

ADAC Tyre test

Tyre abrasion vs. safety performance

Data basis: ADAC summer tyre test 2023

**Dino Silvestro, ADAC e.V.
Senior Manager Vehicle Testing**

ADAC tyre test - tyre wear vs. tyre safety



Motivation

The reduction of tyre wear not only ensures a low environmental impact, but also ensures lower resource consumption and extends the lifetime of a tyre until it is worn out. However, the reduction of tyre wear must not have the consequence that the original tasks of the tyre - namely as a safety-relevant link between vehicle and road - are negatively influenced.

- **Data basis:** Measurement data from the ADAC tyre test
- **Evaluation period:** 50 tyres from the ADAC summer tyre test 2023 [Source: adac.de/reifen]
- **Methodology:** All objectively recorded measured values are compared with the respective tyre wear in order to obtain statements as to whether disadvantages are to be expected per se in other criteria for tyres with low wear, or whether the latest tyre technology can largely resolve the conflicting targets.
- **Limitation:** The evaluation currently only addresses summer tyres.

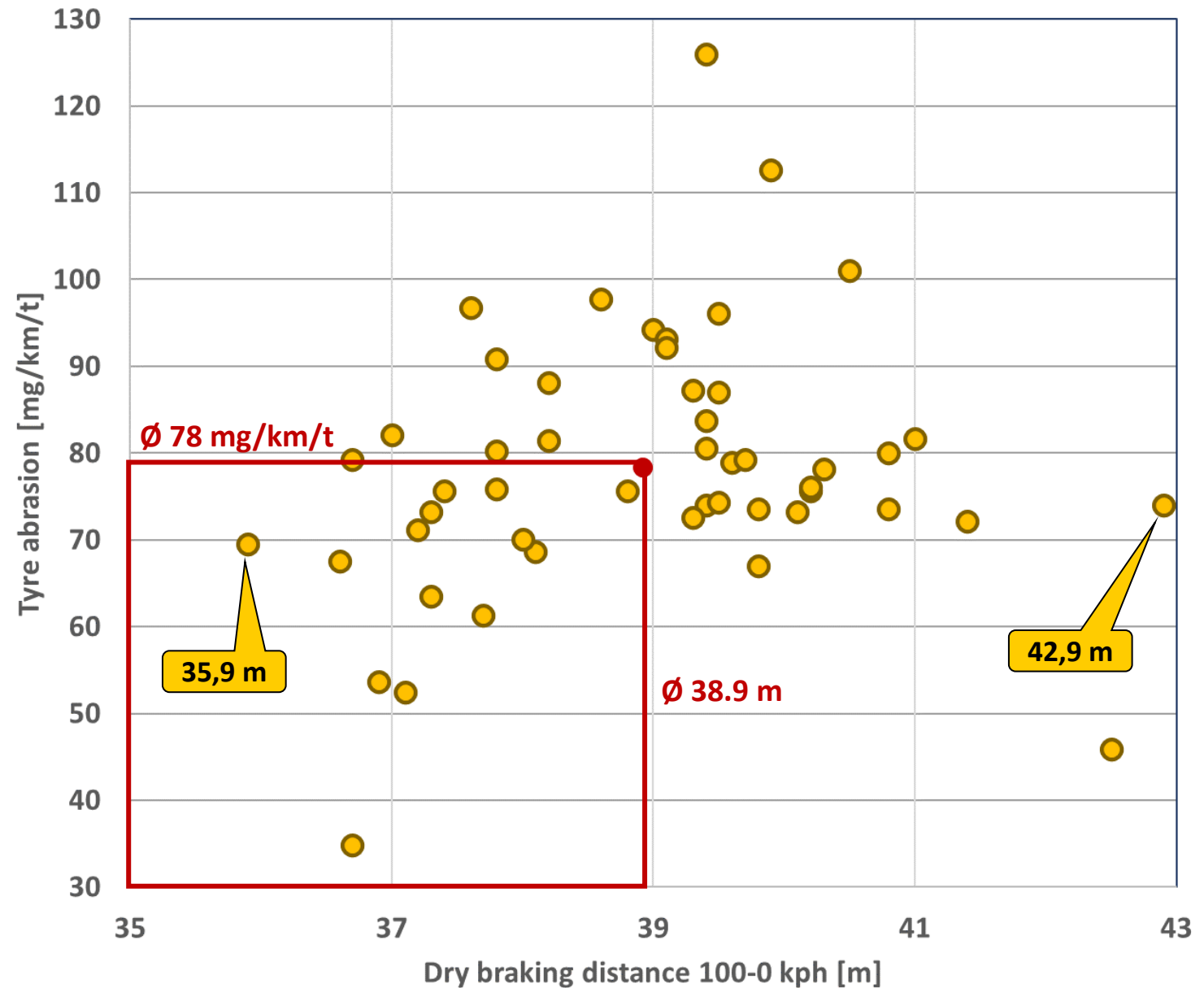
Methodology for determining tyre wear

- Of the 50 summer tyres, 35 tyres were run on an abrasion test bench and 19 tyres in the on-road test.
- 4 tyres went through both the test bench and the on-road test. To make the results comparable and to compensate for individual environmental conditions during the on-road test, the results of the tyres run on the test bench were corrected using a correlation factor.
- This ensures, on the one hand, that the results from the two procedures are comparable with each other. On the other hand, the performance of the cross-check is an important quality feature for ADAC in order to secure the results of the external service provider. For this reason, the cross-check is carried out anonymously.

Dry braking distance

Braking distance from 100 kph to standstill. Average value from 10 individual measurements.

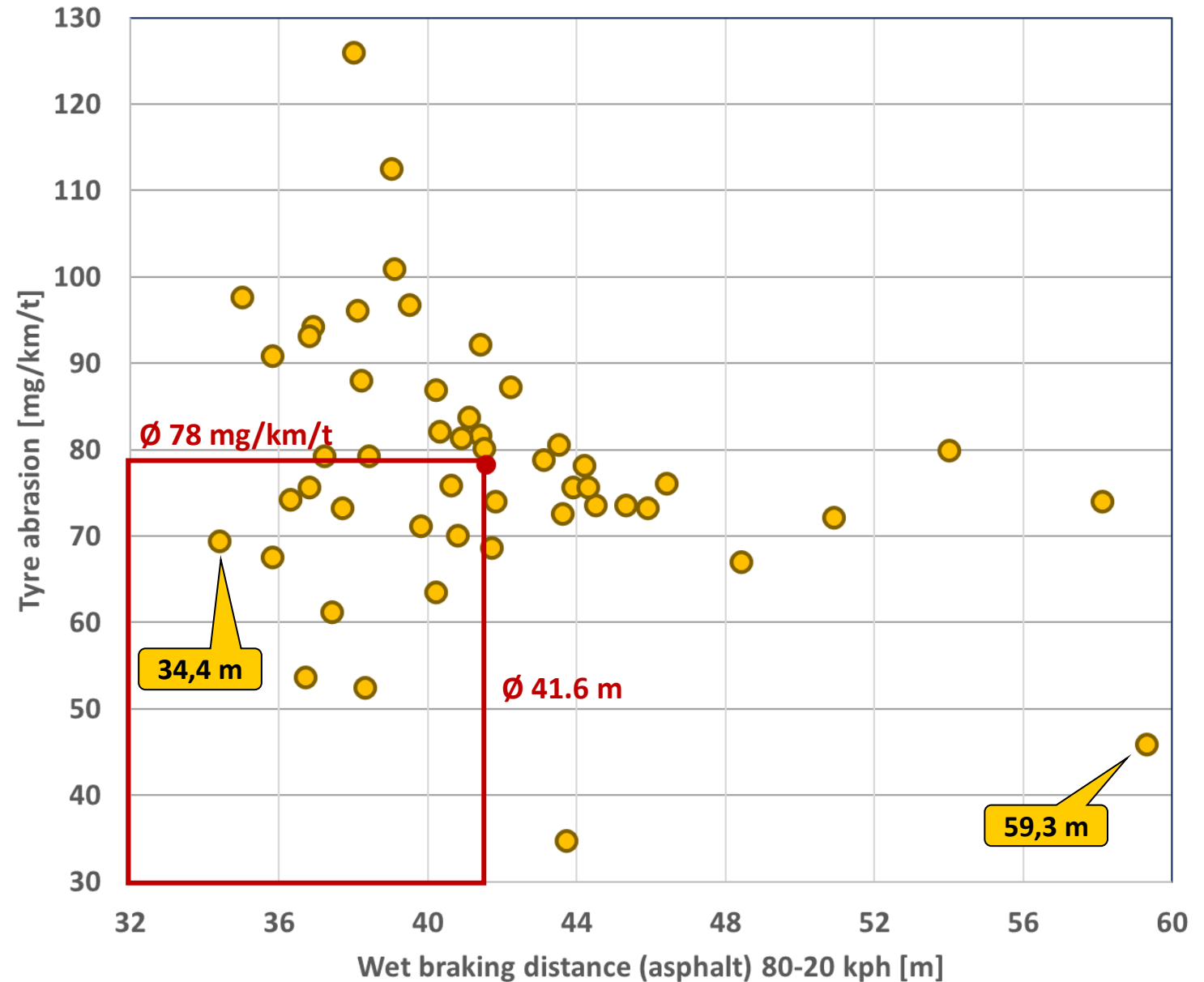
- Tyres with low abrasion are not expected to have any disadvantages in dry braking.
- Of the 10 tyres with the lowest abrasion, 8 show above-average braking performance on dry roads.
- The shortest braking distance is achieved by a tyre with above-average low tyre wear.



Wet braking distance (asphalt)

Braking distance from 80 kph to standstill, according to ECE-R 117. Average value from 25 individual measurements.

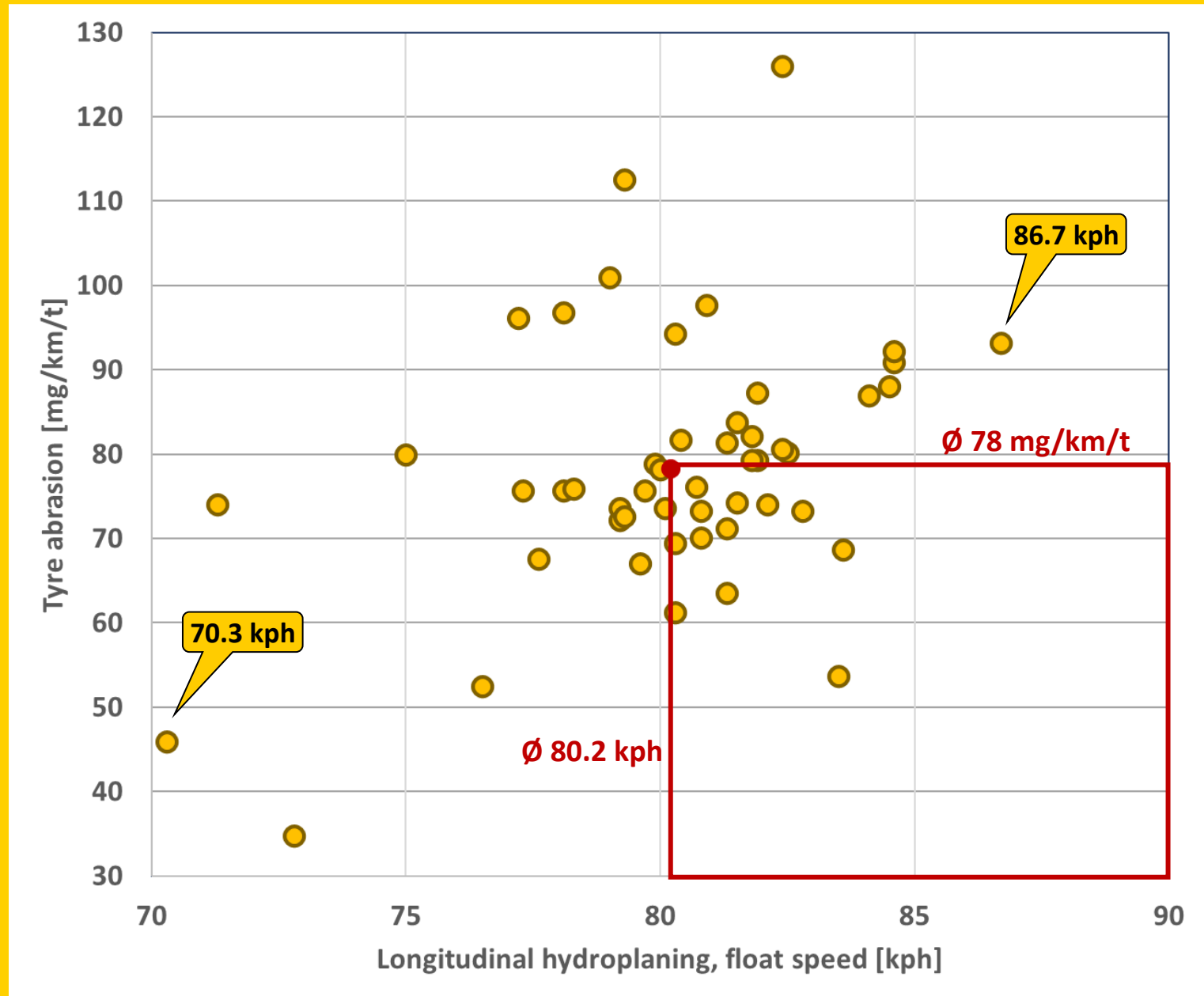
- According to current evaluation, even tyres with low abrasion can achieve low braking distances on wet roads.
- Of the 10 tyres with the lowest abrasion, 7 show above-average braking performance on wet roads.
- The shortest braking distance on wet roads is achieved by a tyre with above-average tyre wear.



Longitudinal Hydroplaning

Measurement of the max. speed at a water depth of 7 mm until the tyre float up. Average value from 7 individual measurements.

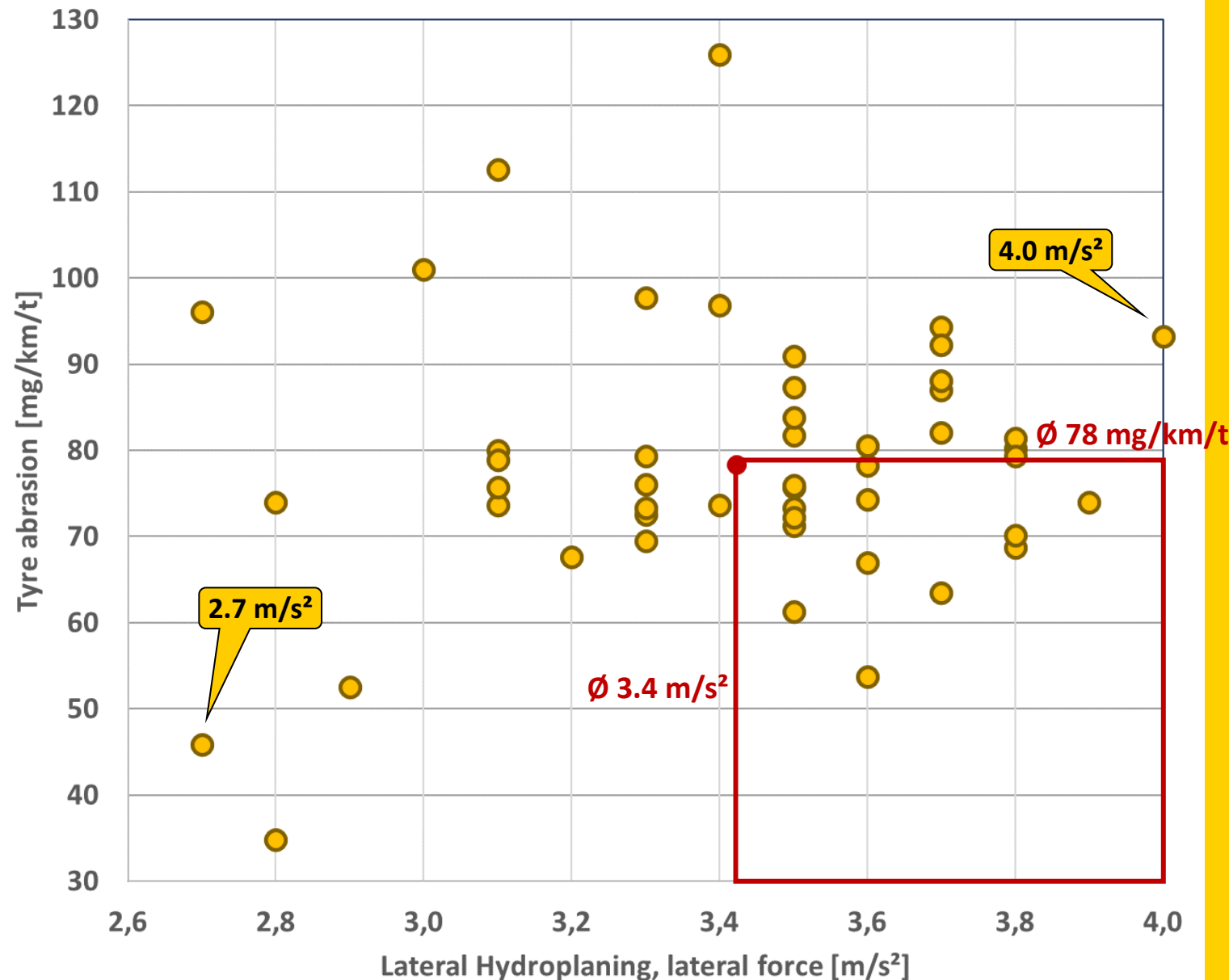
- Tyres that have lower tyre wear show slightly increased hydroplaning sensitivity overall.
- 5 of the 10 tyres with the lowest abrasion show above-average safe behaviour in longitudinal aquaplaning.
- The tyres with the best longitudinal hydroplaning performance shows an increased tyre wear.



Lateral hydroplaning

Evaluation of the lateral acceleration when driving through a flowing water section in a curve with a water depth of 5 mm. Average value from 8 individual measurements.

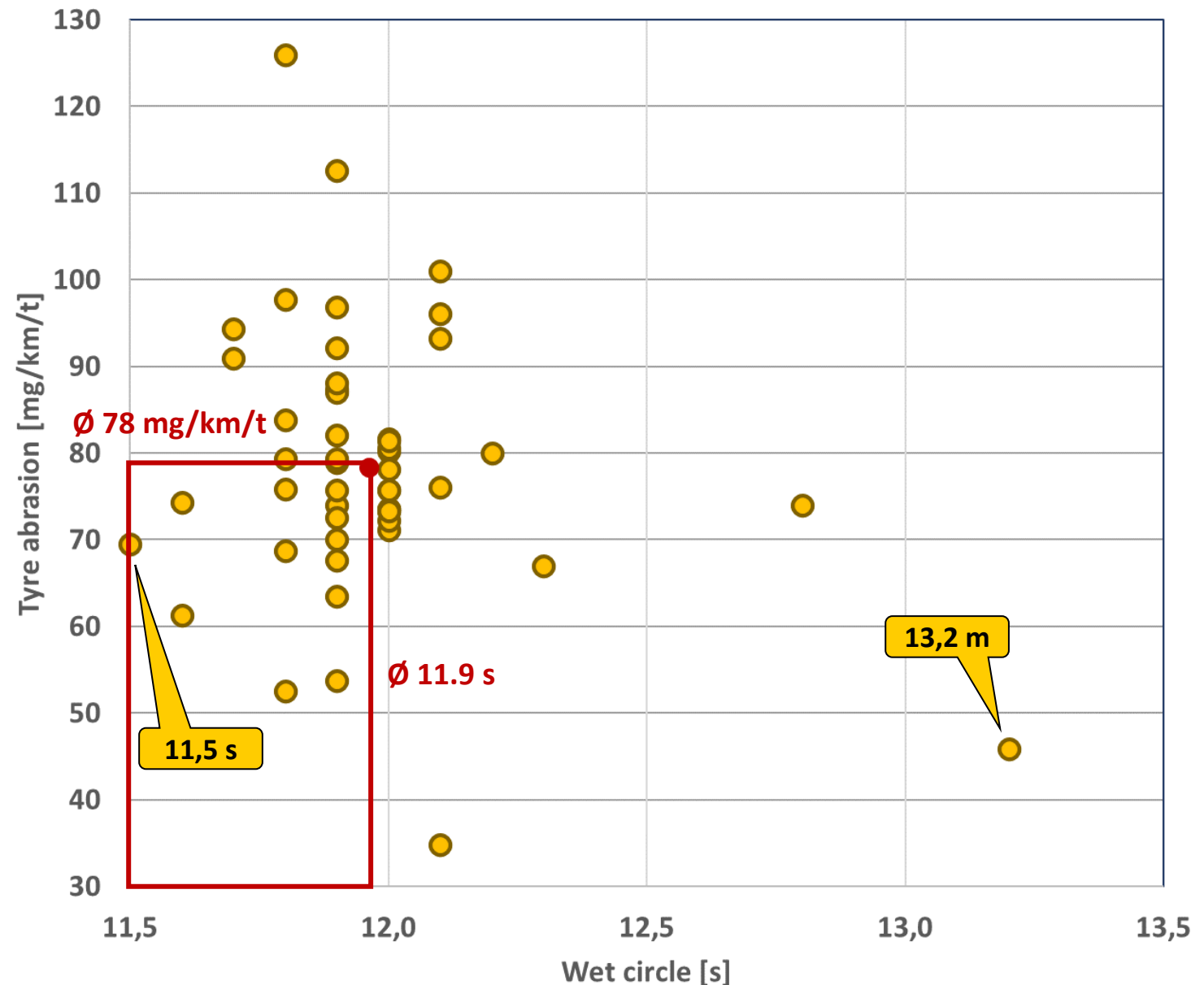
- In the case of lateral aquaplaning, no tendency can be derived as to whether tyres with low abrasion could have fundamental disadvantages.
- 5 of the 10 tyres with the lowest abrasion show above-average safe behaviour in transverse aquaplaning.
- Tyre design and tread depth are the relevant criteria for lateral hydroplaning performance.



Wet Circle (lap time)

Measurement of the lap time during a constant circular drive at the grip limit to evaluate the mechanical grip of a tyre on a wet road surface. Average value from 5 individual measurements.

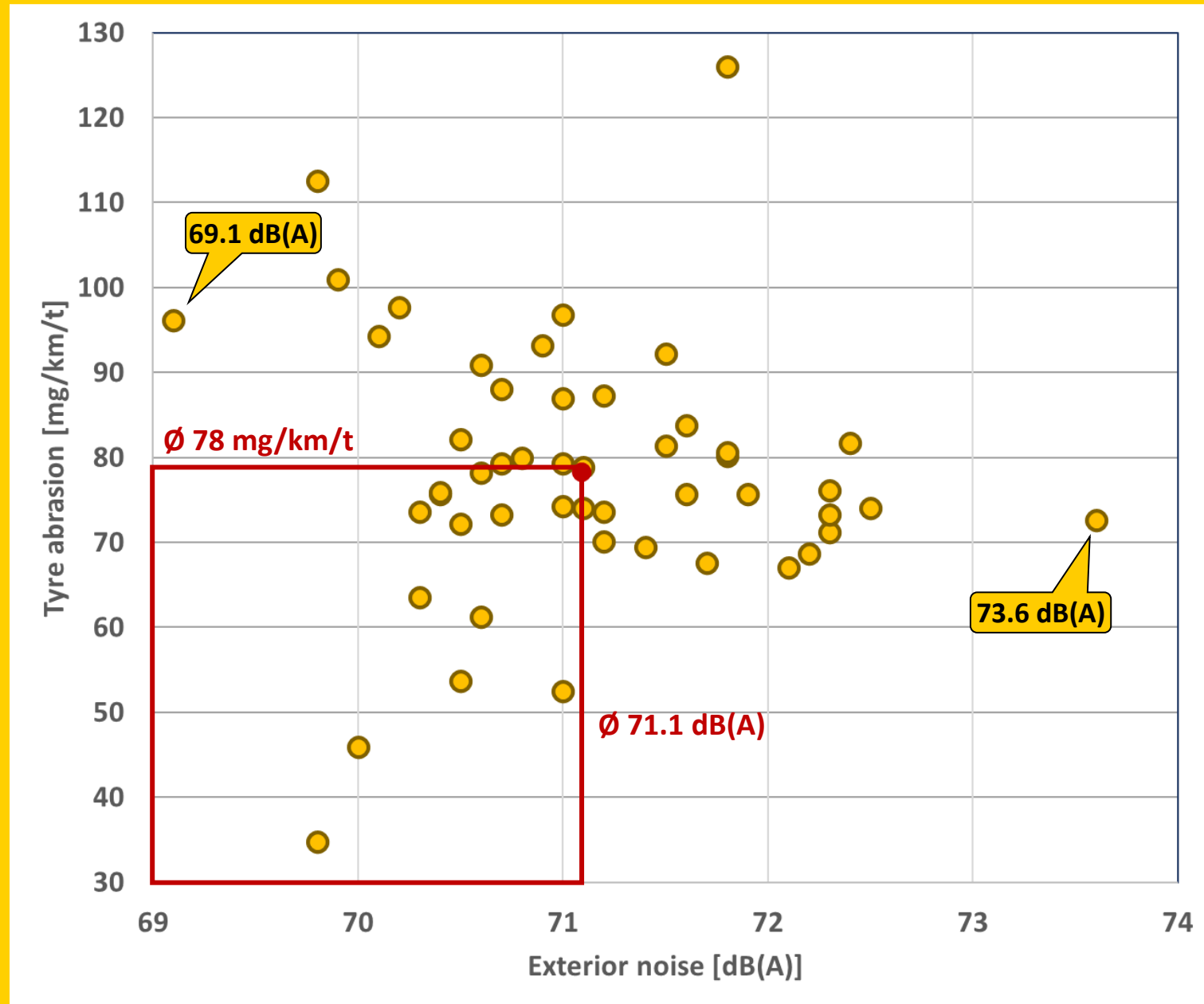
- When driving in circles on a wet road, no tendency can be derived that tyres with low abrasion could have disadvantages in principle.
- 7 of the 10 tyres with the lowest abrasion show above-average high grip limit on wet road.
- The tyre with the lowest lap time is one of the tyres with the lowest tyre abrasion.



Exterior Noise

Measurement of the exterior noise according to ISO 362 at 80 km/h and 50 km/h on asphalt according to ISO 10844. Average value from 4 individual measurements each.

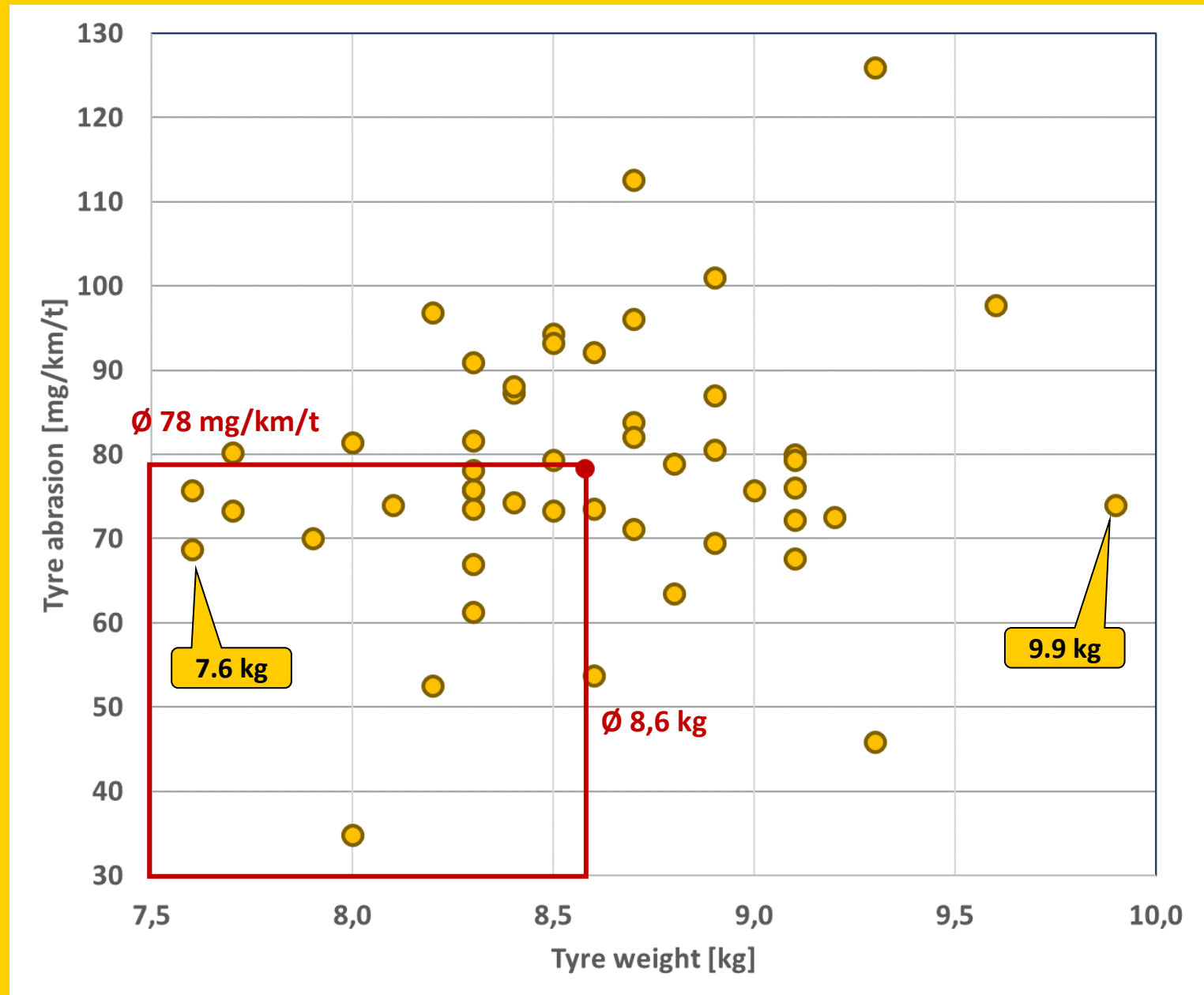
- In particular, tyres with low tyre wear also seem to have advantages in terms of noise levels, which may be due to the somewhat reduced new tread depth of many eco tyres.
- 6 of the 10 tyres with the lowest wear are show also an above average low tyre noise level.



Tyre Weight

Measurement of the tyre weight in new condition.

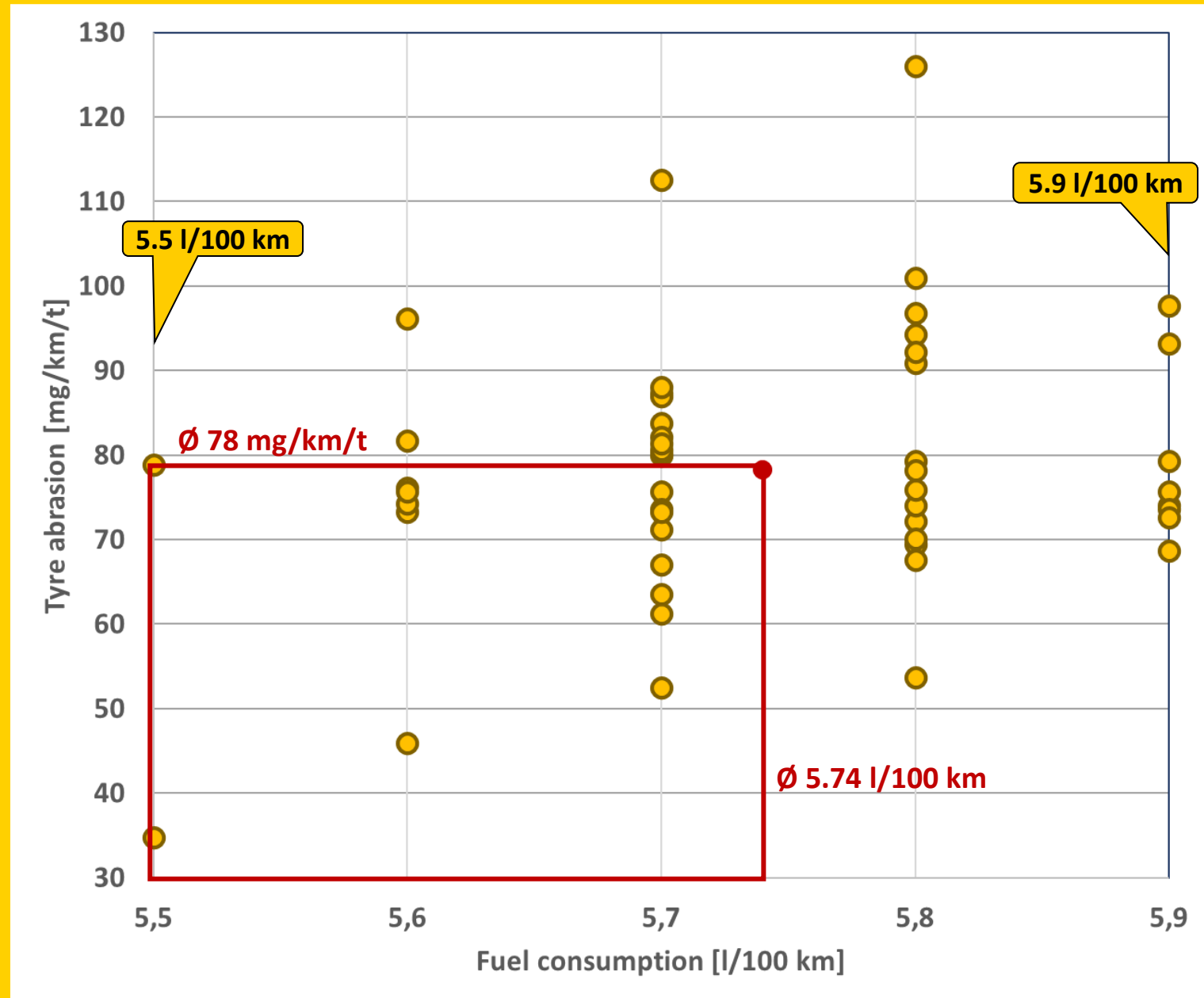
- Tyres with low tyre wear often also appear to be lighter than average.
- 5 of the 10 tyres with the lowest abrasion are also lighter than average.
- The tyre with the lowest weight convinces at the same time with an above-average low abrasion.



Fuel Consumption

The fuel consumption is measured at a constant speed of 100 km/h. The vehicle is driven 19 km and the fuel consumption is measured. A distance of 19 km is driven and the fuel consumption of the vehicle is measured.

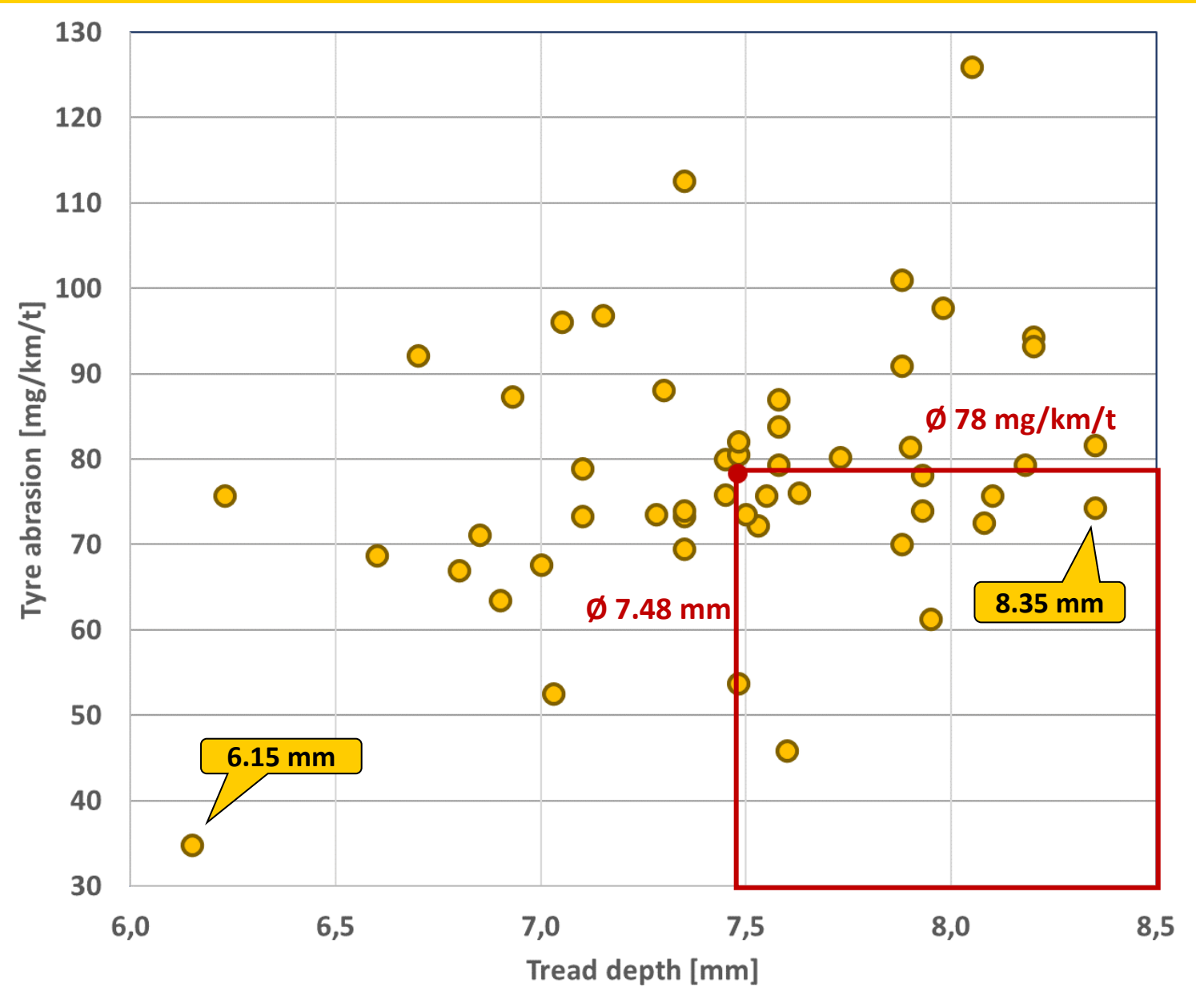
- Tyres with low tyre wear also seem to tend to have slightly better energy efficiency.
- 6 of the 10 tyres with the lowest wear also ensure above-average fuel economy.
- The tyre with the lowest fuel consumption also has the lowest tyre wear.



Tread Depth

The tyre tread depth when new is the second relevant criterion, along with tyre wear, for determining how much mileage a tyre can achieve before it needs to be replaced. The tread depths shown are the average value of the main tread grooves.

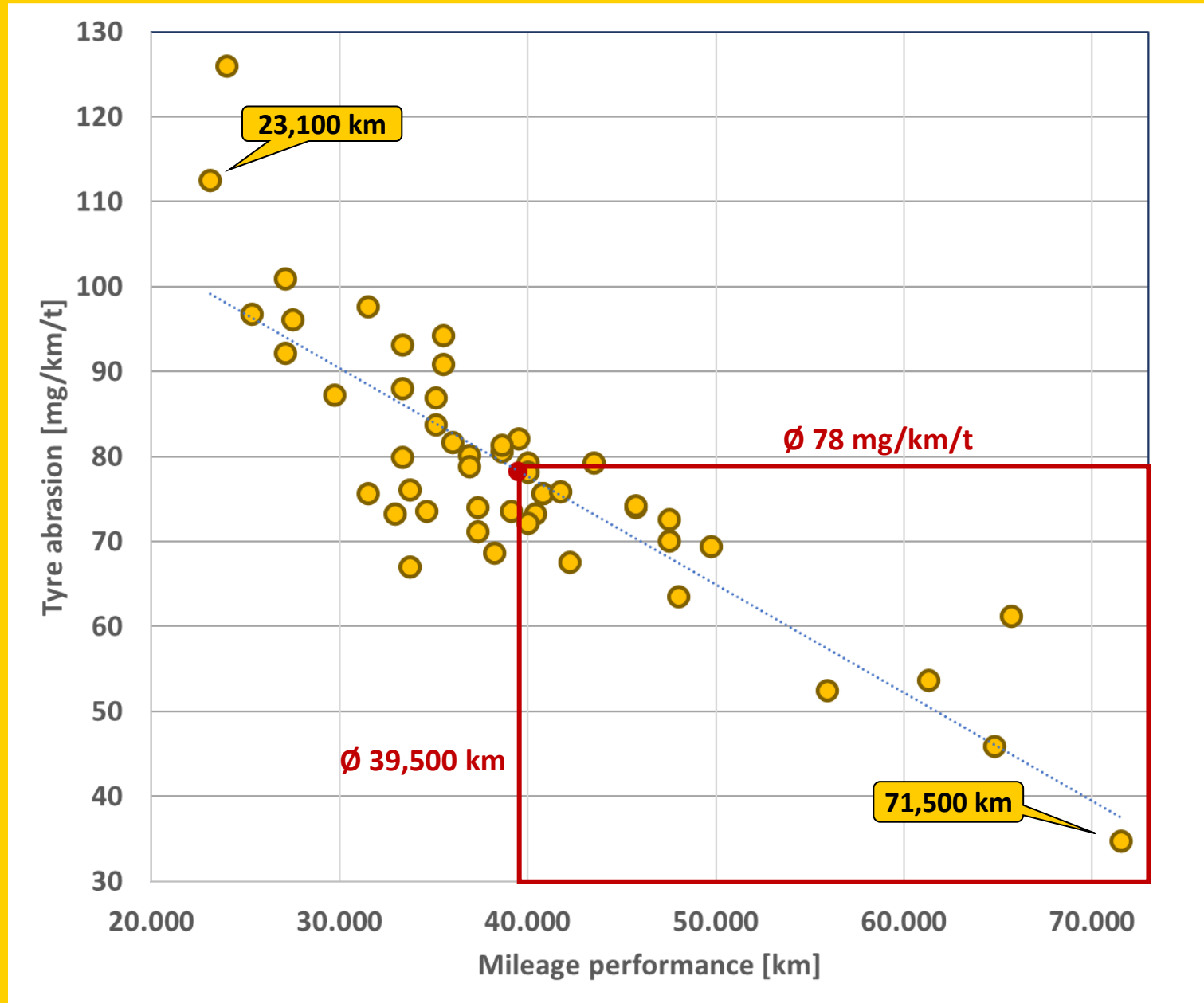
- Tyres with low abrasion tend to have a slightly lower new tread depth.
- Only 3 of the 10 tyres with the lowest wear also have an above-average tread depth when new.
- In order to ensure the longest possible usage of a tyre, it is also always preferable to have the highest possible new tread depth.



Mileage Performance

The possible mileage is determined from the tyre wear and the available tread depth. The mileage is calculated until the legal minimum tread depth of 1.6 mm is reached.

- Basically, there is a strong correlation between tyre wear and the life expectancy of a tyre.
- Individual results show that a slightly higher tyre abrasion can be compensated for by an increased new tread depth. Even though the use phase of the tyres is identical as a result, the tyre with higher abrasion emits more rubber abrasion in the same period and is therefore less environmentally friendly.

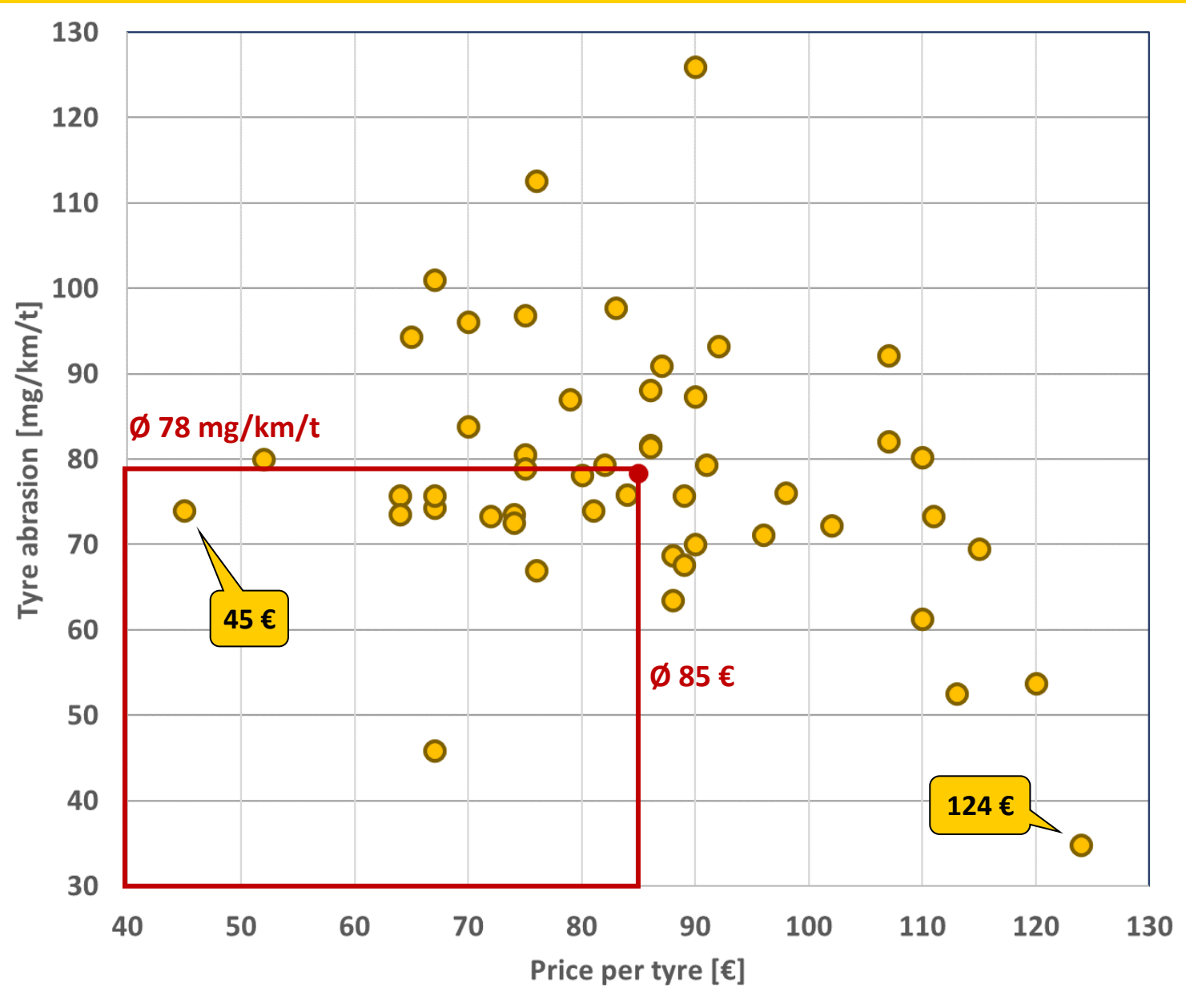


Price

The price of the respective new tyre was determined in January 2023 as part of a price survey by the BRV (Bundesverband Reifenhandel e.V.).

- Tyres with low abrasion (and at the same time good safety properties) are more expensive than average.
- Only 2 of the 10 tyres with the lowest abrasion are also cheaper than average. However, both tyres have serious safety deficiencies.

Note: This slide is only valid for the German market, but gives a good overall estimation, how tyres with low abrasion affect the price of a tyre.



Summary

➤ The ADAC evaluations of 50 summer tyres in the dimension 205/55 R16 show, that in principle, tyres with low abrasion not have in general any disadvantages in other (safety) relevant criteria.

➤ However, care should be taken to keep an appropriate balance, that tyres not loose safety because of environmental thresholds. As things stand today, eco tyres that have been uncompromised developed to minimise abrasion do not yet fully meet all safety criteria.

➤ It must be aware that correspondingly state-of-the-art tyres, which resolve all conflicts of objectives, are more expensive on average. It is therefore also for the tyres sector important to keep sustainable and affordable mobility. This can also be done by raising consumer awareness of the longer service life of low-wear-tyres and the resulting cost compensation. However, it must also be ensured that, on the other hand, the depth of new tyres is not reduced. At the end, the additional information of the tyre mileage is a very important point, to make this issue clear to the consumer.

This ADAC study is currently only valid for summer tyres. How the snow properties of winter tyres in particular are influenced by tyre wear was not the subject of this evaluation.

Thank you for your attention

