

# RubberWorld

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**Thermoelastic properties and relaxation behavior of S-SBR/silica vulcanizates**

**A step forward in introducing the silica/silane system in natural rubber**

**CO<sub>2</sub> clean manufacturing technology – a business sustainability strategy**

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International Rubber Expo Information on page 44



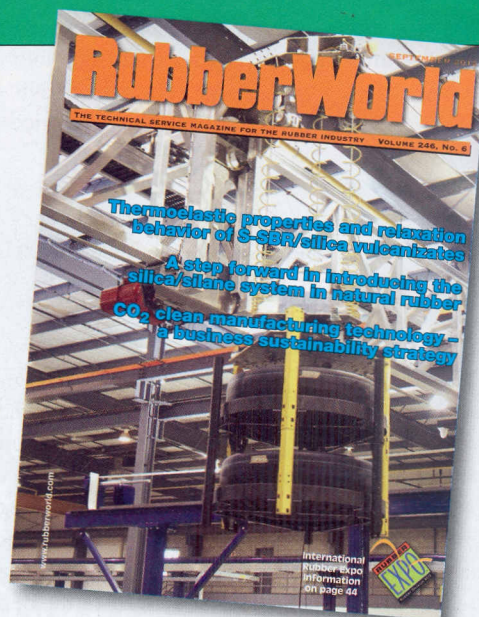
## FEATURES

### 18 Thermoelastic properties and relaxation behavior of S-SBR/silica vulcanizates

by Norbert Vennemann and Miao Wu, University of Applied Sciences Osnabrück, and Michael Heinz, Orion Engineered Carbons. Thermoelastic properties and the relaxation behavior of silica-filled S-SBR vulcanizates were investigated in this research project, and the method presented here constitutes a meaningful complement to the usual Payne effect measurements.

### 24 A step forward in introducing the silica/silane system in natural rubber

by Anke Blume, Janine Fähr and Clément Morisse, Evonik Industries. Influence of impurities like amino acids in natural rubber on the silica/silane reaction are studied, and a combination of Ultrasil 7000 GR and VP Si 363 is recommended, with Ultrasil 7000 GR showing a high amount of reactive silanol sites on the surface to enable a high coupling efficiency, and VP Si 363 guaranteeing a sufficient coupling rate.



Cover photo: Courtesy of RMT Robotics Ltd.

### 31 CO<sub>2</sub> clean manufacturing technology for business sustainability

by David Jackson, CleanLogix. Merging of green practices into manufacturing promises to deliver additional value in the form of less chemical, energy, labor and water usage, as well as fewer pollutants.

## DEPARTMENTS

- 4 Editorial
- 6 Business Briefs
- 10 Market Focus
- 12 Silicone/Medical Update
- 15 Patent News
- 38 Meetings
- 46 Suppliers Showcase
- 51 People in the News

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