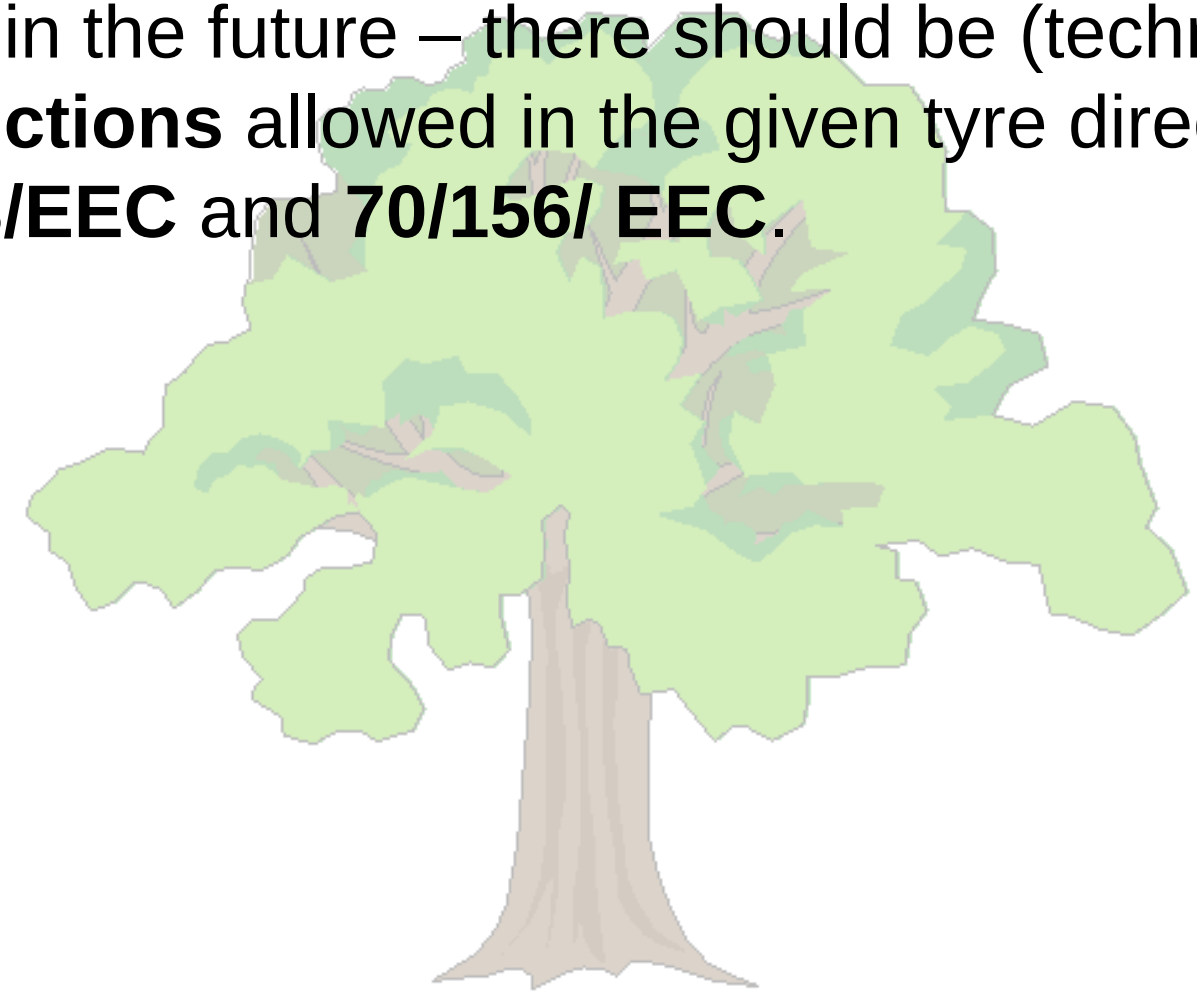
- Current European laws concerning tyres and wheels are not sufficient for today and the future.
- In the Vehicle, Chassis and Chassis control, big changes are going on. These changes include tyres and tyre performance.
- In the future tyres will be actively controlled!
- New technologies are now ready for series production. New laws don‘t exist for these advances.
- The goal of the following German proposal is; As long as we don‘t have a clear view of what we

need in the future – there should be (technical) **restrictions** allowed in the given tyre directives **92/23/EEC** and **70/156/ EEC**.



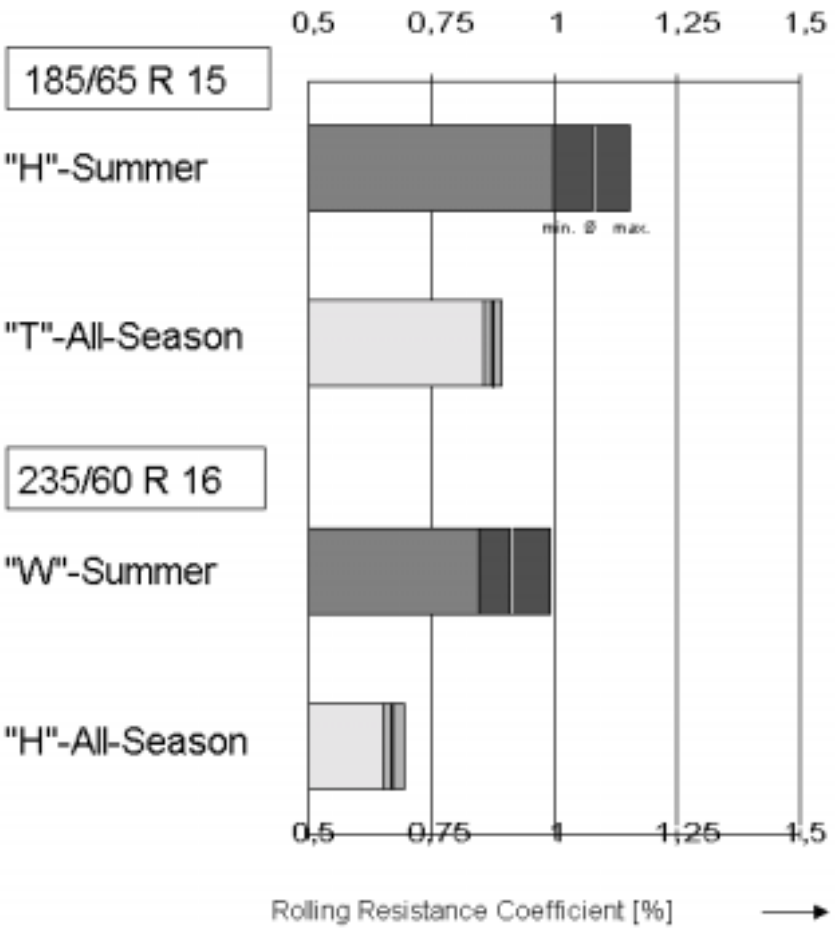
Development of HP Tyres for HP Cars

Future Major Developments and Trends

- Committment for CO_2 reduction will put more emphasis on tyre weight and lower rolling resistance without any deterioration in other tyre performance criterias
- US Zero Evap regulations might change the chemical composition of todays tyres, since virtually no HC-evaporations can be allowed for
- General drive to reduce tyre noise is a major challenge for the tyre industry if other performance criterias may not be affected

Rolling Resistance Index

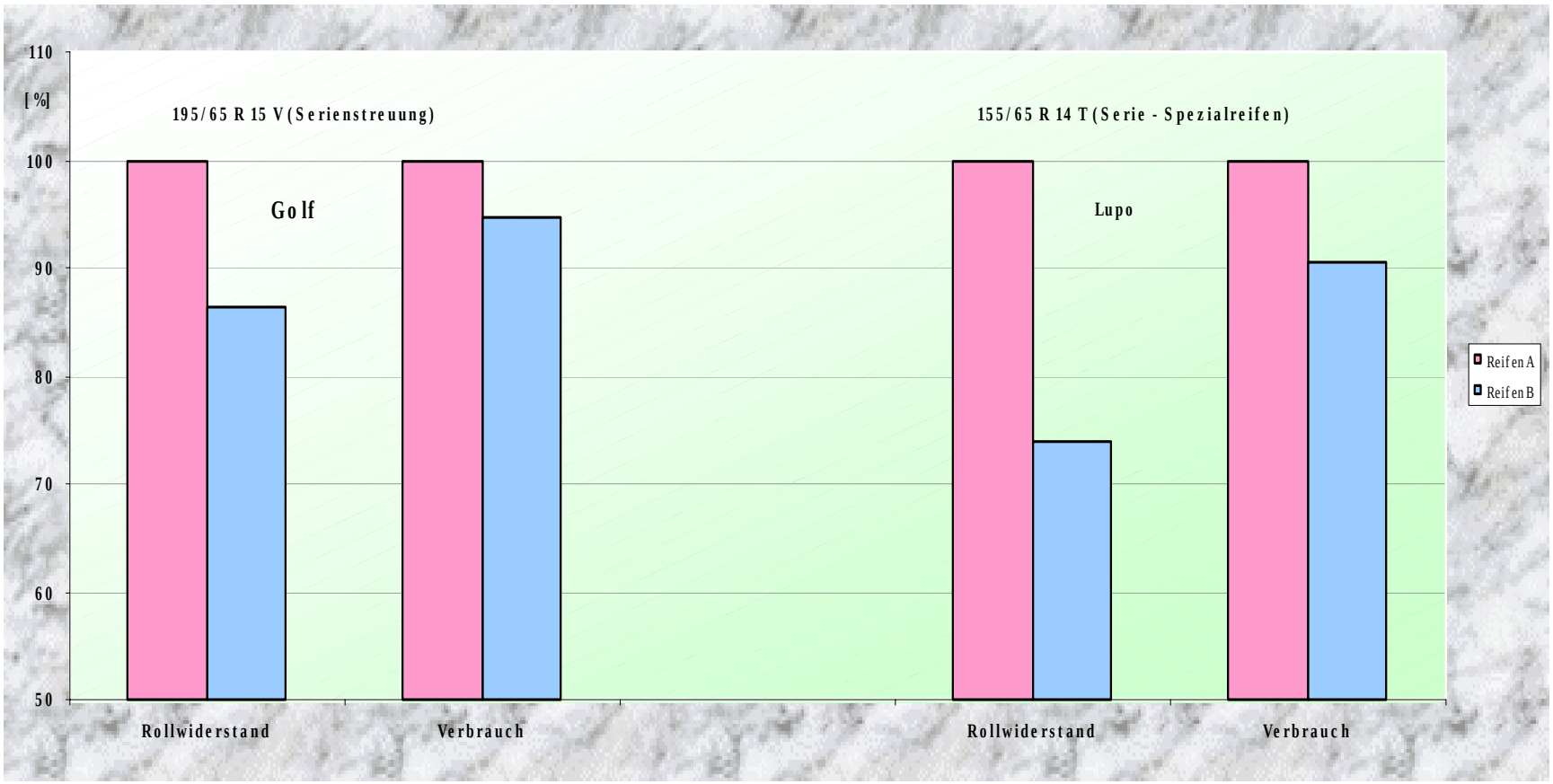
Summer and A/S Tyres
(Range of different brands on A and B series)



Test Conditions

Drum Diameter:	2 m	
Tyre load (R1/R2):	360 kg	490 kg
Tyre Pressure:	2.2 bar	2.4 bar
Rim:	6J x 15	7 ½ J x 16
Ambient Temperature:	25 - 28 °C	
RR - Index:	Average for worst test value at 40, 70 and 100 km/h (based on 5 Tyres)	

Proposal for a Commission Directive
- amending Council Directive **92/23/EEC** (types for motor vehicles and their trailers)
- and Council Directive **70/156/EEC** (type approval of motor vehicles and their trailers)
from Germany



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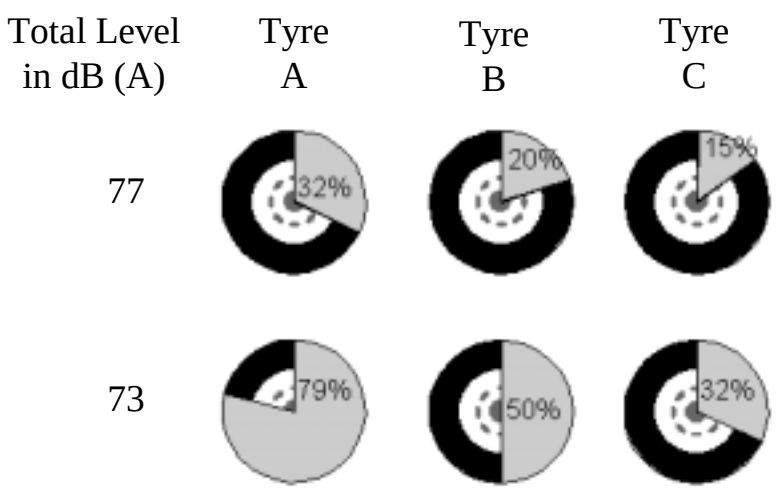
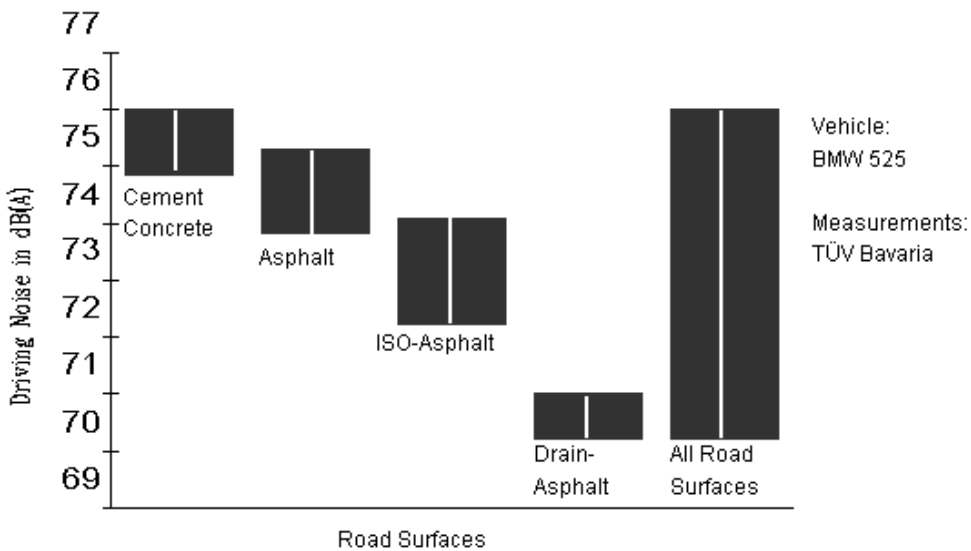
Noise Reduction Potential in Traffic

"Who" can do "what" ?

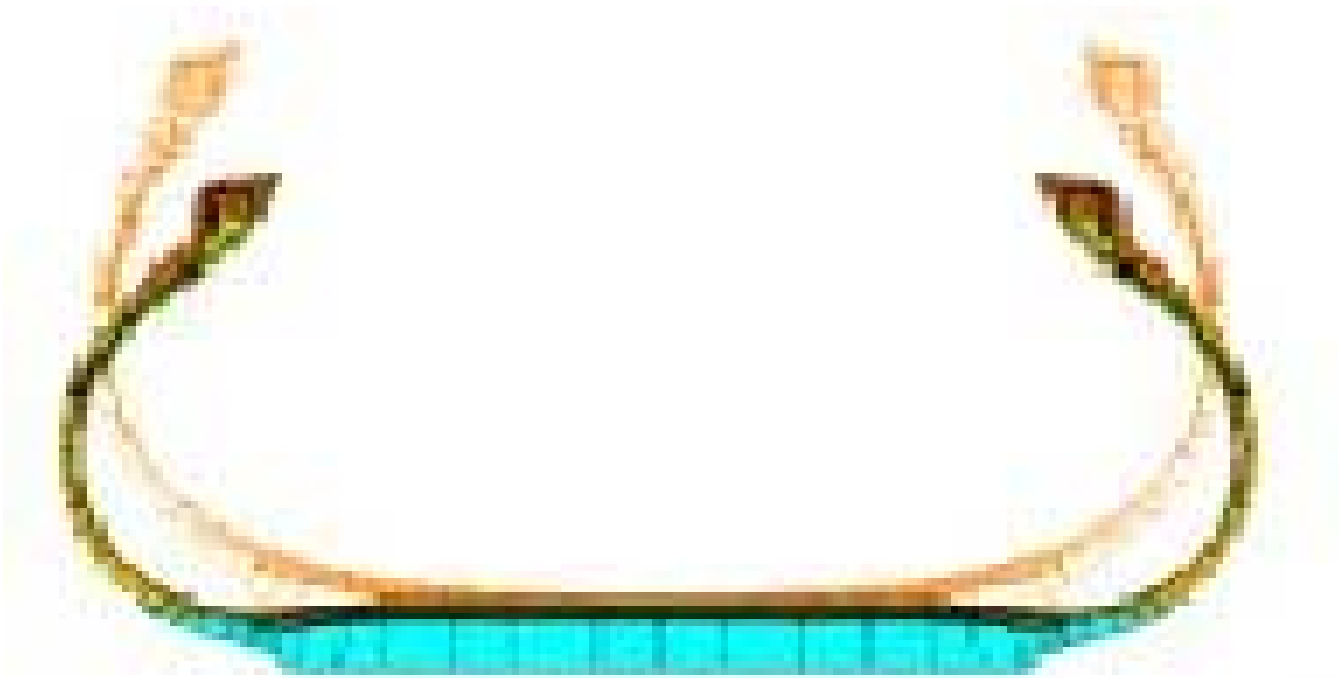
Share of Tyre/Road Noise as Part of Total Noise Level



Potential : Tyre/Road Noise Spectrum of Driving Noise (Road Influence)



The problem of (too) big tolerances



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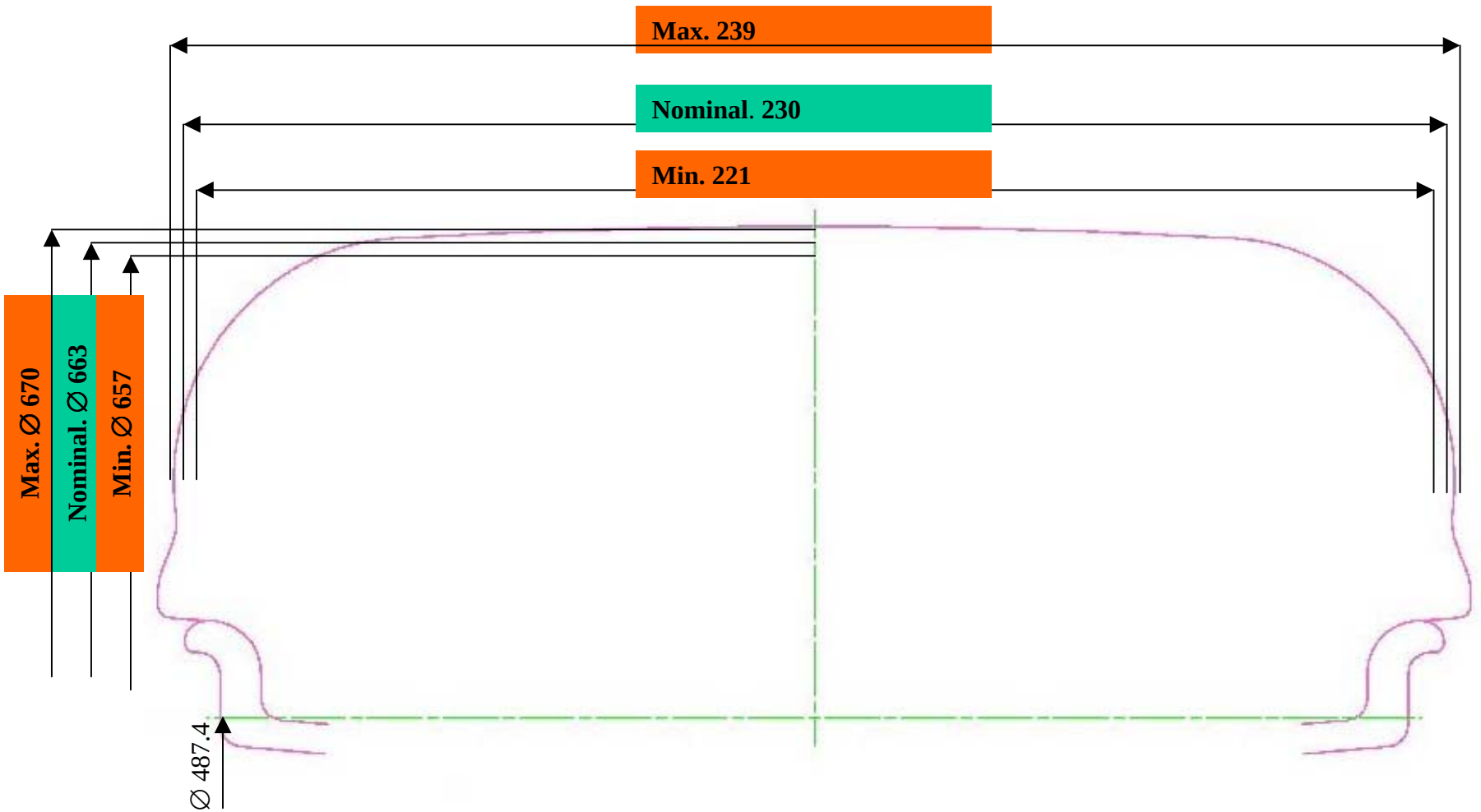


Max. allowed tolerances, new tyre **225/40 R 19 + 8.0 J * 19**
summer and winter tyre

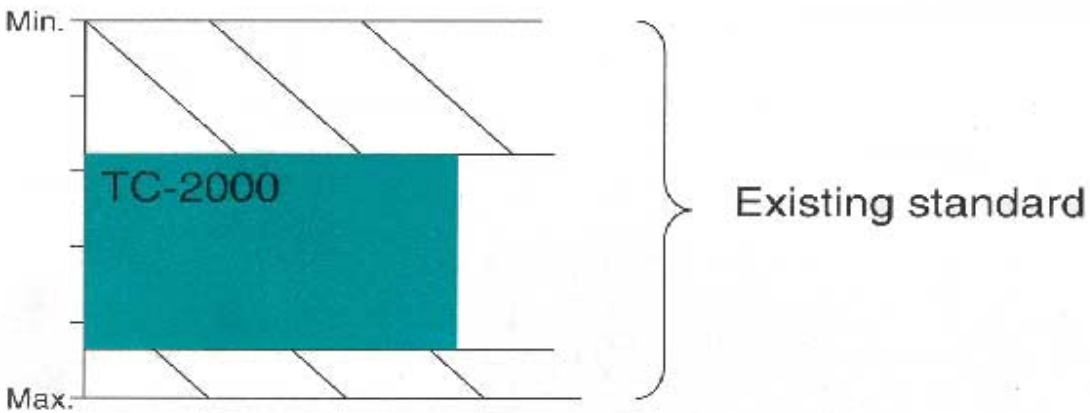
“TC-2000“ (Tyre Concept 2000)

Tolerances

D640x200/65 R15 92H new TC-2000

195/65 R15 91H existing standard

(195/65 HR 15 „old“ standard)



Double Marking (DM) should be possible, if the new tolerances are inside the existing tolerances; DM was possible from “HR“ to “R...H“!

Proposal for a Commission Directive
- amending Council Directive **92/23/EEC** (types for motor vehicles and their trailers)
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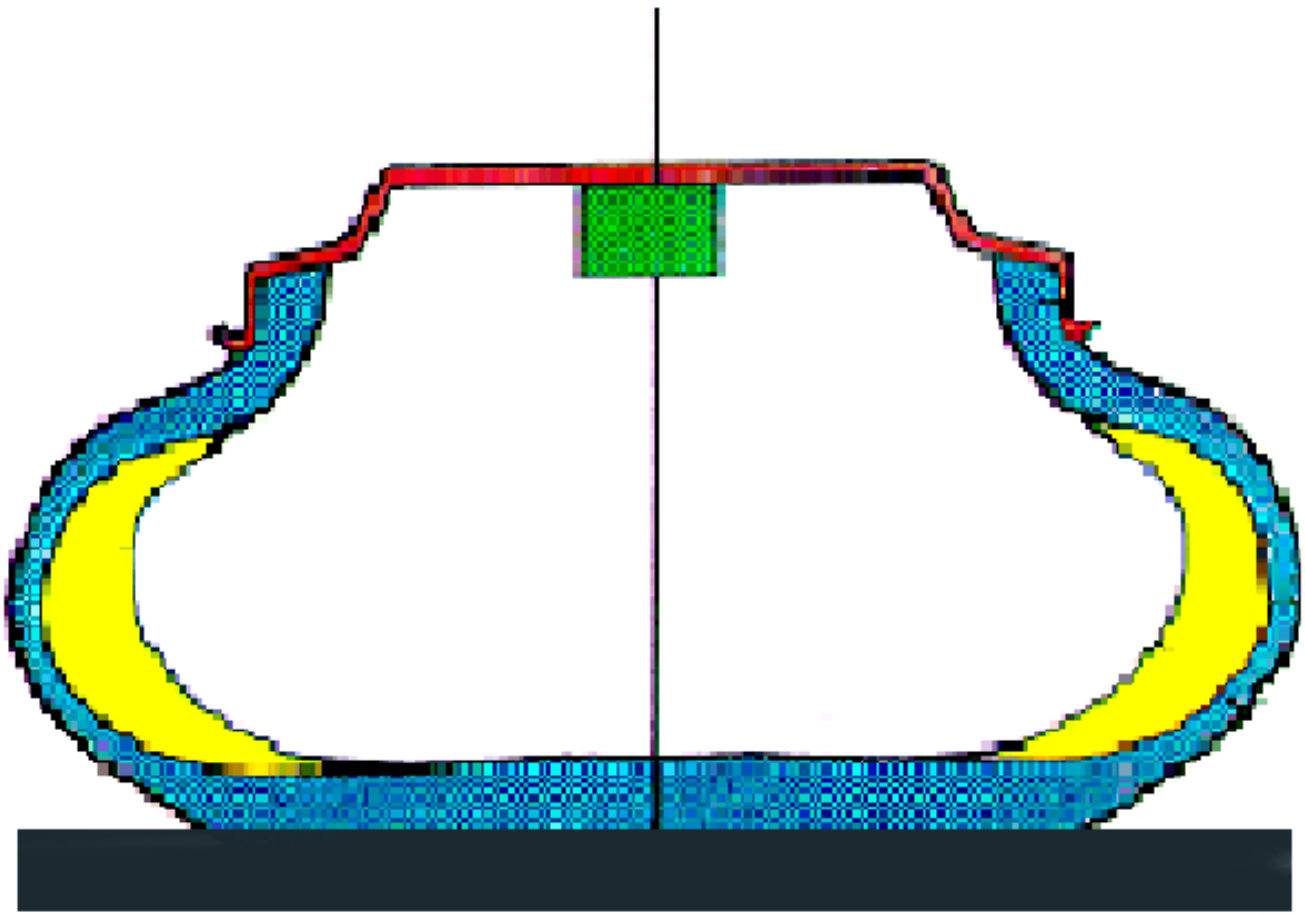
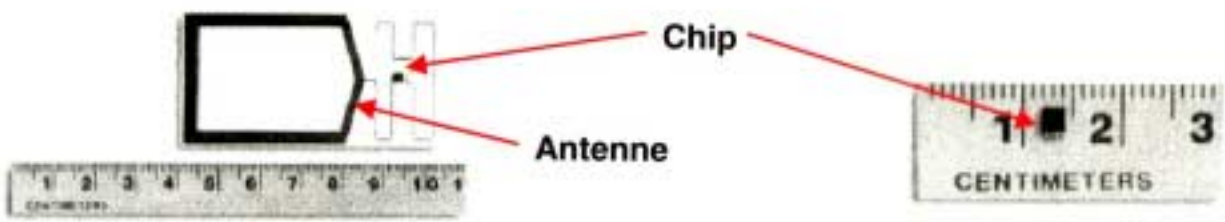
Runflat- or Extented Mobility Tyre / Wheel System



Transponder-Technology in Passenger Car Tyres

Der Transponder:

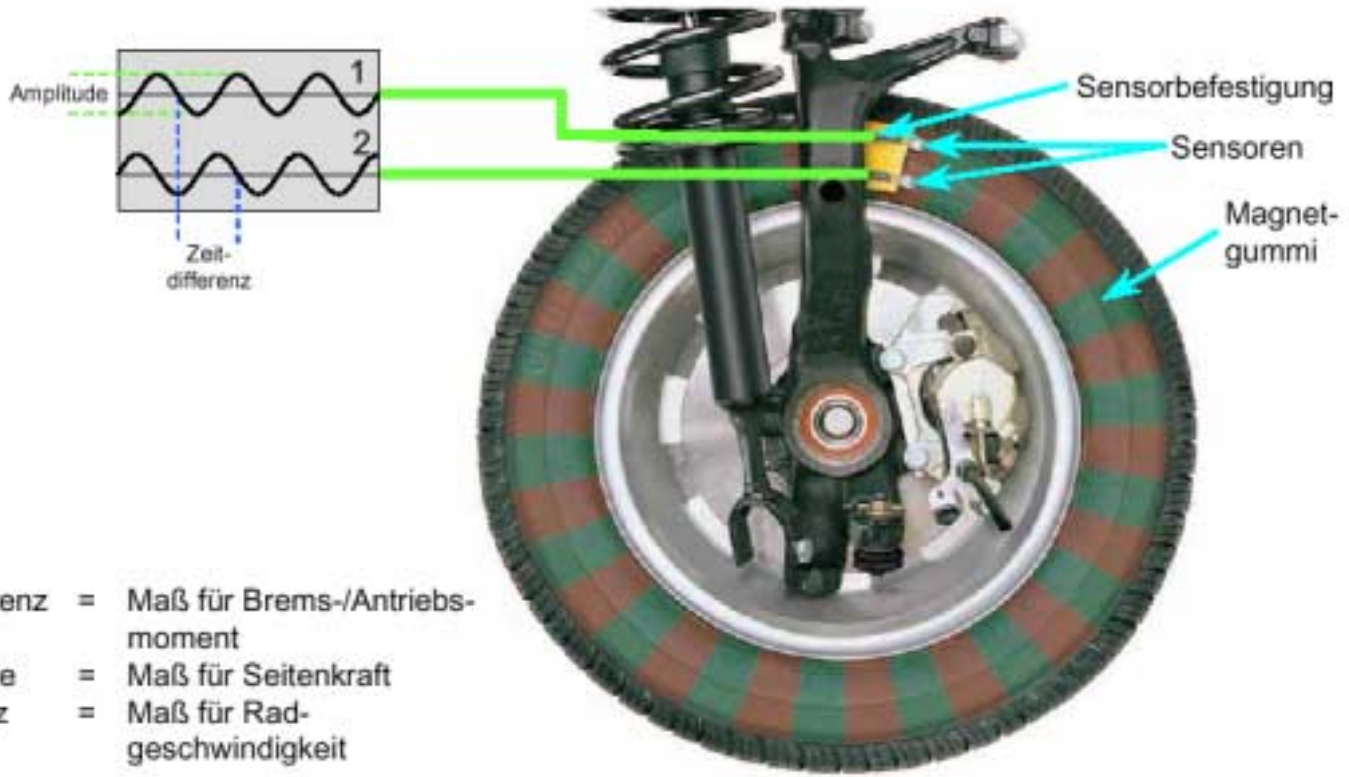
"…besteht grundsätzlich aus Chip und Antenne, wobei Daten im Chip gespeichert, verändert, ergänzt oder gelöscht werden können."



Hauptvorteile der Transpondertechnologie:

- große Dateninhalte bei geringer Baugröße (Chiptechnologie)
- Lesen/Schreiben erfolgt: *berührungslos, orientierungsunabhängig, ohne Sichtverbindung*
- Mehrfach beschreibbar
- Daten elektronisch les- und auswertbar
- Lesedistanz und Richtung variabel
- Großer Temperaturbereich
- Keine Eigenenergie notwendig
- Mehrere Transponder gleichzeitig lesbar

Sidewall Torsion Sensor
How it Works in a Car



Zeitdifferenz = Maß für Brems-/Antriebs-moment
Amplitude = Maß für Seitenkraft
Frequenz = Maß für Rad-geschwindigkeit