



Statens vegvesen

**Norwegian
Public Roads Administration**

STD-04-09

Snow braking and ice braking tests

Test World Ltd, Finland

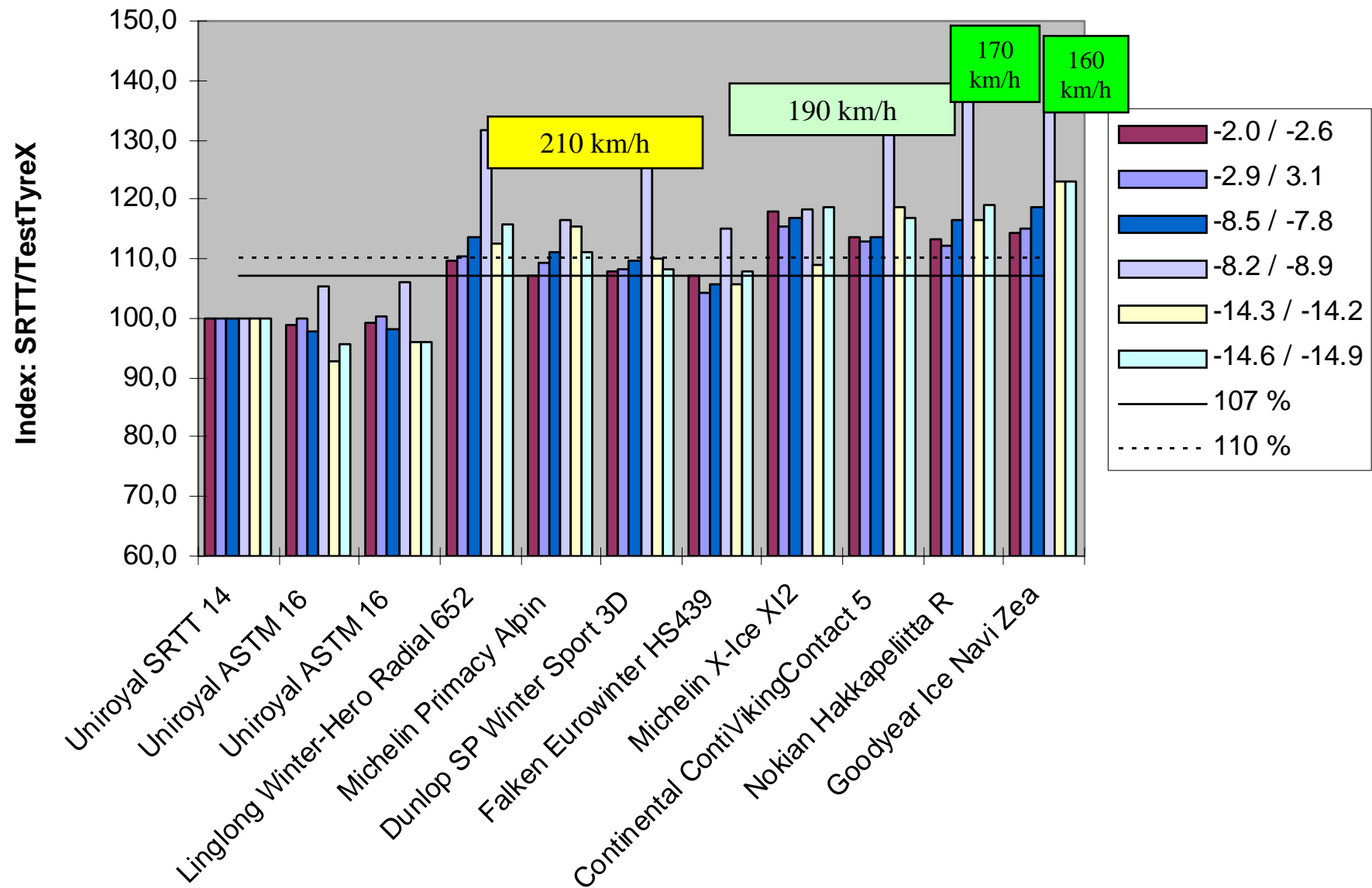


Objectives

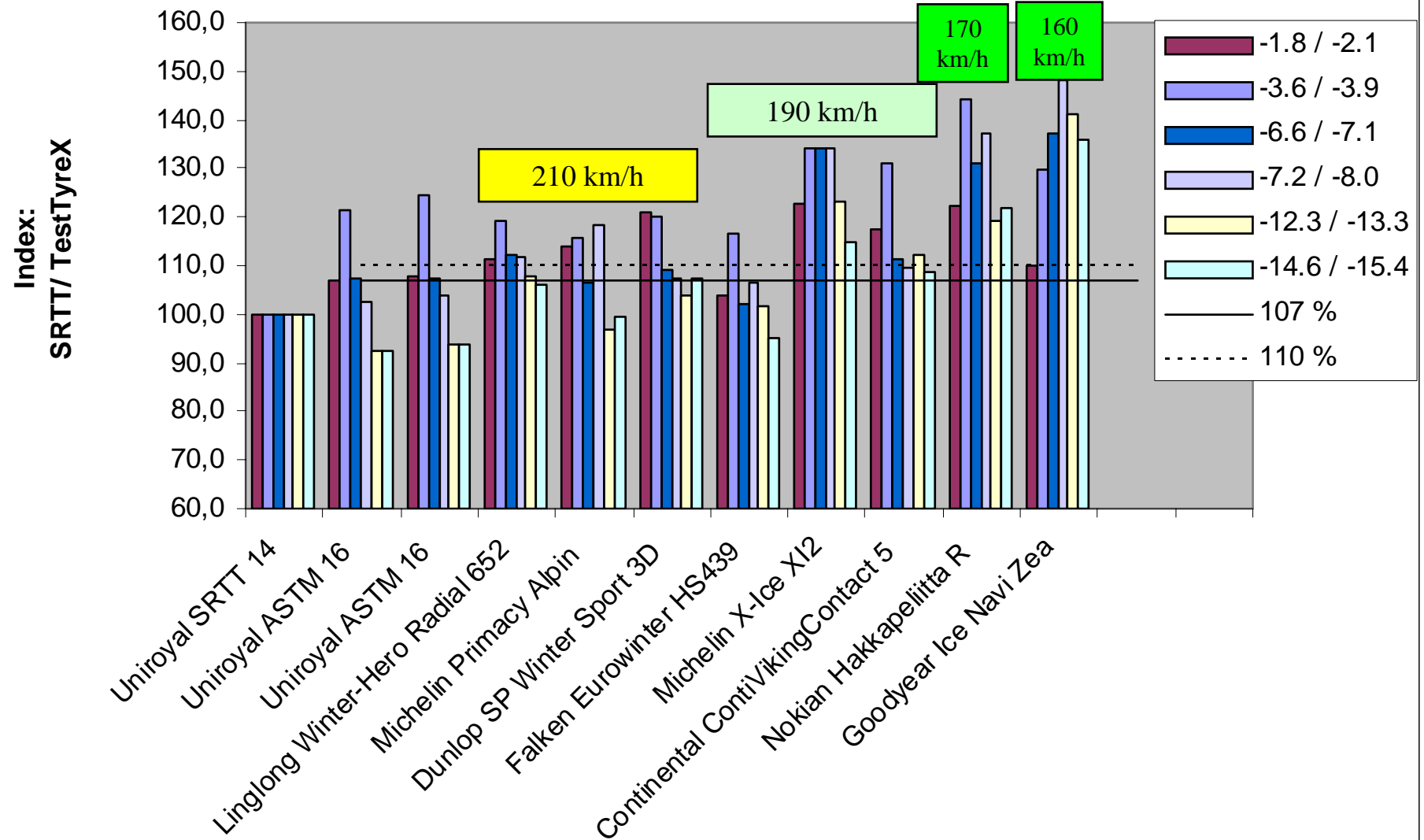
- Test the performance of 8 winter tyres, consisting of tyres designed for both Nordic and milder winters, and to compare them with the SRTT 14' and the ASTM 16' tyres.
- Find the performance levels of different tyre types
- Find the performance limits of premium and low quality tyres
- Check the performance on ice, snow and wet asphalt
- Test the effect of test conditions, having tests made in a range of different temperatures
- Have information about the reproducibility, by repeating the tests also in same temperatures



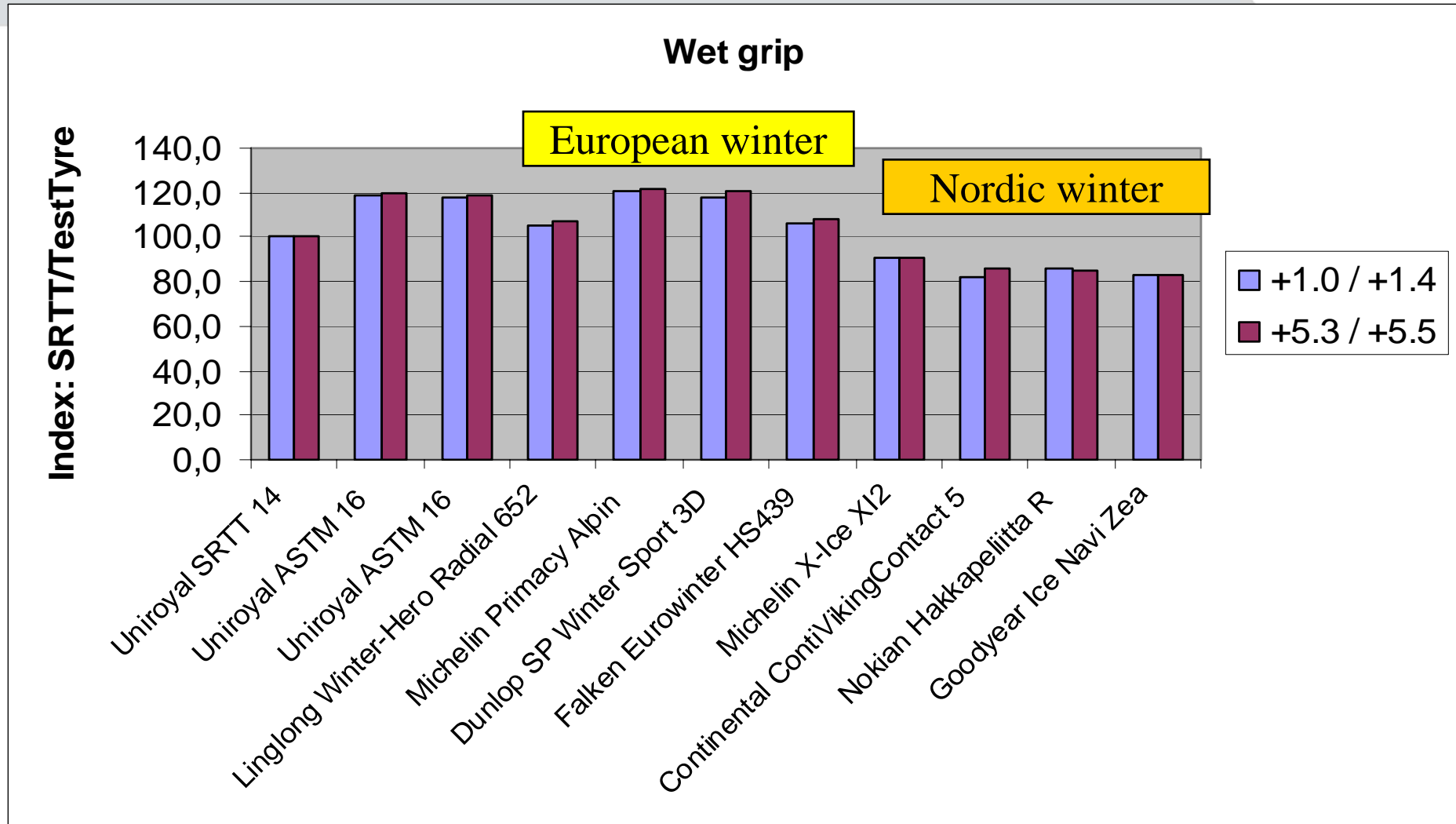
Snow braking at different temperatures, °C



Ice braking at different temperatures, °C



Braking on wet surface

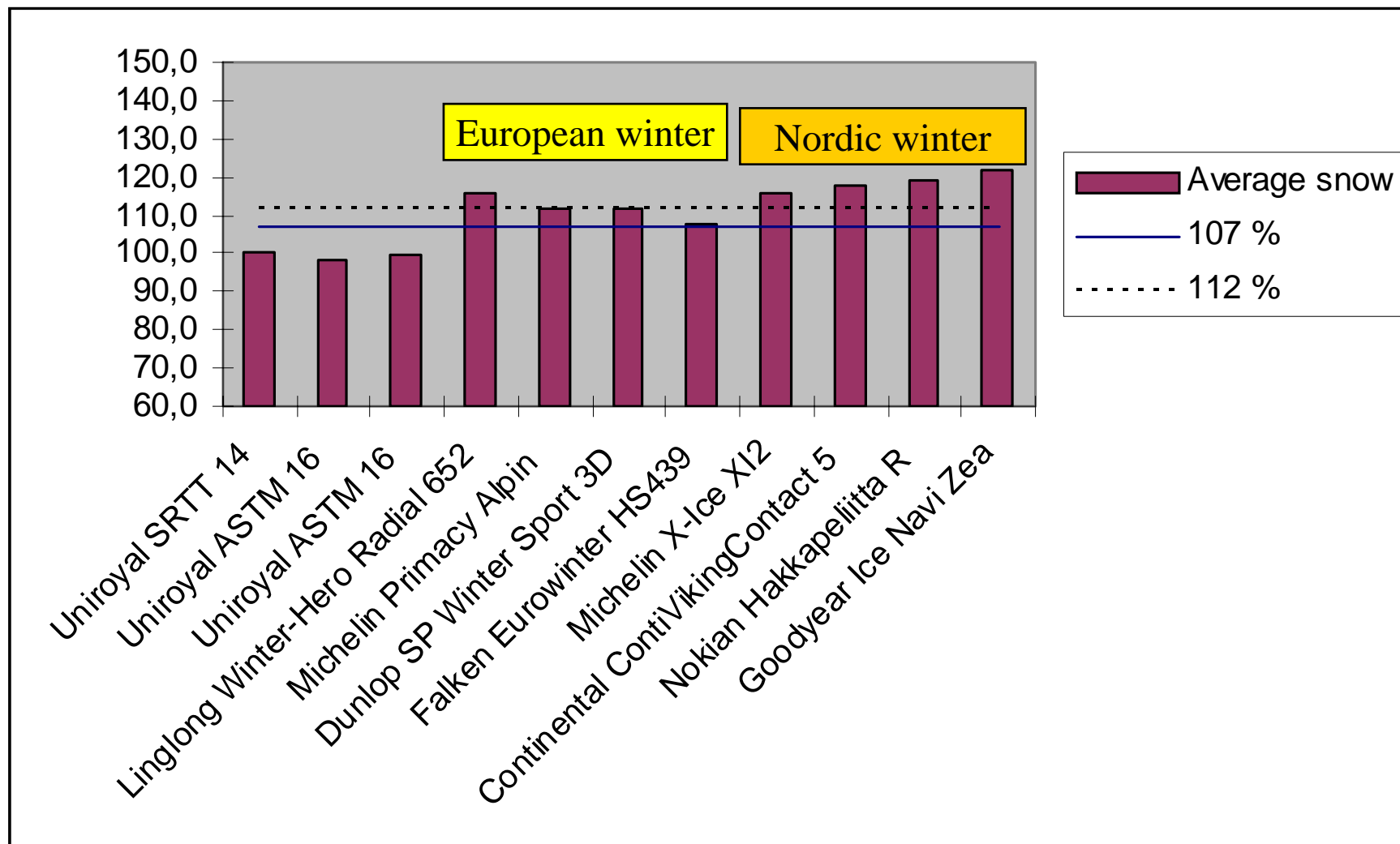


Results: snow and ice braking

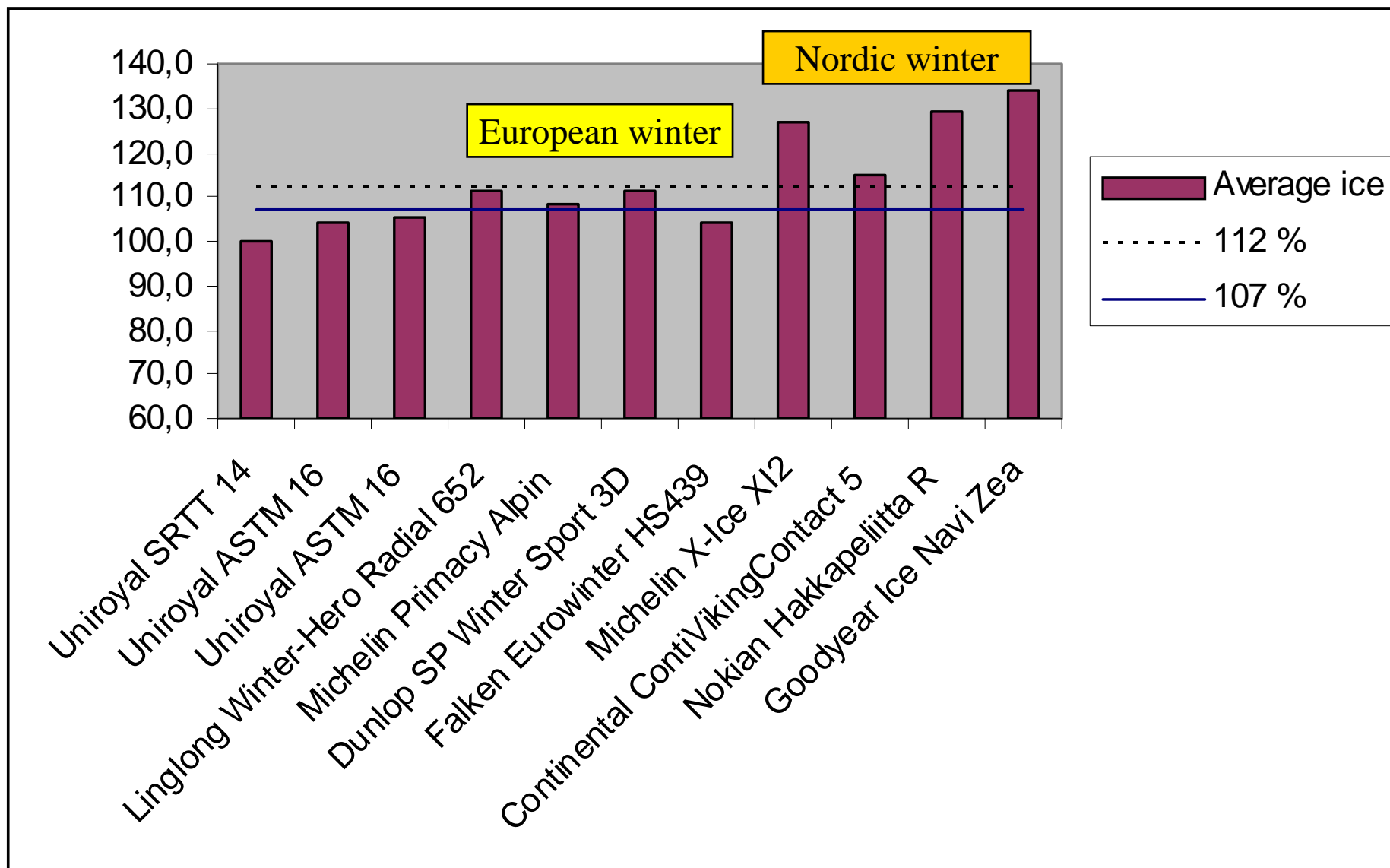
- The main challenge is that in some tests and conditions, some tyres behave very differently, but only some.
- The temperatures have an effect for the above, but not always. The conditions have different effect to different tyres. Some tyres perform better in low temperatures, some in high temperatures.
- The main conclusion is that it is vital to do the tests more than once. Probably at least 3 times, each in different day and temperature. The average would give a good view of the tyre performance.
- When tested only once, it is possible to get almost any result for a certain tyre.



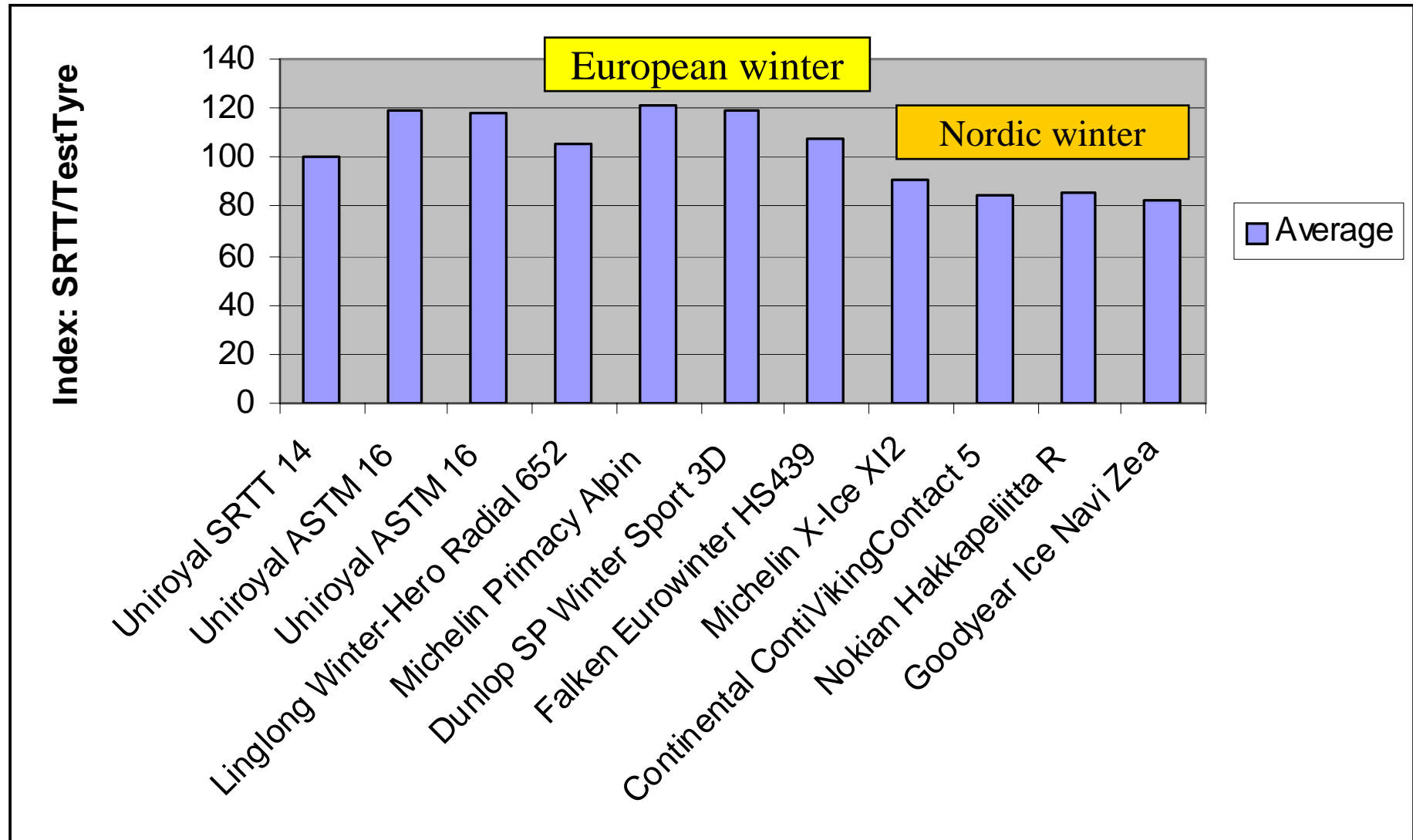
Average results – snow braking



Average results – ice braking

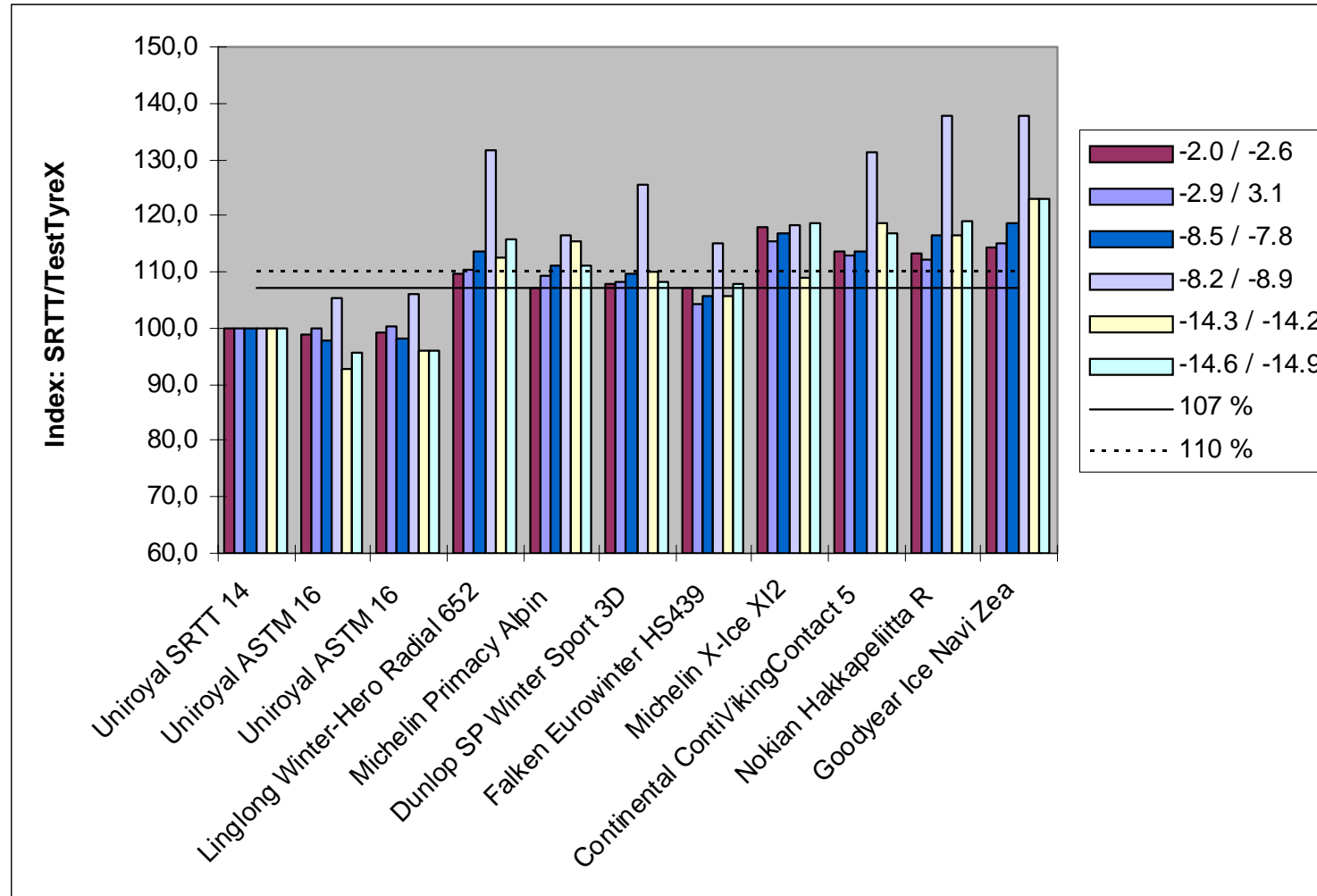


Average results - braking on wet surface

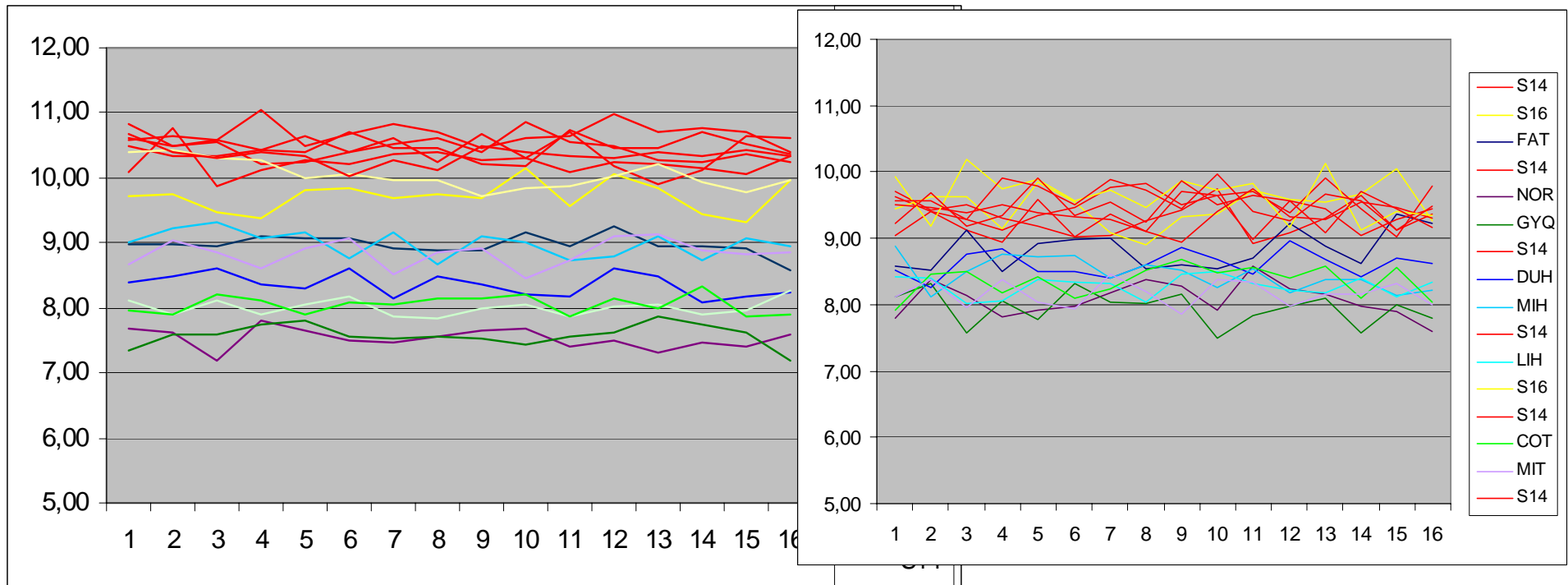


More about the snow tests:

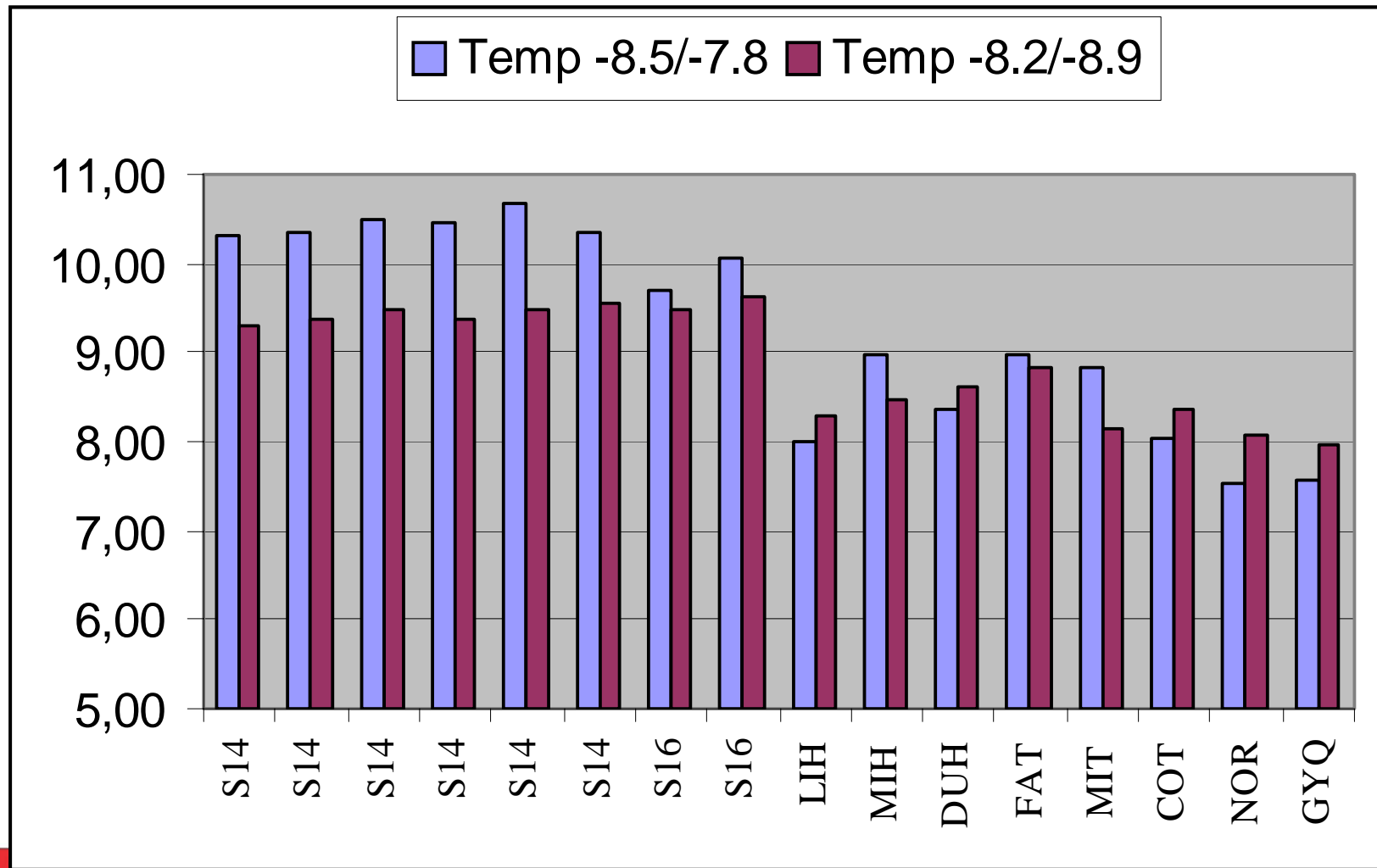
-why peaks when the temperature is the same?



Snow braking two different days at $-8.5/-7.8^{\circ}\text{C}$ and at $-8.2/-8.9^{\circ}\text{C}$

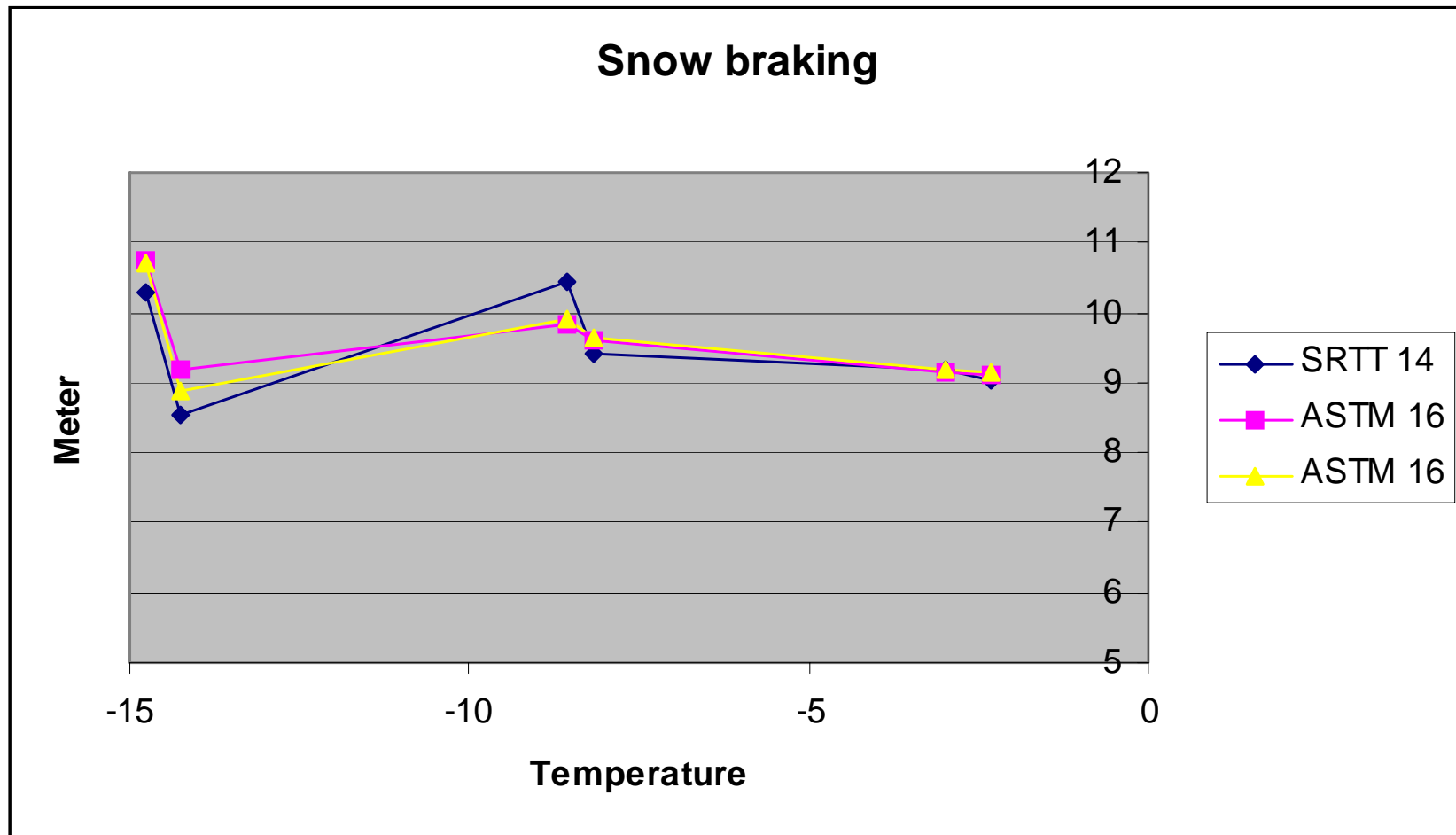


Snow braking – variation SRTT

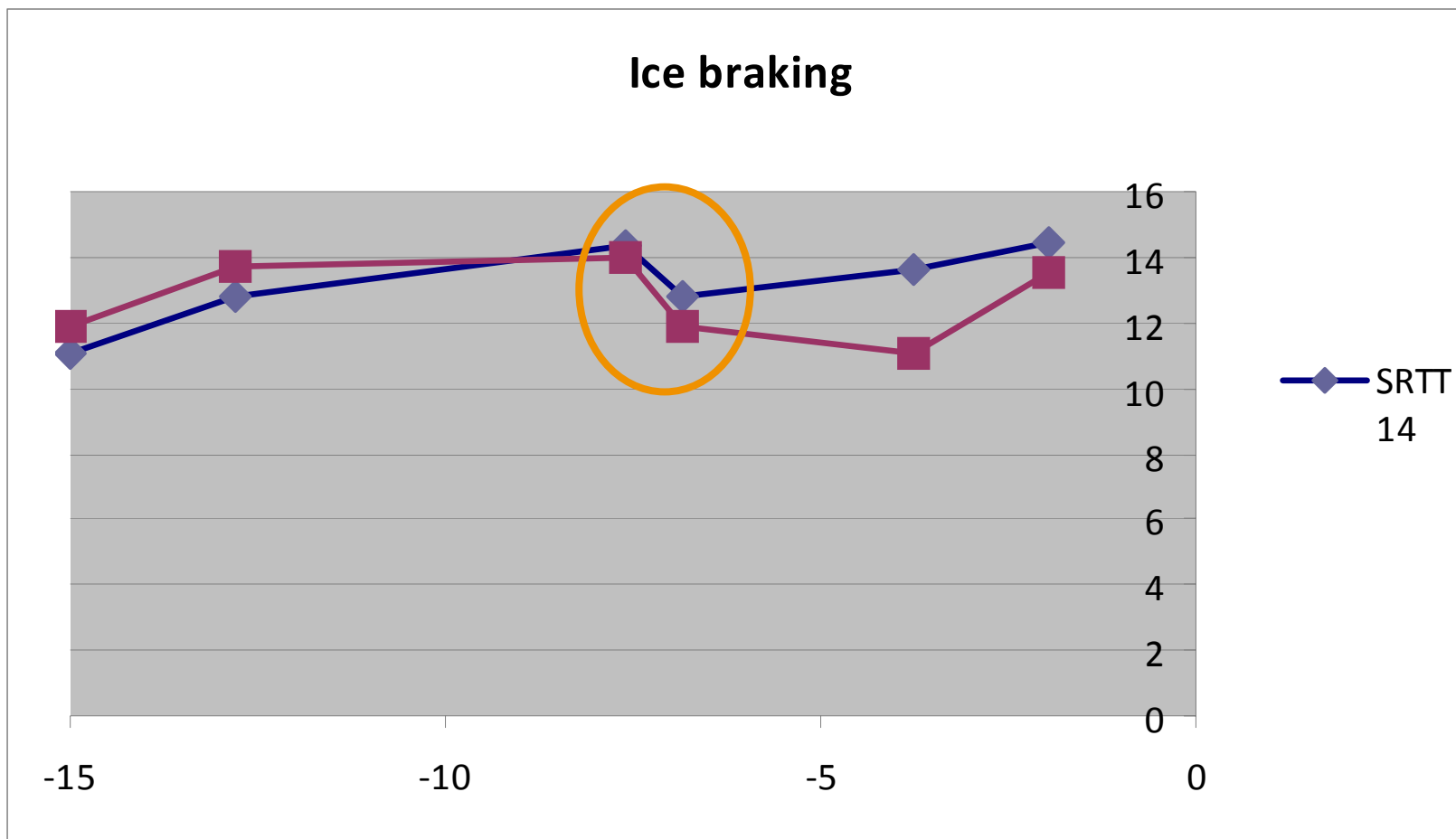


Reference tyres and temperature

- the SRTT 14 varies most



Reference tyres and temperature



Summary

- Braking performance on wet asphalt and on ice are contradictory qualities
- The behaviour of the reference tyres varies more than desirable
- It is vital to do the snow braking tests more than once. Probably at least 3 times, each in different day and temperature. The average would give a good view of the tyre performance.
- When tested only once, it is possible to get almost any result for a certain tyre.
- To get a correct general impression of a tyre one needs information about braking performance on both snow, ice and wet surface

