

The current international tyre regulations cause road accidents

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Abstract - The current Brussels EU Regulation No. 1235/2011, valid from May 30, 2012, has introduced an European Tyre Label with wet grip index G classes from A to G for passenger car tyres C1, light commercial vehicles tyres C2 and heavy truck- and bus tyres C3. Every wet grip class for each vehicle category has a defined band of numerical values for the wet grip index G. The legislated wet grip values G in this EU- Regulation are very low. The measured braking distances and corresponding impact speeds of the test vehicles are showing very critical results.

Regulation No. 1235/2011 of the European Parliament and the Council for Type Approval of Vehicles (EU) should be changed in such a way, that for C1-tyres (normal passenger cars tyres) the minimum wet grip index G is 1.25. All C2-tyres (light commercial vehicles tyres) should at least meet a minimum wet grip index of $G = 1.1$. All C3-tyres (heavy trucks and buses tyres) should at least meet a minimum wet grip index of $G = 0.95$.

Due to the missing lower limits for G in the wet grip class F for C1, C2 and C3 tyres according to Commission Regulation (EU) No. 1235/2011, officially valid from 30 May 2012, a tyre-to-road coefficient of adhesion in the extreme of 0 (zero) is legally permitted. This is an apparent flaw in above cited EU Regulation, which causes a potential danger to the road traffic safety for all motor vehicles in Europe with such tyres. The wet grip class F has to be removed urgently from said EU-Regulation, since a direct liability of the responsible EU-Commission can not be excluded.

1. RETROSPECTIVE VIEW

Before the year 2000 vehicle manufacturers were responsible for the selection of tyres, which were chosen after lengthy and intensive tests and were matched to the vehicles. These tyres were specified in the vehicle registration certificate.

Resulting from a complaints procedure of EU against the Federal Republic of Germany because of “unnecessary business obstructions on the market” codifying of tyre brands as done by the vehicle manufacturers was abandoned from the year 2000 onwards.

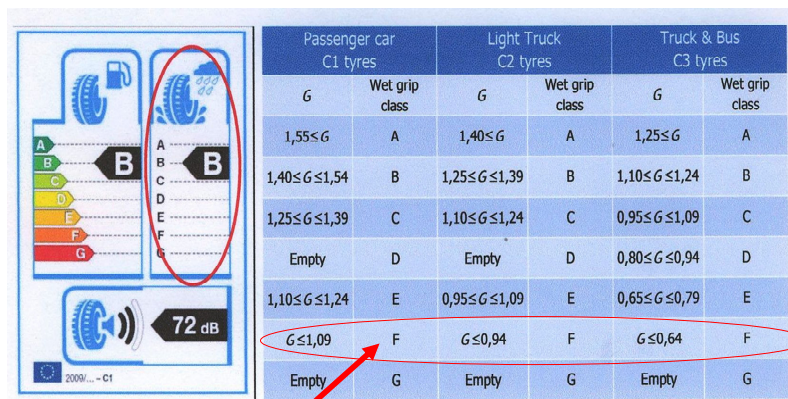
In the following years from 2000-2012 there were no legal demands per EU legislation on the lateral force- or braking force performance of tyres on a wet road surface.

2. DEMANDS OF THE EUROPEAN UNION ON THE BRAKING ABILITY OF TYRES ON WET ROADS

The EU has introduced a tyre label in the year 2012, which includes requirements on the braking ability of tyres on wet roads for passenger cars (C1-tyres), for light trucks (C2-tyres) as well as for heavy trucks and buses (C3-tyres).

These EU-requirements are subdivided again into braking performance classes from A to G classified according to the degree of the wet grip index G, which allows some evidence of the braking and road holding ability of tyres on a wet road surface (**Figure 1**).

Figure 1: EU-Label Demands on Tyres for Cars, Light and Heavy Trucks



NOTE: There are no limits set for C1-, C2- and C3-tyres in class F



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This label contains a dangerous mistake:

The minimum legal demands on the wet grip index class F for C1-, C2- und C3-tyres, shown in Figure 1, are absurdly low and they are a great danger for the safety of all traffic participants.

In the current EU-legislation (EU Regulation No. 1235/2011, valid from May 30, 2012), there is even explicitly defined under wet grip index class F with the “ \leq ” definition for C1-, C2- und C3-tyres:

The wet grip index G can be lower than 1,1 (for C1-tyres), lower than 0,95 (for C2-tyres) and lower than 0,65 (for C3-tyres) without limit. That means in the extreme, that tyres with a wet grip index of $G=0$, which are not able to realise any braking or lateral forces, are legally permitted on the European road system! All it takes to comply with this “EU tyre safety regulation” is a printed, removable sticker of paper attached to the tyre, defining the tyre as “Wet Grip Class F”, and even the lowest road-holding quality of tyres qualifies legally for use on the European Market.

It is remarkable, that the “wet grip class”, at which the tyre is sold, is not required to be permanently moulded on the tyre sides, which is for example legislated for the winter tyre definition.

2.1 Tests with passenger car tyres (C1-tyres)

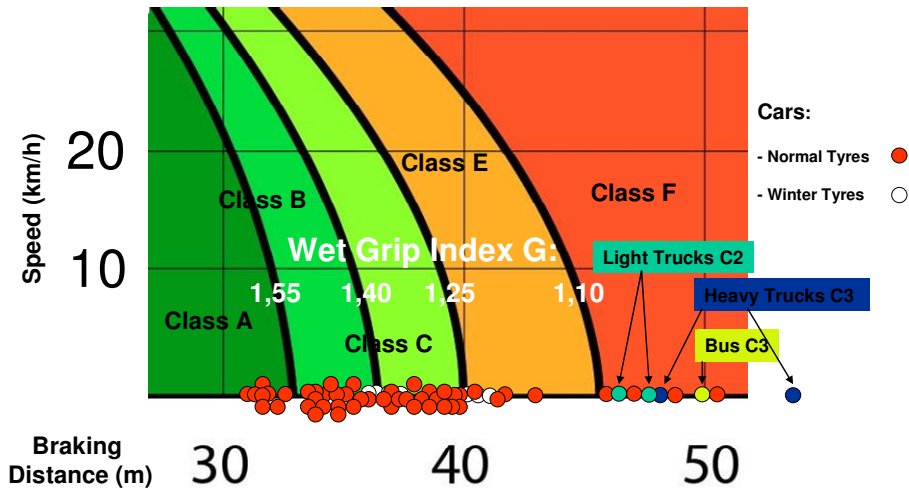
Braking tests with C1-tyres available on the market showed significantly, that tyres of the wet grip classes E and F are a safety risk because of the big differences in braking distances (**Figure 2**).

A car with premium tyres of class A showed a braking distance of 32 metres, when braking from 80 km/h on a wet road. A car equipped with budget-tyres of class F, showed a braking distance of 48 metres, which results in an impact speed of 46 km/h into the already standing vehicle with the premium-tyres of class A (**Figure 3**).

If this braking procedure happens on a wet motorway from 130 km/h, the impact speed will increase to more than 70 km/h (**Figure 4**).

Additionally, one has to take into account the serious fact that due to low minimum values for the wet grip index G the effectiveness of driver assistance systems like emergency braking system, lane keeping, vehicle stability control, etc. is reduced significantly, and thus influences negatively the traffic safety.

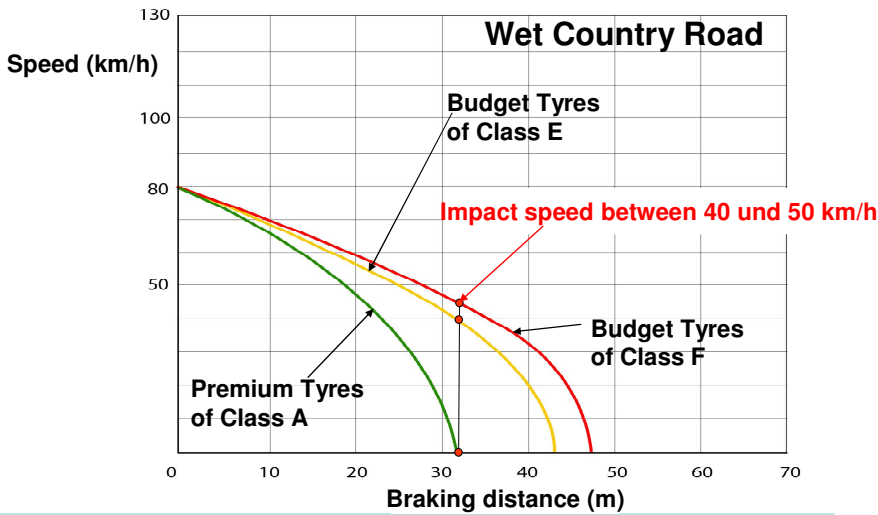
Figure 2: Comparison of Braking Distances from 80 km/h on a Wet Road



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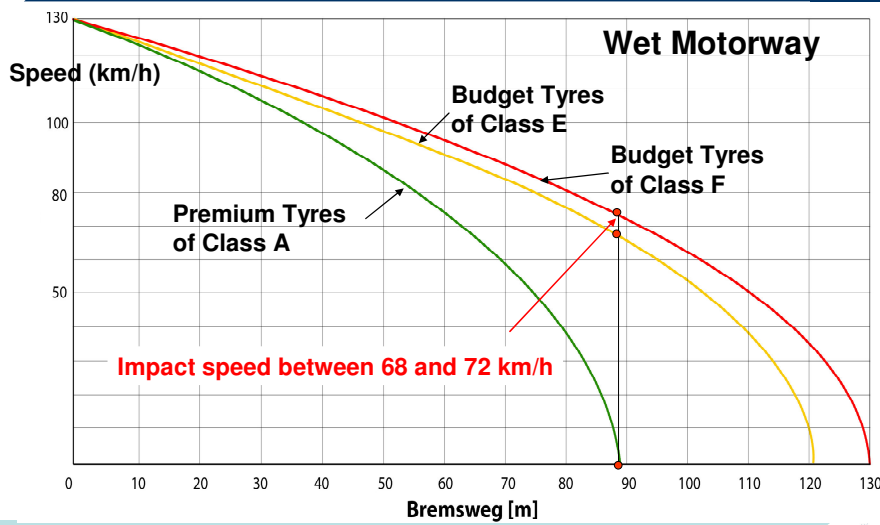
Figure 3: Braking Distances from 80 km/h with Car Tyres of Classes A, E and F



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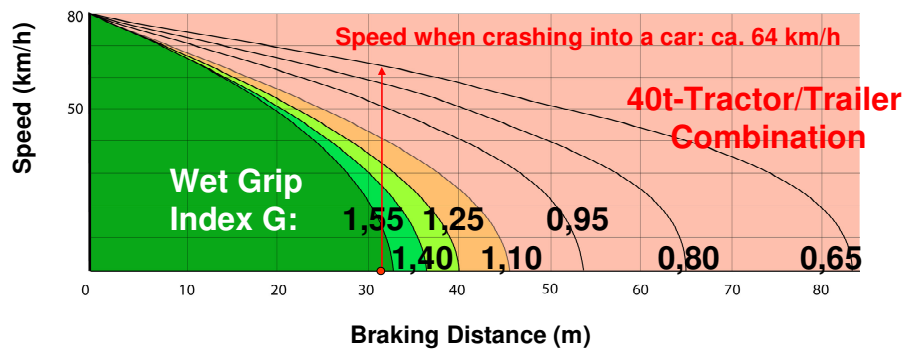
Figure 4: Braking Distances from 130 km/h with Car Tyres of Classes A, E and F



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Figure 5: Braking Distances of a Car (C1-Tyres, Class A) and a Tractor/Trailer (C3-Tyres, Class F)



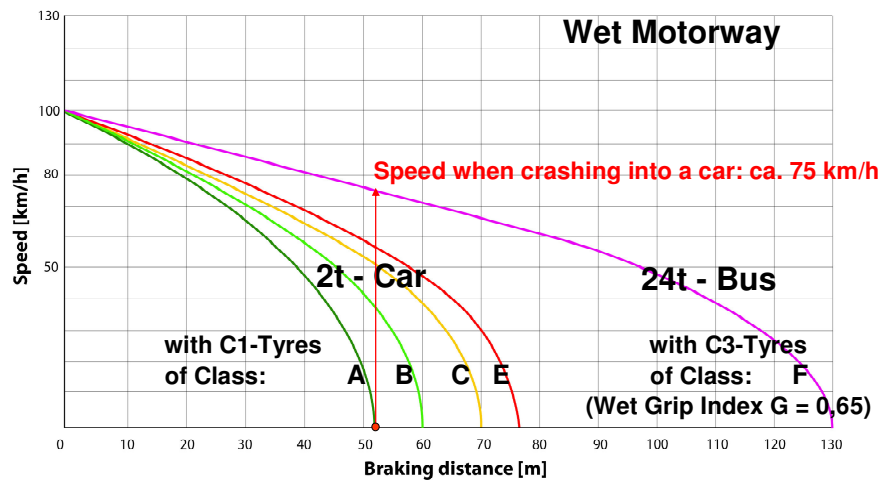
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2.2 Investigations of tyres for trucks and buses (C2- und C3-tyres)

Contemplating the EVU-analysis, the wet grip index $G = 0,65$, as accepted by EU for tyres of heavy trucks and buses, means, that the coefficient of adhesion between tyre and road surface is only $k = 0,35$. Additional calculations and computer simulations showed, that tyres with a wet grip index of $G = 0,65$ reached a very long braking distance of ca. 83 metres from 80 km/h only (**Figure 5**).

Figure 6: Braking Distances from 100 km/h with a Car (C1-Tyres) and a Bus (C3-Tyres)



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As already shown in chapter 2.1, a car with premium tyres of wet grip index class A needs a braking distance of ca. 32 metres (**Figure 3**). During simultaneous braking in a convoy a heavy truck or a heavy tractor/trailer combination with tyres of a wet grip index $G = 0,65$, accepted by the EU-regulations, would crash into the already standing passenger car with a speed of ca. 64 km/h (**Figure 5**).

Under the same conditions a bus braking from 100 km/h on a wet motorway would hit the already standing car with a speed of ca. 75 km/h (**Figure 6**).

3. DEMANDS ON THE EUROPEAN LEGISLATION

1. The current low values for the wet grip index class G, as legislated by the European Union, are just contrary to the demand of the same EU to reduce drastically the number of fatally and seriously injured persons on our roads and will not contribute positively to the safety demands in the EU-Action Programme 2011-2020.

2. The regulation No. 1235/2011 of the European Parliament and the Council for Type Approval of vehicles (EU) should be changed in such a way, that for C1-tyres (normal passenger cars) the minimum wet grip index G is 1.25.

3. All C2-tyres (light commercial vehicles) should at least meet a minimum wet grip index of $G = 1.1$. All C3-tyres (heavy trucks and busses) should at least meet a minimum wet grip index of $G = 0.95$.

4. All C1-winter tyres should at least meet the demand of the minimum wet grip value G of 1.15. The minimum wet grip value for C2-winter tyres should be 0.95 and for C3-winter tyres it should be 0.85.

5. Due to the missing limits for G in the wet grip class F a tyre-to-road coefficient of adhesion of 0 (zero) is legally permitted, according to Commission Regulation (EU) No. 1235/2011, officially valid from May 30, 2012. Therefore the road traffic safety for motor vehicles in Europe is acutely jeopardized. This is an apparent flaw in above cited regulation and it is strongly recommended, that the wet grip class F is removed urgently from said regulation, since a direct liability of the responsible EU Commission can not be excluded in this case.