

Michelin presents the performance of its tire ranges and explains the new European tire labeling regulation

At a time when European tire labeling legislation is authorizing tiremakers to display their tire gradings, Michelin is reaffirming its commitment to delivering the best performance balance in each of its tire lines.

Michelin supports the introduction of the new European tire label, which is designed to provide consumers with practical information about three important tire performance parameters: wet grip, energy efficiency and rolling noise.

MICHELIN summer tire ranges

All of the summer tire lines marketed since 2010 have earned the maximum A grade in wet grip, the safety-related parameter.



- The MICHELIN Energy Saver + line, which will be brought to market this summer, **has been classed A** in wet grip¹.
- The MICHELIN Primacy 3 line **has been rated A** in wet grip.
- The MICHELIN Pilot Super Sport and MICHELIN Pilot Sport 3 **have been classed A** in wet grip.



Michelin's commitment to improving fuel efficiency has been validated by the classification of its new core ranges in grades C or better.

- The MICHELIN ENERGY Saver + line is rated either **B or C** in energy efficiency, depending on the size.
- The MICHELIN Primacy 3 line is rated C.

Note that most of the Sport lines have been graded E, reflecting the fact that they deliver a very specific performance balance by combining high total mileage and very strong grip, even in extreme driving conditions.



In the area of tire noise, all of the summer lines comply with the future limits on outside rolling noise that will come into effect on November 1, 2016 (two waves maximum).

¹ In 15 and 16-inch sizes, but not in 14-inch versions.

MICHELIN winter tire ranges

The latest generation **Alpin** winter tire ranges have been rated **C in wet grip performance** and E in rolling resistance. These winter tires are designed to deliver a safe ride in a variety of pavement conditions (ice, snow, slush) and in the full range of winter temperatures. They meet motorists' priority expectations by offering both optimal grip in every driving situation and the excellent longevity of a MICHELIN brand tire.

MICHELIN light-truck tire ranges

Scheduled for market launch this summer, the new MICHELIN Agilis + line again demonstrates an **excellent performance balance with a B grade in wet grip**, a very good energy efficiency rating of C, two waves in outside rolling noise and the range's superior robustness and total mileage.

More than just ratings – the market's best balance of performance

Michelin's strategy is focused on designing and manufacturing tires that combine **safety in all driving conditions** (on dry and wet pavement, on straights as well as curves) **improved fuel efficiency** and **longer total mileage**, whose impact on the total cost of owning a car makes it a key consumer concern, yet one that is not reflected in the new regulation. The useful lives of commercially available tires vary widely, by up to twice as long, or more than a whole extra year of driving.



Michelin explains the new European tire labeling regulation

Beginning November 1, 2012, all tires sold in Europe will have to carry a label displaying information about three performance criteria. Two concern the environment (energy efficiency and rolling noise) and the third is safety related. The new EU regulation therefore requires that every tire sold carry a standard label indicating its rolling resistance (see detailed explanations below), external noise level and braking distance on wet pavement (wet grip).

The regulation is designed to meet two objectives:

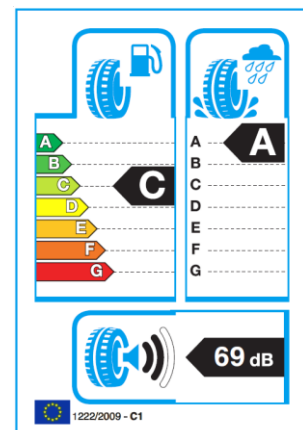
- Provide consumers with objective information about a tire's performance, of which the general public is not always aware.
- Help to improve tire performance by publicizing this information.

Supported by Michelin, this broad-reaching initiative will offer consumers keys to better understanding the real safety and environmental impact of their tires, both for themselves and the community. The regulation is especially important in that it is the first in the world to require the display of data indicating a tire's energy efficiency.

The label will look like the ones consumers are already used to seeing on household appliances. It will display the tire's grade in three performance parameters:

- Rolling resistance, which indicates the impact on fuel consumption and therefore carbon emissions – classed from A to G.
- Wet grip, as measured by braking distance on wet pavement – classed from A to G.
- Outside rolling noise – measured in decibels (dB).

Beginning November 1, 2012, the new European label must be affixed to all passenger car, light commercial vehicle and heavy commercial vehicle tires manufactured after July 1, 2012 and must appear in standardized form in the tiremaker's print and online technical promotional material.



The same information must appear on or with the tire invoice, thereby enabling end-users to improve their understanding of tire products and to compare them on the basis of the three parameters.

A closer look at the European label's three performance criteria

1st Criterion: Energy Efficiency

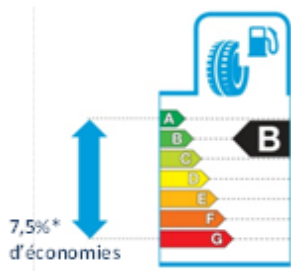
Rolling resistance

With each rotation of the wheel, a tire is deformed under the weight of the load when it makes contact with the road, thereby causing its component materials to heat. Reducing this heat build-up makes it possible to lower fuel consumption and, consequently, greenhouse gas emissions. The force that impedes a vehicle's forward movement is called "rolling resistance." It is measured by the amount of energy used over a given distance traveled. To overcome this rolling resistance, tires use around 20% of a vehicle's fuel consumption. Put another way, this means that **one full tank of fuel out of five is used by the tires**. Reducing rolling resistance therefore helps to noticeably improve the energy efficiency of road transportation, thereby lowering carbon emissions and enabling drivers to reduce their fuel bill. A tire's rating is measured on a test machine, which determines its rolling resistance coefficient.

Bear in mind that each liter of gasoline burned releases 2.3 kg of CO₂ into the atmosphere and that each liter of diesel fuel releases 2.65 kg.

Expressing a tire's energy efficiency

Energy efficiency is expressed as a coefficient calculated by dividing the machine-measured rolling resistance by the load carried by the tire during the test. On the new label, it will be symbolized by a letter on a color scale similar to those on household appliances or new vehicles, under the standard energy efficiency pictogram defined by the European Union.



The seven efficiency classes range from A (the most efficient) to G (the least), with their difference meaning that, for a given vehicle, a full set of Class A tires

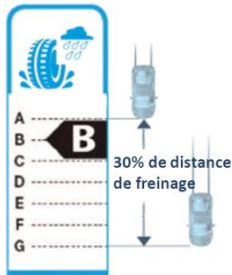
could reduce **fuel consumption (and with it, carbon emissions) by up to 7.5%** compared with a full set of Class G tires.

The standards for the energy efficiency classes are very strict, especially for smaller tires, thereby offering potential for improvement in each tire line.

*Performance measured according to testing methods specified in Regulation (EC) 1222/2009, as amended by (EC) 228/2011 and (EC) 1235/2011. Source: European Commission's Impact Assessment SEC (2008) 2860.

2nd Criterion: Wet Grip

Braking distance on wet pavement



Braking distance is measured according to a standard procedure, comparing the graded tire to the reference tire defined in the standard. The ratio between the two distances (tested tire/reference tire) determines the tire's wet grip class on the label. Like rolling resistance, wet grip is expressed in seven efficiency classes, from A (best) to G (worst). While results can vary depending on the vehicle and actual weather conditions, the difference between the classes means that the braking distance of a vehicle equipped

with a full set of Class A tires could be up to 30% shorter than for a vehicle equipped with a full set of Class G tires. This would correspond to around 18 meters* for a vehicle braking to a full stop from 80 km/h. However, there is more to safety than just this performance. Michelin's strategy is focused on designing and manufacturing tires that are safe in every driving condition, on dry and wet pavement, on straights as well as curves.

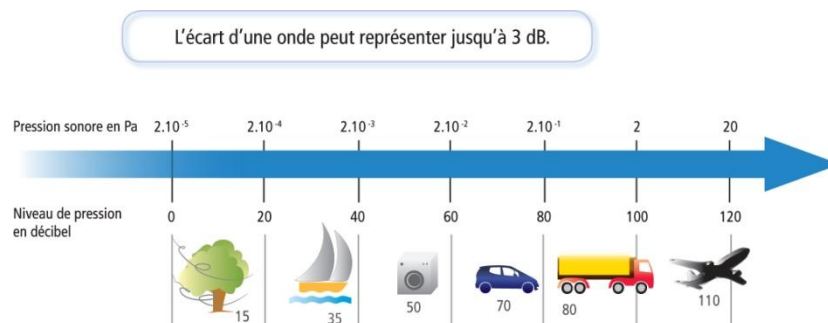
**Performance measured according to testing methods specified in Regulation (EC) 1222/2009, as amended by (EC) 228/2011 and (EC) 1235/2011. Source: European Commission's Impact Assessment SEC (2008) 2860.

3rd Criterion: Outside Rolling Noise

Because tires contribute to traffic noise, a major disamenity, the new label displays the level of the tire's outside rolling noise instead of the noise perceived by the driver inside the vehicle. The measured value is indicated in decibels (dB) and visually symbolized by one, two or three black waves,



depending on the noise level's relation to the EU standard. Three waves mean that the tire's noise complies with the current limit, two mean that the tire is 3dB¹ under the current limit, or **twice as quiet as the regulatory standard**, and one wave means that the tire is 6dB¹ under the current limit, or **four times as quiet** as the regulatory standard.

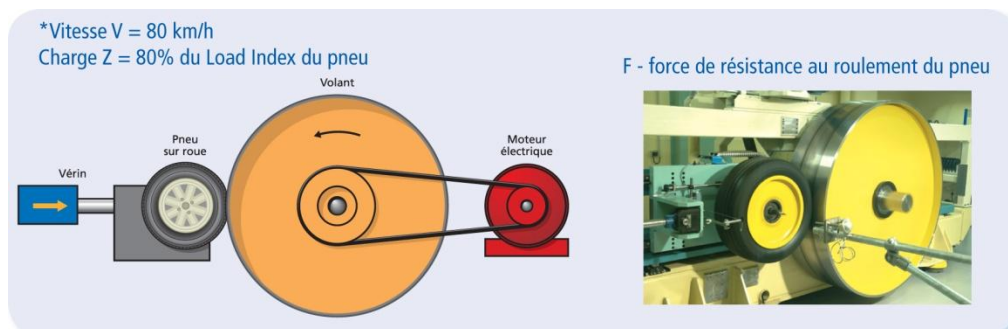


¹ Depending on size

Testing methods and tiremaker responsibilities

Tiremakers are responsible for carrying out the performance tests in accordance with regulatory procedures and standards, as follows:

- Rolling resistance is tested on machines in a laboratory. A procedure will be introduced to align the different laboratories used by tiremakers and the independent testing organizations, such as UTAC and TÜV SÜD Automotive.



- Wet grip is measured on an outside track in comparison to a reference tire, either on a vehicle or on a test trailer. The tests are run on the same standardized pavement, and with the same water height (1.0 mm \pm 0.5 mm for car tires). Ambient temperatures depend on the tire category, with summer tires tested at between 5° and 35°C and winter tires at between 2° and 20°C.

To better reflect actual usage, Michelin has chosen to perform the tests at temperatures more representative of the European climate, at **7°C** for winter passenger car and light truck tires and **20°C** for summer tires.

- Tire noise is measured using an outdoor pass-by procedure. Because noise depends primarily on speed, type of pavement and temperature, the test is performed at 80 km/h on a pavement carefully aligned with the defined weather conditions (wind speed, temperature, etc.)

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