

Rome, October 22, 2015

On October 02, 2015 AISICO S.r.L. Test laboratory performed a test, based on the Reference Standard **IWA 14-1:2013** and **PAS 68:2013** on the **PILOMAT 275/K4 900A bollard**.

PILOMAT 275/K4 900A, a single retractable bollard, has received an impact rating of N3C test level for the IWA 14-1:2013 standard and an impact rating of N3 Test Level for PAS 68:2013 standard. In both test levels the nominal impact speed was 48 km/h.

Description of damages:

- Test Vehicle: PILOMAT 275/K4 900A completely disabled test vehicle, deformed vehicle cabin causing severe damages to the chassis and drivetrain. The maximum penetration was recorded dynamically on the vehicle driver's side and it was 1.0 m.
- PILOMAT 275/K4 900A: PILOMAT 275/K4 900A sustained minor damages during the impact. The bollard foundation no shifted, but the impact caused a bollard rotation of 10.0° in the direction of vehicle travel. The vehicle remained blocked during and after the impact and PILOMAT 275/K4 900A was operational after the test.

Classification of performances of PILOMAT 275/K4 900A single retractable bollard is:

- IWA 14 - 1:2013 standard: **IWA 14-1:2013 Retractable bollard V/7200 (N3C)/48/90:1.0**
- PAS 68:2013 standard: **PAS68:2013 Retractable bollard V/7500(N3)/48/90:1.0/2.5**

Complete information relating to the test can be found in Test Report # IWA/001/15 and DVD serial number IWA/001/15 issued by AISICO S.r.L., including test conditions, test vehicle information, test article specifications and manufacturer drawings.

This letter should not be considered as complete documentation of this test without Test Report and DVD data.

AISICO Crash Test Scientific Manager

6 Results

6.1 Weather conditions

WEATHER	Cloudy
TEMPERATURE	21°C

6.2 Test conditions

IMPACT SPEED	49.4 km/h
DIFFERENCE FROM NOMINAL SPEED	+ 1.4 km/h (+ 3 %)
APPROACH ANGLE	90°
IMPACT ANGLE	90.2°
DIFFERENCE FROM NOMINAL ANGLE	+ 0.2° (+0.2%)

6.3 Test device results and damages

As recommended in ISO IWA14-1:2014 the following full scale impact test was conducted to evaluate the impact performance of the PILOMAT RETRACTABLE BOLLARD 275/K4 900A to the N3C level and for BSI PAS68:2013 to the N3 level.

The test article was positioned at an angle of ninety degrees (90°) to the direction of travel of the test vehicle, with the vehicle's centreline intersecting the center of bollard.

The test vehicle impacted the test article at a speed of 49.4 km/h with an angle of 90.2°.

The height of the impact point between the vehicle and the test article was 0.8 m.

The impact test was documented by four high speed digital color video cameras.

The test vehicle's forward motion was completely arrested by the PILOMAT RETRACTABLE BOLLARD 275/K4 900A.

The maximum penetration was recorded dynamically on the driver's side of the vehicle and was 1.0 m measured using high speed video.

PILOMAT 275/K4 900A sustained minor damages during the impact. The bollard foundation no shifted, but the impact caused a bollard rotation of 10.0° in the direction of vehicle travel. The vehicle remained blocked during and after the impact and PILOMAT 275/K4 900A was operational after the test

PILOMAT 275/K4 900A completely disabled test vehicle, deformed vehicle cabin causing severe damages to the chassis and drivetrain. Air tank weight of 4.5 kg was detached to a distance of 2.5 m.

Test vehicle kinetic energy at impact was 677.8 kJ.

Classification of performances of PILOMAT 275/K4 900A single retractable bollard is:

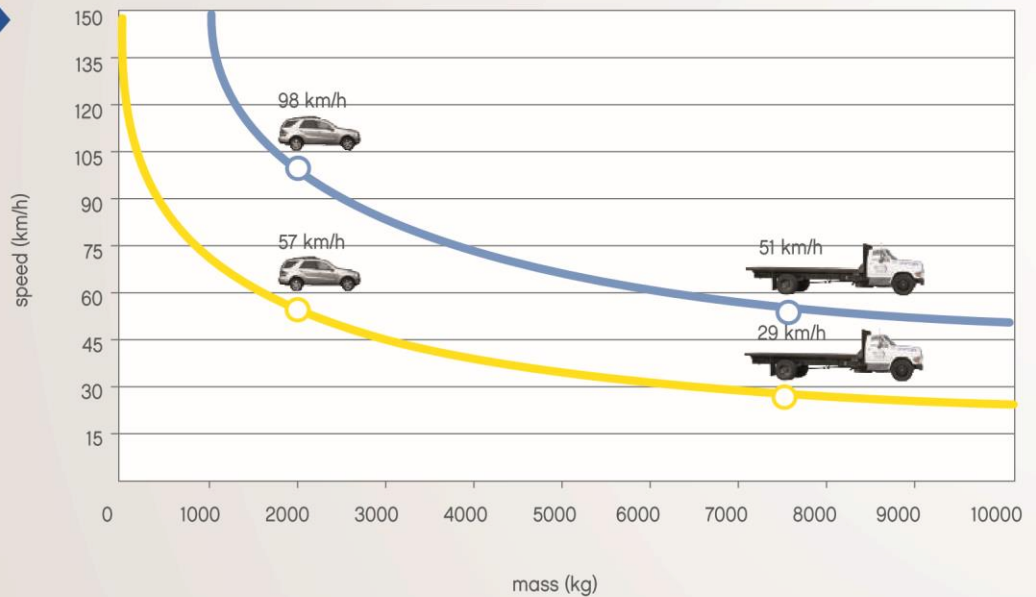
- ISO IWA 14 - 1:2014 standard: **IWA 14-1:2014 Retractable bollard V/7200 (N3C)/48/90:1.0**
- BSI PAS 68:2013 standard: **PAS68:2013 Retractable bollard V/7500(N3)/48/90:1.0/2.5**

TEST ARTICLE BEHAVIOR	
HEIGHT OF THE IMPACT POINT	0.8 m
DYNAMIC VEHICLE PENETRATION	1.0 m
STATIC VEHICLE PENETRATION	0.9 m

275/K4 900A	
MOVING CYLINDER	FE 510 STEEL
MOVING CYLINDER NOMINAL DIAMETER	275 mm
MOVING CYLINDER HEIGHT	900 mm
MOVING CYLINDER FE 510 STEEL THICKNESS	10 mm
MOVING CYLINDER FE 510 STEEL FINISH	POLYESTER POWDER PAINT – STANDARD GREY ANTHRACITE
OTHER MOVING CYLINDER FINISH	RIBS ON CYLINDER SURFACE - 316 AISI STAINLESS STEEL BRUSHED COVERING 1,5 mm
REFLECTING ADHESIVE STRIP	YES - HEIGHT 55 mm
RISING SPEED	10 cm/sec (optional 25 cm/sec)
LOWERING SPEED	20 cm/sec
MANUAL EMERGENCY LOWERING	YES (VERSION WITH RELEASE NO 220 = AUTOMATIC LOWERING)
CONNECTION LINE TO CONTROL UNIT	STANDARD 10 m (MAXIMUM LENGTH: 80 m)
HYDRAULIC PUMP	BUILT-IN INTO THE PILOMAT
PROTECTION CLASS	IP 67
TYPE OF USE	INTENSIVE - LIFE AVERAGE 3.000.000 MOVEMENTS - 2.000 MOVEMENTS/DAY
IMPACT RESISTANCE (WITHOUT DEFORMATION)	250.000 J
BREAKOUT RESISTANCE	750.000 J
OPERATING TEMPERATURE	- 40°C + 70°C (FOR LOW TEMPERATURES SEE HEATING RESISTANCE)
NOMINAL PILOMAT WEIGHT (WITHOUT PIT)	210 kg
NOMINAL WEIGHT OF STANDARD PIT, WITH COUNTER-FRAME AND BRACKETS	174 kg

PILOMAT 275/K4 900A

- 750.000 JOULES
- 250.000 JOULES



BREAKOUT RESISTANCE

The resistance to breakage at a given threshold applies to the impact of a vehicle causing the Pilomat permanent damage in its active and structural mechanisms. The Pilomat, although damaged, provides the vehicle stop within a metre from the point of collision.

IMPACT RESISTANCE

Resistance to impact at a given threshold indicates that the impact of a vehicle does not cause the PILOMAT blocking or damage to the structural and action mechanisms. The Pilomat's continued functionality and safety are guaranteed.

