



# THE EVOLUTION OF AIR SPRING SYSTEMS

# ERA OF NEW COMFORT

## It All Started with Air Spring Bellows

- › Air Spring bellows were used as suspension for commercial vehicles to provide a smoother ride
- › New level of comfort enables travel with strongly reduced impacts, vibration and noise
- › Introduction of adaptive suspension technology offering new functions for commercial vehicles like kneeling of buses and lifting for trucks and trailers



# ERA OF SYSTEMS

## Integrating Structural Components

- › Continental became a full system supplier
- › Consolidated Air Spring systems as “full design system” with “integrated structural components”
- › Introduction of rigid crimped interfaces and vulcanized structural components enable enhanced kinematic stability for advanced axle designs with maximum travel capacity
- › Consolidated system approach with delivery as one-piece design simplifies product handling and streamlines vehicle assembly



# ERA OF HIGH TECH

## Excellence in Technology

- › High Tech development is fundamental to Continental's position as pacemaker in the air spring market
- › Introduction of polyamide comfort piston with fully usable inner volume, **reducing the air spring weight by up to 30 %, this makes 12 kg weight saving for the truck axle**
- › Introduction of synthetic rubber compound Chloroprene for Air Springs providing improved weathering resistance (ozone resistance)
- › Introduction of high performance modification of Chloroprene Heat RaCR for hot countries life time improvement up to 80°C



# ERA OF SUSTAINABILITY

## Sustainable Highly Flexible Material

- › Continental is committed to the Paris Agreement and is aiming for 100% carbon neutrality by 2050 at the latest - along its entire value chain
- › Actively improving the environmental impact of air springs through
  - use of recycled materials
  - improved recyclability of materials
  - use of bio-based instead of fossil-based materials



### Bead Plate

Green steel in the bead plate reduces material carbon footprint by 50%

### Rubber Compound

Replacing Chloroprene with Tough RuNR reduces material carbon footprint by over 45%

### Fabric

Recycled polyester replaces polyamide, reducing material carbon footprint by over 45%

### Piston

Sustainable thermoplastics replace steel, reducing material carbon footprint by 55%



Discover more about our ambitious sustainability roadmap

**Our sustainable air spring concept reduces the overall product carbon footprint, including manufacturing emissions, by over 45%.**



Non 3rd party-certified estimation oriented towards ISO 14040/14067. System boundaries: Cradle-to-gate.  
Methodology: CML2001, category "Global Warming Potential". Purchased goods (scope 3): Emissions LCA for Experts database & suppliers (if available and 3rd party-certified). Purchased goods (scope 3): Average emission data for green steel from public manufacturer source.  
Scope 1 & 2 and other Scope 3 emissions: Calculated by using weight-based approach.

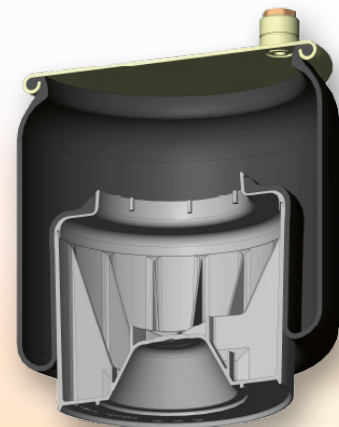
# LIGHT WEIGHT AIR SPRINGS

## Raising Efficiency with Polyamide Solutions

- › Reducing the air spring weight by up to 30%, this makes 12 kg weight saving for the truck axle

### Benefits

- › Less fuel consumption
- › Reduction of energy and operating costs
- › Payload increase
- › Road protection and higher comfort by reduction of unsprung axle mass
- › Compensate additional weight of Euro 6 exhaust treatment



# TOUGH RUNR AIR SPRINGS

## Excellence in Technology

Continental's material experts have substituted synthetic rubber with natural rubber that has been improved by ethylene-propylene-diene rubber (EPDM).

By doing so, the rubber compound's carbon backpack is reduced by more than 45 percent while achieving the same product performance

- › Tough RuNR offers the perfect combination of material properties with dynamic excellence and protective properties for Air Springs
- › Low temperature operability like Natural Rubber (NR)
- › Improved aging resistance to tough environmental conditions - high temperature - ozone - UV - chemicals - like Chloroprene Rubber (CR)



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