tire technology EXPO 2018

20, 21, 22 FEBRUARY 2018

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10:50 The use of EPDM for improved tire sidewall performance

Philip Hough, senior technical manager, Arlanxeo Performance Elastomers, NETHERLANDS

Attention is given to the use of EPDM in tire sidewall compounds to replace PPDs for non-staining ozone protection. EPDM has a fully saturated polymer backbone, giving it excellent resistance to ozone and oxidative ageing, unlike polydienes that are susceptible to main chain scission. Blending of EPDM with natural and polybutadiene rubbers presents challenges due to differences in solubility and cure rates. However, it is shown that combining best practice for compound design, mixing methodology and the type of EPDM gives sidewall compounds closely matching typical sidewall properties, but with improved heat ageing, ozone resistance and dynamic behaviour.

11:15 - 11:35 Break

11:35 Bio-Liquid Polymer for winter tires

Keiji Ikeda, manager, Sumitomo Rubber Industries Ltd, JAPAN

Sumitomo Rubber Industries Ltd has adopted Bio-Liquid Polymer (BLP) in tread compounds for winter tires. BLP enhances ice grip because it improves softness of the tread rubber compound. In addition, BLP has the unique characteristic that it can stay in rubber compound longer term and keep softness longer than conventional oil. This means ice grip is maintained for the long term. Also in this presentation, Sumitomo's activities on biomass material and simulation technologies will be reported.

12:00 Current developments in rubber rheology

Jorge Lacayo-Pineda, head of materials evaluation expert field, Continental Reifen Deutschland GmbH, GERMANY

Some of the latest innovative developments in the assessment of rubber rheology, including temperature scanning stress relaxation and Fourier transform rheology, are described and their potential to contribute to the understanding of basic rubber behaviour is discussed. Examples of applications on natural and synthetic rubbers are presented to illustrate these new techniques.

12:25 Functionalised polymers and their effect on tire performance

David Hardy, technical service and development, Arlanxeo Deutschland GmbH, GERMANY

Functionalising butadiene rubbers is a proven method employed to improve their interaction with silica fillers. This results in the enhancement of dynamic performance in passenger tire tread compounds. Tire testing data will show that this results in reduced rolling resistance but can also lead to a deterioration in other important tire properties such as handling/cornering (among others), which are not covered by the tire label.

12:50 - 14:00 Lunch

14:00 SSBR for energy-efficient and safe tires

Dr Sven Thiele, R&D leader process and product development anionic, Trinseo Deutschland GmbH, GERMANY

Energy efficiency and safety standards are at the centre of any tire approval process, and durability is often key to consumers' purchasing decisions. Furthermore, good rubber formulation process conditions are a key characteristic of an economical tire plant. The diverse market needs for high-performance passenger car tires is addressed by Trinseo SSBR products and developments. Therefore, a new Trinseo grade improves tire grip properties, and another new Trinseo functionalised SSBR grade enables a substantial rolling resistance/grip balance improvement with good rubber formulation processing characteristics. SSBR capacity expansion at Trinseo is going to enable the market availability of the new grades.

14:25 Quality improvement of tire compounds by fine mesh straining

Winfried Trost, business area manager rubber extrusion systems, UTH GmbH, GERMANY

Product quality requirements have been continually growing for the rubber processing industry during the past few years, while the pressure to contain costs has significantly increased for some elastomer products. Clean rubber compounds are the prerequisite for meeting these requirements. Impurities lead to an increase in the reject and waste rates. This problem can be counteracted by straining the rubber compound. The Roll-ex gear extruder technology allows the precise extrusion of materials and the use of extremely fine strainers.

14:50 Advantages of NKNK new rubbers for tires production

Alexander Shalfeev, deputy chief process engineer, NKNK, RUSSIA

The presentation shows the results of the company development of new commercial and prospective grades of rubber. For today, three new grades of anionic and stereoregular rubbers have been developed at NKNK to produce high-performance tires with low rolling resistance, improved wet grip and wear resistance. Further prospective fields of BR and SSBR development will be presented.

15:15 Easy processing SSBR for UHP tread and high silica load

Dr Fabio Bacchelli, technical manager, tire, Versalis, ITALY

Manufacturers of UHP tires can now overcome the difficult processing of traditional high-performance batch SSBR. A high molecular weight continuous grade containing a controlled amount of long chain branching was specially designed to optimise processing and performance at the same time. The molecular architecture able to conjugate those extremely different aspects was determined on the basis of relaxation time spectrum and non-linear viscoelasticity. By considering high-severity recipes with more than 100 phr of silica, the processability results are comparable with those of emulsion SBR, while keeping the traction properties at the same level as traditional batch grades.

15:40 - 16:00 Break

16:00 Liquid rubber for safer and faster tires

Marcel Gruendken, technical manager, elastomers, Kuraray Group & University of Twente, GERMANY

Kuraray Liquid Rubber (KLR) acts as a co-vulcanisable plasticiser and provides rubber modification that exceeds the pure plasticising effect. This presentation introduces the different liquid diene rubbers. Depending on the backbone and microstructure, liquid rubber can modify tire performances such as abrasion resistance, rolling resistance and wet grip as well as snow and ice grip. In particular, the latter can be significantly improved by liquid polybutadiene (LBR). This will be discussed via DMA characteristics and ice grip test results.

16:25 New functionalised SSBR types for overall improved tire performance

Chigusa Yamada, synthetic rubber development, Asahi Kasei Corporation, JAPAN

Asahi-Kasei Solution-SBR (S-SBR), developed with proprietary functionalisation, brings significant improvement to the balance between fuel efficiency, wet grip and wear resistance of high-performance eco-tire treads. New S-SBR grades will be introduced and a new strategy for eco tires will be presented. A special emphasis will be laid on the relationship between polymer structure and performance in vulcanised compounds.