Targeting the tire ‘triangle’

Rubber and materials company, Trinseo, is developing its neodymium BR (Nd-BR) capability, in a bid to supply tire market more effectively, according to the company’s new head of synthetic rubber business unit Samer al-Jabi, who took over in October 2015.

The focal point is, according to Al-Jabi, collaboration with customers to develop rubbers with improved processing characteristics while also preserving performance attributes, such as low rolling resistance and effective abrasion.

To this end, Trinseo has increased long-term investments into rubber R&D in 2016. “Our product pipeline ranges from concept research to new experimental polymer grades,” said Al-Jabi.

An example is Trinseo’s neodymium butadiene rubber (Ni-BR) technology. In 2014, Trinseo announced that it was converting its nickel butadiene rubber (Ni-BR) production train in Schkopau, Germany to manufacture Nd-BR.

“Though we are a newcomer in Nd-BR technology, we decided to tackle different polymer viscosity versions,” explained Al-Jabi.

Trinseo, he said, expects its start-up ND-BR to meet the “increasingly strict and demanding market requirements and standards that are now imposed on the processing and performance balance of products in these rubber industries”.

In adding Nd-BR capability, Trinseo is implementing proprietary technology for production of standard as well as functionalised high-cis Nd-BR, the rubber boss added.

Al-Jabi, however, declined to give further details on the time and scale of the Nd-BR production plans.

He went on to say that one of the most important trends in the tire and rubber industry was the need for more sustainable products.

Green tires

Consumers worldwide are shifting toward “green tires” with lower rolling resistance, which results in increased energy efficiency and decreased fuel costs and carbon emissions, explained Jabi.

Manufacturers, he said, are in response increasing production of green tires that minimise rolling resistance without sacrificing safety – or wet grip – and performance – high abrasion resistance.

To meet the demand, Trinseo introduced two new additions to its range of Sprintan solution styrene butadiene rubber (SSBR) in 2014.

The grades of functionalised SSBR, according to Trinseo, allow a balance of low rolling resistance and high abrasion resistance, and reduced stiffness at low temperatures. Among other benefits, the feature can boost snow grip potential in winter tread applications.

According to Jabi, the new SSBR grades, which can partially replace traditional rubber grades, can technically reduce fuel consumption by up to three percent.

“Over a typical life span of a set of tires – about 45,000 km – that could mean savings of up to 80 liters of fuel compared to traditional tires,” the Trinseo boss pointed out.

Trinseo has also developed a new oil-extended SSBR that offers several improved properties. It enables tire producers to move up the boundaries of the “magical triangle” of rubber properties in “all dimensions” and “previously unreachable levels”.

In the production of the grade, Trinseo has employed a new technology to manufacture multifunctionalised polymers.

This process, explained Jabi, enhances the interaction of the rubber polymers with silica and carbon black fillers, therefore limiting the hysteretic energy loss and improving filler distribution in the rubber.

Together, these effects decrease the heat build-up and rolling resistance in tires, helping tire-makers produce more suitable products.

Al-Jabi pointed out that Trinseo also employs a proprietary batch process which gives it more control over the modification process and therefore allows it to produce “tailor-made products” for its customer base and their differing needs.