

Vyncolit NV and Sumitomo Bakelite Co., Ltd. Co., Ltd. summit highlights need for lightweighting powertrains in the electric future

- Industry experts gathered for the Vyncolit NV and Sumitomo Bakelite Co., Ltd. 'Lightweight Composite Solutions Conference' in Gent last month.
- Attendees from the automotive industry's best and brightest discussed the pressing need for lightweight parts in both internal combustion and electric motor-based drivetrains, and detailed how composites will be key to making this happen.
- The switch to Vyncolit NV and Sumitomo Bakelite Co., Ltd. plastics and materials in parts such as fuel pumps, electric motor housing and brake system parts is proven to dramatically slash weights and reduce costs.

Vyncolit NV and Sumitomo Bakelite Co., Ltd., Gent, Belgium, May 17th 2018: Powertrains, be they conventional, hybrid or fully electric, will need to be light in weight if carmakers are to meet the stringent regulations on carbon dioxide emissions (CO₂) to come into force in 2025 - and composites will be key to making this happen.

This was the key message delivered at the *Lightweight Composite Solutions Conference* organized by thermoset plastics professionals Vyncolit NV and Sumitomo Bakelite Co., Ltd. and held in Gent, Belgium.

The conference was attended by over 50 experts from leading OEMs, suppliers and research institutes in automotive lightweighting, including Nissan Motor, Volkswagen, Renault Nissan Mitsubishi, FEV Europe, Brembo, Robert Bosch, Mahle Filtersysteme, KraussMaffei and the Fraunhofer Institute for Chemical Technology (ICT).

The automotive industry is on the cusp of some dramatic changes. Increasingly stringent regulations on carbon dioxide emissions are driving a move away from vehicles with conventional internal combustion engines to those with hybrid and fully electric powertrains. For example, in Europe, the fleet average emissions to be achieved by all new cars in 2021 is 95 grams of CO₂ per

kilometre. By 2025, this could be reduced further to 75 grams of CO₂ per kilometre. The average emissions level of a new car sold in 2016 was 118.1 grams of CO₂ per kilometre.

With the powertrain accounting for 32% of an electric vehicle's weight, reducing this figure will be key in enabling these vehicles to travel further on a single charge and allowing smaller and cheaper batteries to be used.

The managing director of Vyncolit NV, Pieter Vanderstraeten, told the conference delegates: "All OEMs, have a lot of work to do in the next six to seven years. Lightweighting will be key in hitting these targets, regardless of the drivetrains employed. For electric vehicles, there are few standard technologies and limited means for the true mass production of electric motors. The need for regenerative technologies, small city cars and autonomous vehicles will change the requirements of braking technologies. All of these present opportunities for lightweight composite solutions."

Nissan's General Manager of planning group, powertrain technology and prototype development department, Kimio Nishimura, outlined the OEM's mid-term plan "*M.O.V.E to 2022*" to accelerate the electrification of its vehicles in order to hit the CO₂ targets. He highlighted the need for compact, efficient and powerful motors, and heat-resistant, thermally conductive and low-permittivity materials for their construction.

Sumitomo Bakelite Co., Ltd. has developed a broad portfolio of materials and processing expertise that enable its partners to not only reduce the weight of their powertrain parts in comparison with metal solutions, but also save money through the opportunities plastics present for integrating many functions into a single component.

For example, Fraunhofer ICT's Lars-Fredrik Berg talked delegates through the *DEmiL* project, the aim of which is to develop a direct-cooled electric motor with an integrated lightweight housing that delivers power on a consistent basis. A highly-filled, low-viscosity epoxy from Sumitomo Bakelite Co., Ltd. is used to overmould the motor's stator. Channels are formed during this transfer moulding process that help to cool the active materials, helping to produce a motor with a very high weight-specific power output.

In internal combustion engines too, there is still a significant scope for lightweighting using composites, thereby lowering fuel consumption and CO₂ emissions. Group leader for composite materials at Robert Bosch, Gerrit Hülder, outlined the company's work replacing aluminium fuel pumps with those made from plastics. Not only did this switch of materials lead to a weight saving of 40%, it also cut costs by 30% through a reduction in part count.

Further still, Vyncolit NV's Chief Innovation and Technology Officer Hendrik De Keyser told delegates that the use of phenolic resin for the manufacture of brake pads can slash the weight of the brake systems in a car by 1kg.

Conference chair, Fraunhofer ICT Institute Leader Frank Henning said: "Two thirds of innovations are based on developments in materials science. Materials seem to be old economy, but they are enablers of the new economy."

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