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THE USE OF SOLVENTS IN AUTOMOBILES

Every year there are more than 52 million cars produced in the world. That's almost two cars per second! Solvents play an essential role in the production and the performance of many key components in cars and related products. Solvents ensure that when you drive, your journey is as safe as possible: they are used in tyres and brake pads; and because they prevent water from freezing, solvents make sure that windscreen washer fluid actually dissolves dirt on your windshield. Let's look a little bit closer.

FUEL ADDITIVES

Thanks to fuel additives, the petrol that fuels our cars is more efficient and more powerful. Hydrocarbon solvents are often used in fuel additives as a carrier medium to deliver detergents to the engine. Detergents are an important aid in preventing deposit build-up within the engine. Today's cars are equipped with sophisticated engine systems, which ensure fuel burns as efficiently and properly as possible. It is critical that an engine system stays clean, not only to guarantee that our car runs smoothly, but also to keep emission levels low for the entire life of the car.

WINDSCREEN WIPING FLUID AND DE-ICING FLUID

Isopropyl alcohol (IPA), the main component in windscreen wiping fluid and de-icing fluid, has high evaporation rates, adequate volatility and low odor. In these fluids, IPA is primarily mixed with water; however, the water to IPA ratio depends on the season. IPA has a lower freezing point than water and so more IPA is used in the winter months, preventing the fluids from freezing. For windscreen wiping fluids, in addition to water, IPA is combined with a cleaning detergent and a small amount of ethylene or propylene glycols.

BRAKE SYSTEM

Brake fluids facilitate the transfer of pressure (power and speed) from your brake pedal to your brake pads. Alcohol based glycol ethers, used for these hydraulic fluids, have several interesting properties that ensure this process systematically takes place, guaranteeing that when you break, your car actually slows down. Glycol ethers are hygroscopic and attract water. As such, the glycols absorb water so that it does not end up in the breaking system or elsewhere in the car. Thus, glycols prevent the creation of a vapour lock hazard which arises from water turning into steam under heat and pressure - glycol ethers assure the integrity of your brake hydraulics system. Furthermore, these solvents remain fluid over a wide range of temperatures and make sure the brake system is properly lubricated.

TYRES

Dearomatised aliphatic hydrocarbon solvents with various boiling point ranges are used in the production of tyres. From the outside, tyres look as though they are one solid piece of rubber but they are in fact produced in a complex process that 'glues' together many layers of rubber - hydrocarbons act like a glue to bind these layers together.

Solvents also play an indirect role in the production of the rubber used for tyres. Rubber is a polymer, made from molecules reacting together. This reaction must take place in a *solvent environment* to keep it under control. Methyl isobutyl ketone (MIBK) is also used to delay the cracking of tyres over time, which can be accelerated by very high or very low temperatures.

COATINGS

Automotive coatings do more than just colour your car (although coatings do allow for great customization, providing a wide choice of colors and gloss finishes). The coatings layer has many functions to protect from rain, snow, sun's ultraviolet rays, corrosion and stone or pebble chips.

Alkyl esters and glycol ether esters used in coatings have high solvency power and slow evaporation rates. These properties allow the coatings to stay in liquid form so it can be easily applied to the car but also ensure that it dries within a relatively short period of time. n-Butyl acetate is an important solvent in the coatings industry. Its moderate volatility and its resistance to blushing and levelling problems, such as orange peel effects, make it possible for paints with excellent levelling and gloss to be formulated.

