



TECHNICKÝ A ZKUŠEBNÍ ÚSTAV STAVEBNÍ PRAHA, s.p.
Technical and Test Institute for Construction Prague, SOE

Akreditovaná zkušební laboratoř, Autorizovaná osoba, Notifikovaná osoba, Oznamovaný subjekt, Subjekt pro technické posuzování, Certifikační orgán, Inspekční orgán • Accredited Testing Laboratory, Authorized Body, Notified Body, Technical Assessment Body, Certification Body, Inspection Body • Prosecká 811/76a, 190 00 Praha 9 - Prosek, Czech Republic

Notified Body 1020

CERTIFICATE OF CONSTANCY OF PERFORMANCE

No. 1020 – CPR – 090-041130

In compliance with Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 (the Construction Products Regulation or CPR), this certificate applies to the construction product:

FIXED VERTICAL ROAD TRAFFIC SIGNS

variant : Delineator post

type : Smart Flexbollard 8, Smart Flexbollard 11

Functional class **D3**

Wind load **WL1, WL2**

placed on the market under the name or trade mark of

CV Plás, Indústria de Plásticos e Derivados Lda

Identification No.: PT 514104090

Address: Travessa da Trindade N° 16 5° Andar C/D, Lisboa, PORTUGAL

and produced in the manufacturing plant(s):

CODE FORMAT CV1 and CV2

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in Annex ZA of the standard

EN 12899-3:2007

under system 1 for the performance set out in this certificate are applied and that the factory production control conducted by the manufacturer is assessed to ensure the

constancy of performance of the construction product.

This certificate was first issued on 27 April 2018 and will remain valid as long as neither the harmonised standard, the construction product, the AVCP methods nor the manufacturing conditions in the plant are modified significantly, unless suspended or withdrawn by the notified product certification body.

The stamp of the Notified Body 1020

Prague, 27 April 2018

Ing. Jiří Studnička
Deputy Manager of the Notified Body





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Notified Body 1020

Branch 0900 – Technical Engineering Services

REPORT

**on the outcome of the assessment and verification of constancy
of performance of the product**

according to the Regulation (EU) 305/2011 of the European Parliament and of the Council of 9 March 2011
(the Construction Products Regulation or CPR), Art. 1.2 of the Annex V

No. 090-041129

Trade name:

FIXED VERTICAL ROAD TRAFFIC SIGNS

variant: Delineator post

type: Smart Flexbollard 8, Smart Flexbollard 11

Manufacturer:

CV Plás, Indústria de Plásticos e Derivados Lda

Identification No.:	PT 514104090
Address:	Travessa da Trindade N° 16 5° Andar C/D, Lisboa, PORTUGAL
Manufacturer:	CV Plás, Indústria de Plásticos e Derivados Lda
Address:	Travessa da Trindade N° 16 5° Andar C/D, Lisboa, PORTUGAL
Production plant:	Code format CV1, CV2
Order:	Z090170586

Number of report pages including title-page: 6

Number of Annexes: 0

Stamp of the Notified Body 1020

Prague, 27 April 2018




Roman Ondruška
Head Assessor

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Technický a zkušební ústav stavební Praha, s. p., Branch 0900-TIS, Prosecká 811/76a, 190 00 Prague, Czech Republic
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Bank: KB Praha 1 Czech Republic, account No.: 1501-931/0100, ID No.: 000 15679, Tax No.: CZ00015679

1. General

1.1 Information about the manufacturer

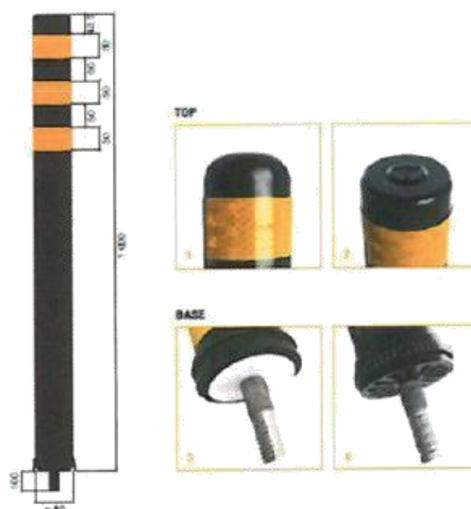
- Manufacturer: **CV Plás, Indústria de Plásticos e Derivados Lda**
Travessa da Trindade N° 16 5° Andar C/D, Lisboa, PORTUGAL
- Production plant: Code format CV1, CV2

1.2 Information about the product and its intended use

Delineator post is a product for directing vehicles and pedestrians. It is installed where the danger of car accidents is high and drivers' extra focus is needed, to support road traffic signs. The Delineator Post spatially divides traffic flows from both directions and catches drivers' eyes to warn them of dangerous areas.

Delineator posts are made from the polyurethane, fitted with retro-reflective foil and fixed on the road by glue, drilling hole with depth 100 mm in surface and insert chemical glue.

Smart Flexbollard 8 – different height and color, installed on the road by drilling 24 mm hole in surface.



Smart Flexbollard 11 – different height and color, installed on the road by drilling 32 mm hole in surface.



1.3 List of documentation provided by the manufacturer to the assessment and verification of constancy of performance (AVCP)

- application for performance of activity of notified body – AVCP system1
- Drawings of the elements
- Description of product
- Product catalogue
- Inspection certificate
- CE handbook
- CE declaration of microprismatic retroreflective sheeting – 3M High Intensity Prismatic 3300 (Declared Performance by 13/0304, 17/0465)

1.4 List of the other documentation used during the product AVCP

- None

1.5 Technical specification relating to the AVCP

- EN 12899-3:2007 Fixed, vertical road traffic signs - Part 3: Delineator posts and retroreflectors

1.6 Information about previous AVCP

The producer did not demonstrate any previous product certification.

2 Product Assessment

2.1 Technical requirements

The product was assessed under EN 12899-3:2007 Fixed, vertical road traffic signs - Part 3: Delineator posts and retroreflectors, with respect to the following monitored properties:

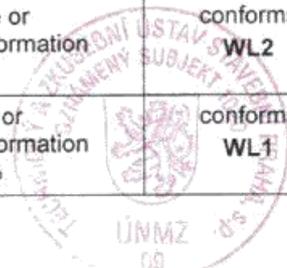
- Resistance to horizontal load
- Functional properties during vehicle impact
- Resistance to impact
- Visual characteristic
- Durability

2.2 List of the Test Reports:

- Protocol on ITT testing Nr. 090-041231, issued test lab TZUS Praha s.p., branch TIS on 24 April 2018
- Protocol on ITT testing Nr. 090-040778, issued test lab TZUS Praha s.p., branch TIS on 16 April 2018

2.3 Evaluation of the results of the product tests and assessment

Monitored property	Test Protocol	Test procedure	Test result	Required / declared level	Evaluation
1	2	3	4	5	6
Resistance to horizontal load					
– Static requirements	2.2	EN 12899-3:2007 art. 6.4.1.1	Test report 090-041231 090-041778	R: No damage or permanent deformation more than 5%	conforms WL2
			Test report 090-041231	R: No damage or permanent deformation more than 15%	conforms WL1



Performance under vehicle impact (passive safety)					
Dynamic impact resistance (material requirements)	2.2	EN 12899-3:2007 art. 6.4.1.2	Test report 090-041231 090-041778	R: post class D1 and D2 no damage and class D3 must return to the upright position	conforms D3
Dynamic impact resistance (functional requirements)		EN 12899-3:2007 art. 6.4.1.3	Test report 090-041231 090-041778	R: post class D1 may not be applicable, D2 shall be applicable and class D3 shall be applicable and must return to the upright position	conforms D3
Dynamic impact resistance (passive Safety)		EN 12899-3:2007 art. 6.4.1.4		NPD	
Visual characteristic					
Daytime chromaticity and luminosity factor	1.3	EN 12899-3:2007 art. 6.3.1	Assessment, product declaration	R: trichromatic coordinates and luminosity factor – value by tab. 1	conforms
Durability					
Resistance to corrosion	1.3	EN 12899-3:2007 art. 6.4.1.5	Assessment, product declaration	R: condition in article 6.4.1.5	conforms
UV Resistance	1.3	EN 12899-3:2007 art. 6.4.1.6	Assessment, product declaration	R: reflective factor – value by tab. 3, 4, 5	conforms
Hazardous substances		EN 12899-3:2007 art. 10		NPD	

Evaluation conclusion: the product confirms to and complies with the declared purpose.

3 Factory Production Control Assessment

The product assessment was performed in manufacturer CV Plás, Indústria de Plásticos e Derivados Lda, Travessa da Trindade N° 16 5° Andar C/D, Lisboa, PORTUGAL and manufacturing plant CV1 and CV2 on 17 April 2018.

3.1 Requirement of the technical specification regarding Factory Production Control:

The requirements on the production management system are stipulated in EN 12899-3:2007 Fixed, vertical road traffic signs - Part 3: Delineator posts and retroreflectors

3.2 Evaluation of the Factory Production Control assessment results:

- The technical documentation of the producer CV Plás, Indústria de Plásticos e Derivados Lda contains a description of the production management system in the internal document Technological Guideline for Delineator post.
- The production management system complies with the technical documentation and ensures that the marketed products conform to the technical specifications, and is assessed as conforming

4 Conclusion

- The sample of product fulfils the requirements of the technical specification.
- The FPC is in accordance with the harmonised technical specification and ensures that the declared performances are achieved.
- Findings and conclusions mentioned in this Report are valid providing the conditions under which FPC assessment was carried out remain unchanged (e.g. technical regulations, technical specifications, production technology, incoming raw and manufacturing equipment).



- In compliance with provision of the CPR Art. 1.2, Annex V Surveillance Reports containing FPC assessment and evaluation have to be complementary to the technical documentation.

5 Annexes

The documents are not part of this Protocol and are kept by the author.

Prepared by: Roman Ondruška



RELATÓRIO DE ENSAIO

LABORATÓRIO DE ENSAIOS DE PRODUTOS

Nº. RELV3018/18

DATA DE EDIÇÃO / EDITION DATE: 2018/07/17

CLIENTE / CLIENT:

CV PLÁS - Indústria de Plásticos e Derivados, Lda.
Travessa da Trindade, n.º 16, 5º Andar C/D
1200-469 - LISBOA

N.º DE AMOSTRAS / N.
OF SAMPLES::

1

DESIGNAÇÃO
DA(S) AMOSTRA(S)
/ SAMPLE(S)
DESIGNATION:

SMART FLEX BOLLARD Ø8 H80

PRINCIPAL
EQUIPAMENTO /
MAIN EQUIPMENT:

Nível Digital / Digital Protractor (Código Interno / Internal code - LV51-00)
GPS GARMIN (Código Interno / Internal code - LV67-00)

TIPO DE ENSAIO / TYPE OF TEST:

Ensaio de passagem sobre a Baliza Flexível /
Test of passage on the Flexible Bollard

DOCUMENTO DE REFERÊNCIA / REFERENCE DOCUMENT:

Procedimento de Ensaio PELV34 (Edição 0 de 26/06/2018) /
Test Procedure PELV34 (Edition 0 of 26/06/2018)

RESULTADOS / RESULTS:



Figura 1 - Fotografia da Baliza Flexível utilizada no ensaio.
Figure 1 - Picture of the Flexible Bollard used in the test

Resultado Global / Global Result: **CONFORME / APPROVED**

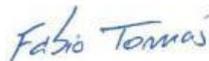
Os resultados do ensaio encontram-se nas páginas seguintes.
The test results are presented in the following pages.

DATA DO ENSAIO /
DATE OF TEST:

2018/07/02

PAGINA /
PAGE: 1 / 11

EXECUÇÃO / EXECUTION



Fábio Fernando Silva Tomás

RESPONSÁVEL TÉCNICO / LABORATORY RESPONSIBLE



Paulo Renato Pires da Silva

1 - INTRODUÇÃO / SCOPE

O presente documento tem como objetivo apresentar o resultado dos ensaios efetuados, com vista a verificar a conformidade da amostra com o documento de referência aplicável // The present document has the purpose to present the results of the tests carried out, verifying the conformity of the sample with the applicable reference document

O ensaio foi realizado, na amostra, segundo o Procedimento de Ensaio PELV34 (Edição 0 de 26/06/2018); / The test was carried out on the sample according to the following Test Procedure PELV34 (Edition 0 of 26/06/2018)

Os ensaios foram realizados no Circuito do Estoril - Estoril (Portugal) / The test were carried out at Estoril Circuit - Estoril Portugal

Número de embates na Baliza Flexível, definido pelo fabricante / Number of attack at Flexible Bollard, defined by the manufacturer: **1000 embates / attacks**

2 – INSTRUMENTAÇÃO / INSTRUMENTATION

O ensaio foi realizado utilizando os seguintes recursos / The test was performed using the following resources:

- Veículos de ensaio / Testing vehicles: **BMW 520d (1810 kg; Altura ao solo / Ground clearance: 240mm); Volkswagen Golf (1395 kg; Altura ao solo / Ground clearance: 220mm) e Peugeot 406 (1535 kg; Altura ao solo / Ground clearance: 215mm);**
- Pista de ensaio / Test track: **Padock do Circuito do Estoril;**
- Dispositivo de medição da velocidade do veículo / Vehicle speed measuring device: **GPS GARMIN LV67-00**
- Contador de ciclos / Cycle counter: **OMRON H7 EC**
- Equipamento de medição da deformação, em termos de perpendicularidade ao solo / Equipment for measuring deformation in terms of perpendicularity to the ground: **Nível Digital / Digital Protractor LV51-00**

3 – AMOSTRA DE ENSAIO / TEST SAMPLE

A amostra utilizada no ensaio foi selecionada aleatoriamente do processo produtivo, de forma a ser representativa da produção / The sample used in the test was randomly selected from the production process, so as to be representative of the production.

Designação da Amostra / Sample Designation: **SMART FLEX BOLLARD Ø8 H80.**

No Anexo 1 é apresentada a Ficha Técnica em Português e em Inglês / Annex 1 shows the Technical Data in Portuguese and English.

4 – MÉTODO DE ENSAIO / TEST METHOD

A realização do ensaio consistiu em / The test shall consist of:

- Fixar a Baliza Flexível no solo (pista de ensaio) de acordo com as instruções do fabricante, respeitando o tempo de estabilização da fixação de forma a assegurar que a fixação reproduz as condições normais de utilização / Attach the Flexible Bollard to the ground (test track) according to the manufacturer's instructions, respecting the stabilization time of the fastening to ensure that the fastening reproduces the normal conditions of use;
- Efetuar as medições iniciais de referência, relativamente ao desvio de perpendicularidade ao solo / Carry out the initial reference measurements, relative to the deviation of perpendicularity to the ground;
- O veículo deve aproximar-se da Baliza Flexível a uma velocidade estabilizada de 50 km/h (-0 / +5 km/h) / The vehicle must approach the Flexible Bollard at a steady speed of 50 km/h (-0 / +5 km/h);

- O veículo foi conduzido em linha reta na zona de aceleração de tal forma que o eixo longitudinal médio do veículo esteja alinhado com o eixo da Baliza Flexível / The vehicle was driven in a straight line in the acceleration zone such that the median longitudinal axis of the vehicle is aligned with the axis of the Flexible Bollard;
- A avaliação da deformação da Baliza Flexível foi feita a cerca de 30%; 50% e 75% do número de passagens definido pelo fabricante e no final de todas as passagens (100%) / The evaluation of the deformation of the Flexible Bollard was made to about 30%; 50% and 75% of the number of passes defined by the manufacturer and at the end of all passes (100%);

5 – CRITÉRIO DE ACEITAÇÃO / ACCEPTANCE CRITERIA

Após a realização do número de passagens definido pelo fabricante, a Baliza Flexível considera-se “Conforme” se / After realizing the number of passages defined by the manufacturer, the Flexible Beacon is considered "Conformed" if:

- Manter a sua funcionalidade (regressar à posição vertical após cada embate) / Maintain its functionality (return to the vertical position after each attack);
- Permanecer perpendicular ao solo, com um desvio máximo de $\pm 5^\circ$ face à posição inicial de referência / Remain perpendicular to the ground, with a maximum displacement of 5° from the initial reference position.

6 – RESULTADOS DO ENSAIO / TEST RESULTS

Para a medição do desvio de perpendicularidade ao solo, foi efetuada a marcação de 4 quadrantes no topo superior da Baliza Flexível (“A”, “B”, “C” e “D”), como indicado na Figura 2 / For the measurement of perpendicularity to the ground, four quadrants (“A”, “B”, “C” e “D”) were marked on the upper top of the Flexible Bollard, as indicated in Figure 2.



Figura 2 – Topo superior do SMART FLEX BOLLARD Ø8 H80.
Figure 2 - Top of the SMART FLEX BOLLARD Ø8 H80

6.1 – Perpendicularidade ao solo (referência inicial) / Perpendicular to ground (initial reference)

Na Tabela 1 são apresentados os valores de referência para o desvio de perpendicularidade ao solo, antes de iniciar o ensaio / In the Table 1 are indicated the reference values for the deviation of perpendicularity to the ground, before starting the test.

Tabela 1: Perpendicularidade ao solo, antes de iniciar o ensaio. (referência inicial) / Perpendicular to ground, before starting the test, (initial reference)

Posição / Position	A	B	C	D
Perpendicularidade / Perpendicularity	-88,5°	87,5°	88,7°	-87,6°
Desvio de Perpendicularidade / Perpendicular deviation	-1,5°	2,5°	1,3°	-2,4°

6.2 – Desvio de perpendicularidade após 300 embates / Perpendicular deviation after 300 attacks

Na Tabela 2 são apresentados os valores do desvio de perpendicularidade ao solo, após a realização de 300 embates / Table 2 shows the values of the perpendicularity deviation to the ground, after 300 attacks.

Tabela 2: Perpendicularidade ao solo, após 300 embates / Perpendicular to ground, after 300 attacks

Posição / Position	A	B	C	D
Perpendicularidade / Perpendicularity	-86,2°	88,1°	87,4°	-87,2°
Desvio de Perpendicularidade / Perpendicular deviation	-3,8°	1,9°	2,6°	-2,8°
Deformação permanente / Permanent deformation	-2,3°	-0,6°	1,3°	-0,4°

Na Figura 3 é apresentado o desgaste da amostra após 300 embates / In Figure 3, the wear appears of the sample after 300 attacks



Figura 3 – Desgaste da amostra após 300 embates.
Figure 3 - Wear appears of the sample after 300 attacks

6.3 – Desvio de perpendicularidade após 500 embates / Perpendicular deviation after 500 attacks

Na Tabela 3 são apresentados os valores do desvio de perpendicularidade ao solo, após a realização de 500 embates / Table 3 shows the values of the perpendicularity deviation to the ground, after 500 attacks.

Tabela 3: Perpendicularidade ao solo, após 500 embates / Perpendicular to ground, after 500 attacks

Posição / Position	A	B	C	D
Perpendicularidade / Perpendicularity	-85,9°	88,0°	86,6°	-86,8°
Desvio de Perpendicularidade / Perpendicular deviation	-4,1°	2,0°	3,4°	-3,2°
Deformação permanente / Permanent deformation	-2,6°	-0,5°	2,1°	-0,8°

Na Figura 4 é apresentado o desgaste da amostra após 500 embates / In Figure 4, the wear appears of the sample after 500 attacks



Figura 4 – Desgaste da amostra após 500 embates.
Figure 4 - Wear appears of the sample after 500 attacks

6.4 – Desvio de perpendicularidade após 750 embates / Perpendicular deviation after 750 attacks

Na Tabela 4 são apresentados os valores do desvio de perpendicularidade ao solo, após a realização de 750 embates / Table 4 shows the values of the perpendicularity deviation to the ground, after 750 attacks.

Tabela 4: Perpendicularidade ao solo, após 750 embates / Perpendicular to ground, after 750 attacks

Posição / Position	A	B	C	D
Perpendicularidade / Perpendicularity	-86,6°	88,1°	85,9°	-87,5°
Desvio de Perpendicularidade / Perpendicular deviation	-3,4°	1,9°	4,1°	-2,5°
Deformação permanente / Permanent deformation	-1,9°	-0,6°	2,8°	-0,1°

Na Figura 5 é apresentado o desgaste da amostra após 750 embates / In Figure 5, the wear appears of the sample after 750 attacks



Figura 5 – Desgaste da amostra após 750 embates.
Figure 5 - Wear appears of the sample after 750 attacks

6.6 – Desvio de perpendicularidade após 1000 embates / Perpendicular deviation after 1000 attacks

Na Tabela 5 são apresentados os valores do desvio de perpendicularidade ao solo, após a realização de 1000 embates / Table 5 shows the values of the perpendicularity deviation to the ground, after 1000 attacks.

Tabela 5: Perpendicularidade ao solo, após 1000 embates / Perpendicular to ground, after 1000 attacks

Posição / Position	A	B	C	D
Perpendicularidade / Perpendicularity	-86,1°	88,4°	86,5°	-88,0°
Desvio de Perpendicularidade / Perpendicular deviation	-3,9°	1,6°	3,5°	-2,0°
Deformação permanente / Permanent deformation	-2,4°	-0,9°	2,2°	0,4°

Na Figura 6 é apresentado o desgaste da amostra após 1000 embates / In Figure 6, the wear appears of the sample after 1000 attacks



Figura 6 – Desgaste da amostra após 1000 embates.
Figure 6 - Wear appears of the sample after 1000 attacks

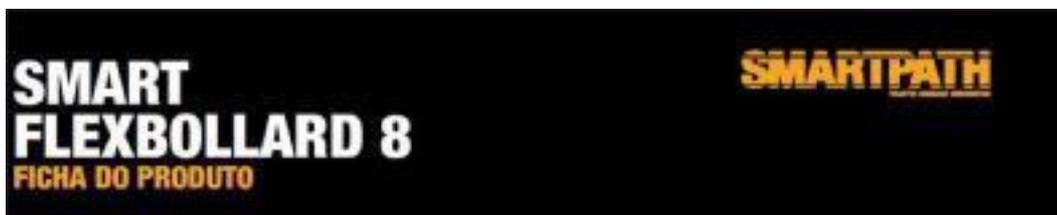
6.7 – Resultado Final / Final Result

Após 1000 embates / After 1000 attacks:

- A Baliza Flexível manteve a funcionalidade (regressa à posição vertical após os 1000 embates) / The Flexible Bollard maintained the functionality (it returns to the vertical position after the 1000 attacks): **CONFORME / CONFORM**
- Desvio máximo face à posição inicial de referência / Maximum displacement from the initial reference position: **- 2,6° a 2,8° (< ±5°) - CONFORME / CONFORM**

ANEXO 1 / ANNEXE 1

Ficha Técnica da Amostra (Dados fornecidos pelo fabricante) / Technical Data (Data provided by the manufacturer)



Gama Smart Flexbollard 08

SINALIZAÇÃO INTELIGENTE

O Smart Flexbollard é um produto concebido para a sinalização rodoviária, que pode ser utilizado em estradas, zonas de estacionamento e cicloviárias. Tem um efeito preventivo, reduzindo significativamente os acidentes rodoviários. Graças ao seu processo de fabrico e aos materiais de elevada qualidade, o Smart Flexbollard é extremamente resistente e flexível, retomando a sua forma original após impactos sem evidenciar danos.

NOME DO PRODUTO

SMART FLEXBOLLARD 8

DESIGNAÇÃO DO PRODUTO

BALIZA FLEXÍVEL

MODELOS

H40 / H60 / H80 / H100

MATERIAL

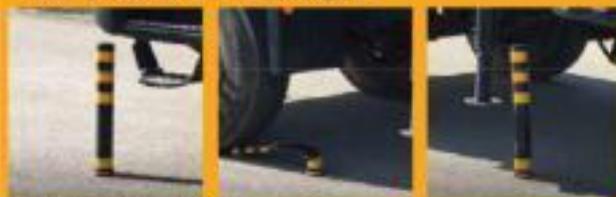
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Cores disponíveis

INOVAÇÃO FLEXÍVEL

- Fabricado com recurso a tecnologia de modelagem por injeção de poliuretano flexível;
- Total capacidade para recuperar o seu formato original;
- Resiste a mais de 1000 embates;
- Inclui aditivos com proteção contra os raios UV e degradação térmica;
- Fabricado de acordo com a norma UN 12599-3;
- Película refletora prismática flexível – película refletora de lentes prismáticas, resistente a impactos e revestida com autocollante sensível à pressão, capaz de superar os valores de reflexão descritos na norma ASTM Tipo II.



Demonstração Smart Flexbollard

APLICAÇÃO FÁCIL

PROCEDIMENTO

1. Realizar um orifício com uma profundidade de 100mm;
2. Limpar bem;
3. Aplicar bucha química no orifício, preenchendo todo o espaço até cima;
4. Instalar a baliza no orifício com a bucha metálica já colocada;
 - para utilização temporária: aplicar a baliza com PVC de 1mm
 - para utilização permanente: aplicar a baliza sem o PVC de 1mm
5. Deixar secar completamente;



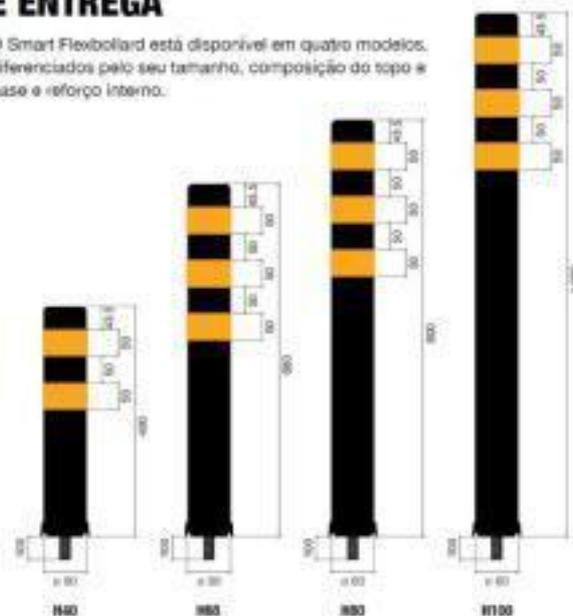
EQUIPAMENTO

- Broca de 24mm
- Bucha química
- Bucha metálica Ø22mm X 100mm
Incluída com a baliza
- Chave Smart para fácil remoção
Não incluída com a baliza



DIMENSÕES, COMPOSIÇÃO E ENTREGA

O Smart Flexbollard está disponível em quatro modelos, diferenciados pelo seu tamanho, composição do topo e base e reforço interno.

DIMENSÕES (mm)

Modelos	Dímetro (D)	Altura (A)	Parafuso (D)	Bucha metálica (D)
H40	40	400	16	22
H68	60	680	16	22
H80	80	800	16	22
H100	80	1 000	16	22

COMPOSIÇÕES DISPONÍVEIS

Modelos	Topo	Base	Reforço Interno	Peso
H40	ARREDONDADO (1) / DIREITO (2)	ESFERA REGULAR (1) / WORM (2)	N/A	1Kg
H68	ARREDONDADO (1) / DIREITO (2)	ESFERA REGULAR (1) / WORM (2)	N/A	1,2Kg
H80	ARREDONDADO (1) / DIREITO (2)	ESFERA REGULAR (1) / WORM (2)	600mm	1,7Kg
H100	ARREDONDADO (1) / DIREITO (2)	ESFERA REGULAR (1) / WORM (2)	600mm	1,9Kg

ENTREGA

BALIZA H40

- Caixa 20 unidades
- Paleta 300 unidades
- Altura da paleta 1400 mm

BALIZA H68

- Caixa 20 unidades
- Paleta 300 unidades
- Altura da paleta 2150 mm

BALIZA H80

- Caixa 20 unidades
- Paleta 200 unidades
- Altura da paleta 2250 mm

BALIZA H100

- Caixa 20 unidades
- Paleta 160 unidades
- Altura da paleta 2150 mm



Smart Flexbollard O5 range

SMART SIGNAGE

The Smart Flexbollard is a product designed for road signage that can be used for roads, parking areas and bike paths. It has a deterrent effect, significantly reducing road accidents. Thanks to its manufacturing method and high-quality material, the Smart Flexbollard is highly resistant and flexible, returning to its original form following impact, undamaged.

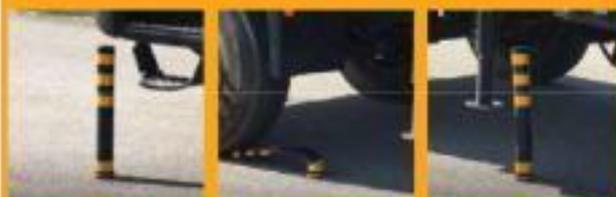
PRODUCT NAME	SMART FLEXBOLLARD 8
PRODUCT DESIGNATION	FLEXIBLE BOLLARD
MODELS	H40 / H60 / H80 / H100
MATERIAL	PU



Available colours :

FLEXIBLE INNOVATION

- Produced using highly flexible polyurethane injection mould technology;
- 100% able to return to its initial position;
- Resistant against over 1000 attacks;
- Additives incorporated with UV protection and thermal degradation;
- Manufactured in accordance with UN regulation 12699-0;
- Flexible Prismatic Reflective Sheeting - impact resistant prismatic lens reflective sheeting pre-coated with pressure sensitive adhesive and exceeds the reflectivity values of ASTM Type III.



Smart Flexbollard demonstration

EASY APPLICATION

PROCESS

1. Drill a hole 100mm deep;
2. Clean thoroughly;
3. Insert chemical glue in the hole - bottom to top;
4. Mount the bollard in the hole with the metallic sleeve attached;
 - for retro-reflective use: apply the bollard with 1mm PVC
 - for permanent use: apply the bollard without 1mm PVC
5. Let dry completely;



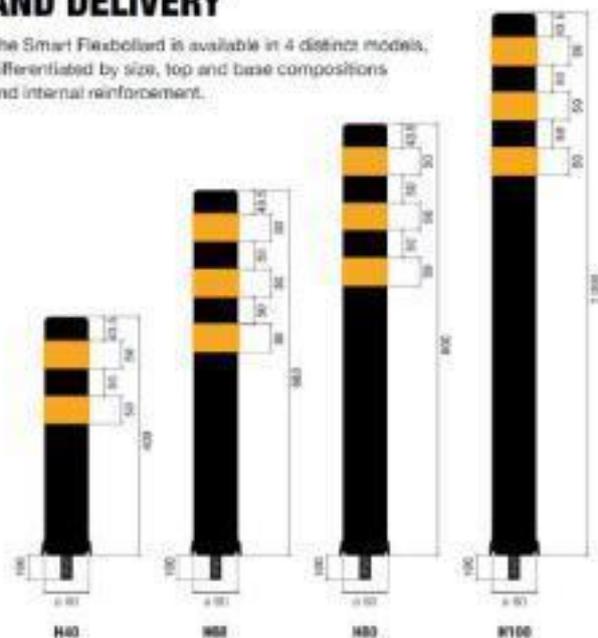
EQUIPMENT

- 24mm Drill
- Adhesive
- Metallic Sleeve (32mm X 100mm included with the Bollard)
- Smart Key for easy removal (Not included with the Bollard)



DIMENSIONS, COMPOSITION AND DELIVERY

The Smart Fixbollard is available in 4 distinct models, differentiated by size, top and base compositions and internal reinforcement.

DIMENSIONS (mm)

Model	Diameter (D)	Height (H)	Screw (S)	Mobile Sleeve (L)
H40	80	400	16	22
H68	80	680	16	22
H80	80	800	16	22
H100	80	1 000	16	22

AVAILABLE COMPOSITIONS

Model	Top	Base	Internal Reinforcement	Weight
H40	ROUNDED (1) / STRAIGHT (2)	REGULAR SPHERE (1) / GLASS (2)	N/A	1Kg
H68	ROUNDED (1) / STRAIGHT (2)	REGULAR SPHERE (1) / GLASS (2)	N/A	1,2Kg
H80	ROUNDED (1) / STRAIGHT (2)	REGULAR SPHERE (1) / GLASS (2)	600mm	1,7Kg
H100	ROUNDED (1) / STRAIGHT (2)	REGULAR SPHERE (1) / GLASS (2)	600mm	1,9Kg

DELIVERY

H40 BOLLARD

-  Box 20 units
-  Pallet 360 units
-  Pallet Height 1400 mm

H68 BOLLARD

-  Box 20 units
-  Pallet 300 units
-  Pallet Height 2150 mm

H80 BOLLARD

-  Box 20 units
-  Pallet 220 units
-  Pallet Height 2250 mm

H100 BOLLARD

-  Box 20 units
-  Pallet 100 units
-  Pallet height 2150 mm

Os resultados expressos neste relatório referem-se às amostras ensaiadas. Reprodução parcial proibida.