

Is the new nature-mimicking Velcro concept feasible for an alternative silica/polymer coupling??

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A new concept for an alternative silica/polymer coupling system was introduced to the tire industry in 2019 to overcome the disadvantage of the current system. If currently the relatively stiff covalent sulfur bridge of the silica/silane/polymer connection is broken, there is no possibility to reconnect. As a consequence, a completely different coupling concept was considered, mimicking the Velcro system known from nature. The tangled and cross-linked rubber macromolecules act as molecular loops and relatively long elastomer brushes grafted on the silica surface act as molecular hooks. The in-rubber properties will be presented to show the efficiency of this new system.