energy absorption categories available (HE, LE, NE)
- Long lifespan
- Fully recyclable

Hydro has a great deal of know-how in the field of passive safety through years of experience with crash tests and active participation in the standards committee (TC50 / WG10).

Table NA.1 Performance class recommendations (BS EN 12767)

Situation	Location	Type of support structure		
		Lighting column Classifications listed (A, B, C, etc.) are in order of preference ⁽¹⁾	Sign or signal support ⁽²⁾ Classifications listed (A, B, C, etc.) are in order of preference ⁽¹⁾	Non-harmful support structure
Non-built-up all-purpose roads and motorways with speed limits > 40 mph	Generally in verges of motorways, dual carriageways and single carriage-way roads	100:NE:NR:NR:NR:MD:0 ⁽³⁾	100:NE:NR:NR:NR:MD:0 ⁽³⁾	100:NE:A
	With significant volume of non-motorized users at the times when impact events occur	100:HE:NR:NR:NR:MD:0 ⁽³⁾	(A) 100:HE:NR:NR:NR:MD:0 ^(3,4) (B) 100:LE:NR:NR:NR:MD:0 ^(3,4) (C) 100:NE:NR:NR:NR:MD:0 ^(3,4)	100:NE:A
	Where major risk of items falling on other carriageways below (e.g. at grade separated interchanges)	100:HE:NR:NR:NR:MD:0	(A) 100:HE:NR:NR:NR:MD:0 ^(3,4) (B) 100:LE:NR:NR:NR:MD:0 ^(3,4) (C) 100:NE:NR:NR:NR:MD:0 ^(3,4)	100:NE:A or 70:NE:A
Built-up roads and other roads with speed limits ≤ 40 mph	All locations	(A) 70:HE:NR:NR:NR:MD:0 (B) 100:HE:NR:NR:NR:MD:0 (C) 70:LE:NR:NR:NR:MD:0 (D) 100:LE:NR:NR:NR:MD:0 (E) 70:NE:NR:NR:NR:MD:0 ^(3,4) (F) 100:NE:NR:NR:NR:MD:0 ^(3,4)	(A) 70:HE:NR:NR:NR:MD:0 ^(3,4) (B) 100:HE:NR:NR:NR:MD:0 ^(3,4) (C) 70:LE:NR:NR:NR:MD:0 ^(3,4) (D) 100:LE:NR:NR:NR:MD:0 ^(3,4)	100:NE:A or 70:NE:A

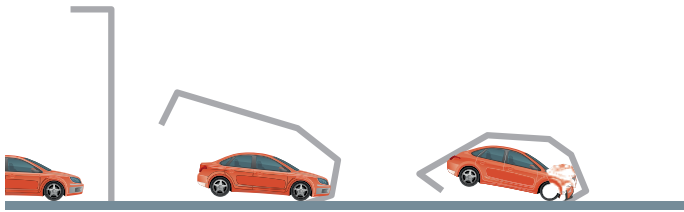
⁽¹⁾ Subject to the availability of compliant products that meet the specific needs of the particular situation

⁽²⁾ Includes supports for items of similar weight to that of the item supported in the test, such as variable message signs and speed cameras

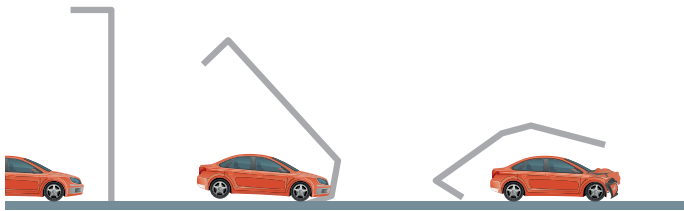
⁽³⁾ Category MD is the most preferable in all situations, followed by category BD or category SD

⁽⁴⁾ Category NE can be accepted in any situation where the standard posts defined as 'deemed to comply' in Annex K are used

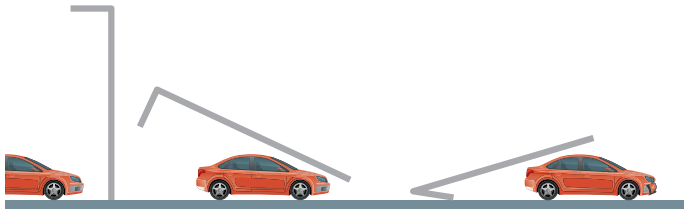
How does a passive safe column react in a collision?



HE column: High energy absorbing



LE column: Low energy absorbing



NE column: Non energy absorbing

HE columns

Distort when the car hits the column until the column breaks off. They reduce the speed of the vehicle significantly in the event of a collision, reducing the risk of secondary collisions with third parties or other obstacles. The risk of injury to the occupant(s) is therefore higher. In order to meet occupant safety level C or D, Hydro has integrated an arresting solution in the columns, which considerably reduces the speed of the vehicle after collision with the light columns, while at the same time, guaranteeing maximum occupant safety.

LE columns

Are a collision-safe interim solution. Aluminum columns often naturally perform in such a way that they bend under the vehicle in the event of a collision before breaking or shearing. As a result, they do not need any extra facilities, which is favorable for the pricing.

NE columns

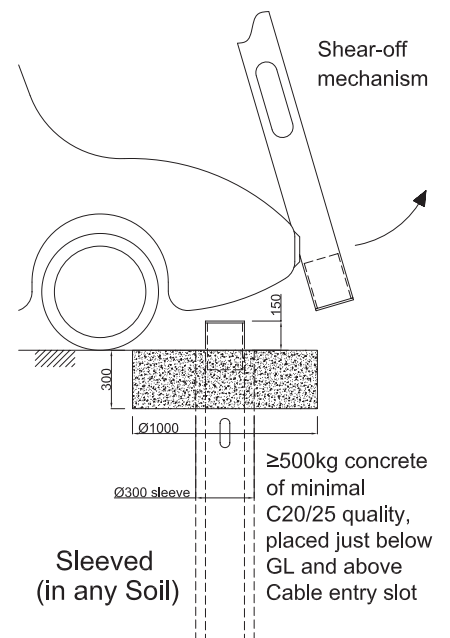
Allow the vehicle to continue at a reduced speed after the collision. This reduces the risk of injury to the occupant(s). To meet occupant safety level B, Hydro has developed an internal shear construction. Installed in a rigid foundation, the column will shear off the moment the vehicle hits the column, regardless of the direction (see sleeved foundation).

Sleeved foundation

To rule out deviations in the soil type (compared to the test determinants), the influence of soil variables can be minimized by installing the column into an over-sized plastic tube or 'sleeve'. For shearing NE poles with occupant safety level B this can be done using a concrete element, for example. The element consists of at least 500 kg concrete of minimal C20/25 quality and creates a stabilizing structure around a vertical column.

By positioning enough concrete around an NE poles with occupant safety level B with a shear off construction (which was originally tested in Soil "S"), all the variables in the soil are eliminated. This guarantees the NE-B classification.

For more information on foundations, see NA.5 of the national annex BS EN 12767.





Would you like to know more about passive safe columns or do you have questions about the revised EN 12767?

Then contact us. We will be happy to help you select the right passive safe aluminium columns so the infrastructure in your community becomes safer and more sustainable.

Pole Products / Hydro Extrusion Drunen BV

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Hydro is a global supplier of aluminium with activities throughout the value chain, from bauxite extraction to the production of rolled and extruded aluminium products and building systems. Based in Norway, the company employs 35,000 people in more than 40 countries. Rooted in a century of experience in renewable energy production, technology development and progressive partnerships, Hydro is committed to strengthening the viability of the customers and communities we serve.