Past > Development of Tire Requirements

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www.continental-tires.com
Continental
Long partnership with Original Equipment

OE article count

PremiumContact 6
more than 70 articles already in development

ContiSportContact 3
ContiPremiumContact 5 &
ContiPremiumContact 5

ContiSportContact
ContiSportContact 2
ContiPremiumContact 2

2017

TechnikForum 2016
Growing Complexity in the OE Segment
Growing Complexity in the OE Segment

OE fitments

<table>
<thead>
<tr>
<th>Land Rover D90 from the 1980s</th>
<th>Porsche Macan, 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 OE tire</strong></td>
<td><strong>20 OE tires</strong></td>
</tr>
<tr>
<td>All-round fitment</td>
<td>Mixed fitment</td>
</tr>
<tr>
<td>Summer</td>
<td>Summer</td>
</tr>
<tr>
<td>All season</td>
<td>18&quot;</td>
</tr>
<tr>
<td>Winter</td>
<td>18&quot;</td>
</tr>
<tr>
<td></td>
<td>19&quot;</td>
</tr>
<tr>
<td></td>
<td>20&quot;</td>
</tr>
<tr>
<td></td>
<td>21&quot;</td>
</tr>
</tbody>
</table>

- In the 1980s there was often just one single tire size available as OE
- For the current Porsche Macan, Continental offers 20 different OE tires
Tire Requirements according to Target Market

Ideal tires for each target market

› Information is collected on which types of tires are most popular in specific target countries and what customers in individual markets expect from them.

› In emerging markets tires need to be particularly robust and if necessary capable of withstanding loads that go beyond normal standards, while luxury-segment customers in Asia want tires that run very quietly.
# Tire Requirements in Europe

Ideal tires for Replacement & each individual OE partner

<table>
<thead>
<tr>
<th></th>
<th>Handling</th>
<th>Dry Braking</th>
<th>Mileage</th>
<th>Rolling Resistance</th>
<th>Noise</th>
<th>Wet Braking</th>
<th>Hydro-planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer A</td>
<td>++</td>
<td>++</td>
<td>+</td>
<td>+++</td>
<td>++</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Customer B</td>
<td>+++</td>
<td>++</td>
<td>0</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>Customer C</td>
<td>+</td>
<td>0</td>
<td>++</td>
<td>++</td>
<td>+++</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Replacement</td>
<td>+</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>+</td>
<td>+</td>
<td>0</td>
</tr>
</tbody>
</table>

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*Continental*

*TechnikForum 2016*
Growing Importance of Rolling Resistance

Global CO$_2$ budget per capita

- US
- CA
- SA
- AU
- KR
- RU
- JP
- DE
- ZA
- UK
- EU
- IT
- FR
- CN
- MX
- TR
- AR
- BR
- ID
- IN

[tCO$_2$/capita]

2020

2050

2008
Growing Importance of Rolling Resistance

CO₂ goals of Germany

CO₂ goal per capita till 2050:
- Consequence for the CO₂ emission per vehicle

<table>
<thead>
<tr>
<th>Year</th>
<th>CO₂ Emission</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>130 g/km</td>
</tr>
<tr>
<td>2020</td>
<td>95  g/km</td>
</tr>
<tr>
<td>2050</td>
<td>30  g/km</td>
</tr>
</tbody>
</table>
Growing Importance of Rolling Resistance

Why the focus on new tire solutions?

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Tire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rolling Resistance</td>
<td>16 %</td>
<td>16 %</td>
</tr>
<tr>
<td>Air Resistance</td>
<td>36 %</td>
<td>4,5 %</td>
</tr>
<tr>
<td>Internal Friction</td>
<td>32 %</td>
<td>0 %</td>
</tr>
<tr>
<td>Inertial Resistance</td>
<td>16 %</td>
<td>0,4 %</td>
</tr>
<tr>
<td>Total Resistance</td>
<td>100 %</td>
<td>20,9 %</td>
</tr>
</tbody>
</table>

Source: Continental AG certified ecobalance of a tire, 2012
The Tall & Narrow Tire Concept
Tailor made for the Renault Scenic

› Launch of new Scenic and Grand Scenic in 2016
› Single tire fitment with 195/55 R 20
The Tall & Narrow Tire Concept

Tall & Narrow vs. Standard Tire

› Key development focus
  **Rolling Resistance (RR)**

› Reference tire PremiumContact 5 in 17”

› One Label class improvement and a 15% improvement in Rolling Resistance

› Result is a reduction in fuel consumption and CO₂ emissions

› Improvement in wear, even with reduced pattern depth

› Exceptional handling performance

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205/55 R17 95 V XL CPC5 J95

195/55 R20 95 H XL CEC5

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**TechnikForum 2016**
The Tall & Narrow Tire concept

Impressive rolling resistance from summer to extreme winter

The new Tall & Narrow tire concept ensures lower fuel consumption and CO₂ emissions, even for Nordic winter fitments, where Continental is the single supplier in this size.

Summer

ContiEcoContact™ 5

<table>
<thead>
<tr>
<th>EU tyre label value</th>
<th>A*</th>
<th>B</th>
<th>dB</th>
</tr>
</thead>
</table>

*15% improvement

Winter

WinterContact™ TS 850 P

<table>
<thead>
<tr>
<th>EU tyre label value</th>
<th>B*</th>
<th>C</th>
<th>dB</th>
</tr>
</thead>
</table>

*12% improvement

ContiVikingContact™ 6

<table>
<thead>
<tr>
<th>EU tyre label value</th>
<th>C*</th>
<th>F</th>
<th>dB</th>
</tr>
</thead>
</table>

*9% improvement
Growing Importance of Tire Noise

Influencing factors

<table>
<thead>
<tr>
<th>Regulation</th>
<th>U-UHP</th>
<th>New Customers</th>
</tr>
</thead>
</table>

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Road surface causes vibration of tire crown

Tire crown vibration leads to a variation of air pressure inside tire cavity

Alternating force on wheel / rim / suspension

Vibration of cabin panels generating interior noise
Growing Importance of Tire Noise
Current situation within OE business

- Strong development focus of OEM customers on interior noise level
- Low aspect ratio tires show higher sensitivity towards the cavity noise phenomenon
- Distinctive noise peak between 200 and 250 Hz
ContiSilent features a foam absorber placed on an adhesive layer inside the tire.

ContiSilent can reduce road noises inside the vehicle by up to 9 dB(A).

Depending on the type of vehicle, tire size, speed and road surface.
ContiSilent
Target Approvals for OE Summer Tires

Target Approvals

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Thank you for your attention!