FÉDÉRATION INTERNATIONALE
DE MOTOCYCLISME

CCR/002/2019

- *FMNs et CONUs*
- *Circuits de Vitesse homologués FIM*
- *FIA*
- *Fabricants de systèmes de protections accessoires*
- *Membres CCR*

11 janvier 2019

Nouveaux systèmes de protection supplémentaires (homologués) par la CCR FIM

Mesdames, Messieurs,

Suite aux récents test réalisés au « Impact Laboratory » (Université de Saragosse), Veuillez noter que de nouveaux systèmes de protections accessoires ont été testés avec succès et homologués par le Bureau de la CCR-FIM.

Le nouveau modèle homologué en type B est la protection « Bridgestone Urethane Barrier »

Les Normes FIM 2019 pour les Circuits sont donc modifiées comme suit :

4.10.1 SYSTÈMES DE PROTECTION SUPPLEMENTAIRES RECONNUS PAR LA CCR/FIM

Les systèmes de protection supplémentaires suivants sont reconnus par la CCR/FIM (voir coordonnées des fabricants et/ou distributeurs en annexe)

Type A (systèmes homologués)
•Protections accessoires « Air Active »
- Alpina Air-Module AA

•Protections accessoires « Air »
- Alpina Air-Module
- Airfence Type I S et Airfence IIS SPM AirPADS
- Liski Air Safety Mattress
- Trackcare Inflatable Barrier

•Protections accessoires « mousse »
- Alpina Super Defender et Alpina Super Defender 2
- Airfence Bike et Airfence Bike Evo
- Bridgestone Module 1000 et Bridgestone Module 1300
- Liski Safety 1
- Recticel Safeguard barrier 1 et Recticel Safeguard RR

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- SPM Energy Absorber Type A
- Trackcare Hi-Lite
- PKS Modele 1

Type B (systèmes homologués)
- Airfence Type I et Airfence Bike B
- Alpina Defender Barrier
- **Bridgestone Urethane Barrier**
- Liski Safety 3
- Recticel Safeguard barrier 2

Type C (systèmes homologués)
- **Air Protek – Racing Safety Wall**
- Alpina Synthetic bales and "Big bales"
- Filling Italiano Protection System (ONDA 27/33 - 20/26)
- Liski Safety 4
- PKS Modele 5
- Recticel Safeguard barrier 3 and Safeguard barrier 4
- SPM Energy Absorber Type C2
-Trackcare barrier

- Barrière de pneus horizontale construites et installée selon les spécifications et instructions de montage de la FIM pour les barrières de pneus (disponibles sur demande auprès du Secrétariat FIM).
- Barrière de pneus verticale construite et installée selon les spécifications et instructions de montage de la FIM pour les barrières de pneus (disponibles sur demande auprès du Secrétariat FIM).

Tous les systèmes de protection supplémentaires doivent être placés contre l'obstacle rigide (pas de vide).
Tous les systèmes de protection **supplémentaires** doivent être utilisés et installés selon les indications et préconisations du fabricant

Des systèmes de protection **annexes et non homologués** peut être requis dans le rapport d'homologation afin d'être disponibles lors de chaque épreuve.

Il est recommandé que les vis fixant les bandes transporteuses aux pneus, barrières ou murs aient une tête ronde et plate.




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Nous vous joignons les résultats des tests réalisés ainsi que les coordonnées mises à jour des fabricants de systèmes de protection accessoires homologués par la CCR FIM.

Restant à votre disposition pour tout complément d'information veuillez agréer, nos meilleures salutations.

Paul DUPARC
CCR COORDINATOR

ANNEXE: *Rapport des tests réalisés pour le système Bridgestone +*
Coordonnées de tous nos fabricants de protections accessoires

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CO-ORDINATES OF MANUFACTURERS & SUPPLIERS OF ADDITIONAL PROTECTIVE DEVICES:

Airfence I, I S, IIS, Bike, Bike B & Bike Evo

AIRFENCE SAFETY SYSTEMS
Harim Industrial Corporation, M. Andy Coffey
P.O. Box 293
Apollo Bay, Vic 3233 - AUSTRALIA
Tel.: +61 (0)417 500 852
Fax: +61 (0)3 8660 2577
www.airfence.com
airfence@airfence.com

Airprotek - Racing Safety Wall Type C

AIRPROTEK SAS
ZI Combe de Bramefond,
46200 SOUILLAC, FRANCE
Tél : +33 (5) 65 27 01 85
commercial@airprotek.com

Alpina Air-Module, Air-Module AA, Defender, Super Defender, Super Defender 2, Synthetic Bales & Big bales

ALPINA SAFETY SYSTEMS GMBH
Bundesstrasse 20
9552 STEINDORF - AUSTRIA
Tel.: +43 4243 2480 0
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robert@alpina.at
office@alpina.at
www.alpina.at

Bridgestone Module 1000, Module 1300 & Urethane Barrier

BRIDGESTONE DIVERSIFIED CHEMICAL PRODUCTS Co., Ltd.
Mitsui Sumitomo Kaijo Tepco Bldg. 9F
1-6-1 Kyobashi, Chuo-ku
TOKYO - JAPAN
Tél. : +81 3 3538 7218
Fax : +81 3 3538 7223
kikaku.hanbai@bridgestone.com
www.bridgestone-dcp.co.jp/contact.html

Filling Italiano Protection System (ONDA 27/33-20/26)

FILLING ITALIANA
Via Mameli 51
20058 VILLASANTA (MI) – ITALIA
Tel.: +39 039 20 50 999
Fax: +39 039 20 50 977

Liski Air Safety Mattress, Safety 1, 3 and 4

LISKI S.r.l. Via Veneto, 8
Brembate (BG) - ITALY
Tel.: +39 0 35 4826195
Fax: +39 035 2283818
info@liski.it
www.liski.it

PKS Modele 1 & Modele 5

PKS PROMOTER SERVICE
Via Michele Angileri 162
91020 PETROSINO (TP) - ITALY
Tel./Fax: +39-0923-986166
pks@ctomline.it

Impact Laboratory
Aragon Institute of Engineering Research
University of Zaragoza

Dynamic Test of Protective Devices: Barrier

Barrier: BRIDGESTONE URETHANE BARRIER
References: S-167 - S-169

Testing Date: 14/DEC/2018

Applicant:
Bridgestone Diversified Chemical Products Co Ltd
4F JP Building, 3-4-4 Nihombashimuromachi,
Chuo-Ku, 103-8307 Japan
Tel. 81-3-3270-5661

Prepared for:
Fédération Internationale de Motocyclisme (FIM)
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Tel. +41 22 950 95 28

Tested by:
Impact Laboratory – University of Zaragoza
Ctra. TE-V-7033 km. 1 – TechnoPark MotorLand
Ed. Dr. Joaquín Repollés, 44600 Alcañiz – Teruel – Spain
Tel: +34 978 830 172 – http://impacto.i3a.es

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Óscar Juste		20 December 2018

Contents

1. Goal

Dynamic test of stopping barrier according to FIM rules: *"Duties and criteria for barriers homologation":*

Duties and Criteria

The tests must be carried out with a hanging body block, which comes off just before the impact.

- Depth of the module: 120 cm (for type A)
- Weight of the body block: 35 kg
- Body block surface that comes into contact with the tested sample: 0.24 m^2
- Velocity at the instant of impact: 24 km/h (+/- 1 km/h)

Classification criteria:

- Peak deceleration (g number): the maximum deceleration.
  - Type A: $G \leq 10$
  - Type B: $10 < G \leq 20$
  - Type C: $G > 20$
- Deformation distance:
  - Maximum 50% of the width of the module, for all the types.

2. Description of the Test

Tests were performed using the Universal Impactor Machine shown in Figure 1. The universal impactor is capable of throwing different body forms up to a nominal speed of 15 m/s, either in free or guided flight. The upper boundary of the impactor is a throwing energy of 3 000 J.

Figure 1. Universal impactor machine.

The tests of the stopping barriers were done using a certified body block with a nominal mass of 34-36 kg and a moment of inertia of 2.26 ± 0.23 kgm^2. The body block was launched in free flight at a nominal speed of 6.66 m/s (24 km/h). The body block was instrumented with two accelerometers (Measurement, Model 64C) and one angular rate sensor (DTS, Model ARS-8K).

Location	Sensor	Ref.
Center of gravity of the body block (X Local Axis)	Accelerometer	ACE-027
Center of gravity of the body block (Y Local Axis)	Angular rate	ARS-119
Center of gravity of the body block (Z Local Axis)	Accelerometer	ACE-026

The local coordinate system and the polarities for the sensors were defined according to the standardized sign convention in SAE J211. Data were recorded at 10 000Hz and were filtered using a 180 Channel Frequency Class (180 CFC).

Therefore, the global reference system is defined as:

X global axis perpendicular to the impact face of the barrier (horizontal).
Z global axis pointing downward (vertical).
Y global axis defines a right-handed coordinate system.

Two high-speed video cameras (1 000 Hz) were used to track the motion of the body block during the flight (lateral and zenithal planes). To calculate the test results, a two-dimensional (2D) analysis was carried out.

3. Description of the Samples

Model: Bridgestone Urethane Barrier
Depth of the module: 800 mm

Reference: S-167; S-168; S-169
Height of the module: 1300 mm

Figure 2: Bridgestone Urethane Barrier module.

Figure 3. Connection between two modules.

4. Tests Configuration

Test	Configuration
S-167	Guardrail + Bridgestone Urethane Barrier. Centered impact. First impact.
S-168	Guardrail + Bridgestone Urethane Barrier. Centered impact. Second impact (15 min later).
S-169	Guardrail + Bridgestone Urethane Barrier. Impact at the union of two modules[1].

[1] This test is included just as additional information about the connection between modules.

5. Test Results

The 2D analysis of the data allowed calculating the following specifications:

- Impact velocity [km/h]: velocity in the X global axis at the instant of the body block impact with the barrier.
- Rebound distance/velocity [km/h]: the return velocity in the X global axis (calculated from the deceleration curve).
- Absorbed energy [%]: the percentage of total impact kinetic energy absorbed by the tested sample (calculated from velocity in X global axis).
- Peak acceleration [g]: the maximum deceleration in the X global axis.
- Average acceleration [g]: mean deceleration in the X global axis. Calculated from the beginning of the event up to the instant when the maximum deformation distance is reached.
- Event duration [ms]: time-frame of the impact event, taken from the beginning of the event up to the instant when the maximum deformation distance is reached.
- Deformation distance [mm]: the maximum distance reached by the impacting body block penetrating into the tested sample.

Table 1 summarizes the results of the tests.

Sample identification no.	S-167	S-168	S-169
Impact velocity (Angle)	23.0 km/h (-1.5°)	23.8 km/h (-1.5°)	23.9 km/h (-1.4°)
Rebound distance/velocity	13.4 km/h	13.0 km/h	11.5 km/h
Absorbed energy	65.8%	70.4%	76.9 %
Peak acceleration	**19.4 g**	**19.9 g**	17.3 g
Average acceleration	14.8 g	14.7 g	13.8 g
Event duration	44 ms	46 ms	49 ms
Deformation distance (Angle*)	167 mm (-1.5°)	183 mm (-1.5°)	189 mm (-2.5°)
Deformation [%]	**20.9%**	**22.9%**	23.6%
***Note:** The value of the deformation distance corresponds to the center of gravity of the body block, as the orientation of the body block, at the instant of maximum deformation, is not perpendicular to the ground. This inclination value is indicated in brackets ().			

Table 1. Results of the tests.

Deceleration Graphs:

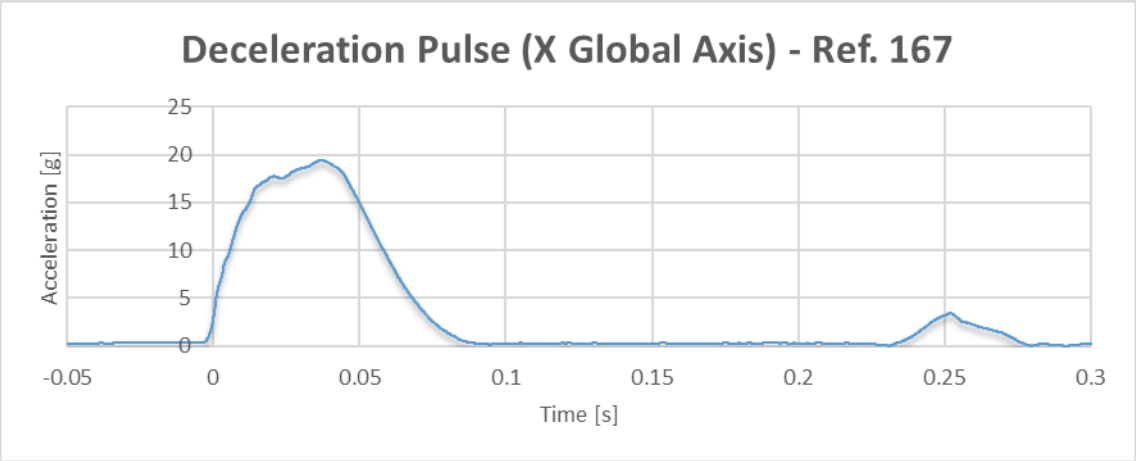

Figure 4. Deceleration pulse of S-167 test.

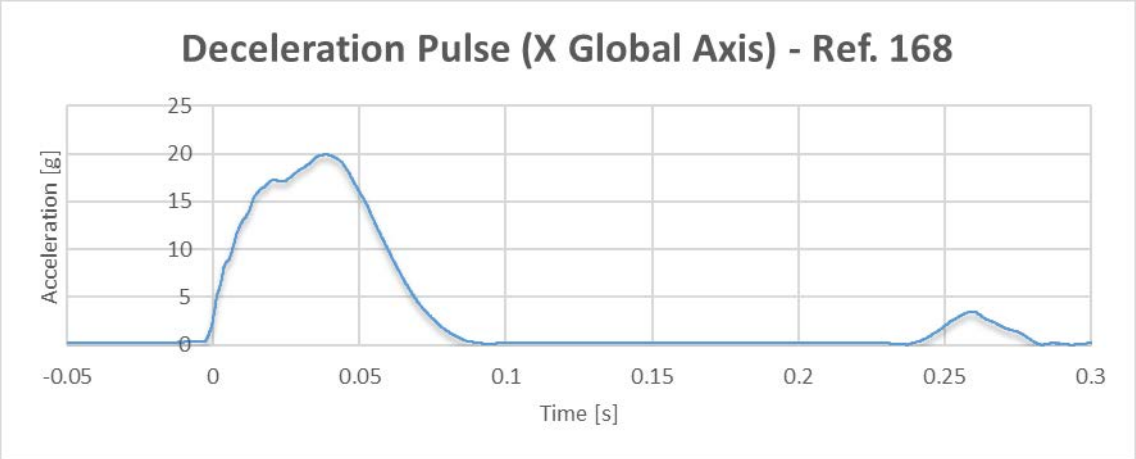

Figure 5. Deceleration pulse of S-168 test.

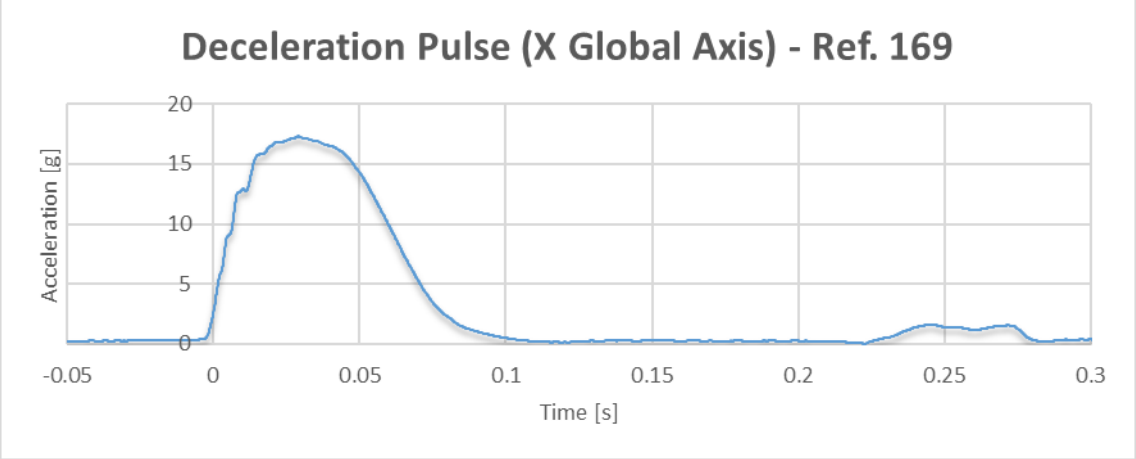

Figure 6. Deceleration pulse of S-169 test.

6. Conclusions

According to the classification criteria described in section 1, test results lead to the following conclussions:

- Peak acceleration obtained is: 19.4 g (1st shot): 19.9 g (2nd shot). These values classify the barrier as a **type B** stopping barrier.
- Deformation obtained is: 20.9% (1st shot); 22.9% (2nd shot). The **deformation values do not exceed the 50%** of the width of the module.

Final conclusion: These values classify the **barrier** as a **type B** stopping barrier.

7. Notes and Comments

1) For the test, the module was installed leaning against a triple guard rail as it is defined by FIA for circuits.
2) The classification criteria is as described in section 1, with the following inclusion: for type C, maximum g threshold of 30.
3) The height of the barrier is 1300 mm.
4) There was not anti-sliding "skirt" in the tested samples.
5) It was appreciated that the protective device did not contain any metal rings on the impact surface (ex. For attaching advertising panels).
6) It was appreciated that the protective device did not present a connection between modules robust enough to prevent the rider to slide in between modules.
7) The replacing time was not checked as it is a foam barrier.

The following product specifications were provided by the manufacturer:

— Product Standard —
Material : Polyurethane foam + Sheet Cover
Product Size : High1.3m × wide2.0m × depth0.8m
Weight : 49 kg (about)

【Polyurethane foam Physical Property】
Density : 20 kg/m3
Hardness : 95 N

【Sheet Cover Physical Property 】
Tensile strength : warp over 457 N/cm ・ fill over 408 N/cm
Breaking elongation : warp under 30% ・ fill under 40%
Tearing strength : warp over 78 N ・ fill over 88 N