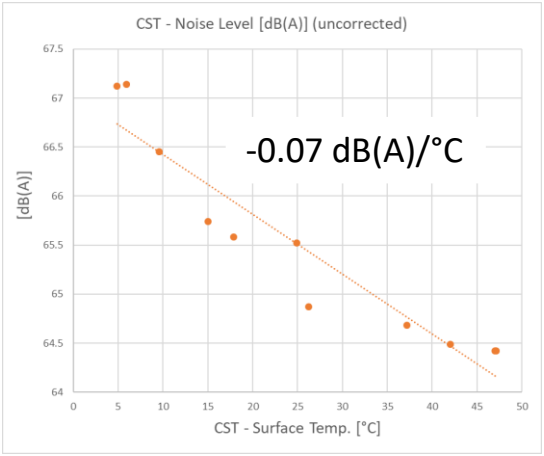
Tyre Temperature/Aging Effect on UN Reg. 51.03

Temperature Effect on UN Reg. 51.03

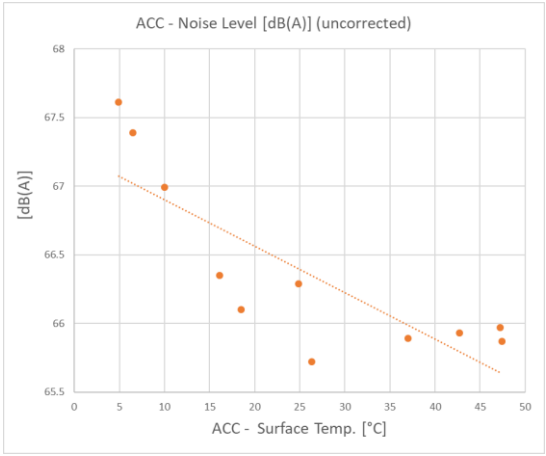
Tyre/Road Noise for C1 summer tyres

Example: tyre/road noise summer tyre measured at different temperatures.

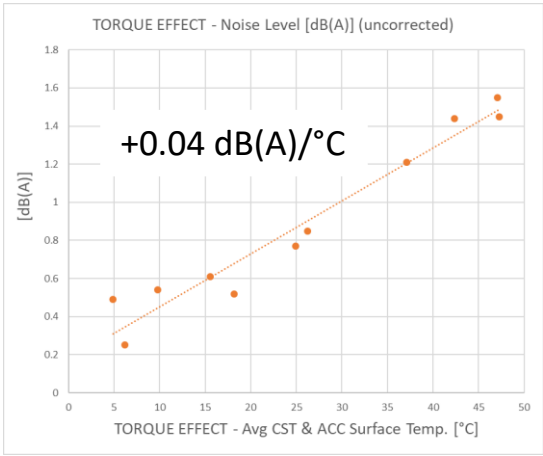
50 km/h constant speed



2 m/s² accelerated at 50 km/h



Noise increase due to acceleration



- A linear relationship can be used to approximate the temperature dependency of the constant speed noise at 50 km/h (R^2 ~0.84). Based on data from multiple C1 summer tyre designs and sizes an average value of -0.07 dB(A)/°C surface temp. is found for 50 km/h constant speed.

- A linear relationship can be used to approximate the temperature dependency of the noise increase as a result of the acceleration (R^2 ~0.86). Based on data from multiple C1 summer tyre designs and sizes an average value of +0.04 dB(A)/°C surface temp. is found for the noise increase due to acceleration (2 m/s² accelerated at 50 km/h).

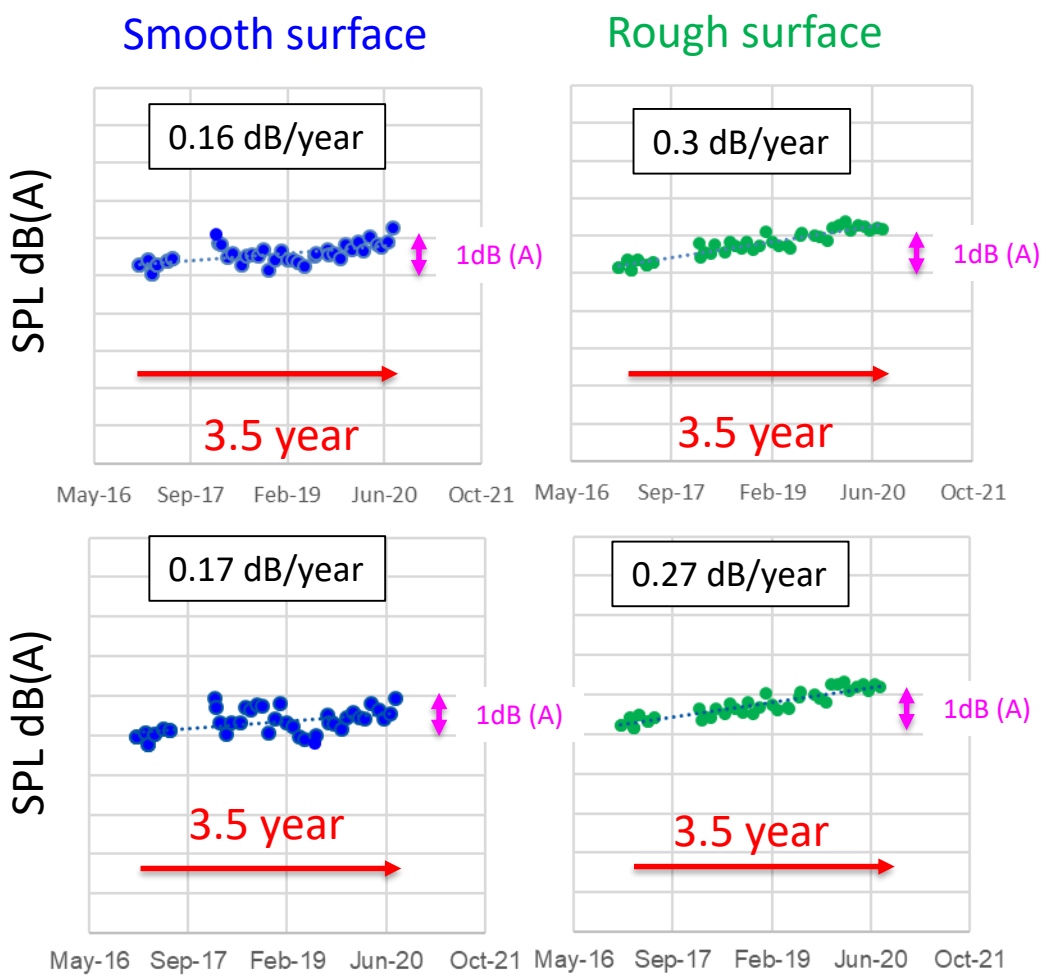
- Based on data from multiple C1 summer tyre designs and sizes it is found that a linear relationship is not appropriate (R^2 ~0.44) to describe the temp. dependency of the noise under acceleration (2 m/s²) . The noise generation phenomena linked to constant speed rolling and a driving torque show an opposite temperature dependency. Therefore, the noise under acceleration cannot longer be approximated by a linear relationship.

Tyre aging effect on UN Reg. 51.03/ Reg.117

Same tyre periodically tested in the Lab over a period of 3.5 years

Reg.117
Reference
speed 80 km/h

Reg.51
Reference
speed 50 km/h
(Constant speed)



Averaged aging effect (multiple tyres on smooth/rough surface)= **0.2 dB(A)/year**
both for Reg.117 (80 km/h) and Reg.51 (km/h) cruise.